

QST

December 1969
50 Cents
\$1.00 in Canada

devoted entirely to
AMATEUR
radio



SEASON'S GREETINGS TO ALL



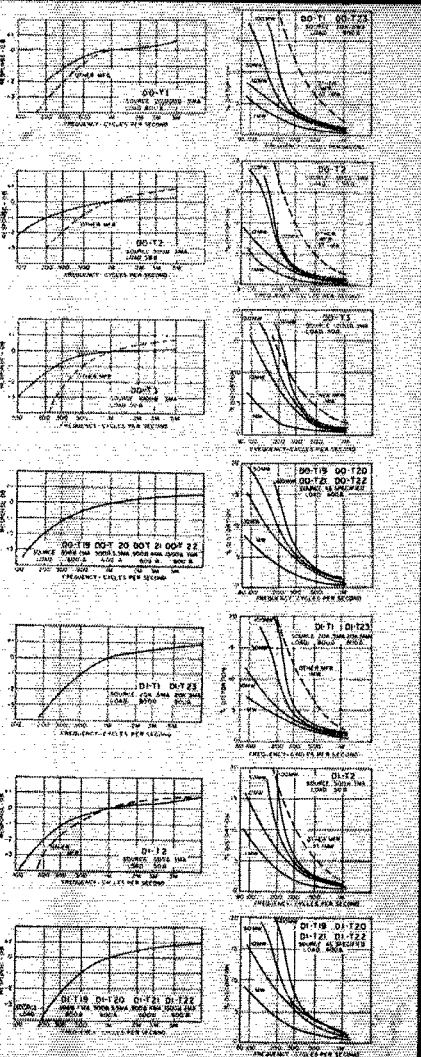
**UTC NEW
EXPANDED**

DO-T and DI-T SERIES

Drawn Hipermetall shield and cover for DO-T's, provides 25 to 30 db shielding, for DI-T's DI-TSH
DCMA shown is for single ended usage (under 5% distortion—100MW—1KC) for push pull, DCMA
can be any balanced value then by 5W transistors (under 5% distortion—300MW—1KC)
*DO-T units have been designed for transistor application only... not for vacuum tube service. Pats. Pend.



DO-T's are available in a wide variety of sizes and configurations to meet your specific requirements. They are designed for high efficiency and low distortion, and are available in both single ended and push pull configurations. For more information, contact your nearest UTC distributor or write to UTC, Dept. 100, New York 13, N.Y.



DO-T No.	MIL Type	Application	Pri. Imp.	D.C. Ma.†	Sec. Imp.	Pri. Res. DO-T	Pri. Mv. DI-T	Level Mw.	DI-T No.
DO-T1	TF4RX13YY	Interstage	20,000 30,000	.5 .5	800 1200	850	815	50	DI-T1
DO-T2	TF4RX17YY	Output	500 600	3 3	50 60	80	65	100	DI-T2
DO-T3	TF4RX13YY	Output	1800 1200	3 3	50 60	115	110	100	DI-T3
DO-T4	TF4RX17YY	Output	600	3	3.2	60		100	
DO-T5	TF4RX13YY	Output	1200	2	3.2	115	110	100	DI-T5
DO-T6	TF4RX13YY	Output	10,000	1	3.2	790		100	
DO-T7	TF4RX16YY	Input	200,000	0	1000	8500		25	
DO-T8	TF4RX20YY	Reactor 3.5 Hys. @ 2 Ma. DC, 1 Hy. @ 5 Ma. DC				630			
DO-T9	TF4RX13YY	Output or driver	10,000 12,000	1 1	500 CT 800 CT	800	870	100	DI-T9
DO-T10	TF4RX13YY	Driver	10,000 12,000	1 1	1200 CT 1500 CT	800	870	100	DI-T10
DO-T11	TF4RX13YY	Driver	10,000 12,000	1 1	2000 CT 2500 CT	800	870	100	DI-T11
DO-T12	TF4RX17YY	Single or PP output	150 CT 200 CT	10 10	12 16	11		500	
DO-T13	TF4RX17YY	Single or PP output	300 CT 400 CT	7 7	12 16	20		500	
DO-T14	TF4RX17YY	Single or PP output	600 CT 800 CT	5 5	12 16	43		500	
DO-T15	TF4RX17YY	Single or PP output	800 CT 1070 CT	4 4	12 16	51		500	
DO-T16	TF4RX13YY	Single or PP output	1000 CT 1330 CT	3.5 3.5	12 16	71		500	
DO-T17	TF4RX13YY	Single or PP output	1500 CT 2000 CT	3 3	12 16	108		500	
DO-T18	TF4RX13YY	Single or PP output	7500 CT 10,000 CT	1 1	12 16	505		500	
DO-T19	TF4RX17YY	Output to line	300 CT	7	600	19	20	500	DI-T19
DO-T20	TF4RX17YY	Output or line to line	500 CT	5.5	600	31	32	500	DI-T20
DO-T21	TF4RX17YY	Output to line	900 CT	4	600	53	53	500	DI-T21
DO-T22	TF4RX13YY	Output to line	1500 CT	3	600	86	87	500	DI-T22
DO-T23	TF4RX13YY	Interstage	20,000 CT 30,000 CT	.5 .5	800 CT 1200 CT	850	815	100	DI-T23
DO-T24	TF4RX16YY	Input (usable for chopper service)	200,000 CT	0	1000 CT	8500		25	
DO-T25	TF4RX13YY	Interstage	10,000 CT 12,000 CT	1 1	1500 CT 1800 CT	800	870	100	DI-T25
DO-T26	TF4RX20YY	Reactor 6 Hy. @ 2 Ma. DC, 1.5 Hy. @ 5 Ma. DC				2100			
DO-T27	TF4RX20YY	Reactor 4.5 Hy. @ 2 Ma. DC, 1.2 Hy. @ 4 Ma. DC					2300		DI-T26
DO-T27	TF4RX20YY	Reactor 1.25 Hy. @ 2 Ma. DC, 5 Hy. @ 11 Ma. DC				100			
DO-T28	TF4RX20YY	Reactor .9 Hy. @ 2 Ma. DC, 5 Hy. @ 6 Ma. DC					105		DI-T27
DO-T28	TF4RX20YY	Reactor .3 Hy. @ 4 Ma. DC, 15 Hy. @ 20 Ma. DC				25			
DO-T28	TF4RX20YY	Reactor .1 Hy. @ 4 Ma. DC, .08 Hy. @ 10 Ma. DC					25		DI-T28
DO-T29	TF4RX17YY	Single or PP output	120 CT 150 CT	10 10	3.2 4	10		500	
DO-T30	TF4RX17YY	Single or PP output	320 CT 400 CT	7 7	3.2 4	20		500	
DO-T31	TF4RX17YY	Single or PP output	640 CT 800 CT	5 5	3.2 4	43		500	
DO-T32	TF4RX17YY	Single or PP output	800 CT 1,000 CT	4 4	3.2 4	51		500	
DO-T33	TF4RX13YY	Single or PP output	1,060 CT 1,330 CT	3.5 3.5	3.2 4	71		500	
DO-T34	TF4RX13YY	Single or PP output	1,600 CT 2,000 CT	3 3	3.2 4	109		500	
DO-T35	TF4RX13YY	Single or PP output	8,000 CT 10,000 CT	1 1	3.2 4	505		500	
DO-T36	TF4RX13YY	Isol. or interstage	10,000 CT	1	10000 CT	950	970	500	DI-T36

And Speed Limits in Your Specifications

UNITED TRANSFORMER CORPORATION

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PACIFIC MFG. DIVISION, 4008 W. JEFFERSON BLVD., LOS ANGELES 16, CALIF.
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*Man's desire to communicate still offers our
greatest opportunity to achieve peace on
earth and good will toward all mankind*



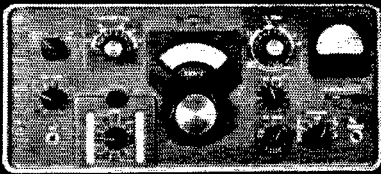
*Merry Christmas and
Happy New Year*

hallicrafters  company

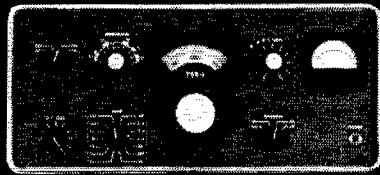
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W. J. Halligan W9AC Russ Halligan Jr.

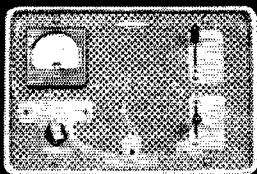




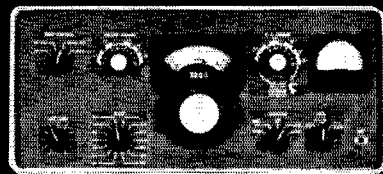
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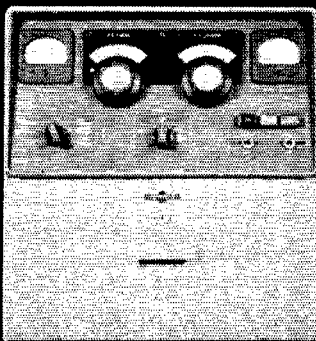
GIFT



WILL GIVE



GREATER



PLEASURE



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Christmas Greetings

from all of us to you

WA6AFG
WA6ANY
WA6BAN
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W2UXY
W2VL
K4AIM
W4DLL
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W4TO
W5FBL
W5SLQ
W5FPY
W5SKL
K5QZC
K5QZW
W6ENV
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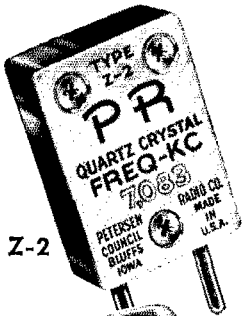
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SAN CARLOS, CALIFORNIA

It pays to insist on

PR crystals

STANDARD OF EXCELLENCE SINCE 1934

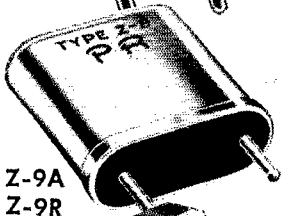
AMATEUR TYPES



Z-2

40, 80 and 160 Meters, PR Type Z-2

Rugged. Low drift, fundamental oscillators. High activity and power output. Stands up under maximum crystal currents. Stable, long-lasting, hermetically sealed; ± 500 cycles..... **\$2.95 Net**



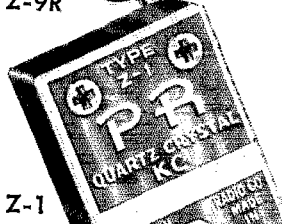
Z-9A
Z-9R

24 to 27 Mc., PR Type Z-9A

Third overtone; multiples into either 2-meter or 6-meter band; hermetically sealed; calibrated 24 to 27 Mc., ± 3 Kc.; .050" pins. **\$4.95 Net**

50 to 54 Mc., PR Type Z-9A

Fifth overtone; for operating directly in 6-meter band; hermetically sealed; calibrated 50 to 54 Mc., ± 15 Kc.; .050" pins. **\$6.95 Net**



Z-1

COMMERCIAL TYPES

Commercial Crystals available from 100 Kc. to 70 Mc. Prices on Request.

SPECIAL TYPES

Type Z-1 Aircraft

3023.5 Kc., .005% **\$3.45 Net**

VHF Type Z-9R, Aircraft

For Lear, Narco and similar equipment operating in the 121 Mc. region, requiring crystals in 30 Mc. range. Each..... **\$4.95 Net**

Type Z-1, MARS and CAP

Official assigned frequencies in the range. Calibrated to .005%. 1600 to 10000 Kc..... **\$3.45 Net**

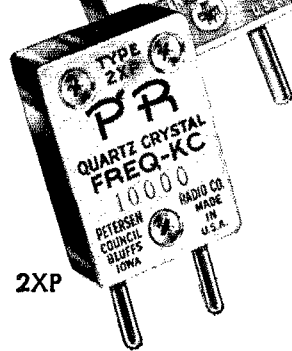
Type Z 1, TV Marker

Channels 2 thru 13..... **\$6.45 Net**

4.5 Mc. Intercarrier, .01% **\$2.95 Net**

5.0 Mc. Signal Generator, .01% **\$2.95 Net**

10.7 Mc. FM, IF, .01% **\$2.95 Net**



2XP

Type 2XP

Suitable for converters, experimental, etc. Same holder dimensions as Type Z-2.

1600 to 12000 Kc., (Fund.) ± 5 Kc..... **\$3.45 Net**

12001 to 25000 Kc. (3rd Overtone) ± 10 Kc..... **\$4.45 Net**

ALL PR CRYSTALS ARE UNCONDITIONALLY GUARANTEED. ORDER FROM YOUR JOBBER.

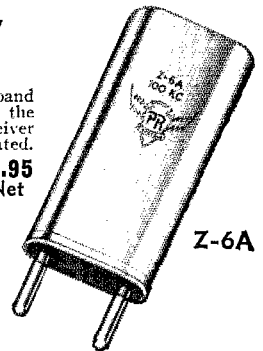
TYPE Z-9R CITIZENS BAND CLASS "D"
FCC assigned frequencies in megacycles: 26.965, 26.975, 26.985, 27.005, 27.015, 27.025, 27.035, 27.055, 27.065, 27.075, 27.085, 27.105, 27.115, 27.125, 27.135, 27.155, 27.165, 27.175, 27.185, 27.205, 27.215, 27.225; calibrated to .005% **\$2.95 Net**

TYPE Z-9R RECEIVER CRYSTALS FOR CITIZENS BAND CLASS "D"—Specify I.F. frequency, also whether I.F. is above or below transmitter frequency. Calibrated to .005% **\$2.95 Net**

TYPE Z-9R RADIO CONTROL CLASS "C"
FCC assigned frequencies in megacycles: 26.995, 27.045, 27.095, 27.145, 27.195, 27.255; calibrated to .005% **\$2.95 Net**

Type Z-6A, Frequency Standard

To determine band edge. To keep the VFO and receiver properly calibrated. 100 Kc. .. **\$6.95 Net**



Z-6A

Silver Anniversary Year 1934-1959

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Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCML, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in QST. **ARRL Field Organization station appointments** are available in the areas shown to qualified League members holding Canadian or FCC amateur license, General or Conditional Class or above. These include ORS, OES, OPS, OO and OBS. SCMs also desire applications for SEC, EC, RM and PAM where vacancies exist. OES appointment is available to Novices and Technicians.

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*Official appointed to act temporarily in the absence of a regular official.

A
Merry
Christmas

and
Happy QSO's for
1960



THE TECHNICAL MATERIEL CORPORATION

IN CANADA
TMC Canada Ltd., Ottawa, Ontario

Main Office: MAMARONECK
NEW YORK

THE AMERICAN RADIO RELAY LEAGUE, INC.,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

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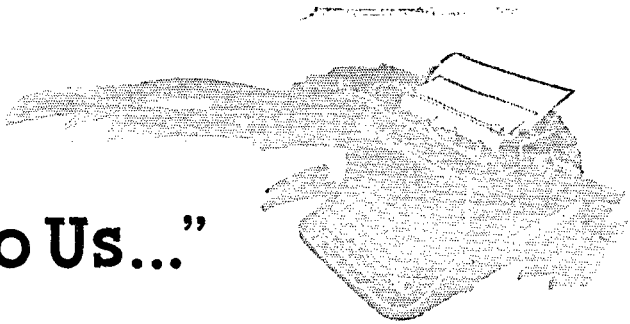
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"It Seems to Us..."



ROGUE'S GALLERY

Last month our colleagues farther down the hall and further down the magazine, in the Communications Department, passed on WØLA's comments about a few of the fellows who show up in emergency work: the good guys, Reliable Roger and Silent Sid, and the bad guys, Inquisitive Ike, Cooperative Charley, Newshawk Ned, Relaying Rodney, Selfish Sam, and Demanding Dan (November *QST*, page 72). Jeeves and his pal take a crack this month (page 91) at another unsavory type, the weirdy who, finding life a little dull, decides to bootleg a DXotic call. Now we want to get in our licks, too. Some of the boys we're going to mention are *really* ripe and, sad to say, a real danger to the rest of us.

At first glance, you'll like Highpower Harry. He's a neat fellow, has an attractive XYL and two fine jr. ops, belongs to two or three clubs, and holds down a very good job as an electrical engineer. His shack is a model of orderliness, and his signal is one of the cleanest in the bands. The trouble is that it's 4 kw. too big! Not only does he drown out the poor guy using legal power or less, but much worse, Harry gives newcomers the opportunity to say, "Why should I bother to observe the regs? Look what Harry is getting away with!"

Helpful Hal is another guy you might like at first. He's the fellow who thinks John Doe down the street is a nice guy, and would make a good ham, and he's been studying hard, and it isn't John's fault that he didn't take physics in school, or can't seem to get right up to speed on the International Morse and anyway John just gets nervous when he has to take any kind of a test, so Hal decides he'll just take it easy on John when he comes to take his Novice, Technician or Conditional exam. Even worse is Greedy Greg, who does precisely the same thing, but expects an 813 in return!

The next bird to watch is Moneybags Mike. Mike has the best of everything. He goes out, the day his General arrives, and buys two thousand bucks worth of beautifully engineered, ready-to-plug-in single sideband equipment and has it installed by the distributor's men. Then, without one glance at the instruction book, he proceeds to put the thing on the air. Complain to Mike about his squeals, squawks and splatter, and he'll say, "You don't know your apples, old boy. Probably

got your a.v.c. on. Couldn't be anything wrong with my sig; I'm using a Duck Special Supersidebander," pride and scorn evident in his voice!

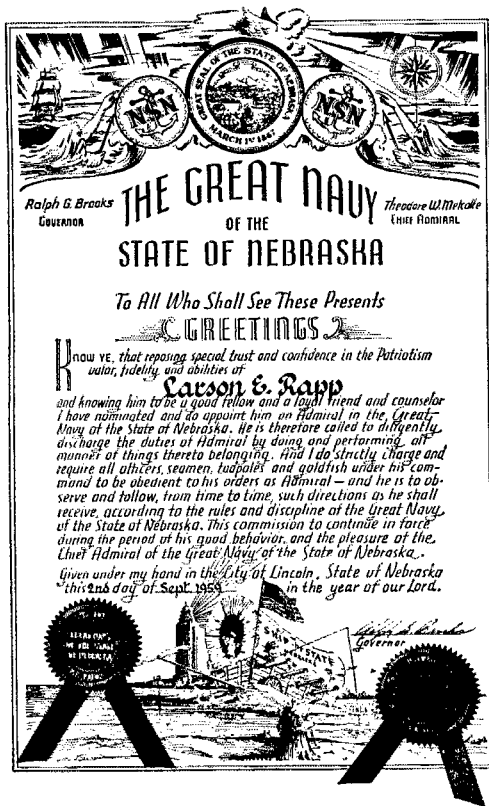
Next we deal with a couple of guys — Workshop Willie and his close friend, Comforting Cal. Willie is a do-it-himselfer, and has turned out a nice a.m. rig running 900 watts. He doesn't see any need for fooling around with an oscilloscope; he doesn't own one himself, and it's too much bother to drive across town to borrow Engineer Ed's. Besides, he's been having a little trouble with his back, and the scope is kinda heavy. So Willie throws the rig on 75 for his sked with Cal. Oh Cal, sitting there with the mike on his chest and his feet on the operating desk, is happy to give his buddy a "critical" report: "Yep, your new rig sounds f.b., very natural, and you're putting out a terrific signal, Willie" he says. Only trouble is Cal didn't bother to rock his receiver dial up and down from Willie's frequency to see what type of junk Willie was radiating elsewhere.

Maybe this next character isn't especially dangerous to the fraternity, but he sure is obnoxious. Unless you're one of his friends of long standing who hasn't noticed him gradually growing crankier, we guarantee you won't like Squatter Squagg. Squagg got his "Class A" back when the Commission first issued this class. You can check your clock and your freq meter by Squagg: every night he gets on the air, same time, same spot, same cracks about everybody else. He won't budge off "his frequency" for anything or anybody; his v.f.o. dial is rusted to the panel!

There are plenty more we could mention — Swishbird Sol, Tailend Tom, Keyclick Kurt, Finebiz Fred and his first cousin, Okay Ollie — who are more nuisance than menace. We don't need to describe them further.

But Highpower Harry, Helpful Hal, Greedy Greg, Moneybags Mike, Workshop Willie and Comforting Cal (if you and I don't pin their ears back) may very well be the cause of tough new regulations which could make ham radio more work and less pleasure for all the rest of us. These creeps amount to only one or two per cent of the ham population, but they spoil our operating fun and wreck our reputation as a group.

QST



You too can be an Admiral in the Nebraskan Navy, just like our esteemed Larson E. Rapp,—Admiral Rapp, that is. All you have to do, after January 1, if you are a W or VE, is to work one member of each of ten amateur radio clubs in Nebraska. There are actually 15 clubs in the state, so you have a little leeway. DX stations need work only five of the clubs. When you have worked the 10 stations, send a log of the contacts to Box No. 626, Omaha, Nebraska, and if you live in the States include 8¢ postage. The reproduction of the commission that you see here is but a pale shadow of the original, which is a handsome item.

Some of the participating clubs are: the Hastings Radio Club, the Alliance High School Radio Club, the Crete Amateur Radio Club, the Falls City Ham Club, the Grand Island Amateur Radio Society, the Homesteader Radio Club, the Northeast Nebraska Radio Club, the Pioneer Radio Club, the Tri-State Radio Club, the Western Nebraska Radio Amateurs, and the Ak-Sar-Ben Radio Club.

Strays

The United States has a navy, too, and a newly activated National Naval Reserve Radio Network is now operating each Friday night. This circuit gets underway at 0200 GMT on 7375 kc. (with 4010 as an alternate), and continues for approximately two hours on c.w. The network is controlled by NCR in Arlington, Va., which is at the same location as the old Navy radio NAA. Participation in the net is open to all individual Navy, Marine Corps, and Naval Reserve radio stations.

If you are a Marine Corps or Naval reservist with an amateur license and want to take part in the net, follow this procedure. Use your amateur call sign, replacing the "W" or "K" prefix with "N" and using the "W" or "K" prefix at the end of the call. For example, on the Navy circuit W1IKE would sign N1KEW, while KN1MJA would sign N1MJAKN. The net will be opened by the master control station or a designated alternate. Do not attempt to report in until after the net has been officially opened. A taped broadcast will follow immediately after the net is opened, and for about a half hour will send information of general interest. Upon completion of the broadcast, stations will be requested to report in. Stations reporting in should acknowledge receipt of the broadcast if received.

If you are in doubt about the procedure to be followed, monitor the net for a week or so and see how the others do it. Complete instructions concerning this network will be found in OPNAV Instruction 2000.22.

On Christmas Day, 1959, 52 children, patients at the National Foundation for Asthmatic Children, Tucson, will get to talk with their parents by amateur radio. Tucson hams hope that the following frequencies will be kept clear from 0800 to 1700 MST on Dec. 25: 29.3, 21.39, 14.265 and 7.275 Mc. This will be the third year for Operation 52. For more information, contact its originator, W7CKV.

OUR COVER

Our cover this month shows a quiet winter scene in New England. A light snow has fallen during the night and the temperature is hovering around the zero mark. It's a crisp winter day and the DX is rolling in nicely on all bands. Conditions are just fine, and we hope it's the same where you are.

Transequatorial Propagation of V.H.F. Signals

A Study of North-South V.H.F. Propagation

*Based on the work of F9BG, G4LX,
ZC4IP, ZC4WR and ZE2JV*

BY R. G. CRACKNELL,* ZE2JV

DURING the years since the end of World War II increasing use of the 50-Mc. band by amateurs in areas adjacent to the tropics has revealed the existence of radio propagation in the v.h.f. region, up to at least 80 Mc., that cannot be explained by conventional theories. Peculiarities of the earth's magnetic equator,¹ about which this mode of propagation occurs, give Southern Rhodesia a most favorable position from which to observe *TE* effects. For this reason study of transequatorial propagation was chosen as a project for the International Geophysical Year.

Commercial and other use of the 30-80-Mc. portion of the spectrum is mainly restricted to short-range "groundwave" services, such as television broadcasting and mobile communication. Results of amateur observations indicate, however, that for the areas of the world where *TE* propagation is encountered it represents an opportunity for long-distance communication having a high degree of reliability for certain hours and seasons.

In general, the *TE* path is between areas on either side of the geomagnetic equator¹ and 1500 to 2500 miles away from it. It is effective during the hours of darkness, and on frequencies up to 1.5 times the observed daytime maximum usable frequency for *F*-layer propagation. Optimum propagation conditions occur at the time of the equinox, between points in the same longitude, located about 2000 miles from the geomagnetic equator.

The *TE* mode may be usable between locations where the direct line between the two stations cuts the geomagnetic equator at an angle as low as 45 degrees, and beyond the distance limits mentioned above, but moving away from the most favorable spots causes both the reliability and the maximum usable frequency to drop off. The quality of the modulation on a *TE*-propagated signal is often distorted by a characteristic flutter fading. The signal is good enough for communication purposes, but the mode is unlikely to be of value for broadcasting or television. The

In 1947 a form of long-distance propagation of 50-Mc. signals hitherto unknown was discovered when XE1KE began working Argentine stations on 50 Mc. in the afternoon and evening hours. In recent years this transequatorial propagation has received much attention in scientific as well as amateur circles. Detailed here are the results of a remarkable series of observations by competent v.h.f. enthusiasts bearing on this as yet little-understood phenomenon.

transmitter power required to produce an intelligible signal is small. A few watts of r.f. in a vertical quarter-wave aerial may induce a signal of one microvolt or more in a similar aerial located 4000 miles away in the opposite *TE* zone.

Transequatorial propagation is by no means limited to the hours of darkness. At the peak of solar activity, daytime signals above 50 Mc. were weak and infrequent at Salisbury, but in 1959, probably due to decreased ionization at the lower levels, signals from the *TE* area around the Mediterranean have been received at ZE2JV very regularly, and at great strength on frequencies up to 56 Mc., throughout the day.

Examination of Fig. 1 shows that the geomagnetic equator traverses Africa in an arc approximately centered on Victoria Falls, and having a radius of about 2000 miles. The effect of this curvature is to give places in southern Africa lying within the *TE* belt an abnormally large zone into which *TE* propagation takes place, and from which interference and noise can be received.

The density of ionization is affected by the angle of the sun. Across Africa the geomagnetic equator lies well to the north of the geographical equator. Hence Southern Rhodesia and its neighbors experience *TE* propagation effects together with a higher density of ionization than is generally experienced elsewhere.

* Salisbury, Southern Rhodesia.

¹ Southworth, "A Look Back and Ahead at PRP," *QST*, June, 1959, page 48.

The Experimental Program

An automatically keyed c.w. transmitter delivering 60 watts to a 4-element array has been in operation from the author's location in Salisbury, Southern Rhodesia, since September, 1957. Its transmissions on 50.04 Mc. have been received with varying degrees of consistency in Poona, Bahrein, Israel, Cyprus, Libya, Switzerland, Morocco, France, Portugal, Madeira Islands, England and North America. Two-way contacts were made with all of these countries where operation on 50 Mc. is permitted. Crossband work was done with the others, 50-28 Mc.

Jean Garat, F9BG, Toulon, France, George Barrett, ZC4IP, and R. A. Whiting, ZC4WR, Limassol, Cyprus, accurately recorded the time of arrival, variations in signal strength, and peculiarities of the propagation of these signals throughout the evening, over long periods. It was found impractical to record the time of closure of the propagation path, it being in the early morning hours ordinarily. Gordon Spencer, G4LX, Newcastle, England, undertook similar thorough observation of the 50-Mc. signals, though he received them for much shorter periods and with considerably reduced regularity. From February 1959 on, L. S. Cole, ZS6IG, Johannesburg, South Africa, transmitted twice each evening, for regular observation on Cyprus. Regular reception of European television signals in Salisbury was of interest, but multiple use of the same frequencies, especially 48.25, 49.75 and 53.25 Mc., was confusing.

An estimate of the m.u.f. was made regularly in Salisbury by tuning a receiver over the range of 30 to 75 Mc. Television signals and harmonics of commercial stations in southern Europe and the Middle East countries were sufficient for reasonable accuracy. It is probable that the m.u.f. actually rose above 75 Mc. many times. However, resonant beam antennas are necessary for effective reception at these frequencies, and for practical reasons these were limited to the amateur bands at 28, 50, 72 and 144 Mc. From

March through May, 1958, F9BG made three transmissions nightly on 72.025 Mc. His signal was never positively identified in Salisbury, but this may have been due to strong interference on this frequency from Beirut, Lebanon.

ZC4WR, who conducted the experimental work on the characteristics of *TE*, developed a technique for photographing the received signal, as displayed on an oscilloscope. The receiver was operated without a.v.c., and the signal voltage was taken from the a.m. diode detector and fed to the oscilloscope amplifier. Though the technique was later improved, the pictures were taken with a time-base duration of 0.08 to 0.1 second. First exposures were 0.1 second at f.2. Pulses of 0.03 and 0.02 second were transmitted, and photographs were made of signals received during various kinds of propagation. Normal 28-Mc. signals were also photographed for comparison purposes.

As the directional properties of the antennas appeared to vary from day to day, and even from hour to hour, tests were made to determine the degree of scatter, and to investigate possible correlations between this and the percentage of flutter, and extensions of the *TE* zone. The Yagi array at ZE2JV was aimed first north, then east and then south, while signal levels and characteristics were recorded at Cyprus. The tabulated observations showed very marked differences in both scatter and degree of signal flutter, but there was no significant correlation between the two. The strength of signals received in Cyprus from Johannesburg was found to vary directly with the degree of scatter. The scatter indication was also high when the ZE2JV signal was heard in England by *TE*, and when direct contact was possible on 50 Mc. between Salisbury and Kenya-Uganda.

An attempt was made to determine the effect of vertical directivity. The 4-element Yagi (low-angle radiator) was compared with a half-wave dipole mounted $\frac{3}{4}$ wavelength above ground (high-angle radiator). These tests showed a fairly constant gain of about 6 db. for the Yagi, but the percentage of flutter was always higher with the dipole.

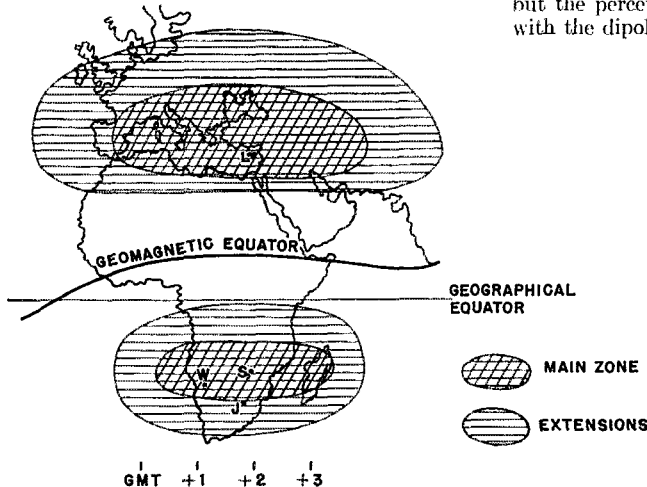


Fig. 1—Northern and southern *TE* zones, as indicated by amateur experience. The curve in the Geomagnetic Equator as it crosses Africa appears to have a focussing effect on *TE* propagation. The cities of Windhoek, Salisbury, Limassol and Johannesburg are indicated by their initial letters.

Results

Extent of Zones: The northern and southern *TE* zones, as indicated by our observations, are shown in Fig. 1. The extent of the northern zone is based on reports of reception of the 50-Mc. transmissions made from ZE2JV, and from reception of television and other signals in the v.h.f. range at Salisbury. The southern zone outlines are based on the reception of amateur 50-Mc. signals in Limassol, Cyprus. At frequencies higher than the 50-Mc. band, the zones are more limited in geographical extent, but extensions at lower frequencies were of no significance.

To avoid complication of the results by the possibility of confusion between normal F_2 and *TE* propagation, no account has been taken of the reception of signals lower in frequency than 50 Mc. Reports from England showed that our 50-Mc. signals were received there frequently for two brief evening periods, 1700 to 1715 GMT, usually showing a "clean" signal, and 1900 to 1930, always showing flutter fading that is characteristic of *TE* propagation. (Local time in Southern Rhodesia is GMT plus two hours.)

The 1700-to-1715 period was discounted, as F_2 propagation may have been responsible, but F_2 propagation during the later period appeared unlikely. Tests on 52.5 Mc. in the other direction bore this out. Transmissions on this frequency by GHLX were received in Salisbury (though very weakly) in the later period, but only one 5-second burst was heard during the 1700 to 1715 period in three months of testing.

There are some 500 television stations in Europe and the Middle East. With the majority of them in the 40-to-70-Mc. range there is no way of telling with any degree of certainty the origin of the mass of TV signals received at Salisbury in this frequency band. It was assumed, for example, that a very strong video signal on 49.75 Mc., heard from 1000 to 2200 daily for 6 months of the year, and less consistently the rest of the year, was from Odessa. Published data indicated that all Russian stations used this frequency (video 49.75 Mc., audio 56.25 Mc.), but an Odessa amateur told us that the video of that station had been shifted to 97 Mc., and that the only Russian video on 49.75 Mc. after early 1959 was the 100-kw. station in Moscow. If this information is accurate, the reception of strong signals on this frequency consistently is of considerable significance.

A graph of the m.u.f. as observed at 1830 GMT for an entire year is given in Fig. 3. Typical m.u.f. for the evenings of April, 1958, is shown in Fig. 4.

Extensions of the southern zone over Africa were observable with greater accuracy, since they were based on the reception of amateur signals in Cyprus. The geographical location and power limitations of these stations are, of course, readily ascertained, but it is by no means certain that a 100-kw. TV signal comes by direct path. Test transmissions from Jinji, Uganda, beamed at Cyprus, were not received there, but Uganda

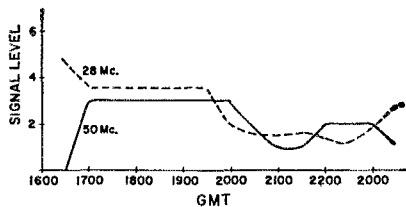


Fig. 2—Signal levels during a long evening contact, October 18, 1957. ZC4IP, Limassol, Cyprus, was on 28 Mc. and ZE2JV, Salisbury, Southern Rhodesia, on 50 Mc.

stations have been heard in Cyprus when they were beamed south, into the region where backscatter can carry them back north across the equator. Test transmissions from Johannesburg showed clearly that this city is at or just outside the main *TE* zone.

It would appear that Newcastle, England, is situated near the northern limit of *TE*, and that Capetown, South Africa, is near the southern limit. From this it would appear to be possible that reception of TV from the north of England on 48.75 Mc. in Capetown is the longest "one-hop" propagation that has been experienced.

Seasonal Effects: The principal effects of the position of the sun are discussed later, but it may be mentioned here that there tend to be more frequent and longer extensions to the south in the southern summer, and to the north in the

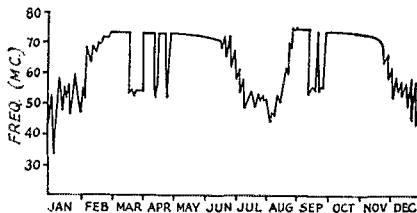


Fig. 3—Maximum usable frequency at Salisbury, Southern Rhodesia, at 1830 GMT. Two major *TE* seasons are clearly indicated.

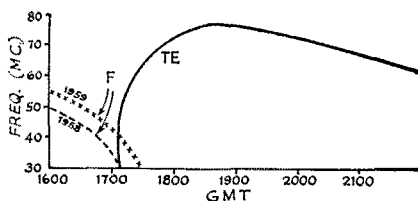


Fig. 4—Hourly curve of the m.u.f. as observed by ZE2JV in April, 1958. F_2 -layer curves for 1958 and 1959 are given at the left.

northern summer. These are most noticeable a month or so each side of the respective solstice. The line joining locations most favorably situated with respect to each other appears to veer away from the line of longitude between an equinox and a solstice. This can possibly be explained by a tendency for conditions to be optimum when the

time of sunset approximates. Thus, from Southern Rhodesia there is an extension to the east in the southern winter, and to the west in summer.

Scatter and seasonal extensions of the *TE* zone do not appear to be entirely independent. The longest scatter extensions to the north take place in the northern summer, and vice versa.

Extension of the range by other forms of propagation was experienced in February and November to North America (northwest) and in May to Japan (northeast). In order that this may occur at 50 Mc. the m.u.f. at the point of the second reflection must be high enough to propagate the wave at the angle at which it was propagated by *TE*. These openings were of a sporadic nature, but they seemed to occur 48 to 60 hours after an outburst of fairly high sunspot activity. The distance was always in the region of 8000 miles. No east-west DX was worked, except by back-scatter or tropospheric propagation.

Reliability

September–November, 1957: Although the equipment used by ZC4IP for this period was not as good as that employed subsequently, and his antenna was merely an indoor dipole in a built-up area of Limassol, he received signals from ZE2JV on 50 Mc. 58 evenings out of 63 on which tests were made. Frequently conditions were good enough for duplex telephony, using 50 and 28 Mc. An attempt to determine the time of closure of the path was made on the night of October 18–19, but it was abandoned at 0135 local time, with both bands still open. Communication had been maintained crossband since 1830. Fig. 2 shows the signal levels on both bands during this 5-hour contact.

March–July, 1958 F9BG, Toulon, had co-operated in many tests since September, 1957. From September to November he received the ZE2JV 50-Mc. transmissions less regularly, and for shorter periods, than they were received at Cyprus. In March, 1958, he erected a 3-element Yagi on the top of a building overlooking the Mediterranean, and thereafter failed to hear the transmissions on only four evenings, testing 4 or 5 evenings each week. Many of the transmissions were received with considerable strength.

Though commercial transmissions on 70 to 71 Mc. from Cyprus and f.m. and other signals up to 74 Mc. were frequently received at Salisbury in March and April, the 72-Mc. transmissions of F9BG were never positively identified.

September, 1958: G4LX, Newcastle, England, reported reception of the ZE2JV tests several times in May, 1958. In the fall he had permission for operation on 52.5 Mc. He made tests every evening in September, and at noontime (at the midpoint) on Sundays only. The evening tests were received at Salisbury 3 evenings out of 29 tried in September, though European television interference made reception very difficult. G4LX, on the other hand, heard ZE2JV 15 evenings out of 29 tried, and heard noontime tests on 2 out of 4 tries.

September–December, 1958: ZC4WR, also of Limassol, Cyprus, listened to the 50-Mc. tests in 1957. He was then using a single 6J6 converter and a vertical wire of random length. Even so, he heard the 50-Mc. signals every day in October that tests were made by ZE2JV (all but two days). In 1958 he erected a 4-element Yagi on the top of a block of flats, 100 feet above ground, and employed a crystal-controlled converter of modern design. The signal levels during October and November, 1957, and September and October, 1958, are shown graphically in Fig. 5.

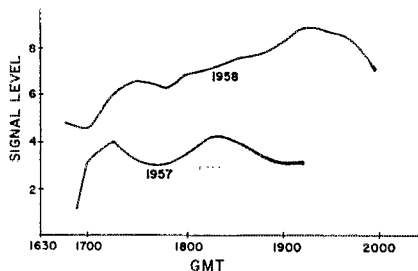
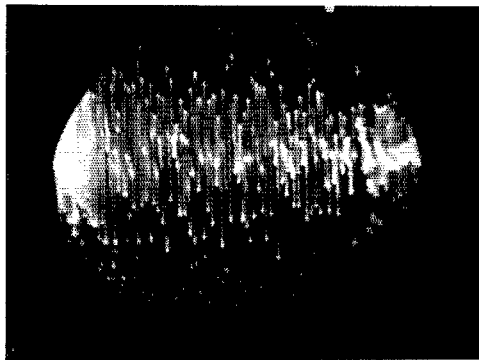


Fig. 5—Average 50-Mc. signal level of ZE2JV, as observed by ZC4WR during 20 days in October and November, 1957, and September and October, 1958. Higher levels in 1958 were due in part to improved equipment at the Cyprus end.

Looking at *TE* Signals

The first photograph shows an unmodulated signal from ZE2JV as received on Cyprus. This and subsequent photographs were made with an exposure of .08 second at f.4, from a short-persistence cathode-ray tube. The time base was truly one-shot, in that opening the camera shutter triggered the time base, which gave a single sweep. Fly-back could not occur until the shutter was closed. Examination of *TE* signals is still in progress, but it seems safe to assume that the received energy consists of components arriving so that they differ in phase or frequency. Oscillograms of this nature do not appear continuously, but rather at five times per second, or thereabouts, at irregular intervals. The rest of the time the carrier is relatively "clean."



Unmodulated carrier of ZE2JV, as received on 50 Mc. by ZC4WR by *TE* propagation.

Flutter is usually of a complex nature. Phase distortion can make amplitude modulation unintelligible, and amplitude variations can "key" a signal so that even the slowest code is difficult to copy. These effects can appear simultaneously, each in varying degrees, but extremes of flutter are experienced only with simple antennas. Never, when low-angle antenna systems have been in use at both ends, has the degree of flutter been sufficient to destroy intelligibility. A.m. signals appear to be demodulated. More speech clipping than would normally be tolerated, and modulation depth in excess of 100 per cent (with suitable precautions to prevent carrier splitting) are helpful under conditions of severe flutter.

Flutter is not an essential feature of *TE* propagation, though it is normally present in the late evening. It may appear over the whole band of *TE*-propagated signals, or only over a segment of it. Generally signals within a few kilocycles of the m.u.f. show little or no flutter.

Types of Evening Propagation

Most evenings showed propagation similar to that of the early-evening part of Fig. 2. The 50-Mc. signal appeared about 1900 local time (1700 GMT), building up to moderate strength with only minor variations. Flutter fade was present after about the first hour, and beam tests would show a moderate degree of scatter. Fig. 6 shows an average of three such evenings in September and October, 1958.

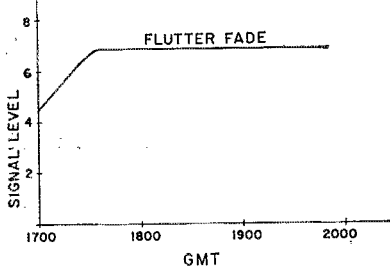


Fig. 6—Average of three typical evenings of *TE* propagation. Signal levels build up to moderate levels around 1900 local time, and thereafter show only minor variations. *TE* flutter appears after the first hour.

On abnormal evenings following high daytime m.u.f., signals of *F*-type characteristics may last as late as 2100 local time. When this happens, the fadeout affects all frequencies from 28 to 56 Mc. simultaneously. Fadeout is not necessarily rapid, and signals from high-powered TV stations (at the high end of the range) may last for 30 minutes after weaker signals have faded out. *TE* propagation has not been observed after these occurrences, but this is not proof that it did not occur later at night. No flutter appeared on these signals, but beam tests indicate that the degree of scatter may be very high.

More frequently *F*-type signals would not appear until late afternoon, and in these cases fadeout occurred earlier in the evening, to be followed by the return of a signal showing *TE* characteristics, but with exceptional strength.

Fig. 7 shows a graph of signal strengths on two such evenings. Photographs of the received signals show the characteristics of *F* and *TE* propa-

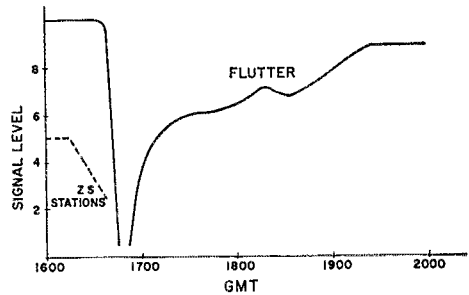


Fig. 7—Both *F* and *TE* propagation appear in this graph for September 26 and October 7, 1958. Solid line is the ZE2JV signal. Farther south ZS signals are shown in broken line at the left.

gation. Still another type, Fig. 8, shows no fadeout in the period of transition from *F* to *TE*. Photographs made of this (not reproduced here) show a mixture of the two types of propagation.

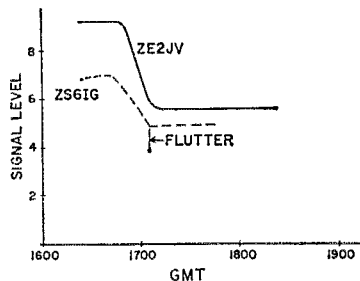


Fig. 8—Gradual transition from *F* to *TE* reception at ZC4WR, September 18, 1958. ZS6IG, Johannesburg, South Africa, is shown in dashed line.

There were few evenings when propagation was not in one of the categories described above. Ionospheric storms apparently had little effect. Disturbed conditions are of two types, as shown in Figs. 9 and 10. Of the two, the first occurred more often, and was probably due to late-persisting ionization in the lower levels. The second shows sporadic signals observed, and it would appear that late-evening *F*-type signals were being cut off by sporadic-*E*.

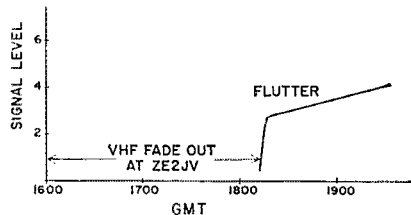


Fig. 9—ZE2JV signal during disturbed conditions, September 9. The v.h.f. range was devoid of signals from the north at ZE2JV, between 1800 and 2000 local time.

Noise Levels

Noise measurements made in Salisbury show the level to be high through the *TE* seasons.

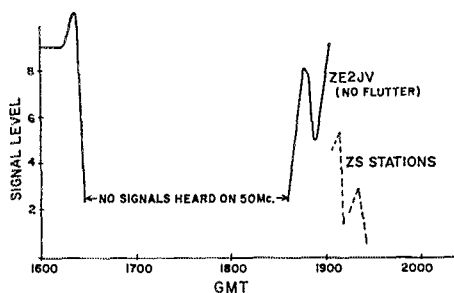


Fig. 10—Another type of disturbed conditions, September 30, showed the ZE2JV signal hitting a high level in the early evening at Cyprus, followed by a 2-hour fadeout and subsequent TE propagation from ZE and ZS.

There is a marked drop in midsummer and mid-winter, when receiving on frequencies above the m.u.f. At these times the noise level is comparable with that experienced in temperate zones. Noise level during the TE seasons stays high through the day, and often does not appear to vary directly with the degree of scatter, however.

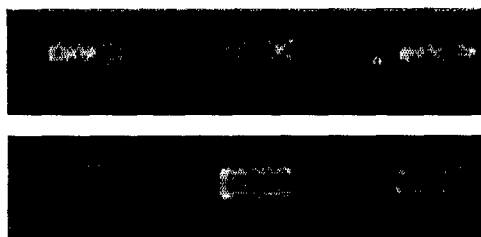
Observations on Cyprus were quite different. There the noise level rose with propagation conditions. A belt of severe thunderstorms across the Rhodesias gave an S-unit increase in noise level at the Cyprus end of the path. Apparent contradictions in these noise observations can be explained by two factors: The TE zone as seen from Salisbury is larger, and the geomagnetic equator crosses Africa well to the north of the geographical equator.

The tropical convergence zone can be considered as a vast noise generator. This zone remaining approximately in the subsolar region is substantially in the southern TE belt. North of the geographical equator (Kenya-Uganda, from where 50-Mc. signals scatter back into Rhodesia with great strength) desert conditions are rapidly approached. Noise from the tropical convergence zone can, therefore, be received in Cyprus only by TE propagation, whereas in Rhodesia noise from the zone can be received by direct scatter and back-scatter propagation. This is consistent with the fact that noise is received throughout the day up to the highest frequency reached by TE propagation.

Echoes

Occasionally echoes indicating a $\frac{1}{6}$ -second delay appear on TE signals. Unfortunately, these have not yet been photographed. Such echoes were prevalent on the 40-Mc. signals of Sputnik I as it travelled over the TE zones during the evening.

The delay suggests that these echoes may be circumterrestrial. It is difficult to imagine how this can happen when east-west work within the TE belts has not been possible. (IGY beacon stations in South America, just below 50 Mc., were never received.) Unconfirmed evidence has



Periods of unmodulated carrier showing the complex fading pattern of TE propagation (upper three examples) in comparison with the steadier F₂ signal in the lower row.

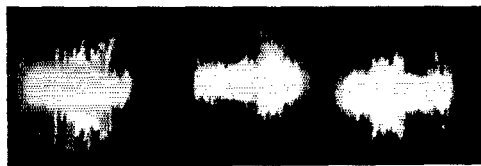
suggested that signals may be propagated to east and west by beaming a powerful signal away from the equator. If, as seems likely, ionization at the lower levels is the main barrier to east-west work, it would appear possible for such propagation to take place.

Echoes of even longer delay have been reported.

Back-Scatter

Contacts on 50 Mc. with Kenya and Uganda were commonplace in the evening hours. Signals usually had TE characteristics, but when these East African stations work farther south into Johannesburg and Windhoek their signals are often without flutter. Such contacts took place only when the indication of scatter was high.

Back-scatter from other Rhodesian amateurs is common on 28 Mc. when both stations beam north. Signals are the flutter type, but remarkably constant day and night. The level is just sufficient for readability on a.m. with 100-watt stations. Back-scatter is not so consistent on 50 Mc., but the lower level of activity, lower power, and frequent interference from DX television are limiting factors.



50-Mc. pulses from ZE2JV, recorded when flutter was relatively severe and beam tests showed a high degree of scatter.

A portable station on a 5,200-foot elevation near Umtali provided round-the-clock communication on 50 Mc. with Salisbury, a 160-mile path. During the evening its back-scatter signal from the north was of good strength. The same transmitter working from the town itself was never heard, despite numerous tests.

Only once was a sporadic-E signal heard on 50 Mc. This was from Windhoek, Southwest Africa. Lack of sporadic-E signals otherwise is in part due to low activity, as there are few stations within the usual range for this type of propagation.



Split pulses from ZE2JV recorded during October, 1958—Such pulses appeared only occasionally, in a string of normal ones. Breaks in the continuity of the signal in this way occasionally make keyed signals difficult to copy.

Conclusions

For purposes of this account, *TE* propagation is defined as v.h.f. propagation between points on opposite sides of the geomagnetic equator, and at least 1000 miles from it, without intermediate reflection from the surface of the earth. It will be noted that the term "*TE* scatter" is avoided. This term is thought unsuitable, as scatter appears to play a part only in certain circumstances.

The differences in signal characteristics at various times might suggest entirely different modes of propagation, but the writer feels that the mode is substantially similar for each type mentioned, and that all are merely variations of the same basic mode. The regions of the ionosphere between the temperate zones and the geomagnetic equator have been said to exhibit a tilt, and would appear to be regions of flux and turbulence. A wave transmitted toward the geomagnetic equator, striking the tilted ionosphere, could be projected forward to take a similar deflection at the region of tilt on the other side of the geomagnetic equator before being returned to earth. This low angle of strike at both points would enable higher frequencies to be propagated by the F_2 -layer than would normally be possible.

There would appear to be no reason why a signal so propagated should have characteristics widely different from those propagated in the normal manner. However, a wave reflected from a moving medium will show a frequency shift (Doppler effect) and should the ionosphere in these regions be turbulent it would seem likely that characteristics similar to those observed would be imparted to the signal.

The effect of lower-level ionization in the *E* and *D* regions appears to be the controlling factor, in daytime, of the maximum usable frequency. Late persistence of lower-level ionization may delay the appearance of *TE*, and sporadic-*E* may occasionally obstruct propagation. The possibility of propagation from the top of lower-level ionization in the subsolar region is not entirely rejected as a possible explanation for long-persisting *F*-type propagation. Duct propagation conceivably could support circumterrestrial propagation around the equator.

All types of propagation observed exhibit certain features in common. The zone into which signals propagate remains substantially the same irrespective of the type of propagation (two-hop propagation excluded.) All types of propagation

are observed over a wide band of frequencies. Scatter readings do not vary with different types of propagation observed on the Salisbury-Cyprus path.

Carrier photographs show that the types of propagation tend to mix, even when this is not apparent in listening to the received signals.

The possibility of propagation outside the F_2 -layer is discounted by the similarity of conditions over the range from 18 to 72 Mc.

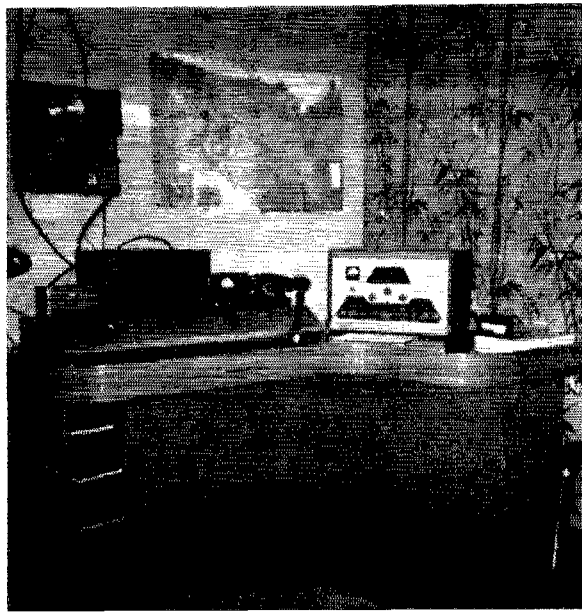
Pulse tests and carrier photography, and the lack of connection between scatter tests and the degree of flutter, indicate that the flutter is caused by the state of the ionosphere at the regions of refraction. The presence of identical flutter on signals from East Africa, and the sharp directivity of beams on this path, confirm this opinion.

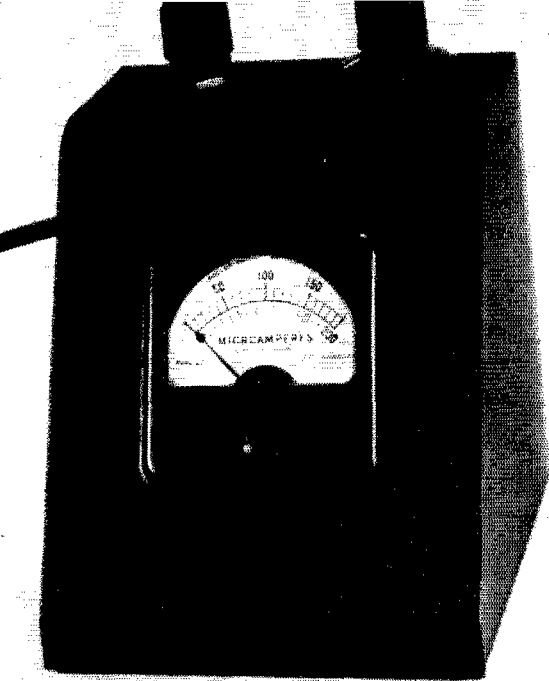
Acknowledgments

The help and information supplied by the Propagation Research Project of The American Radio Relay League was responsible for the beginning, and to a large degree, the continuation of this project across the African continent. The willing cooperation of amateurs in many countries, who supplied data upon which this account is based, and the work of R. A. Whiting, ZC4WR, who played a major part in the experiments, are gratefully acknowledged. QST

Strays

Here's another neat console, this one the pride and joy at W7CQK. It is a home-built job, and certainly no wife could ever object to such a handsome piece of furniture. Incidentally, that map in the background is made up from two of the United Airlines maps that are found at the seat of each airline passenger. Pasted together at the center (they are in register) you end up with a fine relief map of the country. Back to the console—it's made up of hard-board (perforated in the lower sections, for ventilation) fastened to a wooden frame, and finished off with a smooth-as-glass top.





The S meter is built into a sloping-panel cabinet, with the controls at the top. The one at the left is for R_1 . The skirted-knob at the right is for R_2 .

Auxiliary Unit for Surplus and Other Receivers

BY H. O. LORENZEN,* W3BLC

Owners of surplus receivers and other receivers not equipped with signal-strength meters will be interested in this S-meter unit. It is simple, easy to install and universally adaptable.

A Foolproof S Meter

OVER the years I have tried many S-meter circuits without very gratifying results. Some of the circuits resulted in the meter reading backwards, while others compressed the scale all in one short part of the meter's reading range. Most of these circuits used the usual 1-ma. meter in some form of a bridge circuit in the plate of a pentode.

This S meter uses the simple circuit shown in Fig. 1.¹ It is the essence of simplicity and yet it has many features to make it foolproof for any application. By using a 0-to-200 microammeter (readily available from surplus), a better range of sensitivity is achieved over those circuits using a 0-to-1 milliammeter. The 500-ohm potentiometer R_1 allows for a zero adjustment of the S meter to compensate for different levels of circuit noise. Some receivers have gain-adjusting circuits which have a major influence on the residual noise level in the a.v.c. circuit, but the adjustment of R_1 permits compensation for these varying noise levels. The a.v.c. level control R_2 also permits the matching of the meter scale to the a.v.c. voltage. When a converter or an extra r.f. stage is used ahead of any of the conventional S-meter circuits, the scale no longer reads correctly. Not so with this circuit. All that is required is a simple read-

justment of the a.v.c. level control R_2 and the S meter again reads correctly.

A photograph shows a close-up of the calibration scale on the 0-to-200 microammeter. Adequate spread is provided for the lower S units, but likewise, the scale also accommodates readings up to 20 db. over 9. Beyond this I feel the reading is unimportant.

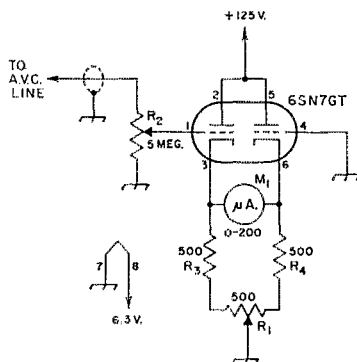
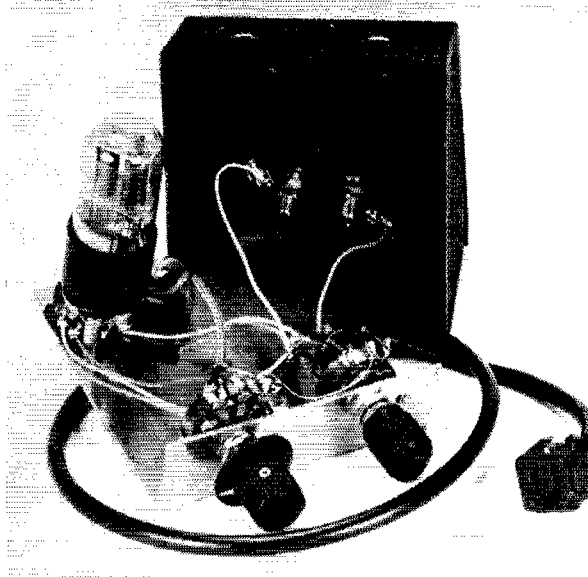


Fig. 1—Circuit of the foolproof S meter. Resistances are in ohms and fixed resistors are ½ watt. R_1 and R_2 are potentiometers. M_1 is a 0-200 d.c. microammeter. R_3 and R_4 preferably should have 10 per cent tolerance ratings.

¹ A similar circuit was suggested by W0WLR in *QST* for March, 1955. See Amfahar, "Unidirectional Loops for Transmitter Hunting," that issue.

* 3713 Bangor St., S.E., Washington 20, D. C.

Interior view of the S meter showing the mounting of the 6SN7GT and the potentiometers R_1 and R_2 .

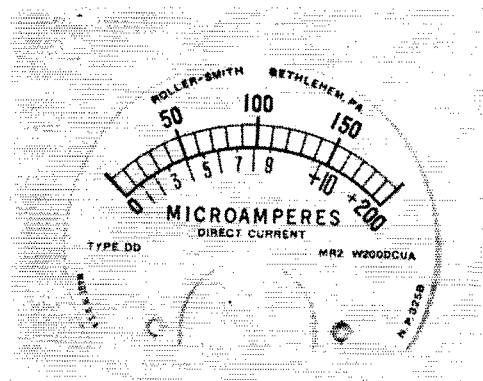


R_3 and R_4 in the cathodes of the 6SN7 are not critical but probably ought to be 10 per cent resistors so R_1 will balance near the center of its range.

The B+ lead shown was connected to the screen supply on my BC-348 which provided 125 volts. This gave about the right sensitivity. The same voltage could be obtained from a simple voltage divider across the plate supply with the 6SN7 plates tied to the center point of the two resistors.

R_2 has a pointer knob on it so it can be set to the correct value and marked for the various converter or receiver combinations. Wires for the power and a.v.c. connections are formed into a cable terminated with a 4-prong Jones plug. Shielded wire should be used for the a.v.c. connection. A covering of black vinyl tubing gives the cable a professional finished look. By providing matching sockets for the cable plug, the S meter can be used on more than one receiver combination. Later I plan to use it on a Command-receiver Q5-cr, also.

Operation of this unit has been extremely gratifying. After trying lots of circuits that required cutting and trying to get them to work suitably, I must report this unit worked the first time. It hasn't been necessary to make any modifications either. Calibration of the unit was arrived at by using the comparison method with two of the more reputable commercial receivers equipped with S meters. The two receivers didn't match each other when the S meters were compared on the air. However, by adjusting R_2 , the a.v.c. level control, I could match the scale of either one extremely closely. That's the advantage of the controls. So, if you have been searching for a foolproof S-meter circuit, I can't see how you could possibly go wrong using this one. I am sure some of the fellows using BC-348s, BC-342s and other combinations will appreciate this extremely versatile S-meter circuit. **QST**



The calibrated S-meter scale.

Other photos show the meter mounted in a conventional sloping-front meter cabinet. As shown in the rear view, all the components are mounted on a 1/16-inch aluminum bracket which fits the back opening in the sloping panel cabinet. This aluminum bracket is held in the cabinet by the two extra nuts on the potentiometers. R_1 is shown on the right with R_3 and R_4 mounted between the two end terminals and two phenolic stand-off bushings. The socket for the 6SN7 is mounted on two bushings slipped over mounting screws which support the socket from the base.

Strays

You will note in "Correspondence" this month that we have been taken to task for the story on the railroad mobile that appeared in October QST. Also in our mailbag was one letter saying that the story was liked, and another pointing out that there *has* been other railroad mobile. A couple of other fellows admitted to submarine/mobile, but don't care to be identified!

The normal output of an existing low-power transmitter is often considerably in excess of that required to drive a high-power amplifier. This usually presents a problem, since the output coupling of the driver cannot always be reduced conveniently to the required level. Even in cases where this can be done, it may result in excessive screen dissipation, and otherwise impair the proper functioning of the driver stage. The T-pad attenuator described here permits operation of the driver at its normal load, and yet provides for adjustment of drive to the high-power amplifier's proper level.

Reducing Driver

Output for Linear

and Other Amplifiers

BY EUGENE A. HUBBELL,* W9ERU

A Step-Type R.F. Attenuator

IT came as a distinct shock to the author to find that there are times when it is necessary to throw away some of that precious r.f. energy from a transmitter. This realization came about with the advent of s.s.b. in the shack.

The Pacemaker sideband exciter has a normal output of 60 to 70 watts, as indicated by an M. C. Jones Micro-Match s.w.r. bridge. The Johnson Kilowatt, operating in Class AB₁, requires only 2 to 3 watts of driving power. It is not recommended that the Pacemaker be operated at lower than full input, because the signal-to-noise and signal-to-carrier ratios will suffer. The problem, therefore, was how to drop the full output of the Pacemaker to the necessary drive level for the Kilowatt.

A 50-watt noninductive dummy load resistor was used across the grid-input line when driving the amplifier on a.m. and c.w. With this dummy load in the circuit, the Pacemaker drive was still far in excess of what was needed. Apparently, some sort of variable attenuator was indicated. A continuously-variable attenuator would be nice, but nothing practical which would present a constant load to the Pacemaker turned up in

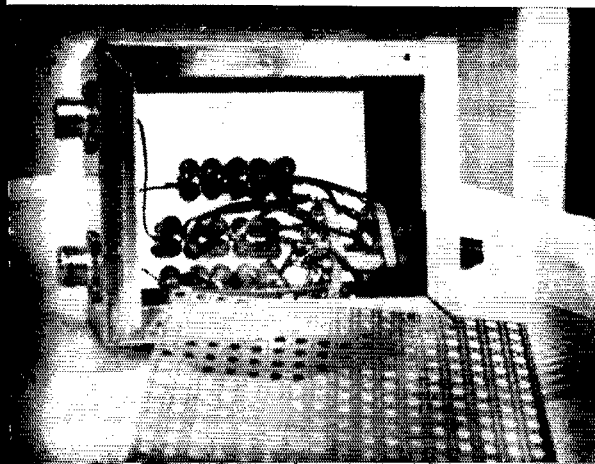
* Box 273, R.R. 4, Rockford, Illinois.

any of the various handbooks. So a step-type attenuator seemed the practical solution.

A suitable formula for H, T, and L pads was found in Nilson & Hornung's *Practical Radio Communications*. The T pad was chosen, mostly because the resulting unit would be usable in either direction without regard to how it was hooked up. The first design was for one with five steps of 0, 3, 6, 9 and 12-db. attenuation. It was built and found to operate satisfactorily, except that it did not provide quite enough attenuation on 75-meter phone. So a redesigned unit was built, adding another step which brought the maximum attenuation to 15 db. The description to follow is of this unit.

Circuit

The basic T-pad configuration is shown in the inset of Fig. 1, while the main diagram shows the practical circuit used in the construction of the unit. A resistance of 50 ohms was chosen for input and output impedances because results would be easy to check with the 50-ohm Micro-Match, the Pacemaker would operate into this load, and the grid-input circuit could be swamped down to this value with the dummy load mentioned

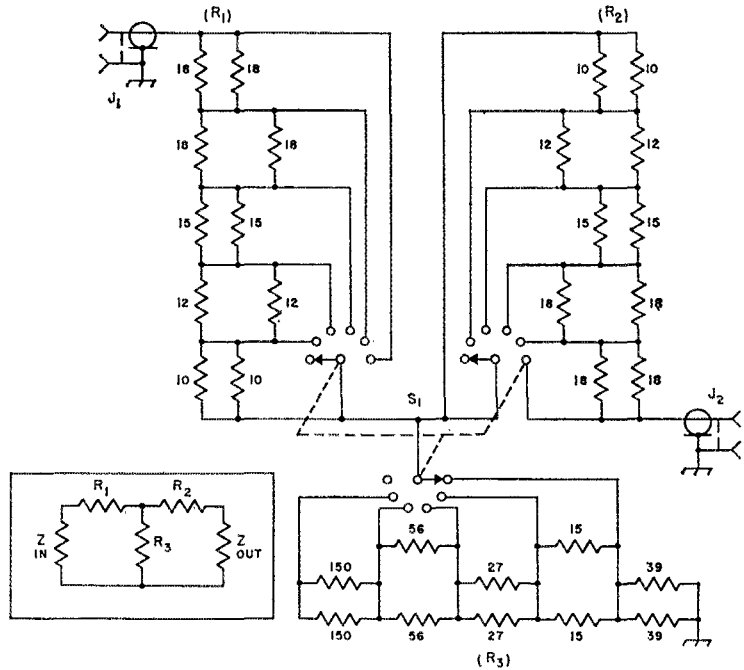


The step attenuator is assembled in a standard 3 X 4 X 5-inch aluminum box fitted with perforated aluminum covers.

(Photos by K9BJA.)

QST for

Fig. 1—Circuit of the T-network attenuator. Resistances are in ohms, and resistors are 10-per-cent, 2-watt composition. J_1 and J_2 are chassis-mounting coax receptacles (SO-239). The switch, described in the text, is in the maximum-attenuation position.



above. With the dummy load next to the Pacemaker and the step-type attenuator on the grid input, the dummy load current does not pass through the attenuator. Values of resistance for the three legs of the pad for various levels of attenuation are given in the accompanying table. The table includes both the calculated values and the actual values of standard resistors that were used.

The resistors are 2-watt types made by Ohmite or Allen-Bradley. Since the calculated values were below 10 ohms in many cases, the required resistance was obtained by paralleling two resistors. Ten ohms is the lower limit for these carbon resistors. Be careful not to use wire-wound units since they may have sufficient inductance to make the attenuator useless at radio frequencies. The paralleled values also result in sufficient dissipation rating to handle the full output of the Pacemaker over the short duty cycle of s.s.b.

Construction

The box in which the resistors and switch are mounted is a Premier AC-453, 3 by 4 by 5 inches in size, with two removable 4 x 5-inch sides. The original sides are replaced by perforated aluminum sheet or aluminum screen, for ventilating

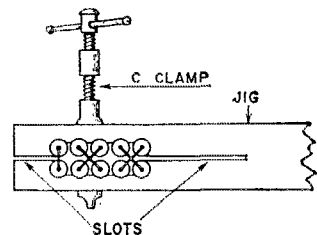
purposes. Two coax connectors are mounted in one 3 x 4-inch end, about 2 inches apart, and the switch is mounted in the opposite end, as shown in the photograph.

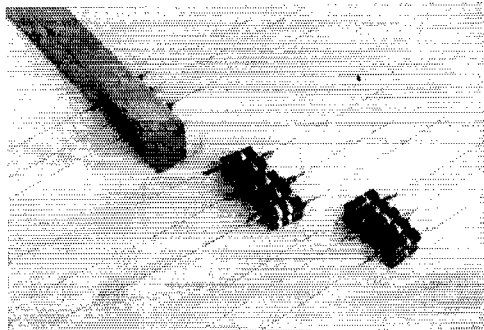
The switch is special, made up of a Centralab index kit P-121 and two ceramic sections, one having two-poles and five positions, while the other has a single pole and six positions. The two-pole section actually has six positions, one of which is "off," where the rotor contact is made. The index stop is adjusted to use this sixth position in the maximum-attenuation position. Hardware furnished with the index kit includes sufficient 1/2-inch spacers so that the two switch sections may be assembled on the index. Place the single-pole section next to the index and the double-pole section away from it. The sections used may be either types T and R (shorting) or X and RR (nonshorting).

Assembly of the resistor bundles shown in the photograph is best accomplished with the aid of the wooden jig illustrated in Fig. 2. In a small piece of 1-inch soft pine (actually about 13/16 inch thick), 1 1/2 by 8 inches, drill ten 5/16-inch holes in a two-hole by five-hole pattern. Put the holes close enough together so that they touch, but do not overlap. Remove the wood left be-

Atten. (db.)	R_1, R_2		R_3	
	Cal.	Actual	Cal.	Actual
3	8.5	9	144	143.5
6	16.7	18	67	68.5
9	24	25.5	40.5	40.5
12	30	31.5	27	27
15	35	36.5	18.5	19.5

Fig. 2—Sketch showing wood jig and clamping arrangement for assembly of resistor bundles.





Wooden jig and "bundles" of resistors.

tween the holes, and saw a slot in each end of the hole pattern, between the two holes at the end. Insert the ten resistors making up the group designated R_1 in Fig. 1. Clamp the wooden jig on the resistors with a C clamp, so they will not slip. Cut off the long leads to about $\frac{1}{2}$ inch, and bend into bundles of four leads, except for the end pairs, where the leads will be of two each. Into each bundle of four insert the end of a 6-inch length of No. 16 tinned wire and solder securely. Also solder 6-inch lengths of this wire to the paired leads at the end. Note the finished assemblies shown in the photograph, and make up similar bundles for groups R_2 and R_3 .

Switch Assembly

The resistor bundles may now be soldered to the switch, and this can be done outside the box, if a little care is used to see that the result will not interfere with the box sides. The two bundles forming R_1 and R_2 will extend directly back of the switch, and be soldered to the two-pole, five- (or six-) position section. (The confusion as to identification of this section is because we are making use of an "off" position not considered as usable by the manufacturer.) The bundle of resistors making up R_3 is placed just above the switch, and soldered to the appropriate terminals of the single-pole, six-position section. A jumper connects the terminals of the R_1 and R_2 groups together, and the latter to the two rotor connections on the two-pole section and also to the rotor on the single-pole section. Then the whole assembly is inserted in the box and the switch secured with its nut. The two remaining terminals of R_1 and R_2 are soldered to the two coax jacks, and the remaining terminal of R_3 is grounded to a lug on one of the bolts securing one of these coax jacks. The circuitry calls for leads between the hot terminals of the two coax jacks and switch points, and these are added last.

Testing

The wiring may be checked by an ohmmeter. Put a 50-ohm resistor across one coax jack, and the ohmmeter across the other. Rotating the switch should show very little change in the ohmmeter reading at any switch position, and the reading should be just about 50 ohms. Check-

ing with a Micro-Match and a good dummy load will show a barely perceptible increase in s.w.r. when the attenuator is added to the circuit. Placing the Micro-Match between the dummy load and the attenuator, the following output readings were obtained:

Step	10-Watt Input	100-Watt Input
0 db.	10 watts	100 watts
3 db.	5.5 watts	46 watts
6 db.	2.9 watts	21 watts
9 db.	1.5 watts	10 watts
12 db.	0.85 watt	5 watts
15 db.	0.5 watt	3 watts

The strict accuracy of these readings is somewhat doubtful because of the difficulty in reading the Micro-Match accurately. The scales vary considerably between the 100-watt and 10-watt levels, and the power level may vary considerably from the nominal value. The results obtained agree very well with calculated values, considering the fact that the resistors are not exactly what is needed, and are of ten-per-cent tolerance.

Using the Attenuator

In use, the attenuator does all that is required. The Pacemaker is tuned up with the attenuator in the zero db. position, but with the 50-ohm dummy load on the output, and the grid circuit of the Kilowatt detuned. When the Pacemaker is properly loaded, the grid circuit is tuned to resonance and enough attenuation introduced to prevent overloading in the Class C mode of operation (20-ma. grid current). The plate circuit is tuned to resonance and properly loaded for Class C operation. Then the mode switch is turned to s.s.b., which places the amplifier in Class AB₁, and the attenuator is set to the position where s.s.b. modulation peaks show only a slight indication of grid current on the final-amplifier grids. It is even handy for a.m. and c.w. work when the drive runs too high at a given setting of the 32V-1 output circuits. No trouble has been experienced with heating of the resistors, as long as the drive is not left on continuously over a minute or so. Try one; it works!

QST

Strays

Here's some excellent philosophy from the Potomac Valley Radio Club, quoted from a recent bulletin having to do with contest operating tips.

"Above all, remember the Amateur's Code: An amateur is balanced. Do not become so obsessed with Sweepstakes operating that all other considerations are swept aside. Save something for the DX Contest!"

—♦♦♦—

VK9VM worked JAØHA, and the two aren't very many miles apart. But in order to swap QSLs they had to get in touch with their stateside QSL managers, K2QXG and W2CTN.

A Two-Meter Converter with a Noise Figure Under 2 Db.

Optimum Performance in an Easily Duplicated Design

BY C. E. SCHEIDELER,* W2AZL

SOME ten years ago I became interested in investigating propagation at very high frequencies. In deciding which band to use, consideration was given to the availability of efficient high-power tubes for transmitters, the possibility of constructing a stable sensitive receiver, and the practicability of making a high-gain antenna of reasonable size, keeping in mind that it had to be erected in any average-sized back yard. The 144-Mc. band looked as if it would satisfy the requirements.

The first project was to build a stable low-noise converter to work into a communications receiver. A survey of low-noise amplifier circuits and tubes was made and it was decided to use the "Wallman Cascode" circuit in conjunction with 417A triodes. The 417A was designed for broad-band preamplifier service at 70 Mc. It has a transconductance of between 20,000 and 30,000 micromhos and is ideally suited to v.h.f. work.

A four-tube crystal-controlled cascode converter incorporating 417A tubes was designed and constructed. The original model had a noise figure of around 2.8 db., much better than anything else available at that time. In the process of making impedance measurements looking directly into the grid of the first 417A, it was found that the grid-to-ground impedance was only 300 ohms at 144 Mc. In an effort to find the reason for this low impedance it was discovered that decreasing the value of the cathode bypass capacitor (500 $\mu\text{mf.}$ in the original model) increased the input impedance markedly. When the bypass capacitor was reduced to 30 $\mu\text{mf.}$ the input impedance increased to 18,000 ohms but the amplifier was unstable. A compromise was then made between stability and high input impedance and a 50- $\mu\text{mf.}$ ceramic was used for the bypass capacitor. After the above changes the input circuit was adjusted for best noise figure and it was found that noise figures under 1.5 db. could be obtained. This was quite an improvement over the original 2.8 db.

Circuit and Construction

When working at very high frequencies it is important to keep leads short and strays to a minimum. With this in mind, the detailed circuit and construction information given here should be followed as closely as possible. The model shown in the pictures was constructed working directly from the instructions that follow and it worked at once, with only a few minor adjustments needed to develop optimum performance.

* 727 Coolidge St., Plainfield, N. J.

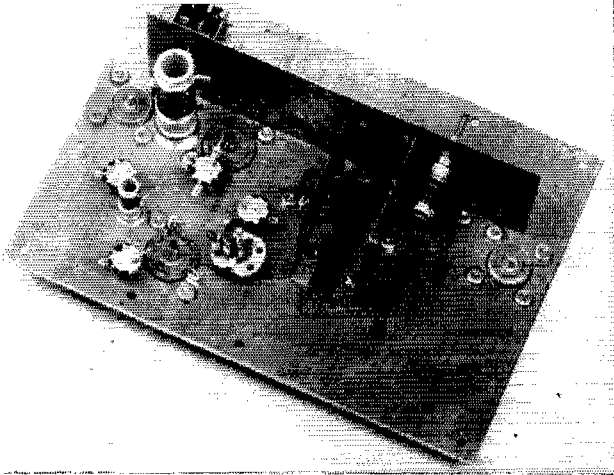
When the first work was done with meteor scatter on 144 Mc. some years ago, all four participants, W2UK, W4HJK, W2NLY and W2AZL, used similar converters. This design, the work of W2AZL, has since been duplicated widely, from instructions and drawings similar to those presented here. Today the "W2AZL Converter" is practically standard equipment for v.h.f. men who want the best obtainable sensitivity on 144 Mc. Converters of this type were in use at both ends of the record-breaking 144-Mc. QSO across the Pacific, made in 1957 by KH6UK and W6NLZ. If a signal can be heard on your antenna, you can hear it with this converter.

A 417A neutralized triode is used in the first r.f. stage. The second r.f. stage is another 417A as grounded-grid amplifier. The plate of the first 417A is coupled to the cathode of the second through 500- $\mu\text{mf.}$ button capacitors. The ground return for the cathode of the grounded-grid stage is made through the neutralizing coil and grid coil of the first stage. The plate of the grounded-grid stage is coupled to the grid of a 40A¹ mixer through a double-tuned circuit. This tends to improve skirt selectivity and reduce the feed-through at 14 to 18 Mc. The plate of the mixer is tuned to 16 Mc. and link-coupled to the communications receiver.

The oscillator and multiplier stages use a 2C51/396A² dual triode. A 32.5-Mc. crystal is used in series resonance between the cathodes of the dual triode. The first plate resonates at 32.5 Mc. and is capacity coupled to the second triode grid. The second plate is resonated at 130 Mc. and is inductively coupled to the mixer stage. The communications receiver is tuned between 14 and 18 Mc. to cover 144 to 148 Mc.

The converter is constructed on a flat 1 1/16-inch piece of brass or copper which covers the open side of a 5 × 7 × 2-inch chassis. This type of construction makes the converter convenient to work on. When the chassis and shield partitions have been punched, drilled and tapped, clamp the large partition in a vise by means of the small lip. Place the 500- $\mu\text{mf.}$ button feed-through capacitors in the 3/8-inch holes, with the

^{1,2} These are Western Electric types that may not be found in most radio distributors' stocks. A 6AK5 or 6CB6 can be substituted for the 40A. The 2C51 is similar to the 12AT7. These more commonly available types may be used with only minor changes such as pin connections.



The W2AZL converter before wiring, showing mounting positions of the button capacitors.

capacitors on the same side as the lip, and bend the tabs on the other side flat against the partition. Solder the tabs with a hot iron to ensure good joints. This is important because these capacitors and the r.f. chokes form decoupling networks and ground returns for the various stages in the converter.

Next, the parts should be mounted on the 5 × 7-inch plate as shown in the pictures. The first r.f. socket is mounted so that Pin 6 faces the coaxial input jack. The second r.f. socket has the same orientation. The mixer socket is mounted with Pin 1 facing the second r.f. stage. The oscillator socket has Pin 1 toward the left side of the chassis. Small lugs should be mounted under each

screw holding the first r.f., second r.f., and oscillator sockets. Pin 2 on each of the r.f. sockets should be removed by squeezing with a pair of long-nose pliers and pushing out through the top. Remove Pins 2, 5 and 7 from the mixer socket. Pin 9 on each r.f. socket and the oscillator socket should be bent and soldered to the nearest lug. Pin 3 on the mixer and Pins 3 and 5 on the oscillator should also be grounded to the nearest lug.

Next, the large partition should be mounted and the small shield dividing the second stage should be bolted in place with a few 4-40 brass screws. Pins 4, 5, 7 and 8 should then be soldered to the partition along with the metal cylinder in the center of the socket. Next, the filament and plate chokes should be soldered in place as shown in the diagram and pictures. The rest of the wiring in the oscillator and mixer circuits should be completed, keeping the leads short and referring to the pictures where necessary.

The 130-Mc. multiplier coil, mixer grid coil and second r.f. plate coil are wound of No. 16 tinned copper wire, using a 5/16-inch drill for the oscillator and mixer coils and a 3/8-inch drill for the r.f. coil winding form. It is important that the coils be wound in the same direction.

First, the r.f. coil, L_3 , should be soldered in place, between the B-plus bypass capacitor and Pin 1 on the second r.f. tube socket. Next, the mixer grid coil, L_4 , should be soldered between Pin 1 on the mixer socket and the edge of the button capacitor, alongside the 3-15- μ f. variable capacitor. These coils should be lined up as shown in the picture, with about 1/8 diameter overlap and about 1/8 inch apart. Last, the 130-Mc. multiplier coil, L_8 , should be soldered between the tab

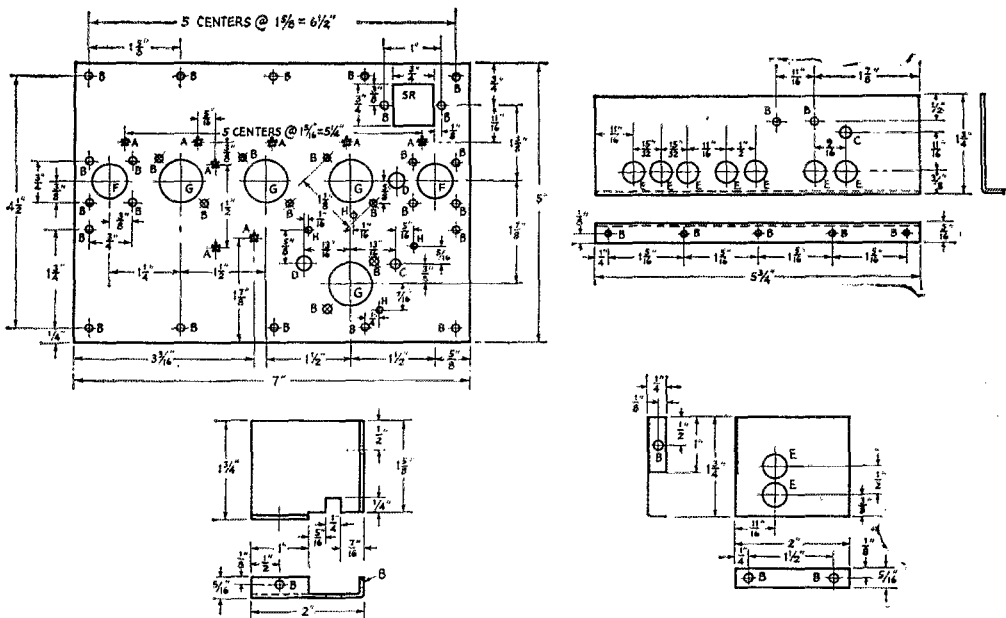
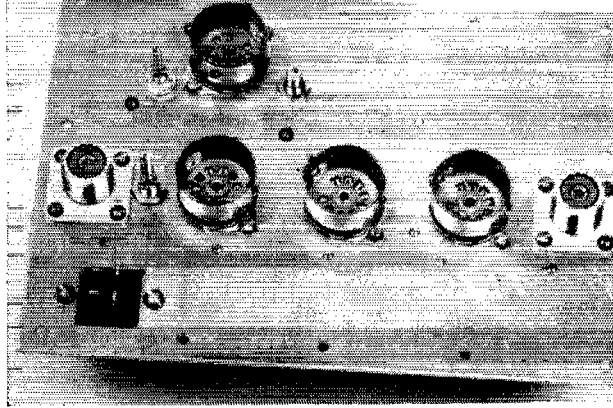


FIG. 1—Dimensions of the base plate (A) and shield parts (B, C, D) used in the W2AZL converter. Plate is 1/16-inch copper or brass. Shields are .015-inch copper or brass. Hole diameters in thousandths of an inch: A—112, tap 4-40, B—125, C—187, D—250, E—375, F—625, G—750, H—113.

on the B-plus bypass capacitor and the stator tab on the 3-15- μ f. variable capacitor. This coil is mounted directly in line with the mixer coil and about $\frac{1}{4}$ inch away from it. This completes the oscillator-mixer section of the converter.

To complete the second r.f. stage, one lead of a 91-ohm resistor is bent at right angles as close to the resistor as possible. The second lead is bent around against the resistor and bent again so that it runs parallel to the first lead about $\frac{1}{4}$ inch from it. A 500- μ f. feed-through button is slipped on the twice-bent lead as far as it will go without shorting. One of the tabs is soldered to the other lead and then the center is soldered in place. The lead soldered to the outside of the capacitor is clipped off close to the rim and another feed-through capacitor is slipped on the center lead and soldered in place about $\frac{1}{8}$ inch from the first, with one of its tabs perpendicular to the plane of the resistor. This is the coupling capacitor between the first and second r.f. stages. The junction of the resistor and tab on the rim of the resistor bypass capacitor is soldered to Pin 6 on



Top view of the low-noise 2-meter converter. Three sockets in line are, right to left, the two r.f. amplifier stages and the mixer. The oscillator-quadrupler socket is at the rear.

the second r.f. socket, with the resistor parallel to the chassis and the center lead perpendicular to the long partition and pointing away from it. This assembly, not visible in the photographs, is

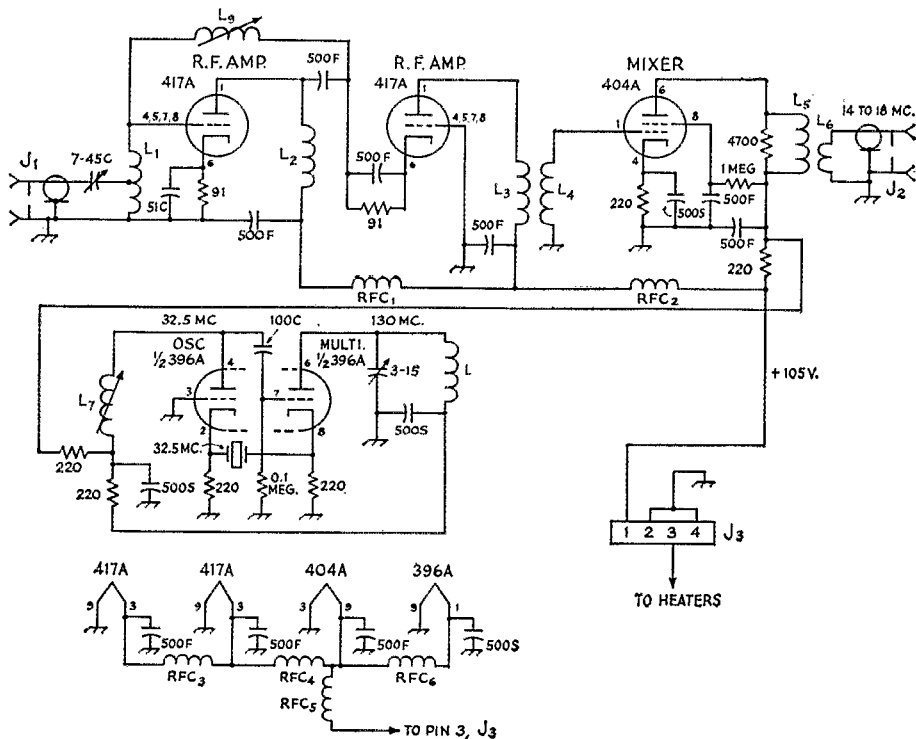


Fig. 2—Schematic diagram and parts information for the W2AZL 2-meter converter. Capacitor types are indicated by letter following value; C for ceramic, F for feed-through type button, and S for standoff type button. All resistors $\frac{1}{2}$ watt.

- J₁, J₂—Coaxial chassis fitting, SO-239.
- J₃—4-pin power connector, male.
- L₁—4 t. 5/16-inch diam., $\frac{1}{2}$ inch long. Tap at center (see text).
- L₂—5 t. $\frac{3}{8}$ -inch diam., $\frac{1}{2}$ inch long.
- L₃—7 t. $\frac{3}{8}$ -inch diam., $\frac{3}{8}$ inch long.
- L₄—4 t. 5/16-inch diam., $\frac{3}{8}$ inch long. (L₁₋₄ all No. 16 tinned.)
- L₅—40 t. No. 26 enam., close-wound on $\frac{1}{2}$ -inch diam. iron-slug form $1\frac{1}{4}$ inches long.

- L₆—5 t. No. 22 enam., wound over B-plus end of L₅.
- L₇—23 t. No. 28 enam., close-wound on $\frac{1}{4}$ -inch iron-slug form $\frac{7}{8}$ inch long.
- L₈—Similar to L₄.
- L₉—12 t. No. 26 enam., $\frac{1}{2}$ inch long on form similar to L₇.
- RFC₁, RFC₂—No. 30 enam. Close-wound full length of 1-meg. $\frac{1}{2}$ -watt resistor.
- RFC₃-RFC₆, incl.—6 turns No. 22 enam. on 1-meg. $\frac{1}{2}$ -watt resistor.

Looking at the low-noise converter from the one side, showing the de-coupling chokes and feed-through capacitors in the power leads.

shown in Fig. 3. The shield partition separating the first and second r.f. stages is next fastened in place with a few 4-40 brass machine screws.

The first r.f. plate coil is wound on a $\frac{3}{8}$ -inch drill and is soldered in place between the center of the plate bypass capacitor and the tab on top of the coupling capacitor. From the tab it runs through the bottom hole in the shield partition to Pin 1 on the first r.f. socket. A lead is run from the center of the coupling capacitor up through the top hole in the shield partition to the end of the neutralizing coil. The first r.f. grid coil is wound on a 5/16-inch drill and mounted as shown in the pictures. A lug is next mounted under the long partition and first r.f. socket. The 50- μ f. ceramic capacitor is soldered between this lug and Pin 6 of the first r.f. socket with leads as short as possible. A 91-ohm resistor is soldered from Pin 6 to the same ground lug. The 7-45- μ f. ceramic trimmer is soldered between the center of the coaxial connector and the center of the first r.f. grid coil. This completes the wiring of the converter. The chassis lip is cut out adjacent to the coaxial connectors, power socket and oscillator socket, to allow the plate to seat flat against the chassis. Holes are drilled with a No. 42 drill in the lip of the chassis to match the holes in the plate, and tapped to take 4-40 machine screws.

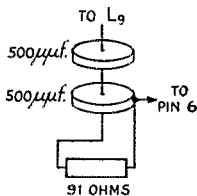


Fig. 3—Detail of the coupling and bypass capacitors and bias resistor wiring used between the two r.f. stages. This assembly does not show in the photographs.

Testing

The power supply may be anything that will deliver 105 to 125 volts d.c. at 50 ma. and 6.3 volts a.c. at 1.2 amp. Desirable test equipment for converter alignment includes an oscilloscope, such as Dumont 208, a sweep oscillator with a good 50-ohm attenuator or an external attenuator, and a Z-50 (7- μ h.) or equivalent choke. The sweep generator and scope system outlined below makes possible an accurate adjustment of all circuits for flat response across the band.

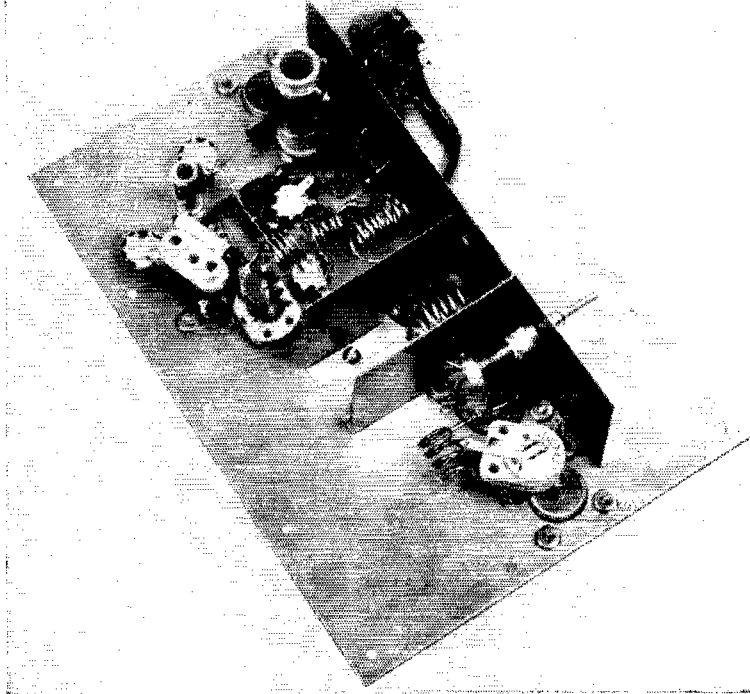
Remove the crystal and adjust the input ceramic trimmer to approximately $\frac{3}{4}$ of the way toward maximum capacity. Solder the Z-50 choke to Pin 4 of the mixer socket. The other end of the choke goes through a shielded lead to the vertical amplifier of the scope. Connect the sweep generator through the external attenuator (if used) to the input of the converter and connect the horizontal amplifier on the scope to the sync on the sweep generator. Set the sweep generator to sweep 140 to 152 Mc. The sweep generator is run at minimum level and the scope at maximum gain.

With the power turned on the inductance of the mixer grid and the second r.f. plate coils should be adjusted by compression or expansion of coils so that the band pass is nearly flat on the scope, with a small dip in the middle and slight peaks at 144 and 148 Mc. The skirts should fall off rapidly below 144 and above 148 Mc.

Next, disconnect the heater on the first 417A and increase the output of the sweep generator to maximum. Adjust the neutralizing coil until a dip centered on 146 Mc. appears on the scope. The heater is then reconnected and if necessary the second r.f. plate and mixer grid coils are readjusted to give the proper pass band.

The r.f. choke is removed from the mixer cathode and the 32.5-Mc. crystal plugged into its socket. The oscillator coil, L_7 , should be

The other side of the completed converter. R.f. circuits are at the right, mixer and oscillator-multiplier at the left.



adjusted until oscillation is detected at 32.5 Mc. with the aid of a grid-dip meter or receiver.

Next, the converter should be connected to a good communications receiver set to tune the 14- to 18-Mc. range and a 50-ohm 144-Mc. antenna connected to the input jack of the converter. The trimmer tuning the 130-Mc. coil of the oscillator should be adjusted for highest noise level in the receiver, and then the coil in the plate of the mixer should be adjusted so the noise peaks evenly across 14 to 18 Mc. in the communications receiver. Tuning the communications receiver between 14 and 18 Mc. (144-148 Mc.) should now bring in 2-meter signals which, when the b.f.o. is turned on, sound stable and clean. The stability of the combination should be as good as that of the communications receiver alone.

If one wants the maximum sensitivity the converter input circuit should be adjusted with a noise generator³ for best noise figure, by squeezing or pulling the grid coil and adjusting the 7-45 ceramic trimmer. The position of the antenna tap may also be checked for lowest noise figure. For best adjustment it is suggested that the noise generator be coupled to the converter through a length of coax similar to that to be used on the antenna system. This assures the maximum transfer of energy from the antenna to the input of the converter. Best noise figure is obtained by adjusting the input circuit for a mismatch, when the generator is connected directly. With the coax cable added the best noise figure is obtained with an adjustment that includes the effect of line losses due to the mismatch. If it is desired to know the exact noise figure the loss of the cable

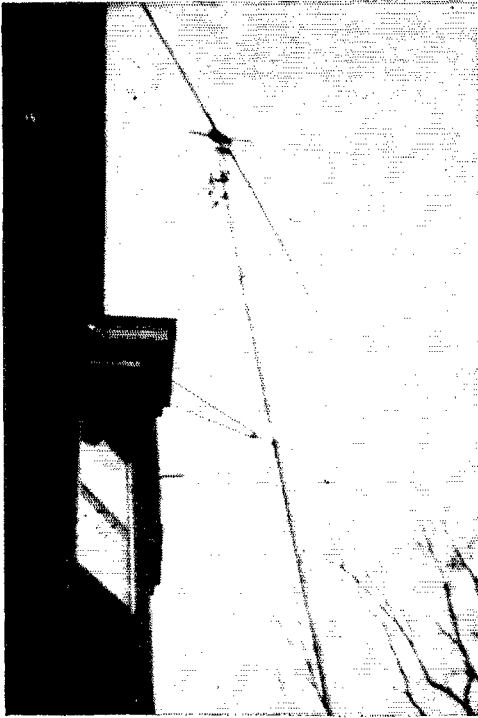
³ Tilton, "Noise Generators — Their Uses and Limitations," *QST*, July, 1953, p. 10.

may be subtracted from the noise figure reading with the cable in place.

If a sweep generator and scope are not available the converter may be aligned by adjusting the second r.f. plate coil and the mixer coil for even noise level when tuning the communications receiver across the 14- to 18-Mc. region. This should be done with the converter input circuit loaded with a 50-ohm resistor, not with the antenna connected. If the coils were constructed and mounted as shown in the pictures it will be found that little adjustment is necessary. The neutralizing adjustment may be accomplished by tuning in a local signal near the center of the band and disconnecting the first r.f. stage heater. The neutralizing coil is then adjusted until the signal disappears. The heater is then reconnected and the mixer grid and second r.f. plate coils are readjusted for flat band pass if necessary. The remaining adjustments are made as mentioned in the previous paragraphs. QST

Strays

Like to be an FCC engineer? There are a number of openings in the Federal Communications Commission both in Washington, D. C., and in the 31 field offices and 18 monitoring stations in the 50 states and in Puerto Rico. Starting pay is around \$4500 to \$6000, depending on education and experience. If you would be interested in this sort of a career, write to the Executive Secretary, Board of U. S. Civil Service Examiners, Federal Communications Commission, Washington 25, D. C. and request Announcement 187-B.



A beam antenna can be expensive. It may also be inexpensive, as W3PMV demonstrates here. This one includes three-band operation and a support that can be lowered for antenna adjustment.

A Simple Tilt-Over System at Low Cost

BY FRANCIS J. McDONOUGH,* W3PMV

Two-Element Three-Band Beam and Mast for the Lean Purse

UNFORTUNATELY, all of us cannot afford tilt-over towers and the splendid multiband beam antennas to be found on the amateur market. However, the ham with a little ingenuity and elbow grease can sometimes come pretty close to duplicating the results, if not the appearance, of the fancier installations at a fraction of the cost.

The sketch of Fig. 1 shows a 35-foot antenna support that is inexpensive and easily made from readily-available materials. It can be raised and lowered at will by one man, eliminating the need for hazardous climbing. No digging or concrete mixing is required. The mast sits right on the surface of the ground.

The Mast

Two 13-foot sections of $1\frac{1}{2}$ inch pipe are joined with a pipe coupling. A 9-foot length of 1-inch pipe is added at the top by means of a standard reduction coupling. The mast is easily raised and lowered by a block-and-tackle arrangement made up of three galvanized pulleys (40 cents each at the hardware store) and 120 feet of $\frac{3}{8}$ -inch manila rope ($2\frac{1}{2}$ cents per foot at Sears). The fixed pulleys are anchored to the side of

the house in my case, but a tree would serve the purpose almost as well. The pulley anchors are large galvanized hooks screwed through the siding into studs. Two of these hooks are used at each pulley for added strength. The movable pulley is wired to the mast at about 20 feet up from the base. A few "dry runs" after the antenna has been mounted will show the optimum anchoring point, depending on the weight at the top end. At the same time, the lengths of the side guys can be adjusted for proper tension when the mast is up. If these guys are anchored in a line through the base of the mast, at right angles to the direction in which it will be lowered, the guys will remain in tension at all times. Even if the guys are anchored a little behind the mast on the side that it falls when lowered, there will be enough tension to prevent any serious side travel while the mast is being lowered. The mast, of course, cannot be lowered if the side guys are anchored on the house side of the base. The mast can be propped on an "X" frame or "scissors" to hold it off the ground while mounting the antenna.

Mast Mounting

The base mounting for the mast is shown in

* 1226 Clairhaven St., Pittsburgh 5, Penna.

Fig. 2A. The horizontal part rests on the ground, running at right angles to the direction of fall of the mast. The bottom end of the mast slips over the vertical part of the mounting. The mounting is held in place by driving lengths of pipe or stakes into the ground along both sides of the horizontal part. To keep the mast from turning on the mounting, a length of 2 × 4 is bolted to the mast near the bottom, as shown in Fig. 2B. Stakes are used to check the 2 × 4.

The Antenna

A simple light-weight beam for three bands is shown in the sketch of Fig. 3. The elements are of No. 14 wire. The arrangement provides two elements on 15 and 20 meters and three elements on 10 meters. The 10- and 15-meter driven elements are fed in parallel with a single 50-ohm coax line. The 20-meter elements are inductively loaded and the driven element has a separate 50-ohm feed line. Each of the four loading coils has 9 turns of No. 18 3 inches in diameter, with the turns spaced to make the coil length 3 inches.

The elements are supported on a framework formed by four 12-ft. bamboo poles clamped in sockets made of angle iron fastened to a wood block at the center. The major spread is adjusted to about 23½ ft. The minor spread is spanned by lengths of plastic clothesline which provide suspensions for some of the elements. The elements in each of the two groups of three are spaced 6 inches apart, and the groups are spaced to bring elements for corresponding bands 6 ft. 6 inches apart. This provides an element spacing of 0.2 wavelength at 10 meters, 0.15 wavelength at 15 meters, and 0.1 wavelength at 20 meters. The 10-meter director has a spacing of 0.1 wavelength (3.3 ft.). Note that maximum gain is toward the top of the page on 20, and in the opposite direction on 10 and 15.

It is probable that the mast could be carried to greater heights by adding more pulleys along the mast and fixed support.

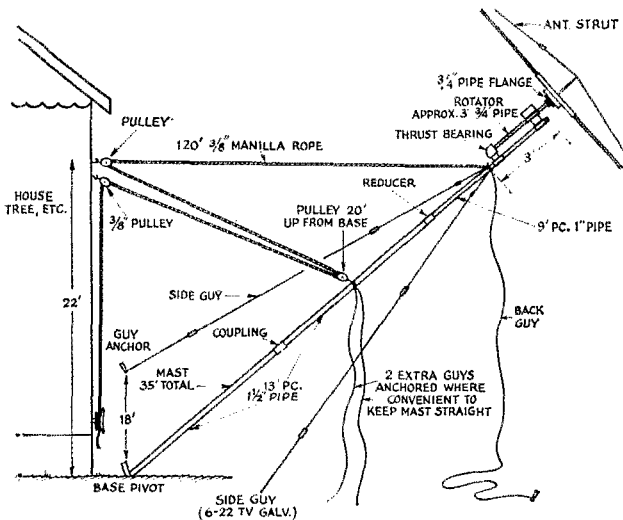


Fig. 1—This simple pipe mast can be raised and lowered by one man. Details of construction will be found in the text.

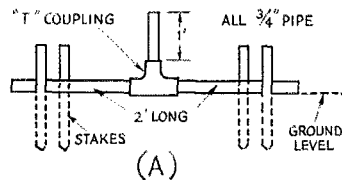


Fig. 2—Details of mast base mounting. The bottom section of the mast is slipped over the 1-foot vertical pipe in A. The 4-foot horizontal section rotates as the mast is lowered. The 2 × 4 in B is clamped to the mast near the bottom. Stakes driven into the ground keep the mast from turning.

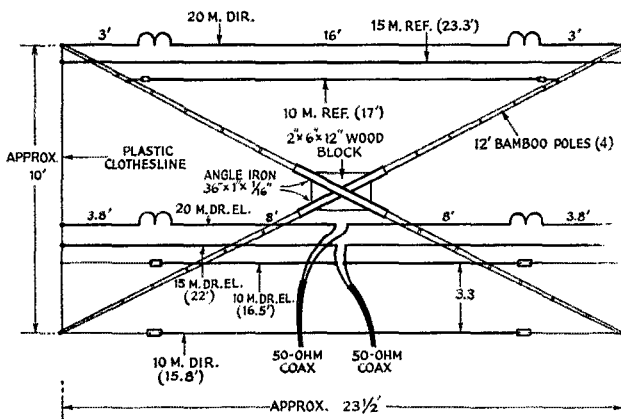
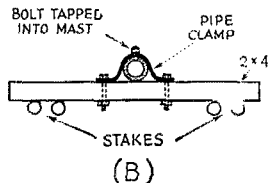


Fig. 3—Sketch of the light-weight three-band beam used at W3PMV. Elements are of No. 14 wire and the 20-meter elements are loaded inductively. Details not shown will be found in the text.

BY EDWARD A. STANLEY,*
W4QDZ

This article doesn't tell you how to design a tower, but it does discuss some of the things you should look for if you're in the market for a support for your beam.

Some Considerations in the Selection of an Antenna Tower

IN RECENT years, the trend away from long-wire antennas and toward the rotating type of directional radiator has been phenomenal. So also has been the general migration of dwellers from the noise and turmoil of the cities to the peace and quiet of newly developed suburban areas. Many of these areas have been planned from the moment of their conception for the ultimate in "gracious" living. To assure that the level of standards set initially will be maintained, duly appointed and legally equipped planning and zoning boards have been established with power to decide, among other things, what sizes and types of structures will be permitted, from the consideration of not only safety but appearance as well. As a result, it is becoming more the rule than the exception that a permit must be secured before the amateur may install a tower to support his beam.

Working hand and glove with the planning and licensing committees are engineering consultants, and quite often the ham who wants to erect a tower will be called upon to furnish engineering data in addition to sketches or pictures of the proposed installation.

Many factors bear strongly on the selection of the right tower to do the job at hand. Towers may be resolved into three general classifications:

Self-supporting towers (free-standing).

Guyed towers.

Mechanically actuated towers, guyed and self-supporting.

Structural Considerations

Primarily, the tower must be able to support the static weight of its own structure, and that of the antenna, mast and rotator. Also, it must support incidental ice, sleet and snow which may form radially about its members. In addition to the foregoing, it must be sufficiently strong to support all of the static weight plus the pressures placed upon its surface areas by winds which will be encountered, all taking into consideration the height at which the ham desires to place his beam. Thus, we see, the prospective ham-tower erector has a multitude of things to consider be-

fore he makes a sizable investment in this new piece of highly important equipment for his station. He will begin to run into new terms such as "windload," "L/r," "maximum compression," and "moment." He will peruse specifications which will describe towers in terms of "so many pounds" or "so many miles per hour." This is bound to be confusing to him, and it is well to go into some of these things in order to assist him in evaluating the actual tower he will need. It is far from the intention of this article to go into complex analysis and integration of loads, but it is the opinion of the author that a little knowledge will be more helpful than dangerous and will materially assist the prospective ham-tower user in his selection of a proper structure.

Determination of Structural Capacity

Since our main concern is to know whether or not a given tower will stay up with the beam and rotator we place on it, we should consider the forces which act upon the tower. They are:

Wind pressure
Static weight
Torsion.

Of course there are other factors, but from the standpoint of the amateur user, these will be the most important to consider. Most amateurs do not even begin to realize the tremendous forces which build up within a tower structure when winds begin to work on it. We may well take the time to consider some of these effects in order to approach a basic understanding of the essential ingredients of a workable tower structure. Let us first take up the problem of pressure as applied by a wind. The formula for pressure is:

$$P = 0.0032V^2,$$

where P is the pressure in pounds per square foot,

and

V is the velocity of the wind in miles per hour.

Therefore,

$$V = \sqrt{\frac{P}{0.0032}}$$

Example: Given a tower rated as a "50-pound" tower. Determine the velocity of wind for which

* Emergency Coordinator, Hillsborough County, 3006 Fair Oaks Ave., Tampa, Florida.

this tower is rated.

$$V = \sqrt{\frac{50}{0.0032}}$$

$$= 125 \text{ miles per hour.}$$

One important thing to remember is that we are working against squared velocities and therefore a wind of 100 miles per hour will exert 4 times as much pressure as a wind of 50 miles per hour.

A few simple computations will illustrate the order of the strain which a tower must withstand under high wind velocities. The formula for obtaining the surface areas when calculating the pressure per square foot exposed to the wind is as follows for tubular members:

$$A = \frac{0.666LD}{144}$$

where

- A is the area in square feet
- L is the length of the member in inches
- D is the width of the member in inches (in this case the outside diameter of the tubing).

The correction factor of 0.666 is applied to tubular surfaces. Where flat surfaces are involved, this factor should not be applied.

Example: Given a beam with the following dimensions:

- Boom — 2 inches o.d., 16 feet long
- Element No. 1 — 1 inch o.d., 33 feet long
- Element No. 2 — 1 inch o.d., 32 feet long
- Element No. 3 — 1 inch o.d., 31 feet long

Determine the maximum surface area which will be exposed to the wind.

Since $A = \frac{0.666LD}{144}$

- then A (El. 1) = 1.831 square feet
 - A (El. 2) = 1.776 square feet
 - A (El. 3) = 1.720 square feet
- for a total of 5.33 square feet.

Since it is obvious that the elements of the array will present the greater face to the wind, the area of the boom need not be calculated in this case.

Now, let us see how much windload would be developed by this array if it were mounted atop a tower, say, 40 feet in height, and placed in a wind of 100 miles per hour velocity. Using $P = 0.0032V^2$, we find that the pressure in pounds per square foot at this velocity is 32. Multiplying this by the area, 5.33, we find that the total pressure will be 170.56 pounds. To go further, multiply this figure by 40 (the height of the tower), and we find that there is transmitted, due to wind pressure on the *antenna alone*, a force of over 6000 foot pounds which will result in that much compression on one leg of the tower, or that much tension on the other two legs, assuming it is a triangular structure. Already, it does not take long for a ham with a curious disposition to begin to envision the terrific forces which begin to develop in his tower when the winds start tugging at it and its associated equipment.

Computations for a Hypothetical Tower

Suppose, just for the purposes of practice, we set up a hypothetical tower and try to get a rough idea of what happens to it when subjected to the above beam, a rotator, mast and wind. We will select a wind velocity of 85 miles per hour, since this is a figure often used in the description of a tower. Let us use material with a rather heavy-gauge wall in this hypothetical tower, retaining an outside diameter of 1¼ inches for the legs and braces, and keeping the wall thickness at 10 gauge rather than 16 or 14. Our tower would be specified like this:

Legs — To be of 1¼-inch o.d. steel tube, with 10 ga. (0.134-inch) wall.

Braces — Same as legs.

Windload — 23.12 pounds per square foot (85 m.p.h.).

Structure — Triangular, 40 feet tall, 12-inch spacing between legs, braces located on 12-inch centers, totaling 40 in all. Tower to be free standing and topped with beam, rotator and mast with a total of 6 square feet of exposed area and a static weight of 100 pounds. Static weight of the tower is 400 pounds.

To compute: The area of the tower exposed to the wind.

Using the basis formula for determining the surface area of tubular members, we compute the area of one face,

$$2 \text{ legs} \times 1\frac{1}{4} \text{ inches o.d.} \times 480 \text{ inches height} = 1200 \text{ square inches}$$

$$40 \text{ braces} \times 1\frac{1}{4} \text{ inches o.d.} \times 12 \text{ inches length} = 600 \text{ square inches}$$

for a total of 1800 square inches, or 12.5 square feet. Apply the correction factor for tubular members, $12.5 \times 0.666 = 8.33$ square feet.

Since the tower is triangular, we apply a corrector of 1.5 to the above figure, making the total again 12.5 square feet. The area of the exposed face of the tower is 12.5 square feet and the pressure per square foot is 23.12 pounds at a velocity of 85 miles per hour. If we take the product of the two (12.5×23.12) and divide by the length of the tower in feet, we find that the tower has a windload of 7.2 pounds per lineal foot.

We now have the necessary figures to determine roughly what happens to our tower at the stated wind velocity. Refer to Fig. 1, which shows the general layout of the structure. To keep things simple, we will take a little license in our computations and make them on the basis of ten-foot increments, applying the wind force against the center of each increment. The block at the top of the tower represents the combined areas of antenna, rotator and mast. The tower sections are labeled A, B, C, and D from the top to the ground. Keeping in mind that we are computing force at a wind velocity of 85 miles per hour blowing against the exposed faces of the tower and the beam, mast, and rotator, let us total up the

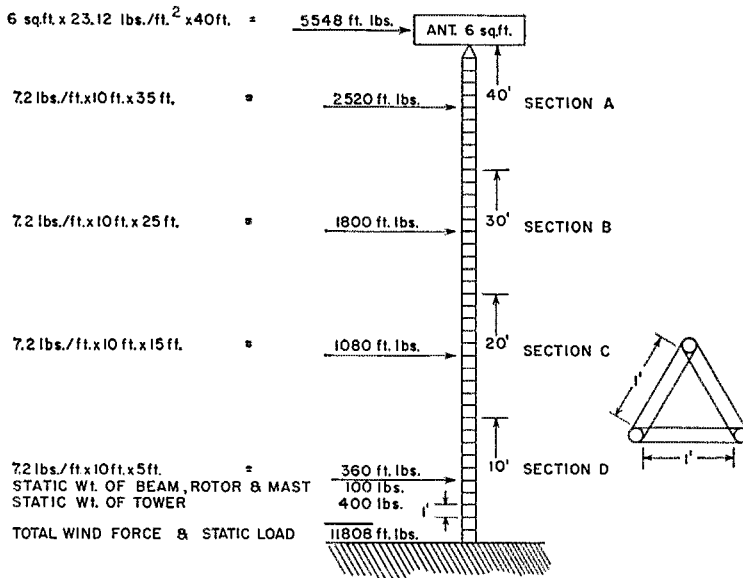


Fig. 1—Sketch showing loading on a 40-ft. triangular tower at a wind velocity of 85 m.p.h.

number of foot-pounds which are being transmitted down to the base of the tower:

At the top of the tower:

$$6 \text{ sq. ft.} \times 23.12 \text{ lbs.} \times 40 \text{ ft.} = 5548 \text{ ft. lbs.}$$

At the mid-point of Section A:

$$7.2 \text{ lbs.} \times 10 \text{ ft.} \times 35 \text{ ft.} = 2520 \text{ ft. lbs.}$$

At the mid-point of Section B:

$$7.2 \text{ lbs.} \times 10 \text{ ft.} \times 25 \text{ ft.} = 1800 \text{ ft. lbs.}$$

At the mid-point of Section C:

$$7.2 \text{ lbs.} \times 10 \text{ ft.} \times 15 \text{ ft.} = 1080 \text{ ft. lbs.}$$

At the mid-point of Section D:

$$7.2 \text{ lbs.} \times 10 \text{ ft.} \times 5 \text{ ft.} = 360 \text{ ft. lbs.}$$

Static weight of beam and tower = 500 ft. lbs.

Total transmitted force = 11,808 ft. lbs.

This means that there is a force of roughly 12,000 ft. lbs. or *six tons* being transmitted to the base of the tower. It means that one leg may be put under a compression of 12,000 lbs. while the other two legs are under a tension of 6000 lbs. each.

According to the official yardstick of the tower industry, EIA Standard TR116, this is much in excess of the proper permissible compression considering the amount of steel available to do the job. The 1½-inch o.d. tubing with the 10-gauge wall which we used has a cross-sectional area of steel of approximately 0.470 square inch. It is upon this cross-sectional area that we place a lot of our dependence when designing a steel tower. According to the standard, one square inch of steel of a certain grade and under certain conditions, will be permitted a maximum compression load of 17,000 lbs. Using this as a figure, our 0.470 square inch will only handle approximately 8000 pounds of allowable compression. This means that according to good engineering we have overloaded our tower 50 per cent.

It will be noticed that the support of the

steel provided by the braces has not been considered in this computation. We have made our computations on the basis of the worst situation in this regard. Standard TR116 has been adopted in the public interest and is designed to eliminate misunderstandings between the manufacturer and the purchaser, and to assist the purchaser in selecting and obtaining without delay the proper product for his needs. This standard sets forth the basic requirements for the structural requirements for radio transmitting towers and towers for radio transmitting antennas. Copies may be obtained from EIA, 777 14th St. N.W., Washington 5, D. C. for 25 cents each. Incidentally, the above referenced standard makes no note of any material other than steel.

Torsional Stability

One thing which should always be considered in any tower topped with a rotating-beam antenna is the torsional stability, or ability to resist twisting. A directional array, during its rotation, builds up a considerable amount of kinetic energy. When rotation is stopped suddenly this energy is transmitted directly to the tower and tends to twist the section. It has been observed that the starting and stopping of a rotary beam quite often places more torsion on a tower than it might receive during a 100-mile-per-hour wind. To withstand this frequent impact of forces, it is necessary that diagonal bracing be employed. The proper tower for a large beam equipped with a positively locking rotor brake must be well designed in order to take these forces.

Special Types

From the standpoint of appearance, a self-

supporting unit with a small base area is usually considered best. Unsightly bulk is avoided and also the need for guy wires and a large base area. A special type of self-supporting tower is the type that can be cranked up and down and tilted over. Towers of this type have many advantages. They are easy to erect. The antenna can be mounted from the ground, eliminating the dangers involved in climbing. They can be easily lowered during exceptionally strong winds or when heavy icing occurs which might damage the antenna. However, the installation of these towers does require some special consideration. Positive locking devices are essential. There must be provision to prevent the tower from telescoping should a cable fail, and also to remove the weight of the telescoping sections from the cable when the tower is extended. Winches should have removable handles so that the tower may be left unattended with no danger to children or unthinking adults who may be tempted to tamper with the mechanism.

There has been considerable discussion about the feasibility of using a ground post for mounting tilt-over towers. The author has had considerable experience with one such mounting. This post is mounted in Florida sand and supports a 40-foot tower topped with a full-sized tri-band beam, rotator and heavy-duty 10-meter ground-plane antenna. Radial fins project out in four directions from both the bottom of the post and that portion just under the surface. It is set into about five feet of sand, the last two and a half of which is watery. In fact, after reaching a depth of three feet it was necessary to bail continuously in order to complete the hole. The post shows no "budge" even when the tower is tilted horizontally across it with all weight on

the ground post. Mounting the ground post in sand or earth, rather than in concrete, definitely helps to prevent shear at the ground line, since the soil will tend to compress under force of the post. Radial fins such as described will withstand a pressure of 4000 lbs. per square foot at a depth of five feet in normal soil. At six inches below the surface, the figure of 1750 lbs. per square foot would be approximate. Also, the ground post itself will withstand considerable pressure in the soil. A 5½-inch o.d. ground post set five feet into the soil will withstand a pressure of 1150 pounds per lineal foot averaged along its five-foot length underground. This particular tower was recently moved from one QTH to another in a matter of three hours, with three willing hands working on the project.

Tower Protection

Towers are often finished off in a traditional aluminum color. An often neglected and expensive mistake is that of not determining the proper finish for the area where the tower is to be used. In areas which have a high incidence of atmospheric corrosion, it is advisable that the tower be hot-dip galvanized by total immersion after fabrication. This will protect all surfaces, including the internal surfaces of the tubing. On the other hand, if the corrosive action in the atmosphere is low, a painted tower will, with care, give lifetime service.

The serious amateur radio station owner will do well to give much careful consideration when he selects a supporting tower for his rotary beam. It is a commodity which must last for years and not become obsolete. But, it must be able to do a man-sized job. QST



December 1934

... We note in the editorial of twenty-five years ago that QST had been taken to task because of a large amount of material relating to the ultra-high frequencies (we'd call them very-high frequencies today). It seems that some correspondents felt that these frequencies were good for nothing but local communications and we shouldn't waste space on them. That viewpoint is well refuted in "The World Above 50 Mc." this month.

... Technical articles included information on a transportable 10-watt public address system, increased sensitivity with the regenerative detector, band switching for the transmitter, practice vs. theory in antenna performance, quartz crystal fundamentals, and low-loss transmitting coils. There were, in addition, the usual collection of hints and kinks for the experimenter, station descriptions, and notes on v.h.f. experiments.

... The Japanese Amateur Radio League was welcomed as a new member of the International Amateur Radio Union.

... The National Company announced that shipments of the new HRO receiver would be made shortly. (Incidentally, there's a chap here at ARRL Hq. that still has one of those early model HROs.

Silent Keys

It is with deep regret that we record the passing of these amateurs:

W1BX, Albert E. Weymouth, sr., Belfast, Maine
 W2AGD, Thaddeus F. Rudnicki, sr., Dumont, N. J.
 ex-2ANG, Eugene T. Turney, Brewster, N. Y.
 WA2FRZ, Floyd Rue, jr., Plainfield, N. J.
 W3ALE, Richard M. Krauss, Abington, Pa.
 W5BSC, George Lynn, Crawford, Texas
 K5JFN, Emmet K. Carson, San Antonio, Texas
 K5ORG, Dorman D. Taylor, Albuquerque, N. Mex.
 W5VLV, Chester W. Thomas, jr., Houston, Texas
 W6CZ, Raleigh W. Whiston, Los Angeles, Calif.
 K6HP, George N. Hawley, Glendale, Calif.
 K6YRC, Kenneth H. Doolittle, Los Angeles, Calif.
 W8HOY, Randolph L. Saffen, Warren, Ohio
 W8RTQ, Frederick M. Holbrook, Jackson, Mich.
 W9FUM, Horace P. Stuart, Anderson, Ind.
 W9HGV, Charles C. Walker, Seymour, Ind.
 WØFCF, Charles H. Clock, Kansas City, Mo.
 CX8AD, Aurelio Flores, Montevideo, Uruguay
 DL8AZ, Fritz Meyer-Buchardt, Saarbruecken
 Saarland, Germany
 FY7YB, Hermann Ravin, Cayenne, French Guinea
 VE3CEZ, George Cornish, Kingston, Ontario
 VK7AJ, Athol W. Johnson, S. Hobart, Tasmania

Transistorized V.F.O. for Mobile S.S.B./D.S.B.

Factors Influencing Stability

BY HARRY B. DUNLAP,* W6ZNM

The frequency sensitivity of the transistor v.f.o. with respect to electrode voltages has been a deterrent to its application to amateur transmitters, particularly in s.s.b. operation. Investigation by W6ZNM has led to a simple method of getting good frequency stability over the range of battery-voltage change normally encountered in mobile installations.

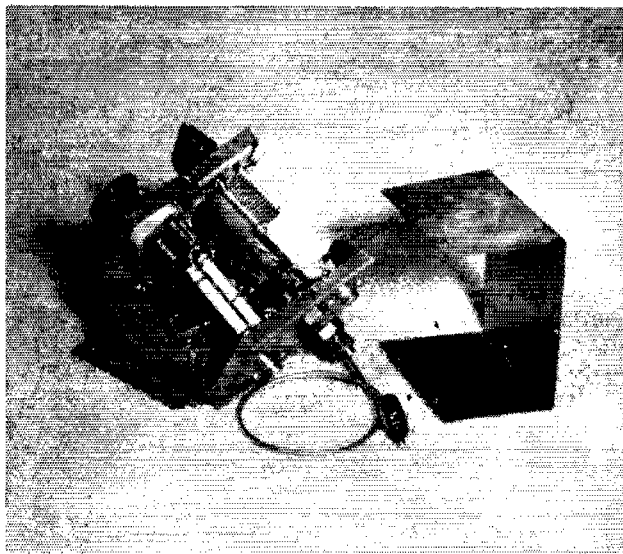
SEVERAL years ago after a cross-country tour mobiling on a.m., I decided to increase the effectiveness of my 75-meter installation by transistorizing, and by converting to suppressed-carrier operation. The design and construction of a transistorized d.s.b. exciter and subsequently a filter-type s.s.b. exciter were much less serious problems than that of stabilizing the v.f.o. It was found that transistor oscillators constructed in accordance with published circuitry could not be operated directly from the car battery. The ordinary transistor oscillator required a collector bias voltage control of the order of 6 millivolts for a frequency stability of 20 cycles. Regulation

of the car voltage to this degree could not be considered.

The powering of a transistorized v.f.o. directly by the car battery requires that the transistor static operating point and the natural frequency of the tank circuit be maintained nearly constant with respect to supply-voltage variation. The stabilization of the operating point is not too difficult to achieve and may be satisfied by the selection of bias-resistor values for constant emitter-base bias at the operating point based on the manufacturer's operating data. The maintenance of the natural frequency of the tank circuit, which is more difficult to obtain, may be aided by the partial isolation of the tank circuit from the maintaining circuit by (1) inserting a reactance in the transistor collector-to-tank lead, and (2) by tapping the collector connection down from the top of the tank coil.

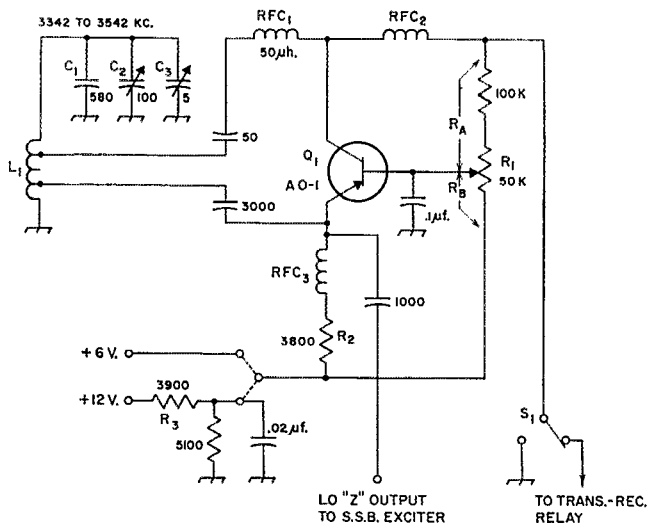
Incorporating a potentiometer into a bread-board circuit for base-bias control in lieu of fixed resistors proved to be most significant. The supply voltage was varied for each setting of the potentiometer in the range of constant emitter-base bias while observing the change in output frequency. It was soon discovered that the minimum change in the output frequency of the oscillator occurred for a small arc of potentiometer settings coincident with constant emitter-base bias. This amounted to a reduction in the

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Left-side view of the transistor mobile v.f.o., showing the tank coil and fixed tank capacitors.

Fig. 1—Circuit of the mobile transistor v.f.o. Unless indicated otherwise, capacitances are in μmf . and resistances are in ohms; fixed capacitors are ceramic, and fixed resistors are $\frac{1}{2}$ watt. R.f. chokes are 50-ma. type.



- C_1 —580- μmf . total (500 μmf . NPO and 80- μmf . N750K in parallel).
- C_2 —100- μmf . midget variable.
- C_3 —5- μmf . miniature variable (Hammarlund MAC-5).
- L_1 —11 turns No. 28 enam., close-wound on $\frac{3}{4}$ -inch form, collector tap at 4 turns from top end, emitter tap

- at 2 turns from ground end.
- Q_1 —AO-1 transistor (Philco).
- R_1 —50,000-ohm potentiometer.
- RFC_1 —50- μh . r.f. choke (National R-33).
- RFC_2 , RFC_3 —1-mh. r.f. choke (National R-50).
- S_1 —S.p.d.t. toggle.

variable effects of the maintaining circuit upon the natural frequency of the tank circuit.

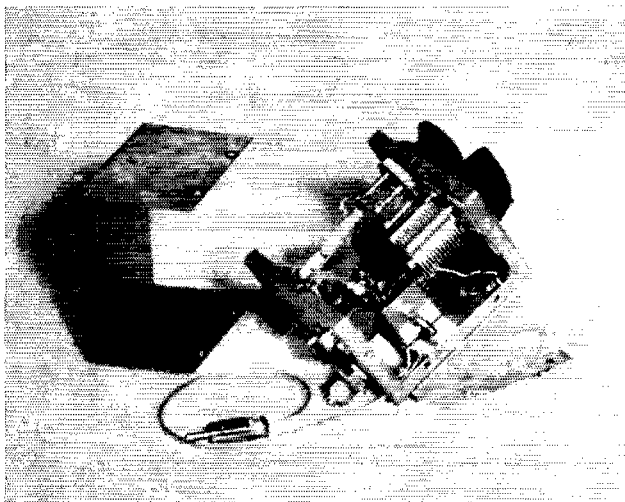
The final v.f.o. circuit resulting is shown in Fig. 1. The transistor is the inexpensive surface-barrier-type Philco AO-1. A combination of "coarse" (C_2) and "fine" (C_3) tuning is employed in setting the v.f.o. to frequency by heterodyning in the product detector of the mobile receiving system. I have found this system to my liking—eyes for the road only. RFC_1 is the stabilizing reactor in the collector lead.¹ I

¹ There is some question as to what effect RFC_1 may have on isolation in this instance, since RFC_1 and the 50- μmf . capacitor are series-resonant at 3300 kc. — Ed.

found a value of 3800 ohms for R_2 to be best for this circuit. RFC_3 is used to eliminate car-system noise modulation of the oscillator. A connection is shown for either 6- or 12-volt operation. The voltage at the v.f.o. input should be approximately 6.1 volts for a 12-volt input to R_3 .

Fig. 2 shows the relative independence of the v.f.o. output frequency with a variable power supply. I have been using this type v.f.o. in my 1950 Buick (6-volt system) since 1957, and I found that potentiometer settings between 2 and 3 provided adequate stability. The peak output voltage into a high-impedance load (grounded-

Right-side view of the transistorized v.f.o., showing the transistor mounting.



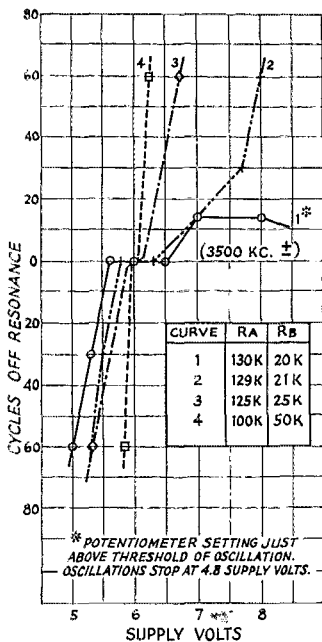


Fig. 2—Curves showing v.f.o. frequency vs. supply voltage for different settings of the base-biasing potentiometer. A setting somewhere between 2 and 3 is optimum.

collector amplifier) at setting 2 is 0.1 volt, and 0.2 volt at setting 3. Additional amplification is provided by a grounded-base amplifier in the s.s.b. exciter, just ahead of the balanced mixer.

The construction of the v.f.o. is shown in the photographs. The chassis box, sketched in Fig. 3, was shaped to fit my installation. The v.f.o. was put together in one week end, utilizing parts available in the junk box. Consequently some component compromise was made. The unit has worked so well that I have been reluctant to "clean up" my original work. All of the capacitors in the tank circuit have their ground ends fastened directly to the chassis. Thus each is equally exposed to external temperature variations. The v.f.o. was subjected to a 25-degree F. temperature rise from an ambient 70 degrees and cooling back to ambient. The average frequency

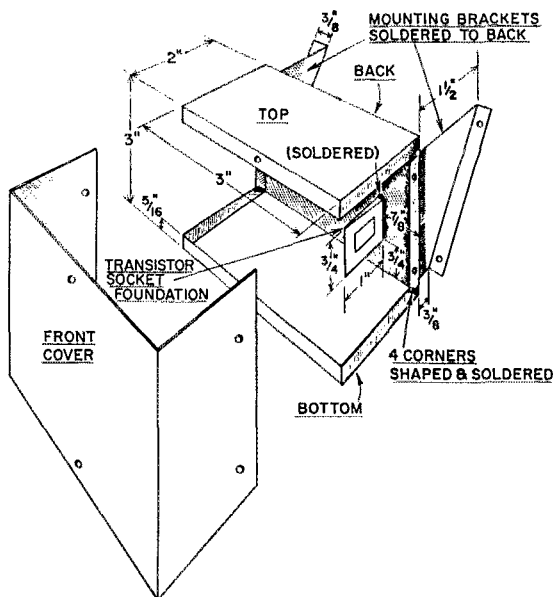


Fig. 3—Sketch showing the essential dimensions of the v.f.o. enclosure. The author made his of 22-gauge galvanized sheet steel. The transistor-socket mounting has triangular bracing wings bent back to provide rigidity.

deviation from resonance (3500 kc.) over the temperature cycling was 44 cycles with a maximum excursion of 120 cycles.

The odd frequency range of the v.f.o. resulted from moving 458 kc. down from the 75-meter band. I had been using the v.f.o. on 3.8 to 4.0 Mc. for d.s.b. and, when changing over to s.s.b., found it easier to move down in frequency by adding 150 $\mu\text{f.}$ to the tank circuit. The original tuning range can be restored by reducing C_1 by 150 $\mu\text{f.}$

The easiest way to observe the v.f.o. frequency variation while setting up the potentiometer is to heterodyne the output in a receiver with a stable b.f.o. or an external oscillator. The frequency deviation from resonance (zero beat) can be measured by Lissajous figures or can be roughly checked by audible beat tones. I used a Heathkit Model 0-11 oscilloscope with commercial 60 cycles as the reference frequency. **QST**

Strays

The brother of K2PTI received the call WV2ITP. Sort of backwards, you see.

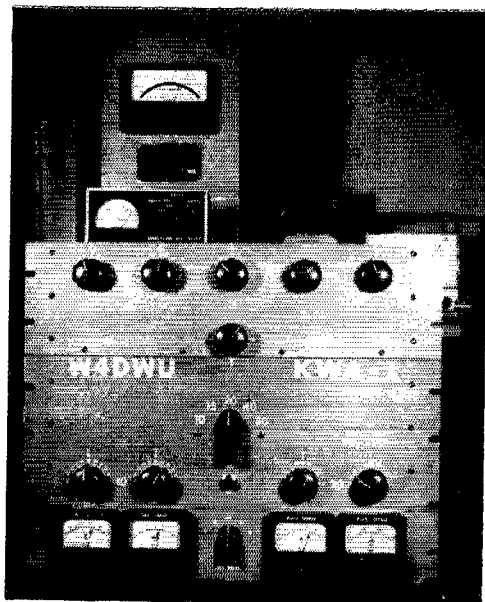
K6HJN started a tour of visits to some of his Mexican ham friends, but was the victim of a hit-and-run, and ended up in the CQ Hospital in Mexico City.

Anyone within 29.1 Mc. range of Chicago might listen between 1700 and 1800 CST for code

practice being sent by K9BBC, of the SCEDS (Illinois) Radio Club.

K8KPJ reports that the University of Detroit recently had a one-half hour show on amateur radio over education TV channel 56.

The Oakland Radio Club has recently awarded its Worked All California Counties certificate to W6MGN. This is only the 27th award—a toughie!



Using four 811As in parallel, this amplifier runs a kilowatt peak-envelope power input on s.s.b. and up to a kilowatt on c.w. A feature of the design is the use of a completely separate pi-network tank circuit for each band, making for quick band change to pretuned frequencies. The lower panel, 10½ by 19 inches, is on the main amplifier chassis, which also contains the 14- and 28-Mc. tanks. The other three tanks are behind the upper panel, 5¼ by 19 inches.

The author argues himself — and maybe you, too — into a "kilowatt" that is comparatively inexpensive to build. The band-switching scheme, although possibly not entirely new, has had little application in amateur gear; it provides the convenience of separate finals in much less space and at lower cost.

The "Medium Power" Kilowatt

A Fresh Approach to the High-Power Question

BY B. B. BLACKBURN,* W4DWU

THERE are a good many articles floating around these days on r.f. power amplifiers, linear and otherwise. Most of them give a little bit of philosophy as to how the particular design was evolved, plus considerable information on how to put the thing together and get it operating. There is also plenty of discussion of high versus low power, but there seems to have been a disproportionately small amount of agitation for the medium-power class of operation. No doubt others are mulling the "ideal rig" problem over, and perhaps some of them would like to know that they have company.

Let's assume to start with that you have a home-grown or commercial c.w./s.s.b. exciter, preferably an "all-band" job covering 80 through 10 meters with output in the order of 70 to 100 watts (input 100 to 150 watts). Such a rig is quite adequate for everyday home-station use, as thousands of satisfied operators of transmitters in this power class will confirm. Sooner or later, though, comes the urge for higher — or even HIGH — power. Where do we go from here?

I think it generally will be agreed that if we are presently running around 100 watts final input power we should go to at least 500 watts input to make the change really worthwhile. As may be seen from Fig. 1, this should lift the other fellow's

S meter an additional 7 db., or about 1½ S points. If 500 watts are better than 100 watts, then 1000 watts must be better than 500 — right? Well, maybe. We'll see.

As long as we are cooking up a new final, it might as well be the *ne plus ultra*. Quite possibly you have gotten tired of twisting all the knobs on that all-band exciter of yours when changing bands . . . personally, I am not about to rattle an equal number of knobs on an all-band high-power pi-net final, what with roller or tapped coils, vacuum capacitors, loading switches and controls, and the like. Even with preset readings

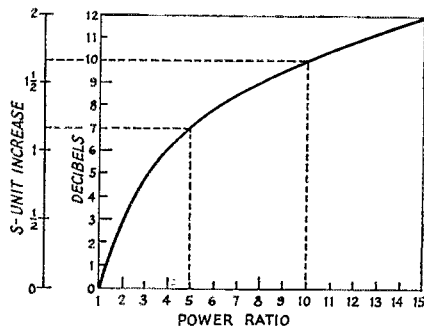


Fig. 1—Increase in signal strength to be expected with increased transmitter power, at 6 db. per S unit.

* Attache, American Embassy, APO 928, San Francisco, Calif.

it's a pain. Ah-ha, you say, separate finals for each band . . . that's the answer. Again, maybe — along with an optimized antenna for each band.

Now before deciding on a separate kilowatt final for each band and five acres in the suburbs, let's sort things out a bit more. You take your hobby seriously and figure that a full gallon would give you that extra edge on the competition. You are ready to take the big step up into the big league and join THE KW. GANG whom you have always secretly envied. My advice: *don't do it!* (or at least not until near the end of this article — *Ed.*). Quit worrying about the almighty input watt and concentrate instead on real operating convenience, amplifier efficiency, and good antennas.

A few more brief observations on the kw. subject: Have you tried asking the ham who owns one? If he is honest, he will tell you that he receives many rude shocks of the non-electric variety. He often gets less than S9 reports, especially when he has not had a chance to slip in his "RUNNING KW HR OM" before the other fellow gives him his report. It is also somewhat unsettling for the proud kw. owner to call a rare DX station in Upper Remotia, only to have said rare DX station come back to the Novice in the next county running 75 watts to a good beam. Believe me, these things do happen. Sure, the more watts the better; but having jumped from 100 watts input to 500, going from 500 watts to 1000 isn't going to wrap S-meter needles around pins all over the world.

High Power Defined

Before someone accuses me of reversing myself later on in this discussion, let's define high power in today's terms.

Point 1: A c.w. kilowatt is 1000 watts input, as computed by multiplying the key-down final amplifier d.c. plate voltage by the d.c. plate current.

Point 2: Power input on s.s.b. per FCC definition is the final amplifier plate voltage times the plate-current meter reading on speech peaks. For average voices, a final capable of talking up to a full kilowatt input on voice peaks, as indicated by meter swing, will run close to 2000 watts input on a sustained whistle (this is p.e.p. input). I consider this to be a "high power" rig.

Bandswitching Methods

Where does all this leave us? Well, let's get back to that separate-final-for-each-band idea. A nice 750-watt-input/500-watt-output grounded-grid final using three 811A tubes in parallel can be put together for about \$50, exclusive of meters. I contend that five such finals that can be selected at the flip of a switch will give a lot more in operating pleasure and convenience than will an all-band kilowatt final requiring retuning with each band change. The separate-final approach makes even more sense if you operate on only two or three bands. Total cost of parts for five such finals with one power supply is about \$350, versus

around \$125 for an all-band pi-net kilowatt final with power supply.

On the other hand, \$350 is still a lot of money, and $5 \times 3 = 15$ are a lot of 811As to have plugged in around the house. Even with separate finals it is still necessary to operate a control to select finals, so how about designing separate tank circuits for each band, and then switching these tanks — which are pretuned and connected to separate, or switched antennas — with a band switch? Bandswitching in the plate lead on the cold (for d.c.) side of the plate blocking capacitor is better than shorting turns in the tank inductance itself, where the switch contacts have to carry a circulating current of Q times the r.f. plate current. Only one set of tubes and one filament supply are now needed. True, this band-switching system is about as new as the coherer detector, but who cares? It works fine.

Interim Design

Having saved all those 811As just now, let's put a few of them back to work. I started out by trying three 811As in parallel grounded-grid on 14 Mc. Input power on s.s.b. (p.e.p.) or c.w. was 750 watts, and the measured output power into a 51.5-ohm dummy load was 500 watts with a driving power of 40 watts. The 811A is rated at 170 watts output, which for three tubes would be 510 watts; however, this is output at the tube plates, and tank circuit losses decrease this figure somewhat. It happens that in the grounded-grid circuit the fed-through driving power helps compensate for plate circuit losses; of the 40 watts driving power used in the three-tube amplifier roughly 10 watts are burned up in the form of grid driving power and grid-circuit losses, while the balance of 30 watts is fed through to appear in the output.

Should eyebrows be raised at squeezing this amount of power out of three 811As, reference might be made to the "Lazy Linear" article in *GE Ham News*¹ in which c.w. and s.s.b. p.e.p. outputs of 400 watts for two tubes are cited. C.w. operation at these inputs is recommended under intermittent keying conditions only. With admittedly morbid curiosity, I held the key closed for two minutes while the final ran at the 750-watt input/500-watt output level. The tubes actually ran fairly cool, showing only the slightest trace of color on the plates.

Ultimate Design

By now you have probably guessed it — the temptation to add a fourth 811A and run a real live kw. input was too much to resist. The grounded-grid circuit was retained because of its simplicity and the availability of adequate drive. Despite a few earlier jibes at the pi-network I use this type of output circuit to provide a convenient loading adjustment. Separate tank circuits permit optimizing the L/C ratios on each band and eliminate retuning when changing bands. The input impedance of the amplifier is in the order of

¹ "Lazy Linear," *GE Ham News*, July-Aug., 1949.

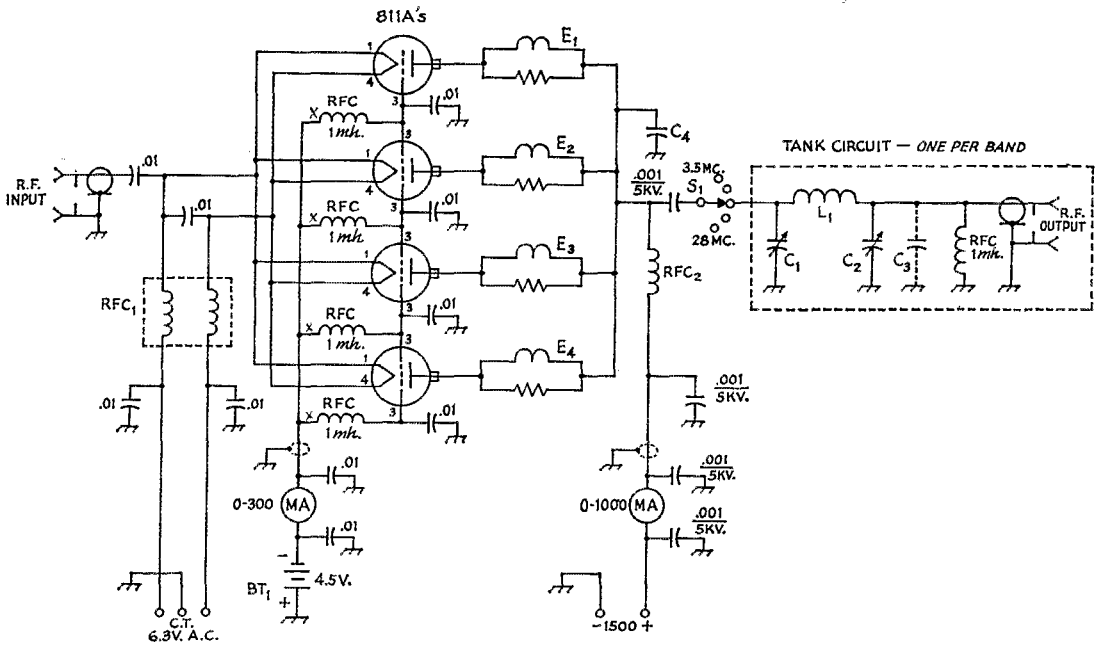


Fig. 2—Circuit of the "Medium-Power Kilowatt" grounded-grid amplifier using four 811As in parallel. Capacitances are in μf ; capacitors are disk ceramic, 1000-volt d.c. working, except as indicated. For reading individual grid currents, the grid milliammeter may be switched across 47-ohm resistors inserted in grid leads at points marked X.

BT₁—Flashlight cells.

C₁, C₂, C₃—See Table III.

C₄—Coaxial capacitor for TV harmonic suppression, if required; 3-inch (active) length of RG-59/U.

E₁—E₄, inc.—Parasitic suppressor; 4 turns No. 18 on 47-ohm 2-watt composition resistor.

L₁—See Table III.

RFC₁—Filament-choke assembly (B & W FC-15).

RFC₂—Solenoid r.f. choke, app. 90 μh ; 4 $\frac{3}{8}$ -inch winding of No. 26, 40 t.p.i., on $\frac{3}{4}$ " dia. ceramic form. (B & W 800).

S₁—Single-pole 5-position ceramic, to handle 1-amp. r.f., 2000-volt insulation.

70 ohms,² while the output tank circuits are designed to match 52-ohm coaxial line. The design borrows previously published ideas and exemplifies the usual ham approach of adapting and adding to such ideas. Fig. 2 gives the circuit diagram.

The "Medium-Power" Kilowatt

This amplifier using four 811As will take the maximum legal power input of one kilowatt on c.w., and will deliver an honest 700 watts of r.f. output at 7 Mc. (See Table I for driving power and output power on various bands.) So any time you feel the urge to run a kilowatt, go ahead. I normally restrain myself and run a conservative 750 watts input on c.w., using a Variac in the plate transformer to adjust input power. On s.s.b. the p.e.p. input is also 1000 watts. The rig will talk up to better than 333 ma. on voice peaks, as indicated by plate meter swing, without distortion showing up on the output monitor scope, thus giving an FCC s.s.b. input power of 500 watts at 1500 volts d.c. on the plates. The s.s.b. p.e.p. input power is about 1000 watts, and the p.e.p. output power is 700 watts on 7 Mc. and about the same on 14 Mc.

² Technical Topics, "Input Impedance and Fed-Through Power in Grounded-Grid Amplifiers," QST, Dec., 1958.

Power Supply

A well-regulated power supply furnishing 1500 volts d.c. under load is required for the final. Key-down plate current on c.w. (or single-tone p.e.p. input on s.s.b.) will run around 666 ma. for a kilowatt input. This is a lot of plate current, but look at the savings on filter capacitors and plate tank tuning capacitors. The same plate spacing in the tuning capacitor can be used at 1 kw. input with four tubes in parallel as would be used at 250 watts input with a single tube.

Freq. (Mc.)	Watts Drive	Watts Output *
3.5	80	750
7	80	710
14	75	690
21	90	580
28	50	500

* At 1-kw. input

If you can't find a power supply to handle four tubes, you can build up the final as shown, but only plug in two or three 811As. Modify the tank-circuit constants for the actual value of plate load

impedance resulting, as shown in Table II, by referring to some of the available pi-network design charts.³ The power supply need not be rated for continuous operation at the full current drain since the s.s.b. or keying load is intermittent. Naturally, a lower plate voltage than 1500 may be used at a corresponding reduction in power output.

TABLE II

Input Impedance and Plate Load Impedance for from One to Four Parallel 811As

No. of Tubes	Input Z	Plate Load R_L
1	284	6200
2	142	3100
3	95	2067
4	71	1550

(Z and R_L in ohms.)

Components

Several notes now on components, since the paralleling of four 811As pushes filament and plate currents up considerably. The filament requirement of 6.3 volts at 16 amperes can best be met by using two 10-ampere transformers connected in parallel; the extra current margin results in a slight increase in available filament voltage which is helpful in offsetting the 0.2-volt drop in the broad-band filament choke.

Sixteen amperes of filament current through the FC-15 filament choke (rated at 15 amperes) cause it to run barely warm; this constitutes a negligible overload by ham standards, as I am sure Messrs. Barker and Williamson will agree. Since plate current flows intermittently with voice or keying impulses, a plate r.f. choke rated at 500 ma. will suffice. The filament and plate r.f. chokes can be wound in the ham shack^{4,5}, as was done here for the three-tube version of the rig; this can save you about ten dollars.

Since the circulating tank current is high, the tank coils must be wound with heavy wire or tubing. The coils (Table III) wound with $\frac{3}{16}$ -inch copper tubing run cool. The 3.5-Mc. coil wound with No. 12 wire runs slightly warm, and larger wire or tubing would be better here.

The band switch is a very important item, so get the best one you can find; a good one may cost eight or ten dollars new, although I managed to locate a suitable surplus switch for eighty cents. It is not necessary to ground the tank

TABLE III

Pi-Network Tank-Circuit Data for Four Parallel 811A Tubes

Band (Mc.)	C_1 $\mu\text{mf.}$	L_1 $\mu\text{h.}$	$C_2 + C_3$ $\mu\text{mf.}$
3.5	325	6.5	1800
7	145	3.2	900
14	55	1.6	450
21	25	1.08	300
28	21	0.64	275

Based on 1500-ohm load for four tubes with 52-ohm output load on network, with $Q = 12$, except on 28 Mc., where $Q = 15$ to allow a practical value of tuning capacitance at C_1 . "In-use" tuning capacitance, C_1 , shown above is approximately 35 $\mu\text{mf.}$ lower than the required design value of input capacitance because of tube output capacitance (22 $\mu\text{mf.}$ for four tubes) and strays. C_2 is 500- $\mu\text{mf.}$ variable plus fixed capacitance, C_3 , as needed to total the value given.

Coil Data

3.5 Mc. — 12 turns No. 12, $2\frac{1}{4}$ -inch diam., length $2\frac{1}{4}$ inches (B & W 3905-1).

7.0 Mc. — 10 turns $\frac{3}{16}$ -inch copper tubing, $2\frac{1}{2}$ -inch diam., length $3\frac{1}{2}$ inches.

14 Mc. — 9 turns $\frac{3}{16}$ -inch copper tubing, $1\frac{3}{4}$ -inch diam., length 3 inches.

21 Mc. — $5\frac{1}{2}$ turns $\frac{3}{16}$ -inch copper tubing, $1\frac{3}{4}$ -inch diam., length 2 inches.

28 Mc. — 4 turns $\frac{3}{16}$ -inch copper tubing, $1\frac{3}{4}$ -inch diam., length 2 inches.

Note: Diameters measured center to center. Turns of copper tubing coils spaced evenly to length given.

circuits which are not in use — the floating resonances are well-removed from the amateur bands, and the tank coils are oriented for minimum interaction.

The four-tube amplifier as built here cost \$125. A suitable power supply will run \$75 or so. Access to a well-stocked junk box can reduce even these figures.

Variations

If you are mainly interested in two particular bands, such as 10 and 20 meters, only the basic deck need be constructed. The "roof" can be built up later and the remaining three tank circuits then connected to the band switch. Locate the 10-, 15-, and 20-meter tanks for shortest leads to the band switch. Of course, if you like to twist knobs, a very compact kilowatt final can be built on the main chassis by substituting an all-band pi-net output circuit⁶ for the five separate tank circuits. This was suggested by W6COU in describing his plug-in coil half-gallon linear using a pair of 811As.⁷

Tune-Up

In adjusting the tank circuits for proper operating Q , follow any of the recommended procedures such as W3GEG's.⁸ Or wind the coils exactly as shown; the tank (plus stray) capacitances, when adjusted to resonance, will give the desired Q if you have the design value of load resistance connected. Do not exceed 200 ma. total grid current, or 50 ma. per tube. A grid

³ Wulf, "Pi-Network Tank Design," *QST*, Sept., 1958; *ARRL Handbook or Radio Handbook*.

⁴ Wilson, "A Filament Choke for Grounded Grids," *CQ*, Nov., 1957.

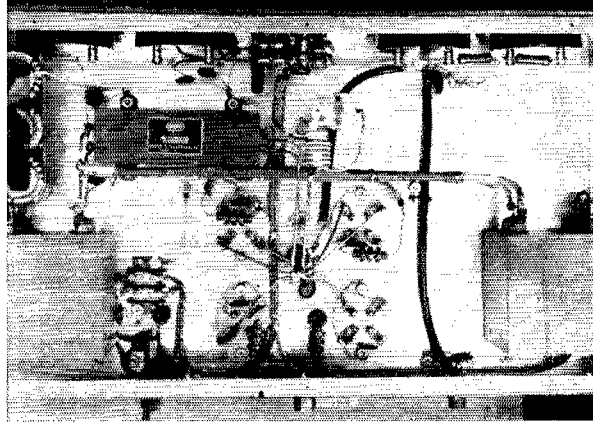
⁵ Chambers, "R.F. Chokes for High-Power Parallel Feed," *QST*, May, 1954.

⁶ Gonset is now manufacturing such an amplifier — W4DWU.

⁷ Smith, "An Economical Half-Gallon Linear," *CQ*, March, 1958.

⁸ McLaughlin, "Pi-Net Tuning," *CQ*, April, 1957.

This bottom view shows the filament wiring of the four tubes and the two 6.3-volt 10-ampere transformers used for heating the filaments. The neutralizing circuit shown in Fig. 3 is in the upper center. The switch at the top center (not shown in the circuit diagram) is for shifting the grid meter to read individual grid currents. The three-cell bias battery is at the upper left.



meter switch will permit reading the total or individual grid currents. Do not apply full drive unless the plate voltage is on, because excessive grid current will flow.

Output Measurement

When you have finished the amplifier and are ready to give it the smoke test, see if you can promote the use of a really good dummy load and r.f. wattmeter. Some excellent units are available commercially, but these are a trifle expensive. If you use one of the less-expensive versions, calibrate it at some school or technical laboratory if possible. The Collins Directional Coupler and Wattmeter Type 302-C1 used here is a very good instrument, having 100/1000-watt scales for forward and reflected power. This unit is useful for both loading and matching operations, and its power output readings checked within a few watts with readings made on a much more expensive laboratory instrument.

Neutralization

What? Neutralize a grounded-grid amplifier? Sad but true, this may be necessary on 28 Mc. Self-oscillation can take place via the plate-to-filament capacitance of the tube, especially at high frequencies when tubes are paralleled. The circuit can be neutralized by using an extra winding on the filament r.f. choke to furnish the neutralizing voltage to the cathode, but since a suitable choke was not at hand, the makeshift scheme shown in Fig. 3 was devised. Installing this in the filament circuit external to the filament r.f. choke eliminated a trace of oscillation on 28 Mc. when the amplifier was unloaded. The series

filament coil L_1 is electrically large enough to provide anti-feedback voltage, while being physically constituted so as to make the filament voltage drop across it negligible. Neutralization may not be necessary if 23-Mc. operation is not desired, and can probably be omitted even on 28 Mc. if fewer than four tubes are paralleled.

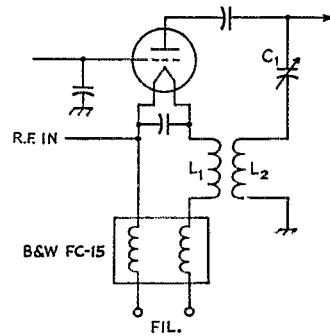
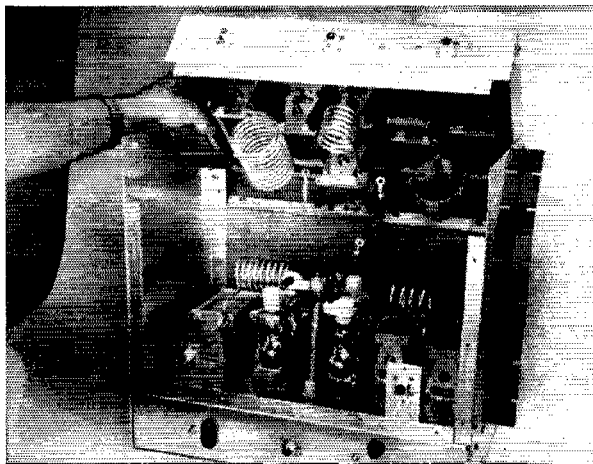


Fig. 3—"Field-expedient" neutralizing circuit.
 C_1 —6- μ mf. variable, 2000 volts (app. 0.045" plate spacing).
 L_1 —6 turns No. 12, 1/2-inch diam.
 L_2 —6 turns insulated wire wound over L_1 .
 Note: Reverse connections to L_2 if neutralization cannot be achieved at first try.

Parasitics?

No amplifier article is complete without a statement that "while no parasitics were encountered, suppressor chokes were included everywhere as a precautionary measure." I can practically guarantee that v.h.f. parasitics will crop up with-
 (Continued on page 194)

Three tank circuits are mounted in an inverted chassis the same size as the main chassis, 17 X 10 X 3 inches. The strap leads from the band switch, part of which is visible behind the tubes, are detached from the tank tuning capacitors in this view with the tank assembly swung up. The tuning capacitors are Johnson type E, 3000-volt rating, selected to provide the capacitance called for in the table of tank-circuit data. Output variable capacitors are Johnson 500E20, shunted by fixed units (2500-volt mica satisfactory) as required to make up the capacitance values given in Table III.



• Beginner and Novice —

Choosing a Transmission Line

Some Information on Lines, Antennas, and S.W.R.

In Two Parts — Part I

BY LEWIS G. McCOY,* W1ICP

The beginner frequently is bewildered by the variety of transmission lines mentioned in amateur publications, available from suppliers, and discussed on the air. Some of the information he gets, especially the kind picked up by listening in, often does no more than add to the confusion. Here's the story, in elementary language.

WHAT kind of transmission line should I use? This is a question that every amateur asks himself at one time or another. Actually, the choice of line to use with any given antenna depends on many factors. In this article the pros and cons of various type lines will be discussed with the end purpose of helping the reader select the best type for his particular installation.

First, let's get one point clear: It is possible to use any type of transmission line with any antenna as long as the proper methods are used to couple the two together. Many amateurs are led to believe (usually by other hams who don't know better) that a certain type of antenna requires a certain type of line. This is not true. It is sometimes more convenient to use a particular type of line but there are no hard and fast rules that say it must be used.

What is a transmission line supposed to do? Well, the answer is quite simple: Its purpose is to provide a path over which the r.f. energy will travel from the transmitter to the antenna, and to do it as efficiently as possible.

It would be nice to be able to say that you merely pick out any type of transmission line, connect it to an antenna, and that's all there is to the problem. Unfortunately, it isn't quite that simple. However, before discussing feed lines it is important to have some knowledge of antennas and their feed-point characteristics.

Antenna Feed-Point Characteristics

The place where the transmission line is attached to the antenna is called the *feed point*. At this point the antenna exhibits certain char-

* Technical Assistant, QST.

acteristics that represent the principal factor in determining the best choice of line. When energy is fed to an antenna it is dissipated in two ways, as heat in the resistance of the antenna wire and in nearby dielectrics, and as radio waves. The energy lost in heat is lost in a real resistance while power dissipated as radio waves is used in an assumed resistance which, if it were actually present, would consume exactly the amount of power radiated by the antenna. The actual resistance in the wire and its equivalent in the dielectrics is called the *ohmic resistance*, while the fictitious resistance is called the *radiation resistance*.

Thus at the feed point the antenna has a certain *impedance*, and when the antenna is operated at its resonant frequency the impedance is a simple resistance and equal to the sum of the ohmic and radiation resistances. The ohmic resistance of most types of antennas represents only a very small part of the total resistance, so very little power is lost in heat. But in the case of antennas having quite low radiation resistance — say, 10 ohms or less — the ohmic resistance starts to become a considerable factor.

At frequencies other than resonance, the antenna impedance will have reactance along with resistance. Reactance can be defined as the opposition (expressed in ohms) offered to the flow of r.f. current either by inductive or capacitive effects in the antenna circuit. These effects become appreciable when the antenna is driven at other than its resonant frequency.

The feed-point impedance depends on many factors — too many, in fact, to cover in a single article — the principal one being the type of antenna you use. It can be as low as a few ohms or as high as several thousand ohms. A little later on we'll discuss some typical antennas and how to determine their impedances, together with the problems involved in using different types of feed lines.

Feeder Characteristics

Two types of line are in common use in ham stations. One type has two similar conductors running side by side with constant separation between them. This is called *parallel-conductor line*, or *two-wire line*. The other type consists, in its most familiar form, of a tube-shaped braided

conductor enclosing another conductor of smaller diameter, usually a solid or stranded wire, which is centered in the tube and insulated from it by flexible solid low-loss insulating material. This is called a *coaxial line*. Examples of both types are shown in Fig. 1.

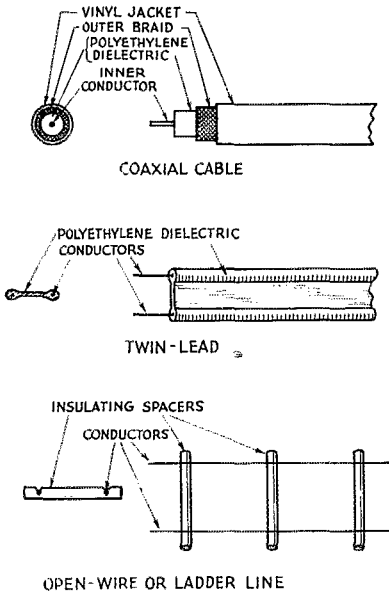


Fig. 1—Three examples of transmission lines commonly used by amateurs.

Any line, whether parallel or coaxial, has a certain amount of capacitance and inductance per unit length which, when r.f. energy is ap-

plied, establishes a definite relationship between voltage and current. This results in a property which is commonly referred to as the *characteristic impedance* of the line. The characteristic impedance of any line will depend on the conductor size, shape and spacing, and on the dielectric material used to separate the two conductors. The symbol ordinarily used to express characteristic impedance is Z_0 .

Table I lists some of the electrical characteristics of different types of lines. Let's look at an example of coaxial line, RG-58/U. This particular type is less than $\frac{1}{4}$ inch in diameter and is capable of handling several hundred watts of r.f. It is also the lowest priced of the different types of coaxial line, hence is quite popular. Looking across Table I we find that RG-58/U has a characteristic impedance of 53.5 ohms, will handle 430 watts up to 30 Mc., and has an attenuation factor, or power loss, of 0.78 decibels per hundred feet at 3.5 Mc.

Let's consider the attenuation figures. If a transmission line were perfect it would have no resistance and dielectric losses and therefore no power would be lost as the r.f. traveled from the transmitter to the antenna. However, it is impossible to make a perfect line, and all transmission lines have a certain amount of loss. In rating lines for loss or attenuation it is customary to give the figures in terms of decibels loss per hundred feet of line because the total loss in decibels is directly proportional to the line length. The decibel, abbreviated db., is a unit used for measuring power ratios; Fig. 2 is a chart showing power vs. decibels gain or loss. For example, a power gain of 3 db. is a power ratio of 2 to 1.

Suppose you have a transmitter capable of 100 watts output (not input), and you are using 100

TABLE I

Type	Z_0 Ohms	Attenuation in db./100 feet							Power Rating in Watts	
		3.5 Mc.	7 Mc.	14 Mc.	21 Mc.	28 Mc.	50 Mc.	144 Mc.	30 Mc.	200 Mc.
RG-58/U	53.5	0.78	1.1	1.7	2.2	2.5	3.5	6.3	430	140
RG-8/U	52	0.30	0.45	0.66	0.83	0.98	1.35	2.5	2000	560
RG-11/U	75	0.35	0.55	0.80	0.98	1.15	1.5	2.3	1400	400
RG-59/U	73	0.60	0.90	1.3	1.6	1.9	2.7	4.8	680	208
Twin-Lead, Receiving	300	0.19	0.28	0.41	0.52	0.60	0.85	1.5		
Twin-Lead, Transmitting	300	0.10	0.15	0.24	0.31	0.37	0.52	1.0		
Twin-Lead, Tubular, Receiving	300	0.19	0.28	0.41	0.52	0.60	0.85	1.5		
Twin-Lead, Tubular, Transmitting	300	0.14	0.22	0.33	0.41	0.48	0.68	1.25		
Open-Wire*	—	0.03	0.05	0.07	0.08	0.1	0.13	0.25		

* Attenuation figures are based on No. 12 conductors, with no allowance for dielectric or radiation loss. "Ladder-type" TV line has somewhat higher losses because of numerous spacers and smaller conductors.

Note: Data on attenuation and power-handling capacity of coaxial cables based on information contained in Amphenol Catalogs B5 and W1.

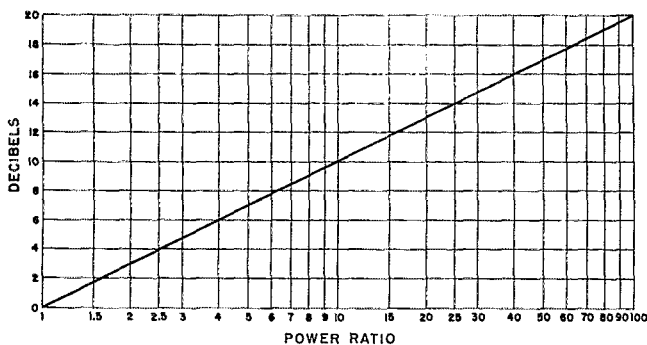


Fig. 2—Chart showing ratios for decibels vs. power. For example, four decibels is equal to a power ratio of 2.5 to 1.

feet of RG-58/U to feed an antenna on 50 Mc. Table I shows that you will have a power loss of 3.5 db. in the feed line. Since a power loss of 3.5 db. corresponds to a power ratio of about 2.3 to 1 (Fig. 2), this means that of the 100 watts output from the transmitter, less than 45 watts reach the antenna to be radiated! Furthermore, this loss figure assumes that the feed line is matched at the antenna by a load that is of the same value as the characteristic impedance of the line. (This question of "matching" will be taken up a little later.) If there is a mismatch the losses can be even greater. All attenuation figures given in Table I are based on the assumption that the line is terminated at its output end in a power-absorbing load (such as an antenna) that matches the line's characteristic impedance.

Looking again at Table I, notice that the higher the frequency the greater the losses. As another example, at 144 Mc. 100 feet of RG-58/U has a loss of 6.3 db. With 100 watts output this amounts to radiating 23 watts from the antenna and using 77 watts to heat the line! Also observe that the power rating of the cable decreases as the frequency increases. Power ratings also are given for matched conditions; in other words, for a cable terminated in a load equal to its characteristic impedance.

But after looking at the figures for RG-58/U don't jump to the conclusion that this line is not for you. In many cases the line is quite suitable, as we shall see. The data on the other types of coaxial lines show the differences in power ratings, characteristic impedance, and losses of the various types.

Parallel-Conductor Lines

Next, examine the ratings on open-wire line, which is a parallel-conductor type having insulating spacers at intervals instead of a continuous solid dielectric. The insulation is thus mostly air. No figure for characteristic impedance is given for this type line because the impedance will depend on the size and spacing of the conductors. Amateurs can make their own open-wire lines or can buy any of the several different commercial varieties, manufactured primarily for u.h.f. TV use. The commercial types usually have a characteristic impedance of 450 ohms and are capable of handling power at any amateur level.

Note in Table I that the resistance loss of open-wire feeders made of No. 12 wire is only 0.03 db. per 100 feet at 3.5 Mc. and only 0.25 db. at 144 Mc. The resistance loss is the principal loss at the lower frequencies, where dielectric losses in the spacers are small. The resistance loss increases when smaller wire is used, and also increases at higher frequencies. The dielectric losses become important at v.h.f., and increase with the number of spacers used. For these reasons the "ladder" lines sold for TV reception have greater attenuation than is indicated for open-wire line in Table I, but the loss is always considerably smaller than the loss in the coax cables listed, at the same frequency, so it is quite safe to say that of all the different types of lines available to amateurs, open-wire line has the least loss.

Another common type of parallel-conductor line is 300-ohm Twin-Lead,¹ available in both receiving and transmitting types. The receiving variety is used by many amateurs for transmitting purposes since it is capable of handling several hundred watts and is available everywhere. The receiving type usually consists of two conductors each made of seven strands of No. 28 or No. 26 wire, spaced about $\frac{3}{8}$ inch apart, and imbedded in a flat web of polyethylene. Two No. 16 solid conductors are used in the transmitting type, with wider spacing, but in general the construction is similar to that of the receiving type.

There is also available a tubular-type Twin-Lead, again in both receiving and transmitting types. As compared with the flat type, the tubular form helps to make the line less susceptible to moisture effects; the flat kind, when wet, will not maintain its rated characteristic impedance and will show increased loss. For this reason the tubular line is preferred by many amateurs.

Standing-Wave Ratio

In deciding on the type of transmission line to use, it is necessary to give consideration to the problem of standing waves. Remember that the loss figures for transmission lines are based on the line's being terminated in a load that is the same value as its characteristic impedance. When the feed-point impedance of an antenna is the same

¹ "Twin-Lead" and "Ladder Line" are trade names for particular makes of line, but are such well-known names that they are used for general identification regardless of actual brand.

as the characteristic impedance of the line, the line is said to be *matched*. Under such conditions, the power that reaches the antenna end of the line is completely absorbed from the line and, except for the resistance loss mentioned earlier, is all radiated by the antenna.

On the other hand, when the impedance of the antenna differs from that of the line there is a *mismatch*. When this condition exists, some of the power reaching the antenna is reflected back along the line toward the transmitter. Thus both *forward* and *reflected* power are present all along the line. The actual voltage at any point along the line is the sum of the forward and reflected voltages at that point, and the same is true for the current. The forward and reflected voltages combine in such a way that the resultant voltage along the line changes in amplitude with distance from the antenna. If you could measure the voltage with a voltmeter which you moved along the line, you would find that the readings would vary smoothly between a high and a low limit, and that the positions on the line at which these high and low readings occurred would be at intervals of equal length. The variation in current along the line would follow the same pattern, although a low-current point would coincide with a high-voltage point, and vice versa. The *standing-wave ratio* is the ratio of the maximum voltage to minimum voltage on the line, or the ratio of maximum to minimum current. This ratio is the same as the ratio of the antenna's feed-point impedance to the characteristic impedance of the line, if the antenna is operated at its resonant frequency. When the antenna matches the line this impedance ratio, and also the standing-wave ratio, is 1 to 1, and there is no variation in either current or voltage with distance along the line starting from the antenna.

Line Losses and S.W.R.

If you've done much listening to the conversations that go on in the ham bands, you've probably heard that the losses in a line increase when the standing-wave ratio is greater than 1 to 1, so probably the first conclusion you'll reach is that the line always should be matched in order to keep the standing-wave ratio as low as possible. Don't jump to such a conclusion too quickly! A low standing-wave ratio may or may not be important.

Let's first consider coax line. Take RG-58/U as an example, and consider its characteristics at 21 Mc. From Table I it can be seen that the loss per 100 feet at 21 Mc. is 2.2 db. when the line is matched. Assume that this length of line is used to feed a resonant antenna that has an impedance of 530 ohms. Since the impedance ratio is 530/53, or 10 to 1, the standing-wave ratio is also 10 to 1. In addition to the inherent 2.2-db. loss of the 100-foot length of line, the s.w.r. of 10 to 1 will cause an *additional* loss, as shown in Fig. 3, of 3.6 db., making the total line loss 5.8 db. If you don't think this is appreciable, look at the power ratio corresponding to 5.8 db. in Fig. 2. The power ratio is slightly less than

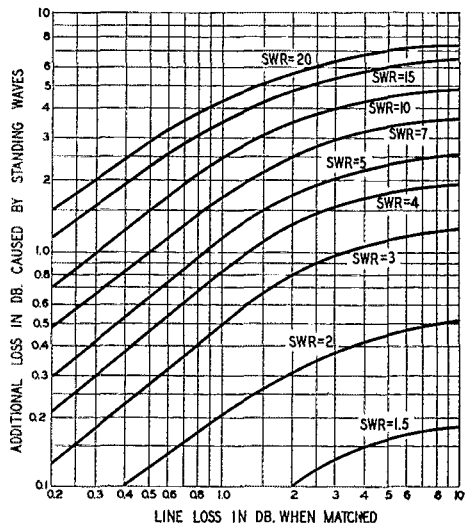


Fig. 3—Chart showing increases in feed-line losses because of standing waves. To use the chart, first determine the line loss when the line is matched by the load, as given in Table I. Locate this point on the horizontal axis and then move up the chart to the curve that corresponds to the standing-wave ratio on the line. The additional loss in decibels is found on the vertical column on the left-hand side of the chart. For example, a line that has a loss of one decibel, when matched, will have an additional loss of 2.5 db. when the s.w.r. is 10 to 1.

4 to 1, which means that little more than a quarter of your power will reach the antenna to be radiated.

Another thing to think about is the effect a high s.w.r. has on the power-handling capabilities of coax line. All lines have voltage and current limitations and in coax, because of the comparatively close spacing of the conductors plus the use of a solid dielectric material to keep the conductors evenly spaced, these limitations are rather definite. The amount of power that a line can handle safely is inversely proportional to the standing-wave ratio. This means that although 100 feet of RG-58/U can handle 430 watts at 21 Mc. when it is matched, an s.w.r. of 10 to 1 will reduce the safe power-handling capacity of the line to 43 watts.

As you can see from studying Table I and Fig. 3, it is important to keep the standing-wave ratio low when using coax at high frequencies. However, if coax line is reasonably well matched by the antenna impedance, the inherent losses are insignificant on the lower frequency bands. In such a case line losses needn't influence your choice of a type of line. However, at higher frequencies, and particularly at v.h.f., length of line and inherent losses should be given considerable thought before deciding on which type of line to use. A high standing-wave ratio is relatively unimportant when using a low-loss line such as the open-wire type. Power-handling capabilities will depend on the size and spacing of conductors, but even TV type open-wire line will

(Continued on page 194)

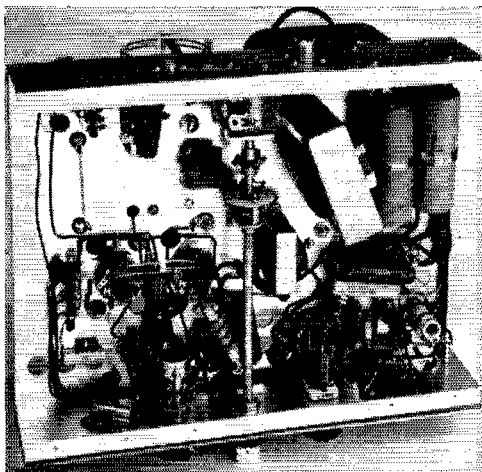
• Recent Equipment —

The Johnson Viking Challenger Transmitter

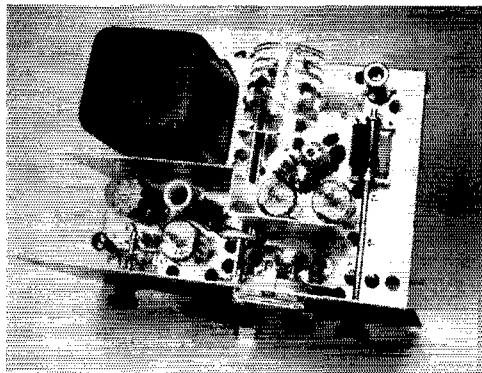
THE E. F. Johnson Company's Viking Challenger is a crystal-controlled handswitching transmitter which covers the amateur bands from 80 through 6 meters and provides both phone and c.w. operation. It is rated at 120 watts input on c.w. and 70 watts on phone, with input restricted to 85 watts on 6 meters. Loading can be reduced so that the input is restricted to the 75-watt maximum for Novice use.

The Viking Challenger is housed in a 9 by 10 by 13 inch cabinet, weighing some 22 pounds, with the usual Johnson styling. The front panel has the band switch, a socket for crystal or v.f.o., the several tuning and loading controls, an operate switch, a power indicator lamp, and a meter which can be switched to read either final plate current or final grid current. Across the back of the chassis are the microphone jack, the key jack, the r.f. output coax fitting, and the line cord.

As shown in the block diagram of Fig. 1, the Challenger uses a 6AU6 as a crystal oscillator, a 6DQ6A as an r.f. buffer/driver, and a pair of 6DQ6As in parallel in the final. A 12AX7 is used as a two-stage speech amplifier to drive a 6AQ5 clamp-tube modulator. This same 6AQ5 is used on c.w. to clamp the final screens and thus limit key-up plate dissipation. The transmitter is



Underneath the chassis the miscellaneous small components in the r.f. circuits are grouped around the tube for each stage. The two electrolytics at the upper right are 80- μ f. capacitors connected in series for power-supply filtering. The shaft that runs from the center of the panel to the switch and the variable capacitor at the rear is a concentric job; one shaft controls the coarse loading by progressively switching three 680- μ f. fixed capacitors in or out of the circuit, and the other controls the fine loading by means of a 700- μ f. variable capacitor.



In this top view of the Viking Challenger the crystal oscillator tube can be seen at the far left, just back of the panel. The 6DQ6A driver is to its right. The 5U4-GB rectifier is in front of the baffle shield that separates the power transformer and final amplifier from the oscillator and driver components. The 12AX7 speech amplifier is at the right rear of the chassis. The 6AQ5 clamp tube is partially hidden just below the meter.

keyed in the cathodes of both the 6AU6 oscillator and the 6DQ6A buffer, with the keyed wave being shaped by means of a 2-henry choke and a 2- μ f. capacitor.

The crystal socket on the front panel accepts crystals with standard FT-243 pin spacing. 160- or 80-meter crystals are used for 80-meter operation, and 40-meter crystals are used for 40-, 20-, 15-, and 10-meter operation. For 6-meter work, crystals in the 8-Mc. range are used. On 6 meters, the crystal frequency is doubled in the oscillator, tripled in the buffer, and the final works straight through. A v.f.o. can be plugged into the same socket that is used for the crystals, in which case power is fed to the v.f.o. and the v.f.o. r.f. output is fed back into the Challenger. The 6AU6 then serves as an r.f. amplifier for the v.f.o.

The OPERATE switch has five positions, allowing

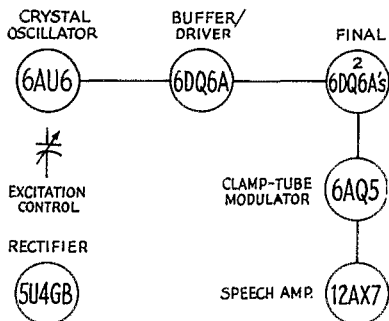


Fig. 1—Block diagram of the Challenger.

the choice of TUNING, STANDBY, PHONE, and c.w. operation. The EXCITATION CONTROL is a variable capacitor in the plate circuit of the 6A U6 oscillator, and is adjusted for proper drive at the final grid. The DRIVER CONTROL tunes the plate tank circuit of the driver, and is adjusted with the meter in the GRID position. Both the driver and the final, incidentally, are neutralized.

High voltage (about 650 volts) for the transmitter is supplied by a husky power supply using a 5U4-GB rectifier through a single-section filter which has 40 $\mu\text{f.}$ of capacitance and a 5-henry choke. Fuses are in the power plug. Power consumption of the transmitter is about 115 watts in the standby position and 250 watts when on c.w. — R. L. B

The Deluxe LW-51 50-Mc. Transmitter

HERE is a 50-watt 50-Mc. transmitter, complete with audio equipment and full metering facilities, in a package 5 by 6 by 9 inches in size. Circuitwise and in appearance it bears a family resemblance to earlier LW v.h.f. transmitters, but several new features have been added. Two models are available. One is assembled on a chassis only; the other, a deluxe version, is housed in a case of perforated metal. The latter has all its controls brought out to the front panel and includes metering of the various stages, the r.f. output and the modulation percentage.

A 6U8 overtone oscillator-doubler drives a 6146 amplifier, in a circuit quite similar to that employed in the simple 50-Mc. transmitter in the 1959 *Handbook*. The modulator uses a 6U8 speech amplifier, with provision for crystal or carbon microphone, driving a pair of 6CZ5s as modulators. The LW-72 power supply, a similarly packaged unit, delivers 225 or 450 volts, selectable with a front-panel switch, allowing the transmitter to be run conveniently on low power whenever the maximum capability of 50 watts input is not needed. Any other power supply capable of delivering 450 volts at 250 ma. may be used, provided that a simple voltage divider system consisting of two 0A2 regulator tubes and a 3000-ohm 10-watt resistor is added. The equipment may also be run from a single 300-volt 150-ma. supply for mobile or low-power home-station service.

An appearance of extreme simplicity is achieved in the LW r.f. units through the use of wafer sockets. All socket lugs that are to be grounded are soldered directly to the cadmium-plated chassis, a procedure that also pays dividends in stability, through the elimination of r.f. ground leads.

Connection between the r.f. assembly and the power supply is made through a cable with 8-pin

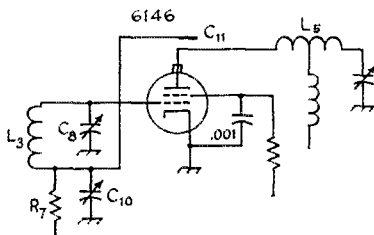
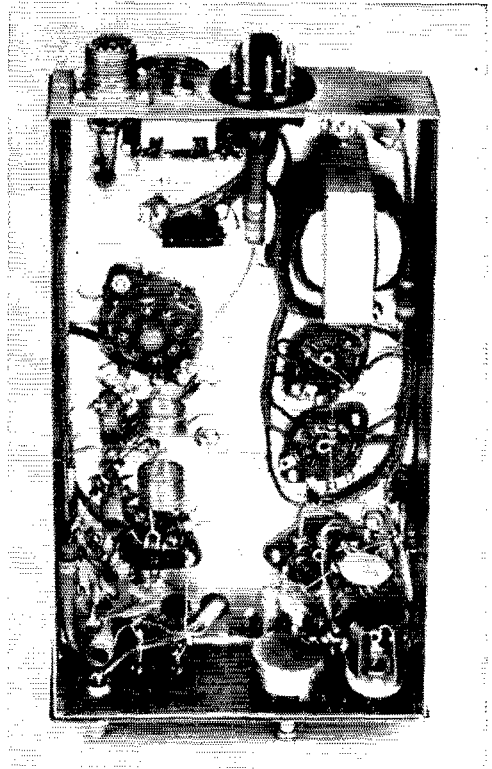


Fig. 1—Basic amplifier circuit of the LW-51 50-Mc. transmitter, showing the neutralizing system used. Designations are those of the manufacturer. A high-capacitance mica padder, C_{10} , is used in place of the usual fixed capacitor.



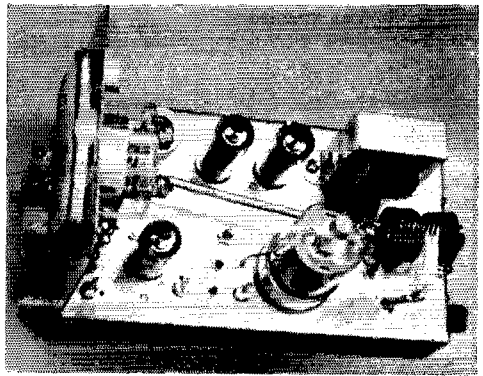
Bottom view of the deluxe LW-51. Doubler plate and amplifier grid coils are near the lower middle of the photograph. Note use of wafer sockets for effective grounding and wiring simplicity.

plugs and chassis fittings. The amplifier may be keyed for c.w. work by inserting a keying adapter between the transmitter and the power cable. Keying should be done with a relay, as the screen circuit is broken, and the high voltage appears across the contacts.

The method of neutralizing the 6146 amplifier may be of interest to those who have had trouble tuning tetrodes at 50 Mc. The circuit is shown in Fig. 1. It will be seen that it is a variation of the familiar capacity-bridge system, in that both capacitive elements are variable. C_{11} is merely a stiff wire lead brought up through the chassis and run vertically for about a half inch, close to the envelope of the 6146. C_{10} is a high-capacitance mica padder, adjustable from either the bottom

or top of the chassis. Making the larger of the two capacitors in the bridge system variable gives a smooth control over the feedback introduced for neutralization. The method more commonly employed is to use a fixed capacitor for C_{10} , usually about 250 μf . at 50 Mc., and then adjust the neutralizing capacitance. As the range with a neutralizing wire or other small capacitance is very limited, it is often necessary to do some cut-and-try work with the value of the bypass (C_{10}) when a fixed capacitor is used there.

The LW-51 50-Mc. transmitter is sold in kit form or completely wired and tested, and it may be purchased with or without tubes and crystal. The companion power supply, LW-72, is also sold in kit form or ready for use. Chassis soldering is done in all LW kits. LW Electronic Laboratory, Route 2, Jackson, Mich. — E. P. T.



The deluxe LW-51 50-Mc. transmitter with cover removed. Audio tubes appear in the upper portion of the picture.

Strays

Sound-N-Sight Code Course

FOR many years the radiotelegraph code has been taught by means of a system which is described in the ARRL publication *Learning the Radiotelegraph Code*. Basically, this system calls for the student to learn that a given sound represents a certain letter. For example, "di dah" is the letter "a". At no point in this method of training is one supposed to memorize the notation "dot dash". This system calls for the student to learn the sounds that represent the different letters of the alphabet, and the numbers, and then practice copying these sounds at gradually increasing speeds.

A new course published by the John F. Rider Company and called "Sound-N-Sight" goes at this task of learning the code in a rather different method. The procedure is this. The student first listens to some records which transmit various code characters. Three seconds after each character is sent a voice announces the verbal equivalent, as "didididit." This is aimed at helping the student distinguish between a dit and a dah, and may even weed out those who are unable to make such a distinction. Following this, the student puts the records aside and picks up a set of flash cards. This part of the course is really unique. Each flash card carries a letter of the alphabet on one side and its dot-dash equivalent on the other. Thus, on one side of the first card is the capital letter A; and . — is on the other side. After shuffling the cards, the student (who up to this point is not supposed to have any idea of what dot-dash combinations stand for what letters) looks at the dot-dash side of each card and *guesses* what letter it might represent. Having guessed, he turns the card over and determines whether his guess is correct. If it is, the card goes in one pile; if not, into another pile. And so on through the entire alphabet. (The same procedure is subsequently followed for numerals and punctuation marks, but we'll restrict our description of this

course to the alphabet portion.) Then, the cards are gone through again and again until all are "guessed" correctly in a single run. The theory apparently is that as the student looks at each card after he has guessed what letter its symbols represent, learning takes place. According to the publisher, this is "reinforced learning."

So the student has listened to dits and dahs and has learned to distinguish between them, and then he has learned what the printed dot and dash equivalent for each symbol is. Now he goes back to the records and listens. A code character is sent at a slow speed, and three seconds later the announcer gives the dit-dah equivalent and the phonetic name of the letter. (The new military phonetic alphabet is used, so that R comes out Romeo.) After the student is able to go through this a couple of times without error, he begins copying from the records at three w.p.m. The announcer no longer speaks; instead, after each run of 80 characters the student checks back in the instruction manual and corrects his own copy. Again, after the student is able to go through each run with only a couple of errors, he is told to proceed to the next higher speed. However, speed jumps are in multiples of one w.p.m., and the student is cautioned against increasing speed more than once per day. This is said to do away with the learning plateaus that most of us have experienced in learning the code. The Sound-N-Sight course comes in two parts. The Novice portion takes the student up to 8 w.p.m., while the Advanced portion goes on up to 20 w.p.m. It is manufactured for use on 33 r.p.m. turntables, but can also be used on 45 r.p.m. tables with a corresponding increase in speed.

The Sound-N-Sight course, in an expanded version, has also been tried out by the Army's Signal Corps, and faster learning has been reported. It will be interesting to see what the experience of would-be amateurs is. QST

September V.H.F. Party Results

THOUGH it was not the intention of the originators of our June and September V.H.F. Parties, these affairs are becoming more like v.h.f. field days every year. Looking over the logs for the September V.H.F. Party, the week end of the 19th and 20th, we find that 20 per cent of the entries are for portable stations. The stay-at-homes would not have it otherwise, for there is nothing like a few strategically located portable stations for building up section multipliers and QSO totals for all of us.

V.h.f. men long ago found out that location is not everything. A high elevation far from city noise is fine, but it is only one factor in a winning combination. Unless the best possible equipment and capable operators are available, the highest spot in the country will not pay off in contest awards. Working from the high spots is fun, however you do it, and plenty of v.h.f. enthusiasts "go portable" during a contest just for the pleasure to be derived from it. Others make it a serious business, and the stations they set up for a v.h.f. party week end rival the best Field Day efforts. Transmitters running 500 watts or more are common. Nothing but the best converters and biggest beams will do. Then shifts of operators engage in simultaneous operation on several bands, making hundreds of contacts and running scores into 5 figures.

It was this kind of operation that produced the country's top multioperator score in the September V.H.F. Party. Eight members of the Copperhead V.h.f. Associates of the Washington area set up W3JZY/3 in the Foxville Fire Tower, not far from the presidential retreat at Camp David, Md. The last 150 feet of elevation to the fire tower can be made only on foot, but some 3000 pounds of gear were hand-carried up the hill. The 50-Mc. transmitter had a pair of 4X-250Bs in the final, modulated by 203Zs. A Tape-tone converter ran into a Super-Pro. These were hitched to a 5-element beam installed on a 50-foot crankup tower. Another pair of 4X250Bs served on 144 Mc., with another Tapetone converter working into a 75A-4. The array was an 8-element job atop the fire tower. A single 4X250B in a coaxial tank was the final 220-Mc. stage. This had a 416B converter and a 51J-4 re-



Second place in scoring, nationwide, was achieved by W1BJ/1, Mt. Kearsarge, N. H., operated by W1PZA, W1RMH, W1AZK and W1JDF. Here W1PZA is working at the 220-420 position.

ceiver for company. The array, an 11-element Yagi, was at the 50-foot level on the fire tower. The 432-Mc. setup had a 5894 final, a Centimeg converter and 51J-4 receiver, and an 11-element Yagi at 40 feet above ground.

This array of gear was furnished by W3MUO, W3SFY and K3AKK. With it, and last year's experience to profit by, W3JZY/3 racked up 560 contacts, the country's highest total. With a section multiplier of 47, this netted 28,482 points.

Another group of old hands at mountain-topping made up the crew of W1BJ/1, Mt. Kearsarge, N. H. With W1PZA, W1RMH, W1JDF and W1AZK on the job, W1BJ/1 ran up 420 contacts on 4 bands, for 25,960 points. Their section total, 55, was the largest reported.

With no pronounced band openings to build up section multipliers, scores were naturally higher in the areas where the ARRL Sections are geographically small. There is the reason, of course, that no national awards are made in our contests; there is no fair basis for scoring on a nationwide basis. A switch in propagation to favor another section of the country, and these

It was cold on top of Mt. Hamilton, in the Santa Clara Valley Section, but K6TJL/6 was hot. The Southern Peninsula Old Timers Society made 274 contacts on 4 bands for the West's top score, 6304 points. Operators shown are W6CBE, K6SKU, W6GGV and K6IOM.



Easterners might have been snowed under by similar group efforts in other areas. Typical of Western portable ventures was the effort of the Southern Peninsula Old Timers Society, K6TJL/6, operating from Mt. Hamilton, a 4300-foot elevation 65 miles southeast of San Francisco. Bad weather held down the portable activity in Northern California, but K6TJL/6 worked 274 stations on 4 bands, for 6304 points. Highlight was a 144-Mc. QSO with W6NLZ, some 300 miles away. He was also heard on 220 Mc., though no contact could be made on that band.



W5MVL surveys the view at sunset from Ranger Peak, El Paso, Texas, scene of operations for W5MVL/5 in the September Party. Mountain top is reached only by aerial tramway.

At the opposite end of the scale as far as scores go, but certainly with one of the most spectacular locations, was W5MYL/5, atop Ranger Peak, El Paso, Texas. The site is 1900 feet above downtown El Paso, but only 3 miles distant. Access is by 2300-foot aerial tramway only. A TV station is under construction there, but this will not rule out v.h.f. work there in the future. Chief Engineer of the new layout is W5MCL. The transmitter supervisor is W5ESZ. W5VYD is program director, and W5MYL is the studio engineering supervisor. The owner is a former ham. Adequate provision for amateur radio is being made in the building plans!

Leading home station, and winner of the Eastern Massachusetts Section award was W1OOP, Needham, Mass. Hank and K2CBA, Troy, N. Y., shared top section honors, with 37 each. Both worked 4 bands. W1OOP ran up 6253 points on 145 contacts. W8WEN, Alliance, Ohio, worked almost twice as many stations, but with two bands and a lower section potential he finished second to W1OOP, with 5796 points and the Ohio Section award. Top one-band total was made on 144 Mc. by K1CRQ, Bethlehem, Conn. Stu worked 298 stations (largest contact total by a single operator) in 18 sections, for 5328 points and the Connecticut Section award. W9ROS, Roselle, Ill., used 50 and 220 Mc. effectively in taking Illinois Section honors with 273 contacts and 3731 points. K9KLU, Tinley Park, Ill., was the top 50-Mc. station, with 281 contacts for 2810 points.

The countrywide v.h.f. boom is reflected in



K2JWT at the operating position of W2YKQ/2, station of the Lake Success Radio Club, atop Jane Hill, Huntington, L. I., highest spot on the island. 308 stations were worked on 50, 144 and 220 Mc., for 10,948 points.

scores almost everywhere. K4OSF/4, Sharps Ridge Park, Knoxville, Tenn., had no breaks in the form of DX openings, yet worked 140 stations on 50 and 144 Mc. K5WPD says that there was very little activity in the North Texas Section, but he worked 92 stations on 50 Mc.

Our contest report would not be complete without a little story from W2WZR, Syracuse, N. Y. Jim has an "aurora location," what amounts to a 3-sided well, open to the north. He operates only on e.w. — which is the hard way to run up a big total under average conditions. He is not a needed section under ordinary conditions, and most of the phone-only operators give him little attention. His moment of glory came when aurora burst forth Sunday night. It didn't last long, but it gave W2WZR a chance to be "wanted" for a few minutes. Result: 15 contacts in 10 different sections, after almost no results in the first 18 hours of operating.



Crew of W2LW1/2, third-ranking multioperator station. Front, K2UKE, W2KGC. Rear, K2GCH, K2OZT, W2YPM and W2LW1. Operating from Overlook Mountain in the Catskills, W2LW1/2 worked 380 stations on 4 bands. Section multiplier of 51 gave them 21,624 points.



Hints and Kinks

For the Experimenter



ADJUSTABLE POWER SUPPLY

FIG. 1 shows a power supply with d.c. output adjustable over about a 3-to-1 range. Although not a regulated supply, it does tend to compensate for a.c. line fluctuations and changing d.c. load. The diagram shows a 6N7 dual triode used as a rectifier, but triode-connected pentodes such as the 6L6 can also be used. Surprisingly enough, the normal 5-volt winding intended for a conventional rectifier tube will usually power the 6.3-volt heater satisfactorily for the triode or pentode rectifiers. If this arrangement bothers the constructor, the rectifier heaters may be powered from the 6.3-volt heater winding. However, this winding should not be grounded or used to power any other tube heaters since the heater-to-cathode insulation will probably break down unless it is rated to take the full d.c. supply voltage.

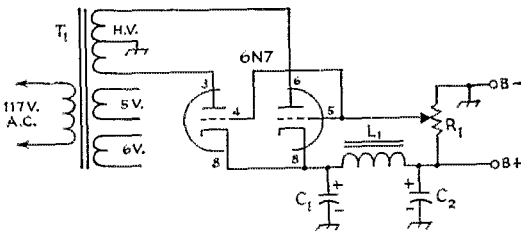


Fig. 1—Adjustable power supply. $L_1C_1C_2$ is a conventional filter section.

R_1 —See text.

T_1 —Power transformer. When using a 6N7, the transformer voltage should not be over 300 volts each side of center tap. The load should not exceed 70 ma.

Variable resistor R_1 can be any type of potentiometer but one with a linear taper is preferred. Resistance should be in the order of 100,000 to 500,000 ohms in most cases.

An added feature of the circuit is the fact that the potentiometer acts as a bleeder and will discharge the filter capacitors when the supply is turned off.

—F. T. Swift, W6CMQ

MOUNTING POWER TRANSISTORS

IF circuitry requires that power transistors be electrically insulated from their heat sink, anodized aluminum washers will make good insulators. Small sheets of anodized aluminum are available from almost any radio-supply house in the form of dial plates used for identifying controls on audio amplifiers. After drilling the anodized plates, be sure to clean and deburr the holes.

—Melvin Leibowitz, W3KET

DEMAGNETIZING TOOLS

ANYONE who owns a soldering gun can use it as a demagnetizing apparatus. Pass the magnetized tool through the arch at the tip of the gun and pull the trigger. Slowly remove the tool from the gun area. The tool will now be free of its former magnetic qualities.

—Luis C'ineo Macchiavello, CE2DA

APACHE SPOTTING SWITCH

As pointed out in the recent report on the Heath Apache in *QST*, March 1959, page 44, a minor inconvenience exists in using the Apache for c.w. break-in operation. The difficulty lies in the use of a push-button "spotting" switch which is in shunt with the key so that in c.w. operation it is necessary to throw the plate switch off in order to zero beat. This requires two switching actions and means wasted motion.

The situation can be remedied by disconnecting the push-button spotting switch and substituting a normally closed push-button switch in another part of the circuit. Fig. 2 shows where the new spotting switch is connected. When the switch is in its normally-closed position, the v.f.o. and buffer tubes are cut off by the -120-volt bias supplied at point K. When the spotting switch is opened, the bias is removed from the v.f.o. tube which then supplies a v.f.o. signal.

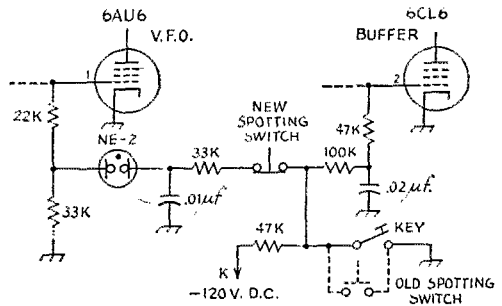


Fig. 2—Diagram showing a new spotting switch for the Apache transmitter.

To make the change, disconnect the yellow wire running from the wiring harness to the spotting switch. Tape the wire end and fold it out of the way. Splice two leads in the circuit at the junction of the 33,000-, 100,000-, and 47,000-ohm resistors (see Fig. 2) and connect the leads to the normally-closed push-button switch. While you are at it, bring out another pair of leads and connect them in parallel with the switch and install a connector at the rear panel of the Apache so that a remote spotting switch can be installed.

—Gary Lindstrom, K2UZJ

PANEL BUSHING FROM POTENTIOMETERS

DON'T discard those old burned-out potentiometers. Throw away the carbon element and case but save the shaft and threaded bushing. It can be used as panel feedthrough bushing for 1/4-inch shafts.

— Ira L. Simpson, W3LKS

91-MEGOHM RESISTOR

THE "Hint & Kink" in *QST*, October, 1958, page 75, concerning a modification to the a.v.c. system of the Communicator III, mentioned the addition of a 91-megohm resistor to the circuit. For those interested, this resistor's Motorola part number is 6K538716.

— Richard M. Stevens, W1SUZ

CRYSTAL FREQUENCY COMPARATOR

WHEN working with high-frequency crystal filters, a means of measuring the relative frequency of the crystals is necessary. The method described here allows accurate measurement of frequency difference down to a few cycles. The diagram for the required unit is shown in Fig. 3. The circuit consists of two identical crystal oscillators, V_{1A} and V_{2A} , with cathode followers, V_{1B} and V_{2B} , for isolation, and a mixer (V_3). The sum frequency from the mixer is filtered out in the filter network, L_1C_1 , while the difference frequency (which is usually an audio frequency) is fed to the vertical plates of an oscilloscope. An external calibrated audio oscillator is fed to the horizontal plates of the scope and adjusted until the trace shows a single loop figure. The difference frequency is indicated by the frequency of the audio-frequency generator.

When constructing the unit, place the oscillators at opposite ends of the chassis with the mixer located in the chassis center. To make certain of electrical similarity between the two crys-

tal oscillators, transpose the crystals. If the oscillators are identical, the scope pattern should be the same.
— Warren H. Clark, W6COK

TUBE TESTING HINT

THE number of do-it-yourself tube testers appearing in the supermarkets and drugstores these days can prove a blessing to the amateur whose personal tube tester is outdated. These self-service testers cover all the latest TV and radio tubes, and are quite accurate if one knows how to interpret their readings.

I tested an old 5U4 rectifier that someone had discarded and left at a tube-testing machine and found that it checked "no good" even though the filament lighted up. I took the tube home and checked it on my personal tube tester, and found that the tube tested "O.K.," except that the filament emission was down about 50 per cent. Suspecting that the store tester was biased to exaggerate the condition of the tubes, I tested several tubes I had around the shack and compared the readings on the self-service tester with those on my home tester. Results showed that the U-test-em machines are biased to give a "no good" reading on a tube that is about 50 per cent down on emission, but on the other hand is quite accurate on tubes that are up to snuff. This action of the store tester will sometimes eliminate a tube that really isn't completely useless.

— Harry K. Long, W7CQK

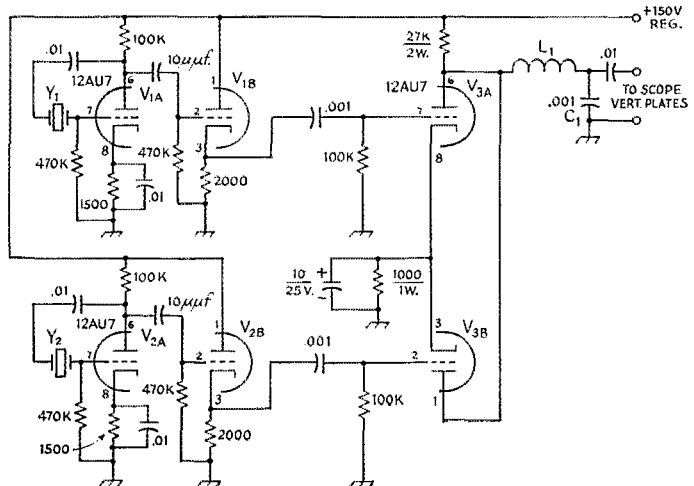
TRANSISTOR PROTECTION

To prevent burning out of transistors because of incorrect power-supply polarity, place an ordinary crystal diode in series with one of the power leads so that current will flow only in the proper direction. If the power supply is accidentally connected backwards, the diode will protect the transistors. Of course, the diode should be capable of carrying the total circuit current.

— Charles Curran, K2DQD

Fig. 3—Circuit diagram of the crystal comparator. Capacitances are in $\mu\text{f.}$, resistors are 1/2 watt, unless indicated otherwise.

C_1 —.001- $\mu\text{f.}$ ceramic capacitor.
 L_1 —5-mh. r.f. choke.
 V_1, V_2, V_3 —12AU7 tubes.
 Y_1, Y_2 —Crystals to be compared.



13th V.H.F. Sweepstakes, Jan. 9 and 10

*Certificates to ARRL Section, Novice, Technician Winners;
Gavel to Top-Scoring Club*

FRIEND, do you have aching bones, falling arches, failing eyesight, greying hair, and loose teeth? Are you in a general run-down condition? Can you no longer do the hundred yard dash in less than twenty minutes, or swim underwater, or hit a baseball out of the infield? Friend, you are in bad shape. May I suggest Mother Fletcher's Cure-all Formula Nine guaranteed to make you straighten up and fly right. The prescription? *Get with it in the Thirteenth ARRL V.H.F. Sweepstakes.* The details? Read on.

To get started just call "CQ Sweepstakes" or answer such a call, and exchange information as shown in this announcement. The preamble follows along the lines of a standard message preamble. You can work a station once per band, so versatility is the thing.

The rules are the same as last year. Contacts count only as long as the contest period is in progress at both ends of the QSO. To clarify, suppose Western Mass.'s W1RFU starts right out at the beginning of the contest, 2:00 P.M. (1400) local standard time. For the first hour, Bill can work only other stations in the eastern time belt. During the second hour he can then begin working W9s and others on CST, as the contest has now begun there. By the fourth hour he can

work the far west, as the contest will have just begun there.

The scoring is exactly as last year. The multiplier consists of the number of sections worked, *plus ten*. K6TYW, for example, could make 100 contacts in 17 different sections, with the following resultant score:

100 QSOs
 $\times 2$ (if all SS data exchanged in both directions)
 200 (QSO points)
 $\times 27$ (17 sections plus 10)
 5400 (claimed score)

The top-scorer in each section will receive a certificate award. Also, a certificate will be given to the top Novice and Technician in each section where at least three such licensees submit valid logs.

Club competition will again highlight the activity. The club with the highest aggregate score will receive a cocobolo gavel with a sterling-silver band engraved with the name of the winning club.

Write ARRL for contest forms now. If you don't use these log sheets, *please follow the log arrangement shown in this announcement.*

This is the opportunity for you to show what

SUMMARY OF A.R.R.L. V.H.F. SWEEPSTAKES EXCHANGES

SUMMARY OF A.R.R.L. V.H.F. SWEEPSTAKES EXCHANGES														
Station		Class License				ARRL Section								
Freq. Band (Mc.)	SENT (1 point)				Time ST	Date (Jan.)	RECEIVED (1 point)				Date (Jan.)	Number of Each Different New Section as Worked		
	NR	Sta.	CK-RST	Section			NR	Sta.	CK-RST	Section			Time	
50	1	W1AW	57	Conn.	4:15 P.M.	9	3	W1RJA	47	Conn.	4:18 P.M.	9	1	2
50	2		43		4:35 P.M.	9	7	W1PHR	59	Conn.	4:40 P.M.	9	..	2
50	3		58		9:09 P.M.	9	6	W1WTR	359	R. I.	9:11 P.M.	9	2	2
144	4		49		9:30 P.M.	9	32	W1OOP	58	E. Mass.	9:36 P.M.	9	3	2
144	5		57		9:50 P.M.	9	15	KN0HAC	58	Conn.	9:46 P.M.	9	..	2
50	6		54		11:30 P.M.	9	11	W2YHP	48	N. Y. C.-L. I.	11:32 P.M.	9	4	2
420	7		58		11:35 P.M.	9	30	W1RJA	57	Conn.	11:35 P.M.	9	..	2
144	8		57		11:45 P.M.	9	21	W3CGV	59	Md.-Del.-D. C.	11:56 P.M.	9	5	2
144	18	W9WOK	449	Ill.	12:34 A.M.	10	6	1
144	9	W1AW	34	Conn.	8:50 A.M.	10	7	W1RFU	59	W. Mass.	8:47 A.M.	10	7	2
50	10		479		9:18 A.M.	10	12	W6AJF	379x	S. F.	9:20 A.M.	10	8	2
50	11		589		10:46 P.M.	10	20	VE3A1B	589	Ontario	10:35 P.M.	10	9	2

Claimed score: 23 points \times 19 (9 + 10) = 437. Bands Used: 5C, 144 and 420 Mc. 9 sections worked

Names and clubs of operators having share in above work

Participating for club award in the (name of Club), of which I am a member.

I hereby state that score and points set forth in the above summary are correct and true.

Equipment

Signature

Number of QSOs

Address

EXPLANATION OF V.H.F. SS CONTEST EXCHANGES

<i>Send Like Standard NR Msg. Preamble</i>		<i>Call</i>	<i>CK</i>	<i>Place</i>	<i>Time</i>	<i>Date</i>
Exchanges	Contest numbers 1, 2, 3, etc., a new NR for each station worked	Send your own call	CK (Readability and strength or RST of station worked)	Your ARRL section	Send time of transmitting this NR	Send date of QSO
Purpose	QSO NR tells how you are doing	Identification	RS or RST report	See page six for section list	Time and date must fall in contest period	
<i>Sample</i>	NR 1	W1AW	58	CONN	1812	JAN 9

your station can do. Novices and Technicians are urged to submit their logs so that the top scorer in each section can qualify for a certificate. Club members are urged to do likewise, as getting your club at the top of the heap may hinge on *your* log entry.

That's the Mother Fletcher prescription; now just straighten up and fly right into the ARRL V.H.F. Sweepstakes.

Rules

1) *Eligibility:* Amateur operators in any ARRL section (see page 6) operating at home, or mobile or portable under one call on or above 50 Mc. are invited to take part.

2) *Object:* Participants will attempt to contact as many other stations in as many ARRL sections as possible.

3) *Contest Periods:* The contest starts at 2:00 P.M. your local time, Saturday, Jan. 9, 1960, and ends at midnight, Sunday, Jan. 10, 1960. Contacts between stations in different time zones can be counted only when the contest period is in progress in both of the zones concerned.

4) *Exchanges:* Contest exchanges, including all data shown in the sample, must be transmitted and received for as a basis for each scored point.

5) *Scoring:* (a) *Contacts count one point* when the required exchange information has been received and acknowledged, a *second point* when exchange has been completed in both directions.

(b) Final score is obtained by multiplying total contact points by the sum of different ARRL sections worked (the number in each of which at least one SS point has been credited) plus 10.

6) *Conditions for Valid Contact Credit:* (a) Repeat contacts on other bands confirmed by completed exchanges of up to two points per band may be counted for each different station worked. (Example: W1HDQ works W1RFU on 50 and 144 Mc. for complete exchanges of 2 points on each band; 2 + 2 gives 4 points but only one section multiplier.)

(b) Cross-band work shall not count.

(c) Portable or mobile station operation under one call, from one location only, is permitted.

(d) A transmitter used to contact one or more stations may not be used subsequently under more than one other call during the contest period.

(e) Contacts with aircraft mobiles cannot be counted for section multipliers.

7) *Awards:* Entries will be classified as single- or multi-operator, a single-operator station being defined as one manned by an amateur who neither receives nor gives assistance to any person during the contest period. Certificates will be awarded in each ARRL section to the top-scoring amateur in the single-operator classification. In addition, a certificate will be awarded to the top Novice and Technician in each ARRL section where at least three such licensees submit valid contest logs. Multioperator work will be grouped separately in the official report of results in QST.

When three or more individual club members compete and submit logs naming the club with which they are identified, an ARRL certificate will be issued to the leading club

member. When less than three individual logs are received there will be no club award or club mention.

A gavel with an engraved sterling-silver band will be offered the club whose secretary submits the greatest aggregate score, provided such scores are confirmed by receipt at ARRL of the individual contest logs from such members. Only the score of a bona fide club member, operating a station in local club territory, may be included in club entries. Claims from federations, radio club councils, or other combinations of radio clubs, will not be accepted, nor can special memberships granted for contest purposes be recognized.

8) *Conditions of Entry:* Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Award Committee.

9) *Reporting:* Reports must be postmarked no later than Jan. 27, 1960, to be considered for awards.



Celebrating its tenth anniversary, the Braille Technical Press announces that its publication will now be available on *Talking Books*. Two hours of information will be available each month, recorded at 16 2/3 r.p.m. on 10-inch unbreakable vinylite records. The subscription price (purchase, not rental) is \$10 per year. If you are looking for an appropriate gift for a blind ham or electronics enthusiast, contact the Braille Technical Press at 984 Waring Ave., New York 69, N. Y.

Here are the December schedules for the various MARS technical nets.

First Army MARS

(Wednesday evenings, 2100 EST, 4030 kc. upper sideband)

Dec. 2 — Technical Aspects of Satellite Communications.

Dec. 9 — The Transatlantic Submarine Telephone Cable.

Dec. 16 — Determination of Percent Success Expectable in High Frequency Radio Transmissions.

Dec. 23 — F. M. Forward Scatter Tropospheric Communications Systems.

Dec. 30 — Coaxial Cable.

AF-MARS Eastern

(Sundays 1400 EST; 3295, 7540 and 15,715 kc.)

Dec. 6 — U.H.F. Air-Sea Rescue Communications.

Dec. 13 — Underwater Sound Detection.

Dec. 20 — Reinforced Plastics.

Dec. 27 and Jan. 3 — Recess dates.

Field Day '59 Bonanza Bonus of Activity!



Never fails. Someone always goes FD on a raft. This year it was VE2AWD shown in both pictures. The rig is on the raft on the left, while the other raft supports the other end of the 80 meter half-wave doublet.

THE following excerpt is from a note which crossed my desk recently. It is submitted by none other than VE9NG, one of the more active contest enthusiasts of late. Prescott thusly relates:

Let me refer you to an afternoon I chanced to find myself in the shack. The sun was shining brightly outside, with light gusts of wind blowing occasionally. It was what I would call a typical summer day on Baffled Island. I chanced upon tuning the 20 meter c.w. band in search of a possible DX contact. I must confess the band was rather dead except for a few W/YE stations tuning up and testing. However in the matter of an instant (I thought perhaps an r.f. tube may have been reactivated in the inverter) the entire band was a complete jam of signals, every one of which was calling "CQ FD." I had not worked this prefix as yet, so I proceeded to listen for him. Unable to hear the FD station (my Call Book said French Togoland), I chanced to consult my trusty QST and proceeded to discover that FD was an operating activity, namely, Field Day. Gads, how could I have missed this one? However, I promptly set up my FD station in the reindeer shed and herewith submit my entry, 73.

Well, we at ARRL can't figure out how *anybody* could have bypassed Field Day. For what other activity is a camping trip, picnic, hamfest, contest, and emergency preparedness test, all rolled into one? But judging from the logs that hit 38 LaSalle Boulevard, it appears that nobody did miss it, for following the trend of previous years, records were again shattered. A new Field Day record of 13,137 dyed-in-the-wool hams made their way to fields, mountain tops, deserts, islands, waterways, backyards, parks, outdoor theaters, athletic stadiums — anyplace to combat the elements and set up Field Day stations. And the elements were mean in certain parts of the country. Big winds hampered many a FD installation, with rain and fog in other localities. But that is what Field Day is for — to get out in the

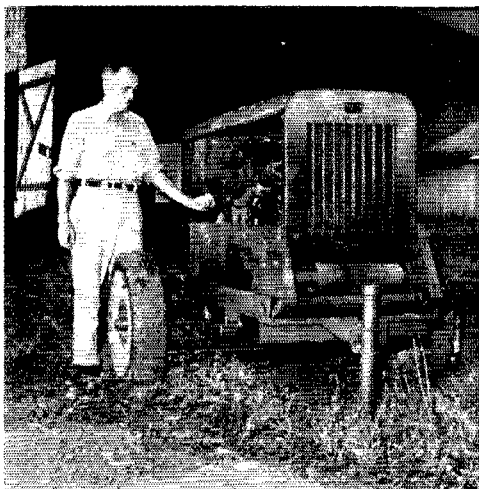
BY JOHN F. LINDHOLM,* WIDGL

elements to see what you can do. That's just what many thousands of hams did. Without a doubt Field Day is the granddaddy activity of them all!

As the smoke cleared, we found King Arthur gathering together his nobles of varying rank, squires, dukes, counts, and monarchs of every description. Atop the "Class Kings," running 12 transmitters, was the Tri County Radio Assn., W2LI/2, who racked up 22,851 points, slightly below last year's top effort. Using 3.5 through 220 Mc. payed off with 2539 QSOs, with the best band 15-meter phone, where 392 contacts were



* Communications Assistant, ARRL.



Some had husky, rugged, dependable type generators (left), whereas others had to rely on a cruder type of power house (right). W4KJP cranks up the 7 kw. job on the left for the W4KJP/4 gang, while the stunt on the right is the brain child of the Door County Amateur Radio Club, W9AIQ/9.

logged. Special compact portable Field Day rigs were used. Seated next to the above group at the royal table was the San Antonio Radio Club, W5SC/5, with 20,376 points to lead 11A groups.

Thumbing down the list of "Class Kings" according to the number of transmitters, we find the 1A groups led by W8CEA/8. S.s.b., separate rigs per band, beams, and ten operators did the trick. Best band was 40-meter c.w. where 146 contacts were tabulated. The 2A's really turned in some nifty scores. A record of 10,863 was scored by the Hughes Amateur Radio Club, K6QEH/6.

Ground planes and beams highlighted the installation. A tremendous place effort was made by the Frankford Radio Club, W3JNQ/3. Class 3A was again led by the Ohio Valley Amateur Radio Assn., W4FU/8, scoring 12,096 points and employing a 6AU6-5763-6L6 rig on each band. SX-101s and 75A-4s highlighted the receiving setup at W6HS/6, Crescenta Valley Radio Club, where that group paced the 4A division with 10,305. The 13A classification drew a blank this year, but two clubs were able to put 14 rigs on the air—a major accomplishment in itself. The Communications Club of New Rochelle, K2YCJ/2 emerged atop with 5178 points. For other class leaders, consult the adjoining "Class Kings" box.

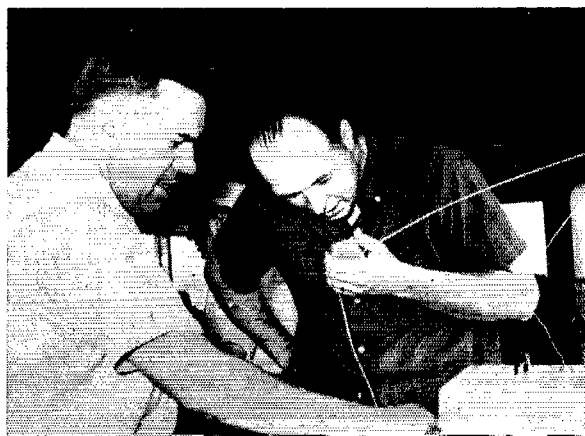
The unit or individual outfits, or the "Class B Barons," were also present in regal splendor. K5DG1/5 with able assistant K5ESW turned in a record performance in the 2B category with 10,894 points. Wes passed along the following hints for the benefit of other would-be Class B entrants: "(1) Use s.s.b.; (2) Operate full time at each rig, with a minimum of sleeping by either operator. (3) If possible put up antenna system before Saturday; clubs can have other people than the operators do the job. Fatigue is an important factor. (4) Pray for good weather and no

CLASS KINGS *

Class	Call	Club Name
1A	W8CEA/8	(nonclub group)
2A	K6QEH/6	Hughes ARC
3A	W4FU/8	Ohio Valley AR Assn.
4A	W6HS/6	Crescenta Valley RC
5A	W2OYH/2	Morris RC
6A	K2AA/2	South Jersey R. Assn.
7A	W7HZ/7	Valley ARC
8A	K2SOQ/2	Fordham RC
9A	K4DTV/4	Huntsville ARC
10A	W7DK/7	RC of Tacoma
11A	W5SC/5	San Antonio RC
12A	W2LL/2	Tri County R. Assn.
14A	K2YCJ/2	Comm. Club of New Rochelle

* Leaders in each transmitter class.

Pulling the old coathanger stunt are W1AMJ (left) and K1EKC (right) at the Waterbury Amateur Radio Club installation, W1LAS/1.



CLASS B BARONS¹

K5DGI/5 ²10,854	W9UA/9.....2988
W2FBA/2.....6272	K5DRC/5.....2826
K6SXA/6.....5256	W6UF/6 ²2640
K6QIK/6.....3659	K3TEL/5 ²2580
W9DO/9.....3492	K6GOT/6.....2578

¹Top ten class B scorers. ²2 rigs.

solar storms!" In the one transmitter Class B setup, W2FBA/2 teamed up with W2JBQ for their 17th consecutive Field Day combo, having teamed up together for each FD since 1938. Exchanges with 445 stations for 6272 points accounted for the score. Other top scorers in Class B are listed in the box.

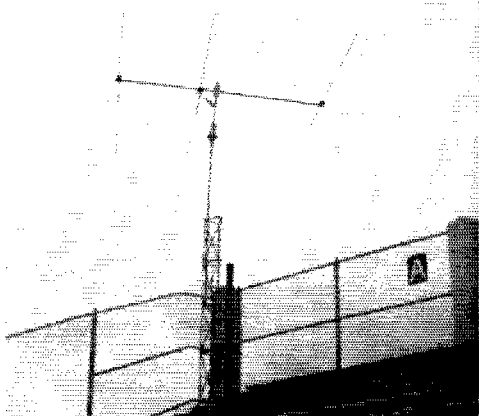
The mobiles were again led by W8PVC/8 with 7989 points, which also contributed to the Club Aggregate Mobile totals of the West Park Radiops. They again topped other clubs with 80,225 points. Their tremendous turnout of 35 mobiles and handling of hundreds of messages did the trick. Other mobiles topping 2500 were K6EPC/6, W8GHO/8, and W2MTU/2.

MOBILE MONARCHS*

West Park Radiops.....	80,225
Phil-Mont Mobile Radio Club (Penna.).....	30,231
Radio Amateur Mobile Society (Calif.).....	18,827
Mobile Amateur Radio Club of South Bend.....	10,415
Associated Radio Amateurs of Long Beach.....	5172
Richmond Radio Club.....	3443
Clifton CD-DC Communications Section.....	2525
Hughes Amateur Radio Club (Calif.).....	2195
Dayton Amateur Radio Assn.....	918
Coffee Dunkers of Detroit.....	256
Heath Amateur Radio Club.....	216
Skywide Amateur Radio Club (Ont.).....	55

* Club aggregate mobile scores.

Thus Field Day took place — records broken, some aurora, varying weather conditions, and a bundle of fun. The real picture of what transpired Field Day, however, is painted in the very quotes of the groups themselves. These we are very pleased to present.



The Adams Heights Radio Club, K5PZZ/5 has this teaser for you. What's missing?

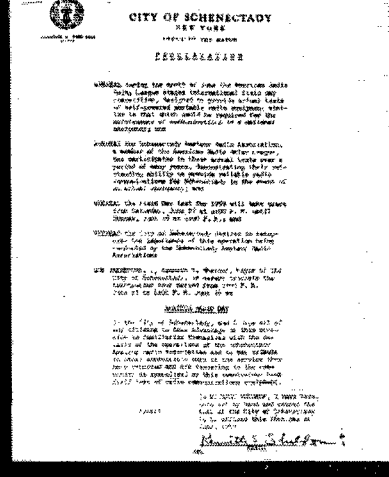
Quotes

"Use of the club's new 15-meter beam was a great improvement over previous 'non-beam' years." — *Aiken ARC, K4JLY/4*. . . . "The club secured a Hornet tri-band beam. After FD the beam was raffled off to club members, with the net return practically paying all FD expenses. The beam was ideal for FD, as a light TV rotator will handle." — *Oklahoma City ARC, W5GU/5*. . . . "Good weather, good site, good fishing, good picnicking, good swimming, and, oh yes, good hamming. Used beams on bands above 40. Also made a 15/20-meter quad on the spot, and it worked fine despite the fact that forgot to solder the coax. Minor troubles with receivers and v.f.o.'s held our score down, but this was our highest score yet." — *Harrisburg RAC, W3ZEK/3*. . . . "Home built beams FB." — *Marathon ARC, K2LNK/2*. . . . "We spliced together three 16-foot two-by-fours to put our four antennas up in the air over forty feet. Conditions were perfect and the food committee did a wonderful job. We were either eating, sleeping, eating, operating, or eating." — *Marietta Amateur Radio Club, W8HH/8*. . . . "Wind sufficient to operate windmill, which provided drinking water and coolant for power plant which ran hot and out of gas three times." — *Boat Hill ARC, W0PMW/6*. . . . "\$27 worth of neekies were used to mark guy wires, but they should have been luminous." — *Mount Diablo ARC, W6CX/6*. . . . "At 2058 Saturday our 75-meter position handled an emergency message regarding a man lost on Seymour Mountain. As a result we were able to contact a Vancouver station and relayed the message for additional personnel to be sent out to assist in search for the lost person. Once again Amateur Radio scored as it obviated the time and effort needed to send a man from the search area to a telephone." — *North and West Vancouver ARC, VE7APL/7*. . . . "The KWM-1 was a big hit; an ideal contest rig. Despite this operating convenience, the c.w. boys outdid the s.s.b. gang by about 2 to 1 in contacts made." — *ARC of the Ohio State University, W8LT/3*. . . . "Used a down-spout vertical with very good results. One operator was so excited and in such a hurry to arrive at the FD site that he used Colgate tooth paste for his hair oil." — *RF ARC, W0WAN/0*. . . . "This is a brand new club. The license arrived a couple of days before FD and we then went into high gear making up antennas etc." — *Free State ARC, K3IVO/3*. . . . "First time in six years that we were not really 'roughing' it on Buxton Mountain, which would have been impossible to reach because of heavy rains this year. This year we lived the 'life of Riley' with a newly constructed building on Bull Mountain with almost 5000 square feet in which to lay out our antennas for maximum efficiency." — *Oregon Tualatin Valley ARC, W7OTV/7*. . . . "Some difficulty was experienced in getting antennas up, because of 40 m.p.h. constant wind." — *W0DEP/0*. . . . "Only odd feature was that just one of the 124 contacts was with a W9 station." — *W7AW*. . . . "Burned out two transmitters before finding our generator was putting out 155 volts." — *Western Illinois RC, W9AWE/0*. . . . "We resisted that impulse to select a high, rocky, windy and cold mountain top for Field Day this year, and chose instead a lake shore in the flatlands where the horizon is under seven degrees elevation in all directions. We worked under the premise that, except for v.h.f. line-of-sight, propagation should be as good or better than from extremely rough mountainous terrain." — *Nevada ARA, W7YN/7*. . . . "We used a 300-foot No. 22 wire antenna from the lake shore to an island. Despite breakdown or improper operation of T-R switch, v.f.o., transmitter, two receivers, and the thunderstorm and uncomfortable operating positions, we

ZONAL CZARS*

W1OC/1.....13,941	KL7AIR/KL7.....675
W2LI/2.....22,851	KP4FAC/KP4.....4668
W3RCN/3.....15,495	KZ5AF/KZ5.....5445
K4CYP/4.....7845	VE1JV/1.....2430
W5SC/5.....20,376	VE2BY/2.....3837
W6FNE/6.....12,501	VE3NAR/3.....8916
W7HZ/7.....18,027	VE4JW/4.....396
W4FU/8.....12,096	VE5AA/5.....873
W9RK/9.....12,609	VE6NQ/6.....2595
W0OI.....5733	VE7ARV/7.....4482
KH6RS/KH6.....5202	VO2HA/2.....1509

* Class A call area leaders.



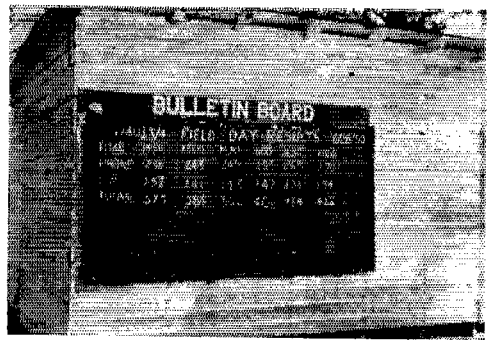
Grade A publicity for hamdom can be the outcome of FD. Newspapers throughout the country carried stories and pictures of FD 1959. Left shows cameraman for newscast shooting WØVDY of the Denver Radio Club, WØQUI/Ø. Center shows the proclamation of Amateur Radio Day for the city of Schenectady, N. Y. in view of the operations of the Schenectady Amateur Radio Assn., W2EFU/2. Right shows publicity at the site itself with neat sign of the IMO VHF Club, W9QWW/9.

slightly bettered last year's score." — *K2MBT/2*. . . . "Our first club activity found us only about 200 feet from the Delaware River. A thunderstorm forced our early shut-down." — *Philadelphia Electric Co. Employees Ass'n RC, W3EQA/3*. . . . "Our tour for the beam consisted of two extension ladders tied together at the top and spread at the bottom; guys were used at the sides." — *Huron Valley ARA, W8KGG/8*. . . . "That suggestion to get samples of handwriting of loggers certainly is to the point. Both stations were constructed so that equipment used at home stations could be torn down, moved, and reassembled in 20 minutes at each end." — *Winter Haven ARA, K4CK/4*. . . . "Antennas were cut for 80 meters full length and then broken for other bands with insulators. An alligator clip was used for jumper across insulators for operation on lower frequencies." — *Mid-Mo ARC, K00Y/0*. . . . "The rig is a portable job built into a suitcase. I built a vibrator power supply and hauled everything into the field. This was my first FD and it just went to prove that I am right — Ham Radio is great." — *KVSLNE/3*. . . . "Tried to put up a vertical with a big balloon, but bottled gas is heavier than air, hi; consequently antenna was poor. Water got into the breather hole in the putt-putt and also in the gas cans." — *W2WZQ/2*. . . . "First contest in which nothing went wrong." — *K2IRS/2*. . . . "The first year we operated, we were plagued with inexperience. Last year we were plagued with generator trouble. This year we were plagued with our girl friends, but what a nice plague." — *K9CAH/9*. . . . "Best FD conditions and weather we ever had. The boys who operated A3 this year are not proud of their score; they say it will be e.w. for them next year." — *W3YZD/3*. . . . "The biggest thrill was to have a pile up calling K1BAB. Signing Vermont, it was a pleasure to know we helped several make WAS; incidently K1BAB still needs Vermont." — *K1BAB/1*. . . . "Have you ever called CQ FD without the mike connected or put water in the oil case of the generator?" — *K4ZYI/4*. . . . "Had enough food for fifty people; fourteen finished it in less than twelve hours." — *Short Skip RC, K3DVS/3*. . . . "Had good emergency power unit. First year that we had no noise on receivers. Had rousin' good time complete with club family picnic on Saturday." — *Flint Hills ARC, W0ECD/0*. . . . "This marks our sixth consecutive FD entry and by far our worst. We have had no trouble with more than ten rented generators. But this year our new pride and joy, our own generator, blew all our plans sky high at 2200 Saturday night." — *Alexander Hamilton High School RC, K6CXI/6*. . . . "A real FB Field Day enjoyed by all including the chiggers." — *Ventura County ARC, K6CST/6*. . . . "Help! Rush mosquito disintegrator gun." — *South East ARC, K8EMY/8*. . . . "Found that higher power really helps in making contacts, but also helps in losing multipliers; still

don't know which is best." — *K2TJM/2*. . . . "K2OTP locked in truck of K2DZA's car with key." — *Central Queens RC, K2DZA/2*. . . . "We had an unusual experience on Field Day which could easily have been a tragedy. A runaway airplane crashed into the hanger where we were operating. No one was hurt but the runaway plane and the one it crashed into were severely damaged. If it had veered just a little to the left, it would have crashed into our Field Day station and would have undoubtedly killed the three operators who were present. If it had swung a little to the right, it would have clobbered our emergency power plant. In either case it would have been the end of our Field Day. The accident occurred three hours after we began operation and from then on there were a great many spectators." — *Harlo RC, W7TRU/7*. . . . "We didn't ground the xmtr for eight hours of operation and when we did we noticed a decided difference in our signal reports." — *Bayshore RC, W5DGJ/5*. . . . "We took advantage of the 1000 ft. circle; it really helps eliminate local QRAL. Only thing is that it's a long walk from station to station. We needed a jeep, hi." — *Seneca RC, W8ID/8*. . . . "We used a 50-ft. tower with three separate half-waves on 80 going at 45



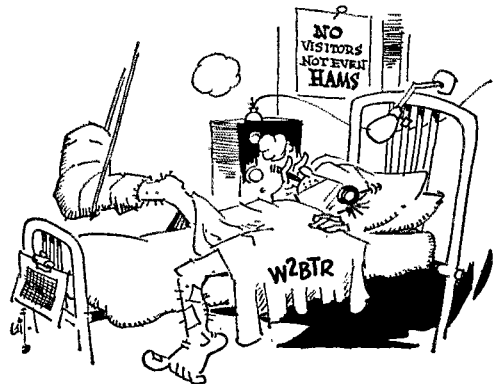
"This group decided to try a 'beercan vertical.' Everything was O.K. except we experienced difficulty erecting said antenna. A good all-around solder job is needed. Wound up soldering two ten-foot sections, then guying them; then proceeded to solder a few cans at a time until the desired length was reached. By the way, it took 74 beer cans to make 33 feet of antenna." — *Pan Am Beer Canners, K6ZOP/6* (Rather than carry the old joke any further, we won't ask who had the pleasure.—Ed.).



Some talked big (left), while others actually racked (right). Left shows K5CDH, President of the Denton County Amateur Radio Club, K5AEX/5, telling about the one that got away. Right shows the running up-to-the-minute totals of the Kinston Amateur Radio Society, W4OIX/4.

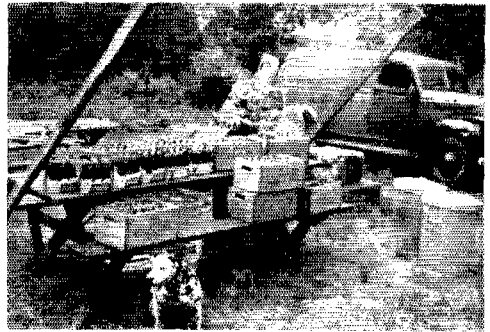
degree angles to extension ladders which we guyed, and used a triangle-type open-wire feeder to a Johnson Matchbox. We could then choose whichever two wires best suited our needs." — *The Radio Amateurs of Greater Syracuse, W2W5/2*. . . . "Operated half the time with no antennas. My t.r. switch failed on me and it took me a while to figure out what was wrong." — *K0LAX/0*. . . . "This year we used a transceiver. Next year we hope to have two or more; they're wonderful for contests." — *W3ATV/3*. . . . "Our first FD attempt was complicated by very bad weather, but there was no trouble as far as radio went. Because the woods were so wet, we had more trouble getting a fire to cook breakfast than keeping the rig going." — *Lexington High School RC, K1JMQ/1*. . . . "We were sabotaged by vandals. Eggs were thrown and pepper thrown in drinking water around 0400. No one watching food area. One antenna tower almost fell, because of broken guy wire. Next year we will be on the alert with spot lights." — *Raritan Bay Radio Amateurs, K20ML/2*. . . . "Everything worked well except the operators. It was too hot!" — *W9OHU/3*. . . . "Why don't all participants read the rules? Had several heated arguments about the necessity of giving one's section. I had to quote QST to one lad, where it states section or location may be used. A real swell FD." — *W6CIS/6*. . . . "The only unusual experience during the hours I was on occurred around 2145. I had knocked my cup of water over and as I set it back on the table, columns of grey smoke were billowing forth from my transmitter. Thus endeth my Field Day operations. Murphy's Law strikes again." — *W4IPT/4*. . . . "Actually, the group brought along four transmitters and six receivers. We were dumbfounded as we watched them fail in operation, one by one." — *K3DSQ/3*. . . . "We relayed messages to the forest ranger for a woman whose husband and son had become lost in the brush near our site. I might add, all turned out happily." — *Club 13, VE7SE/7*. . . . "A ten-inch fan was placed on the operating table to blow away the bugs and it did a fine job. Suggest that other groups try it next year. The red ants hit camp about 1400 and ate us alive. Cure?" — *USNR Div 8-35 Ruston, K6NBD/5*. . . . "We had our two rigs side by side and we QRM'd each other almost as much as we got QRM'd on the air. We woke up the loggers at 1600 to tell them FD was finally over." — *Mississippi Valley RC, K9OBO/9*. . . . "We had a real ball. Because of the fine showing of the six-meter rig, interest in v.h.f. has increased and many members are planning rigs for six and two meters. The six meter station worked 25 states." — *Ft. Meyers ARC, W4LX/4*. . . . "Maybe we didn't come out on top this year, but perhaps next year we'll have so many transmitters we'll be in a

class by ourselves. Then we'll have to come out on top. Unfortunately, we'll also be on the bottom. By the way, somebody brought along a 1500-watt 110-volt d.c. generator." — *Fisherman's Net, W3ZIG/3*. . . . "We need some incentive to use 14, 21, and 28 Mc. Contacts come too easily on 3.5 and 7 Mc., and it becomes harder to milk either of these bands each year." — *Candelwood AR4, W1VB/1*. . . . "Our 11th club FD turned out to be one of the best yet. Both operating positions were in an unused chicken house on a 200-acre farm. Careful planning, and checking of the gear beforehand, resulted in 24 hours of continuous operation without failure." — *Keystone ARC, W3PSH/3*. . . . "Talk of problems, we had them all! On June 25 we found out that we could not use the car we had planned to use in category 3C. That put us in class 1A which called for entirely different plans. Saturday afternoon we called that the place where we had reserved a generator was closed. After we located another, we found our antennas did not work very well. When the generator ran out of gas at 1700, we gave up." — *Johnson County Teenage RC, K0PFV*. . . . "A shorted-out generator on FD is private disaster. Murphy's Law again but



"W2BTR has developed a method which saves considerable time in getting down from tall trees after stringing antennas. As soon as he is allowed visitors, we will send in details of Bill's technique." — *Pelham Bay Radio Club, W2BTR/2*

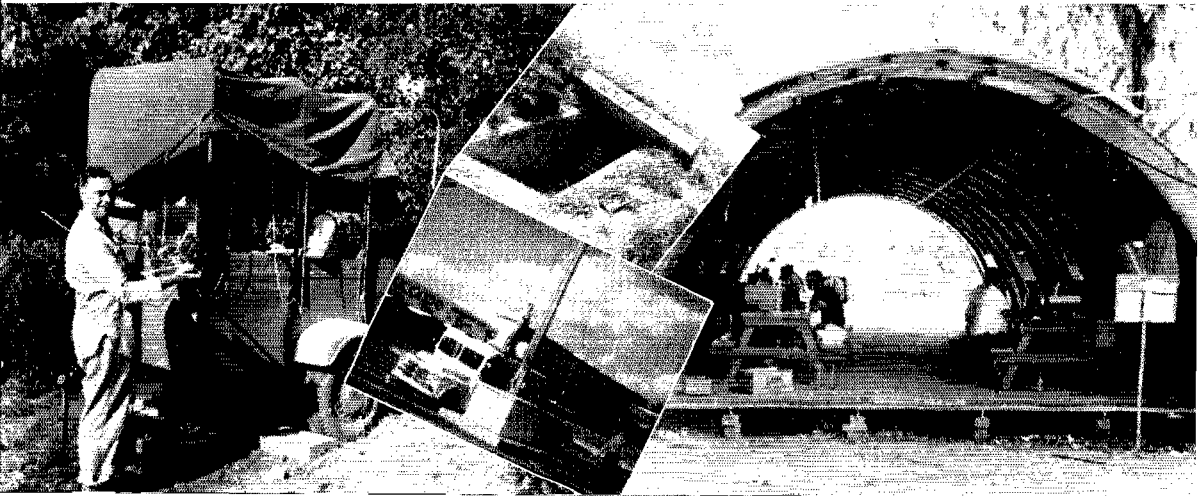
we had a ball." — *Crescent Bay Emergency Net, K6LDA/6*. . . . "Our generator delivered more than ample power for our equipment, but the substitution of silicon rectifiers in the receiver and transmitter reduced stand-by drain by 35 watts, and at the same time delivered more output voltage, lowered the cabinet temperature a great extent, and improved reliability." — *Radio Amateurs of Erie County, W2EUP/2*. . . . "Chow wagon was the star performer, again; our best score yet, but I know we can do better next year." — *Rio Hondo RC, K6PYN/6*. . . . "We used a full length three-element 20-meter beam this year that covered half the hill on which we were operating. When it swung around there was barely enough room to clear our low-frequency dipoles. In the middle of the night someone stumbled over one of the guy stakes and down came the beam on top of the tents and equipment. Was there ever a FD that something unforeseen didn't happen?" — *Detroit Metropolitan RC, W8RJ1/8*. . . . "Nothing special but lots of boo-boo's. Next year watch our smoke." — *Colonic Central High School RC, W4ZDN/2*. . . . "We were all enlightened a little more in operating in portable conditions. If we had a tornado, the hams could do a very good job of carrying out the responsibility of providing communication." — *Kay County ARC, W5EQT/5*. . . . "We borrowed our generator in March and stored it in a room at our school, until FD. A few weeks before the end of school, there was a power failure in the city, and we used the FD generator to supply power for bells and a few lights, thus keeping the school going." — *Baltimore Polytechnical Institute RC, W3CDI/3* (My, I bet you were popular! — Ed.). . . . "The Novices had a lot of contacts on 2-meter phone and did a fine job. Technicians did likewise on six, thus leaving the Generals free for other bands." — *Newport County RC, W1SYE/1*. . . . "If ARRL has any weather control experts, let's shoot for a little cooler week end, 90 degrees plus in a cow pasture is mighty rough." — *W2RUI/2*. . . . "We proved to the gang that we could work all U.S. call areas with eight-watts output." — *Elkhart County AREC Team, W9LX/9*. . . . "Operated approximately 500 feet from the Gulf of Mexico on Grand Isle, La. Nice time was had by all with good fishing in surf. Mosquitoes were very bad despite nice gulf breeze most of the time. Other insects were scared off by the giant mosquitoes." — *W5USA/5*. . . . "Two generators were used as follows: one 3 kw. job for operating rigs, and one 2-kw. job for operating coffee maker and hot-dog bun warmer. Cost of heating hot dog buns and coffee was 35¢ per hour or \$8.40 for twenty-four hours. Kinda expensive heat for hot dogs and coffee, huh?" — *Broward ARC, W4AB/4*. . . . "Oh, these chigger bites! Advise all future participants who have their equipment set up on a hill in the weeds to take a bath in 6-12." — *Manumouth ARC, W4ZDN1/2*. . . . "Best score yet in five years." — *Reynolds-Rapp, W3EAN/3*. . . . "We used a 'Magic Track Op Saver' which automatically tracks and zero-beats a station that you want to work, as you tune the receiver." — *Walla Walla Valley RAC, W7DP/7*. . . . "Water in the generator carburetor; archer arrows boomeranged in shooting up antennas; snake whipped through the tent routing all hands. All adding up to a heckuva good



Always a boon to the operating crew is the liquid refreshment platoon. This collection of soft drinks belongs to the Pompton Valley Radio Club, W2QR/2. The operator in the foreground not identified.

time." — *Suburban Colonels, W4CJG/4*. . . . "To reduce QRM, how about a schedule where alternate call areas would be transmitting during specific periods of four hours on each frequency with the frequencies shifting with the call area?" — *New York RC, W2KR/2*. . . . "Our operating time was curtailed because of the intense heat and our open site. But the club members found relief in a local luncheonette where a better score was made on a pin ball machine than our FD score." — *Orford Circle RC & 807 Society of Central High School, K3ALD/3*. . . . "We are hoping that by having a two-element Moseley tribander beam up about 50 feet, improved 40-meter antenna, and by reducing power, we would be able to do a little better than last year. So the only thing we can do is wait for the results." — *Lafayette ARC, W5DDL/5*. . . . "For our use we now have available a 20-kw. generator for all power. Since we use it each FD we have built up cables and keep them on large cable reels which we can easily transport to any site for emergency or FD use." — *Lower Columbia ARA, W7NCW/7*. . . . "We planned for FD for a month, and then arrived at the FD site with all our gear fifteen minutes before the last 24-hour period." — *K4UGR/4*. . . . "The generator blew up before we started, and the v.f.o. on the 10-meter rig blew up shortly therefore, FD was a bang" — *Owen County ARC, W9QAJ/9*. . . . "Our location was on the shores of Puerto Rico at the exact spot where Columbus landed in 1493." — *Ramey ARC, KP4FAC/KP4*. . . . "We claim high score on using motor oil. One generator used five gallons!" — *Lake ARA, W4YKY/4*. . . . "No TVI! Operated from the base of an old drive-in theater. Antennas located on top of 65-foot screen. Gang had to go without donut breakfast; about 2 million ants beat us to them." — *Old Post Amateur Radio Society, W9EOC/9*. . . . "Block Island did not seem to be 'rare DX' as it was last year. We had to

Field Day draws people out to oddball locations as evidenced here. The trailer scene on the right of the Bandhopper Radio Club, W0RFU/0 finds left to right: W0GEP, W0VEP, W0JHH. The Quonset on the right was the site of the Westside Amateur Radio Club, W5ADB/5. Mysterious and intriguing upper insert is the rear entrance to a bunker with a 250 foot drop to the bay in front, FD home of the Mount Erie Radio Club, W7UF/7. Lower insert, a city street scene, shows W4WTI (left) and K5MGO (right) taking down antenna for Mid South Amateur Radio Association, W4EM/4.



work for our contacts. Fog so heavy around 0100 Sunday that we could just barely see the beams, with the aid of a flash light, of course." — *Shoeline VHF Society, W1FVY/1*. . . . "Two hours of downpour Sunday caused static from some poor cords lying on the ground. There was no quest for water." — *Grays Harbor ARC, W7TZ/7*. . . . "Operated on an island, Fisheries Experiment Station, not open to the public." — *Pensacola ARC, K44LI/4*. . . . "Twenty-nine minutes after arrival at site both stations were on the air. Isn't this what FD is really for? Our small group can do this any day of the year." — *All Band Amateur Radio Klub, W3RSC/3*. . . . "Our FD location was on Pine Mountain elevation 7400 feet and approximately 100 miles northeast of Los Angeles. A cool, windy, dusty time was had by all." — *K6QXZ/6*. . . . "Hastily erected doublet for 75 meters loaded fine on all bands so no other low frequency antennas were put up; far end was in Tennessee with the rig in North Carolina. Many stations worked on 6 meters reported; 'first N.C. QSO.'" — *Greenville ARC, W4ZZ/4*. . . . "We enjoyed eating steaks, sleeping, and operating when we wanted to get on the air." — *Loafers and Steak Eaters Ass'n, W5PIZ/5*. . . . "The band seemed poor both days, with northern lights and weak signals. Everyone had lots of fun though." — *Spokane RAC, W7NBR/7*. . . . "Had beautiful display of northern lights plus an electrical storm which did not assist in securing an abundance of contacts." — *Shoshone County ARC, W7UAK/7*. . . . "The XYL and OM took their annual amateur radio honeymoon again this year, with the OM at the key and mike, and the XYL handling the log, coffee pot, and ant-chasing duties." — *K6QIK/6*. . . . "Saturday evening a fisherman got his plug caught in our 414-foot long wire, and Sunday night just as we finished our 24 hours of operation, a sailboat mast took the antenna down." — *W9DO/9*. . . . "Wow!" — *K5DRC/5*. . . . "Anyone collect moths? I captured after a vicious battle, a beautiful blue-green one who tried to steal page one of our log." — *W6ANB/6*. . . . "The 40-foot sailboat mast created a much bigger disturbance when we carried it through the center of town on our shoulders than the groundplane did in the contest." — *K2SY3/2*. . . . "Food, soft drinks, ice, gasoline for generators, and transportation were donated by the local citizenry on an individual asking basis. All we had to do was ask and state our objective. We were not denied a single donation. We have tried to keep ham radio a respectable, fun loving, enjoyable hobby, without tramping on the rights of TV viewers and others, and this should serve to illustrate that we are not in anyone's hair. In a real emergency and under pressure we could double the number of stations on the air, not to mention eight or ten mobiles." — *Wayne County ARA,*

K4CYP/4. . . . "Deserted house we called home for FD's burned to the ground during the winter. Set up in tents this year and had the best year since organizing the group." — *Hamfesters RC, W9A1/9*. . . . "Darned aurora again. Also wasted a lot of time calling CO stations coming through in 60 over 9 on six meters." — *Elizabeth-town Area Radio Society, W3MFW/3*. . . . "The 15- and 10-meter rigs were set up right on the bank of the Mississippi River with beams on both sides." — *Old Natchez ARC, W5KIB/5*. . . . "There ought to be a prize of at least a glass arm for the guy who has to translate the logs and re-write them for headquarters." — *Crescenta Valley RC, W6HS/6* (Agreed! — *Ed.*). . . . "Compact, light weight, low drain, transmitters and receivers specially built for FD were used on 40- and 80-meter c.w. requiring only about 150 watts of primary power per station. Entire seven transmitter setup was powered by a single 2.5-kw. PF75 gasoline generator with power to spare. Band opening on 6 meters Sunday provided a field day on Field Day." — *Watchung Valley RC, K2DN/2*. . . . "Don't ever put two beams on one rotator unless the two operators are out of shouting (or rumbling — *Ed.*) distance of each other. 'They said it couldn't be done' department: (1) accurately hit the 1/4-inch ARRL log sheet line at 0300; (2) forsake aid number 6 and still have no duplicate QSOs; (3) have all equipment work the very first time turned on. Well, our FD proved one thing. They were right." — *Fordham RC, K2SOQ/2*. . . . "Saturday dawned bright and clear and remained that way until approximately 1400 when the rigs started their operation. But about one half hour later a group of clouds floated over and either from irritation from r.f. or other mysterious Field Day gremlins, one of the finest thunder storms of the young season became an unwanted guest at our site." — *RC of Tacoma, W7DK/7*. . . . "Our antennas were put up with the help of a helicopter from the 4th Army." — *San Antonio RC, W5SC/5*. . . . "The 6-meter Long John was carried 20 miles to the site and assembled on top of one of the cars. The kw. low band phone rig never did get on the air, because of a bug that remains yet to be found to this day." — *Reusselaer Institute RC, W2SZ/2*. . . . "We were forced to stop along the way to the FD location to tie down in better fashion 6 twenty-foot 2 by 4's on the roof of the car, as it had begun to behave in somewhat of a teeter-totter fashion. No rope was to be found in the car (owned by VE3QU). However, VE3FT had some in his which caused VE3QU to slam his trunk door in thankful relief — oops the car keys are inside! We had to empty the back of the car, remove the seats, tear out the back cushions, yank out the generator, cooler, food, beer and gosh knows what else through the hole in the back and then we finally reached the keys." — *Blackheath Cold Beer and Hot Bun Propagation Society, VE3FT/3*. . . . "At our FD site on 4000-foot Mary's Peak, the weather was miserable. We were constantly engulfed in clouds, with a never-ending 35



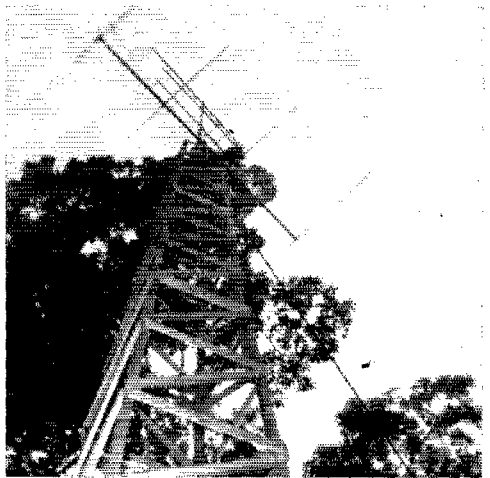
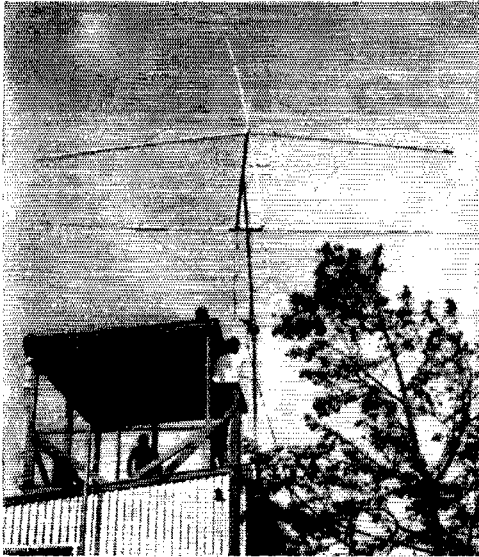
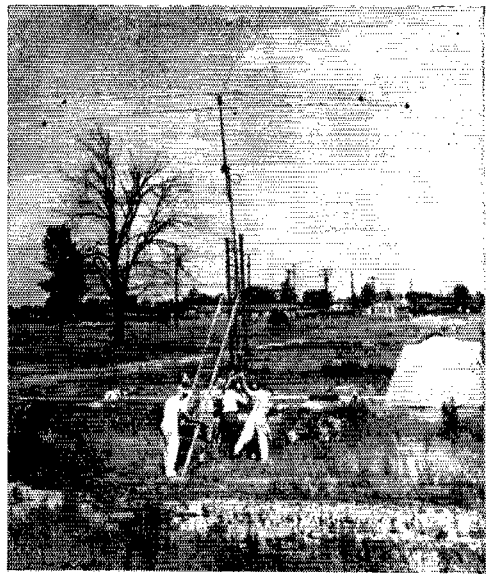
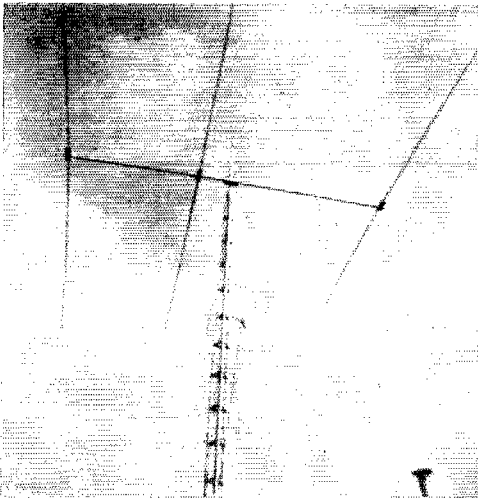
Birds-eye view of FD operating positions in the upper insert the Massilon Amateur Radio Club, K8APE/8. Lower insert shows the Radio Amateurs of Greater Syracuse, W2WS/2 in operation; while the center photo finds KN7EVA pausing at K7AYF/7, Shy-Wy-Radio Club.

m.p.h. wind blowing from the south. Rain and near freezing temperatures added to the misery. Irregardless of the elements, the three operators battled the QRMI to a new high score for the club. This itself helps alleviate the suffering encountered." — *Salem ARC, W7SAA/7*. . . "This year's secret weapon was a 40-meter quad." — *Miami Springs RC, K4OSQ/4*. . . "Short skip conditions were best ever heard on FD and we had to go PD without any 10- or 20-meter gear. Biggest thrill was working two KP4s on 6 meters. QRMI on all lower bands terrific and less than 30-watt power requires lots of perseverance." — *West Side RC of Toronto, VE3JJ/3*. . . "Best FD yet! No breakdowns, excellent food, crack c.w. operators, but need more to maintain around-the-clock operation." — *Waterbury ARC, W1LAS/1*. . . "Used a 250-foot vertical supported by a helium balloon." — *The Sperry Gang, W6WUB/6*. . . "Our best FD except for that 75 m.p.h. wind that blew down two of our three 35-foot towers Friday afternoon. Boy, Lake Erie can kick up quite a storm!" — *St. Joseph High School RC, K8BFF/8*. . . "One new experience for us all was having charcoal broiled steaks at 0300!" — *Dade RC, W4NYU/4*. . . "Again our all-YL operator FD was a huge success! Our OMs again furnished brawn for setting up camp and stations, antennas, etc., as well as cooking the meals and serving the YLs. They think they had fun, but we know the YL operators did. Making big plans for FD, 1960." — *Gulf Area Young Ladies Amateur Radio Klub, K5SKF/5*. . . "Low-hanging trees were something of a menace to antenna system when mobile in motion." — *K8EPC/6*. . . "Too much food and beer to keep the boys 'point hungry.' The secretary simply went berserk deciphering the log sheets." — *Woodbridge RC, K2ODP/2*. . . "Catfish' beam really paid off on 10 and 15 meters. The use of this beam and s.s.b. on 80 made possible this group's best score yet." — *Harrison Emergency Communications Assn, K5AUC/5*. . . "The 10-meter homebrew had output of approximately 15 watts. It was thrown together on a piece of wooden board, after having been originally used on hidden transmitter hunts." — *Oak Park ARC, W8MLN/8*. . . "Perfect!" — *K6PVS/6*. . . "Operated at Boy Scout Camp with three trucks and large tent. Flag pole held end of two dipoles." — *Michigan City ARC, W9KLL/9*. . . "Could not start the old 750-watt generator. After having searched for hours, finally found a 3-kw. job. That decided to give us anywhere from 70 to 140 volts depending upon temperament. W2TQY got stuck in the mud while K2KTEK got a flat tire. Grand time had by all." — *W2TIO/2*. . . "Welcomed by the state to use their parks for any such worthwhile work." — *I.M.O. VHF Club, W9QWV/9*. . . "A 45-foot c.d. trailer and a Volkswagen truck contained our operating, sleeping, and cooking facilities. A 60-foot crank-up tower on wheels supported the 20-meter beam." — *Hali-fax ARC, VE1FO/1*. . . "Used high power this year which worked O.K. with little interference. Had some generator-voltage stability trouble however." — *Hampden County ARA, W1N7/L*. . . "Lucky we had a spare generator, as we had to dismantle the other one completely to remove dirt from the fuel section." — *Massillon ARC, K8APE/8*. . . "Our home brew c.w. rig broke down twenty minutes before the contest but fortunately we were able to throw in a BW-5100 without much delay." — *KBT RC, W2UDD/3*. . . "The refreshment committee did a great job, hi." — *Horseshoe RC, W3QZF/3*. . . "Built a rig from QST but had a different layout and set the power down." — *North Augusta-Belvedere ARC, K4IVI/4*. . . "Within one hour on 20 c.w. we worked W5FC, W5KC, and W5SC." — *Chaminade High School RC, W2JTZ/2*. . . "It was like being a DX station in a rare country with 240 contacts in seven hours on 10-meter phone." — *Sevani RC Unit #, K9HOL/9*. . . "To officially finish off Field Day for this year, we hold our Post Mortem during which we discuss our mistakes and make recommendations for the next year. This we tape record and listen to a few months prior to next June to get things humming again." — *VE2CB/2*. . . "DX100 kept blowing low voltage filter capacitors, seven all told. Local county fire department gave us a hand in raising a fifty-foot tower with tri-band beam." — *Richmond ARC, W6FFZ/6*. . . "Found out a YL's voice is a good drawing card on phone!" — *Green Bay Mike and Key Club, K9EAM/9*. . . "We put up a six-meter beam 40 feet high, all guyed, but forgot to connect the coax, hi." — *W1SEA/1*. . . "Thought of everything except food and good sleeping bags. We only stopped two hours at noon time to cool off the generator, as we were looking for hot dogs during that time." — *Le*

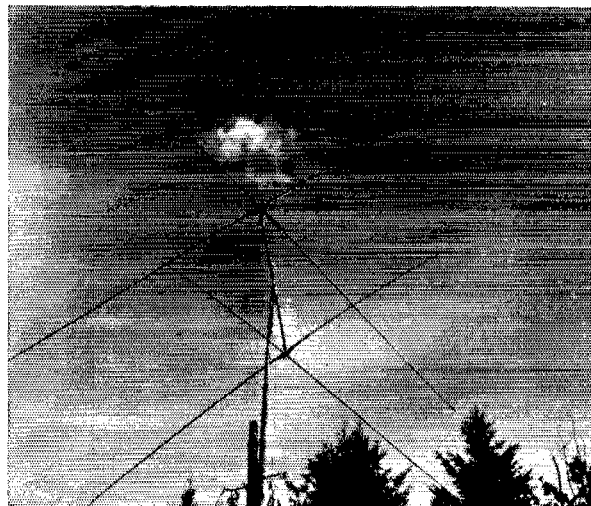


You've heard of the college telephone booth manias. Well, how about this. Squeezed in are K2MMT (left) and K2LRR (right) for the Communication Clubs of New Rochelle, K2YCJ/2.

club des Jeunes Operateurs, VE2JC/2. . . "One receiver gave out with smoke signals, but no damage." — *Winklow Amateur Radio Society, W9QID/9*. . . "ZL2FT woke us all up at 0157 — can stand more shocks like that." — *Dinosaur Valley RC, K4VMX/4*. . . "Can't figure it out — for a second year in a row our coax relay broke down." — *Manchester RC, W1KKS/1*. . . "White Tower people must have thought I was crazy when I came in for coffee at 0200." — *Pinhead Net, W1EUH/1*. . . "Is there a method of eliminating mosquitoes?" — *Radio Amateur Megacycle Society, K9CJU/9*. . . "Had a jolly time this year." — *Quad City ARC, W9YCR/9*. . . "All three stations connected by portable telephone. How about a better FD summary sheet?" — *Mount Shasta ARC, W6BML/6* (Yes, new summary sheet on the agenda for next year — Ed.). . . "All-band vertical failed to function, so had to go back to old reliable wire dipole." — *Door County ARC, W9A1Q/9*. . . "Even the grats behaved!" — *Kinston Amateur Radio Society, W4OIX/4*. . . "This was a great moral victory for our group, showing that our 260 contacts could come close to our club's c.w. group and their 270-odd contacts; thanks to our G4ZU beam." — *Cuyahoga Falls RC — Phone Group, W8VPV/8*. . . "Found out six and two-meter beams don't work out too well inside a barn." — *Southern Chester County ARC, K3BKG/3*. . . "We set up in Long Island's famous potato fields from an old abandoned farm house; primitive facilities and near primitive results." — *Frog Hollow RC, K2OPQ/2*. . . "Our site was on top of a little mountain 900 feet high. Since we had to bring water from over a mile up a mountain trail, we had to ration the stuff. A ham must really love his hobby if he will go through all the hardships of Field Day knowing what will happen beforehand." — *K4KW/4*. . . "Winds with gusts up to 60 m.p.h. hampered our FD activity this year. It whipped the feeders in two about three times. Until the wind died down near 0400, it spit snow, sleet, and rain, keeping everyone miserably cold." — *Boulder ARC, W0IA/0* (In June? — Ed.). . . "Regardless of the fact that visibility was zero from our mountaintop FD site; had two transmitters break down minutes before the contest, forcing us into the one-rig class; and then had a bobcat run off with our choice steaks — most of the operators survived and immediately set forth to formulate plans for a bigger and better FD 1960." — *Royal Order of Left-handed Bug Swatters, Donut Dunkers and Peanutwhistle Propagators, Ltd., K1APR/1*.

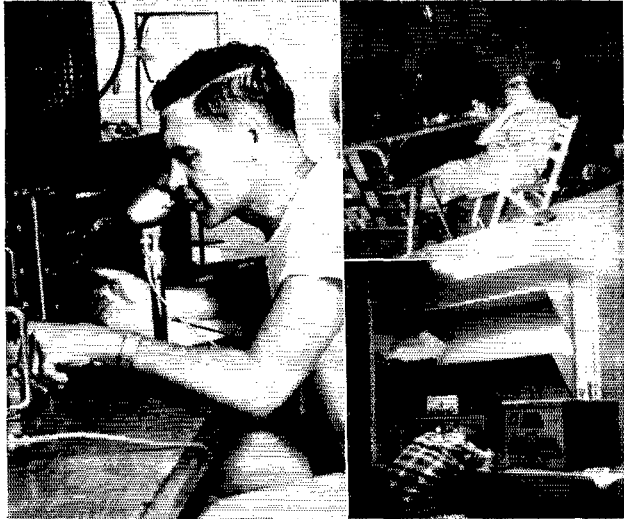


Beams, quads, and towers—a highlight of the 1959 Field Day. Trying to get maximum signal from low power rigs, there was a big switch to big antennas this year. And it isn't usually easy to get these big babies up for portable operation. Left column, top to bottom: W9DO/9; W3UHP/3. Right, top to bottom: Mumford High School Amateur Radio Club, W8GMP/8; Camptown Amateur Radio Club, K2KIB/2; Valley Amateur Radio Club, W7HZ/7.

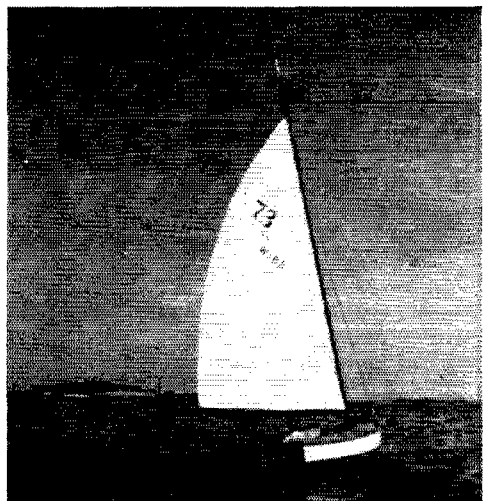


W8YDJ/8	Kent RC	507-ABC-15-	2802	K6CXI/6	Alexander Hamilton	149-	A-15-	1341
K9QOA/9	Hooster Hills Ham Club	554-BC-18-	2694	K9CW/9	High School RC	197-	B-14-	1332
K5FHL/5	Curry County ARC & Cannon ARB MARS Members	422-B-8-	2682	W7UF/7	Randolph AR Assn.	221-	B-4-	1326
W2MAC/2	Syracuse VHF Club	410-AB-7-	2679	W1S-A/1	(nonclub group)	167-	AB-9-	1323
W2MBC/2	Delaware Township High School RC	261-A-9-	2574	K4FHJ/4	North Miami RC	200-	AB-10-	1314
W1WHF/1	Hamden AR Assn.	586-AB-12-	2573	W7ML/7	(nonclub group)	218-	B-	1308
W9BKR/9	Montgomery County ARRC	317-AB-6-	2519	K9AIR/9	Rishwaukee RC	170-	AB-20-	1272
W7DP/7	Walla Walla Valley ARC	408-AB-27-	2505	VE6KC/6	(nonclub group)	210-	B-5-	1260
K9RUT/9	Chicago Radio Traffic Assn.	285-AB-10-	2499	W9EPN/9	Sky-Wire Int	209-	B-12-	1254
W3LHP/3	(nonclub group)	410-B-13-	2460	K3ALD/3	807 Society of Central HS & Oxford Circle RC	161-	AB-15-	1248
K3DHE/3	Alliquippa Area RA Assn.	377-AB-13-	2436	W9BRN/9	Three Rivers ARC	167-	AB-12-	1239
W2HP/2	(nonclub group)	287-AB-8-	2367	W9MJL/9	Vermillion County AR Assn.	308-	BC-40-	1227
W5HMF/5	Oil Capital Mobile Club of Tulsa	352-AB-20-	2364	W9BZP/9	National Trail ARC	197-	AB-15-	1206
W4SRX/4	Eglin AR Soc.	367-B-10-	2352	W5AGAN/2	466 RC	199-	B-15-	1194
W7ECA/7	Electric City RC of Great Falls	114-ABC-12-	2332	K2YNT/2	Metuchen Y RC	179-	AB-15-	1172
W4ZZ/4	Greenville ARC	360-B-7-	2322	K5ISK/5	Okla. State Tech. AR Assn.	188-	B-17-	1128
VE3DOH/3	Windsor ARC	257-A-25-	2313	K2VZK/2	(nonclub group)	121-	A-4-	1089
K9KGR/9	Ornate Order Bloodshot Eyeballs	350-B-23-	2250	K6HMK/6	Delta ARC	93-	A-6-	1062
VE1FO/1	Hillfax ARC	271-AB-10-	2214	K9HGX/9	Cenob. group	148-	AB-33-	1026
K6FMA/6	North Bay AR Soc.	247-A-15-	2235	K1AOP/1	(nonclub group)	148-	B-11-	1008
K9GLV/9	Sherby County RC	570-B-15-	2220	W9MWQ/9	La Crosse ARC	167-	B-25-	1002
W6PNW/6	Downey ARC	386-ABC-10-	2208	W2RON/2	(nonclub group)	121-	AB-3-	999
W1LAM/1	Fristal County R Assn.	115-AB-12-	2151	K8DJA/8	Holland Area RC	85-	A-10-	990
K2AAN/2	Great South Bay RC	353-B-12-	2118	W9ZOU/9	Blue Valley RC	184-	AB-15-	969
W7AQ/7	Yakima ARC	295-AB-14-	2088	CQ ARC	Chgo County RC	136-	B-8-	966
K4BXZ/8	(nonclub group)	292-A-6-	2043	W9VMW/9	Toten ARC	129-	AB-6-	951
W8NTL/8	Scioto Valley ARC	338-B-23-	2043	VE7EN/7	Snyder ARC	156-	B-8-	936
W3QZF/3	Horseshoe RC	338-B-12-	2028	K5QEL/5	Black Hills ARC	131-	B-25-	936
K5RY8/5	Sun City ARC	334-B-15-	2004	W9BLK/9	Telephone Employees RC Assn.	135-	AB-10-	882
VE3PSQ/3	Quinte ARC	308-B-12-	1968	K2CD/2	Fort Assn.	137-	B-14-	822
W2HYD/2	Squaw Island ARC	225-AB-20-	1902	W9RJY/9	Falls ARC	109-	AB-6-	765
W2WXI/2	Rockhill Communica-tions Club	250-AB-8-	1881	K9RHH/9	Fr. Sheridan ARC	124-	B-10-	744
W6BML/6	Mt. Shasta ARC	304-B-10-	1824	W9DR/9	Tri-State R Soc.	114-	AB-15-	687
K2LNK/2	Marathon RC	230-AB-10-	1821	K9ENAL/9	Communicators RC	111-	B-25-	666
K5ANN/5	West Suburban YMCA AR Council	184-A-12-	1818	K1JMR/1	Norwood ARC	46-	A-9-	648
K2EXW/2	Cumberland County RC	233-AB-12-	1800	Penn Central RC	254-	AB-7-	645	
W9PMW/9	Foot Hill ARC	214-AB-9-	1776	Walpole High ARC	87-	AB-8-	615	
W3PG/3	Apro ARC	271-B-15-	1776	Grand Island AR Soc	97-	AB-12-	603	
W5CJG/3	Northtown High School ARC	295-B-	1770	Burlington ARC	80-	AB-10-	594	
W6NKR/6	(nonclub group)	258-B-7-	1698	Minot AR Assn.	82-	B-12-	492	
K6HAI/6	North Shores ARC	228-AB-6-	1698	Mike & Key Club	87-	B-8-	478	
VE7IP/7	East Kootenay ARC	163-A-8-	1692	W3GUR/3	Pottstown AR Assn.	475-	C-	475
W8SWX/1	(nonclub group)	247-B-3-	1632	W9QID/9	Winstow AR Soc.	235-	B-5-	470
W1NC/1	Montrose CD Radio Group	268-ABC-6-	1614	W3ROW/3	Carbon ARC	211-	B-10-	422
W7TZ/7	Grays Harbor ARC	239-B-30-	1584	K1TAWR/1	Kodlak ARC	58-	B-9-	408
K6KHZ/6	Tehama County ARC	175-A-9-	1575	VE26T/6	Northern Alberta RC	150-	AB-6-	405
K6HPC/6	Indian Wells Valley ARC	261-B-12-	1566	K2MYY/2	Rathway High RC	134-	AB-6-	393
W1IA/1	South Shore ARC	173-A-3-	1567	K1DJH/1	Windhams RC	52-	B-8-	357
K9TOA/9	Air Capital AR Assn.	247-AB-25-	1521	W7MRW/7	Newberg ARC	51-	AB-18-	357
W3VV/3	McKean County RC	251-B-3-	1506	W2M88/3	Tu-Boro RC	148-	AB-16-	297
W1HQH/1	Falmouth AR Assn.	238-AB-11-	1503	K1CLP/1	(nonclub group)	56-	BC-4-	291
W16BME/6	Polisertia RC	238-AB-15-	1482	W6MLK/6	High-Frequency Ama-tour Mobile Soc.	108-	AB-4-	282
W3CAB/3	Washington RC	465-ABC-6-	1470	W3SJI/3	Hazleton ARC	26-	B-7-	156
W9LMA/9	Midway RC	237-B-15-	1422	W6HS/6	Crescenta Valley RC	1120-	A-17-10-	305
W9ECP/9	Flint Hills ARC	207-B-15-	1392	W2OR/2	Pompton Valley RC	1551-	AB-50-	9837
K9GCV/9	Southwest Iowa AR Assn.	254-BC-20-	1383	W3ISE/3	Soc. for Preservation of Key Cities, Splatler & PVI	1011-	A-22-	9324
W3GV/3	R Assn of Erie	229-B-8-	1374	W4SKH/4	Oak Ridge R Operators Club	963-	AB-48-	7366
W1PX/1	Town of Barnstable RC	224-B-10-	1344	K4HEN/4	Lynchburg ARC	1019-	B-30-	6264
				K6QZJ/6	Riverside County ARC	878-	AB-20-	5961
				W2CWV/2	Slater Island AR Assn.	677-	AB-25-	5919
				K9AYE/9	Illinois Valley R Assn.	621-	A-20-	5814
				W8TO/8	Columbus AR Assn.	946-	AB-25-	5703

Four Transmitters Operated Simultaneously



Some folks were eager beavers (left), while others just . . . well (right, top and bottom); so they took five now and then. Left, Amateur MARS Communications Club, K8AIR/8. Right top, Distinct Heights Radio Club, K3HDO/3; bottom, W3SL/3.



Some went to the mountains (left), while others went to the seashore (right). Left, Aerojet Radio Amateur Club, K6DQE/6, and right W1BB/mm.

K9QMH/0	Montrose County ARC	569-	A-24-	5346
K4DPZ/4	Gainesville A Soc.	567-	A-15-	5328
W6CF/5	Kilcoyee Club	822-	B-18-	5202
K6QEZ/6	Sequoia ARC	947-	A-20-	4923
K3GFV/3	Cumberland Valley ARC	533-	A-23-	4797
W3RDM/3	York Road RC	494-	A-13-	4671
W1U88/1	Pittsfield RC	678-	AB-15-	4443
W1SYE/1	Newport County RC	733-	B-25-	4398
W67BA/7	Humbly ARC	445-	A-31-	4230
W9JOC/9	Old Post AR Soc.	676-	B-20-	4206
W6MNO/6	Inglewood ARC	649-	AB-20-	4191
K2OML/2	Raritan Bay RA	608-	AB-12-	4188
W2KR/2	New York RC	452-	A-15-	4068
W6PML/6	Santa Maria City RC	629-	AB-15-	4023
W4HFL/4	Alexandria RC	614-	AB-11-	4020
K8BA/8	20/9 ARC	635-	B-16-	3960
W6MIG/6	Helix ARC	629-	B-11-	3936
VE3AIS/3	Oakville ARC	436-	A-15-	3924
W3ZEK/3	Harrisburg ARC	648-	B-20-	3888
W5IU/5	Kerrville RC	567-	AB-17-	3768
W8ARA/9	Bloomington ARC	597-	AB-20-	3732
K9CJT/9	RA Megacoye Soc.	429-	AB-16-	3696
W9DJK/9	Delaware AR Assn.	562-	B-25-	3660
K9JK/9	Martinsville ARC	554-	AB-10-	3576
W1KKS/1	Manchester RC	440-	AB-30-	3546
W3WFW/3	Chesapeake ARC	387-	A-10-	3483
K2SOJ/2	Glenrover County ARC	538-	AB-31-	3450
K1GAY/1	Bedford RC	509-	AB-11-	3372
W8MAA/8	Central Michigan ARC	558-	B-19-	3348
W8DC/8	Grand Rapids AR Assn	461-	AB-30-	3282
W6PMK/6	No. Peninsula Electron- ic Club	364-	A-10-	3276
W9KLL/9	Michigan City ARC	462-	AB-24-	3246
K7AUO/7	Tektronix Employees RC	528-	AB-24-	3192
W5HPT/5	Terry County ARC	504-	B-12-	3174
K6SVO/6	Imperial Beach RC	500-	AB-8-	3114
W4LEN/4	Desautel ARC	491-	AB-12-	3087
W2DYM/2	Amateur UHF Club of Jamaica	366-	AB-21-	2964
W4HBB/4	Savannah ARC	193-	B-17-	2968
VE3DRT/3	Skywide ARC	434-	AB-15-	2829
K9OXN/9	Huntington RC	466-	B-15-	2796
VE3KCD/3	Kitchener Waterloo ARC	450-	AB-17-	2778
W1FCM/1	Hartford County AR Assn.	283-	A-35-	2772
W8HTX/8	Heath ARC	420-	AB-21-	2756
W4LX/4	Fl Meyers ARC	422-	B-15-	2682
K8BYL/8	Southeastern Michigan AR Assn	377-	AB-25-	2646
W8FY/8	Van Wert ARC	414-	AB-17-	2577
W1VPU/1	Shelton Emergency R Assn.	362-	AB-23-	2523
W6MIX/6	El Dorado County ARC	404-	AB-20-	2523
W6TO/6	Fresno ARC	407-	AB-28-	2493
K6DMM/5	Richardson ARC	415-	B-20-	2490
K5INH/5	(nonclub group)	408-	B-	2448
K1COV/1	(nonclub group)	363-	B-9-	2328
W2PG/2	(nonclub group)	538-	AB-14-	2244
W8JPT/8	Livonia RC	337-	AB-30-	2244
K8BU/8	Tri Cities ARC	344-	AB-17-	2244
W9URC/9	Central Indiana Mobile Club	446-	BC-14-	2182
W9AML/9	Central Illinois RC	309-	AB-23-	2178
K2KED/2	Burlington County RC	240-	A-14-	2160

W1CLO/1	Podunk ARC	238-	A-13-	2142
W8RJ/8	Detroit Metropolitan RC	294-	AB-8-	2043
K2IBC/2	Averett RC	311-	AB-14-	1977
K9IXS/9	Elkhart High School ARC	322-	AB-12-	1959
W1JT/1	East Providence AR Assn	247-	AB-15-	1953
W5RLN/5	Peatmont ARC	302-	AB-15-	1944
W6LAIN/6	San Mateo RC	322-	B-12-	1932
W3OI/3	Lehigh Valley ARC	314-	B-16-	1884
W4TMM/4	Bristol ARC	1147-	BC-20-	1872
W3TTL/3	Pocono AR Klub	265-	AB-12-	1845
W8EVE/8	Tri-County AR Assn	299-	AB-14-	1824
W3TQC/3	South Philadelphia AR Klub	286-	ABC-4-	1791
W9GRP/9	(nonclub group)	298-	B-	1788
W9LXA/9	Chippewa RC	276-	AB-25-	1692
W6OPT/6	Venice High School RC	223-	AB-8-	1608
W2AVZ/2	Hamilton Township R Assn	202-	AB-20-	1587
W8WNK/8	Mid St. Louis County AR Assn	264-	B-11-	1584
K00GT/0	AR Assn of Tonawandas North Shore R Assn.	263-	B-18-	1578
W28EX/2	AR Assn of Tonawandas North Shore R Assn.	262-	B-30-	1572
W1GES/1	Duff Happy Dash Hounds	212-	AB-12-	1548
W3FQR/3	Hounds	238-	B-8-	1428
W7NBR/7	Spokane RAC	213-	B-25-	1428
VE3DC/3	Hamilton ARC	230-	B-18-	1380
VE7CM/7	Point Grey ARC	203-	B-7-	1368
K1GHR/1	Pawtucket Cove R Assn Rensselaer Polytechnic Institute RC	224-	AB-6-	1356
W28Z/2	South East ARC	297-	BC-8-	1356
K8EMV/8	Stratford ARC	335-	BC-20-	1338
W1ORS/1	Chautauque High School RC	198-	AB-18-	1335
W2JTZ/2	Burlington Short Wave RC	175-	AB-13-	1323
K2MXX/2	RC	131-	AB-7-	1254
K9ONA/9	6 Meter Club of Chicago	170-	ABC-24-	1161
W1IHO/1	Aberlona ARC	112-	AB-8-	1131
W3MER/3	Huntingdon County ARC	176-	AB-8-	1110
K3HDO/3	District Heights RC	200-	ABC-13-	1105
K6STG/6	Texas Southmost RA	183-	B-7-	1098
VE2MO/2	St. Maurice Valley AR Assn.	177-	AB-25-	1074
W9ZRT/9	Central Dakota R Assn AR Soc. of Harrison	162-	B-10-	972
K2IAT/2	Black River Valley ARC	129-	AB-8-	915
K2MIQX/2	ARC	137-	AB-9-	843
W8TYL/8	Fairborn Chigler & RF Propagation Soc.	114-	AB-4-	705
K17AIR/CL7	(nonclub group)	155-	BC-12-	675
K9PFB/9	quad County RC	85-	ABC-8-	113

Five Transmitters Operated Simultaneously

W2OYH/2	Morris RC	1402-	A-30-	12,843
W8FNE/6	(nonclub group)	1389-	A-18-	12,501
K8AIR/8	Amateur MARS Com- municators Club	1340-	AB-25-	11,595
K6BAG/6	Pacific RC	1286-	AB-11-	11,454
W2YKQ/2	Lake Success RC	1195-	AB-21-	10,338
W2GTD/2	Hidgewood ARC	1056-	A-22-	9504
K6D1/6	Santa Barbara ARC	937-	AB-23-	7904

W8UDB/8	155	A-1656	WIMKE/1	20	A-634
K8KFK			WIZPT		
W9WLY/9	273	B-1638	K11IK/11	102	B-612
K9DZ			K07Z/9		
K2IRS/21	270	B-1620	K0EKA	64	A-576
W2IFS/2			K0IZD/0	54	A-486
K2DWW	265	B-1590	K1DNG/1	50	A-450
W2DMJ/2	149	A-1566	W5FCX/5	72	B-432
W5VC/5	256	B-1536	W9BKJ/7	69	B-414
K5EMA			L7ZDB/KLT/139	C-309	
W6RAM/6	163	A-1467	K4QIA/1	86	B-396
K6LWN			K8BSZ/8	196	B-392
K2MBU/2	30	A-1418	K8JFT		
K2MKC			W8MTI/8	4	A-392
W1NXX/1	210	B-1410	K8EXF		
W1FKJ			W6DCL/91	65	B-390
W1ESV/1	229	B-1374	K1ITU/1		
W1ZQT			W1RW	61	B-366
W9OHU/8	76	A-1364	W1YNL/1	26	A-351
W9OEY			W2AAW/5	1	A-351
W9ZMU/9	201	B-1356	W6CIR/6	175	B-350
K9AVZ			W2WZQ/2	114	C-342
K2AZJ/2			K2CSN		
K2VXA	122	A-1323	K7HYX/7	9	A-324
W3WDK/31	219	B-1314	W9JUT/9	53	B-318
W8HNY/8	213	B-1278	W9KYC		
K8JZZ			W8QI/8	33	A-297
W8GUV	127	A-1278	K2AUW/2	143	B-286
K6DYX/61	89	A-1269	W8NZ		
K6VKO/6	140	A-1260	K8JVV/81	86	A-258
K6TVO			W0WUU/0	43	B-258
K00BF/91	147	A-1233	W9HWN/91	114	B-228
K4HX/4	205	B-1230	W2SKS/3		
W40WV			W3ZXT		
K1BAB/1	124	AB-1218	K8NIN/8	95	B-190
K1DRX			K8N8PEN		
K8DKU/8	133	AB-1200	K2PHC/2	21	A-189
W2TXU/2	128	A-1152	W2RZK/2	27	AB-183
K6HFA/6	192	B-1152	W2DGV		
W6DGR			W12DZ/21	75	B-180
K4ZYI/4	190	B-1140	W76AW/6	58	A-174
K4TBN			W2LQO/2	72	B-144
K4QPJ/41	100	A-1125	W4BUU/4	10	A-135
W9ISJ/9	180	B-1080	K0LAX/0	41	B-132
K9JL			K1GVQ/1	21	B-126
W7VII/7	152	B-1074	W3ML/4	106	AB-256
W7UPS			K5JL	51	B-120
K2PSR/3	149	B-1044	K8SOMO/8	51	B-102
K2PGC			K6RAU/6	23	A-89
W7GVV/7	146	B-1038	W5GI/5	7	B-63
W6VQQ/61	115	A-1035	K8KJ/81	23	B-46
W9CHD/9	114	A-1026	K5UYI/5	6	B-42
W9NGP			K8NINE/3	3	A-41
K3DCR/31	112	A-1008	W1LIG/1	16	B-32
W3DUN/41	124	AB-981	W8VZE/8	13	B-30
W8WJL/8	69	A-932	W4FT/4	2	B-12
K5IRV/5	153	B-918	K8N1PK/8	1	B-6
K5BNZ			VE9NG/9	1	A-3



FD 1921? Nope, this is for real. OM, W9USJ showed son (left) and new hams what an old time ham station looked like. This spark gap transmitter and crystal detector receiver was set up at the Chicago Suburban Radio Association site W9SW/9.

W4MIVX/4	69	AB-441	K3EVT/3	68	A-204
K4MUT			K3EXF		
W2DILT/21	34	AB-303	K9OCX/91	102	B-204
W3DHF/8	44	AB-303	K8JPF/8	60	AB-123
W3KDX			K8NLEN		

CLASS C

(Grouped in this tabulation are the scores of entrants in the mobile class. Figures following the call indicate number of contacts, power and final score.

Two Transmitters

K5DGI/5	804	A-10,864
K5E2I/5		
W6UF/6		
W6HB	440	B-2640
K5TEL/51	430	B-2580
K2TJM/21	242	B-1602
K1KFR/11	234	B-1554
W5CX/5	197	AB-1445
W5COF		
K2ARS/2	122	A-1359
K2JAP		
K7NXZ/7	184	B-1266
W7HFZ		
K5LSE/5	121	AB-1107
K5MPM		
W7GUS/7	106	A-954
W7BJW		
W8WGR/81	436	B-872
W1MRQ/1	100	AB-861
K1HCN		
K4MWB/4	330	B-600
K4TEX		
VE2UN/21	80	B-522
K6VXN/61	75	B-450

W8PVC/8	485	A-7987	W8QYT/8	65	A-2133
K6EPC/61	230	A-3443	W8URX/8	65	A-2133
W8GHO/8	125	A-2930	K8GVT/8	65	A-2133
W2MIU/21	162	A-2525	W8AGA/8	65	A-2133
W3VXN/3	156	A-2484	W8CZW/8	65	A-2133
K8ZAI/8	90	A-2417	W8SDY/8	65	A-2133
W8GMK/8	86	A-2390	W8BDZ/8	65	A-2133
K6RRD/6	147	A-2322	W8UNL/8	65	A-2133
W8QAV/8	77	A-2282	W8NLX/8	65	A-2133
W8AEU/8	75	A-2268	W8WAG/8	65	A-2133
W8QXQ/8	75	A-2265	W8AJH/8	65	A-2133
W8GZM/8	70	A-2201	K8JIC/8	65	A-2133
K8GBH/8	67	A-2160	K2OLG/2	37	A-1860
W8NNX/8	65	A-2133	W3HLY/3	107	A-1782
W8QYS/8	65	A-2133	W3DSG/31	107	A-1782
W8NMA/8	65	A-2133	W6GGW/61	93	A-1593
K8CFH/8	65	A-2133	W3RQZ/31	118	B-1593
W8FKB/8	65	A-2133	W9TVA/8	100	A-1691
K8MVA/8	65	A-2133	W3CNO/3	90	A-1580
K8PZV/8	65	A-2133	W2SOX/81	99	A-1674
W8MAF/8	65	A-2133	K6LUV/6	58	A-1499
K8SWH/8	65	A-2133	W6FTG/6	52	A-1485
W8ZET/8	65	A-2133	W6OPY/6	74	A-1364
K8GDE/8	65	A-2133	K6VUZ/6	65	A-1298
W8OHA/8	65	A-2133	K9MFK/8	90	A-1298
K8GVK/8	65	A-2133	W3ILZ/3	71	A-1296

FD installations come in handy when a real emergency occurs. The Fordham Radio Club gang, K2SOQ/2, pitched in to rescue four people in distress on a cabin cruiser close to rocks.



W3PNY/3.....70-	A-1283	W1DMH/1.....40-	B-585
W3SRU/3.....70-	A-1283	W6IKJ/6.....41-	A-554
W6OOR/6.....62-	A-1175	K6LFO/6.....41-	A-554
W3OOH/3.....61-	A-1161	K6ZFL/6.....16-	A-554
W6BTV/6.....61-	A-1161	W3YHV/3.....37-	B-548
W0TUL/7 ²102-	B-1143	W3MTR/3.....15-	A-540
W6QPX/6.....57-	A-1107	W3GFP/3.....18-	B-536
W3NIP/3.....55-	A-1080	W3WC/3.....14-	A-527
K3CRU/3 ¹55-	A-1080	W0RVA/9.....39-	A-527
K2DEV/2/3 ¹54-	A-1067	W3LNQ/3.....13-	A-513
K9LJC/8.....53-	A-1055	W3SAA/3.....12-	A-500
K4JGR/8.....52-	A-1042	K6SWZ/6.....12-	A-500
W9EZR/8.....51-	A-1028	K6IGB/6.....29-	A-492
W6CXD/6.....48-	A-999	VE2SC/2.....26-	B-477
W7ARB/6.....48-	A-986	W6DYZ/6.....35-	A-473
W3IGW/3.....44-	A-932	W3YJM/3.....10-	A-473
K9LWB/8.....43-	A-920	W3BBB/3.....9-	A-459
W3JH/3.....43-	A-918	W3LKI/3.....6-	A-388
W81TF/8 ²41-	A-891	W1BB/1/7 ¹26-	A-351
W3GOW/3.....41-	A-891	W1ZPT/1.....1-	A-351
W7UCA/7 ¹37-	A-837	W3IDR/3.....13-	B-342
W3AWH/3.....66-	B-819	K6IGW/6.....10-	A-315
W8SKP/8 ²45-	A-810	K1GTV/7.....17-	A-230
W3VY8/3.....35-	A-810	K6RVS/6.....25-	A-225
K6JNV/6.....35-	A-810	K8KJL/8.....16-	A-216
W9TTL/8.....36-	A-810	W3KFA/2.....15-	A-203
W6BRT/6.....6-	A-770	KN1WY/1.....10-	A-135
W3PWG/3.....31-	A-756	W3CIB/3.....15-	B-135
W3FFT/3 ¹82-	B-774	K3CAC/6.....9-	A-122
W6KQL/8.....11-	A-716	W9MY/9.....9-	A-122
K3CJC/3.....28-	A-706	W0DSE/4/VE3.12-	B-108
K9MAD/8.....26-	A-690	W8MPZ/8.....8-	A-108
W3IVD/3 ¹26-	A-689	K2LWQ/2.....6-	A-95
W3HOJ/7 ¹26-	A-689	W3LBM/3.....7-	A-95
K6RJU/6.....25-	A-675	W8CBM/8.....7-	A-94
W3TMC/3.....37-	B-674	W9BT/3.....6-	A-81
W3WNC/3.....24-	A-662	W8CU/8.....6-	A-81
W2KOY/2.....38-	B-657	W8HHV/8.....6-	A-81
K3DJE/3 ¹43-	B-657	VE5JK/5.....7-	B-63
W6KTB/6.....28-	A-648	K5CBA/5.....7-	B-63
K9IBW/8.....22-	A-635	VE3AUU/3.....5-	B-45
W3JMY/3.....22-	A-621	W3OBY/3.....4-	B-36
K8SQQ/8.....5-	A-621	W3OBY/3.....4-	B-36
K6POZ/6.....5-	A-621	VE3BMS/3.....2-	A-27
K6KYH/6.....5-	A-621	W0PB/0.....1-	A-14
K6KNP/6.....5-	A-621	VE3DMS/3.....1-	A-14
K6GPP/6.....4-	A-608	VE3BRQ/3.....1-	A-14
W6GAU/6.....3-	A-594	W1SWX/1.....1-	B-9

Strays

K4PPR, whose last name is Beam, lives at 73 Grid Drive. — W4PJU

W1ERB would like to hear from other AVEA members who are hams. (For those of you who don't know what an AVEA is—each year the CAP has an exchange program for CAP cadets with about twenty other nations. A Viation Exchange Alumni.)

W8WT points out that at least twenty-one certificates are now available for working counties in the various states. If each ham would list the name of his county on his QSL, it would certainly help the award hunters.

The Minot Amateur Radio Ass'n of Minot, N. D., is sponsoring a QSO party the second week end of January, 1960, to give as many amateurs as possible the opportunity of working North Dakota. The party will start at 0900 CST on Saturday, Jan. 16, and will end at 2100 CST, Jan. 17. All QSLs received will be answered. Look for North Dakota stations on the following phone frequencies: 3930 kc., 7250 kc., 14,250 kc., 21,360 kc., 29,100 kc., 50.2 Mc., and 144.05 Mc. The only c.w. frequency listed is 7160 kc., which will be awarded by KN0WIO. The club asks that you keep each contact short, keeping the exchange of information down to name, QTH, and RS reports.

WA2BWM now lays claim to living in the hammiest neighborhood. He reports that within a one-mile radius of his home there are 16 licensed hams, plus two more waiting for their tickets to arrive. It's Brooklyn, naturally!

Here's a fellow who has no one to blame but himself. W7HOP, engineer at a broadcast station, started a 15-minute transcription going and then dashed out to his mobile rig for a quick QSO. Right away he was in trouble, as his rig got back into the broadcast station's audio and its listeners heard not only the music but also one end of a QSO with Iowa!

The Owensboro (Kentucky) Amateur Radio Club is sponsoring its fourth annual class in amateur radio. In the past more than 60 students have enrolled in the course, with about half of them going on to get their amateur licenses. — K4URX

WA2BWT reports the FCC's sense of humor is still in high gear. They issued WV2BRA to his cousin, a YL.

W2VYP says he got a QSL from W1RJA confirming a QSO that took place eleven years ago, but doesn't tell us how come it took so long to get the card.

CLASS D

Grouped in this tabulation are the scores of home stations operated from emergency power.

W4NPT ² 546, W1HPM ² 447, K6VTT ¹⁰ 230, W5FC ¹¹ 210, K4FLA ¹² 154, K1BM ¹³ 140, W1BDH ¹⁴ 138, W1GFB ¹³² , W6BBL ¹⁴ 113, W5HTK ¹² 102, K6FCC ⁸⁶ , W2JC ¹⁵ 82, K4DSD ⁷⁹ , K9GCL ²⁴ 75, W3ZRQ ⁶⁷ , K7CQQ ⁵³ , W0JUI ¹⁰ 48, K2BCL ² 17 ³⁹ , K1GCS ³⁴ , W4NYF ²⁵ , W1BNB ¹⁸ , WV6EPA/6 ¹ 18.
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CLASS E

Grouped in this tabulation are the scores of home stations operated from commercial power sources.

W4BTO 407, K6QHC 382, W4LYV ¹ 370, K4HAV ¹ 358, K4OHG 347, K4MSM ¹ 338, K0LLR ¹⁸ 294, K6TKX 271, W5VVF ¹ 246, W6GEB ¹⁹ 246, K2EZG ²⁰ 240, K2TCD 215, K4RBE 209, K9SLD 200, K3DMO 181, K6LPL 176, K9OKD 170, K7BHQ ¹ 166, W4WKQ 165, W4KFC 164, K3DPE 151, K4YFB 142, K0ZWS 141, K6PXQ 140, K0LRS 137, W1AQE 136, K2GTC 129, W1AW ³ 124, W7AQZ 7 123, K2MMW 122, K4MYR 115, K7GQM 111, K6VLG ¹ 110, K9ELT 110, K6STI 106, W2GRD/2 ²¹ 105, W2MRV 103, W8ELE 101, W6KG 93, K9MNT 95, K0UDQ 95, W3KHA 86, K7DNX 84, K6GLS 83, W3JRX 78, W8LJF/8 ²² 75, K9STN ²² 71, K9RWB 70, K1GPF 68, W6LYM 67, K0PFE 61, W5OTI 60, W4CDP 57, K9JUU 56, W1EZM 54, W2EWZ 54, W6AEX 34, K6RPZ 49, K0COA 48, K6KPB 47, W5GLD 46, K6SUV 45, K5GBU ⁶ 42, K3GJE 41, W4OGG 38, W5WB 38, W7FB1 36, K9CBE 36, W4VZD 35, K2RJE/2 ¹⁹ 34, W1IQD ¹⁹ 33, K8KCB 33, K0KMZ 33, W6OJW 31, K2VYQ 30, K0GRS 29, W1LHY 28, K8H6G 25, W2DUN ²⁴ , K6ICQ 24, K6S7Z 24, W3JUF 22, K7CFC 20, W1BDI 19, K5ELJ 19, VE3ELX 19, VE3CTN 19, W2QJY 18, W3BDX 17, W3ROA 17, W6CRO/17, K6HYX 17, VE7FD 17, W1NJL 16, K3CTN 16, K9GAG 16, K6HOV 15, W2FBC 14, W6AM 14, W8IBX 14, K8OOC 14, K1BHC 13, W2KVL 13, K3EHC 13, W8DAE 13, K9SFB 13, K2HGR 12, K9SHLJ 12, W6QZC 12, K8MLO 12, W2BDI 10, W3MLX 10, K9SRT 10, W6GPT 9, VE3CKW/3 9, K5SKT 7, W6QFY 7, W9QGA 7, W2DQD 6, K2SKY/2 ⁶ 6, K4ZRU/4 6, K9OJC 6, K2PTI 5, W4CDA 5, K4DRF 5, K8GUV 5, W9IWW 5, K9N9KI 5, K4QMS 4, K5LOV 4, K9RJO 4, W6PLG 3, K9NRQJ 1.
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¹ 2 oprs. ² 10 oprs. ³ K0MFY 2nd opr. ⁴ K3GAY 2nd opr. ⁵ 3 oprs. ⁶ W8RBD 2nd opr. ⁷ 2 rigs. ⁸ W1WPO 2nd opr. ⁹ 5 rigs. ¹¹ oprs. ¹⁰ 6 oprs. ¹¹ 3 rigs. ²⁵ 8 rigs. ¹² 2 rigs. ¹⁰ oprs. ¹³ 2 rigs. ¹⁶ oprs. ¹⁴ 10 oprs. ¹⁵ 2 rigs. ¹¹ oprs. ¹⁶ 11 oprs. ¹⁷ 7 rigs. ⁸ oprs. ¹⁸ 4 rigs. ¹² oprs. ¹⁹ 2 rigs. ²⁰ 2 oprs. ²⁰ 4 oprs. ²¹ 2 rigs. ³ oprs. ²² 2 rigs. ²¹ oprs. ²³ 6 rigs. ¹⁵ oprs. ²⁴ 15 oprs.

Happenings of the Month

REPORT FROM GENEVA

During the period September 28 through October 23, subcommittees and working groups dealing with allocations problems for chunks of the spectrum brought in reports generally favorable from the amateur point of view. It must again be emphasized that these decisions are subject to change later on in the full allocations committee (Committee 4) or on the floor of the conference itself.

For Region II, which includes North and South America, the western Atlantic and the Pacific Ocean to Hawaii, recommendations at the working level were encouraging. If these recommendations are finally adopted by the conference, amateurs in our hemisphere will have no changes in our bands below 220 Mc.

In the bands above 220 Mc., the only change from the present U. S. allocation appears to be a return to 3300-3500 *Megacycles* in lieu of the 3500-3700 *Megacycle* band we now have.

The 11-meter band is still provided for by a footnote, but the language of the footnote has been changed slightly to make it permissive rather than mandatory. The effect is that those countries now enjoying use of an 11-meter amateur band, including Canada, will probably continue to have the privilege.

Elsewhere, the picture is not quite so bright. As was reported last month, amateurs outside the Western Hemisphere likely will lose their sharing arrangements above 7100 kc. to the broadcasting service. In Europe, several countries want to assign — by footnote — fixed and mobile services to the 29.0-29.7 Mc. band, but would protect amateur stations elsewhere from interference. Japan wants a similar footnote for 29.2-29.7 Mc. In Region I (Europe, Africa) the 70 cm. band will probably be cut to 430-440 Mc. shared with radiolocation (called "radiopositioning" in FCC regulations).

General Manager Budlong has been appointed a member of the Steering Committee of the U. S. delegation by FCC Commissioner Craven, head of the delegation.

ARRL President Dosland was in attendance at the Conference for about a week, in addition to our other people previously reported as being present.

The conference is now expected to conclude about Christmas time. Members are advised to listen to W1AW bulletin schedules (see page 77, November *QST*) frequently toward the end of this month for news of final results of the conference.

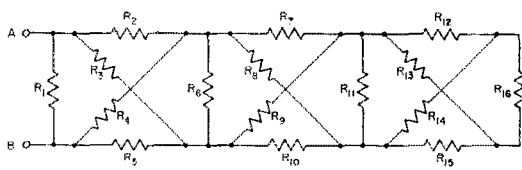


FEEDBACK

On page 36 of the October issue ("Perseids Powerhouse") the caption at the bottom of the page should say that the tube sockets are at the right.

Quist Quiz

John Roberts jr., W2HRG of Cranford, N. J., submits the teaser below. Each resistor is 1000 ohms, and the problem is to find the equivalent resistance of the network as measured across A-B. With only 16 resistors like this, par for the course is one minute.



The answer to last month's d.c. amplifier problem is 12 ma. through R_5 . We trust you noticed that it wasn't necessary to know the value of R_1 , R_4 or R_7 .

Strays

WV2IMH and WV2IMP are having fun cross-banding between 7 and 21 Mc. Wonder how many other Novices have tried this.

W1SS conducted tests with several other members of the SDL net on the morning of the eclipse in New England, Oct. 2. He reports that he himself was in the path of the darkened area and that all the net stations he worked were outside the path of the eclipse. All these stations reported sizeable increases in his signal strength during the period of the eclipse.

K9RQU and K9RQX both are named Wright. The Novice licenses of both were dated the same day, and the General licenses of both were dated the same day. One lives in LaGrange and the other lives in LaGrange Park. Obviously, their call signs are similar. Despite all this, they are not related and never knew each other until the day they were taking the General Class exams in the FCC office.

Nominations for the annual Cosmos G. Calkins Memorial Award must be mailed to the award committee before Feb. 28, 1960. The purpose of the award is to give recognition to that Michigan amateur who has performed the most outstanding public service for amateur radio in Michigan during the past year. The facts and all information on the services rendered by the amateur must be submitted in writing and countersigned by the officers of the sponsoring club or by three individuals submitting the nomination. Mail nominations for the award to the Central Michigan Amateur Radio Club, c/o Curran L. Skutt, W8FSZ, 119 N. Foster St., Lansing, Mich.

First, You Make a Country . . .

BY PAT MILLER, W2AIS*, KH6ARA, ZC8PM

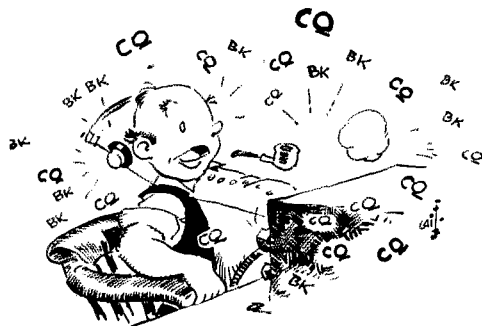
WELL, of course I've heard about Willy. Who hasn't? In fact, I'll bet I'm the only one who really knows the whole story. You see, Willy and I were college roommates and I still drop in on him once in a while. This last time, I guess he just felt like talking. No, I guess it isn't a secret. Well . . . sure . . . I'll tell you.

You sail east-northeast from Montauk Point, Long Island, to reach Willy Barron's QTH—the Southeast Point Lighthouse on Block Island. Willy's a retired Navy chief, a big, easy-going fellow with a grin that splits his face from ear to ear. Everybody likes Willy—he'd do anything for you. Yeah, I know what some people say, but I'm telling you. Willy is a great guy. They don't make 'em better than Willy. Well, anyhow, Willy has two hobbies: lighthouse keeping and ham radio. And his first love is traffic—even more than his old pipe, Willy loves the Driftwood Net on 3610 kc. where he's been moving traffic for ten years.

Willy's call is WIIIN—well, I mean that's what it was for ten years. Then he got a notice from the FCC stating that his call had been changed to WBIIN. Yeah, I know. But Willy's a happy-go-lucky fellow and he just never thought about it. So he went on his net as usual that night. And that's how it all began.

Willy had accepted three messages for relay to the Musselshell Net on eastern Long Island when a dozen S9 signals started howling zero beat on the net frequency for Willy. Some chattered "BK" and others just called continuously.

* c/o Radio Officers Union, Suite 1568, 1440 Broadway, New York City.



The net was completely blanketed. Even Willy's best buddy in Providence was buried in the bottom layer.

Stunned, Willy pulled himself together and answered a W2, who promptly came back: "Gee, thanks for my number 299." A hailstorm of signals rattled against Willy and his reply to a W3 brought: "Golly, you give me double DXCC!" Willy tried to find out what the W3 meant, but the fellow had gone and the deafening calls now covered about 40 kc. either side of the net frequency. Willy answered a faint W4 on the edge of the pile-up and tried to get an explanation of all the excitement, but all he got was: "589, thanks for new country, OM."

"New country?" muttered Willy. "They must be out of their collective minds!" His thoughts were interrupted by a loud, very loud, and mind-reading W1, who cried: "Well, Buster, you've had it. How do you like being a new country?" But when Willy frantically tried to get more information a caterwauling of loud signals, zero beat, drowned the W1's attempts to explain. Willy, dizzy and bewildered, shut off the rig and lighted up his favorite meerschaum to consider the incredible state of affairs.

"New country?" mused Willy, puffing meditatively. "Number 299? What kind of madness is this?"

In the next day's sunshine, it all seemed an impossible nightmare. At sked time that evening, Willy turned on his rig and found to his relief that the net was clear. His buddy in Providence was shooting a couple of QTCs to one of the gang at Bass Rocks. Willy came in with a QRU and his call. It was like flipping a switch. Seven dozen signals, nearly zero beat, roared in with delirious racket of assorted BKs and call letters. Shaking his head and sighing, Willy turned off his rig. After 15 minutes, he turned it on again with hesitant fingers and found to his horror that the fearsome clatter was still going on. Trying again an hour later, he found the frequency quiet and gave his buddies a quick call.

The response to his effort was an even greater build-up of signals that swept out of nowhere to zero beat right on his frequency. He could make out fellows as far away as the Ninth District trying to break through. Then his telephone shrilled through the babel. It was his pal in Providence. The conversation crushed poor Willy. The net boys were sorry, but they wanted Willy to quit. All the traffic between 3570 and 3700 kc. was disrupted by a solid mass of signals calling

Willy. Tragic as it was, Willy realized that his new call was forcing him out of his favorite phase of ham radio. His friend suggested, in what was supposed to be a tactful manner, that Willy go on 20 and work a few of the guys calling him. Willy could only hang up the phone numbly and go out to tend his lighthouse chores, the plaintive CQs whining in his ears.

One evening two weeks later, Willy sat listening wistfully to his net. All was peaceful now and his erstwhile buddies briskly rattled off the traffic. Willy, the exile, just sat and listened with his transmitter cold and silent in the corner. He was deep in a reverie of mingled self-pity and anger when he became suddenly aware of a truck pulling up the driveway and babbling voices outside. The doorbell rang sharply. Willy opened the door and a rush of humanity swept over the threshold and formed a group in the middle of his living room. As Willy, his hand still on the door knob, stared in amazement, a man strode forward from the group. Hand outstretched, he boomed with Elk Club heartiness:

"Willy Barron, aren't you? I'm Herman Harrington, sales manager of Teleceptonic Industries." He waved at another man. "With me is my distinguished friend and competitor, Art Lindemann of Collicrafters and on his right is one of ham radio's maddest engineers, Sam Zhukov, the inventor of the Zero Beat Peeler."

"Oh," said Willy in dazed tones. "And who is the young lady with you?"

"Why that's Helen Keese. She has a major role to play in our master plan. But more about her later. May we sit down, Willy?"

"Oh, Sure," said Willy, letting go of the door-knob and advancing somewhat doubtfully into his own living room. "Do make yourselves comfortable . . ." He couldn't finish as Harrington and the group noisily made themselves at home while Harrington's full golden tones rolled above the chatter.

"Willy, I cannot tell you how disappointed we all are over your leaving the air. Whether you

know it or not, it took an Act of Congress to make you into a new country. The least, we feel, you could do is to show your appreciation by getting on the air and giving the boys a new one. . . ."

"Whoa! Whoa! Whoa!" wailed Willy. "Look, I don't know what this is all about but I do know I have been driven off the air by the crazy Indians calling me on the net frequency." Taking fire at the thought of his wrongs and his silent transmitter, Willy squared his drooping shoulders and continued with outraged dignity: "As a matter of fact, I have been asked by the net to resign. By what right did Congress make me a new country, anyhow? Was it your idea? You people surely have your nerve coming here . . ." Willy choked with rage.

"Now, now, Willy," soothed Harrington. "We do know how you feel. But it's your duty, OM, and it should be an honor to be hamdom's newest country."

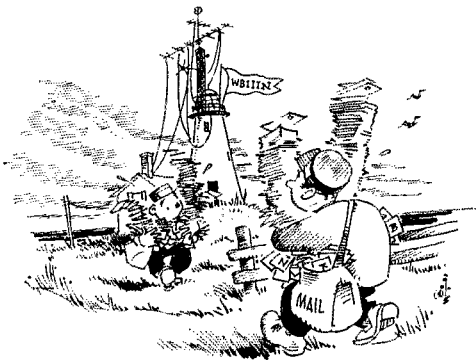
"Duty! Honor!" howled Willy, his eyes rolling with fury. "Even if I tried to work those maniacs, I'd be out of my mind in 15 minutes! They're just too many of them. And talk about operating practice! They make anarchists look like a bunch of policemen!"

"Softly, softly. Easy does it," crooned Harrington, patting Willy's shoulder and pushing him into a chair. "That's why we are here. Our truck is piled with the best goodies that store buyin' money can buy." Harrington showed his smooth white teeth in a Cheshire grin. "Just imagine yourself on the air with the newest Collicrafter's X5 receiver using quadruple conversion with 2 kc. i.f.'s and a 50-cycle mechanical filter . . . plus a Teleceptonic new Broomelocet Kilowatt and its five-band five-element curtain with a 90 db. front to back ratio. With such a set-up, you will have it made!"

"Have what made?" rasped Willy. "I don't need your store-bought gear. I build my own and it works fine."

Harrington and Lindemann gasped in horror.





Lindemann recovered first and purred in soft, condescending tones: "Willy, I'm sure your gear is fine, but when it comes to being a new country you just need the best . . . and that is what we have brought with us. The best — and it is yours as a gift."

"A gift?" gasped Willy. "Why that gear including the antenna must net at seven thousand dollars!"

"Yes, that is true," purred Lindemann. "But we are hard-headed business men and a new country is good for our business. Anyway, these are lab samples and we want to put them to the test."

Willy filled his pipe with fumbling fingers as the group eyed him in expectant silence.

"Willy, I know what you're going to say," piped Sam Zhukov in a reedy voice. Willy, who hadn't any idea what he was going to say, looked at Zhukov hopefully.

"You're going to point out that even the best gear couldn't cope with several dozen stations zero beat. Right?"

"Hum," mumbled Willy, drawing a deep breath of familiar, soothing pipe smoke. "That's true."

"Well," Zhukov shrilled triumphantly. "That's where my Zero Beat Peeler will come in!"

"What the cotton-pickin' is a Zero Beat Peeler?" asked Willy, taking the bait warily.

"Ahhhh!" exulted Zhukov. "It's the greatest thing yet for ham radio. You can have 36 stations on the exact same frequency and my little toy will just peel 'em apart."

"How?" snapped Willy.

"It's very simple," said Zhukov. "My little black box is a phase-sensitive sampling device. I got the idea from one of Larson Rapp's articles. My box is so designed that any signal that is ten degrees or more out of phase with another signal on the same frequency can be peeled away from the others without a wisp of QRM. I've been trying to convince my business friends here that they should incorporate it in their gear, but we haven't been able to find interference that is dense enough to prove my claims . . ."

"And now that I am a new country, you have your chance," said Willy, breaking into Zhukov's piping monologue. He looked around the group,

his friendly eyes tired and resigned. "Is that right." But it wasn't a question.

"Right! Right! You're a bright fella, Willy," came the chorus.

The next half hour was consumed in haggling, mostly between Willy who just wanted to be rid of them and Harrington who was the more persuasive of the two sales managers. But Willy's resistance weakened when Harrington suddenly took a new tack and made a surprise offer.

"Willy," he boomed. "Suppose we got you reinstated in the Driftwood Net? Would you give the DX men a few hours a day . . . say six?"

"You mean you can control those madmen and keep them off the net?" cried Willy, with hope he hardly dared feel creeping into his voice.

"Well, we could try," said Harrington. "Let's say we allow you an hour per night with your old crowd and then six hours daily for DX? That leaves you eight hours for sleep and plenty of time to take care of the lighthouse." Willy puffed thoughtfully. Harrington's liquid syllables flowed over him. "Why not look at the gear? It's real classy." Before Willy could nod assent, there was another rush through the doorway. A bunch of crates and workmen swept into the room, followed by an outlandishly dressed fellow who identified himself as a Collicrafters interior decorator. One hand clutched a bolt of flowered curtain material and the other gripped a huge pair of scissors which he wagged to punctuate his staccato speech.

"We at Collicrafters aim to please all members of the family! The ham shack should blend! Taking one look at this hovel, I can see that the only thing that will save it is full-length curtains. This cerese material with this calla lilly overprint should go a long way to help." Dancing over to the windows, he sighed and teh'd as he measured.

For ten minutes, a whirlwind of pounding and shouting battered Willy. Then the transformation emerged. Willy's own gear had been unceremoniously ripped out and tossed in a corner of the kitchen. It was replaced by a gleaming desk full of push buttons and hidden lights with recessed inclined panel equipment. The feedline was nowhere to be seen. The new curtains screamed from the windows. The interior decorator was patting in final touches, smiling obsequiously at Harrington and saying: "Oh, Mr. Harrington, I do hope you approve of our Congo motif in the floor lamp. The figure is one of the fertility gods from near the Rhodesian border." Willy stared at it unbelievably for a moment, then averted his eyes, blushing. Even Harrington looked momentarily disconcerted. But he nodded and shoed everyone outside where the workmen hurried to install the beam.

"Well, what do you think of it?" he asked, Willy, beaming at the shiny equipment.

Willy just nodded despairingly and said: "Look, Harrington. The gear looks great, very nicely thought out. But even if I do try to fulfill your scheme, how am I going to keep up with the QSL problem? It would take the rest of my wak-

ing day just sorting them out."

"Tut, tut," beamed Harrington. "That's Helen's job. Meet your new social secretary." Helen, who had been sitting so quietly that Willy had forgotten her, smiled at him. "Hello," she said sweetly and winked at him mischievously. Willy blushed, mumbled hello and asked with growing alarm: "But where's she going to stay?"

"Oh, no worry there," soothed Harrington. "She has a nice room at the inn down the road. Don't fret about her. She's a faithful Collierafters employee. She has her job to do, haven't you, Helen?"

Helen smiled demurely and turned to Willy, who still looked nervous.

"Why don't you sit down?" she said. "There are several people waiting outside to see you — Greeks bearing gifts, shall we say." She moved to the sideboard and poured a glass of sherry which she brought to Willy. Harrington gathered Zhukov and Lindemann and shepherded them outside where the workmen were packing tools into the truck. Helen clapped her hands and a motley group crowded into the room, clutching boxes and papers with anxious hands.

The first stepped forward, a youngish man, rather shy and awkward in his manner. "Hello, Mr. Barron," he said, smiling uncertainly at Willy. "I represent the Cedar Meadow Long Path Only DX Association and we would like you to try to work us long path. Here is a list of our calls and here is a little gift from our club . . . a thousand QSL cards with your call on them."

"Long Path only?" asked Willy in puzzled tones. "How come?"

"Well . . . uh," mumbled the youngish man. "I've already worked 250 short path and my mother won't let me go out with girls so I had to start something . . ." Helen gave him a gentle nudge and called: "Next!"

A heavy-set, florid-faced man stepped forward briskly and shouted: "Welcome, OB, to the DX fold. We of Ramas greet you and wish to present you with this little black stamp box with all our calls inscribed. You will find \$250 worth of reply coupons as a gesture of appreciation. Don't forget to answer us when you hear us!"

"Just what is Ramas?" inquired Willy.

The man beamed broadly. "Why, Ramas means Radio Amateur Mutual Admiration Society. The membership is limited to 250 hams. To become a member, two other hams in our group must vouch for you and you must be good at working DX. So good, in fact, that we want to get you in the group and wangle your trade secrets. Heh, heh!"

"Next!" said Helen with a touch of severity in her voice.

The third fellow, a bit on the middle-aged side, handed Helen a pile of self-addressed, stamped envelopes and a long list of call letters. He said he was a private QSL bureau for more than 500 hams. Willy asked him how he got into that and the man replied sadly: "Well, one morning I came up out of the cellar to tell my wife that I had worked my 210th country and I



found she had gone. She had left a note in the milk bottle telling me that the milkman had more to offer — and she saw more of him. So here I am without wife or kids. I'm trying to make it up by filling out other guys' cards. I'm so busy doing that that I have no time to work any DX myself. Anyway, it helps me forget."

Helen smiled sadly and shoved him gently along. "Next!"

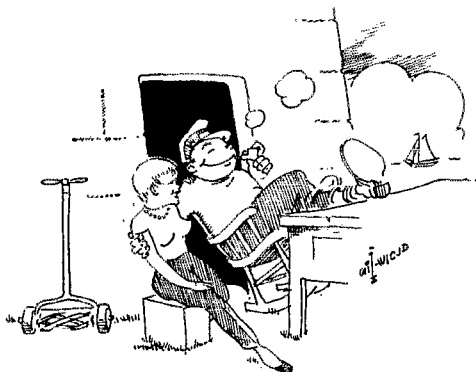
The entourage continued to file past, leaving gifts and pleading for special attention . . . the Quincy, Illinois, QRP Society; the Teaneck Transistor DX Association, Worked All Walla Walla Society. Finally, Willy fell sound asleep. Helen accepted the gifts and sent the representatives on their way. Then turning out the light and tucking a blanket around Willy, she went off to the inn to get the sleep she knew she would need to face the morning's onslaught.

The next few weeks were a mad rush of activity. Harrington had prepared an ironclad schedule: 28 Mc. e.w. 1400-1500 GMT; s.s.b. 1500-1600 GMT; 21 Mc. e.w. 1600-1700 GMT . . . and so on through the day, leaving 0100 to 0200 for the Driftwood Net. Pressure built up and Willy extended his DX efforts to eight and then ten hours a day as he tried to answer the eager CQs. He was grateful to the hams for keeping their word and staying off his net sked — his only happy time these days. Helen's typewriter pounded early and late and reams of QSLs poured in and out of the lighthouse. The first one to quit was the postman. Then the postmaster began begging for funds to build a wing on the post office. Helen took pity on poor Willy, who stuck doggedly to his schedules with red-rimmed eyes and calloused fingers. She began cooking first dinner, then lunch and finally three meals a day.

Three months went by with 75,000 QSOs and it seemed that only a small dent had been made in the massive pile-ups. Sam Zhukov's Zero Beat Peeler was a Godsend, helping Willy day after day to untangle what sounded like the cries of a thousand wounded elephants.

Then, one night, it happened.

One lone man busted in on the Driftwood Net, pleading: "Please, just an RST! I've been calling you eight hours straight for three months!" This keyed off six other plaintive "me toos." In 60 seconds, the frequency was loaded with calls. Willy just shut down. He sighed, turned to Helen and said: "I sure hope that won't happen again." Helen just smiled enigmatically.



The next night, things went peacefully for about ten minutes and then it started again. Two more nights and Willy gave up in disgust. He announced he was going off the air for good.

A week went by. Willy tended to badly needed chores about the lighthouse and his transmitter stood cold and dead. Then a car screeched to a stop in front of the house and heavy footsteps pounded up to the door. Willy answered the doorbell's angry peal. It was Harrington, grim and cold. He stared around the room. "Where is all of our gear!" he exploded.

"Gave it to the new novice over at Clay Head," said Willy quietly.

"Why? In Heaven's name, why?" cried Harrington.

"The boys broke the rules. You know that, Harrington."

"Oh, well, they must have their fun, Willy. Where's your sense of humor?" said Harrington, turning on his golden note.

"I gave it away with the gear," snapped Willy. "Why not go over and meet the Novice. He's a nice chap and I think he should be able to copy the code in about six months."

Harrington's brow darkened. "Are you really leaving ham radio, Willy?"

"Yeah," sighed Willy. "I can't stand the honor of being a new country."

Harrington was a realist. "Well, Willy," he said, "Thanks for your nice try. Where is my secretary? I need her for Sea Island, Georgia. That's going to be our next new country."

"Sorry, OB," chortled Willy. "Helen's retired. She and I got married last Tuesday. Boy, can she cook! . . . Hey, honey! Come out and say bye-bye to Mr. Harrington!"

So, you see, that's why Willy's gone off the air. Yeah, it is quite a story, isn't it? Kind of makes you think. By the way, have you snagged Sea Island yet? The boys say he's been silent down there for the last week.

QST

The WARC Automatic Club Programmer

In Which Everyone Brings a Handful of QSL Cards to the Meeting

BY W. J. PACE,* W1ILV

AS ANY Activities Manager or Program Chairman of the average amateur radio club will fervently aver, coming up with an interesting program for the edification of the membership, meeting after meeting, can be a rough, time-consuming and in many cases, frustrating job.

After all, he can get only so many speakers and show only so many movies before the numerical as well as interest limit is reached, and the worthy gentleman-in-charge finds himself facing a blank wall in the search for program material.

Such has been the case of the writer. Many times he has mentally compared the program-thirsty membership of the Waterbury Amateur Radio Club to the insatiable appetite of the picture-hungry TV audiences and deeply sympathized with the poor harassed soul charged with feeding that bottomless maw.

However, this can now all be changed with the institution of the WARC Automatic Program Plan. It will definitely *not* ease the TV producer's headaches, but will go a long way to accomplish

the following:

Increase Meeting Attendance.

This is the biggest bug-a-boo. Many a chairman has found himself in the position of having an evening's entertainment all worked out, only to be greeted on meeting night by a poor turnout of members. This is especially embarrassing when he has a speaker on the agenda whom he has cajoled into coming because of the intense interest every member has in his particular subject.

Encourage on-the-air Activity.

It may be surprising to many but this must be done. Is this not the basic reasoning behind the many awards, contests, etc. that are with us all the time? We all know and will recognize the member who talks a terrific operating job, who raves on about his gear and DX QSL ad infinitum, but who we just never hear because we are always on at the wrong time. This guy needs jogging to light the filaments and the WARC Plan will do it.

* Upland Road, Middlebury, Connecticut

Promote and Encourage QSL Exchange.

This one hits home. The writer is noted for his Scotch proclivities with regard to QSL's and his cards are sought after like ZC4s. Piteous pleas from WAS-seeking stations fall on hardened and phone-calloused ears. The WARC Plan is guaranteed to persuade such hard-hearted skinflints to loosen up.

Swell the Club Treasury.

No, this is not the catch you have been waiting for. As will be shown, the process is so painless that all you lads who gird for a fight whenever the word treasury is mentioned won't even breathe heavy when you find out how easy it can be.

Enrich Some Lucky Member with a Valuable Piece of Gear at Laughable Cost.

This we all like.

Enfold Any or All-Band Phone or C.W. Operator, Novice or Hoary Old-Timer, Into One Equi-odded Continuous Self-Sustaining Membership-Participation Program.

Sounds impossible! But the WARC Plan can do it!

Ease the Load of the Program Chairman.

This is important, even if only to the chairman. When all other attempts at programming fail, he can very comfortably rely on *the plan* to fill a large hole in every meeting.

Last But By No Means Least, Accomplish all of the Above at Absolutely no Cost to the Club.

You program men interested? Read on . . .

To best describe the plan, it seems only necessary to spell out the Rules and Regulations, as originally drafted by the author, for use of the Waterbury Amateur Radio Club. They are self-explanatory, and can easily be tailored to suit club requirements. It is now being instituted at this club and, so far, has generated a great deal of enthusiasm.

The only equipment needed can be easily obtained. This consists of a plywood disk about 2 feet in diameter and about $\frac{1}{2}$ -inch thick. This must be fitted with a central axle about which it can spin freely, after the manner of the old carnival wheels, but without the control mechanism with which these could be precisely stopped! We leave the details of construction to the user. It can be simple or ornate. The important detail is in the marking.

Four concentric circles must be painted on the face of this disk and each circle must be divided into equal segments. The segments of the outer circle will be marked with the numbers 3-4-5 alternately around the circumference, being certain that each is repeated an equal number of times. The segments of the second circle will

be marked with the numbers 5-6-7-8-9, and observing the same precaution. The third circle will be marked with the numbers 7-8-9-0, in similar fashion. The last or innermost ring will be marked with the names of the fifty states.

If we haven't completely confounded you by now, you probably are already beginning to get the drift. Anyway, here are the simple rules.

1. A definite starting date must be set.
2. To participate, each entrant must pay an entrance fee of fifty cents and ten cents each time he participates. Participation is *not* compulsory.
3. The wheel is spun the first time and the number of the outer circle on which it stops is read. This is compared with the first number of the RST report on a QSL card.
4. The wheel is spun the second time and a reading is made from the second circle. This is compared with the signal strength report on the card.
5. The wheel is spun again. A reading is made on the third circle and this is checked against the tone reading on the card. In the case of phone operation, the number must be 0 on this spin.
6. QSL cards used must bear dates after the starting date decided upon.
7. Entrant must be present to participate.
8. Cards will be cumulative. Thus the more active member gets more cards, and thus more chances to win.
9. If a member comes forward after the drawing with a QSL bearing the correct RST-state combination, he is awarded the prize. In case of duplicate winners, the card bearing the earliest time of QSO is the winner.
10. If no winner is found, the drawings will continue on following meeting nights.
11. If no winner is found after the third month, an additional prize is added of equal value to the original, and this process is continued until a winner is found.
12. When an award is made, a new entry fee is paid and the whole process is repeated.
13. A minimum of five members must participate in each weekly drawing or "no contest" is declared.
14. All cards must be a verification of actual contact by the bearer.

These then are the rules of the WARC Automatic Program Plan, and although they may seem quite complex at first glance, they really are quite simple after examination.

I feel quite certain that the plan will accomplish all the seemingly wild claims we have made for its institution, and I would be most happy to correspond with any club chairman who would like to exchange further ideas or variations of the plan. QST

EDITOR'S NOTE: It might be easier to put the names of the states in the outside circle, as the greater diameter will provide more writing area.

While we're at it, make sure that you check to see whether any local ordinance prohibits such a raffle.

● Technical Correspondence

SATELLITE NOTES

207 Addax Drive
San Antonio 1, Texas

Technical Editor, *QST*:

Here are some notes on the solar-powered satellites. At the present time, there are three earth satellites which are transmitting continuously. These are Vanguard I, Sputnik III and Explorer VI. They transmit continuously because they use solar energy for power, either directly to the transmitter or to charge chemical batteries. As a result, their signals will be around for many years enabling studies to be made on radio propagation, solar radiation and the Van Allen belts, geodetic data, solar converters and many others.

VANGUARD I—This is the first of the solar-powered satellites. It was launched by the U. S. on 17 March 1958. It transmits continuously on 108.025 Mc. only when in sunlight. During some months of the year, it is in sunlight 100% of the time and never less than 70% of its orbit period. Due to the Doppler shift, its frequency can vary as much as 6 kc., from 108.028 Mc. down to 103.022 Mc. as it moves by a receiving location. Its estimated lifetime is now given as 200-1,000 years.

Power for the transistor transmitter is obtained directly from 18 solar cells located in six windows displaced about the 6.4-inch sphere which supply voltage to the emitter and collector. Since the solar cells do not receive uniform sunlight as the satellite spins in orbit, the output voltage of the cells varies. This change in voltage causes the five-milliwatt transmitter signal to chirp about two to three kc. in a matter of seconds as it tumbles through space. There is also a slight bit of amplitude modulation as power output varies with the chirp rate. This transmitter feeds a short dipole (gain three db. below isotropic) so that the signal amplitude also varies slightly as the antenna pattern spins through space. The Vanguard I signal is indeed distinctive and easy to identify.

Because it does not dip very far into the earth's atmosphere at perigee, its lowest point in orbit (405 statute miles), it does not lose much of its energy on each revolution about the earth. As a result, its period is extremely accurate. The Army Map Service has been timing its appearance over islands in the Pacific and has located the positions of the islands to within several hundred feet. Prior to this, their position was not known to within miles. It is no doubt the most perfect satellite orbit established to date.

Vanguard I will transmit indefinitely, until its solar-cell windows cloud over due to micrometeoritic impact, its transistor transmitter is affected by radiation, or it suffers a direct hit by a meteor (rather remote).

Most satellite transmitters on 108 Mc. are very low powered, usually in the milliwatt region. Therefore, it is extremely important to know your receiver frequency to within several kc. The writer uses a Tapetone TC-108 crystal-controlled converter which feeds an SX-28 h.f. receiver. Frequency can be read to within 1 kc. after the equipment has been on for several hours. This is made possible by calibrating the 14-Mc. bandspread dial of the SX-28 using a local VOR aircraft navigation station on 108.400 Mc. The local oscillator of the converter is on 122.400 Mc. The difference of the two is 14.000 Mc. Going back up to 14.400 Mc. on the bandspread dial places the receiver at 108.000 Mc.

VOR stations are convenient to use as they operate continuously and there are many of them throughout the country from 108 to 118 Mc., with assignments every 0.1 Mc.

The most important requirements for receiving weak satellite signals are crystal control, low-noise front ends and frequency resolution. Antenna gain appears secondary; but if it is available, increased signal-to-noise data may be obtained. The writer has received Vanguard I on a six-meter Yagi, 15-meter Yagi, corner reflector and f.m.-band Yagi. The six-meter beam has done much better than expected, receiving signals at apogee, 2500 miles out, and as long as 15 minutes. Signals have been received on five consecutive passes covering more than 180 degrees of equator crossings.

A five-element 108 Mc. Yagi performs best of all.

There is also the possibility of an antipodal (ghost signal) reception of Vanguard I which occurred between the two near passes. In this instance, the signal was heard for several minutes when the satellite was on the opposite side of the earth. The signal rose about 3 kc. in frequency, indicating that first the signal path was away from the receiver and then toward the receiver. This caused the signal to Doppler shift up in frequency instead of down as in the case on near passes. A 108 Mc. ghost signal has been reported from Norway and an over-the-horizon signal with changing azimuths with reciprocal bearings has been reported by the Signal Corps.

SPUTNIK III—Launched by the USSR on 15 May 1958, Sputnik III is still transmitting on 20.005 Mc., with a weak harmonic on 40.01 Mc. Its transmitter is not running the one-watt output as did Sputniks I and II, but it still puts out a very good signal for 5 to 15 minutes during a pass.

In a recent Russian Translations article in *Electronic Design* (2 September 1959), data on the operation of the transmitter power supply was given. When the transmitter is operating off solar batteries, the telegraphic dit-dah lengths are 150 milliseconds (ms.), followed by a 300 ms. pulse. When the transmitter is operating off electro-chemical batteries, the dit is 50 ms. and the dah is 300 ms. long. The switching of power sources is automatic. When the chemical batteries are no longer able to supply power (or cycle), the transmitter will operate only when the solar batteries are in sunlight.

The signal of Sputnik III varies in amplitude at a seconds rate, apparently due to antenna pattern change as it spins through space. A second transmitter reported to be aboard has never been used as the present one has served well.

Originally, the signal sent out was an "L" but later settled down the present "A".

Because of its long enduring signal at 20 Mc., Sputnik III has been used to investigate many unusual propagation effects. Probably the most important are the ghost signals first reported by H. W. Wells, and the ionic cone, or sheath, as reported by John Kraus, W8JK. Both effects have been reported in great detail in the *Proceedings of the IRE*.

Sputnik III is due to re-enter the earth's atmosphere and fall to earth in December, 1959. Amateurs throughout the world can do well to listen to the 20 Mc. signal and tape record the passes as it goes to its fiery death. The cessation of its signal will have the same meaning as that of Lunik II when it hit the moon on 13 September 1959. It's not often we can be aboard a heavenly body when it meets its end.

EXPLORER VI—Placed in orbit on 7 August 1959 by the U. S., the Paddlewheel satellite transmits on 108.06 and 108.09 Mc. It uses solar cells and chemical batteries for power and is expected to operate for one year. After this, it will cease transmitting so that the frequencies can be used for other satellites or space probes.

At perigee, its height is only 157 miles. At this time, its velocity is 22,000 m.p.h. and total Doppler shift can be 7 kc. It has been heard to have this shift in just seven minutes when its height was 170 miles above San Antonio, Texas.

When it is at apogee, its highest point in orbit, it is 26,400 miles above the earth. It then does only 3100 m.p.h. in orbit and actually appears to be stationary and then backs up as observed from the earth. This is because most of its velocity is radially away from the earth rather than around or parallel to the earth.

When at apogee, its signal is 44 db. weaker than when in close. That's when a dipole just won't cut the DX! But its signal has been heard when the satellite was on a north-to-south crossing 5,000 miles above Texas, using a Tapetone converter and 6-meter Yagi. At this same time, Leon Alatheny, ex-CX1BB, ex-DL4ABF, also of San Antonio, heard the signal using an f.m.-band Yagi into a Grundig f.m. receiver. And that's with 200 kc. bandwidth. A BC-221 frequency meter is used to inject a beat signal.

The 170 r.p.m. of the Paddlewheel satellite can easily be heard on its signal as the antenna pattern spins through space. The signal on 108.06 Mc. appears to be slightly stronger than the one on 108.09 Mc.

Explorer VI is not a time-consuming satellite to track.

Because of its 12 hour 45 minute period, it makes only one good pass per day in about four consecutive days. Real good passes are about eight days apart and that is certainly more relaxing than those of the Sputniks which have come every 100 minutes!

— Calvin R. Graf, W5LFM

WHAT WAS IT?

West Baden College
West Baden Springs
Indiana

Technical Editor, *QST*:

On Sunday, September 13, we had some tasks to perform in the shack, and just out of curiosity thought we'd see if we could pick up the signals from Lunik I. Tuning to 20.05 Mc., where we had previously monitored several of the Sputnik signals, we detected a fairly weak but steady signal. It was about R3, S6, T6; not the strong "beep . . . beep" note which we had expected, but as if the signal were showing some trace of what we call "Arctic flutter" and with a very hollow musical ring, like an amplifier approaching the feedback point. Closest phonetic approximation we might make would be "h---eemg, b---eemg, b---eemg" with the dashes showing just a slight trace of syncopation or flutter in the "beep." This signal held steady at a constant, though rough, count of 24 beats to a minute. We listened to it, on and off, through most of the afternoon. When we heard on radio that the Lunik was due to hit the moon around 4:00 CDT, we were on hand and monitoring this same signal. The signal faltered, then stopped at 4:02 CDT in our shack. We thought we had heard the moon shot.

But in *Time* magazine (Vol. LXXIV, No. 12, Sept. 21, 1959, p. 72) we read:

"Signals were received briefly in San Francisco and Japan, then faded out as moon and Lunik disappeared behind the earth. . . .

"The world waited; U.S. radio receivers were on the wrong side of the earth, but at Jodrell Bank the beeping continued while the moon climbed higher . . . they stopped at 5:02:24 EDT." . . .

So we are now wondering what we heard that afternoon on 20.05 Mc., and why it should stop at 4:02 CDT. We have listened since, but not heard that signal. It was not RTTY, but a definite, steady (if weak) signal with constant beat. Could it have been the moon shot? Did any other hams also hear this shot, or at least this signal?

— D. L. Flaherty, K9LJY
Trustee of Club, W9EBB

ELECTRONIC KEYSER CLICKS

230 Orange St.
Duncanville, Texas

Technical Editor, *QST*:

I would like to call your attention to some findings regarding the circuit of the "All Electronic Key and Keyer" published in October 1958 *QST*. I have worked a great many hams that have built this circuit and it does a nice job, but there is one thing which I believe should be brought to the attention of users. I used the keyer for several weeks myself before making a detailed check on the waveform, and when I did I found that there was one discrepancy which could be a possible cause of unknown or undetected trouble, in the form of clicks or TVI, for some users. I observed some clicks on my own transmitter when I first used the circuit, and have observed some clicks on others using it, although not severe.

The waveform at the grid of the keyer tube, observed with a Tektronix scope using a very fast triggered horizontal sweep, shows a positive spike of very short duration very close to the leading edge of each character. This spike is of the same amplitude as a dot or dash, and is so close to the main character that it probably would go unnoticed if observed on a regular scope unless the waveform is spread out enough to observe only the first part of the character. Unless this spike is filtered out in the keying system of the transmitter it could cause various undesired effects.

Referring to the original circuit on page 28 of October 1958 *QST*, analysis reveals that the spike originates in the inductance L_1 of the blocking oscillator. When the blocking oscillator V_{1A} fires, a positive sawtooth voltage is applied to the grid of V_{2A} , which should initiate the leading edge of the character. The 0.25- μ f. capacitor becomes charged suddenly and bleeds off slowly. However, as the blocking oscillator

goes through saturation and into sharp cutoff a very sharp negative pulse appears because of the collapsing field in L_1 . This pulse is superimposed on the sawtooth input to V_{2A} , driving the tube back into cutoff a few microseconds after the initial firing. The superimposed negative pulse only lasts a few microseconds, after which the charge on the 0.25- μ f. capacitor returns V_{2A} to conduction for the duration of the character. But the negative excursion of the blocking oscillator pulse has notched out the leading edge of the character, and can similarly notch out the leading edge of the dot or dash on the air unless it is filtered out (Fig. 1).

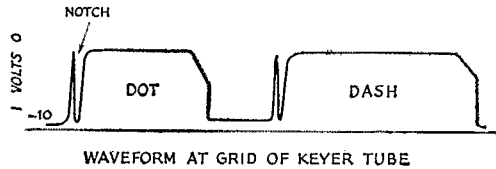


Fig. 1

I was unable to find an effective method of eliminating the notch in the waveform at the source without upsetting the operation of the circuit, but found the circuit of Fig. 2 effective in filtering out the notch while adding a pleasing amount of shape to the characters. I am using a 6BX7 or 6BL7 keyer tube instead of a 6AS7 and do not need the full amount of negative voltage developed at the plate of V_{1B} to keep the transmitter blocked off. Using a voltage-divider arrangement as shown develops enough negative voltage to keep the transmitter blocked off and allows the trailing edge to be shaped in addition to filtering out the notch. I used a switch and three capacitors in order to select a pleasing amount of shaping. The voltage divider from the plate of V_{1B} to ground would have to be determined experimentally for different keying requirements.

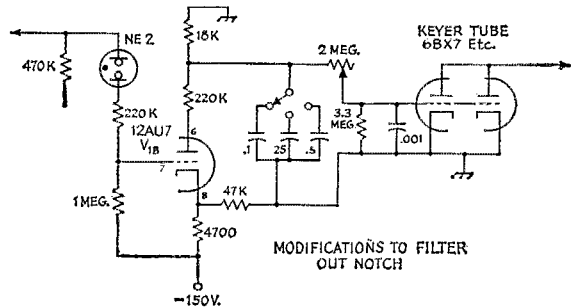


Fig. 2

Users who do not have a scope available may find it interesting to listen carefully to the leading edges of the characters, as the notch does exist. Possibly it is being filtered out in many of the keying systems using the circuit, but possibly in some it is not.

— Earl B. Huff, W5HTB

MECHANICAL FILTER FOR THE TRANSISTOR COMMUNICATIONS RECEIVER

192 Mills St.
Morristown, N. J.

Technical Editor, *QST*:

Mr. C. F. Zilm of the Sales Department of Collins Radio Company, Burbank, California, has informed me that the F45A-3 filter which I used in the transistor receiver described in February *QST* is obsolete and no longer available. However, an improved model to take its place is the F455F-31. When this substitution is made the 0.01- μ f. capacitor between transistor Q_8 and the filter should be changed to approximately 115 μ f., and adjusted for maximum filter output. Also, a 115- μ f. capacitor should be placed in series with the "hot" side of the input to the filter and this, too,

(Continued on page 206)



CONDUCTED BY EDWARD P. TILTON,* W1HDQ

JUST twenty years ago this month regular coverage of activity on the amateur bands above 30 Mc. began in *QST*. The monthly department was called *On The Ultra Highs*, for all frequencies above 30 Mc. were "ultra high" then. The column was the work of your present correspondent, but it was done as a part-time proposition, handled in addition to a full-time job in the radio manufacturing field. Perhaps it would not be amiss if we took a quick look back over our shoulders, at this milestone, to see how far we all have come.

In 1939 we were recovering from the enforced stabilization of amateur transmitters used in the old 56-Mc. band. There had been increasing chaos up to the end of 1938, due to widespread use of modulated-oscillator transmitters. Their fuzzy wandering signals precluded the employment of selective receivers of any kind. Worse, they often drifted outside the prescribed band limits, then 56 to 60 Mc. It had been common knowledge that the "band" extended from about 54 to 62 Mc. in some areas. This was not so bad in earlier times, but now commercial services were beginning to move into the "u.h.f." region, and out-of-band operation could no longer be tolerated. Effective Dec. 1, 1938, amateur transmitters on 56 Mc. were required by FCC to conform to the same regulations as those on lower bands.

This made quite a hole in 5-meter activity for a while, but it also made practical our first real improvements in receiving techniques. Freed forever from the need for broad frequency response in our receivers, we soon went to superhets and high selectivity as standard practice in 5-meter work. There were not so many stations on 5 in 1939, but those that were on made rapid strides in extension of the reliable working range. 1939 is thus remembered as the year that hamming on frequencies above 30 Mc. began to come of age.

In our first *QST* column we recognized the remarkable achievement of W9ZJB, Cashland, Mo., in working all 9 call areas on 56 Mc. A tropospheric contact over 400 miles by W8CIR, Aliquippa, Pa., was recognized as the record for this kind of propagation. There were unconfirmed reports of reception of South African 56-Mc. signals by American amateurs. Sporadic-E skip was common, and the continent had been spanned on 56 Mc. by W1EYM and W6DNS, in 1937.

The 2½-meter band (it was 112 to 118 Mc. in 1939) was jumping with new activity in the larger cities. This was mostly of the modulated-

* V. H. F. Editor, *QST*.

50 Mc. WAS

1 W6ZJB	19 W30JU	38 W7ILL	57 W1SUZ
2 W6BJV	22 W6TMI*	39 W6DDX	58 W1AEP*
3 W6CJS	21 K6EDX	40 W6DO	59 W5LFH
4 W5AJG	22 W6SFW*	41 W6DX	60 W6NLZ
5 W9ZHL	23 W6ORE	42 W6ABN	61 W7MAH
6 W9CGA	24 W8ALU	43 W6BAZ	62 W8ESZ
7 W6OB	25 W6CMS*	44 VE3ACT	63 W2BYM
8 W6INI	26 W6MVG	45 W6JFP	64 W7ACD
9 W1HDQ	27 W6GNM	46 W6QIN	65 K6PYH*
10 W5MJD	28 W1VNH	47 W6WVN	66 W4HOB
11 W2IDZ	29 W9OLY	48 K8ETD	67 K9JJA
12 W1LLL	30 W7HEA	49 W6FKY	68 K6RNO*
13 W6DZM	31 K6GOG	50 W8LPD	69 W9DWT*
14 W8HWV	32 W7FFE	51 W6ZTW	70 W6EDC*
15 W6WKB	33 W6PFP	52 W6GGG	71 K6VLM*
16 W6SMJ	34 W6BJI*	53 W2RGV	72 K6GOX*
17 W6OGW	35 W2MEU	54 W1DEI	73 W6EDM
18 W7ERA	36 W1CLS	55 W1HOY	74 W9JCI*
	37 W6PUZ	56 W6ANN	75 W6LLU

* 49 states

VE7CN	45	VE4HS	41	LU9MA	26	LA7Y	20
KL7AUV	44	SM6ANR	30	ZS3G	26	VQ2PL	18
VE1EF	42	SM7ZN	29	CT1CO	24	JASAO	18
XE1GE	39	PZ1AE	28	CO6WW	21	JASBU	17
VE2AOM	38	SM6BTT	28	LA9T	21	JAI1AAT	17
KH6UK	37	CO2ZX	27	LU3DCA	20	JAI1AUH	16
EI2W	37	ZE2JV	26	SM5CHH	20	VP5FP	7

oscillator type, the boom having resulted from the banning of unstable gear from the 56-Mc. band a year earlier. Receiving-tube oscillator rigs, superregenerative receivers and simple dipole antennas were the order of the day, though we had a note on the crystal-controlled doublers then in use at W1HDF and W1HDQ. The DX record was 150 miles, the achievement of W9WYX/9 atop Pikes Peak, and W9VTK/7, near Cheyenne, Wyoming.

WIKH, Weston, Mass., later to become third president of ARRI, reported extensive 1¼-meter experimentation in the Boston area. A distance of 18 miles was being covered regularly on schedule. The band was 224 to 230 Mc. Frequencies above 300 Mc. were labeled "experimental." They were open to anyone, just as frequencies above 30,000 Mc. are today! We had no way of knowing precisely, but it is likely that not more than 1000 amateurs in the country were interested in the hands from 56 Mc. up.

Those were great days, to be sure. Much had been done, but our horizons were expanding rapidly. Particularly in connection with little-understood and even then unknown forms of long-distance propagation, v.h.f. men were making real contributions. It has been the good fortune of this writer to have been able to write many of these into the amateur record, through the pages of *QST*.

Amateurs were the first to use the aurora as a reflecting medium for long-distance v.h.f. communication. It was from amateur work in this field that much of the early knowledge of the aurora was derived. Following World War II we

were to turn up all manner of interesting facts about the world-wide potential of the 50-Mc. band at the peaks of solar cycles. Until hams first worked on 50 Mc. via the F_2 layer in 1946, nobody thought that the maximum usable frequency for the F_2 layer would go that high.

Our work over long paths in the middle '40s was of real value in many ways. Perhaps the most spectacular was the discovery of what is now called *TE* propagation — the mode by which transequatorial communication is done on 50 Mc. at times of the day and night when it was not thought possible on the basis of existing theories.

Amateur work in the meteor-burst field was instrumental in pointing out that frequencies higher than those normally reflected by the ionosphere could be used for long-distance communication, by reflection from meteor trails — a mode now being intensively investigated for military and other purposes.

Amateur radio stock rose markedly in the world of science with the announcement of the success of KH6UK and W6NLZ in working from California to Hawaii on 144 Mc. in 1957 and on 220 Mc. in 1959. Our contribution to the world-wide effort in the International Geophysical Year has brought and is bringing words of appreciation from people in many high places. And all the while v.h.f. occupancy has been growing by leaps and bounds. The number of amateurs has just about tripled in the postwar era, but the occupancy of the world above 50 Mc. has probably increased by a factor of 10.

This has been a good thing for everyone in the game, for if we are to continue growing at current rates, the new activity will have to be channeled into some part of the spectrum other than the frequencies between 3.5 and 29.7 Mc. There is still room for everyone in the bands above 50 Mc., and who can say what new developments await the hardy pioneers who will populate the bands now open to us, particularly those above 1000 Mc.?

If, in 1979, we can say that the occupants of the world above 50 Mc. have done as well in the second 20 years as they have in the first 20 of this department's existence, the cause of amateur radio as a whole will have been well served.

50-Mc. DX Prospects

Such is the nature of the current solar cycle that some 50-Mc. men who now qualify as veterans cannot remember a year when no world-wide DX was worked on 6. Cycle 19 (we have sunspot records back to 1750) has far eclipsed anything in previous human experience, and it still has plenty of life left.

K6KDU at the camera of his 440-Mc. TV setup, operating at a fair in Auburn, Cal. Seated at the control console is K6ARR. K6KDU is equipped with three cameras. Running the maximum permissible power at his home station in Auburn, Buz has been seen by W6OJB, Orangevale, K6GPB, Auburn, W6MYL, Camino, and several stations in the Bay area.

Operation SHOTPUT Provides V.V.F. Reflector

The first successful firing in the Operation *Shotput* series, Oct. 28, demonstrated something of the potential of these metallized balloons for reflecting v.h.f. signals. This was the first test of what will eventually be an orbiting satellite, capable of reflecting v.h.f. and u.h.f. signals over very long paths. As such it was of more than ordinary interest to v.h.f. men.

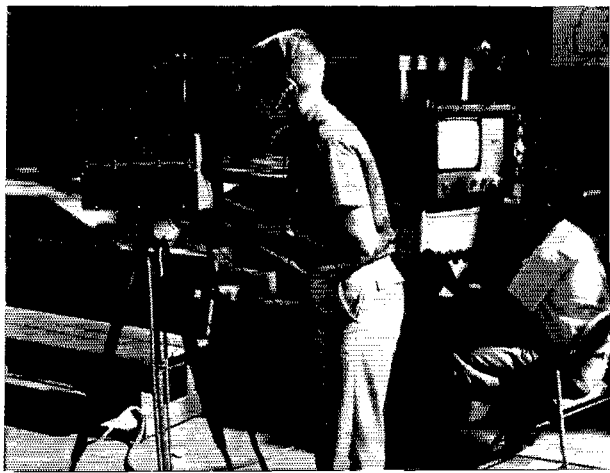
Word of the anticipated firing from Walloups Island at 1740 EST spread rapidly, and alert v.h.f. enthusiasts the length of the Atlantic Seaboard were ready for it. W4RMU, Jacksonville, Fla., W4FJ and K4EUS of the Richmond, Va., area, W4LTU, Springfield, Va., and W2CXY, Chatham, N. J., made 15-second transmissions in sequence, aiming at the anticipated trajectory of the 100-foot sphere. Nothing was heard by or from W4RMU, but all the others achieved positive results. Signals of various characteristics were reported. W4LTU heard W2CXY on some, but not all, of his transmissions, and at times noted something approximating auroral distortion on the signal. W3GKP recorded the entire test, including interesting doppler effects. K2LMD, Ithaca, N. Y., was able to copy W2CXY. Tests on 50 Mc. by W3OJU, Washington, D. C., and K2RRG, Upper Saddle River, N. J., were negative.

Three more rocket shots of this type are planned, before an attempt is made to put a balloon into orbit early in March. These will put balloons into the F_2 region of the ionosphere in a northeast trajectory, starting about 250 miles out over the Atlantic from the firing point, about 40 miles north of Norfolk, Va. Shots are planned for the last week of November, the first week of January, and the first week of February. Precise data on firing times, if available in time, will be put out on W1AW.

Cycle 18 was rated tops, but it provided only one good season of transatlantic 50-Mc. DX, the fall of 1947. The North Atlantic path was open just one day in 1946, the historic Nov. 24, when the first 50-Mc. work was done with Europe. In 1947 the band opened to Europe first on Oct. 25, and it was open frequently through November. There was no late-winter recurrence, however, and there was no transatlantic DX in 1948.

Contrast this record with Cycle 19. Our first transatlantic DX of this cycle was worked in November, 1956. It held into December, longer than the peak year, 1947. In 1957 — 8, 50-Mc. openings across the Atlantic were daily occurrences from Oct. 20 to the middle of February. It was almost as good in 1958-9. The m.u.f. hit all-time peaks of over 70 Mc. in November, 1958, though the season did not last quite as long as the previous year.

How about 1959-60? The first stirrings of fall DX are being observed as we write. European TV signals near the band edge, reliable indicators of DX possibilities, were heard first on Oct. 15. Indications point to at least marginal openings to Europe, probably peaking about the time this reaches the reader's hands in the latter part of November. The m.u.f. on most high-latitude paths is expected to be



well down from a year ago, but north-south DX may actually be better than before.

The QST record shows that 50-Mc. DX was worked between this country and South America as late as 1951, 4 years after the cycle peak. The spring and fall periods of 1949 and '50 provided many good sessions. It is well known that m.u.f. peaks on north-south paths follow immediately on the heels of ionospheric disturbances, and it is currently held that auroral effects tend to lag the solar activity peak by a year or two. Thus we anticipate good north-south openings through this winter and possibly the next.

South American stations were worked this year from Southern Florida as early as Sept. 24 (see OES Notes). On Sept. 27, HC1JW and HC1FS, Quito, Ecuador, were heard in the Memphis area between 1315 and 1345 CST, according to K4PZJ, who reports that they were working 6s and 8s at the time. K5GPR, Pharr, Texas, worked them both at 1912 CST. W6WUZ, Pasadena, heard LU9MA and LU3EX Sept. 19, and worked them on the 26th. LU4HG LU7MAO and JY7BS were heard, all after 1900 PST, which looks like TE scatter. W3OJU reports that Argentina and Ecuador were heard in the Washington area Oct. 4, and Ecuador on Oct. 14. HC1JW and HC1FS worked into W1, 2 and 3 with surprising strength and duration Oct. 18.

A point worth noting is that these were all afternoon or evening openings, whereas in the past South American DX has been a morning phenomenon, except in the southern areas of the country. Most observers agree that the HC's appeared in the Northeast around 1400 EST on the 18th, remaining in for about an hour. There had been commercial signals from the south, just outside the band edge, and some signs of back-scatter on ham-band signals during the morning, but many DX-hounds (including your conductor) had given up when no amateur DX appeared by noon.

Late report: K6RNQ, Oakland, and KGGOX, Fresno, worked KH6s Oct. 25 for their 50th 50-Mc. state. K6RNQ already has 49-state WAS, so his is probably the first 50-50 WAS. This is also the first East-West F₂ of the fall season.

Here and There

Idaho will be on the v.h.f. map if these fellows have anything to say about it. We mentioned W6KUH/7, Idaho Falls, and his 50-Mc. intentions last month (November QST, p. 62), to which we add that Gordon is now K7JUK. His two principal operating frequencies are 50.115 and 50.38 Mc. Business on 144 Mc. can be handled by W7CJAI, who operates from 7150-foot elevation near Boise, the site of KBOI-TV. George finds that mountain locations are not all v.h.f. DX and skiing. There is the matter of keeping antennas up, for instance. The top of his mountain is littered with pieces of aluminum from past arrays that couldn't take his special conditions, including 90-m.p.h. winds. Presently he has stacked 14-element vertical Yagis—vertical because the array is stronger that way, and because most of his 144-Mc. work is with mobiles.

W7CJM has worked W7RLA/mobile as far away as Le-Grand and Burns, Ore., about 150 miles. His home-station DX includes W7AIB, Ogden, Utah, 270 miles, W7SSII, Kennewick, Wash., 235 miles, and W6WSQ via meteor scatter. George runs 500 watts input to a pair of HK-54s, and is planning to go to a full kilowatt soon. A horizontal array is also in the works. He welcomes DX schedules.

An answer to antenna polarization problems may lie in greater use of circular polarization. At least one company is now building beams for 50 and 144 Mc. with elements skewed to give circular polarization. Practically uniform response to vertical or horizontal polarization is claimed for these, and results thus far reported are interesting, to say the least. It is well known that there are very marked shifts in the polarization of waves transmitted over rough terrain. In such work the spiral array should be helpful.

W7MAH, Reno, Nev., and W6GDO, Sacramento, have found it so on their 110-mile mountain path. Their tests with vertical and horizontal arrays showed the latter to give more consistent results, though peak signals appeared to be higher with vertical. Then W6GDO put up a 20-element spiral array. A marked improvement was noted on his skeds with W7MAH, and the new array worked well with both vertical and horizontal stations. When W7MAH also put up a spiral array there was another gain, though he had been using a 30-foot Yagi 70 feet high before, and the new beam was only 30 feet above ground. Not only was there a marked improvement on the W7MAH-W6GDO circuit, and with other stations of either polarization, but both

2-METER STANDINGS

Figures are states, U.S. call areas, and mileage to most distant station worked

WIREZ	.. 32	8	1300	W5VY	.. 10	3	1200
WIAZK	.. 26	7	1205	W6SWV	.. 10	3	600
WIKCS	.. 24	7	1150	W5YYO	.. 5	3	1330
WIRFU	.. 23	7	1120				
WIAJR	.. 23	7	1130	W6WSQ	.. 14	5	1390
WIHDQ	.. 21	6	1020	W6NTZ	.. 12	5	2540
WIMIN	.. 20	6	900	W6DNG	.. 5	5	1040
WIIZY	.. 19	6	875	W8AJF	.. 5	8	800
KICRQ	.. 19	6	800	W6ZL	.. 5	3	1400
WIAFO	.. 17	6	920	W6MIU	.. 3	2	950
WIAFR	.. 17	6	675				
WICLH	.. 17	5	450	W7VMP	.. 15	5	1280
				W7JRG	.. 19	4	1040
W2NLY	.. 37	8	1390	W7CJAI	.. 5	2	670
W2CKY	.. 37	8	1360	W7LHL	.. 4	2	1050
W2ORL	.. 37	8	1320	W7JJP	.. 4	2	900
K2GQI	.. 32	8	1200	W7JU	.. 4	2	353
W2AZL	.. 29	8	1050				
W2BLV	.. 29	8	1020	W8KAY	.. 38	8	1020
K2IEJ	.. 25	7	1060	W8SDJ	.. 35	8	990
W2AMJ	.. 25	6	960	W8PT	.. 34	8	985
W2DWJ	.. 23	6	860	W8IFX	.. 34	8	980
K2HOD	.. 23	7	950	W8LOF	.. 33	8	1060
W2FAU	.. 23	6	753	W8RMI	.. 32	9	910
W2SLX	.. 20	6	940	W8RFX	.. 30	8	1080
K2CEH	.. 22	8	910	W8SPG	.. 40	8	1000
W2LWL	.. 21	6	700	W8CHW	.. 29	8	860
W2RXG	.. 20	6	700	W8LPD	.. 29	8	850
W2TTH	.. 19	7	880	W8WRN	.. 28	8	680
W2LVN	.. 19	6	720	W8RFX	.. 28	8	960
W2WZR	.. 18	7	1040	W8NOH	.. 26	8	970
W2ESK	.. 18	5	850	W8DX	.. 26	8	720
K2RLG	.. 17	6	980	W8LIC	.. 25	8	800
				W8JWV	.. 25	8	940
W8RDE	.. 30	8	975	K8XUJ	.. 24	8	960
W8DFN	.. 29	8	1050	W8GEM	.. 23	8	540
W8GPK	.. 28	8	1020	W8LCY	.. 23	8	610
W8KCA	.. 28	8	1110	W8BLN	.. 21	7	610
W8SGA	.. 26	7	700	W8GTK	.. 17	7	550
W8EPH	.. 22	8	1000	W8NRM	.. 17	7	550
W8BYF	.. 22	6	960				
W8MAA	.. 21	7	720	W9KLR	.. 41	9	1160
W8NKM	.. 20	7	700	W9WOK	.. 40	9	1130
W8LZD	.. 20	7	650	W9GAB	.. 34	9	1075
				W9AAG	.. 32	8	1050
W4HJO	.. 38	8	1150	W9REM	.. 31	8	850
W4EHK	.. 35	9	1280	W9ZIH	.. 30	8	830
W4ZXL	.. 34	8	950	W9LYC	.. 27	8	950
W4AO	.. 30	8	1120	W9BQC	.. 27	8	820
W4LTU	.. 29	8	1160	W9ZIL	.. 25	8	700
W4MKJ	.. 28	8	850	W9BPV	.. 25	7	1030
W4UMF	.. 28	8	1110	K9AQP	.. 24	7	900
W4FLA	.. 26	8	1070	W9BPV	.. 24	8	820
W4QGM	.. 25	8	1040	W9OHL	.. 24	8	850
W4VNH	.. 24	8	850	W9LFL	.. 22	7	825
K4BUS	.. 24	6	765	W9KPS	.. 22	7	690
W4JCV	.. 23	6	725	W9CUX	.. 21	7	800
W4VVE	.. 21	6	720	W9PMN	.. 19	6	800
W4TLV	.. 20	7	1000	W9ALU	.. 18	7	800
W4IKX	.. 20	6	720				
W4OLK	.. 20	6	720	W8SMJ	.. 29	9	1075
W4AIB	.. 19	7	840	W8HLD	.. 27	7	890
W4CPZ	.. 18	6	650	W8BFB	.. 27	8	1060
W4HFR	.. 18	7	820	W8QDH	.. 24	9	1300
W4LDA	.. 17	6	750	W8RUF	.. 23	7	900
K4YUX	.. 16	8	830	W8QNT	.. 21	6	830
W4RMU	.. 15	7	1080	W8UOP	.. 21	7	900
W4LNG	.. 15	6	1080	W8TCC	.. 21	7	875
				W8RYG	.. 20	8	925
W5RCI	.. 34	9	1215	W8IC	.. 16	7	1240
W5DFU	.. 25	9	1300	W8IFS	.. 16	6	110
W5AJG	.. 25	8	1360				
W5LPG	.. 25	7	1000	VE3DIR	.. 30	8	1330
W5KTD	.. 23	8	1200	VE3AIB	.. 27	8	1340
W5JWL	.. 21	7	1150	VE3BQN	.. 19	7	790
W5PZ	.. 16	8	1300	VE3DPR	.. 17	8	1340
W5VKH	.. 15	5	720	VE3AQI	.. 17	7	1300
W5ALL	.. 12	5	700	VE3HW	.. 15	7	1350
W5FSC	.. 12	5	1390	VE2AOK	.. 13	5	550
W5LEZ	.. 12	5	1250	VE3BFB	.. 14	6	715
W5FYZ	.. 12	3	735	VE7FJ	.. 2	1	365
W5CVW	.. 11	5	1180				
W5NDE	.. 11	5	625	KH6UK	.. 1	2	2540

stations are now able to work mobiles more effectively. Nevada was always a tough one for Easterners on 50 Mc. before the F₂ skip of the past few years. It may be rough again, as skip will likely be longer this year, but at least we know that there are stations on the band. One Nevada stalwart a year ago was K2YEB/7. John writes that he is staying in Reno, and will be on 6 regularly as K7ILB, with 200 watts and a 4-element array.

We don't want to take the edge off a story we hope to have soon on the work of KG1FN, but their results indicate that the far north is much more interesting for 50-Mc. work than might have been anticipated. Take the log of VE4TX, Winnipeg, for example. Cliff heard or worked KG1FN on Sept. 3, 5, 19, 20, 25, 26 and 27. The big surprise in this is the distance: about 2000 miles. There was evidence of aurora on Channel 2 on all these dates, and VE4TX finds this very

helpful in making contacts on 6, both by aurora and sporadic-E. A CQ on c.w. when he observed aurora on Channel 2 recently netted him a contact with VE6UV, Edmonton, Alta., the first time he has heard a VE6.

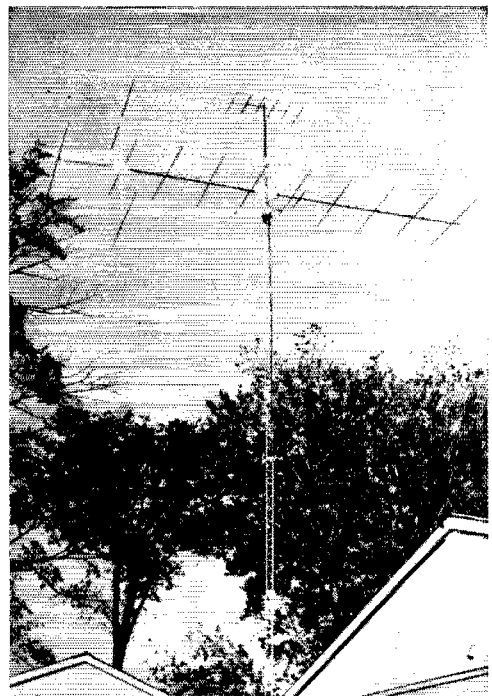
Some opportunities for work between the West Coast and Hawaii on the v.h.f. bands were lost during October, says W6NLZ. John has it from a Pan American Airways engineer that 128.1 Mc. has been open from San Francisco west as follows: on Oct. 12 to a point 250 miles west of the halfway point to Hawaii; Oct. 13 to about three-fourths of the distance first, and later to a point off the Island of Molokai; and on Oct. 15 to two aircraft near Oahu. The aircraft in question used 25-watt transmitters, and simple blade-type antennas!

The Dismal Draconids

Gathering negative data never moved an aspiring v.h.f. enthusiast up a single rung in the states-worked boxes, but it can be an important job in certain circumstances. This is about the only consolation we can offer those who kept all-night vigils on 50 and 144 Mc. the week end of Oct. 9-10. On Oct. 6 we received word from W4PML, author of the material in October QST, on the Draconids shower, that latest astronomical information indicated a deflection of the shower. Prospects were considered poor, but there would be much scientific interest in amateur observations, negative or otherwise. We put this information on W1AW at once, warning any who might be listening not to expect too much from the 1959 visit of the comet Giacobini-Zinner.

K6GOX, Fresno, summed it up by saying that he heard some bursts from the north and east, but he thought these were above normal only because there were so many stations running tests. W6NLZ, near Los Angeles, reported nothing unusual. W5ZLV, San Antonio, monitored both 50 and 144 Mc., in the company of a number of v.h.f. men of the area. No meteor-burst signals were heard on 144 Mc. W5ZLV made frequent checks of WWI, Havana, Ill., on 49.72 Mc. Weak bursts were first heard from this station at 2255 CST Oct. 9. They built up in number and strength until about 0225 on the 10th, when a recording of the signal was made. A second recording was made at 0125 on the 11th. The signal had never been heard before, and it was not received in checks at similar times on the 12th and 13th. Most of the bursts heard were extremely weak, with only a very few hitting high levels.

W3TDF, Langhorne, Pa., kept 144-Mc. skeds with W5PZ, Ponca City, Okla., 1700 to 1730 EST, and W5HYZ in Louisiana, 2330 to midnight, Oct. 9, with no results whatever. Ray heard isolated pings after midnight, during which time he called frequent c.w. CQs on 144 Mc. He worked W4HJQ, Glendale, Ky., but apparently without help from meteors. He also kept a receiver running on WWI, and observed a large increase in the 49.72-Mc. signal whenever there was a pin on 144 Mc. Only 2 pings and one very short



The 50-Mc. array at K2IXN, Rome, N. Y., boasts 10 elements in line on a 35-foot boom, with trigonal elements above and below the driven element. The boom is 2-inch irrigation tubing. Small beam above is a 6-element 2-meter job.

burst were heard from W5JWL while he was keeping a sked with K2IEJ.

Extensive skeds set up by W0IC, W4RAIU, WIREZ, and other experienced meteor-shower workers produced little or no results. Your conductor was in Syracuse for the V.H.F. Roundup. We arranged to check 6 and 2 at W2RHQ, where a receiver was kept on WWI from about 1930 until 0100 EST. The signal was barely audible at first, and it showed only typical ionospheric scatter qualities until around midnight. From then until the end of our monitoring the signal built up, as did the number of bursts. It was nothing like the way the 6-meter band sounded the night of Oct. 9, 1946, however. No DX signals were heard on 50 or 144 Mc., in much careful tuning. It has been our experience in the past that major meteor showers such as the Perseids and Geminids always produce quite a few random bursts on 50 Mc., often with signals strong enough to catch snatches of conversation on voice.

From the PRP Reports

Propagation Research Project logs from U. S. observers showed little 50-Mc. DX in September, other than a few scattered instances of aurora and sporadic-E skip, but elsewhere in the world things were shaping up well. ZF2JV, Salisbury, Southern Rhodesia, found the m.u.f. to the north to be 70 Mc. or higher Sept. 3, 5, 6, 7, 8, 9 and 12. Ray observed again what he has termed an "equinoctial dip" in m.u.f. after Sept. 12, and what appeared to be one-way propagation on Sept. 20. On the latter date ZE2JV was able to hear no signals above 46 Mc., yet his 50-Mc. signal was copied on Cyprus by ZC4WR. Cyprus has a video channel on 48.25 Mc., but it was not heard in Salisbury. ZE2JV heard a weak phone signal, believed to be a U. S. 50-Mc. station, at 1850 GMT Sept. 25. Among his 50-Mc. contacts in September were VQ4FO and VQ5FS. ZC4WR missed hearing ZE2JV only on Sept. 4, 19 and 20.

On only two days in September (the 2nd and 4th) was VK4NG, Rockhampton, Australia, unable to hear Japanese stations. He heard or worked Hawaiians Sept. 3, 5, 7 and 19.

(Continued on page 188)

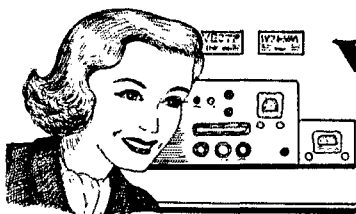
220- and 420-Mc. STANDINGS

220 Mc.

W1AZK	9	3	412	W4UMF	11	5	420
W1BDQ	11	5	450	W5RCL	8	5	700
W1OOP	12	4	400	W6NLZ	3	2	2540
W1RFU	11	5	480	K6GTG	2	2	240
W1UHE	11	4	385	W6MMU	2	2	225
W2AOC	13	5	450	K8AXU	8	5	680
K2AXQ	8	3	230	W8JGG	9	5	475
K2CBA	9	4	325	W8JFD	6	4	480
K2DRC	4	3	140	W8NRH	8	4	390
W2DWJ	14	6	740	W8PT	7	3	550
W2DZA	12	5	410	W8SVI	6	4	520
W3AHQ	4	3	180	W9EQC	8	4	740
W3LCC	8	5	300	W9JCS	5	2	340
W3LZD	15	5	425	W9JFP	9	4	540
W3RUE	5	4	225	W9OVL	5	2	290
W3UJG	11	5	400	W9UED	4	4	605
W3ZRF	5	3	112	W9ZIH	5	2	270
K4TFU	8	4	400	KH6UK	1	1	2540
W4UBY	7	5	320	VE3ATB	7	4	450

420 Mc.

W1BDQ	8	3	210	K2UUR	5	2	110
W1RFU	8	4	410	K3EOF	6	3	250
W1OOP	9	3	390	W4HIC	3	3	520
W1UHE	6	2	430	W4VVE	6	4	410
W2AOD	6	4	290	W5RCL	5	3	609
W2BLV	11	5	360	W7LHL	2	1	180
W2DWJ	6	4	198	W8HCC	3	2	355
K2CBA	5	3	225	W8RMI	3	2	390
W2DZA	5	3	130	W9GAB	7	4	600
W2OTA	5	3	150				



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

The DX YL

By Maxine E. Willis, W6UHA

ALTHOUGH we may pursue that elusive will-o-the-wisp called DX just as eagerly as the OM, YL reaction to this engrossing pastime often proves to be widely divergent to that of the first operator. Of course, we do share the same pride of achievement in working a new or rare country and obtaining the QSL card. However, a DX YL is usually a truly imaginative person and vicarious traveler who finds she has ventured into a strange new world of endless delights.

Back in 1949 the most sought-after station was AC4YN — Lhasa, Buddhist sacred city of Tibet, the "Shangri-La" of James Hilton's *Lost Horizon*. On the morning when W6TS (the OM at W6UHA) worked Tibet for the first time he no doubt made this brief entry in the log: "managed to snag AC4YN today". The log of W6UHA read more like this: "What a thrill it was to meet the famous Reginald Fox of AC4YN! A very polite Englishman who expressed his surprise at finding a lady on the key." My glory was short-lived, however. A few weeks later in a conversation with Lou, W1MCW, I learned that she already had a QSL confirming her phone QSO with AC3SS! Almost invariably upon working a new country I discovered that Lou had been there first. (She is now K4HEF.) Well, competition always adds zest to the game as did local rivalry with long-time DXer Helene, W6QOG/MBD. And neither Reg Fox nor I could foresee the day when an attractive Czechoslovakian YL named Milada would create so much excitement among DXers with her outstanding operating as JT1YL in Ulan Bator, Outer Mongolia.

The past few years have brought many rewarding friendships with YLs and OMs in far distant places. It doesn't really matter whether or not the QSOs are on a.m., s.s.b., or c.w. An hour-long chat with Diana, ZS6GH, can be most pleasant. She was the first DX YL we met in person when she toured the U.S. and Canada in 1947. Likewise, a c.w. contact with a Russian YL operating a club station can seem as personal as a warm hand-clasp. In that brief moment we seem to overcome easily language barriers, difference of ideology, the separation of thousands of miles. We are real friends who share an interest in the same hobby.



How does one become a DX YL? I certainly do not pretend to know all the answers to that question. My DXCC and WAZ awards were issued in 1949, but after thirteen years of fairly consistent operation my country total is only 269 c.w./f, worked and confirmed. At least, I can set down a few suggestions for working DX.

1. Know the country prefixes. Obtain the ARRL Official DXCC Countries List. Exchange lists of countries needed with fellow DXers. Be ready and willing to jump out of a warm bed at 3:00 A.M. to work a new one.
2. Have an efficient transmitter, good receiver and beam. A great circle map centered on your home station will aid in mastering proper orientation of the beam. It is not necessary to have a high-powered station. With persistence, Carol, W6WSV, held frequent 20-meter c.w. skeds with Hub, FB8BR, Madagascar, running 50 watts and without benefit of beam. Of course, it is not quite such a struggle with six or seven hundred watts.
3. Become familiar with the use of GMT, Greenwich Mean Time. Almost all DX amateurs use GMT to avoid confusion in making skeds, QSL cards, etc. GMT clocks are available as are small, simple time computers. For your next birthday ask the OM to get Webster's Geographical Dictionary — more useful than a diamond bracelet.
4. LISTEN! Listen about 95% of your operating time. Observe the operating practices of the fellows who really work the DX. In my early days of DXing I learned a lot from those stern and unrelenting advisors Marv, W6VFR; Bill, W6SAL; and Chan, W6RDR. Make short calls. Don't hold

*YL Editor, QST: Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.

a DX station when others are waiting to work him. QSY off his frequency. Try never to call when the DX station is transmitting. Knowing when, where, and just how long to call — these abilities *may* be acquired after years of operation.

5. Exchange DX news with other DXers. YLs seem to have a strong tendency toward long-time friendships and repeat schedules. Fred, VE3AIU, and I have enjoyed regular skeds for almost fourteen years, but we don't visit when the DX is rolling in. His recent tip enabled me to catch VQ9AIW, Seychelles, on 15 meters after many frustrating attempts on 20.

6. Subscribe to the DX magazine published weekly at Burlington, Kentucky, and edited by W4KVX. It is an FB publication of reliable up-to-the-minute DX information.

Among the DX fraternity YLs are not merely tolerated. We are accepted on our own merit, provided, of course, that we observe the rules of the game, essentially those of good sportsmanship. As a charter member of the Southern California DX Club I have enjoyed the special camaraderie of many topflight operators who have made me feel welcome.

In the years following World War II the ten-meter band conditions were excellent and YLs began to appear on the DX bands. One of the first heard working many European stations was Ethel, VE3DTW, who lived at the Welland Canal Lighthouse in Ontario and was called "DX Mama" by her two teenage sons. While she and Louise, PA0ZC, in Holland, chatted about Christmastime customs in their respective countries, Myrt, ZL4GR, described her annual open-house for a large group of children in Dunedin, N. Z. One did not soon forget a conversation with Iris, ZS2AA, of the ready wit and sense of humor. After an FB QSO with Jeanette, KH6AFN, that keen DXer who had an excellent signal from Hawaii, we might have heard Molly, ZELJE, in contact with a VK teacher whose students listened attentively to her discourse on the wonders of Southern Rhodesia. Interesting women operators and able DXers appeared on all continents — Mary, LU4DMG, Argentina; Lucia, CR7LU, Mozambique; Marie, ZS6KK, South Africa; Paula, EA2CQ, Spain; Nell, G2YL, and Constance, G8LY, England; Hilda, W4HWR, was operating from Germany (she is now KA2HA, Japan). Soma, 4S7YL, Ceylon, put her small country on the DX map. Recently I have enjoyed meeting Pat, 15GN, Italian Somaliland; Pinkie, ZS4LB, Orange Free State; Carola, OH5-SM, of composer Sibelius' homeland — to name but a few. It would be almost impossible to list the many DX YLs who are active on the various bands on all continents.

Our hobby, besides being an extremely interesting one provides many opportunities for being of service to others. Maude, VE6MP, has an enviable record for aiding rescue missions and handling emergency traffic between Arctic stations and operators' families in Canada and the States. Lenore, W6NAZ, devotes many hours to this useful phase of the hobby. A few years ago Clara,



Top DXCC YL, with 269 countries confirmed, and author of our story on DX YLs, Maxine Willis, W6UHA, is surrounded by a sampling of her enviable QSL collection. Since 1941 when she was first licensed Maxine has made DXing her speciality, and her friendly QSOs have won her countless friends around the world. Maxine's OM W6TS was the first amateur to work across the U. S. on 20 and 40 meters (with IXAM and 2MU) in 1925. The Willises are both members of the Metro Goldwyn Mayer Studios ARC in Los Angeles.

W6TDL, and Sandy, W6YRL, kept very busy with traffic for service men in Japan, Okinawa, and Guam. DX YLs find time for many worthwhile activities among the handicapped. Thelma, ZL2JO, has long been an active worker in the League for Crippled Children, Wellington, N. Z. and Frances, G3LWY, devotes her energies to a British organization called the Radio Amateur Invalid and Bedfast Club.

The joys of DXing are ever-present. While neighbors visit over the back fence, the DX YL may enjoy an excursion to the Belgian Congo with Mony, OQ5GH, or to the frozen Northwest Territories with Margaret, VE8UC. Unexpected visitors from all parts of the world are always welcome at the QTH of a DX YL. Somehow or other a bridge table conversation seems unbearably dull after hearing the story of that holiday dinner party of December, 1957, in Beirut, Lebanon, where W6QYL, Martha, OD5CD, Lily, and W6GAI, Frances, met and became close friends. The latter's first love has always been working maritime mobiles, and Fran wrote her own chapter in YL history with the memorable world tour aboard the *Flying Enterprise II* with Captain Kurt Carlsen. In the summer of 1958 I spent six happy weeks touring Canada from VE2 land to VE7 land. Princess Margaret did not take note of the fact that our paths crossed in Banff National Park one Sunday afternoon in late July, but amateur friends rolled out that same red carpet reserved for royalty.

Enthusiasm for DXing may wane temporarily, but it usually returns. From seventeen to sev-

enty, from YL to OW, we experience the same sparkling expectation when we venture into the "World of DX" — the feeling that "Something exciting is going to happen today." Through DX, ideas are exchanged, cultures are shared, concepts are broadened. We can play at least a bit role in the promotion of international good-will. Having reached the end of log book No. 33, take it from one who is both proud and humble to say there's just nothing like being a DX YL!

An OM Calls On DX YLs

By R. E. Holloway, G3HUA

AMATEUR radio provides many forms of interest and entertainment, DX hunting, rag chewing, construction, design and etc. I feel that whatever the interest of an amateur may be, it is always and additional surprise and pleasure to hear the ladies on the air.

I have had many QSOs with YLs on various bands but the greatest thrill has been on the occasions that I have been able to visit them in person. Since I fly as a navigator with the British airline B.O.A.C. this is often possible.

The first YL I met was Eve, ZS6YY, who lived with her OM Geoff, ZS6YL, at Hartbeestepoort Dam near Johannesburg, South Africa. The location was perhaps one of the most beautiful in the world with the house situated on the side of a mountain overlooking the huge lake. The location, however, was poor for amateur radio and DX was achieved only with great effort. No main voltage was available, and the rig was supplied from batteries charged by a somewhat ancient and very noisy petrol engine driven generator, which often had to be switched off in order to copy weak signals. I spent many happy hours with Geoff and Eve before I ceased operating on that route.

B.O.A.C. routes, of course, are world wide and it was not long before I began operating to the Far East, and this again brought me in contact with other YL operators.

While visiting VS6CL in Hong Kong, I spoke to VS1ES, Jim, and his wife VS1AA, Joan, who invited me to visit them on the way home. Fortunately my schedule allowed me an overnight stop in Singapore, and I took the opportunity of visiting them in their flat. Joan had the re-issued VS1AA license during her stay in Singapore and she and Jim used a common rig. Soon after we met Jim and Joan moved to Germany and we have not met since.

Again as a result of QSO from the shack of VS6CL a meeting was arranged in Tokyo with Dave, KA2NS (W4UTB/3) and his charming wife Ev, W4VCB/3. This was the start of a lasting friendship. I was able to visit Ev and Dave at their home in Tokyo where I enjoyed Ev's American home cooking in a Japanese atmosphere. I visited them several times before they returned to the U.S., where I was to meet them again some years later.

In Colombo, Ceylon, I stopped over night and visited Soma, 4S7YL, and her husband

Wicks. Arriving at Ratmalana Airport three hours late due to head winds on route from Singapore I, was met by Soma, Wicks, and many other amateurs from Colombo. Never was the saying "East is East and West is West and ne'er the twain shall meet" so completely wrong. Within minutes of arriving at Soma's house we were old friends, comparing DX notes and rag chewing with Jack, VS6CL, on 15 meters.

Another charming YL I met is Carola, OH5SM, whose husband is Axel, OH5NW. She and her husband visited England and during the course of their holiday they stayed three or four days in Southampton with my wife Christine and myself. At the same time we were visited by Jack, VS6CL and his wife, and Tom, VK2NN, ex-C3HSN, and his wife, which made up a most august DX gathering. This same group used to hold a round-table on 15 meters from our home QTHs, with everyone copying Q5. Carola lives in Mustila, Finland, a small village, which, according to VS6CL, is a most beautiful spot. In a little over a year Carola has notched 182 countries with 154 confirmed, which is good considering she has two small children to provide local QRM.

Perhaps the greatest thrill was during October, 1948, when I visited Philadelphia and met Dave and Ev again. Since then I have visited them several times, and we always have so much to talk about that the visits are all too short. During one visit I met Eleanor, W3BIW, who entertained me at lunch and again demonstrated so ably that American women are the perfect hostesses.

I hope that in the future I shall meet many more YLs on the air or in person, but meanwhile I must content myself with thinking about the visits I have had in the past. Perhaps we might meet on the air one day. 88.

Net News:

All YLs who operate s.s.b. are invited to participate in the new YL-SSB Net which meets Wednesday, 1300 to 1500 CST on 14,260 kc. K5BJU is NCS; K2MGE is alternate.

The Florida YLs have started another net in addition to the three listed in last month's column. The new Business Gals net meets Tuesday at 2000 EST on 3950 kc. K4BAL is manager.

Correction on the Loaded Clothes Line Net: Meetings are Monday at 0900 CST on 7235 kc. K4MINI is NCS.

The Georgia Peach YL Net meets Thursday at 0900 EST on 7260 kc. K4DNL is NCS.

— * * * —

With sorrow we record the passing of Ruby F. Word, W6WRT, of Burbank, California, on October 12, 1959. Licensed in 1941, Ruby was a long-time member of the YLRI, and charter member and past secretary of the Los Angeles YLRC. She was the wife of W6UTZ and the mother of a fourteen year-old son.

COMING YL GET-TOGETHERS

Midwest YL Convention — The tenth annual will be held in Indianapolis, Indiana, May 20-21, 1960. Pre-registration is \$2.00. W9RTH is chairman; K9IX1, co-chairman. *YLRI International Convention* — June 17-19, 1960, at the Hotel Commander near Boston, Mass. WRONE is hostess club. Co-chairman are WIZEN and WISVN.

KEEPING UP WITH THE GIRLS

CLUBS:

Portland Rosex — New officers are Pres. W7HPT; V.P. W7QKU; Secy. K7BII; Publicity W7NOK. W7RVM continues as custodian of the Portland Rosex certificate.

(Continued on page 188)



Miss Oly Hopung, VP1OLY, El Cayo, British Honduras. One of two YLs in her country, Oly operates phone ten thru eighty meters.



Peruvian YL O04EH formerly operated as CP1JK. Raquel is on 10, 15, and 20 from Lima.



The suggested caption for this photo, "What the ARRL Did For this Couple," was written by the bride's sister, Betty Sutton, W5ERH. Once upon a time, at the Eleventh National Convention of the ARRL in Galveston in June, 1959, two hams, one YL and one OM, met. Sgt. Paul Brown, W3UOL, was in charge of the Air Force MARS booth. Miss Hazel Sharp, K5SOK, was on duty at the Gulf Area Ladies Amateur Radio Klub booth nearby. The Sgt. stopped to see the GAYLARK display and left so impressed with one of the walking exhibits that they were married early in September.

From Beirut, Lebanon attractive Miss Lilly Chebab, OD5CD. Make a date with Lilly on twenty phone.



VQ2LB is a welcome check-in to the YLRL Hairpin Net whenever Lorraine's signal can be heard from Northern Rhodesia.



Q05FH is QSL Manager for the Belgian Congo. Mony uses a home-built transmitter running 100 watts, the maximum power allowed in her country.



If you have worked any British YLs during the past twenty years, bets are high that one of your contacts was G8LY, Miss Constance Hall of Hampshire. Constance continues activity on ten phone and c.w.

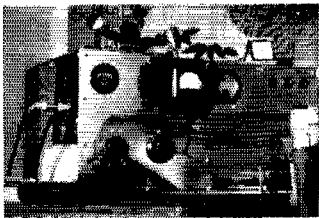


EA2CQ is a call well-known to DXers since 1950. While accompanying her OM EA2CA on a recent expedition to Andorra, Paula operated as PX1DE at a ski lodge 7000 ft. in the mountains. (photo courtesy W2KUW)

ZE1JE's call is synonymous with African YL DX. Ever happy to oblige with a contact from Southern Rhodesia, Molly has been operating since 1948.



(More photos on next page)



Two beautiful African homes and a famous DX YL in each. Left: OQ5IE, Jane Hiernaux, Stanleyville, Belgian Congo. Jane is on 14,330 s.s.b. daily between 2000 and 2200 GMT. Right: ZS2AA, Iris Hayes, Cape Province, South Africa, (and OM). Iris was organizing president of the South African Women's Radio Club.



A Mr. and Mrs. team from Johannesburg, So. Africa—Doreen and Bob Lambert, ZS6APG and ZS6AJX.



Another husband and wife team from South Africa—Mr. and Mrs. Harris of Port Elizabeth. Hal is ZS2LB and Eileen is ZS2MH.



Presenting two more YL pilots—there are enough of such air-minded YLs to perhaps warrant forming a special club of their own. Blonde Millie Doremus, W1SVN, on the left, followed her OM into flying, as she did with ham radio and golf. Millie, the mother of four boys and a policeman in Lynnfield, Mass., says that her only regret is that she didn't take up flying twenty years ago.



Grace Dunlap, K5MRU, (right) now of La Feria, Texas, may be more quickly recognized as ex-KZ5DG. Grace was licensed in 1951 in the Canal Zone and for several years handled great amounts of traffic for the district. Off on a trip to Alaska at the moment, Grace expects to be at the YLRL convention in Boston next June and enthusiastically predicts, "Of course, we'll fly!"

*A Merry Christmas to all
—W1QON*

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

Last month we bored you with Operation Obligato, a playful proposition for hardy souls who dig their DX the hard way on 160 and 80. We swung on static, chief fly in the low-band DX ointment. Now what irksome insect can we take a swat at in similar unorthodox fashion for the orthodox 20-meter crowd? Well, discounting truly foul DX-hog types, what species of propagational skunk makes you the maddest through tragic waste of precious postage and midnight oil? Rare-DX-imitating bootleggers, perhaps.

A typical BL sequence goes thus: (1) VQ7XX suddenly appears on 14,015 kc. with mannerisms reeking of glorious rarity, (2) after the nut's first few QSOs the fun begins in earnest as the mob moves in, (3) victims with rotary beams swap rough bearings on either side of the pile-up but their immediate conclusions are usually inconclusive, (4) DX men and societies in the VQ7 vicinity are hurriedly consulted with the immediate verdict again in some doubt, and (5) with the passage of time, plus lack of evidence to the contrary, it becomes generally acknowledged that the whole episode was a dismal waste. There are variations in this routine according to the antics of the perpetrator but the outcome is always less than nothing, a ridiculous goose egg in a nest of useless QRM and QSLs.

The shrewd 200-country man recommends working everything one hears without hesitation, for one never can be immediately sure that this VQ7XX is a psycho on shipboard off Sandy Hook. He's right; there's no magic formula to quickly differentiate between the ungood and the good. But it would be nice to be able to establish the fraudulence of the fellow as soon as possible, an ability which later might become deterrent.

Carefully consider Step 3 in the chain reaction outlined above, a stage where rotary-beam boys often can throw heavy immediate doubt on a phony's authenticity. Here's a spot where FCC's DF net would be a boon, but FCC monitors can scarcely be expected to rush to the scene of every weird CQ, especially since most of this screwball stuff originates outside FCC licensing areas. *Question:* Could we DXers, with systematic organized approach, raise the efficiency of our own casual "Step 3" direction-finding network to the point where we could do ourselves such favors? The requirement here for dispersed yet integrated effort is unique. Teamwork between DX-minded individuals and groups from coast to coast, exchanging and developing data on prearranged DF-net frequencies, would be necessary to make the scheme pay off.

To be sure, vagaries of propagation make high-frequency triangulation a tricky undertaking even with optimum distribution of elaborate equipment, and the usual ham rotary, peaked for forward gain, leaves much to be desired as a DF sensory array. Its big lobe is broad as a barn door and its null often multiple and shallow. But it's something to start with; compensated cardioidal sniffers could come later. When your club's mood is ripe for a fresh departure we submit Project Pinpoint as a worthy challenge that sounds like fun.

What:

Self-policing is one word for it, and perhaps Pinpoint could help pinpoint the source of some of those hit-and-run commercial radiations that foul up a good DX band from time to time. . . . Consensus of "How's" correspondents confirms that conditions ain't what they used to be just twelve short months ago. Ten, 15 and 20 meters fold their tents like the HZIs and silently steal away when darkness rolls in — even transequatorial stuff goes flimsy. Then Old Sol climbs his skywire after breakfast and the skip shortens up like a snapped spring, bringing with it an avalanche of rag-chew racket. But a sampling of logs from near and afar proves that increased effort can keep the average up. When those hot openings do come along, *move fast*. . . .

20 c.w. is back in the driver's seat of our "How's" Bandwagon with W1s DGL JGY, K1JFF, W2s GVZ (255), JBL (4Q (64/30 worked/confirmed), K2s BMI DGT SFA UYG, WA2s PNA GWF (81/11), W4UO (146), K4s IEX IGD Q1J R/JN (143/115), TEA (117/87), TKM, K5s JZP (30/14), LLJ (32/12), TFR (114/75), W6s JQB KG, K6s CJF DZJ HLL LXS, WA6CPI, W7s DJU LZF, K7s CTH HDB, W8s DAW (280), IBX (192/181), YGR, W9ZYD, K9s HLW KYR, LLO, K9s OVR (59/26), SAJ, EL4A, KH6DGL, KL7PL, VE7CQ (202/170) and VE9NG (2/1) loading 'er up with AP4MD, BV1s US USC, CE9s AH AJ AK AS (14,080 kc.) 3 GMT, GM2QN, CN8BP, COs 2QR 7AI, CP3s CP (CN) (44) 4, CRs 4AX 5AR 6AP (40) 4, 7CH (40), 7CS, CTs 1GK 2AI 2BO,



*4822 West Berteau Ave., Chicago 41, Ill.



JØØDA is a favorite target for the 14-Mc. c.w. gang. This cliff-top view of near-by Hollandia harbor conveys some DXotic Dutch New Guinea atmosphere. (Photos via KL7PI)

CX2AC, DM2ADL, DUs 10R (72) 23, 1VQ 7SV (90) 13, 9AC, EA_s 6AF (40) 22, 6AM 8BF (70) 4, 8RX, FA3DU, FB8_s CJ XX (40) 21, ZZ, FF8CI, FG7XC (7) 2, FK8AW, FO8AC (50) 4, FR7ZD (20) 17, FY7_s YF (2), YG (50), GC2FMV, GD3FXN, HA_s 1KSA 5KAG 7PL, HC_s 1JU 2IU (32), 4E (51) 11, 5CN (20), HD_s 1FF 4JC 6JH, HP1GD, HR8AB (70) 6, 15GN, IT_s 1CKS TAI (76) 0, JA_s 1CJN 2DO 3AP1/mm 4AJ 4QL 7AD (23) 10, 8AA (50) 10, 8GS ØAD, JTIAB, JZ6_s DA HA, KA2LN, KC4USV (12) 0, KG_s 1AQ 1BC 1BL 1DT on that soiled ice cake, 4AD 6AA1 (21), 6CY (40) 11, KM6BT, KR6s HV MD (45), KV4_s AA (80), BO, KW6CQ, KX6CO (23) 10, LA_s 1NG/p (70) 23, 3SG/p (75) 22, 4CG/p 8FG/p (89) 2, LU_s 1ZC (17) 7, 9ZV (80) 0, LZ1_s AF KBA (33) 6, VK, MP4_s BCU QAO, OA4IGY, OR4R_s of the Belgian Antarctic, OX3_s DL GA, OY_s 1J (18) 0, 7ML (20) 22, PJ2_s CP ME of Sint Marten, PY7SC of Fernando, RAEM of Moscow, SL2ZA just Sweden, SM2AQQ (5) 21 of rarer Sweden, SP_s 5ADZ 5AP 5AZ 5HR 5KBM 5ACK, SU1_s AL MS (20) 4, SVØVB, TF5TP, TI2_s DN 3, PZ WR, UAs 1KAÉ and 1KAÉ/6 of Russia's southern polar region, 9CM 9DR 9J 9JR 9KA 9KAG (50) 5, 9KCC 9KDD 9KDN 9KJF 9KA 9KSA 9MD 9OM 9WG 9XE ØBD 9CI ØCN ØFG ØKAR ØKCK (36) 17, ØKCO ØKQB, UB5_s 1I FX KAA KAG KCD KIA TR UW ZE, UC2_s AR CB KSA, UD6FA (10) 4, UG6AW, UH8KAA, UH_s AG KAE, UJ8_s AC KAA (54) 15, UJLTKR (9) 15, UI_s AS AE AG, UO5_s AA (68) 23, PK, UP2_s NN NW, UQ2_s AB AN AS, UR2_s AO BU, VEs 1ADP of Prince Edward Isle, 8DM (30), 8DX (35), 8TO 8TU ØNM on shipboard, VK_s 5NT of Australia's rare Northern Territory, 9GK 9MV (83) 11, 9VAI (80) 10, 9XK (56) of Papua, ØC of Macquarie, ØRH (82) 16 of Antarctica, VP_s 2AB 3VN 4TF 4FR 5ME 7NA 7NA 7NS 7NW 8EG (18) 2, 8EP 9BO 9CC 9EP VQs 2EW 2GV (73) 23, 4HT 5FS 5VK (40), 6LQ (50) 23, 8BBB, VR_s 1B 2DK (25) 12, 3C, VS_s 1EA (36) 15, 1FZ 1JW 4BA 5GS 5MD (29) 17, 9ANS 9OC (85), 9OM (39) 15, VU2_s AK MID, W7YGL/KG6, XE1_s A YF, XW8AP, XZ2TH, YJ1DL (40) 7, YO3_s RI ZR, YS1Ø (47), YV5_s AFR BF FH HL 6, ZB_s 1A 2I, ZD_s 1FG 2HHT, ZE_s 1JV 2VC 2JS (46) 17, 8JN 8JZ (65) 23, ZK1AK (55) 10, ZL3VB of the Chathams, ZP5_s AY CF, ZSA 3T of Walvis Bay, 7R, 3A2BE, 4S7MG, 4X4_s AD CK JN (28) 14, JO 7R KK WF (38) 16, 5As 3TR 5TO 7G1A of Guinea, 811AA (15) 7 of Japan's antarctic outpost, 9G1BQ and 9M2GE.

15 c.w. steps right out for KLJFF, W2_s GVZ JGQ, WA2FNA, K4_s IEX IGD QJY RJN TEA TKM, K5TER, W6_s JQB KG, WA6CPI, W7DJU, K7_s CTI (23/21), HDB, W8_s IBX YGR YIN, W9ZV, K9_s HLW (93/80), KYR LIO, K9_s LEQ OVR, EL4A, KH6DGL, KL7PI and VE7CQ to the tune of CE_s 1AD 3NE 3WZ 9AF, CN8_s CJ JT, CR_s 5AR (1) 23, 6BX (5) 17, CTINT, CX2BT, DM2_s ACA AIL ALN ANG, DU_s 1FM (52) 10, 7SV (82) 5, FA8BG, FO8AP, FY7YF (40) 20, HA_s 5BU 7KLL (48) 18, HCIIU 23, HKØAI 0-1 of San Andres and Providencia Archipelago, JAs 1IF 3AUQ (58) 23, 5FP 8ØF (45) 4, ØAN (53) 23, KG4AU, KN4DPR/mm, KW6CQ (56) 23, LA3SG/p (70) 17, OAs 3A 3D (52) 13-17, 4HK 17, OEs 3AT 3RE 5GR 7AZ (55) 17, OD5_s CI IG, OO5_s IG RH, PIIMID, SP_s 1KAA 2YK/mm ØFZ 6NF 7YN 12, 9DT, ST2AR, UAs 1ØS 3CN 9OM (70) 10, 9VB ØKUV (41) 10, UB5CK 12, UC2BB, UG6AW, UQ2AB, VKØTF, VP_s 3ER (90) 1, 4LE 8CW 9EW, VQs 2GW 2WR 3CF 3HD (25) 19, VR3AC (80) 20, VU2RM, XE1_s AA1 PJ UU, XW8AJ (51) 10, XZ2TH, YO3UM (15) 18, ZB_s 1AQ 2I, ZD7SA, ZEs 2KL (61) 17, 3JO (34) 17, 6JY (53) 10, 8JG 8JO (75) 23, ZS3T, 4X4_s PU HA 1E (28) 18, 1M (35) 18, 5A2CV (30) 18, 7G1A and 9G1CF.

15 Novice news is made by KN1KSH, WV2GHD, WV6_s DNM POL, KN8NHC (30) and KN9PNV (36/17) with the cooperation of CE3WZ, CN8GY, CR5AR, DM2AEH, DU7SV, EI4A, EA_s 1GZ 2FQ 3IH 7IA, F_s 2MA 3II 7GH 8FV 8ZY, GM_s 3NOV 6RL HA5DH, HB9_s EK KC OS, JA7AD, KG4_s AR AU, KH6_s CHM CXO, KL7DFY, KZ5_s JN LLX WXN, LU_s 3AD 4IC 5DEL 8FBU, OH5SS, OK_s 1CN 1KBG 2QK, ON4_s PX RN, OZ2NU, PAØCE, PY_s 1BTC 2BAU 4AO, SP_s 1KAA 9RFU, UB5_s JX SP, VK_s 2ZR 3TX, VO2RII, VP9_s 1ØH EN, VQ3CF, WG6AIL, WP4_s ARR ASK ATJ, YN9BM, ZB1LNW, ZE8JO, ZL2AXU, ZS1CO and 5A5TO.

20 phone was tapped for GN2BK, CT1_s IR JH, CX2AI, EA8CB, EL4A, HB9QP/CR8* (310)15-16, KC4_s USP/mm, USV, KM6BI, LA3SG/p* (328), PJ2AV, SP5WW, SV_s 1AI ØWB* (323) 1, UA3FU, VK_s 2FR* (328), 9AA 9AD, VP2AC, VS9OC (248), VU3YU, 4X4As, 5As 1TR 5TO, 9G1CY and 9M2AW by determined W4IIO, K4RJN, WA6CPI, W8_s 1AW YIN* (263, 141 sideband), EL4A and KL7PI, the asterisks indicating s.s.b.

15 phone's faithful ganged up on CE9AF, CN8_s GI IZ, CO_s 3IGY 8BS 8MW, CR6_s AU DU, FO8AF, GB3GPW just England, GC3CGK, HC_s IRL 2IU 6KA 6KW, HI8_s CJY GA, HI1HC, HR1HP, HV1CN, KG4AW, KH6CV/KG6, KX6BT, MP4BCC, OA6Q, OY2Z, PJ2AN, PZ1_s AP AX, SL5AB of Sweden, TG7CB, TJ2DK, UB5FG, UR2_s BU KAE, VP_s 2GS 2SL 3MC 4LQ 5JW 5ME 6ZX 9RR (208) 13, VO4GQ, VS9OM, VU2NR, XE1CP, YS_s 1MS 3MT, YN_s 1HW 4CB, YV_s 5ABII 5AFH 6BR* 2Ds 1P 2FNX, ZE1KV, ZL_s 1ART 2AAQ, ZS3S and 9M2DW, leading to fattered logs in the shafts of K1s JFF LST (102), W2JGQ, K2SFA*, K4RJN, K5TER, WA6CPI, W81BX, K9HLW, KØLEQ, LU2JV and EL4A — asterisks for sideband efforts as usual.

10 phone catches its breath after the autumn surge. K2SFA*, K4_s RJN TEA TKM, K5TER, W6NKE, WA6CPI, W8YIN*, W9JFT (136/126 on 28-Mc. A3), KØLEQ and EL4A pounced upon CE3AI, CN81X, CR_s 6CI 6LA 7ES, CX7CB, EI_s 7E 9Q, EL4A, FA3LX, one FO8AC/Clipperton, HA8WS, HK_s 2ØI 3ØO, HP2ON, JA_s 1AAT 3EK, KB6BH, KGs 1DT* (480) 19, 6NAA (645) 23, KH6CV/KG6 (645) 23, KM6BT* (600) 20, KW6CW, KX6B, AF BT (820), PJ2AV, IØ9AL (370), TI2OE, UA6KØB, UB5FG, UQ2AN, UR2BU, VQ8AV, YN_s 1CI 1WW 4CB, YU3R, YV5AJK (820), ZØ4DP, ZL_s 1AIX 3GS, 4X4FR and 9G1BM, sneaks for s.s.b.

10 c.w. finished its fall ball in sturdy fashion, K2SJJF, WA2FNA, K4_s IEX TEA TKM, K5TER, W6_s HCS NKE, WA6CPI, KG6JF, W8_s IBX YGR, K9ØVR, and EL4A clashing brass with CX_s 2BT 6CY (70) 22, EL4A, G13SM, JA_s 1AC 1AKH 1ANP 1AØV (100), 1BCC 1BWA 1ØMD 1CUD 1HS 1VL 2RP 2WE 2XH 3AG 4HM 8BP 8EX, KP4KD, SP5HS, SVØWC, TI_s 2CMF (200) 1, 3LR, UA4IF (5) 15, UB2_s VK_s 2FU 4TY (110), 7UW (80), VP6UN, VR3V, VU5_s JA RM, W2SGL/mm near ZL_s, XZ2TH, ZB1A, ZC4_s IP SR, ZD7SA, ZE8s JG JJ, ZL_s 1AAM 1AH 1APQ 1AUM 1KG 2GZ 3VK, ZS_s 1ØA 2EO 6AVW and 9G1BM (21).

40 c.w. continues to come up fast on the outside, KLJFF, K2DGT, K4IGD, K5JVF, W6_s KG NKE, K6_s CJF STI, K7AYP, W8_s GKB IBX, KH6DGL and EL4A document 7-Mc. code developments as follows: CO2WC 4, EL4A (6) 20, GD3UB (3) 6-7, HC4IE 10, HH2JV (18-25) 21, JA1s AHK AHO ALS ANP ATT AUC BAW BNW BFG BTH BRK CID DH EF LF LR LZ OK, JA2_s AAH AFA AJP AQ HX UJ YL, JA3_s AEB ALG AMY ANH IL

KM, JA 6EU 7IC 7XC 8HK 8HO 8JC 8MG 9MI all in the lower 60 kc. of the band around breakfast time out west, K6GNAC, KZSTD (7) 19, LUs IZC (5) 11, 7WC (46) 10, OH0NC of the Alands, OZ4LP/p near the Line Isles, PY1ADA (17) 19, SV0WI, TF3AK, UAs 1DZ 3XN 6PC 9CM 0TK (15) 8, UB5s EZ FP IN KAO KBA KCD KIU MZ ND UK, UO5RO, UP2NL, UR2AA, VE8DM, YKs 2ASF 2ANX 2QL 3AYD 3MH 3YD 5KK 5ZC 7DS 7MZ 7YV 9XK (13) 20, VP4WD of Tobago, VR2DK (10) 20, YV4AS, ZE2JS (44) 17, ZLs in quantity, singular ZM1BL (16) 10, ZSs 10 2HI 3HX 5RM, 4X4JR and 5A2CV.

40 phone's bedlam fails to daunt W8GKB and EL4A who rammed through for items like DL1FF* 5, K3BUU/KP4* (296) 4-5, KL7GO* (205) 9, one T17ORO* (296) 3, ZL3ID* (115) 10, 9G1s CB CC CY and DF. We expect this segment of "How's" to enlarge significantly as higher-frequency phone bands gradually flame out.

80 c.w. is just beginning to move along at this writing. Europeans were reluctant to cross the pond in number till November showed, and the early returns have K2SJJ, W8IBX and EL4A scoring advance-guard hook-ups with such specimens as CO2QR, DJ4ME, numerous Gs, GM3HLQ and old 3.5-Mc. reliable ZL4IE.

160 c.w.'s organized DX offensive gets under way this month with the announcement by W1BB of the Annual Transatlantic and World-Wide 160-Meter DX Tests. All hams authorized to work top band are invited to concentrate their long-haul efforts between 0500 and 0730 GMT on the following Sundays to come: December 6th and 20th, January 3rd and 17th, February 7th and 21st. During those periods special attempts will be made to contact European, Asian, African, and other 160-meter amateurs throughout the world. "Working DX on 'top band' is challenging and extremely interesting," writes Stew. "Interference by atmospherics, BC harmonics, Ioran, etc., calls for great patience, perseverance, a top-notch station and keen operating techniques. An active group of British and other overseas amateurs, in cooperation with U. S. operators, is behind this effort, a yearly DX activity since 1932. There still are new 1.8-Mc. countries to work and 'firsts' to be made. Most W/K/VEs will operate in the 1800-1825-ke. segment, while those in the West will use 1975-2000 ke. Overseas DX will be found mainly in the 1800-1875-ke. region, particularly 1800-1835 ke., but don't neglect 2000-ke. 1X possibilities." W1BB recommends that W/K/VE stations call CQ DX TEST during the first five minutes of each hour, listen during the second 5-minute period, call for five more minutes, etc., until the DX ball starts a-rolin'. Send reports of results and observations to W1BB and/or Jeeves & Co. — good luck and go get 'em!

Where:

Oceania — VK3RJ, in WIA's *Amateur Radio*, lumps QSL hints concerning past and present Australian outposts: VK1s AC BS EG GA, VK3s AB EM IJ KT MK RH RT TC VH all via VQ2EG; VK0s AF CJ to VK3SK; VK0AA to VK1ACA; VK0CC via VK4FJ; VK0PK to P. King, 15 Pine Ave., Gollands, So. Aus.; VK0PT to P. Turner, 3 Parsons St., Clayton, Vic.; VK0RO to Bob Oldfield, 4 Jessie St., Pascoe Vale, W. 8. Vic.; VK0RR to R. Arnell, Box 8, Ararat, Vic.; and VK0TF to VK3YS. . . . From KM16BT: "For the most part I QSL only on receipt and would appreciate the usual s.a.s.e., or s.a.c. plus IRCs."

Asia — W8PQQ is designated as QSL headquarters for the imminent VU4-VU5-AC5 escapade of YAIW & Co. . . . According to the HL9TA gang, the KARL bureau is chartered to handle incoming QSLs for HL9 stations only, these at present limited to HL9s KJ KR KS KT and TA. "HL2 stations, licensed by several schools as experimental radio stations, still are forbidden to QSO foreign hams." . . . VERON has KA0IJ operative Mark still answering to APO 815, San Francisco, Calif., and confirms ex-staffer Vince's availability at 2553 Parkwood Ave., Toledo, Ohio. . . . The ex-VS5JA address to follow may not net you immediate Brunel QSL satisfaction, for Harry still needs his VS5 log and other records.

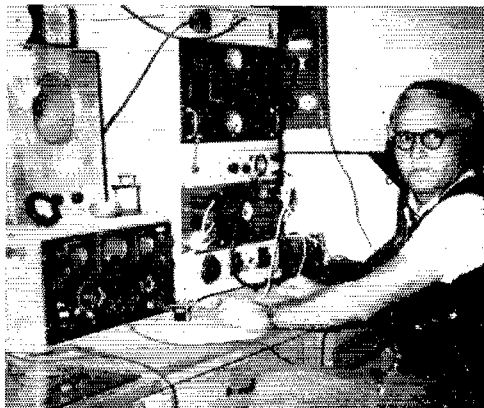
Africa — "I'm now handling QSL chores for ZD1AW," informs W3KVQ. "Please stress the need for self-addressed stamped envelopes." . . . W6ZRK, QSL agent for ELs 2AB 2AD and 8C, can hardly be blamed for accepting an opportunity to grab Mojave, Calif., Box 73 in lieu of old Box 29. . . . "K6VYU is not QSL manager for VQ2RB," advises K4RJN, scotching rumor to the contrary. . . . ZL2AFZ, in WIA's *Break-In*, hints that W5HDS may be of assistance in QSL matters concerning PR7ZC, FB8XX and 3A2AF. . . . Data via WGDXC; W0DVN, VQ9AIW QSL charge, was hoping that all applicants (1) include s.a.s.e., (2) adhere strictly to GMT and (3) refrain from duplicating earlier filings for their Seychelles cards till reasonable time has elapsed. Three good points for all QSL-seekers to keep in mind. . . . Again from the Gullers: Z53T, who would like to see Walvis Bay become Z59, finds his QSL output lagging somewhat but assures all contacts 100-per-cent confirmation. . . . In VERON's *DX press* we see that SUMIS volunteers to act as Egypt's

bureau. . . . Proposes EL4A (W7VCB). "I will accept QSLs from any place in the world for any legitimate EL station. My work as a pilot enables me to get around the country so much that I'm in good position to distribute cards." Wowie — an airborne QSL manager! . . . VQ6AB assures VK3RJ of WIA that he intends a thorough QSL response from Hargeisa.

South America — W3JTC and others would be delighted to hear from ex-CPIC, now understood to be stationed at a military base hereabouts. Primary QSO-certification, you know. . . . K5LLJ finds HC1JU gradually licking the backlog through the bureaus from Quito. . . . The good offices of G8KS are back in action as QSL agency for Ron Pinder, VP8EG, of Signy Island, South Orkneys.

Europe — UR2BU regrets to hear that his QSLs are tardy in getting around but he insists he's doing his damndest to keep things current. "As an oldtimer since 1934 I QSL absolutely 100 per cent. IRCs help considerably in making cards move more quickly." Karl wonders if the "Zone 15, Oblast 091" wording on his QSLs could be causing confusion; this is not part of his address, having to do with awards data only. Anyway, UR2BU will gladly duplicate QSL shipments upon learning that cards sent earlier are overdue. . . . ISWL's *Monitor* affirms, "QSLs from Antarctica's OR4RW will be dispatched upon the operator's return to Belgium early in 1960." . . . SPIJV is grieved by a stingy W/K QSLs return, his average running about 70 per cent for 1658 QSOs made since obtaining his ticket in November of '57. Slawomir did much of this on a mere 10 watts, most on 40 watts, and has DXCC with a 140/107 record. Gee, some of the stations he lists as non-QSLers are prominent DXers on this side of the pond. Do you check each incoming DX QSL to make certain that you QSL'd first? . . . LZ1AF completed filling out some 2000 QSLs for W/Ks and has forwarded them via bureaus," says K2UYG. "Dimitar answers cards direct only if IRCs are included, and may be able to help those in need of LZ1KAB QSLs." . . . ARRL DXCC Deskman W1WPO confirms that one Dimitar Sibirsky, known as LZ1DX, has been declared amateur *non grata* by the Bulgarian society. We mention this only because the chap's heavy output of mail to overly-receptive W/K DX hounds has long been cause for confusion in Balkans QSL matters. . . . Spitzbergen's IAF8G/p tells W6KG his QSL debts will be paid off in full when he returns to Norway in 1960. . . . "SV0WP was operated by W3JTC from March 22, 1957, through July 15, 1959," writes Larry himself. "Anyone not satisfied with QSL for QSO between those dates should send a card to W3JTC. SV0WP sent QSLs to those who QSL'd first." . . . Regarding H1ADW/HV verifications, W6AWT intended to answer cards in the order received, s.a.s.c. appreciated.

Hereabouts — VE7CQ, who manages to get a good chunk of W1NJM's 60-w.p.m. code transmissions of a Sunday evening, declares, "The best bunch of QSLers I have found are the boys in the French colonies." . . . W6NKE commends YN1WV for answering all QSLs 100-per via air. . . . W3GJY rolls up his sleeve to aid FG7XC's QSL cause and has ample blanks ready for the mill. . . . KL7PT's procedure is representative: "I answer cards as received — except for new countries, of course. All QSLs are answered immediately, usually by the same route as received, direct or via bureau." Joe requests bureau-users to be patient, for QSL managers depend on systematic clearances to keep their task in hand. . . . Now scoop



FK8AC enjoys 20- and 15-meter sideband work but also knows his way around on c.w. Felix has charge of government broadcast facilities at Noumea. (Photo via W7KCN)



A recent MARS-Fest at Aguadilla, Puerto Rico, produced this rare gathering of local DXCC talent. From left to right, KP4s RK KD YT WD and MV hover over KP4s ES and AIO. The latter will be recalled as prewar DXCC member W8OSL and operator of juicy TA3AA some years ago. Archrival KP4CC could not attend this clam-bake and there was widespread concern that Juan might nab some new ones before all got back to their shacks.
(Photo by KP4ALO)

from the group and from here and there as space will allow. . . .

- AP2BH (via W4ANE)
ex-CN8GK (to W6KYT)
CQ7AI, Box 28, Camaguey, Cuba
CP5AD, P.O. Box 960, Cochabamba, Bolivia
CT2BO (via W6NJU)
DL4ME, E. H. Bort (K6YTF), Box 88, APO 171, New York, N. Y.
EL2s AB AD, via R. Moneriff, W6ZRK, Box 73, Mojave, Calif.
EL2O, % Bishop's House, Monrovia, Liberia
EL4O, Le Tournau, Roberts Field, Liberia
EL8D (via W6ZRK as above)
F7GL, J. Gammon, Co. C, USA Sig. Svc. Bn., APO 58, New York, N. Y.
FB8CE, Box 730, Tananarive, Madagascar
FG7XC (via W3GJY)
FP8JG (to VE2ABE)
FQ8AW, P.O. Box 298, Brazzaville, Republic of Congo
FQ8HA (via REF)
FQ8HK, Box 919, Brazzaville, French Eq. Africa
HA8CZ, Janos Bahr, Danko Pista U. 14, Szeqed, Hungary
HB9QP/GR8 (via W4LYC)
HC1JU, Box 2951, Quito, Ecuador
HC5BZ, K. Dorfaun H., P.O. Box 790, Cuenca, Ecuador
HH2CC (to HH2HB)
HK3SO, F. Garbrecht, P.O. Box 2773, Bogota, Columbia
HR0AB (to HR1AB)
HS1C, H. Christensen, USA CAC Stn., Phil-Thai, APO, 146, San Francisco, Calif.
HS1E, APO 146, San Francisco, Calif.
HADW/HV (via W6AWT)
KA0LJ (see preceding text)
KC6JA, Koror, W. Carolines
KC6PE, % G. L. Countryman (W4JA), Page Comm. Engr. Inc., 1856 Kalakua Ave., Honolulu, Hawaii
KG1DT, Drift Stn. Bravo, APO 731, Seattle, Washington
KH6AHQ, Barbers Point ARC, Box 13, Navy 14, FPO, San Francisco, Calif.
KH6DGL (via KH6BA)
KH6JEM/KJ6 (to KH6JEM)
KK6AF (to KM6BD)
KL7AUG, R. Paulsen, Box 1392, Ketchikan, Alaska
KL7PI, J. Paquette, % FAA, Homer, Alaska
KR8AB, 237 Aza Daido, Daido, Naha, Okinawa
KW6CL, R. Drake, Box 26, Wake Island
LA5AD/p (via NRRL)
LA8FG/p (to LA8FG)
LA9JG, R. Aalberg, National Cash Register Co., Brochsgt. 1, Fredrikstad, Norway
LU1ZC, Valentin Alsina, Habana 424, Buenos Aires, Argentina
OD5CL, J. Koenreich, P.O. Box 1348, Beirut, Lebanon
SP9ADU, Box 606, Krakow, Poland
ex-ST2NG-ZD3G-VS9AG-MP4BCN (to VQ6NG)
ex-SV0WP (to W3JTC)
TG5HG, H. Patricio, Box 10, Huehuetenango, Guatemala
TC9AL (via W2CTN)
TJ3LR, Box 8, Turrialba, Costa Rica
UA1s DG FE FT, Alekseev, Ul. Communa 15-1, Leningrad-Petrodvorets, U.S.S.R.
UA3YI, Evgenii Razbitnov, Ul. Dzerzhinskogo, Dom 78, Kaluga, U.S.S.R.
VE8DM (non-VEs via VE8JW)
VE9NM, HMCS Cape Scott, % PMO, Halifax, N.S., Canada
VK1s AC BS EG GA (see preceding text)
ex-VK9OK (to ZL1AJJ)
VK6s AA AB AC AF CC CJ EM LJ KT MC PK PT RH RO RR TC TF VH (see preceding text)
VP2LO (via K3CFR)
VP2VA, R. Rowan, Tortola, B.V.I., B.W.I.
VP7VB (via KV4AA)
VP8BH (via RSGB)
VP8EG (via G8KS)
VQ2s DG PM, % Mrs. Donald Nehls, 1417 Prospect St., Watertown, Wis.

- VQ2VG, Box 599, Chingola, No. Rhodesia
VQ6NG, L. Grant, P.O. Box 27, Hargeisa, Br. Somaliland
VQ8BBB (via VQ8AD)
VR3AG (via VR2AS)
VR3V (via RSGB)
ex-VS1BJ (to VQ6AB)
ex-VS1HU-VS2FW (to G3MRC)
ex-VS5JA, H. McQuillan, Resident Geologist, % IOEPC, Gach Saran via Abadan, Iran
VS9OC (via RSGB)
VU2JA (via W4YWX)
W7YGL/KG6 (to W7YGL)
XW8AP, P.O. Box 87, Vientiane, Laos
YN1CK (via W1EQ)
ex-YN4CB (to TG5HC)
YV1GS, J. Azurza A., P.O. Box 19, Maracaibo, Venezuela
YV2BS, Maria Quinones, P.O. Box 238, San Cristobal, Venezuela
YV5AIP, P.O. Box 1542, Caracas, Venezuela
YV6BR, R. Barbanti Bassoli, P.O. Box 4109, Puerto la Cruz, Venezuela
ZC5AF (via W5QL)
ZD1AW (via W3KVQ)
ZD1PB, % Army P.O. 3000, Freetown, Sierra Leone
ZD2AMS, Box 524, Jos, Nigeria
ex-ZD8JF, J. Packer, High Knoll, Furze Close, High Salvington, Worthing, Sussex, England
ZD9AK, Weather Stn., Gough Island, Tristan da Cunha via Capetown, So. Afr. (or via SARI)
ZS1UM, 89 Hillside Rd., Fish Hoek, Capetown, So. Afr.
9G1CX (via G3ELW)
9K2AL, P.O. Box 1947, Kuwait
Your enormium falls due to W1s AYG DF IKE JGY UED WFO, KLJFF, W2s DJT JBL, K2s BMI SFA UTC UYG, WA2GW, W4IUO, K4s IEX IGD TEA TKM, K5s JVF JZP LLI, W6s HCS HG, K6s CJF HLL LXS UFT, W7s DJU LZF, W8s DAW IBX KX, KN8NIC, W9FFD, K9s HLEW LIO, EL1A, VO2AW, J. Howard, C. Morrow, A. Rugg, International Radio Listeners League, International Short Wave League, Japan DX Radio Club, Newark News Radio Club, Northern California DX Club, Southern California DX Club, West Gulf DX Club and Willamette Valley DX Club for any QSL speed you may gain from that glossary.

Whence:

Africa — W8DAW sends us word from VQ8APP (VQ8AP) who made such a splash from Cargados Carajos this August: "For the past three years I have operated portable on such trips but this is the first time I have had such success. It was because of previous disappointments that I made no DX skeds before my departure, relying instead on CQs. Coco Island, where I was established most of the time, is three miles long with a maximum width of 800 yards. Palms grow there as its name indicates, and there is also some brushwood. Fishermen, about twenty of them, have built five or six shacks plus storerooms for salted fish and provisions. Apart from this there were only sea birds, mice, and VQ8APP operating from the tent in which we lived. My power was supplied by a half-horsepower gaso-



Japan has become one of the world's ham radio strongholds, boasting an impressive body of capable communicators and technicians. This representative group of DX-chasing operators and stations includes, clockwise beginning top left, JA5 2JW 8AH 1AD 1SA 4AH 1CC 3SJ 2AE 2LC 2OJ; at upper and lower center, JA5 3DM and 5AL. (Photos via VJs 1VG 7DJU, Ks 2OAH 6DV 6SXA and DU75V)



line engine which charged a 12-volt battery. This gave light for the tent and was connected to a vibrator which fed 240 volts a.c. to a 350-volt power pack sufficient to operate my transmitter and receiver. My antenna was simply a long wire tied to two coconut trees. On phone I got very good reports as far as Madagascar, but the c.w. really performed wonders. W/K stations alone would have kept me busy for months! I used only the 7- and 14-Mc. bands because I brought no 21-Mc. coils for my HRO. My friend VQ8BBB now is active on Raphael island, twenty miles from Coco." VQ8APP's vibrator gave him a hard time. He would have repaired it, but the job required soldering, and soldering required the vibrator! . . . W9JFT hears that CT3AF now lives in Sao Paulo with hopes of early PY2 DXing . . .

EL4A makes mention of a Ghana network on 7025 kc., phone and c.w., each Sunday around 0700 GMT with such 9G1s as CB CC CY and DF in attendance. The six-watter of 9G1CC gets out surprisingly well from Accra

On the Liberian scene, EL4A (W7VCR) reports the activation of EL4M, a 12-year-old YL. Ken has a potent c.w. or phone signal on 10 through 160 meters and, with the help of EL2Z, soon will add 100 watts of d.s.b. "My QSO total for September was 874, making 6640 contacts here so far. Countries worked/confirmed: 137/75. For the time being I'm on 7006 kc. every Saturday around 0400 GMT, 14,012 kc. all other mornings at the same time, 21,030 kc. on even days of each month and 28,040 kc. on the odds, all this c.w. work. I'll have regular 80- and 160-meter hours beginning in November with a 800-ft. long-wire 125 feet high." . . . ZE2JS schedules KH6DGL on 40 and the latter is told that Yanks are really crackin' through on 7 Mc. lately, especially the Fives . . .

More Africa offerings courtesy ISWL, WGDXC, WIA and VERON: Eight or nine ZD2s are to be found in a Nigeria net each Sunday on 14,100 kc. around 0900 GMT. . . . VQ6AB's husky 14-Mc. signal stems from a four-stage 40-watter and dipole. New neighbor VQ6NG, none other than ubiquitous Lee Grant, is eager to become more active upon arrival of the full complement of his gear from Bahrain. . . . W0AIW tallies his FB summer Seychelles VQ9AIW squeezing at close to two kiloQSOs. . . . ZS6IF intends to pass out ZS6IF/ZSS contacts on the low edges of 15 and 20 meters over the middle week of this month. . . . In time to come, K4PDU hopes to make Ascension isle more workable. . . . SU1MS hungers for KH6 contacts (and doubtless vice versa) near 14,050 kc., 0400 GMT. . . . VE8AEE is nominated to replace VE8EGD/SU on Gaza Strip, and VE8QC/SU is reported homeward bound.

South America — Say, if a W/K/VE/VO works any five of PY3s ABA ADE ADG ADZ AFE AIO AIL AJU AJZ AKW ALV ANE APV APO AUF AWB AWN AWS AYC HU NR PP and ZA this month he or she can qualify for the Sao Gabriel Century Diploma (DCSG) as issued by Delgado Municipal da LABRE, Dr. Celestino Cavalheiro St., 634, Sao Gabriel, RGS, Brazil. It's a phone-only function, and entries must be filed before January 31, 1960. The award is made in conjunction with centennial festivities commemorating the founding of Sao Gabriel. Inquire at the preceding address for full data. By the way, W2GVZ received his WAA diploma from LABRE in a quick six weeks . . .

W8YIN confirms that PY4PK can assist toward sidebar contacts with Fernando Noronha's PY7SC . . .

Elisa of LU7AU is recommended by W6KG as a comely candidate for your global YL QSO collection . . . LU2JV overcame the lack of a.c. mains in Concordia with spirit enough to work all United States and 65 countries in 1958. Jose's "high-power" rig runs 20 watts and his regular 6V6-6V6 line-up manages eight watts input from a six-volt source. LU2JV prefers 15-meter work and gives much credit to his 3-half-waves collinear array . . . KHGD collected rare Tobago where G3TA pounds 7-Mc. brass as VP4WD . . . Ten-phone regular YV5AJK

tells W6NKE that book-larnin' now cramps his DX style except for vacation periods. . . . LU1ZA keeps VP8EG company in the South Orkneys, 14-Mc. c.w., preferred . . . NNRC has it that CE3DY, VE5 5RV and 7ZM are cooking up a DXpeditionary outburst in the San Felix or San Ambrosio Islands, specks about 600 miles north of Juan Fernandez and around the same distance west of Antofagasta, in time for the upcoming ARRL International DX Competition.

Asia — Nepal's 9N1s AA AB AC and AD are rarin' to go on 15 and 20, according to info via W8KX. "The only answer I am able to give to questions about methods of operation is that they will be working s.s.b.," writes an official of Cook Electric, the company responsible for brightening ham prospects over there. As mentioned previously, King Mahendra of Nepal now is 9N1AA, and K4RJN understands that 9N1AB is W3FEL. . . . K6LXS observes 9M2GE and spouse engaged in a spirited domestic contest to see which operator can work the most W/K stations before the pair returns to New Zealand. Let's have more such rivalry, eh? . . . Cho Dong-in, HL9TA operator and secretary of the Korean Amateur Radio League, writes, "We tried for several years to get an amateur license and finally KARL headquarters has HL9TA active on 40 through 10 meters, mostly 20 phone, with 50 watts." So far HL9TA is the only ham station licensed to Korean nationals, and Cho adds, "Unfortunately there are no individual amateur stations here yet, but we believe we shall have them by next spring." Last month's column featured a photograph of HL9TA's staff, a group steadily growing . . . UA0OM tells neighbor KL7PI of plans to visit Taunū Tuva early next year. . . . W8YIN notes that W8CGN is in the Arabian area on assignment . . .

The Prince of Sikkim, AC8PT, writes KH6DGL that he has been inactive for various reasons but that AC3NC is workable . . . KA0IN tells K2QXG that KG6I is scheduled to become the all-inclusive Bonin-Volcano Islands prefix. In that event, KA9s IJ and IN would become KG6s IJ and IN . . . K6CJF, endeavoring to amass 100 JA QSLs on 7 Mc., was doing fine until the recent typhoon season all but blew Japan off the map. "For ten days they were off the air, then gradually reappeared." . . .

Membership of the Japan DX Radio Club now includes JA1s AA AB AG AS BG BK CC CJ CO CR DM EF JM KF LL NP TD TJ VP AA W, JA2s AW BL DN JW LC UT, JA3s AA BG IW, JA5s AB AI, JA6s AD AO HK TA, JA8s AA AQ, JA9s AA AB AC BE, JA9s AA BR and CA. This year's DX Bulletin ranges far and wide . . . Additional Eastern items via JDXRC, NNRC and WGDXC: KR8AB, with four watts of phone near 14,150 kc., may be the first Okinawa national to hit ham bands since the '30s. . . . Son of 9M2DW, 9M2FX is a chip off the old DX block. . . . AC4AX reports all quiet on the Lhasa front and means to hook a rhombic to his BC-610 shortly. . . . Y41IW, VU2s AK and NR hope to launch their VU4-VU5-AC5 DXpeditionary sputnik on the 19th of this month with the assistance of W6TQU's KWM-1. What a juicy orbit!

Oceania — Another surge of Line Islands ham action — W6HCS bumped into VR3V of Christmas on 28,130-ke. c.w., 0100 GMT. VR3s W and X are also mentioned in dispatches, and VR3AC as well. . . . W8DAW recently completed his 11th year of regular schedules with friend ZL2AL. "I don't think there have been ten misses in that time due to conditions. This speaks mighty well for the reliability of old 14 Mc.!" And so it does — gosh, what would we do without old pro 20? . . . KH6DGL and other Hawaii-based DXers report a terrific onslaught by 50th-state hunters. KL7s know just how it is. . . . KM6BT was delighted to receive his General on the day his Novice permit expired this summer. Since then Mort has

(Continued on page 184)

DL1BO, near the 250-country mark on the DXCC ladder, found time to excavate "DXCC²" No. 19 from his bulging QSL files at Karlsruhe (see page 69, July QST). Theodor's is the third such square deal from Europe and follows similar filings by W3GAU, VE2WW and W6TXL in that order. Nos. 20 and 21 are K2PIC and VE3HB.



I.A.R.U. News



QSL BUREAUS OF THE WORLD

For delivery of your QSLs to foreign amateurs, simply mail cards direct to the bureau of the proper country, as listed below. Cards for territories and possessions not listed separately can be mailed to the bureau in the parent country; e.g., cards for French Cameroons (FES) go to REF in France; cards for VP8s go to RSGB in England. W, K, VE and VO stations only may send foreign cards for which no bureau is listed to ARRL.

For service on incoming foreign cards, see list of domestic bureaus in most QST's under "ARRL QSL Bureau."

- Algeria:** G. Deville, FA9RW, Box 21, Maison-Carree, Alger
Angola: L.A.R.A., P.O. Box 484, Luanda
Argentina: R.C.A., Carlos Calvo 1424, Buenos Aires
Australia: W.I.A., Box 2611 W, G.P.O., Melbourne
Austria: Oe. V.S.V. P.O. Box 15, Klosterneuberg, 2
Azores: Via Portugal
Bahamas: C. N. Albury, Telecommunications Dept., Nassau
Barbados: Arthur St.C. Farmer, Storms Gift, Brandons, Deacons Road, St. Michael
Belgian Congo: U.C.A.R. QSL Bureau, P.O. Box 3748, Elisabethville
Belgium: U.B.A., Postbox 634, Brussels
Bermuda: R.S.B. P.O. Box 275, Hamilton
Bolivia: R.C.B., Casilla 2111, La Paz
Brazil: L.A.B.R.E., Caixa Postal 2353, Rio de Janeiro
British Guiana: D. F. Yong, VP3YG, Box 325 Georgetown
British Honduras: L. H. Alpuche, VP1HA, P.O. Box 1, El Cayo
Bulgaria: Box 830, Sofia
Burma: B.A.R.S. % Tara Singh, 187 Eden St., Rangoon, Burma
Canton Island: H. B. Johnson, KB6BA, U.S.P.O. 06-50000, Canton Island, South Pacific
Ceylon: P.O. Box 907, Colombo
Chile: Radio Club de Chile, Casilla 761, Santiago
China: M. T. Young, P.O. Box 16, Taichung, Formosa
Colombia: L.C.R.A., P.O. Box 584, Bogota
Cook Islands: Ray Holloway, P.O. Box 65, Rarotonga
Costa Rica: Radio Club of Costa Rica, Box 2412, San Jose
Cuba: Radio Club de Cuba, QSL Bureau, Ayestaran 629, Altos Cerro, Habana
Cypres: Mrs. E. Barrett, P.O. Box 219, Limassol
Czechoslovakia: C.A.V., P.O. Box 69, Prague 1
Denmark: OZ2NU, Borge Petersen, P.O. Box 335, Aalborg
Dominica: VP2DA, Box 64 Roseau, Dominica, Windward Islands
Dominican Republic: Jose de les S. Perkins, P.O. Box 157, Ciudad Trujillo
East Africa: (VQ1, VQ3, VQ4, VQ5): P.O. Box 1313, Nairobi, Kenya Colony
Ecuador: Guayaquil Radio Club, Casilla 784, Guayaquil
Ethiopia: Telecommunications Amateur Radio Club, P.O. Box 1047, Addis Ababa
Fiji: S. H. Mayne, VR2AS Victoria Parade, Suva
Finland: SKAL, Box 306, Helsinki
Formosa: Hq MAAG, APO 63, San Francisco, California
France: R.E.F. BP 26, Versailles (S & O).
France: (F7 only): F7 QSL Bureau, MARS, Headquarters U. S. European Command, APO 128, New York, N. Y.
Germany (DL2 calls only): G. E. Verrill, G3IEC, 10 Seahorse St., Gosport, Hants, England
Germany (DL4 calls only): DL4 QSL Bureau, % DL4HAB, 50th Comm., APO 109, N. Y., N. Y.
Germany: (DL5 calls only): Via France
Germany (other than above): D.A.R.C., Box 99, Munich 27
Gibraltar: E. D. Wills, ZB2I, 9 Naval Hospital Road
Ghana: 9G1AB, John Burton, Telecommunication School, Post & Telecommunication Dept., Accra
Great Britain (and British Empire): A. Milne, 29 Kechill Gardens, Hayes, Bromley, Kent
Greece: George Zarafis, P.O. Box 504, Athens
Greece (Unlisted SV0s only): USASG, APO 206, New York, N. Y.
Greenland (OXs only): Via Denmark
Greenland: (KGIs only): MARS Director, Directorate of Operations, Hq. 8th Air Force, Westover A.F.B., Mass.
Grenada: VP2GE, St. Georges
Guam: M.A.R.C., Box 145, Agana, Guam, Marianas Islands
Guantanamo Bay: Guantanamo Amateur Radio Club, Box 55, NAS, Navy 115, F.P.O., New York, N. Y.
Guatemala: C.R.A.G., P.O. Box 115, Guatemala City
Haiti: Radio Club d'Haiti, Box 943, Port-au-Prince
Honduras: O. A. Trochez, P.O. Box 244, Tegucigalpa, D. C.
Hong Kong: Hong Kong Amateur Radio Transmitting Society, P.O. Box 541, Hong Kong
Hungary: I.I.S.R.L., Postbox 185, Budapest 4
Iceland: Islenzkir Radio Amatorar, Box 1058, Reykjavik
India: P.O. Box 534, New Delhi
Ireland: I.R.T.S. QSL Bureau, 39 Booterstown Ave., Blackrock, Co. Dublin
Israel: L.A.R.C., P.O. Box 4099, Tel-Aviv
Italy: A.R.I. Viale Vittorio Veneto 12, Milano, Italy
Jamaica: Ruel Samuels, VP5RS, 34 Port Royal Street, Kingston
Japan (JA): J.A.R.L., Box 377, Tokyo
Japan (KA): F.E.A.R.L., A.P.O. 994, % Postmaster, San Francisco, Calif.
Kenya: East Africa QSL Bureau, Box 1313, Nairobi
Korea: Korea Amateur Radio League, Central Box 162, Seoul, Korea
Kuwait: William N. Burgess, 9K2AZ, % Kuwait Oil Co. 14—5th St. North, Kuwait, Persian Gulf
Lebanon: R.A.L., Ahmadi, B.P. 3245, Beyrouth
Liberia: (ELIs only) HARC, P.O. Box 32, Harbel
Libya: 4A2TZ, Box 372, Tripoli
Liechtenstein: via Switzerland
Luxembourg: R. Schott, 35 rue Batty Weber, Esch/Alz. Luxembourg
Macao: Via Hong Kong
Madagascar: P.O. Box 587, Tannarive
Madeira Island: P.O. Box 257, Funchal
Malaya: QSL Manager, Box 777, Kuala Lumpur
Malta: R. F. Galea, ZB1E, "Casa Galea," Railway Road, Birkirkara
Mauritius: V. de Robillard, Box 155, Port Louis
Mexico: L.M.R.E., Liverpool 195-A, Mexico 6, D.F.
Midway Island: KM6BI, AIRBARSRON Two Detachment, Midway Navy #3080, F.P.O. San Francisco, Calif.
Montserrat: VP2MY, Plymouth
Morocco: A.A.E.M., P.O. Box 2060, Casablanca
Mozambique: Liga dos Radio-Emissores de Mocambique, P.O. Box 812, Lourenco Marques
Netherlands: V.E.R.O.N., Postbox 400, Rotterdam
Netherlands Antilles (Aruba): Verona, Postbox 392, San Nicolas, Aruba
Netherlands Antilles (Curacao): Verona, Postbox 383, Willemstad, Curacao
New Guinea: Via Papua
New Zealand: N.Z.A.R.T., P.O. Box 489, Wellington C1
Nicaragua: YN1RA, Apartado Postal 555, Managua
Northern Rhodesia: N.R.A.R.S., P.O. Box 332, Kitwe
Norway: N.R.R.L., P.O. Box 898, Oslo
Okinawa: O.A.R.C., P.O. Box 739, APO 331, % Postmaster San Francisco, Calif.
Pakistan: Box 4074, Karachi
Panama, Republic of: L.P.R.A., P.O. Box 1622, Panama
Paraguay: R.C.P., P.O. Box 512, Asuncion
Papua: VK9 QSL Officer, P.O. Box 204, Port Moresby

(Continued on page 186)



Correspondence From Members -

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

WHOSE OX?

Box 736
Balboa, Canal Zone

Editor, *QST*:

W3SUR's comments stirred considerable agitation if this column is indicative. Being run off the air appeared to be the biggest fear from 10 kw. ham (?) rigs. As long as ludicrous suggestions appear here's one: Re-examine every amateur in the code speed of the license held upon renewal. Why do I make this suggestion? Because I am a commercial operator with basic requirements of a 30-30 code speed. A precedent exists for code re-examination, at least sentimentally, since the ARRL Board — back in 1948 — voted en masse, to re-examine all applicants when converting from Class "B" to Class "C" and at, I believe, 16 w.p.m. . . .

Why don't I suggest re-examination on technical subjects? Because I am lousy on such subjects. For, as you see, it all depends on whose ox is being gored, to introduce an old saw that does *not* cut both ways.

— Len Collett, KZ5LC

CQ QRP

2238 Bolton Dr., N.W.
Atlanta 18, Georgia

Editor, *QST*:

I am trying to locate others who are low-power enthusiasts. Are there any low-power contests, get-togethers, etc.?

All this talk of super-power makes me laugh. Anyone can work the world with 100 watts or so. I've been on ten-meter phone with a five-watt Heathkit CB-1 Transceiver using a single dipole antenna. With this rig I work California and Central America regularly. Others are doing even better — for example, the ZLIAAX story on page 89 of the October *QST*.

— Jack Gibson, W4SVH

HITS . . .

707 Sheridan Road
Evanston, Illinois

Editor, *QST*:

I think the article, "Simplified Design of Inductively Coupled Circuits" by W2VLA in the October issue is outstanding among the aids provided to us, his fellow members.

Many of us have had the involved math of coupled circuits, but tend to shy away in ham radio from labor of the calculations. "Simplified Design . . ." was so good I have copied it out and am filing it with special "helps" in the shack.

— Temple Nieter, W9YLD

Box 88, APO 171
New York, New York

Editor, *QST*:

In my second year of Full Membership, I continue to find the League as much or more a part of my necessary requirements as a ham than ever. The monthly *QST* in the mail is only a very small part of this membership, though it is always eagerly devoured as soon as it arrives. Even more important to all hams (even those who for one reason or another do not choose to sign up for a membership) is the support that our organization gives every ham. This support is especially manifest this year in the excellent work that Mr. Budlong and his capable staff have accomplished regarding the coming decisions at Geneva. No matter what the outcome of the convention, here is at least one ham who appreciates this, and much more, less spectacular work, which is done in our behalf every day.

Thanks again for your many services, and hope to work WIAW sometime for the really big thrill.

— Edward H. Bort, K6YTF/DL4ME

4516 N. Stanley
Oklahoma City 12, Oklahoma

Editor, *QST*:

May all the rare DX call WIICP! May his antenna never fall and his rig never fail. These good wishes in return for his article on "What Value Component" (*QST* October). Let's have more, more, *more* of those down-to-earth articles to help us newer hams understand what goes on. My thanks to WIICP helping me "savvy" the theory in a practical way.

— Albert B. Smith, K5PBD

. . . AND A MISS!

809 East Lake Street
Petoskey, Michigan

Editor, *QST*:

K8GJM's article "Riding the Rails" in Oct. *QST* seems to me to have hit an all time low. It's rather sickening to keep reading about these moochers who want to promote an expedition providing some one else furnishes everything. By his own admission after one year of planning they didn't have enough money for car fare. If you insist on taking up valuable space in *QST* for such junk at least let's hear from expeditions that have something to offer.

— Carlin Peck, W8BTX

413 West 47 Street
New York 36, New York

Editor, *QST*:

Shame on all that participated in this *method* of operation, and on *QST* and its editor for publicizing same. Regarding the "No mention of successful railroad mobile transmissions" previously, wasn't W3WTE from the presidential car an amateur operation???

"We had hoped to get the railroad to sponsor the tickets . . ." Amateur radio is a hobby. Is it in the fraternity's interest that an amateur should be a beggar, a panhandler? In recent times we have seen plenty of cases of amateurs begging from other hams (dollar QSLs, etc.). Now these fellows in Ohio have gone further, even outside of the radio field, and have begged from a railroad. Being refused, they went further and begged from the general public, via newspapers, radio stations, and television stations. ARRL supplies aids and suggestions for getting *favorable* publicity for ham radio — but public begging cannot be considered favorable to the fraternity. Then, several small contributions were raised from local merchants. I am sure the merchants consider this more as a contribution to blackmail than as a contribution to a worthy cause.

Three days before the trip, no equipment was available. Some planning! So, more begging, in the form of an invitation to W8FAT to make the trip, because he "managed to borrow some excellent gear," apparently because of his work at Pioneer Electronic Supply. Are there rules in DX-peditioning that forbids one to supply one's own equipment???

Then the railroad had to install the antenna, and had to furnish the 1-kw. supply. As an amateur expedition, what had the amateur group planned to supply, the operators and log paper only???

Better to have stayed at home!
— Clay Cool, W2EBZ

. . . AT 60 W.P.M.

46 Whitmore Avenue
Toronto, Ont., Canada

Editor, *QST*:

Re Oct. 1959 *QST* page 64, article by KH6LJ. (c) Operating Technique — "Any DXer worth his salt is good for at least 60 words per minute."

Wonder if we have a typographical error here? The old time telegraph men in the office say it is virtually impossible
(Continued on page 196)



Operating News



F. E. HANDY, WIBDI, Communications Mgr.
GEORGE HART, WINJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, WIDGL, Communications Ass't.

ROBERT L. WHITE, WIWPO, DXCC Awards
LILLIAN M. SALTER, WIZJE, Administrative Aide
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., Phone

Easy Steps to Accuracy in Our Traffic Work; About Use of QTB. We're indebted to W9TZN and "Watch Words" for the following ideas. Accepting traffic commits us to do our very best to see it through with little delay, and to maintain 100% accuracy in handling. A receiving operator should always ask for a repeat of anything in doubt. A good operator never objects to such requests. In fact, listen to traffic being handled by some of the best operators in any traffic net, and you will hear occasional repeats asked and given. It seems as though many a new traffic man is hesitant about asking for repeats, perhaps feeling that by so doing he is revealing that he is a poor operator. On the contrary! *Not* to ask for a repeat when needed is the sign of a poor operator. To *show* you are a good operator ask for that repeat when needed; also get a confirmation on anything doubtful. Then you will know you have done your best. To send your message in standard ARRL procedure likewise assists speedy accurate transmission.

The League's *Operating an Amateur Radio Station* booklet explains that the check of a message is a simple count of the number of words or groups in the text *as sent*. The signal QTB, in W9TZN's opinion, ought to be understood and used much more in amateur traffic handling. Sending each message carefully in correct form promotes accuracy. Difficulty over checks can be avoided, if the word space is sent twice as long as a space between letters within a word. The text can appear correct sometimes whether sent as one word or two. For example, an originator may send the word ARTCRAFT as one group in a message with check 18. If the relaying operator leaves a little extra space after ART, and the receiving operator copies as two words he gets a check of 19. The use of QTB will properly straighten this matter out in a hurry. Much time, however, can be saved if *carefully spaced* words are sent. Use this signal, whenever there is any doubt:

QTB? Do you agree with my number of words?

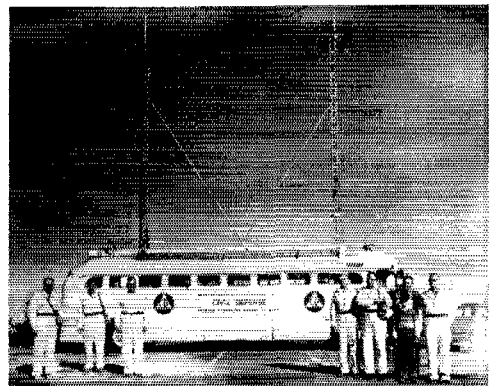
QTB I do not agree with your number of words; I will repeat the first letter of each word and the first figure of each number.

Two- and Six-Meter Nets on Increase. Late last year we found that there were *three times as many* six-meter nets registered, some 73 nets, as compared with one year earlier. Also the 68 two-meter nets registered were a similar increase in the same period. Any newly organized traffic or emergency nets should use ARRL form

CD-85, to be registered in the new '59-'60 ARRL Net Directory.

It is working present-day ARRL policy for SCMs to give every encouragement to foster the growth of v.h.f. nets. Section coverage, increased fraternalism, traffic handling, and opportunities to train new amateurs are direct objectives. OES appointments will be granted to v.h.f. members who work consistently in such v.h.f. nets and report their work. SCMs will appoint PAMs to assist in the organization and maintenance of such nets wherever possible. Also, wherever such nets meet the criteria or standards established by SCMs, one can become eligible for a Section Net Certificate.

Among the early netters to start such operations this fall were the members of the *Auburn (N. Y.) Amateur Radio Association*. Their new six-meter c.w. net's first session on 50.7 Mc. was at 1900 September 21, following a showing of enthusiasm at the September club meeting. We mention this just as one current example in the course of presenting the merits of such operation. The net is one means to help all members get larger operating and fraternal value from time spent on the air. The AARA's bulletin-description of its six-meter c.w. net operation may well be applicable to every such net: "Come on fellows, and gals too, get in there and give the net a try. Experienced ops will tell you, the first time is the hardest but you're sure to enjoy it. For those of you who have never operated c.w. before, this net is the ideal place to get your feet wet. Our



The crew poses in front of the Winston-Salem (N.C.) mobile communications center. Left to right are W4YJG, an SWL, W4YSB, K4DVE (five-county EC), W4CPI, W4CAV and W4YLU.

chief purpose in this project is to provide practice and training in the art."

Two-meter nets also can now command the interest of *both* Novice and Technician members. We can quote FCC's thinking when evaluating its docket to permit technicians the use of 145-147 Mc. as pertinent and valid here: "... this would permit Technician and Novice to inter-communicate on the same band using voice or telegraphy; the two classes (of operators) could take advantage of this for the purpose of increasing their code speed and hence qualifying for General Class privileges." For leaders in areas *not* yet having the advantages of v.h.f. net operation but now interested, more how-to-do-it details may be gleaned from our operating booklet, mentioned above. See (on page 13) those sections on network operation.

ARL-Check Messages. The numbered-text message is primarily a tool to meet amateur emergency work and holiday needs. Personally, we always prefer individually worded radiograms, but this ARRL system has assisted amateurs to reach higher levels of public service in handling greetings and emergency traffic through the years.

Some cautions are in order concerning the handling of standard text messages that are identified by a number. ARL should be sent both

in the check and in the text ahead of the *spelled out* number which represents a given text. More than one text can be sent by putting the ARL indicator directly ahead of *each* number, which is necessary to prevent running numbers together. If one gets such a message for delivery, it is his responsibility as receiving operator to expand the message fully for delivery, since the numbers are merely system designators within amateur radio, and otherwise convey no meanings to the addressee. A radiogram to ARRL will bring an extra copy of the list of standard texts (CD Form 3) so that it can be placed on your operating desk for ready reference.

Starting Holiday Messages. Thanksgiving and Christmas have special family appeal, and the exciting possibility of demonstrating one's hobby to exchange greetings always builds up our amateur traffic reports at this season of the year. New Net Directory listings appeared in these pages in November *QST*. Nets, especially those identified with the National Traffic System, are our organized means of routing communications to any part of the U. S. A. and Canada. It may be timely for us to set down for the benefit of newer amateurs those steps most essential for transmission of your holiday radiograms. International communications are prohibited in behalf of third parties, except with ten countries with which we have special agreement. However, we amateurs (under FCC Section 12.102) can freely handle traffic, holiday or other, as long as no compensation, direct or indirect, is involved in the performance of our station. Similar privileges are not generally granted within most foreign countries in view of the fact that radio communications are generally run as a government monopoly and are a source of revenue. But we started to tell you some of the essentials of making use of our message capabilities, and demonstrating your own ability as a communicator.

Routing Your Message. Setting up your message to send should be pure routine; just use an official ARRL message form and this will put all the parts of your message in the right order to send. Consult our operating booklet for full details. It explains the function of each part of a message, if you need more details. It's important to get the address complete and correct, otherwise it may be impossible to deliver the message. All the parts should invariably be sent in the same correct order, since it may give rise to errors if a message is sent in a haphazard manner.

We mentioned the NTS; your own local ARRL Section Net in practically all cases has connections through liaison stations and NTS to other sections and time zones. The Net Directory or in some cases *QST*'s Station Activities reports will help you ascertain the proper frequency and daily time of operation for a given net. You can then get on this net, indicating to the NCS that you have traffic. As you report in, indicate the number and destinations of messages; then stand by until the net control station tells you what station to give your traffic to. When, after sending

A.R.R.L. ACTIVITIES CALENDAR

Dec. 2: CP Qualifying Run — W6OWP
Dec. 17: CP Qualifying Run — WIAW
Jan. 7: CP Qualifying Run — W6OWP
Jan. 9-10: V.H.F. Sweepstakes
Jan. 15: CP Qualifying Run — WIAW
Jan. 16-17: CD Party (c.w.)
Jan. 23-24: CD Party (phone)
Jan. 31-Feb. 15: Novice Roundup
Feb. 3: CP Qualifying Run — W6OWP
Feb. 6-8: DX Competition (phone)
Feb. 9: Frequency Measuring Test
Feb. 15: CP Qualifying Run — WIAW
Feb. 20-22: DX Competition (c.w.)
Mar. 3: CP Qualifying Run — W6OWP
Mar. 5-7: DX Competition (phone)
Mar. 15: CP Qualifying Run — WIAW
Mar. 19-21: DX Competition (c.w.)
June 25-26: Field Day

OTHER ACTIVITIES

The following lists date, name, sponsor, and page of this *QST* in which more details appear.

Nov. 21/22: 21-28 Mc. Telephony Contest, RSCB (p. 69, last month).

Dec. 5-6: West Virginia QSO Party, Kanawha Radio Club (p. 170, this issue).

Dec. 6: Wisconsin QSO Party, Milwaukee Radio Amateurs' Club (p. 110, this issue).

Dec. 12-13: Massachusetts QSO Party, Merrimack Valley Amateur Radio Club (p. 156, this issue).

Jan. 9-10: WAE DX Contest (c.w.), DARC (next month).

your message, this station QSL's the message, it is successfully on its way.

Should you not be active on the air, it is possible to file your amateur radiogram with another local amateur, especially one who holds ORS, OPS, or OES appointments and has traffic connections. There is ever so much more satisfaction, of course, in sending the message from your own amateur station, so that your own call can rightfully go in the "station of origin" part of the message. It's possible, if one has lots of time and desires to make a project out of finding an amateur right at or near the destination, to comb the different bands for "actives" and try to work a dependable station there to handle your message direct. You are taking more of a gamble to locate a reliable man to assist in the relay in this case, unless you can confirm from a recent *Station Activities* report that your man is regularly engaged in traffic handling. Instead of "landing" a traffic-dedicated member, you may run into an amateur who has interests lying in other directions.

Thousands of amateurs, however, do experience a deep sense of satisfaction in delivering radiograms. It so often brings warm expressions of thanks from those receiving a message by telephone as well as letters from grateful recipients of messages.

Your station can be part of the traffic group all year 'round by once or twice a week participation in a net. Or you can just use the *system* as described for starting traffic on holidays or special occasions. The principle to bear in mind in the latter instance is that to insure *best* speed and accuracy your message should be placed in the hands of those amateurs who specialize day after day in the relaying and delivery of traffic and who consequently are best equipped in the know-how and the techniques to see the message through.

Club TVI-BCI Committees. We've been happy to report to the ARRL Board a decreasing trend in demand for ARRL TVI Kits in the previous year. This can be ascribed in part to better general amateur attention to this problem. We supplied about 200 sets of TVI information on specific club-and-committee request. Some other Kits were distributed to newly organized groups and placed where we thought good could be done in the public relations field. It is of course an individual responsibility to operate in ways that reflect constructive public service values in our Amateur Radio. This means that every amateur has to be technically and operationally on the ball.

It is well to mention again here the *availability of the ARRL TVI Kit*. This includes FCC infor-

mation, sample publicity, committee outlines, service-shop poster and a bibliography of *QST* articles on the subject. It is an excellent guide in organizing TVI Committees and assisting both clubs and individuals. Radio clubs have top values to their members in any community where they help in meeting common local problems. The maintenance of a club interference committee which centralizes available test equipment, assists in public contacts and promotional work to assure good public relations and public understanding, arranges technical committee demonstrations to the club at some convenient meeting in the year, showing the effects of good and bad engineering in both the TV receivers and amateur equipments will be all to the good.

The League's Communications Department will supply on request the specific ARRL lithographs that cover (1) the bibliography of useful *QST* reading on TVI, (2) FCC general information releases on "TV Reception and Interference," (3) Committee Organizational Plans, (4) a service-shop poster with introduction to committee operation, etc. Amateur radio clubs may well be proud of their accomplishments in maintaining good operating conditions and public relations in this sphere. ARRL suggests that every club continue to organize and maintain the TVI-BCI committee mechanism to deal correctly with cases when they arise. By club organizational foresight we have found the means to forestall this kind of personal operating trouble. Our lithographs show how to attack and lick TVI.

—F. E. H.



In this column, in January, 1957, *QST*, we pointed out that Technician and Novice licensees make good additions to AREC groups and should not be neglected or excluded. Apparently this advice was followed by quite a few groups to supplement their existing personnel. In a few instances, perhaps it was followed *too* well, because we have come face to face with the problem of whether or not Technicians can be appointed as ECs.

The Rules and Regulations of the Communications Department state that only amateurs of Conditional Class or higher can hold appointments, with the exception of the appointment of Official Experimental Station (par. 7). This rule applies to both station and leadership appointments and, we should think, especially to the latter. It was made not because we are "agin" Technicians, as some appear to think, but in considered judgment of the good of the organization.

The appointment of EC is a leadership appointment. He should be an amateur of broad experience and background with full amateur privileges and capabilities, able to command the respect of all within his organization as well as officials and others outside. Can a Technician meet these qualifications? Well, hardly — certainly he doesn't possess full amateur privileges, and it is difficult to see how he could have broad amateur experience and background. Some Technician licensees conceivably could command the necessary respect, but even here there could be trouble with General Class amateurs in the organization feeling that the

**NATIONAL RTTY CALLING
AND WORKING FREQUENCIES**

3620 kc.

7140 kc.

appointed leader is inferior to them. Respect for leadership is a part of leadership itself; if it doesn't exist, regardless of the reason, the leadership is ineffective. True, there may be exceptions, but you can't make effective policy on exceptions. The rule is a just and logical one.

We feel there is nothing discriminatory in this. The Technician licensee is a specialist. He may make an excellent sub-leader in his field, as an assistant EC for six or two meters — an increasingly important field these days, especially in the civil defense picture. Otherwise, the cloak of his specialty can be shed at any time through the simple expedient of acquiring a Conditional or General Class license.

— . . . —

On July 26 K2YEW found himself stranded in his cabin cruiser in Jamaica Bay, New York City. His call for assistance was answered by K2OZS/m on Long Island, who summoned the Coast Guard and immediate aid was dispatched. — K2YEW.

— . . . —

W6NMR/m, while in contact with W6UFJ and K6UAA/m, was witness to a serious accident on August 22. He immediately informed W6UFJ, who called for police and ambulance, both of which arrived at the scene within eight minutes. During this time, K6UAA/m arrived at the scene and operators of both mobiles used first aid gear they carry with them, to control bleeding on the part of one of the victims. Do you carry first aid equipment in your mobile? — W6NMR.

— . . . —

On Sept. 8 a forest fire literally exploded near Deadwood, S. Dak., when a trash burner threw a live flame into the dry grass and pine needles. What with high winds, high temperature and low humidity, the fire was out of control almost immediately. W0s DVB EQV YQR and ZWL established contact on 7225 kc. in anticipation of need, and were able to assist in the evacuation of Deadwood, especially the patients at the St. Joseph Hospital. Later in the afternoon another fire broke out in the Nemo area. K0KJR supplied the communication from this area, and W5DFQ/m and K0ACJ/m also were of assistance, covering many miles of driving in the fire area. W0APL was alerted by the Homestake Mine and released for the emergency, maintaining contact with Deadwood at all times. K0MMN operated from the college at Spearfish, handling much traffic. K7GDW of Sheridan, Wyo., was very helpful in relaying.

K0ACJ sends us some details of his activities during the fire which are of interest. Early in the afternoon he was requested to go to Lead. On his way through Deadwood he contacted K0KJR/m and arranged a personal meeting in Lead. W0s DVB EQV, K0s KJR and ACJ met as planned and proceeded to the home of W0DVB/EQV to plan action. K0ACJ attempted to get in the clear to the north of the fire, while K0KJR went south. After two attempts ended in being turned back, K0ACJ finally found a route which placed him in position, where he contacted W5DFQ/m and W0DVB. Much traffic was handled, as all telephone lines out of Deadwood and Lead were out by then. Traffic was handled until 1930 from that location, when K0MMN took over the contact. K0ACJ then returned to Deadwood and continued handling traffic until 0200.

Communications were conducted on 7225 and 3870 kc. The following is a composite list of participating stations not mentioned in the above account: W0s AEN CTC CTZ DQK EAL FKE GGP GMS HOJ MGV NEO OFP OOK OXN QGZ SCT SBG SLG VAM YOB, K0s BMQ BZX DFO DHA DTL HHV HVV INZ LXF LXH MIMN MMR MRS QYB UDZ VFB YQB, W7s GSQ IOJ ION RJR YSF NOU, K7DNV. Thanks to W0s ZWL, DVB and K0ACJ for these reports, and to SEC W0SCT for sending them in.

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The Cuyahoga County AREC provided communications for three parades in May and June. On May 1, a fixed station was used for the first time as control station for the Loyalty Day parade. The station was located at Cleveland Police radio, from which vantage point coverage of all mobile units with the parade was assured. Communications, all on six meters, were solid throughout the parade, which lasted 2½ hours. Eight amateurs took part.

Then on May 30 there was the Memorial Day parade. This one was handled on ten meters with six mobiles, one hand-carried unit and one base station. The hand-carried unit was in the lead car with the parade marshal, who through it was able to communicate with base or any of the

mobiles. Base station was again located at the police station. Eight amateurs participated.

Hot on the heels of the Memorial Day parade came the Flag Day parade, on June 11. For this activity, six meters was used with five mobiles, one hand-carried unit and again the base station at police headquarters. The mobiles were spaced through the parade until they reached a certain location, then they pulled to the curb, giving reports as units of the parade passed, finally following the end of the parade. This created quite a spectacle as the mobiles all passed the reviewing stand at the end of the parade. Ten amateurs took part.

These activities were coordinated by K8ABA, asst. EC for parades, Cuyahoga County AREC.

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On Sept. 14 an 8-story boiler of the East Texas Pulp and Paper Co. blew up, causing death, destruction and disruption of communications over a wide area. K5HGZ, EC for Silsbee, nine miles away from Evadale where the scene of the explosion took place, was notified by K5HHA, who then took off in his mobile, getting through road blocks to Evadale to establish communication with K5HGZ. This was done by 1105, approximately one hour after the explosion. The single telephone line into the mill was jammed. Since medical help had already been summoned, K5HHA, being an employee of the mill, was put to work handling traffic to Silsbee and Beaumont naming the uninjured. W5STP handled the Beaumont traffic and W5RBQ/m did a good job of keeping the 3855 kc. frequency cleared. The emergency was declared over at 1210. — K5HGZ, EC Silsbee, Texas.

— . . . —

Lake Michigan storms don't often hit Evanston, but on Sept. 26 at about 1900 it was hit by a real dilly which lasted fifteen minutes and did extensive damage. Evanston radio officer W9BUK got in touch with K9IEB and instructed him to survey the situation in his mobile. The latter found quite a turmoil, and a desperate need for mobile communications facilities. Three RACES mobiles were put into action on two meters. Information was relayed to W9BUK, who relayed it to proper authorities. The mobiles assisted in directing traffic, marking blocked streets with flares, removing live wires and branches and running errands for the police. They worked at these jobs until 0500 and were congratulated publicly by the Evanston police chief for their work. Besides the two already mentioned, W9KZA and K9OER participated in this work. — K9IEB.

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Mobiles in Western Michigan mobilized to conduct a search for a missing plane on Aug. 8-9. The plane left Muskegon on Saturday morning (Aug. 8) bound for Rockford and when it failed to show up, was listed as missing. Eight mobiles converged at Stevensville, south of Benton Harbor, to participate in the search, under Van Burun County EC K8IWF. They were operating on 75, 10 and 6 meters when the alert was called off. It was all a mistake.



The Los Alamos Amateur Radio Club (N.M.) participated in a test on the Sept. 12-13 week end to find out how much food, lodging and medical aid would be available in northern New Mexico in case of evacuation of Los Alamos. This is W5GXU, shown operating club station W5DPO.

The plane had run into rough weather and had landed safely at Meigs Field, Chicago. — W8YAN, SEC Mich.

Amateurs all over the country helped provide communications for the Thirteenth Annual Powder Puff Derby, July 4-8, 1959. We have detailed reports from W7OBH at the western terminus and from W2MTA at Binghamton, N. Y., the No. 1 stop point. W2MTA operated his home station with the assistance of two other amateurs, W2EWO from Oswego with one additional operator, and at the Broome County airport K2OYX/2 was manned by eight amateurs. This took place on both six and 40 meters.

Operation at the Spokane terminus of the race was quite comprehensive. Stations were set up at Felts Field, at the Davenport Hotel, and supplemented by W7OBH and W7HCJ at their home stations. Each station operated on a regular schedule. In all, 33 operators took part. The station at the hotel, race headquarters, was operated 100% by YLs under the direction of W7GXL. The club call, W7NBR, was used. The station at Felts Field was operated under the call of K7AFE in the Air National Guard tower. W7OBH took care of the long-distance contacts as well as handling local traffic. Schedules were maintained with W7WMT in Helena, W7YUP in Miles City, W9BYN in Kokomo, Ind., and W1PFA at the starting point. A total of 63 messages were handled. W7HCJ was chief of communications and operated from his home station; he maintained contact with Bismarck, Fargo and Rochester as well as being in constant communication with Felts Field, the hotel, and W7OBH.

We're pretty jubilant about the August SEC reporting record. We received reports from *twenty-nine* sections. This is an all-time record in number of sections heard from in a single month, and that it comes in a midsummer month is even more surprising. The total AREC members represented by these reports is also a record, 10,301! Two sections, Michigan and Eastern Fla., record over a thousand AREC members. Two new sections, Md.-Del.-D.C. and South Dakota, make their appearance for the first time in 1959, putting the total different sections heard from this year at 39. This is past the half-way mark, fellows! It's a reflection of the clean-up campaign going on these days by SCMs and their SECs. Sections submitting August reports: S. Texas, Md.-Del.-D. C., Ore., E. Fla., Colo., Wyo., Mich., S. Dak., N. Mex., Tenn., W. N. Y., Nevada, Minn., Ind., San Joaquin Valley, E. Pa., Ga., N. Dak., E. Bay, Utah, NYC-LI, W. Va., Ala., Wis., Wash., Vt. Santa Clara Valley, Ont., W. Mass.

RACES News

Last month we promised to keep you filled in on results of the USCDARA conference in August. Complete details are still not available, but we can now state that the attendance roster shows delegates from 14 states attended, plus representatives of OCEM Regions 1, 4, 5 and 6, also from OCEM National Headquarters in Washington as well as from Operational Headquarters in Battle Creek, FCC, USNR, MARS-Army, the National Assn. of State and Territorial C.D. Directors, and ARRL. A complete report of the all-important Frequency Allocations Committee has not yet been received, but we understand one recommendation was that s.s.b. be used exclusively on all RACES segments below 28 Mc. after Jan. 1, 1961, and that frequencies be assigned only to states that could justify the use of radiotelephone for long-haul circuits. It points out that by the use of repeater stations many of the states can be adequately covered using the 6- and 2-meter v.h.f. channels; otherwise, c.w. or RTTY can be employed, although this mode will be used mostly for interstate and interregion coverage. However, one state dissented, the first time this has happened in the Alliance.

Speaking of RTTY, the Technical Committee's report dealt exclusively with recommendations for standards on this mode of transmission, in order that all equipment would be compatible. Details are available, but no space to reproduce them here.

More later, if or as we get it.

A RACES plan has been drawn up for Boone County, Ark., and a net organized to meet on 3993 kc. K5UUIJ is the radio officer and W5WEE controls the net, which meets

three times per week. The c.d. director is also an amateur, W5OCY, which is a help. Plans are being made to work this net in with the radar weather tracking unit, with a kilowatt transmitter and control center at the National Guard armory.

On August 25, the RACES repeater station in Los Angeles was used in an activity of the Los Angeles County RACES group aimed at providing communication for an attempted Catalina Channel swim by a certain Capt. Evans. Since K6LKH, the station on the boat following the swimmer, was very low power and used only a 19-inch whip antenna, the use of the repeater station, K6MYK, was required and made communication perfect. Initial contact was made when K6LKH was just offshore of Catalina Island, approximately fifty miles from the repeater. Reliable communications were conducted through K6MYK for twenty hours. Five operators worked in shifts at the control point of K6MYK. The group received excellent publicity on the project.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for September traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CTL	259	244	1916	493	3088
W2KEB	314	1690	1251	421	3676
K2UTV	314	1410	1258	90	3072
K9AIR	22	1127	968	124	2241
W7BA	22	1053	1001	51	2127
K6MCA	45	960	990	11	2006
K5WSP	54	747	744	14	1559
W0LGG	398	556	506	51	1511
W0SCA	33	664	662	2	1361
K6BPL	25	659	629	30	1343
W0BDR	34	698	593	27	1342
W8UPE	24	613	538	74	1249
W0COT	6	620	560	25	1211
K0ONK	124	520	502	15	1161
W0LX	23	564	518	46	1151
W6GYH	212	460	456	12	1140
W9DYG	33	544	506	29	1112
W6RBY	24	561	371	97	1053
K4CX	26	497	436	58	1017
W4PL	12	550	371	16	949
W9NZZ	262	310	0	310	882
W9DO	18	414	368	64	864
K4AHA	21	416	380	30	847
K6HLR	23	428	335	30	816
K4SJE	155	347	298	29	809
K8YB	38	376	345	31	790
K9DAC	17	374	359	15	765
W6WPF	2	381	373	8	764
K1CTF	186	281	231	16	714
VE2WJ	579	77	49	7	712
W7BDU	1	344	341	1	687
W1PXC	12	330	226	2	670
K0CLS	15	325	315	4	659
K1BCS	98	277	212	57	644
W3VR	54	296	263	24	637
W3IVS	22	290	287	28	627
W7ZE	7	306	298	6	617
W0CZP	13	308	227	20	627
K4QES	101	224	222	2	549
W9TT	25	250	195	55	525
K5JLF	8	256	233	21	518
W7DPW	14	256	241	4	515
K5IPJ	12	265	213	19	509
W0BLL	1	251	247	3	502
K60ZT	3	249	235	14	501
Late Report:					
K5WSP (July)	.62	523	519	18	1122

More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
W6IAB	133	870	819	51	1873
K1GRP	39	269	259	10	577

BPL for 100 or more *originations-plus-deliveries*:

K4CNY	169	K2SFL	116	K6TJG	106
W9HCG	162	K7CFL	114	W8DAE	106
K9LFE	159	W9AN	114	W6KJZ	105
W9ETM	140	W6EFE	113	K3WBJ	104
K6GZ	125	K4IFR	110	K4YCG	101
K488A	121	W3TN	109	Late Report:	
K7BKH	121	W4AZA	106	W4GXR (Aug.)	101
W5ZTN	118	W4BAZ	106		
W7AVN/5	118	K4ZKU	106		

More-Than-One-Operator Stations

K0HEA	422	K4WCZ	249	K5NAO	5 115
K61DT	255	W3MFW	143	W6ERG	100

BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: W1NJL, W6WPF.

The BPL is open to all amateurs in the United States, Canada, Cuba and U. S. possessions who report to their SCM a message total of 500 or more or 100 or more *originations-plus-deliveries* for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.



TRAFFIC TOPICS

Once in a while, just browsing around the band listening to the traffic nets, we hear an NCS say something like: "W9ABC please call W0XYZ and if O.K. up 5 kc. and clear Iowa tfe." Either that or the NCS will ask W9ABC if he can hear W0XYZ, whereupon W9ABC asks W0XYZ to QSV; then, if the answer is affirmative, the NCS instructs them to QNY to clear their traffic.

This is a time-wasting and roundabout procedure, but at the present time there seems to be no short-cut for it. It occurs to us that there ought to be some way devised to do this without all the detailed instructions. The obvious way would be use of a new QN signal, since it is a situation that often occurs.

Trouble is, all the QN signals, from QNA to QNZ, already have specific meanings. Now if we could alter the meaning of one of them to accomplish the above objective. . . . Looking down the list, we find the closest one to this meaning now is QNV, which means "Please request to QSV." This isn't very close, but our experience indicates that QNV isn't used very often on the average net. We'll wager that a good many c.w. netters wouldn't even know what it means without looking it up.

Now suppose we altered the meaning of QNV to: "Call and if O.K., move (up or down . . . kc.) to clear This leaves three blanks to fill in, and that's more than we like with a QN signal. But in the above example, the NCS could now say: "W9ABC QNV W0XYZ UP 5 IOWA." Is this a worthwhile shortening? We think it is, when you consider that the normal NCS instruction (in which he assumes that the stations can copy each other) would be exactly the same except for the QNV, which means, in effect, that they should check with each other on the net frequency before moving, in order to make sure they can copy each other.

We don't like to be forever making changes in the QN signals list, but thought we would mention this as a possibility that might be a real advantage. There are other possibilities, too, and if you think of any we'd be glad to know your thoughts — because if we make changes we ought to make them all at once, not have to change our literature again and again.

Another NCS instruction we have heard that is even longer and more cumbersome is one like this: "W9ABC UP 5 WAIT FOR W0XYZ TO FINISH WITH W5DEF THEN QNK IOWA." Can we do something about this, too? What other situations do we have that require frequent lengthy NCS instructions that are not covered by Q or QN signals that could be? Give it some thought, you traffic men.

— . . . —

Net Reports. Hudson Traffic Net reports 30 sessions, 302 check-ins, 251 messages for September. Early Bird Transcon Net had 30 sessions, handled 850 messages. The 7290 Traffic Net reports 651 messages handled by 1038 check-ins during 42 sessions. Eastern States Net had 30 sessions, 306 check-ins, a traffic total of 207.

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National Traffic System. Get ready, we're going to do some more griping. First, however, lest you misunderstand, let it be said that constant listening shows the NTS nets to be, generally speaking, head and shoulders above most. Hang onto that bit of praise, now, while we enumerate some of the faults we have noticed.

First of all, the procedure is too long, too detailed, and often too fraternal, too casual. We're here to clear the traffic, let's clear it, then visit with each other. This point has been argued at many traffic gatherings, but we're still of the opinion that a traffic net should devote all its attention to handling traffic while it is QND (directed). Some of the gang may be in a hurry and not like to sit around while the NCS exchanges pleasantries with the net members or spells out an instruction that could be contained in one or two Q signals. Let's study ways of shortening our procedure, get the traffic cleared and out of the way; then we can chat with each other.

Too many net control stations think they are speed demons. Slow down! You're not gaining anything by sliding up the weights on your bug, and nobody is impressed. Your accuracy suffers and you have to repeat instructions because the net members can't understand you.

Net stations fall asleep. This may be the net control's fault for forgetting about them, but usually it is the individual's fault for not staying alert. When the NCS calls you, be there!

The net station that really drives the NCS crazy is the one who reports in with a wad of traffic when the net is almost over. Sometimes this is hard to avoid, but it should be avoided, somehow. If you intend reporting into the net, get there on time. Nothing can drop an NCS's spirits lower than an initial call-up that goes 100% unanswered.

Fellows, how about paying more attention to the little things about net and traffic-handling procedures? Use that separation sign (AA) between the parts of the address! Use the ending signal AR at the end of the message. Make sure every message you transmit has a check — and a correct one, too!

Zero beat that NCS! This is easily and quickly done if you know how. Just switch off your b.f.o., turn on your transmitter oscillator, tune it until you can hear the NCS, and bring him to zero beat. You'll be right on him. Make a note of your v.f.o. dial setting, so you won't have to do this every time you come back to the net frequency during a session.

Use break-in. So many traffic men make a big deal out of this, but there is nothing to it if you are willing to sacrifice a little ear-comfort. High-efficiency traffic handling without break-in isn't possible.

Let's improve our accuracy. It needs it. All this requires is a little care. Don't let a slip of the bug (or tongue) go by uncorrected. If you miss something, don't guess at it; get it confirmed or repeated.

Bear in mind the formula for efficiency: $E = AS$, where A is Accuracy and S is Speed. NTS is out for efficiency. September reports:

Net	Ses- sions	Traffic	Rate	Average	Repre- sentation (%)
EAN	28	976	.685	34.9	98.2
CAN	30	983	.708	32.7	100.0
PAN	30	1368	.649	45.6	100.0
1RN	29	611	.574	21.1	88.2 ¹
3RN	60	498	.316	8.3	78.3
4RN	60	594	.325	9.9	63.1
RN5	60	851	.437	14.1	94.2
RN6	60	1339	.393	22.3	94.2
RN7	60	592	.278	9.9	42.1
8RN	59	257	.152	4.4	—
9RN	52	1544	.776	29.6	77.4
TEN	60	855	.312	14.3	69.6
ECN	20	36	.113	1.2	60.0 ¹
Sections ²	959	7013		7.3	
TCC Eastern	59 ³	220			
TCC Central	60 ³	1123			
TCC Pacific	112 ³	1211			

Summary	1567	20071	9RN	11.2	CAN/PAN
Record	1442	15861	.882	15.4	100.0
Late Reports:					
PAN (July)	31	1459	.795	47.1	100.0
PAN (Aug.)	31	1675	.798	57.3	100.0

¹ Regional representation based on one session per day. Others are based on two or more sessions per day.

² Section nets reporting: BCEN (B. C.); AEN-O, AENB, AENP, AENP Morning (Ala.); TPTN, Gator, FPTN, FMTN (Fla.); BUN (Utah); NJN (N. J.); Iowa 75 Phone; QKS (Kans.); WSSN & WIN (Wis.); SCN (S. C.); GSN (Ga.); SCN (Cal.); ILN (Ill.); CPN & CN (Conn.); TLCN (Iowa); VFN (Va.); S. Dak. CW, S. Dak. 75 Phone, S. Dak. 40 Phone; NEB (Nebr.); MPN Evening, MJN, MSN, KMG, MPN Noon (Minn.); Tenn. Slow; WSN (Wash.); KYN (Ky.); HNN, Colo. CW (Colo.).

³ TCC functions, not counted as net sessions.

Each month the substantial increase over the same month of last year in sessions and traffic shows the gain in system acceptance by the traffic fraternity. This does not (or should not) mean that those in the system should have to work harder. It should mean that more traffic amateurs in the system share the greater load. Where it has not worked out this way, recruitment of additional operators is required. Let each of us take our cue from that fact.

CAN is having troubles clearing its eastbound traffic, but getting it done. Lateness of PAN NCS in reporting to the manager has delayed PAN reports. Another attempt

is being made to run a second (late) session of 1RN; certificates have been awarded to K1s HAN HWF LSM and W1SO. School and college is taking its toll of the young staff of 3RN, but the net is still holding its own. K5QNF is the new manager of RN5. RN6 is back on its winter (PST) schedule. RN7 certificates have been issued to W7KZ and K7BYC; 2070 participation by Alaska, Idaho, Alberta and Saskatchewan in September. W9ZYK has issued 9RN certificates to K9AIR, W5DTA/9 and K9PLF, all of Illinois.

Transcontinental Corps. There seems to be some question regarding the jurisdiction of TCC Directors over certain assignments of TCC functions. The TCC is set up for ten functions per day. Four of these functions are under the jurisdiction of the TCC-Eastern director, two under the TCC-Central director and four under the TCC-Pacific director. This is not set up arbitrarily or at random, but specifically and for good reason. The geographical location of the station performing the function doesn't change the matter of which director has jurisdiction; that is, if a station located in the central area is performing a function normally assigned to an eastern area station, the function is still assigned by the TCC-Eastern Director and its completion reported to him. Just to clarify this matter, here are the functions (with thumbnail descriptions) assigned to each TCC director (full details in CD-24): TCC-Eastern (W3-WG, director) — Station A (takes from EAN, puts it directly into CAN), B (takes from EAN, gives to Station H), C (takes from CAN, puts it directly into eastern area NTS nets or into EAN), D (takes from Station J, puts it directly into eastern area nets or into EAN). TCC-Central (W8-BDR, director) — Station E (takes from CAN, gives to Station G) and F (takes from Station I, puts directly into central area nets or into CAN). TCC-Pacific (W6EOT, director) — Station G (takes from Station E, puts it directly into PAN), H (takes from Station B, puts it directly into PAN), I (takes from PAN, gives it to Station F), J (takes from PAN, gives it to Station D).

Does that help to clear up the matter, or only make it more confusing? If the latter, see CD-24. September reports:

Area	Functions	% Successful	Traffic	Out-of-Net Traffic
Eastern	59	88.1	976	220
Central	60	93.3	1829	1123
Pacific	112	92.9	2473	1211
Summary	231	91.8	5278	2554

The TCC roster: Central Area — W9CXY, W8BDR, W8LCX, W8SCA, W8LGG; Pacific Area — K6s OJV ZYZ HLR GID, W7s EOT WEP HC YHM CMA, K7CWV, W7s BDU GMC, W0s EDH EDK QKD ANA.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made Nov. 18 at 2130 Eastern Standard Time. Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,600 kc. The next qualifying run from W6WGP only will be transmitted Nov. 5 at 2100 PST on 3500 and 7129 kc.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EST. Approximately 10 minutes' practice is given at each speed. Reference to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of QST text sometimes is reversed. To improve your fist, hook up your own key and audio oscillator and attempt to send in step with W1AW.

Date Subject of Practice Text from October QST

- Dec. 1: 160 for Mobile?, p. 26
- Dec. 7: Firing Up on 6 and 2, p. 23
- Dec. 10: Riding the Rails, p. 44
- Dec. 14: The Perseids Powerhouse, p. 32
- Dec. 22: Balloon Mobile, p. 62
- Dec. 30: The Story of K54BB, p. 74



This is W6EOT, director of the Pacific Area of the Transcontinental Corps (TCC), ARRL National Traffic System. Here is a station really set up for c.w. traffic handling. Transmitter is a much-modified DX-100. The tape recording equipment is not for hi-fi purposes; he can record either from his v.f.o. or the receiver, then play back through an automatic keying device. This system is used frequently for traffic work.

A.R.R.L. AFFILIATED CLUB HONOR ROLL

This Honor Roll is published as a special recognition for all affiliated clubs whose entire membership consists of members of the League. We are here pleased to present the second Honor Roll listing for 1959. See page 95 of June QST for the earlier listing of those affiliates with 100 per cent ARRL membership. Our honor list is prepared each time on analysis of data received in connection with each club's returned early-'59 Annual Report. This coming January or February a new survey form will be sent every active ARRL-affiliated radio club for the annual filings on which continued affiliation and our QST listings are based. These following Honor Roll clubs also now will receive our "100% ARRL Club" certifications following publication of this listing in QST:

- Amateur Transmitters Association of Western Pennsylvania, Pittsburgh, Pa.
- Avenel Radio Club, Avenel, N. J.
- Bandhoppers Radio Club, Ferguson, Mo.
- Beaver Valley Amateur Radio Association, Rochester, Pa.
- Binghamton Amateur Radio Association, Inc., Johnson City, N. Y.
- Central Texas Amateur Radio Club, Waco, Tex.
- Coffee Dunkers, Detroit, Mich.
- Colchester Amateur Radio Association, Truro, N. S., Canada
- Helix Amateur Radio Club, Santee, Calif.
- Lake Success Radio Club, Great Neck, L. I., N. Y.
- Northeastern North Carolina Amateur Radio Club, Elizabeth City, N. C.
- Order of Boiled Owls, Levittown, N. Y.
- Orlando Amateur Radio Club, Inc., Orlando, Fla.
- Ottawa Radio Club, Inc., Ottawa, Ill.
- Radio Association of Erie, Inc., Erie, Pa.
- The Reading Radio Club, Inc., Reading, Pa.
- St. Louis Amateur Radio Club, Inc., Valley Park, Mo.
- Scott County Amateur Radio Club, Scott City, Kans.
- Smoky Valley Radio Club, Abilene, Kans.
- Southwest Missouri Amateur Radio Club, Inc., Springfield, Mo.
- Sunrise Radio Club, Inc., Cambria Heights, L. I., N. Y.
- Sweetwater Amateur Radio Club, Sweetwater, Tex.
- The Thirteen Amateur Radio Club, Burnaby, B. C., Canada
- Tri-City Amateur Radio Club, Phillips, Tex.
- Valley Radio Club of Eugene, Ore.
- Wichita Amateur Radio Club, Wichita, Kans.

CLUB COUNCILS AND FEDERATIONS

- Michigan Council of Clubs, Roland R. Beineman, W8QBA, Secy., 136 Guild St., N.E., Grand Rapids 5, Mich.
- Ohio Council of Amateur Radio Clubs, Karl H. Kanatz W8THX, Secy., 225 Tibet Rd., Columbus 2, Ohio.

ELECTION NOTICE

(To all ARRL members residing in the Section listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. The notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are required on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reasons of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested. (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the.....
.....ARRL Section of the.....
Division, hereby nominate.....
as candidate for Section Communications Manager for this
Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— F. E. Handy, Communications Manager

Section	Closing Date	SCM	Present Term Ends
Yukon*	Dec. 10, 1959	W. R. Williamson	Mar. 17, 1949
West Indies	Dec. 10, 1959	William Werner	Aug. 10, 1958
Mississippi	Dec. 10, 1959	John Adrian Houston, sr.	May 29, 1959
Saskatchewan*	Dec. 10, 1959	Lionel O'Byrne	June 10, 1959
Manitoba*	Dec. 10, 1959	James A. Elliott	Aug. 9, 1959
Quebec*	Dec. 10, 1959	C. W. Skarstedt	Dec. 15, 1959
Eastern			
New York	Dec. 10, 1959	George W. Tracy	Feb. 10, 1960
Maritime*	Dec. 10, 1959	D. E. Weeks	Feb. 15, 1960
Maryland-Delaware-D. C.	Dec. 10, 1959	Arthur W. Plummer	Resigned
South Carolina	Jan. 11, 1960	Dr. J. O. Dunlap	Mar. 4, 1960
Ohio	Jan. 11, 1960	Wilson E. Weckel	Mar. 5, 1960
North Carolina	Jan. 11, 1960	B. Riley Fowler	Mar. 6, 1960
Georgia	Jan. 11, 1960	William F. Kennedy	Mar. 18, 1960
Arizona	Feb. 10, 1960	Cameron A. Allen	Apr. 15, 1960
Tennessee	Feb. 10, 1960	R. W. Ingraham	Apr. 15, 1960
Washington	Feb. 10, 1960	Robert B. Thurston	Apr. 30, 1960
Alberta*	Feb. 10, 1960	Gordon W. Hollingshead	May 1, 1960
Santa Barbara	Mar. 10, 1960	Robert A. Hemke	May 9, 1960
Louisiana	Mar. 10, 1960	Thomas J. Morgavi	May 31, 1960

*In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Utah	Thomas H. Miller, W7QWH	Oct. 29, 1959
Illinois	Edmond A. Metzger, W9PRN	Dec. 15, 1959
Western Florida	Frank M. Butler, jr., W4RKH	Dec. 15, 1959

In the Indiana Section of the Central Division, Mr. Clifford M. Singer, W9SWD, Mr. Raymond L. Hupp, W9CLF, and Mr. John Lamey, W9BDG, were nominated. Mr. Singer received 365 votes, Mr. Hupp received 205 votes and Mr. Lamey received 164 votes. Mr. Singer's term of office began Oct. 14, 1959.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (Kc.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.m.* — 3535, 7050, 14,060; *phone* — 3765, 14,160, 28,250 kc.

YELLOWSTONE EARTHQUAKE

It seems there was much activity in Montana and Idaho in connection with the earthquake in the vicinity of Yellowstone Park on August 17. Many people were killed when a mountain side fell into a canyon and buried a camp ground on the Madison River west of the Yellowstone Park boundary, with communications thoroughly disrupted throughout the area. We have so many reports from so many different people that it is next to impossible to arrive at a sensible chronology of events. So let's paraphrase each report briefly:

W7ED (EC Gallatin Co. Mont., in which quake occurred): The quake occurred at 2342 on Aug. 17, causing a slide and burying some 20 people at the Rock Creek camping ground and threatening the Montana Power Co. dam on the Madison River. W7ED was on the air 20 minutes later, checking stations into the Montana Net on 3910 kc. First contact with disaster area was with W7AYG/m at West Yellowstone, through whom the amateurs were able to inform the sheriff, highway patrol and Red Cross that the Hehgen Dam was apparently undamaged, since the level of the lake was not affected. K7ICM, also at West Yellowstone, was contacted later, and it was primarily through this station that communication was maintained for the next 48 hours, at which time regular communication with the area was reestablished. After that, the net continued handling "worry" traffic and 100 messages for Western Union.

W7KUH (SEC Montana): First amateur radio contact with the disaster area was by W7ED to W7AYG/m. K7ICN in West Yellowstone contacted the outside 20 minutes after the quake, but this was by Weather Bureau facilities. K7ICM was on the air from West Yellowstone six hours after the initial quake, and most of the traffic was handled through this station. W7JPD flew in equipment to be used at K7ICM when the latter was having difficulty.

K7ICN: This station was first to establish contact with the outside. K7ICM was on the air later.

W7GGV (SCM Idaho): Assumed net control of Idaho Sixth District C.D. Net at 0715 Tuesday (Aug. 18). Five radio officers reported in. W7JDS monitored Montana Net frequency for information. Sheriffs, Chambers of Commerce and motels were contacted reference possible evacuation procedures. Other amateurs checked into the net. W7RKI informed he had been up all night. Only K7ICM was on the air from West Yellowstone, with low power. Later he increased power, better contact was made. The net moved to 40 meters at 0900. W7OA advised he had been operating all night under civil defense, in contact with both Idaho and Montana c.d. The net assisted W7OA in relaying traffic; several distant relays were necessary because of conditions on 40. W7DWE and W7RKI arrived in West Yellowstone at 1600 Tuesday, set up stations. W7JAU took over operation of K7ICM during the evening. W7HPII in Boise and W7YBA in Pocatello operated throughout the night Tues-

day. The emergency phase of the operation was terminated at 0830 Wednesday, but amateurs continued handling "worry" traffic for the Red Cross.

W7RKI: Shortly after midnight Tuesday, W7AYG/7 in West Yellowstone was heard trying to relay traffic to report damage on the Montana Net on 3910 kc. W7RKI broke in to assist in relaying, and his services were welcomed. W7ED took over as NCS and continued throughout the night. W7OA was called by civil defense and came on the air at 0300. Big question was status of the dam on the Madison River. Amateurs were able to report that the lake level was unchanged and apparently the dam was holding, thus quenching rumors that it had burst. K7ICM in West Yellowstone being hard to copy, W7RKI continued to act as relay station.

In the morning, W7RKI dismantled his home station, put it into his car and proceeded to West Yellowstone. Being unable to locate K7ICM, he set up the rig with a makeshift antenna at the airport, upon request of officials. Finding difficulty in getting out, his traffic was relayed by K7ICM, who by that time had been supplied with a better transmitter by W7ED. W7DWE arrived with his mobile rig at 1600. The station was dismantled at 1900 when there appeared no further need for it.

W7OA: Came on the air at 0247 Tuesday on the FARM Net frequency, but was unable to obtain any information. Located W7RKI, through him kept UPI informed as details unfolded. K7BJH established 2-meter link to c.d. headquarters in Boise and from there regular communication was available to Montana c.d. headquarters in Helena. W7OA operated continuously until 1930, at which time W7HPH took over his duties and, with the assistance of Boise amateurs, stood by until 0930 Wednesday at which time the services of the amateurs were no longer required.

W7IA: Colorado Weather Net members were asked to get information for two Denver broadcast stations on the actual situation in the earthquake area. W7URH and W7WUN established contact with the Idaho C.D. Net, which was



W7ED of Bozeman, Mont., EC for Gallatin County, the area in which the Aug. 17 earthquake of Madison Canyon and Yellowstone Park hit. Through this station the first contact to the stricken area was made through W7AYG and K7ICM and maintained some 40 hours.

being operated by W7OA and W7GGV and tied in with Montana C.D. through stations in Bozeman. Necessary to use 40 meters, as 75 meters was dead. Frequent relays required from Colorado stations. W7OA, by continued diligent efforts, did a most commendable job of arranging air evacuation of casualties.

Each of those who reported submitted a few calls of amateurs who did outstanding work. The following is a compilation of those in this category not already mentioned above: W7s GI FTD MM EOI YLC YLD CDG/m ZUQ, K7s ALA GHX. Much favorable publicity resulted from this amateur operation in an entirely unforeseen emergency.

DX Century Club

The following list contains the call letters and countries totals of all holders of the Postwar DX Century Club Award as of September 30, 1959. The calls of new members as well as those receiving endorsement credit during the period September 1 through September 30, 1959, are included in this listing.

• 296 W6AM ZL2GCX	• 289 W6DZZ W7AMX W7GBW W7GUV G2PL	• 284 W2LPE W3GAU W9LNM ZS6BW	W8JBI W8KML W8LKH HB9J	W0NTA	HB9EU	• 262 W3JTC W4FLJ W8PUD W9FDX W9WHM DL7AA	• 259 W3EPV W5KBU W6MEK KH6IJ	W4LZF KH6CD W0NUC G3YF G5VT	W3OP W4AAU W4FVR W5NW W5OGS W6NJU W6PH K6UYC W2BRV W2HQL W4CFD W8BHS W9GRV W9BFB W0XO VE3DIF IAOF OK1MB SM8AP	• 245 W2RWE W2ZX W9SFR W0BVY FA8IH G3AAE
• 295 W1FH W8HGW	• 288 W3BES W3KT W4DQH W5BKP W8DMD W9RBI	• 283 W2QHH W4TO W6GPB W6VE W7FZA LU6DJX	• 278 W5KC W7PHO W8NBK W0QVZ VE7ZM	• 271 W1TYQ W4KFC W6YMD W7AC W8MPW VK2DI	• 266 W4HA W9ABA W9AMU W0DU	• 261 W1ZW K2BU W3IYE W4GXB W5CKY W5OLG W6BVM W8ZEN W7ADS G6RH	• 258 W2ZGB W8UDR F8BS	• 257 W6ALQ W6TXL W8QJR W9UXO	• 252 W2BRV W7FB W7HIA W8BHS W9GRV W9BFB W0XO VE3DIF IAOF OK1MB SM8AP	• 244 W1HZ W2CTO W8CED
• 294 W3GHD	• 287 W1CLX W4TM W8ADP W6EBG W6TT W8UAS	• 282 W1BIH	• 277 W6NTR	• 276 W3LMA 4X4DK	• 265 W2CNT W2DEC W2JVV W3DRD W4LWV W5AFX W0QDF GM3EST	• 260 W1MV K2GMO W3PGB W5UX W6CTL W6EFR K6ENX K6EVR W6KEV W6OME W6QNA W6VFR VE2WW OK1WF VK4FJ	• 256 W8KPL W0GKL	• 255 W2CR W2TVR W5BZT G3HLS	• 251 W1HX W1IAS W2OKM W4IMI W6KZL W8CLR LA7Y ON4AU	• 243 W1VG W1ZZK W2HSZ W3WGH W6WO I1AMU I18M ON4NC
• 292 W2AGW W4BFD W8BRA W8JIN G3AAM KV4AA	• 286 W5ADZ W6MX W8NNV W6TS W8KIA W9KOK W9NDA ZL1HY	• 281 W2HMJ W2JT W2WZ W6YY	• 275 W1ADM W1AXA W2KUW W6CVV	• 270 W3ECR W5BCP W7KTN W8SYC W8TMA W9FJB W9FKC W0NLY SM5LL	• 264 W2CT W2CUM W3KDP W5FFW	• 260 W1MV K2GMO W3PGB W5UX W6CTL W6EFR K6ENX K6EVR W6KEV W6OME W6QNA W6VFR VE2WW OK1WF VK4FJ	• 256 W8KPL W0GKL	• 255 W2CR W2TVR W5BZT G3HLS	• 251 W1HX W1IAS W2OKM W4IMI W6KZL W8CLR LA7Y ON4AU	• 242 W1CWX K2CPR W8YIN W3RUT
• 291 W1ME W3JNN W6CTQ W6CFE W9NDA ZL1HY	• 285 W1GKK W9HUK CE3AG	• 280 W1FYH G6ZO VK2ACX	• 273 W2TQC W5ABY W5MMK W6MUR W68N	• 269 W4MR W5EGK W6UHA W0DAE	• 264 W2CT W2CUM W3KDP W5FFW	• 260 W1MV K2GMO W3PGB W5UX W6CTL W6EFR K6ENX K6EVR W6KEV W6OME W6QNA W6VFR VE2WW OK1WF VK4FJ	• 254 W2AYJ W2BOK DL7BA G3DO 4X4RE	• 250 W1BL W1PZ W1BZVP W2CYS W2GVZ W2LAX K20EA W2SUC W2TXB W3LOE	• 248 W5MIS K6EWL W8YIN HB9X	• 241 K4LNM W6TZD W7HXG W8GLK VE6X VE7GI CE1DZ CB3RO G3FNN

(Continued on page 180)

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: DUI, PAM; TEJ, RM; AZA. The PFN Phone Net meets nightly Mon. to Fri. at 1800 EST on 3850 kc. The EPA C.W. Net meets each night at 1830 EST on 3610 kc. With the assistance of OY and BPZ the Lancaster and Reading sections are being covered by the traffic nets. BES is a new OBS in the Philadelphia Area on 53.5 Mc. QJG is the new EC for Schuylkill County. New club officers of the Oxford Circle RC are K3ALU, pres.; K3BFW, vice-pres.; K3ACD, secy. Officers of the Delaware Lehigh ARC are JNC, pres.; FVT, vice-pres.; GEU, secy.; EYV, treas. K3ALD made DXCC. FKE received the R6K Award. This is the Russian equal to WAS. The 807 Society Club station is K3GTZ. K3ATX got all counties for the W-DEL Award on 6 meters. CUL has a new beam and 60-ft. tower to assist West Coast traffic. MFW set up a booth at the Elizabethtown Fair and handled enough traffic to make BPL NF added another 813 to QRO to 700 watts. Hurricane Gracie gave us all a scare but BUR and the Bucks County AREC were prepared for her. So was the PFN gang, with IVS standing a 20-hour watch on the net frequency. ZLP had a rough time of it making net skeds because of Daylight Saving Time. K3DSQ is going to be QRT for the winter months because of enrollment at the University of Dayton. DUI is sportin' a new HQ-145 receiver. K3s EGP and GFF report results good on phone. The Chester County Emergency Net Club is having its share of parades. The Downingtown Centennial and the Newark, Delaware Parades were handled in fine shape by ten of its members. K3HAI is now General Class. AHX and GOQ, father and son, won the first "WAWPRAM" certificates from the West Philadelphia Radio Assn. GOQ also made DXCC. VKQ and ADE received certificates of merit for the Armed Forces Day messages. The Bucks County ARC held a Corn Roast. DVB, ZJD and KN3HWG were VEI visitors over the Labor Day holiday. I wish to take this opportunity to wish you all a very Merry Christmas. Traffic: W3CUL 5082, VB 627, IVS 627, HNK 191, AXA 160, MFW 146, ZRQ 96, KMD 89, K3DCB 75, DRS 57, W3PFE 47, NNL 42, NF 38, K3HLU 34, AHT 28, W3PYF 22, K3ANS 20, W3TTW 20, BFF 16, BUR 16, CUY 14, AMC 12, ZLP 8, WHK 7, K3ALD 6, W3JSX 6, K3DEM 5, DSQ 5, W3NQB 4, ADE 2, DUI 2, K3IAZ 2, W3OY 2, YLL 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Arthur W. Plummer, W3EQK—Asst. SCM Delaware: P. R. DeCourcelle, 3DQZ, SEC: PKC. *Delaware Report:* K3GKF reports his DX now is 134/99. K3KEG reports K3DDE now has a power supply for a kw. John wants all to know the Delaware Amateur Radio Club meets the 2nd Mon. of each month in the Levy Court Bldg. on Capitol Trail, Wilmington, Del. CPA reports FB QSOs with 5 watts on 10 meters lately. FJF reports K3GAD and K3GHC dropped the "N" from their calls. FJF worked W6-Land twice on 3895 kc. with a DX-40. ZNW is working on a fixed 10-meter beam. *District of Columbia Report:* CN says his mobile work is keeping him off the traffic nets. EOY took part in MARS CPX Sept. 17-20 and also is trying a grounded-base antenna on the mobile rig. FRM still is DXing. KN3GJW is having a rough time with code speed. MBL has a TBS-50 but no time to operate. EOY thinks he has gotten all but one bug out of the mobile rig receiver. Ted is having trouble with the jr. YL operator, who monopolizes Papa's QST each month before he can get it and tells him she should have a copy too. K3ANA has been in California on vacation. AHQ has been doing a yeoman job as OO and I want to take this opportunity to congratulate him and tell him to keep

up the good work. Russ also is in the Weather Bureau Net twice a month on 3935 kc. 9 A.M. Sun. BUD has less and less time for ham radio. *Baltimore Area Report:* K3DCP does a bang-up job of arranging entertainment for meeting nights for the BARC. He also worked hard in the Sept. F.M.T. and hopes to qualify for Class I or II. The BARCS had its Annual Dinner meeting Oct. 5 at Welsh's Black Bottle Restaurant. Thirty-five members and XYLS enjoyed the dinner and saw a recently released General Electric Co. movie on the manufacture of vacuum tubes called "The Teacher Wore White." KHA is back in college but expects to be active from GQF, Johns Hopkins U. station. JME and JAS alerted and activated BCEN during the "Gracie" alert and tied in with NAE and Anne Arundel Co. RACES. UE reports EAX, GQF, IWJ, UE, GJD and WZL were active during "Gracie" on ICRN. GQF, WZL, GJD and KHA operators were NCSs along with UE. No activity has been reported in the Frederick, Hagerstown or Cumberland Areas. What's wrong, fellows? Congratulations are in order for K3CXK, who has just received his 2nd-class radiotelephone and 3rd-class radiotelegraph tickets and is now studying for radiotelephone 1st and radiotelegraph 2nd. DCI, the Baltimore Polytechnic Institute Radio Club, at last has its 500-watt amplifier back on the air. MSR now has in operation a fifteen-element 2-meter beam with a TR4 rotor and new 2-meter Tapeton converter. JWN now is a member of TOPS (International C. W. Ragehewers) and will be QNI from now on from EAX. U of Md. station, which plans to up power from a Globe Scout to 500 watts. ECP reports CPAM is elected president of the Washington Radio Club. *ACTOCALL*, the mouthpiece for the Foundation for Amateur Radio Clubs, Inc., now sends each newly licensed amateur in the D. C. Area a flyer on the area clubs and a free first copy of *AUTOCALL*. ZAQ worked with five members of the Aero ARC in W. Va. during the V.H.F. Party. IWJ is sorry he was not more active during the summer. Well, fellows, last but not least is our appeal for ECs for the counties that have none has drawn some blood. Montgomery County, Md., which is a very large suburb of Washington, D. C., and whose ham population is larger than that of the entire State of Delaware, has come up with some action! But we haven't heard anything from the other counties. What about it, fellows? Get in touch with PKC, your SEC. I would also like to take this opportunity to notify you all that I have resigned as SCM and turned the job over to BKE, of Washington, D. C. Tommy has graciously agreed to take over until an election can be held. Thank you one and all for your fine cooperation and interest. Please give Tom the cooperation you have given me and we'll put the Md.-Del.-D. C. section on the map. Traffic: W3UE 306, K3GJD 150, W3AHQ 149, K3WBJ 147, W3PQ 130, TN 130, COK 69, JWN 68, BKE 41, EOY 28, ECP 20, ZNV 13, BUD 12, CN 10, K3DCP 9, W3CFA 2, K3CXK 1, W3EAX 1.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2ZBG—SEC: W2YRW. RMs: W2BZJ, W2HIDW and W2ZL. New appointment: W2TQK, Pennsauken, as OES. The Gloucester Co. ARC elected the following directors: W2STW, W2SUA, WA2CUB and W2PAX. K2-DEI, Maple Shade, continues his Arctic Coast Guard skeds. The Jersey Phone Net held its Annual Meeting and Banquet during October. K2CPR has installed a new trapped ground-plane antenna. W2KHW, Maple Shade, has a new mast and a new 6-meter four-element beam. K2HBA supplied the Southern Counties ARA information this month. Meetings are held in Northfield the 2nd Fri. W2ZK has just returned from a six-week trip to Greenland. NJN Net certificates have been issued to K2LWQ, W2SJB, WA2COO and K2ZHK. W2RXL, NJN Manager, advises that the annual meeting will be held in New Brunswick. Gloucester Co. ARC's paper, *Cross Talk*, is edited by K2JKA, who is assisted by K2HLLJ, K2SOL, W2AQL, K2JKA and K2UUY operate the Gloucester Co. c.d. station each Fri. night. WA2EIE was selected "Airman of the Month" at the Andrews AF Base. W2JAV and W2PAU received a certificate of merit in a recent RTTY competition. K2MGZ is heard operating Maritime on 50 Mc. The SJRA Hamfest was bigger and better than ever this year. Over 1100 attended. W2TBD, W2JAV and K3GDI were the winners of the Hamfest 2-meter transmitter hunt. Remember K2HHO with a card during his illness. Continued support is needed by K2HOD and W2JAV in their efforts to secure

(Continued on page 134)

THOROUGHBRED



... New **SX-111** Receiver ...

\$249⁵⁰

The team that designed the famous SX-101 now brings you an entirely new class of precision receiver at a moderate price.

Objective: bring the advantages of Single Sideband to thousands more without sacrificing performance.

Hallicrafters' answer: SX-111 . . . brilliant offspring of the incomparable SX-101—a receiver that retains the essential performance characteristics of the acknowledged leader but at a price that can put it in your shack tomorrow.

STUDY THESE FEATURES

- CW • AM • SSB reception.
- Complete coverage of 80, 40, 20, 15 and 10 meters in 5 separate bands plus 6th band tunable to 10 Mc. for WWV.
- Hallicrafters' exclusive upper/lower sideband selection.
- Sensitivity: 1 microvolt on all bands. 5 steps of selectivity, 500 to 5000 cycles.
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- Dual conversion. Crystal controlled 2nd converter.
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- 10 tubes plus voltage regulator and rectifier. Operates from 105-125 volts, 50-60 cycle A.C.
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THIS SEASON— VIKING

NEW!

"6N2" THUNDERBOLT POWER AMPLIFIER—Rated at 1200 watts P.E.P. * input SSB and DSB, Class AB₁; 1000 watts CW input Class C; and 700 watts input AM linear, Class AB₁. Drive requirements approximately 5 watts in Class AB₁ linear or 6 watts Class C continuous wave. Continuous band-switched coverage on 6 and 2 meters—effectively TVI suppressed and filtered—wide range pi network output. Outstanding efficiency—losses on 2 meters held to approximately 5%, instead of common 25% losses experienced in some other 2 meter circuitry! This is possible due to the unique silver-plated Hi-Q coaxial line; silver-plated anode and other external metal portions of the 7034 tubes; silver-plated inductors; capacitors; and switch! With tubes.

Cat. No.	Amateur Net
240-362-1.....Kit.....	\$524.50
240-362-2.....Wired.....	589.50

"6N2" TRANSMITTER—This compact VHF transmitter offers instant bandswitching coverage of both 6 and 2 meters. Completely shielded and TVI suppressed, the "6N2" may be used with the Viking "Ranger," Viking I, "Valiant," or similar power supply-modulator combinations capable of at least 6.3 VAC at 3.5 amp., 300 VDC at 70 ma., 300 to 750 VDC at 200 ma. and 30 or more watts of audio. Power input is rated at 150 watts CW and 100 watts AM phone . . . shaped keying results in excellent waveform. With tubes.

Cat. No.	Amateur Net
240-201-1.....Kit.....	\$129.50
240-201-2.....Wired.....	169.50

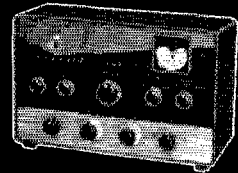
"6N2" CONVERTER—This compact Viking "6N2" Converter provides instant front panel switching from normal receiver operation to either 6 or 2 meters. Maximum sensitivity and low noise figure . . . excellent image and I.F. rejection. With tubes. Available kit or wired in either 26 to 30 mcs., 28 to 30 mcs., 14 to 18 mcs., or 30.5 to 24.5 mcs. ranges. Specify range desired.

Kits	Amateur Net \$59.95
Wired Models	Amateur Net \$89.95

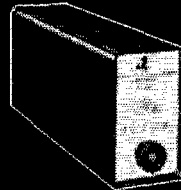
"6N2" VFO—Exceptionally stable and compact—designed to replace 8 to 9 mc. crystals in frequency multiplying 6 and 2 meter transmitters, including types using overtone oscillators. Temperature compensated and voltage regulated for minimum drift and high stability. Plexiglas dial calibrated from 144 to 148 mc., 50 to 51.5 mc., 51.5 to 53 mc. With tubes and pre-calibrated dial.

Cat. No.	Amateur Net
240-133-1.....Kit.....	\$34.95
240-133-2.....Wired.....	54.95

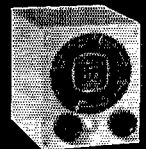
Other equipment for 6 and 2 meters!



"6N2" TRANSMITTER

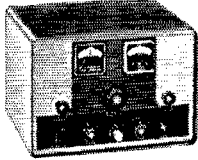


"6N2" CONVERTER

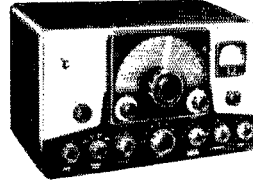


"6N2" VFO

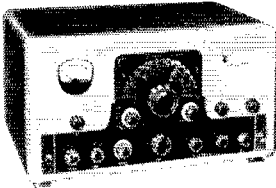
OR ANY OTHER SEASON—YOU'LL FIND A TRANSMITTER IS YOUR BEST BUY!



"CHALLENGER"—70 watts AM input 80 through 6, 120 watts CW input 80 thru 10—85 watts on 6. With tubes.
 Cat. No. Amateur Net
 240-182-1..Kit ...\$114.75
 240-182-2..Wired .\$.154.75



"RANGER"—75 watts CW* and 65 watts phone input. Bandswitching 160 through 10. Built-in VFO. With tubes.
 Cat. No. Amateur Net
 240-161-1..Kit ..\$229.50
 240-161-2..Wired\$329.50



"VALIANT"—Instant bandswitching 160 through 10. 275 watts input CW and SSB (P.E.P. with aux. exciter) 200 watts phone. With tubes.

Cat. No. Amateur Net
 240-104-1. Kit \$349.50
 240-104-2. Wired \$439.50

"KILOWATT" AMPLIFIER—This exciting unit is the only power amplifier available which will deliver full 2000 watts SSB* input and 1000 watts CW and AM! Continuous coverage 3.5 to 30 mcs. Excitation requirements: 30 watts RF and 10 watts audio for AM; 10 watts peak for SSB.

Cat. No. Amateur Net
 240-1000..Wired and tested....\$1595.00
 251-101-1..Matching desk top, back and 3 drawer pedestal..FOB Corry, Pa...\$132.00

*The FCC permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of 2000 watts or more depending upon individual voice characteristics.

3 feature-packed amplifiers!



"COURIER" AMPLIFIER—Class "B" linear rated 500 watts P.E.P. input with aux. SSB exciter—500 watts CW and 200 watts AM! Continuous coverage 3.5 to 30 mcs. Drive requirements: 5 to 35 watts. With tubes.
 Cat. No. Amateur Net
 240-352-1. . . Kit . . . \$244.50
 240-352-2. . . Wired . \$289.50



"THUNDERBOLT" AMPLIFIER—Rated 2000 watts P.E.P.* input SSB; 1000 watts CW; 800 watts AM linear! Continuous coverage 3.5 to 30 mcs. May be driven by "Ranger", or other unit of comparable output. With tubes.
 Cat. No. Amateur Net
 240-353-1. . . Kit . . . \$524.50
 240-353-2. . . Wired . \$589.50



New Catalog

Yes, dollar-for-dollar and feature-for-feature you'll get more of everything in a Viking transmitter . . . that's why Viking transmitters outsell all others! Write for your free Viking Amateur Catalog and you'll soon see why your best transmitter buy is a Viking!



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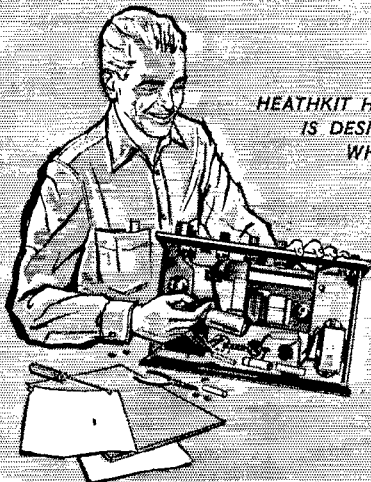
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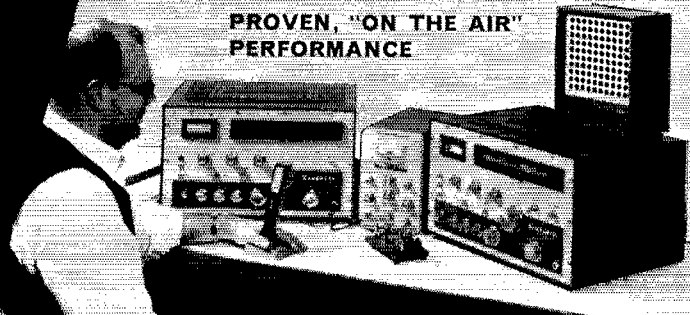


HAM GEAR



HEATHKIT HAM EQUIPMENT
IS DESIGNED BY HAMS
WHO KNOW YOUR
PROBLEMS AND
NEEDS.

PROVEN, "ON THE AIR"
PERFORMANCE

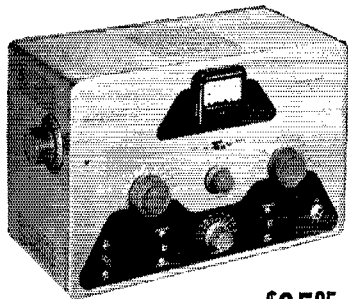


"SENECA" VHF HAM TRANSMITTER KIT

Beautifully styled and a top performer of highest quality throughout. The "Seneca" is a completely self-contained 6 and 2 meter transmitter featuring a built-in VFO for both 6 and 2 meters, and 4 switch-selected crystal positions, 2 power supplies, 5 radio frequency stages, and 2 dual-triode audio stages. Panel controls allow VFO or crystal control, phone or CW operation on both amateur bands. An auxiliary socket provides for receiver muting, remote operation of antenna relay and remote control of the transmitter such as with the Heathkit VX-1 Voice Control. Features up to 120 watts input on phone and 140 watts on CW in the 6 meter band. Ratings slightly reduced in the 2 meter band. Ideal for ham operators wishing to extend transmission into the VHF region. Shpg. Wt. 56 lbs.



HEATHKIT VHF-1 **\$159⁹⁵**




HEATHKIT DX-20 **\$35⁹⁵**

DX-20 CW TRANSMITTER KIT

Designed exclusively for CW work, the DX-20 provides the novice as well as the advanced-class CW operator with a low cost transmitter featuring high operating efficiency. Single-knob bandswitching covers 80, 40, 20, 15 and 10 meters using crystals or an external VFO. Pi network output circuit matches antenna impedances between 50 and 1,000 ohms. Employs a single 6DQ6A tube in the final amplifier stage for plate power input of 50 watts. A 6CL6 serves as the crystal oscillator. The husky power supply uses a heavy duty 5U4GB rectifier and top-quality "potted" transformer for long service life. Easy-to-read panel meter indicates final grid or plate current selected by the panel switch. Complete RF shielding to minimize TVI interference. Easy-to-build with complete instructions provided. Shpg. Wt. 19 lbs.

HEATH COMPANY Benton Harbor, Michigan

 a subsidiary of Daystrom, Inc.

Mobile Gear...for the Ham on the Go!

"CHEYENNE" MOBILE HAM TRANSMITTER KIT

All the fun and excitement . . . plus the convenience of mobile operation are yours in the all-new Heathkit "Cheyenne" transmitter. The neat, compact, and efficient circuitry provides you with high power capability in mobile operation, with low battery drain using carrier controlled modulation. All necessary power is supplied by the model MP-1 described below. Covers 80, 40, 20, 15 and 10 meters with up to 90 watts input on phone. Features built-in VFO, modulator, 4 RF stages, with a 6146 final amplifier and pi network (coaxial) output coupling. High quality components are used for long service life and reliable operation, along with rugged chassis construction to withstand mobile vibrations and shock. Thoughtful circuit layout provides for ease of assembly with complete instructions and detailed pictorial diagrams to insure success. A spotting switch is also provided. A specially designed ceramic microphone is included to insure effective modulation with plenty of "punch". Plan now to enjoy the fun of mobile operation by building this superb transmitter. Shpg. Wt. 19 lbs.



HEATHKIT MT-1
\$99⁹⁵



"COMANCHE" MOBILE HAM RECEIVER KIT

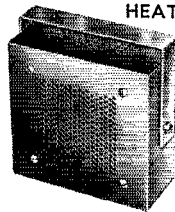
Everything you could ask for in modern design mobile gear is provided in the "Comanche" . . . handsome styling, rugged construction, top quality components . . . and, best of all, a price you can afford. The "Comanche" is an 8-tube super-heterodyne ham band receiver operating AM, CW and SSB on the 80, 40, 20, 15 and 10 meter amateur bands. A 3 mc crystal lattice-type IF filter permits the receiver to use single conversion without image interference, and at the same time creates a steep sided 3 kc flat top IF bandpass characteristic comparable to mechanical type filters. The neat, compact and easy-to-assemble circuitry features outstanding sensitivity, stability and selectivity on all bands. Circuit includes an RF stage, converter, 2 IF stages, 2 detectors, noise limiter, 2 audio stages and a voltage regulator. Sensitivity is better than 1 microvolt on all bands and signal-to-noise ratio is better than 10 db down at 1 microvolt input. One of the finest investments you can make in mobile gear. Shpg. Wt. 19 lbs.



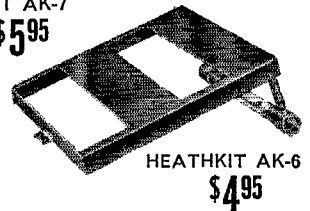
HEATHKIT MR-1
\$119⁹⁵

MOBILE SPEAKER KIT

A matching companion speaker for the "Comanche" mobile receiver. Housed in a rugged steel case with brackets provided for easy installation on fire wall or under dashboard, etc. Uses 5 PM speaker with 8 ohm voice coil. Measures 5" H. x 5" W. x 2 1/2" D. Shpg. Wt. 4 lbs.

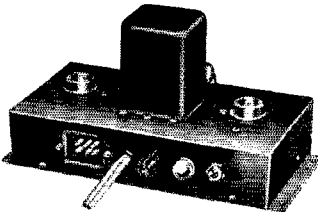


HEATHKIT AK-7
\$5⁹⁵



HEATHKIT AK-6
\$4⁹⁵

HEATHKIT MP-1
\$44⁹⁵



MOBILE POWER SUPPLY KIT

This heavy duty transistor power supply furnishes all the power required to operate both the MT-1 Transmitter and MR-1 Receiver. It features two 2N442 transistors in a 400 cycle switching circuit, supplying a full 120 watts of DC power. Under intermittent operation it will deliver up to 150 watts. Kit contains everything required for complete installation, including 12' of heavy battery cable, tap-in studs for battery posts, power plug and 15' of connecting cable. Chassis size is 9 1/16" L. x 4 3/4" W. x 2" H. Operates from 12-14 volt battery source. Circuit convenience provided by self-contained relay which allows push-to-talk mobile operation. Shpg. Wt. 8 lbs.

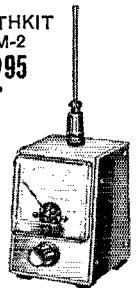
MOBILE BASE MOUNT KIT

The AK-6 Base Mount is designed to hold both transmitter and receiver conveniently at driver's side. Universal mounting bracket has adjustable legs to fit most automobiles. Shpg. Wt. 5 lbs.

POWER METER KIT

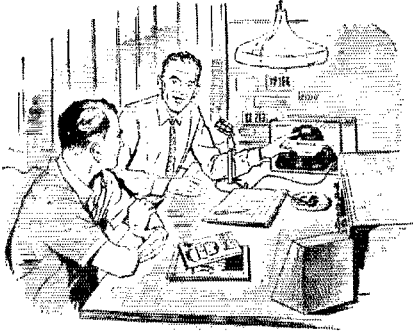
This handy unit picks up energy from your mobile antenna and indicates when your transmitter is tuned for maximum output. A variable sensitivity control is provided. Features a strong magnet on a swivel-mount for holding it on a car dashboard or other suitable spot. Has its own antenna or may be connected to existing antenna. Sensitive 200 ua meter. Shpg. Wt. 2 lbs.

HEATHKIT
PM-2
\$12⁹⁵





COMPANION UNITS



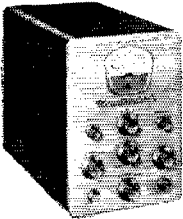
HEATHKIT TX-1 **\$234⁹⁵**

“APACHE” HAM TRANSMITTER KIT

The many features and modern styling of the “Apache” will provide you with just about everything you could ask for in transmitting facilities. Emphasizing high quality the “Apache” operates with a 150 watt phone input and 180 watt CW input. In addition to CW and phone operation, built-in switch selected circuitry provides for single-sideband transmission using the SB-10 External adapter. The newly designed, compact and stable VFO provides low drift frequency control necessary for SSB transmission. A slide rule type illuminated rotating VFO dial with full gear drive vernier tuning provides ample bandspread and precise frequency settings. The bandswitch allows quick selection of the amateur bands on 80, 40, 20, 15 and 10 meters. This unit also has adjustable low-level speech clipping and a low distortion modulator stage employing two of the new 6CA7/EL34 tubes in push-pull class AB operation. Time sequence keying is provided for “chirpless” break-in CW operation. The final amplifier is completely shielded for TVI protection and neutralized for greater stability. A cooling fan is also provided. The formed one-piece cabinet with convenient access hatch provides accessibility to tubes and crystal sockets. Die-cast aluminum knobs and control panel escutchcons add to the attractive styling of the transmitter. Pi network output coupling matches antenna impedances between 50 and 72 ohms. A “spotting” push button enables the operator to “zero beat” an incoming frequency without putting the transmitter on the air. Equip your ham shack now for top transmitting enjoyment with this outstanding unit. Shpg. Wt. 110 lbs. Shipped motor freight unless otherwise specified.

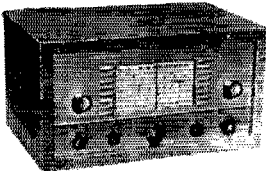
HEATHKIT SB-10 SINGLE SIDEBAND ADAPTER KIT

\$89⁹⁵



Designed as a compatible plug-in adapter unit for the TX-1 “Apache” transmitter, this unit lets you operate on SSB at a minimum of cost, yet does not affect the normal AM and CW functions of the transmitter. By making a few simple circuit modifications, the DX-100 and DX-100-B transmitters can be used, utilizing all existing RF circuitry. Extremely easy to operate and tune, the adapter employs the phasing method for generating a single-sideband signal, thus allowing operation entirely on fundamental frequencies. The critical audio phase shift network is supplied completely preassembled and wired in a sealed plug-in unit. Produces either a USB, LSB or DSB signal, with or without carrier insertion. Covers 80, 40, 20, 15 and 10 meter bands. An easy-to-read panel meter indicates power output to aid in tuning. A built-in electronic voice control with anti-trip circuit is also provided. 10 watts PEP output. Unwanted sideband suppression is in excess of 30 db and carrier suppression is in excess of 40 db. An EL84/6BQ5 tube is used for linear RF output. Shpg. Wt. 12 lbs.

MODIFICATION KIT: Modifies DX-100 and DX-100-B for use with the SB-10 Adapter, Model MK-1. Shpg. Wt. 1 lb. **\$8.95.**



HEATHKIT AR-3

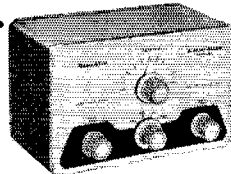
\$29⁹⁵

(less cabinet)

ALL-BAND RECEIVER KIT

A fine receiver for the beginning ham or short wave listener, designed for high circuit efficiency and easy construction. Covers 550 kc to 30 mc in four bands clearly marked on a slide-rule dial. Transformer operated power supply. Features include: bandswitch, bandspread tuning, phone-standby-CW switch, phone jack, antenna trimmer, noise eliminator, RF gain control and AF control. Shpg. Wt. 12 lbs.

CABINET: Opt. extra. No. 91-15A. Shpg. Wt. 5 lbs. **\$4.95.**



HEATHKIT QF-1

\$9⁹⁵

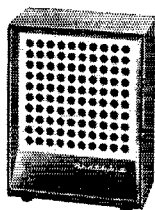
“Q” MULTIPLIER KIT

Useful on crowded phone and CW bands, this kit adds selectivity and signal rejection to your receiver. Use it with any AM receiver having an IF frequency between 450 and 460 kc that is not AC-DC type. Provides an effective “Q” of approximately 4,000 for extremely sharp “peak” or “null”. The QF-1 is powered from the receiver with which it is used. Shpg. Wt. 3 lbs.

OF DISTINCTIVE QUALITY

ACCESSORY SPEAKER KIT

Handsomely designed and color styled to match the "Mohawk" receiver this heavy duty 8" speaker with 4.7 ounce magnet provides excellent tone quality. Housed in attractive 3/8" plywood cabinet with perforated metal grille. Speaker impedance is 8 ohms. Shpg. Wt. 7 lbs.



HEATHKIT AK-5
\$9⁹⁵



HEATHKIT RX-1 \$274⁹⁵

"MOHAWK" HAM RECEIVER KIT

Styled to match the "Apache" transmitter the "Mohawk" ham band receiver provides all the functions required for clear, rock-steady reception. Designed especially for ham band operation this 15-tube receiver features double conversion with IF's at 1682 kc and 50 kc and covers all the amateur frequencies from 160 through 10 meters on 7 bands with an extra band calibrated to cover 6 and 2 meters using a converter. Specially designed for single sideband reception with crystal controlled oscillators for upper and lower sideband selection. A completely preassembled wired and aligned front end coil bandswitch assembly assures ease of construction and top performance of the finished unit. Other features include 5 selectivity positions from 5 kc to 500 CPS, bridge T-notch filter for excellent heterodyne rejection, and a built-in 100 kc crystal calibrator. The set provides a 10 db signal-to-noise ratio at less than 1 microvolt input. Each ham band is separately calibrated on a rotating slide rule dial to provide clear frequency settings with more than ample bandspread. Front panel features S-meter, separate RF, IF and AF gain controls, T-notch tuning, T-notch depth, ANL, AVC, BFO, Bandswitch tuning, antenna trimmer, calibrate set, calibrate on, CW-SSB-AM, receive-standby, upper-lower sideband, selectivity, phone jack and illuminated gear driven vernier slide rule tuning dial. Attractively styled with die-cast aluminum control knobs and escutcheons. No external alignment equipment is required for precise calibration of the "Mohawk". All adjustments are easily accomplished using the unique method described in the manual. An outstanding buy in a communications receiver. Shpg. Wt. 66 lbs. Shipped motor freight unless otherwise specified.



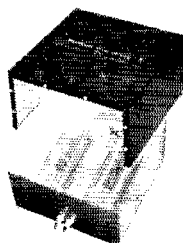
HEATHKIT AM-2
\$15⁹⁵

REFLECTED POWER METER KIT

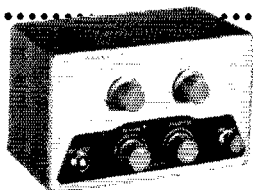
The AM-2 measures forward and reflected power or standing wave ratio. Handles a peak power of well over 1 kilowatt of energy and covers 160 through 6 meters. Input and output impedance provided for 50 or 75 ohm lines. No external power required for operation. Use it also to match impedances between exciters or RF sources and grounded grid amplifiers. Shpg. Wt. 3 lbs.

BALUN COIL KIT

Match unbalanced coaxial lines, found on most modern transmitters, to balanced lines of either 75 or 300 ohms impedance with this handy transmitter accessory. Capable of handling power input up to 200 watts, the B-1 may be used with transmitters and receivers covering 80 through 10 meters. No adjustment required. Shpg. Wt. 4 lbs.



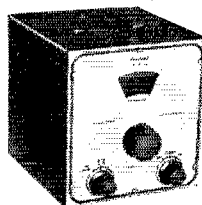
HEATHKIT B-1
\$8⁹⁵



HEATHKIT VX-1
\$23⁹⁵

ELECTRONIC VOICE CONTROL KIT

Eliminate hand switching with this convenient kit. Switch from receiver to transmitter by merely talking into your microphone. Sensitivity controls allow adjustment to all conditions. Power supply is built in and terminal strip on the rear of the chassis accommodates receiver and speaker connections and also a 117 volt antenna relay. Shpg. Wt. 5 lbs.

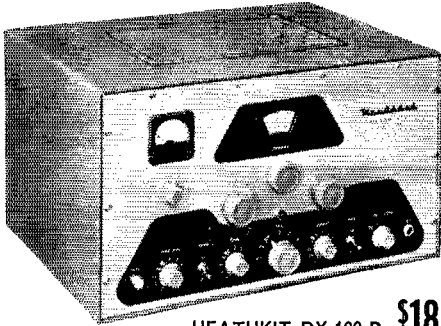


HEATHKIT VF-1
\$19⁵⁰

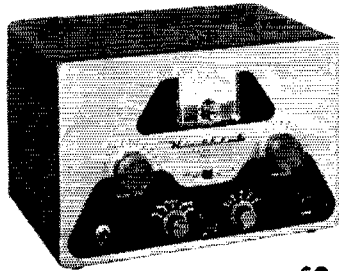
VFO KIT

Far below the cost of crystals to obtain the same frequency coverage this variable frequency oscillator covers 160, 80, 40, 20, 15 and 10 meters with three basic oscillator frequencies. Providing better than 10 volt average RF output on fundamentals, the VF-1 is capable of driving the most modern transmitters. Requires only 250 volts DC at 15 to 20 ma, and 6.3 VAC at 0.45 a. Illuminated dial reads direct. Shpg. Wt. 7 lbs.

Save 1/2 or more...with Heathkits



HEATHKIT DX-100-B **\$189⁵⁰**



HEATHKIT DX-40 **\$64⁹⁵**

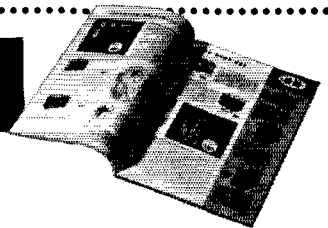
DX-100-B PHONE AND CW TRANSMITTER KIT

A long standing favorite in the Heathkit line, the DX-100-B combines modern styling and circuit ingenuity to bring you an exceptionally fine transmitter at an economical price. Panel controls allow VFO or crystal control, phone or CW operation on all amateur bands up to 30 mc. The rugged one-piece formed cabinet features a convenient top-access hatch for changing crystals and making other adjustments. The chassis is punched to accept sideband adapter modifications. Featured are a built-in VFO, modulator, and power supply, complete shielding to minimize TVI, and a pi network output coupling to match impedances from 50 to 72 ohms. RF output is in excess of 100 watts on phone and 120 watts on CW. Band coverage is from 160 through 10 meters. For operating convenience single-knob bandswitching and illuminated VFO dial on meter face are provided. A pair of 6146 tubes in parallel are employed in the output stage modulated by a pair of 1625's. Shpg. Wt. 107 lbs. Shipped motor freight unless otherwise specified.

DX-40 PHONE AND CW TRANSMITTER KIT

An outstanding buy in its power class the DX-40 provides both phone and CW operation on 80, 40, 20, 15 and 10 meters. A single 6146 tube is used in the final amplifier stage to provide full 75 watt plate power input on CW or controlled carrier modulation peaks up to 60 watts for phone operation. Modulator and power supplies are built in and single-knob bandswitching is combined with the pi network output circuit for complete operating convenience. Features a D'Arsonval movement panel meter. A line filter and liberal shielding provides for high stability and minimum TVI. Provision is made for three crystals easily accessible through a "trap door" in the back of the cabinet. A 4-position switch selects any of the three crystals or jack for external VFO. Power for the VFO is available on the rear apron of the chassis. Easy-to-follow step-by-step instructions let assembly proceed smoothly from start to finish even for an individual who has never built electronic equipment before. Shpg. Wt. 25 lbs.


Free Send now for latest Heathkit Catalog describing in detail over 100 easy-to-assemble kits for the Hi-Fi fan, radio ham, boat owner and technician.



HEATH

*pioneer in
do-it-yourself
electronics*

COMPANY BENTON HARBOR 9, MICH.

 a subsidiary of Daystrom, Inc.

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NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

QUANTITY	KIT NAME	MODEL NO.	PRICE



WALLACE WALKER, KH6CMB — Raytheon radar field engineer — gives on-the-job instruction in radar theory and operation to a U. S. Army class in Hawaii.

FIELD ENGINEERING WITH A FUTURE

Outdoor classes in KH6-land

Wally Walker, KH6CMB, finds teaching an extremely satisfying part of his field engineering activities in our fiftieth state, the land of "Aloha." Wally is assigned to the Army on one of the many programs in which Raytheon's Government Services Division is participating, both overseas and in the United States.

You may qualify as a Raytheon field engineer if you have an EE degree or equivalent field experience with ground and bombing radar, ECM, fire control, missiles or sonar.

Excellence in Electronics



Benefits: attractive salary, relocation assistance, insurance, educational programs and opportunities for advancement — many field engineers have become Raytheon executives. Please contact R. E. Guittarr for details.

RAYTHEON COMPANY
Government Services Division
100 River Street, Waltham, Massachusetts

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a \$16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-T12TG)

List of 105 countries/stations worked with 65 watts and a V-80 vertical

BV1US	KG4AI	VK3YL
CE3DZ	KG6FAE	VK9XK
ZL5AA	KH6IJ	VK9AT
CO2WD	KL7BUZ	VK6CJ
CN2BK	KM6AX	VP2KFA
CN8FB	KP4ACF	VP2AY
CR9AH	KP6AL	VP2DW
CT1CB	KR6BF	VP2MX
CX2FD	KS4AZ	VP2LU
DL1FF	KV4AA	VP2SW
DU7SV	KW6CA	VP5CP
EA1FD	KX6AF	VP5BH
EI4N	KZ5CS	VP6TR
F8VQ	LA3SG	VP7NM
FB8ZZ	LU2DFC	LU1ZS
FG7XE	LZ1KSP	VP9BK
FK8AL	OA4AU	VR2DA
FM7WT	OE9EJ	VR3B
FO8AD	OH2TM	VS1HC
G3DOG	OK1FF	VS2DW
GC8DO	ON4AY	VS6LN
GI3WUI	KG1AX	XE1PJ
GM3GJB	OZ2KK	XW8AI
GW3LJN	PA0FAB	YN1JW
HA5KBP	PJ5AA	YU3FS
HC4IM	PJ2ME	YV5HL
HC8LUX	PY2EW	ZC5AL
HE9LAC	PY0NE	ZE1JV
HP1LO	SM5AQB	ZK1BS
II1MV	SP6BY	KH6MG/ZK1
JATANG	TI2LA	ZK2AD
JZ0HA	UA1AU	ZL1ABZ
W1AW	UA9KKB	ZL3JA
KB6BJ	UQ2AB	ZM6AS
KC4AF	VE8OJ	ZS1OU



FACTS ON THE GOTHAM V-80 VERTICAL

- If K6INI can do it, so can you.
- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Withstands 75 mph wind-storms.
- Non-corrosive aluminum used exclusively.
- Omnidirectional radiation.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price. ONLY \$16.95.

73,
GOTHAM

AN APPEAL TO INTELLIGENCE

A product that is consistently advertised in *QST* month after month, year after year, has to be good. Over 10,000 GOTHAM antennas have been purchased by *QST* readers. Even the "price-is-no-object" customers choose GOTHAM antennas on the basis of performance and value. Select your needs from this list of 50 antennas:

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST
1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for

TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use. *Proven Gotham Value!*

- 6-10 TWO BANDER..... \$29.95
- 10-15 TWO BANDER..... 34.95
- 10-20 TWO BANDER..... 36.95
- 15-20 TWO BANDER..... 38.95

TRIBANDER

Do not confuse these full-size Tribander beams with so-called midgets. The Tribander has individually fed (52 or 72 ohm coax) elements and is not frequency sensitive, nor does it have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

- 6-10-15 \$39.95 10-15-20 \$49.95

2 METER BEAMS

Gotham makes only two different two meter beams, a six-element job and a twelve-element job. They are both Yagi beams, with all the elements in line on a twelve foot boom.

- Deluxe 6-Element 9.95 12-El 16.95

6 METER BEAMS

New records are being made every day with Gotham six-meter beams. Give your rig a chance to show what it can do, with a Gotham six-meter beam.

- Std. 3-El Gamma match 12.95 T match 14.95
- Deluxe 3-El Gamma match 21.95 T match 24.95
- Std. 4-El Gamma match 16.95 T match 19.95
- Deluxe 4-El Gamma match 25.95 T match 28.95

10 METER BEAMS

Ten meter addicts claim that ten meters can't be beaten for all-around performance. Plenty of DX and skip contacts when the band is open, and 30-50 miles consistent ground wave when the band is shut down. Thousands of Gotham ten meter beams have been perking for years, working wonders for their owners, and attesting to the superior design and value of a Gotham beam.

- Std. 2-El Gamma match 11.95 T match 14.95
- Deluxe 2-El Gamma match 18.95 T match 21.95
- Std. 3-El Gamma match 16.95 T match 18.95
- Deluxe 3-El Gamma match 22.95 T match 25.95
- Std. 4-El Gamma match 21.95 T match 24.95
- Deluxe 4-El Gamma match 27.95 T match 30.95

FREE! FREE! FREE!

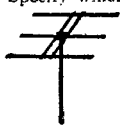
Valuable catalog of 50 different antennas, with specifications and characteristics. Gives bands and frequencies covered, element information, size of elements, boom lengths, power and decibel gain figures, weight, feed line used, polarization, and other valuable information. Send card today!

CITIZENS BAND ANTENNAS • Any of our ten meter beams or the V40 vertical is perfect for the CB operator.

New! Ruggedized Hi-Gain 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

- Beam #R6 (6 Meters, 4-El) ... \$38.95
- Beam #R10 (10 Meters, 4-El) .. 40.95
- Beam #R15 (15 Meters, 3-El) .. 49.95



15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

- Std. 2-El Gamma match 19.95 T match 22.95
- Deluxe 2-El Gamma match 29.95 T match 32.95
- Std. 3-El Gamma match 26.95 T match 29.95
- Deluxe 3-El Gamma match 36.95 T match 39.95

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

- Std. 2-El Gamma match 21.95 T match 24.95
- Deluxe 2-El Gamma match 31.95 T match 34.95
- Std. 3-El Gamma match 34.95 T match 37.95
- Deluxe 3-El Gamma match 46.95 T match 49.95

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

ALL-BAND VERTICAL ANTENNAS

Gotham Antenna Company
 1805 Purdy Ave.
 Miami Beach 39
 Fla.

J. E. Bloomcus
 209 N. 83rd Ave. NW
 Enumclaw, Wash.

Dear Sir:

While I was in Enumclaw I purchased a Gotham V-80 antenna and took it back to Tibet with me. On my way back I stopped off at Tokolau (ZM7) and was on the air for two days and worked many other stations all over the world with 25 watts. I was very surprised at the strength of one station whom I worked. This was W7PHO, who I later found out was using a Gotham vertical. I received very loud reports from all over the world from here.

I went to Tibet and used the V-80 on all bands and got excellent reports from W stations. I have never called a CQ yet and not had quite a large number of stations calling me. This was true at ZM7C as well as AC4AZ. Here in Tibet I heard W7PHO again on 20 meters using his V-80. He is running 100 watts and was the loudest signal on the band.

I am very pleased with all of my results and certainly hope that you can encourage your patrons to use it even more by reproducing this letter as an excellent recommendation.

Sincerely,

J. E. Bloomcus
 EX ZM7C - AC4AZ

- V40 vertical for 40, 20, 15, 10, 6 meters \$14.95
- V80 vertical for 80, 75, 40, 20, 15, 10, 6 meters. \$16.95
- V160 vertical for 160, 80, 75, 40, 20, 15, 10, 6 meters..... \$18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name.....

Address.....

City.....Zone.....State.....

•240 W6STA KH6PM W2BBS W8CQ W2SSC W9UIG W3DKT W3MFW W4CYY W5HJA W5HDS W6CAE W6GME W6HX W6LBD W6ULS W6WVQ W6YK W7AH W8RUP W8BCT W91PQ CR6BX G8KCP
•239 W2AEB W6FXN W9VIN
•238 W1AZK ON4PA
•237 W3ALB K4AIM
•236 W2CWX W2QKS W2UVE W4TFB W5TIZ W9Q1Y SM7MS
•235 W2FBS W3CPV W3RND W3VKD W9KXK LA3DB
•234 W1ICP W2NUT K1G5U W6L9U W6PG1 VE1EP CN8JX JA1AG
•233 W3JTK W3NKM W6DI W7GHB EA2CA PY4ZS
•232 W2TWC W4BYU W4VYP W5AWT W5CE W5GEL W6DBP W6LTX W6VSS W9QLH W9ANF W9AZT W9QZ1 C02SW G6YQ SM5KP PY1GJ
•231 W1NLM W2ESO W2PRN W3ADZ W5NMA W5PZL K6ENL
•223 W6UQQ W7NKKV W8WFB KV4BB OZ7BG
•222 W1FFO W1RB W2YV W3DPA W3FYS W4BQY W6PYH W9DYG VE3ES C02BL L07CD ON4FQ W2LSX W2MUM K2PIC W21E W31MV W3MDE W4DHZ W4GFR W5BNO W5CEW W5LGG K4CQM K6EC W6NHA W6R1P W6ZVQ W7EJD W8VDJ W9JUV VE3RE DL7AH G3BK F PA6FX PA6GN
•229 W1AEW W1BLE W3OCU W6GRL W6QJU W8ZCY W9IU W9MLY F3YR G8KS KP4CC Z86DW
•228 W1TX K6CJQ T12PZ
•227 W2EQS W6BSY W8DCH K9EAB W9FU W9TQL
•226 W5LXY W7MGT
•225 W1KFW K6LGF W1OYR W5DD W6DBP W8DR W8VR K9BR W9WQU W9ANF W9AZT W9QZ1 C02SW G6YQ SM5KP PY1GJ
•224 W2HO W4THZ W5EFC W6ANN W6KYG W7BGH W9RKP BA3CY C01KH W9PVB PY4AO ZS1BK
•221 W1LHZ W1WDD W3HIX W3UW W6GMC W6JHV W6UOY W9FVU W9HBB W9BPA G5RV ZLIAH
•220 W1BOD W1ENE W1LZE W1PFA W2AZS W2EMW W2NSZ W2QJM W3ZAO W4SRT W5ENE W5FNA W6AMA W6BL W6SQP W7AUS K17PI W8ACE W9QNO VE3JD W7MD W9DX DJ2BW D11KB G1M1 HB9MQ PA9TAU SM5W1 SM5AVI TG9AD
•219 W3GRF K4BVQ PY1AJ
•218 W3LMM K6LGF W1OYR VE2NV YS10
•217 W3AXT W6MEL VE3AU OM9AA ON4DM
•216 W3EYF W36HY W6EHW W9RQM BA3CY VE3ZK VE7HL C81G IT1TAI SM5CCE
•215 W1BLR W3AYD W5GNG W6KYT W7AJS W7ASG W9PQA W7LAP OZ7BG
•214 W4LMO W3NCF W5EB K4H6AYG W7DJY W9WVY QTSAN
•213 W1GJE W3HIX W3UW W6GMC W6JHV W6UOY W9FVU W9HBB W9BPA G5RV ZLIAH
•212 W1LJB W2DEW W2GFW W2HZY W2REF W2UFT W3AYS W5QVZ W6MHB W6OSU W8BTI W9JYP W9YNB W6GUS VE8DKY G6XL HB9JK
•211 W1LOP W1TS W2BJ W2DSU W3ELZ W4XU K25WZ Z82AT
•210 W1BET W1BLT K1DLT W1EQ W1FY W2AGO K2FC K2LWR K4HRG K5ADA K6CYO W6PZ W7YQ W8YF W9WFS W5LGS W5PM W6ATO W6K W6MLB W7HC W8ON A W9WCT W9FC G81G W9HCR W9VP
•209 W4KLB W6ORH W7AHX VE7HC DJ2AE W8VDG KH6BA W8HMI W8UMR W9FNR W9GDI W9UOX C86AI KP4WD LA5YE OZ3Y KH6LG W7PCS W9EHW W9HQF
•208 W2OBX W4AIT W7DJY W9UOY C86AI KP4WD LA5YE OZ3Y KH6LG W7PCS W9EHW W9HQF
•207 W2AQW W3EBG W5VIR W9WYB DL1QT PY1AHL
•206 W1AB W3GHS W4NAN W8DUS W9GIL W9HKL CP5EK OE1RZ
•205 W1BAV W4BRB W4JAT W8EYE W8B8K W8MKF HB9MO PA6BW ZP5ET
•204 W1KQF W2HFF W2AGO DL3DU K25WZ Z82AT
•203 W1NHJ W1RAN W3AOH W3BQA W4NBY W4QPM W6LDJ W6TPJ W7YGN W8CDT G6FXB KP4YT SM5WJ YK3YL
•202 W3JKO W4JFN K4LVP K4HRG W4RBQ K5LIA K5IA W5DA K6CYO W6PZ W7YQ W8YF W9WFS W5LGS W5PM W6ATO W6K W6MLB W7HC W8ON A W9WCT W9FC G81G W9HCR W9VP
•199 W1OOS W2AYU W4E0 K4FFS W4EBH W4BQ W4NYW W4UKA W5BR W6H F W6C W6ETJ K6KII W3ALX W60MC W6UY W7ACD W7FBD
•198 W2ROM W3ALX W6BY W9ERB W9PIO
•197 W1CH W2CGJ W3RFJ DL3FM F22AR P9II G3AIZ G3DOG OZ3FL P40NU Y5ZB ZL4JU ZL4GA
•196 W5MCO W6PFW W7AQB EA1BC W6PZL W8PQT DJ2AE W8VDG KH6BA W8HMI W8UMR W9FNR W9GDI W9UOX C86AI KP4WD LA5YE OZ3Y KH6LG W7PCS W9EHW W9HQF
•195 W2ZVS W6K W8LAV W8DMA W8EAW G6VQ K2BA VS1FJ
•194 W1FTX W4HVQ KH6LG W7PCS W9EHW W9HQF
•193 W1OGU K9ATZ W8VBK VE7YR OZ2PT
•192 W1DEP W2ITD W4BRB W8S2S W8RBA W6EPZ DL6YK W6CAL DL7BN DL8AX
•191 W3FMC W3LFP W4AAW W5CFO K6RVO W6ZMX W9HTY W9L W9U2S W9GUV CN8MI F8PQ G3RMD I1KN OH2LA OQ5RA SM3EP YV5FK
•190 W1JMI W1MB W56AE W2VYX W3AS W3KFF W9MJF W9SWV W4E0 W6SRU W9JW G3HCL HB9CU W4UKA W5BR W6H F W6C W6ETJ K6KII W3ALX W60MC W6UY W7ACD W7FBD
•189 W1CKU W11CW W4EEO W8QV W8ZJM G6VQ K2BA VS1FJ
•188 W1QM W2CWE W61PH W910D W91EV EA2CB F82DA W8VBK VE7YR OZ2PT
•187 W1ZDP W9AND VE7JB W8MWL W8NJC W9AJL W9E3R W4XO W8CPM CT1JS JA1AB OQ3BW F8EJ G2EC OIK1KI ON4JW PY1ANR VK1RS
•186 W8D1Z W9QJR W8CPD W8EYR W8HGB W8TKX VE3IR VE4XO VE6JR VE7VO C1X1Z DL1YA DL7CW F8EJ G2EC OIK1KI ON4JW PY1ANR VK1RS
•185 W1WLW W1RY W3EIR VE4XO VE6JR VE7VO C1X1Z DL1YA DL7CW F8EJ G2EC OIK1KI ON4JW PY1ANR VK1RS
•184 K2JGG W2SHC W6KJR W7GUL W91R W9MXX
•183 W6CIS W71AA W8WLB DL9PX I10J
•182 W1AW W2GD X W2GTL W2TWM W2QKX W3MWC W3WDC W4NHN W5MGT W6MUF W6SRU W9JW G3HCL HB9CU W4UKA W5BR W6H F W6C W6ETJ K6KII W3ALX W60MC W6UY W7ACD W7FBD
•181 W1GKH W1ORP W10TX W2CKY W2MTC W3CA K5BGT
•180 W1DQH W1LQ W100A W1YK W2ABM W2BAM LUBAQ W2PCJ W2PDB W2RDD W3AFJ W3JNM W3MDO W3WPG K4DR0 W6FAE W6GSL W6OUN W6RAM W8MWL W8NJC W9AJL W9E3R W4XO W8CPM CT1JS JA1AB OQ3BW F8EJ G2EC OIK1KI ON4JW PY1ANR VK1RS
•179 W2CSO W2GWE W3ZQ W4COC W4GJW
•178 W1AM W2COK W2FXE W6NIE/4 G2WV VK3BZ
•177 W1JEL W2RDK W4AIS W4CYU W4TAJ W8BQ CT1FY K6HAF LA5Q ON4MS ZL1P
•176 W3QJ W4BWP W4ECI
•175 K2SHZ W3NA W3NOH K4JVE W6BAM W6TRX KH6H W9UJ W9YFQ W2ABM W2BAM LUBAQ W2PCJ W2PDB W2RDD W3AFJ W3JNM W3MDO W3WPG K4DR0 W6FAE W6GSL W6OUN W6RAM W8MWL W8NJC W9AJL W9E3R W4XO W8CPM CT1JS JA1AB OQ3BW F8EJ G2EC OIK1KI ON4JW PY1ANR VK1RS
•174 W1ATE W2HJ W3AM W3AM LUBAQ W2PCJ W2PDB W2RDD W3AFJ W3JNM W3MDO W3WPG K4DR0 W6FAE W6GSL W6OUN W6RAM W8MWL W8NJC W9AJL W9E3R W4XO W8CPM CT1JS JA1AB OQ3BW F8EJ G2EC OIK1KI ON4JW PY1ANR VK1RS
•173 W2MZ W2PTD W3ZQ W4LQ W5VGR W8MCC G6GH HB9NL IS1AHC IS1FC KZ5DG OH2MR PA9L PA9ZL PY2NX PY7WS JA1DM JA6D PY4AJD
•172 W3EOB W4NT W4YU W5BUK K5KBH W8RVU K9CJ K91N W91HN W9A1H K0DMY VE3J DL4ZC G3BUC W2RDK W4AIS W4CYU W4TAJ W8BQ CT1FY K6HAF LA5Q ON4MS ZL1P
•171 W1EIO W1HRI W1PKW K2B5M W2FY W2LJR W2PWP W2RGV W2TP
•170 W1ACB W1CUX W1WAI W2AXR W2BXY W2JH W2NOY K20J W3LV K4E0 W4CH W4HX K4QY W5RIO W6GVP W8B W8RDZ W9TJ W9ZTD W9MCC X E4X F8L MF2A ON4LT SM7Q W6PCX V7PM
•169 K2ERC W2PUD W4YU W4CYR W81BX DL1E F3AT
•168 W2UWD W3JYS W6JU W8JX DUTS G3AJ P1AY SP7HX
•167 CT1DJ F3R HB9U PA6HJK
•166 W1LQ W4WS K4CLT W6PCS

(Continued on page 122)



MULTI CHANNEL **GONSET G-12** CITIZENS BAND COMMUNICATOR

Now... G-12... complete two-way station with 4-crystal controlled channels, transmitter and receiver... for fullest operational flexibility. Change channels instantly if interference is present. Also different channels can be used for units in a system as—office to car, truck, boat or plane.

No tuning—select channel by panel switch. Press-to-talk control. Tuning indicator monitors output and modulation. Superheterodyne receiver has RF stage, automatic noise limiter, adjustable squelch. Built-in speaker and 2½ watt audio channel. FCC type accepted.

Universal power supply, 12V DC and 115V AC is built-in.

G-12 is sturdily built for heavy-duty industrial or commercial use. Gimbal-type bracket for desk-top, under-dash, bulkhead mounting. Compact: 4½"H, 7"W, 10"D, weighs only 11 pounds.

G-12 CITIZENS COMMUNICATOR COMPLETE WITH PRESS-TO-TALK MICROPHONE AND CRYSTALS FOR ONE CHANNEL...

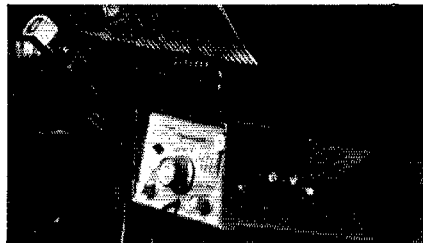
14995

ALSO AVAILABLE, G-11 SINGLE CHANNEL UNIT AT 124.50

HUNDREDS OF USES!

Units may be operated together as a system. Examples:
Business, inter-floor, inter-building. Industrials, storage yards, warehouses, factories, mills, branch businesses. 2-way contacts between fixed stations and pick-up/delivery vehicles... trucks, tractors, earth-moving equipment... tugboats, tow boats, pleasure craft, boat-to-boat or boat-to-shore.

THE IDEAL TWO WAY RADIO... for farming... ranching... forestry... mining... pipe lines... construction... special events... sports... fishing... hunting... boating... clubs.



SEND TODAY FOR FREE CITIZENS BAND RADIO BOOKLET.

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K0DQI
DJ3KR
V56CG

• 165
W2BUY
W3KA
W3KHU
W3LBG
W5ACL
W0DEL
DL3TJ
D2BXP
G3CGE
GM3CIX
KT1FXO
LA5S

• 164
W1BGY
W1DX
W2AOX
W2GTP
W4DXI
W4EFX
W48IB
W6AGO
W6CFS
W8ELL
W8OCA
W9BBU
W9LQF
G4FN
G5LP
OH3NY
ON4AZ
PA9NIC
SM6ID
VP9BM

• 163
W1MTJ
K2QLH
W3JZY
K4GSS
W5WV
KH6BLX
W9EXY
W90XS
W0ERT
VE3HB
EA2CR
G3BYM
HB9MU
1TRC
ON4CU
Z56KK

• 162
W2GST
K2QXG
K2TUI
W3CPB
W4RNP
W4VCB/3
K6OYE
W7BA
W81LG
W9PVA
W0EWH
W0SNL
DL1LH
E15F
G2AJ
HB9AO
JA1CJ
VK6SA
YV5ABD
ZL3CC
Z82AG
4X4BX

• 161
W1IKE
K2MJO
W2RA
W3AFW
W3BYT
W3XTQ
W4CKB
W4HZZ
W4KYI
W5BLA
W6GHU
W6WKU
W8AZD
W8EKK
W9QBA
EA1AB

G2FYT
G2YS
GM3AVA
HB9DU
HB9KU
HB9QU
KP1VN
KV4AQ
OK1LM
OQ5LL
PA6LW
PA6RC
ST2AR
VK5QR
YV5AK
4X4CJ

• 160
W1JDE
W1VAN
W1YZG
W2ADP
W2BAC
W2GUR
K2KCE
K2MGR
W2OCIE
W2ZY
W3KVB
W3LUD
W3MQR
W3MSR
W3ZAL
W4DKP
K4IEK
W4WM
W4ZD
K5DGI
W5OVE
W5LV
W6LVN
W6MUM
K6OXU
W6QDE
W6YMH
W7ATV
W7DET
W7WH
W8AJH
W8TTN
W8YHO
W8ZZU
W9BYN
W9NZZ
W9OVF
W0ZYB
V22WA
VE3EU
DL1HA
EA7CP
G2AJB
G2FSR
G3CBN
GM6MD
1LKDB
ON4GC
OZ7SN
SM6HU
VK3XO

• 159
W1IUI
W3HER
G2AJ
W3KDF
W6APH
K6SXA
W6VOE
W0DGH
EA3KB
G6LX
GW3ZV
11R
OH1TM
OH2YV
OK1VW
SM3ARE
VQ2GW

• 158
W3QOL
W6GDH
W61EK
GM3EOJ
SP8CK
VQ8AD
ZL3IS
W6FLT
W6JZP
WINS

W1QPN
W1UMC
K2AAA
W4JXM
W4YK
W6NIG
W8VTF
W0TJ
G3FHP
G3IDC
GM3BCL

• 156
W1EFQ
W2NAL
W6AFI
W6NZ
W8PHZ
K0DNR
W0JSN
W0LNN
1ICZE
W3FLH
W3LPO
W4ZMC
W5AUJ
W5CGC
W8HUD
W9MZP
W9PGW
W9VZP
W5QN
W6BAG
W6PTH
K6IYJ
W8MFB
W8YCP
DL9TJ
G2AJF
G3JKF
G6GN
11BLF
11VS
PY2AD

• 155
W3RZL
W4LDL
W4WSJ
W5QN
W6BAG
W6PTH
K6IYJ
W8MFB
W8YCP
DL9TJ
G2AJF
G3JKF
G6GN
11BLF
11VS
PY2AD
SM5DZ
VEK3E
W1ZD
K2DSV
W2QCP
W3KJ
W4AIX
W5FJE
W5FPE
W9BZN
W9NZZ
W9OVF
W0ZYB
G3CSL
G3VA
HB9UL
KP4JE
VP9J

• 154
W1ZD
K2DSV
W2QCP
W3KJ
W4AIX
W5FJE
W5FPE
W9BZN
W9NZZ
W9OVF
W0ZYB
G3CSL
G3VA
HB9UL
KP4JE
VP9J

• 153
W1GDDY
W1JSS
W1QF
W2CPD
W3SRW
W4FTD
W4FTL
W4PVD
W4WDI
W4YMG
W4YWX
W5CEB
W5TTB
W5UTK
W6CGQ
W6EAK
W8DE
W8MJP
W6PHI
W6VX
KH8MI
OH2NB
OH3TH
OZ5PA

• 152
W1APA
K1CJV
W1JTD
W1MUN
W1RWS
W2GSN
W2MYM
W3WSF
W4ARR
W4BFR
W6FLT
W6JZP
W6LMZ

KL7MF
W9CAB
VFB3V
DL3BK
DL7CS
DL9SN
EA5BD
G2HAP
G3HJJ
G8UG
LA2B

• 151
W1FQA
W1HWH
W1KXP
W2BBV
K2IAD
W2JZV
W3BVL
W3EIS
W3FLH
W3LPO
W4ZMC
W5AUJ
W5CGC
W8HUD
W9MZP
W9PGW
W9VZP
W5QN
K6LFP
W0SMV
VE2BV
VE3BHS
VE5KG
DL3DP
F8TM
G3DQC
G3LP
GW3FSP
ON4TA
PY2AJ
SM5DZ
VEK3E
ZL3BJ
ZL3LA

• 149
W1AZW
W2UEI
W4YZG
W5YPT
W9DWQ
W9PCF
DL1YQ
F8KJ
W0IDJ
G3JNX
PA6LF
ZL2QM
487NX

• 148
W2RUJ
W3QM
K5ALA
W5TJ
K8BOD
W8BWC
DL1ME
G2AFQ
G8RC
FA9RW
HB9CE

• 147
W1AH
W6CHL
K6CTV
W8UYW
W8DFQ
G5JU

• 146
W4IBB
W4UO
W3LXN
W3RCQ
W5MY
W6LV
W7YMP
W8CKX
W8LQA
W9TGY
VE7CE
G3BDS
G6RB
P22BAU
SM5BRO

• 145
W2PXR
K4DKG
W6HJ
W8MF
K9COS
ON8GU
K85P
F0DW
G3BL
G3GEG
PA9NOF
SM7VX

• 144
W1DGT
W1FTJ
K2QQQ
W3VXE
K6TAA
W7GPP
W8TQY
W9BMM
VE3EHR
E1ZP
E19Q

G3FKH
G3GIQ
G6VC
G8KU
G8PL
GW3BNQ
HB9IM
HK3CK
11BDV
OH1ST
ON4HB
OZ7FE
SM5CXF
SM6VY
VK4EL
XE2FL
ZC4XP
ZL3GK
ZL4CK

EA9AP
G4GD
JA6PB
3V8AB

• 143
W1WKW
W3HDZ
W3HEC
W4IKL
K5BEU
W7BE
K9ENB
W9PSR
W9RH
W9YRO
W0TUB
W0INH
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11BAF
L03DH
NY4CM

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K2CF
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ZL3LR
W2LY
W2M1
W2OCI
W2OMS
K2PFC
W6PHN
W8SSD
W8YGR
EA3KI
HB9DI
PA0CE
PY3QX
Z8S8

• 136
W6WLY
KH6PW
W7PDM
W8CJ
W1CBZ
W4ZJZ
VE2AY
VE7AH
W8RAH
W8RZS
K6SHJ
KH6DKA
G3RB

• 135
W1AF
W1OHA
W3LE
W4DCW
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W4JMW
W6KXG
W6SJ
W9LW
W91U
W9LSV
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W0GKS
W0JW
W0UHU
W0SL
W0UYC
VE1BX
VE2BK
VE2DR
VE5QZ
CE3ZO
F8VK
F9AH
G3JLB
G5YV
G8ON
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SM5LN
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Z56J
W3EFG
W3FUF
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W81QS
DL1SO
F8PM
G3AWP
G5FA
G6QX
OZ7CC
PY7AN

• 138
W4LHT
W6F5J
K9BD
W0DRG
CX1CX
G3GSZ
G5CG
LA5HE

LA7XE
OZ5KQ
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W2LY
W2M1
W2OCI
W2OMS
K2PFC
W6PHN
W8SSD
W8YGR
EA3KI
HB9DI
PA0CE
PY3QX
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• 132
W1AIN
W1YNP
W2DBG
W2DIF
W2TFL
W2YLS
W3QSU
K5JZJ
W5ZZR
W6RCG
W7AFA
W7CMB
W7PZ
W81RG
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W0WAN
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E14B
F8TP
G6UI
G8TS
GM2DBX
HA4SA
HB9KC
KP4MV
LA7Z
SM5AQV
SM7BEM
VK6LC
Y03AC
Z06JY

• 131
W1DEO
W1RYJ
W2AFO
W2GND
W2NIN
K2YOR
W3RBE
W4EJN
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K4RXQ
W3KBC
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W8MQR
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OZ7KY
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SM5AJJ
W0UNG
W9WNB
VE1PA
CR6AU
E73S
F3CT
H99Q
SM5FR
W5BDW
VP7NG

• 130
W1BRX
W1CSC
W1DHO
W1MLG
W1NFA
W1UWB
W2ABS
W2ATE
W2BBK
W2CQ
W8LTP
W9PZM
K2ZAU

W0GVZ
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W9TGT
W0FTJ
CK4CZ
F8VX
G5SR
GM3CMB
K4AL
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W44C
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KP4MV
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Z06JY

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W44Y
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W4HTV
W44C
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W3QSU
K5JZJ
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W6RCG
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W81RG
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G8TS
GM2DBX
HA4SA
HB9KC
KP4MV
LA7Z
SM5AQV
SM7BEM
VK6LC
Y03AC
Z06JY

• 128
W2VRE
W3SW
W4DRK
W7BTH
W8LOF
W9PZT
W0TQG
G8BB
G8VB
PA0JQ
K4QMR
W4OSU
W4TK
W4TWK
W5CPW
W6RRC
W50EN
K6KCG
K6IEC
W61ER
W6NUQ
W60BD
K60WQ
W60XS
W6WJX
KH6ER
W7ABO
W7RFE
W7TMF
W7TPE
W8VVD
W9CQM
W9DGA
W91WX
K91Y
K9KDI
W9MVP
VE3CIO
VE3SR
G3CNM
G3KZI
G3FW
HB9OA
HB9RS
H18BE
H1T
H1RMO
KPRK
LAIK
OH2PK
OH4NF
W8MQR
SM3AZI
SM5AJJ
SM5KG
SM5OW
SM5WZ
W9WNB
UC2CB
VK3YD
VP7NS
VQ2DH
Z86CZ

• 127
W1RZD
W1TSL
W3JOR
W3MFJ
W3TLN
W4WOG
W6MI
W8YX
W8WQJ
W9FKH
VE2IL
EA6AF
G5PP
H1BNU
OZ6K1
OZ4FF
ZL2AHA

• 126
W1BDS
W3WJD
W1AMC
W5GZ
W60HX
W6RDR
W0DJC/9
W0PDN
DL1ES
DJ1KR
DL3TG
EA3CK
FF8AG
HB9HZ
VP6CDI
ZC1CL
ZE3JP
ZLING

• 125
W1AWE
W1MTQ
W2BL5
W4TVQ
W6TMX
W7PTA
K0ESH
VE5FG
K85KG
SM5OW
SM5WZ
W9WNB
UC2CB
VK3YD
VP7NS
VQ2DH
Z86CZ

• 129
W1ODU
W1OJM
W4BGO
K4GB
W70EV
W8UUS
W8ZMC
W9CMB
W9WBL
W9YYG
W6AUB
C08DL
CR7BN
DL3KY
D43XS
DL4EA
F8RT
I0B3J
PA0SP

• 124
W21VS
W2WMG
W3KQU
W3RFB
W4CQJ
W4FNS
W6C5O
W6DYD
W8RSW
W9CDV
CE7AA

(Continued on page 124)



THE ANSWER TO DX . . . GONSET SSB EQUIPMENT

Any owner of the Gonset GSB-100 SSB transmitter/exciter and the powerful 1000 watt P.E.P. linear will have the pleasure of answering plenty of DX cards . . . and calls! This is SSB equipment of advanced design—stable, dependable—entirely non-critical, puts every desirable operating convenience at your fingertips.

Consider the GSB-100 transmitter/exciter:

- An exclusive filter-phasing system for improved SSB quality
- Unwanted side-band suppression of 45 db
- Quartz crystal carrier elimination filter avoids need for critical carrier balancing
- SSB with selectable sidebands, AM, PM, CW.
- Excellent CW keying characteristics
- Flexible pi network output and quick band change on 80-40-20-15-10 meters
- Built-in heavy-duty AC power supply
- VOX, voice operated control circuit complete with anti-trip circuit. Biasing voltage available for linear amplifier cutoff when receiving
- Frequency control by fixed quartz crystals and exceptionally stable VFO
- Transmits both sidebands when on AM, avoids distortion present at high modulation percentage when carrier-and-one-sideband signals are received on conventional AM receivers

and—the GSB-101 linear amplifier: ● 1000 watts P.E.P. input! ● Grounded grid circuit allows driving power to appear in final output—efficiency up to 65%!
● Linear is driven easily by GSB-100 or similar transmitter in the 100 watt class
● full bandswitching with flexible pi network—coverage 80-40-20-15-10 meters.

By themselves—or together as the brightest SSB combination on the market—these fine Gonset units represent BIG, BIG value! See them at your Gonset dealer.

GSB-100 transmitter/exciter . . . #3233 499.50

GSB-101 linear amplifier #3262 459.50



GONSET Division of Young Spring & Wire Corporation

801 SOUTH MAIN ST., BURBANK, CALIFORNIA

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OK2AG
OK2AG

•123
W1GKJ
W1KPK
W1YRO
K2PKT
W3HTF
W3MYL
W4HTR
W4WHN
K5LIX
W5JBD
W6UZX
K6DYX
W8QZA
W8ZNO
W9FB1
W9GKW
W53PK
W1LRK/
VO1
DL3JV
DL6OS
DL7BC
DL8CH
DL9GH
EA4GA
C3DQO
JA3FT
OH1TI
OH3SE
PAMZ
SM6AKC
V51JF
ZL4JA
ZS6GI
4X4DF

•122
W1DIT
W1JLN
W1QV
W2CC
WA2CCC
W2FBA
K2LXP
W3ZBF
W5GSE
K6GJS
W61FW
W7JYZ
W7CWE
KL7BHE
K8E2U
K81QQ
K9BLY
W9D5O
W9POB
CT15R
DJ1UR
DL4TL
DL6FT
F3CB
G51V
H21HZ
JA1GC
LU9CK
O28U
SP5HS

•121
W1HP1
W1WTF
W1YQC
W1YXD
W2AFU
K2DBN
W2QCF
W3DGM
W3MQY
W3WUH
W3YDF
W3YZI
W3ZHQ
W4BEY
W4FFV
W4GFT
W4KET
W4PBH
W4PDP
W4SNR
K4SXR
W5PYU

K6CEF
K6E1E
W6KYV
W6WQT
W6ZBY
K6HBTX
W7KWC
W7LEV
K8CVQ
W8NOH
W8ZPK
W9BRD
W9G1H
W9TMU
W9GTU
W9QPL
CN8EJ
DL1DA
F9DN
G2HIO
G3BXN
HK3PC
IDDCO
K6GAI
KPAADS
OE6RP
OH1SS
OH5PE
OK1GL
ON4KR
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PY2AJK
SM5BO
SM5FA
YU8EU
ZD6RM
ZS1FR
4X4BR

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YEAAG
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CO3YP
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G3BC
G3CCN
G3IOR
G3JHZ
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SM7AVA
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W6WPI
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W9QLD
W9EMG
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CX2AM
G8OJ
JA5AF
ON4SS
OX3MG
OZ7BZ
SM3AGD
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I1P
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G3CMB/A
G3CUG
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(Continued on page 128)

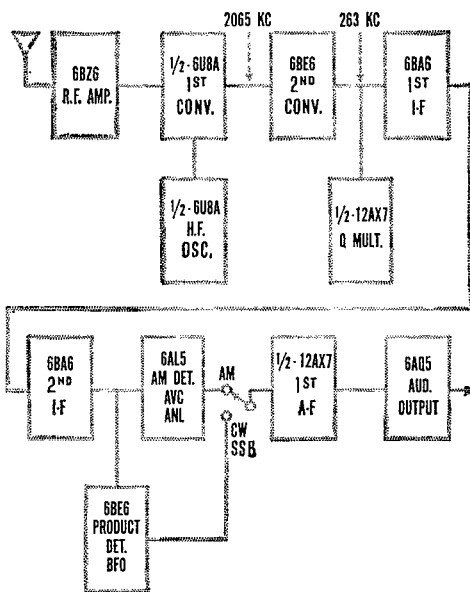
new

amateur communications receiver



GONSET G-63 RECEIVER

G-63 BLOCK DIAGRAM



Gonset presents ...

G-63, designed to give you the greatest number of features obtainable in any amateur communications receiver within its two hundred dollar price bracket.

G-63 gives you six amateur bands, 80 through 6 meters... each separately viewable on calibrated drum dial scale... every band... including 6 meters... has excellent sensitivity and signal-to-noise ratio!

The receiver features double conversion for high image rejection... multiple, band-pass tuned circuits in the second I-F for optimum shaping of I-F selectivity curve... a new peaking-type "Q" multiplier provides variable band width down to near 100 cycles. Two second detectors—diode for AM and a product detector for SSB and CW reception. Stability and drift-factor of both high frequency and beat frequency oscillators is excellent. Refer to the accompanying block diagram for further circuit details and tube lineup.

Available at your Gonset distributor during March, 1960.



GONSET

Division of Young Spring & Wire Corporation
801 SOUTH MAIN ST., BURBANK, CALIFORNIA

EXPORT SALES: WESTREX CORP., 111 EIGHTH AVE., NEW YORK 11, N.Y.

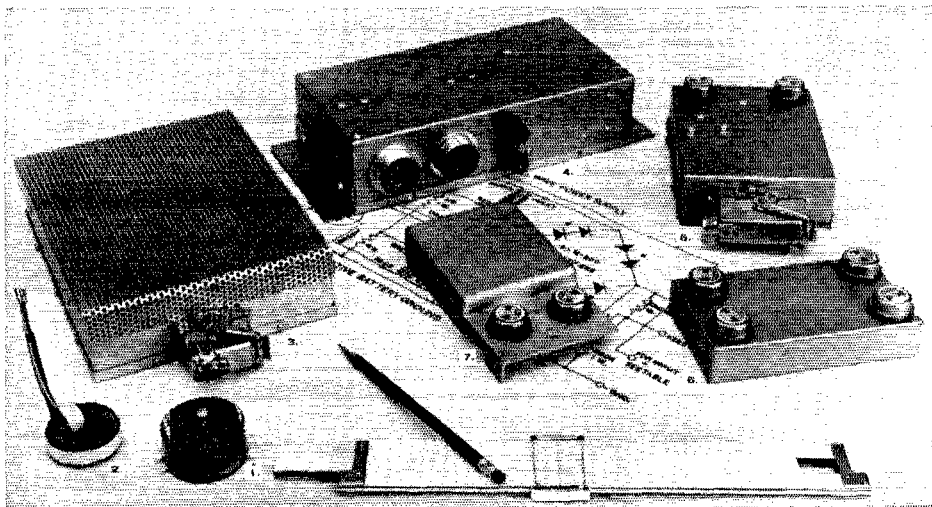
CHOOSE

SUNAIR

for VERSATILITY!

Custom Power Supplies and Transformers

SUNAIR has expanded its staff and plant facilities to give you the advantages of special power supplies and transformers. SUNAIR will design to your requirements, manufacture to your specifications, and conform with Military specifications. Pictured below are a few of the many special items SUNAIR has designed and manufactured.



KEY:

1. Encapsulated toroid supplied manufacturer of FM Mobile Units.
2. Unencapsulated toroid used for missile telemetering device.
3. Multiple voltage transistor power supply unit designed and manufactured for Military Agency. 12 VDC input, 400 VDC @ 200 ma, 250 VDC @ 200 ma, 200 VDC @ 200 ma, 150 VDC @ 200 ma, -60 VDC @ 100 ma, 5 VDC @ 6 amps, 3 VDC @ 3 amps, all simultaneous.
4. Dynamotor replacement used on famous SUNAIR HF transceiver, 500 VDC @ 250 ma, 250 VDC @ 100 ma simultaneous outputs.
5. Power Supply. Power unit used on microwave surveying device. 260 VDC @ 60 ma, -235 VDC @ 15 ma, 6.1 VDC @ 3 amps, 6.3 VAC @ 1 amp.
6. DC-DC Converter. 100 watt. Output voltage to 500 v. maximum. Available in 6 v., 12 v. or 24 v. input.
7. DC-AC Converter. 400 cps, 115 v., 1.5 amp AC output. Available in 12 v. or 24 v. input.

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SUNAIR

- TO YOUR SPECIFICATIONS • TO MIL SPECS
- TO OPERATE -50°C to +85°C

SUNAIR ELECTRONICS, INC.
BROWARD COUNTY INTERNATIONAL AIRPORT
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CHOOSE



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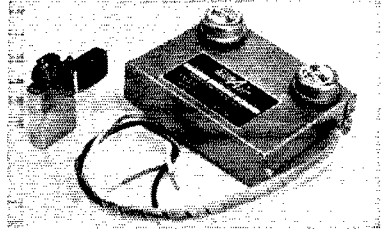
Utility Transistor Power Supplies*

NOTE: ALL ITEMS ON THIS PAGE ARE NORMALLY AVAILABLE FROM STOCK

D SERIES (Standard)

*Complete Units

Continuous operation at 30 watts. Selective taps at 200, 250 and 300 volts; intermediate voltage at 1/2 selective taps. Both voltages can be drawn simultaneously if total power does not exceed continuous ratings. Positive or negative ground operation. Input and output filtering included except for intermediate tap. Size: 4 3/8" x 3 1/4" x 1 1/8". Wt.: 10 oz. 6- or 12-V Input: **\$39.95** 24-V Input: **\$61.95**



DA SERIES

Continuous operation at 45 watts. 450 volts and 225 volts simultaneous if total power does not exceed continuous ratings. Intermittent duty to 90 watts, 450 volts at 150 MA, 225 volts at 100 MA (5 min. on, 20 min. off). Positive or negative ground operation. Input (primary voltage) filtering; partial high voltage filtering provided. Size: 4 3/8" x 3 1/4" x 1 1/8". Wt.: 14 oz. 6- or 12-V Input: **\$57.50** 24-V Input: **\$79.50**

Toroid Transformers for Transistor Power Supply Application

H SERIES

H-6-450-1 Input: 6-VDC. Output: 450-VAC center tapped... 450 and 225 VDC from bridge rectifier... 45 watts.

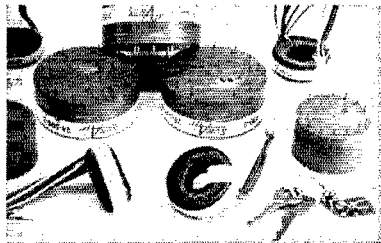
H-14-450-12 Input: 12/14-VDC. Output: 450-VAC center tapped... 450 and 225-VDC from bridge rectifier... 55 watts.

H-28-450-15 Input: 24/28-VDC. Output: 450-VAC center tapped... 450 and 225-VDC from bridge rectifier... 65 watts.

H-6-100-125-150-D Input: 6-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 100 MA.

H-12-100-125-150-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 125 MA.

H-24-100-125-150-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 150 MA. Without Encapsulation (2 ozs.) 1-10 units: **\$12.00** ea. With Encapsulation (3 ozs.) 1-10 units: **\$14.50** ea.



HD SERIES - 2000 CPS

HD-14-225-300-2-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

HD-28-225-300-2-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

Without Encapsulation (3 1/2 ozs.). 1-10 units: **\$14.50** ea.

With Encapsulation (4 1/2 ozs.). 1-10 units: **\$17.00** ea.

HDS SERIES - 2000 CPS

HDS-14-225-300-3-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

HDS-28-225-300-3-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

Without Encapsulation (3 1/2 ozs.). 1-10 units: **\$17.00** ea.

With Encapsulation (4 1/2 ozs.). 1-10 units: **\$19.50** ea.

400 CYCLE SERIES

14-115-1.5-400 Input: 12/14-VDC. Output: 115-V at 1.5 amp.

Dim: 3" dia. x 1" thick. Without Encapsulation (12 ozs.).

24-115-1.5-400 Input: 24/28-VDC. Output: 115-V at 1.5 amp.

With Encapsulation (16 ozs.). Per Unit: **\$57.00**.

OEM Prices on Request

All fully performance tested, 100% guaranteed. Manufactured by makers of world-famous SUNAIR H.F. Aviation Transceivers.

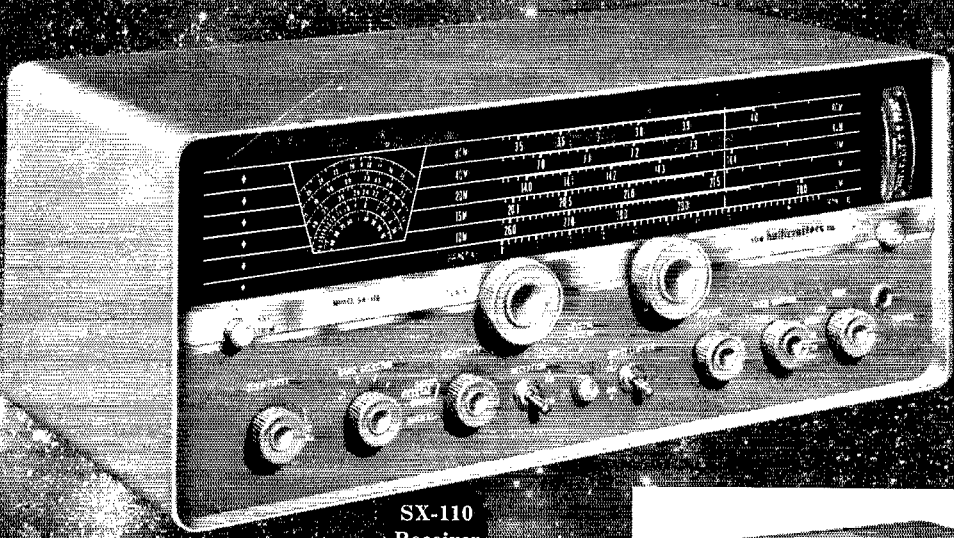


SUNAIR ELECTRONICS, INC.

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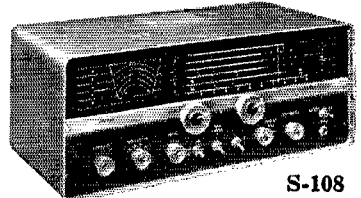
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OH3PB	W0BAF	W3MBN	H1ZCN	W7LQB	H1ATO	W2JME	K9GOQ	OH1AJV	W3HA	W6TZA
OH3UD	K0BIT	W4HZT	JA1CC	W7UVH	JA2AT	W2LFL	W8WDD	OH1KLB	W3HTB	W6TUD
OH6NZ	W0DAO	K4KTR	KPVHU	W7WZW	JA2BL	W2LYO	W8TWC	OH1MP	W3HQO	W6UNP
OK1FF	W0DSO	W4KVV	KT1TX	W8AAP	JA4BB	W2PCI	W9VQC	OK3HF	W3JAK	W6VBY
OK1PD	K9CJD	K4MQG	LA3Y	W8ABV	JA6AK	W2PNA	W9VTT	OK3LA	W3LJL	K6VXX
OK2XF	W0GNC	K4OYR	LU5ABL	W8CEI	JA9AA	W2UZF	W9BCT	ON4RM	W3LKO	K6VYA
OK2OS	W0GXT	W4UG	MD1D	W8HZR	KG6GC	W3AHX	W8WCV	OZ1W	W3LSG	W6VZG
OK3EA	W0GYL	W0VBR	MD5KW	W8IEU	KG6GD	W3COK	K8DRR	PA9FD	W3NBQ	W6WLO
ON41V	W0JYJ	W4VZQ	OE6BN	W8IHN	KP4DP	W3CSS	W8EIB	PA9MT	W3OHC	W6ZTW
ON41B	W0S9Q	W4ZPX	OH2LU	W8JRB	KP1QA	W3DAO	W8FBT	PA9ZB	W3ORU	W6ZZZ
ON4TQ	VE7QI	K5ABV	OH2MQ	K8KAE	KS4AI	W3HDV	W8FEL	PJ2ME	W3YGY	KH6AUJ
PA8A0	DL1FL	W5DF	OH2WV	W8KQE	KZ5AU	W3H	W8LVA	PJ6HA	W3JKJ	KH6SO
PA9JY	DL1PV	W5YJY	OH3OD	W8NNR	LA3SG	W3KAT	K0PIE	PY1AR	W3UVT	K7ABV
PY1MK	DL1SF	W6BAJ	OH5NK	W8PNP	LA4ND	W3NEF	W8SYA	PY1KJ	W3VOZ	W7FMY
PZ1AH	DL3ND	K6BHM	OH5OU	W8YJE	LA8F	W3OPM	W8VDC	SM5BFE	W3VTH	W7IEE
SM3BNL	DL4IH	W6BZ	OH6OA	W9FAP	LU4HU	W3PL	W8WZV	TF3AR	W3VHD	W7JUO
SM4AWW	DL4VR	W6DAC	OH9PF	W9GMZ	LX1AS	W3RFA	VE1BV	U4AKN	W1AFS	W7KEV
SM5EC	FR7ZA	W6GHG	OK1LM	W9GWO	OE1ZZ	W3SFC	VE1OK	UA1NF	K4RAI	W7KOF
UA6UF	G2DUP	W6JNX	OK1NC	W9HYM	OE5BG	W3TMZ	VE2AD	VK1EG	K4BFN	W7LYO
UO5AA	G2GLL	W6JWL	OK1VA	W9JL	OE5BV	K3AMH/4	VE2BD	VK1MF	K4BOM	W7NBO
VK2ADE	G2PQP	W6KUR	OK2SO	W9NXU	OE6RM	W4BO	VE6MN	VK0AB	K4BYN	W7OEB
VK2PV	G2RF	W6LMV	OK3IA	W9RMB	OE13UA	W4BPU	VE6MZ	V59BR	K4CFR	W7ONG
VK6DX	G3APX	W6MKH	ON4BV	W9UBI	OH2XK	K4CFB	VE7YE	V9PAK	W4CR1	W7SNA
VP5DC	G3AZ	W6MLY	PA8IV	W9UDK	OH2ZE	W4GD	VE8TU	VP900	K4DAS	W7VOL
YD1PM	G3CPE	W6WVI	PA8LY	W9VW	OH3TI	K4GLA	VE8YA	VQ4EO	V4GMR	W7ZOH
YU2CE	G3CQF	K6OYD	PI1RS	W9WHF	OH3OT	K4GXK	KN2AP	VQ8CB	W4IA	KL7FAK
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	OA1C	W8J	YU3AB	VE7OJ	PA6SU	DL6TQ			K4PHY	W8JW
	OE3RE	W8PLL	YU3OS	VE8OW	PJ2CA	D106J			W4POF	W8JM
	OH1OW	W8RQP	ZB1AH	W2ZRZ/	PJ2CJ	W6ABA			W4PR0	K8KZC
	OH3TY	W8YAH	ZL1CH	VOI	SL3AG	K6ALB			W4RTX	W8LKN
	OH7OU	W8YLJ	ZL4MK	CE5AW	SM3AU	W6AYZ			W4LAD	W4SHJ
	OH9OB	W8ZIF	ZL5ACD	CR4AD	SM3FY	F31P			W4BGH	W4SOV
	OK1NS	W9CBE	ZS1AL	CX6AD	SM4AEE	K6DDO			F8PA	K4TFI
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	W2TSL	SM2ALU	K6BIB	DJ2UT	SV0WL	W6JRY			G2DVD	W1HSX
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	W3KQF	SM5CHG	VE3BWY	W1CNC	DL3LL	YK2YC			G3BQR	W1PZZ
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	W4IPR	TF3SG	DM2ADL	W2AYS	ET3GB	ZS1KO			W6VUN	G3HED
	W4KR	UA2KAW	DJ2IV	W2FCQ	F8DU	ZS2AW			K6VXM	G3LVC
	W4MOF	UA3BN	DL3DD	W2GJD	F9YZ	ZS2FH			KH6BG	G4GL
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	W6DYP	Z85U	G3CXM	G3FDD	G3FST	W1CPV			W1IHW	CM2TW
	W6EJA		G3DAH	W3PA	G3HFJ	W1CPY			W1KSA	GM3JX
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	W7KEM		G4VQ	W4ZQK	G8FY	W1NAG			W8WFX	HP1GD
	K17GI		G4LX	W5BDH	G8FW	W1NMP			W8WFX	JA8AQ
	W8DSZ		GM3AWW	W5FHP	G8WV	W1ODY			W8WFX	KAN2Y
	W8ELB		GM3DZB	W5JNY	G8ZFC	W1ORG			W8WFX	KM6BL
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(Continued on page 130)

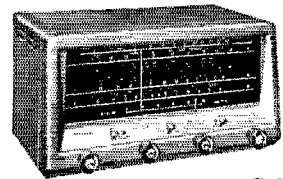


SX-110
Receiver

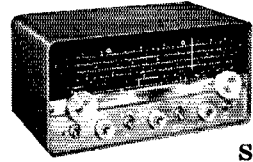
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S-108



S-38E



S-107

NEW: SX-110 Receiver. Advanced features and design make the SX-110 an exceptional value for the radio amateur and short wave enthusiast alike. Standard broadcast plus three short wave bands (540 kc-34 mc). Slide rule bandspread dial, calibrated for ham and citizens' bands; built-in "S" Meter, antenna trimmer, crystal filter. Seven tubes plus rectifier.

NEW: R-48 Speaker. (not shown) Perfect match for SX-110. Latest design; uses new 5 1/2" x 7 1/2" speaker. Exceptional damping qualities, distortion-free response. Switch for selection of voice or music response.

NEW: S-107 Receiver. Outstanding new styling and impressive features. Standard broadcast plus four short wave bands—unusually wide coverage (540 kc-34 mc and 48-54.5 mc). Separate bandspread and logging scale; slide rule dial; phono jack and headset tips. Seven tubes plus rectifier.

NEW: S-108 Receiver. Exceptional value and performance. Same as SX-110 in frequency coverages but without "S" Meter, antenna trimmer and crystal filter. Built-in speaker. Calibrated slide rule dial; temp. compensated oscillator. Seven tubes plus rectifier. Ideal general coverage receiver.

NEW: S-38E Receiver. Latest version of the world's most popular short wave receiver. Modern new styling, improved circuitry for utmost in performance and dependability. Standard broadcast plus three short wave bands (540 kc-32 mc). Electrical bandspread; slide-rule overseas dial; headset output; built-in speaker.

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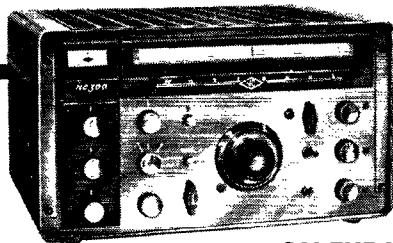
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(Bring along your old gear, for
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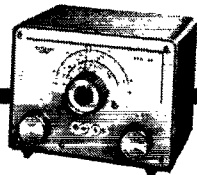


ON THE NC-300

Regular Amateur Net-\$399.00.
Brand new, factory sealed,
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\$329! Act fast—limited offer!
Yours for as little as \$12 A
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payment of \$41 down and low
carrying charge.

Matching Speaker \$21.95; Plug in
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Converters: 6 Meter Band \$41.95;
2 Meter Band \$43.95; 1/4 Meter
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SAVE \$20.00!



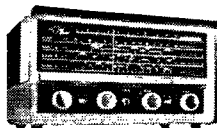
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Don't be rock-bound! Plug the output of this self-powered VFO
into your crystal socket, and you can QSY to any frequency in the
144 to 150 and 50 to 54 Mc bands. Replaces 8 to 9 Mc (and 25 to
27 Mc overtone) crystals.

- Large, smooth vernier dial, with direct frequency calibration.
- For spot freq operation, simply plug desired crystal into socket
on panel.
- Plug 1 Mc crystal into socket, and internal oscillator gives
calibration marker points.
- Headphone jack for direct detection of marker points.
- Provision for remote control.
- Compact! Only 6½" x 5¼" x 5½".

~~\$69.95~~
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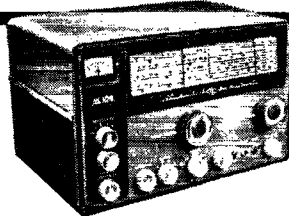
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The all-new, all-band receiver
with easy to read dial and
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In all the catalogs at \$199.95,
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only \$169.95!

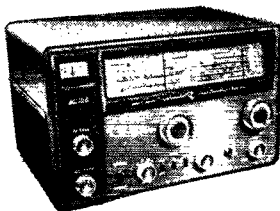
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after 10% down payment and low carrying charge!
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SAVE \$20.00!

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W8OUH
W60BW
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11RM
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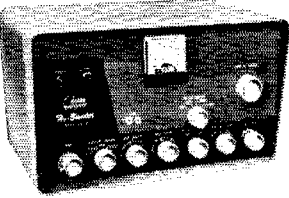
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Station Activities

(Continued from page 108)

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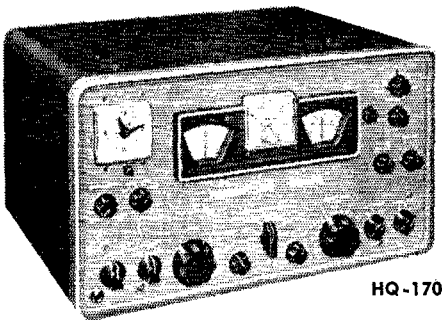


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call letter license plates. Organization is under way at Levittown (N. J.) among the fellows in the new community. A RACES group is taking part in the Burlington Co. c.d. activities. K2YBN (OO) has been supplying news of progress. Traffic: K2DEL 175, W2RG 92, W2ZI 41, K2SOX 28, W2BZL 22, K2JJC 12, W2BEI 8, W2SXX 7, K2CPR 4.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2GBX. RMs: W2RUF and W2ZRC. PAMs: W2PVI and W2LXE (v.h.i.). The NYS C. W. meets on 3615 kc at 1900. ESS on 3590, kc. at 1800. NYSPTEN on 3925 kc. at 1800, NYS C.D. on 3509.54 and 3993 kc. at 0900 Sun., TCPN 2nd Call Area on 3970 kc. at 1900., IPN on 3980 kc. at 1600. W2RUF celebrates ten years as net manager of the C.W. Net. She started when NTS was organized, W2FEB, W2OE and W2WZQ have been faithful members throughout Clara's reign. Good luck and may the next ten years be easier. Endorsements: K2AOQ, W2ATC and W2TPV as ORSs; W2COB, W2BKC and W2ATC as OPSS. Congratulations to W2COB on the high score in the Phone CD Party. W2GBX was elected president of the Niagara Frontier DX Club. W2FXA has DXCC 204, WAZ and WPA Awards. He earned them in two years running a Viking II with 15-, 10- and 20-meter folded dipoles in the attic. He finally has decided to put up a beam! W2PDB has a new Thunderbolt, K2LWR runs a Navigator to a three-element beam 80 feet in the air—in one year DXCC 231/217. W2ZIA has installed 250-watt a.m. mobile. W2ZPV is now on 75-meter phone after 10 years on c.w. K2RTN has a new 10-, 40-meter vertical. K2DOZ reports the Wyoming County Fair Parade was handled by the local c.d. group. K2JXF received 30-w.p.m. CP. WY2DSK is a new YL on 80 and 2 meters. WY2CRE has moved to KLY-Lund, K2JZM has gone s.s.b. using a 20A and 1625s. K2UZJ has a new NC-300. New officers of the North Country RC are K2BFO, pres.; K2INY, vice-pres; K2SAC, secy.-treas. W2ATO has a new NC-303 and a Tribander to go with the Valiant. K2QAE will be at Harvard U, operating WIAF. VF3MR presented the story of his T19, PZ1, VP3 and FY7 expedition to the Buffalo Area clubs. The CVARC's 1959 QSO Party was a great success with more than 200 persons in attendance. The event was held in Randhill Club House and 2-meter and 75-meter transmitter hunts were conducted. The NYLs served the hot dogs. Traffic: (Sept.) K2SSX 334, W2RUF 225, W2TPV 183, W2OE 126, WA-2ALO 124, K2RTN 120, K2JBX 117, K2UZJ 109, K2AOQ 94, K2LYP 90, K2RDY 58, K2GWN 57, K2IMK 54, W2MTA 50, W2ATC 38, W2ZRC 35, W2RQF 33, W2PGA 30, W2BKC 26, K2RWV 24, K2OFU 23, K2BBJ 20, K2GQU 18, WA2DHH 17, W2COB 16, W2OQK 15, K2JXF 14, WA2EOL 13, K2EQB 12, W2ZDL 11, W2PVI 6, K2HUK 5, K2KIR 2. (Aug.) K2RDY 49, K2IMK 16.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA. RMs: GEG, NUG and LXU. It is with deep regret that we have to report in this column the death of DGL. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. The PFN meets Mon. through Fri. at 1800 EST on 3850 kc. WA2AYI announces that the Eastern Area Slow Net (EASN) is back in operation on 3748 kc. at 1800 EST Mon. through Fri. It will cover the 1, 2, 3 call areas and he invites all W. Pa. hams to QNT. CA still is chasing DX; he just recently received DUF-4, WAKI and CAA certificates. K3HWP has his General Class license. ZWZ is now portable three on 6 meters from Carnegie Tech. The WPA Traffic Net is in dire need of more station activity, especially around Pittsburgh, with LXU away at school. K3CLX is working out in the East. That leaves only KUN, LXQ, K3ICN and a few others doing the lion's share of the work. The Semi-Annual S.S.B. Dinner was well attended on Oct. 3 at the Pittsburgh Parkway Hotel. New officers of the Amateur Transmitters' Assn. of W. Pa. are ZJZ, pres.; OVAL, vice-pres.; EOU, secy.; UL, treas.; UGV NUG and KQF, directors. We hear our former PAM TOC is ill at home. A speedy recovery. Bill Up Erie way; KNQ is giving code and theory instruction at the YMCA; K3GAO is heading up a Novice code net. The Washington County ARC reports that UEL is having good success on 2 meters; the PENOWVA Net had a get-together at Thomason Run State Park WVA in the rain. The Etna RC reports via "Oscillator" that SIR got a new receiver; HSW is with the Air Force at Luckland, Tex.; W. Pa. Mobileers have applied for a charter: the Etna RC visited channel 11, WHC studios. ZAO was guest speaker at the ATA October meeting. New appointee: WRE as EC for Cambria County. Traffic: W3KUN 164, CA 12, K3GHH 9, COT 4, W3WRE 3, ZWZ 1.

(Continued on page 138)

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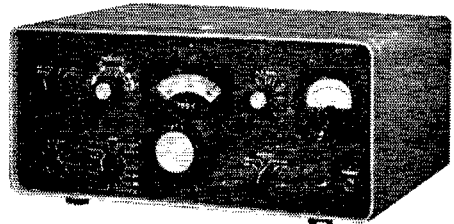
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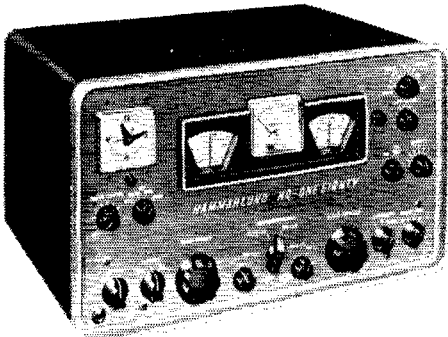
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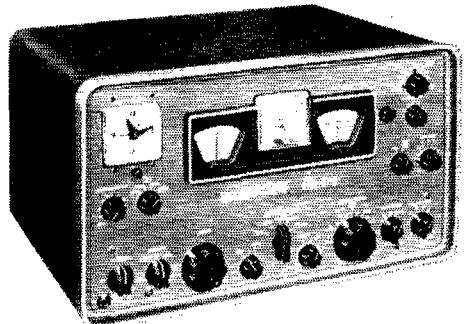
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No amateur receiver has ever gained as fine a reputation as the HQ-170. A 17-tube superheterodyne receiver tuning the 6, 10, 15, 20, 40, 80 and 160 meter amateur bands.

\$359.00 (Optional clock-timer, \$10.00)

Hammarlund shows the way to new standards of performance in SSB with the HQ-170 and HQ-180 receivers. These receivers incorporate the Hammarlund slot filter that allows attenuation up to 60 db for razor-sharp tuning, selectable sideband, selectable IF amplifier tuning, separate product detector, BFO control, crystal calibrator, selectable rates of AVC and other advanced features. Pick the one that suits you best. You can't buy better, or be more satisfied than with a Hammarlund SSB receiver...they're tops!



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LW-51 DELUXE 6m Transmitter

RF set OUT → 0 50 100% Mod.

ACTUAL SIZE OF METER SCALE WHICH
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The LW-51 Deluxe is the well known 50 watt LW-51 that you've been seeing in QST (May, page 136, for example) with these added features: Meter, meter switch, VFO input, front panel final amplifier tuning, cabinet 5" wide x 6" high x 9" deep. The Kit prices are

\$69.50 with tubes and crystal

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and we'll furnish it factory wired and tested for an additional \$15.00.

Please Add 60¢ shipping charges for
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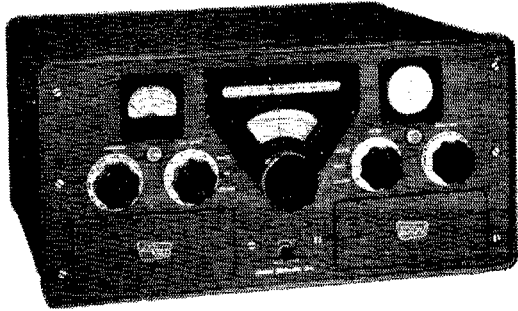
ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: HOA, RM: PCQ. PAM: RYU. EC Cook County: HPG. Section net: ILN, 3515 kc., Mon. through Sat. at 1900 CST. The Hamfesters (Chicago) Silver Anniversary Dinner honoring all the past presidents of the club was very well attended. The North Central Phone Net's traffic total for August was 303 messages and for September was 217 messages. JXW and K9QYW were elected net manager and assistant manager. K9OUU informs us that his new 20-meter dipole is bringing in the DX. K9JXO would like to work some of the LaSalle-Peru gang on 2 and 6 meters while he is attending St. Bede's College in that area. PCQ reports that the ILN cleared 336 messages in 21 sessions during September. SKR is celebrating his 25th year of hamming. Congratulations, George. J2N is working a lot of new countries on the low end of 40 meters. SXL has a new quad Yagi five-element beam. The Rock Island County gang helped with communications and the loan of emergency equipment to the town of Monmouth after the Sept. 26 tornado. MAK received his DXCC certificate and is now heading back to his school books and college. Ask K9BBC about his beam experiences during a 50-m.p.h. gale. BQC has been called by Uncle Sam and will be out of civvies for two years. The Starved Rock Radio Club is enlarging its station club rooms to make room for the generator and other gear. TLC and ZEN are the proud owners of recently-acquired 20-A's. K9PMB, K9RDS and K9SYK are new General Class calls. K9GDQ and K9OZM are working DX with new Hy-Gain beams. New Novice calls heard: K9TTE, K9TUN, K9T'UO, K9TYP and K9UCQ. K9QYY has a new Gonet (8SB-100 and a 101 linear. SUP is moving his QTH to W6-Land. LNQ, K9MDM and K9MKA have new N-300s and are doing a lot of listening and working the tough ones. USR, a housewife with two small harmonics, is doing a lot of work on the ILN, according to her gang. K9OXZ has a new Seneca on 6 meters and K9HEA has added an SX-101A to his shack. GFF lost his tower and beam in the recent 75-m.p.h. gales. New officers for the coming year of the Sangamon Valley Radio Club (Springfield) are K9KKL, K9LDQ, PNO and UYP. GOJ is conducting a new c.d. class for radio operators in Springfield and Sangamon County. Many reports were received of the various activities of emergency handling of communications during the recent wind and rain storms. Now that the summer activities are over and the gang settles back to hamming we should receive many more traffic reports. Traffic: (Sept.) K9AIR 2241, W9DO 864, K9PLF 458, W9USR 409, PCQ 342, K9MHW 158, W9-MAK 128, SXL 49, JXV 39, FAW 33, K9JTB 21, LXG 21, W9SR 8, PIRN 4, TZN 4, K9BLY 2, OXM 2. (Aug.) K9PLF 136, CWF 46, ISP 2.

INDIANA—SCM, Arthur G. Evans, W9TQC—Asst. SCM: Seth Lew Baker, 9NTA. SEC: SNQ. PAMs: BDG, BKJ, MEK and UXK. RMs: DGA, JOZ, TT and VAY. Net skeds (all Central Standard Time): 1FN (a.m.) 0800 daily and 1730 M-F on 8910 kc.; ISN (s.s.b.) 1830 daily and 3920 kc.; QIN 1900 daily and RFN 0700 Sun on 3556 kc. and QIN (training) 1800 M-W-F on 3745 kc. SNQ reports four new ECs are K9BPV for LaPorte Co., K9DUV for Johnson Co., K9MOU for Blackford Co. and QAJ for Owen Co. This makes 58 counties in the State with active ECs. The Wabash Valley ARA elected RIDG pres.; K9EFO, vice-pres.; K9ITK, treas.; and K9IGS, secy. K9MAN and K9PGA were appointed as Official Observers. NTR reports that a new radio club has been started at St. Meinrad. K9ETTF, Gen. Cl. in Muncie, is using a DX-100. K9PDE received her 20-w.p.m. CP certificate. John DeGraft, ex-SYM is now 4ISF at Pleasure Ridge, Ky. RCQ has a new VHF-126 and soon will be on 2 meters. K9KRN has a new Matchbox and s.w.r. bridge. SYX earned WFX before leaving for Rose Poly. Welcome to K9HSA, new in Valparaiso from California, who is building a rig for 6 meters. VAY reports QIN traffic as 451, JOZ reports QIN (training) traffic as 79. 1FN traffic reported by BDG was 222. RFN total was 91, as reported by TT. MEK reports ISN traffic as 65. ETM, NZZ and TT made BPL. I want to thank all the gang for the fine cooperation that I have received during my two years as SCM. The many League Officials who put in long hours of work to keep our activities running smoothly have made being SCM a real pleasure. I sincerely hope you will do the same for the new SCM. Traffic: (Sept.) W9NZZ 882, TT 525, VAY 455, ZYK 309, ETM 228, FJR 179, K9AYI 127, W9JOZ 94, K9JJK 90, IHG 84, W9DGA 81, GJS 77, BDG 65, K9BSU 61, W9RTH 55, QFQ 36, TQC 35, MEK 34, QVQ 31, K9GBB 29, IXD 29, LBD 26, W9SWD 25, CLF 24, K9JKK 23, W9CC 22, K9LZJ 22, W9BKJ 21, K9HMC 21, W9BDG 18, RVM 16, ZPP 12, NTI 11, SNQ 11, DZC 10, QCP 10, EJV 9, K9OFP 9, W9IMU 7, K9RMQ 6, LZN 5, W9NTR 5, K9PTS 4,

(Continued on page 140)

THE REVOLUTIONARY NEW CENTRAL ELECTRONICS 100V EXCITER-TRANSMITTER

BROADBAND! ONLY ONE TUNING CONTROL, THE VFO ITSELF.



CENTRAL ELECTRONICS, THE PIONEER OF AMATEUR SSB IS PROUD TO BRING YOU THE FINAL RESULT OF THREE YEARS OF THE KIND OF PATIENT ENGINEERING, TESTING AND IMPROVING THAT MAKES FOR A SUPERIOR PIECE OF ELECTRONIC GEAR.

MANY OF THE TRIED AND TRUE PRINCIPLES AND FEATURES OF THE ORIGINAL MULTIPHASE EXCITERS HAVE BEEN RETAINED IN THE NEW 100V, ALTHOUGH IN VASTLY IMPROVED FORM. THE USE OF PATENTED BROADBAND CIRCUITRY THROUGHOUT PRACTICALLY ELIMINATES "COCK-PIT" TROUBLE.

REGARDLESS OF YOUR PREFERRED MODE OF OPERATION, IT'S ALL IN THE 100V. SSB, DSB, AM, PM, CW and FSK . . . AND ALL AT THE FLIP OF ONE SWITCH. ALTHOUGH THE 100V WILL PROBABLY FIND ITS GREATEST USE AS A SINGLE SIDEBAND SUPPRESSED CARRIER EXCITER-TRANSMITTER . . . NO ONE HAS BEEN "LEFT OUT IN THE COLD" IN ITS DESIGN. THIS IS THE KIND OF A RIG THAT HAMS DREAM ABOUT!

CHECK AND COMPARE THESE FEATURES

STABILITY: The new patented two tube permeability tuned VFO circuit is exceedingly stable and is immune to the effects of line voltage fluctuations and tube ageing. Built like a battle ship, it is tuned by a husky precision lead screw assembly running in ball bearings. This is a VFO to end all VFO's.

FREQUENCY COVERAGE: 80 METERS — 3.5 to 4.5 Mc. 40 METERS — 6.5 to 7.5 Mc. 20 METERS — 13.5 to 14.5 Mc. 15 METERS — 20.5 to 21.5 Mc. 10 METERS — 27.7 to 29.7 Mc. A spare X position provides for the installation of broad-band coils for 160 meters, MARS, etc. OR any 1 Mc. portion of the spectrum between 1.5 Mc. and 25.5 Mc. OR any 2 Mc. portion of the spectrum between 25.5 Mc. and 29.7 Mc. YOU DON'T SETTLE FOR HALF A LOAF OF FREQUENCY COVERAGE WHEN YOU HAVE A 100V!

THE TUNING DIAL: Band scales in the large slide rule window change with the band switch and are calibrated at each 100 KC point. Frequency is read directly in 1 KC increments by the circular KC dial without any computation whatever. Approx. 12 feet of bandspread on each band. A smooth running two-speed tuning knob allows fast tuning at 100 KC per turn and slow tuning at 750 CYCLES per turn. Calibration accuracy is 250 cycles between any two 50 KC points.

METERING: Reads POWER INPUT (0-200 watts) RF AMPS OUTPUT, AC LINE VOLTAGE and CARRIER SUPPRESSION IN DB DOWN TO 70 DB.

MONITORING: A 2" scope provides an instantaneous visual check on non-linearity resulting from improper loading. Also indicates proper setting of carrier injection for 100% AM modulation. Scope presents trapezoid pattern.

OTHER INDICATORS: Below the meter a neon indicator provides a check on the operation of the NEW AUDIO LIMITER CIRCUIT. Below the scope a second neon indicator starts operating if you have the antenna or load mis-matched.

NEW AUDIO FILTER-LIMITER: The new filter is composed entirely of R-C components, yet has the steep side response and rejection characteristics of a four toroid tuned filter but without the usual harsh, ringing effects. Bandpass is 200 to 3700 cycles. This filter precedes the phase shift system and will maintain 50 DB SUPPRESSION OF THE UNWANTED SIDEBAND. The new audio limiter maintains audio drive to the balanced modulator WITHIN 1 DB, REGARDLESS OF HOW HARD THE MIKE IS HIT. IT'S IMPOSSIBLE TO OVERDRIVE THE 100V BALANCED MODULATOR! Inverse feedback circuits allow 10 DB OF CLIPPING with negligible distortion.

NEW PS-2 AUDIO PHASE SHIFT NETWORK: A twelve cross-over point network is composed of heat-cycled components having .1% accuracy. Even changing the balanced modulator tubes has no effect on its maintaining 50 DB OR BETTER suppression!

POWER OUTPUT: The husky, ultra-linear type 6550 tubes in the final of the 100V will deliver 100 WATTS OF SINGLE TONE POWER, EVEN ON TEN METERS! AND WITHOUT GRID CURRENT FLOW. Two tone third order distortion products are down in excess of 40 DB. A new POWER OUTPUT CONTROL eliminates the need for power dividers when driving AB1 or AB2 linears, since power output is continuously variable from 10 watts to full output.

SET AND FORGET CONTROLS: These seldom used controls are all located behind the flip down magnetic doors on the front.

GENERAL CIRCUITRY: Crystal controlled master SSB generation is at 8 MC. VFO injection is 5 to 6 MC. Crystal controlled heterodyne oscillators operate into mixer stages for various bands. This system, originally developed by C. E. is today the standard of the industry. Blocked grid keying of mixers and final amplifier provides perfect CW and PHONE BREAK-IN.

PHYSICAL DATA: Panel is standard 19" width by 8 3/4" high. Finish is smooth grey. Attractive heavy duty rounded corner cabinet is 15" deep, is finished in grey wrinkle and has a latch type access lid. Shipping weight approx. 90 lbs.

MULTIPHASE 100V complete.....Amateur net \$695.00

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A NEW COMPANION RECEIVER: Which will TRANSCIBE the 100V or separate the two VFO's at the flip of a switch. The 100V has the interlock control sockets built in.

A NEW 2500L BROADBAND LINEAR AMPLIFIER. Big brother to the famous 600L.

A NEW HETERODYNE CONVERTER: To cover all of the 2 and 6 meter bands with the 100V. Interlock control sockets are in the 100V.

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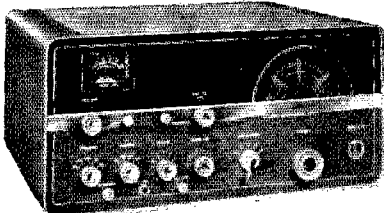
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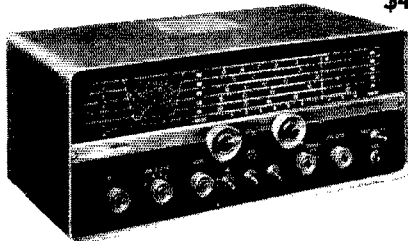
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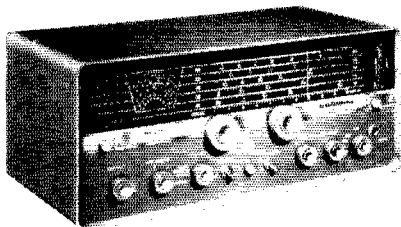
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BETTER STILL, COME IN — PLENTY OF PARKING SPACE

W9YYX 4, DOK 3, FWH 3, K9GSV 3, W9VQP 3, K9ELE 2, (Aug.) W9ZYK 441, QYQ 120, K9RMQ 42, W9QWI 31, DZC 21, K9MWC 13, W9OCC 13, K9PHP 12, W9BUQ 4, K9GSV 4, DWK 2.

WISCONSIN—SCM, George Wolda, W9KQB—SEC: YQH. PAMS: NRP, GFL and K9IQO. RMs: SAA and K9ELT, New appointees: SJL as EC, K9JJR as OO Class III. WIN certificates went to CCO, CXY and LFK. DYG and K9DAC, members of the A-1 Operator Club, made BPL. OO PJT has a BC-342 for portable operation. K9GSC has a new 2nd-class radiotelephone operator's license. CXY is back on regular TCC schedules to the West Coast. K9PQU is a new station in Brussels. A DXCC certificate was received by YT, the U. of Wis. station. The Badger V.H.F. Club of Milwaukee has affiliated with ARRL. An interesting monthly bulletin is published and a 5L1-Mc. net of the members meets Sun. at 8 P.M. Lucky KN9RPM got three 6146s at two meetings of the Oshkosh Club. Thirty-two clubs in Wisconsin registered with the SCM but monthly news is being received from just seven. Activity reports from the other 25 will be appreciated. Working mobile exclusively, JQE has WAS on 10-meter phone and an HK8AI contact on 15 meters. Ralph is a member of the OTC and RCC. VZP has a QSL from JT1AB marked No. 74. PVO, ex-operator at KC4G/SSB, is attending college at Whitewater. The new set-up at MWQ includes an NC-303 Johnson KW, at Matchstick and a doublet. K9AEQ/4 is attending the St. Petersburg Junior College in Florida and is looking for Wisconsin contacts on 10 and 15 meters. K9PZP's 65-watt 15-meter signal was given a boost with a new three-element beam on a 20-ft. tower. A very interesting bulletin is being put out by NRP, manager of the BEN. There are approximately 65 A-1 operators in the Central Division, of which just 10 are in Wisconsin. Let's watch our operating and merit this "Tops in Awards." A Merry Christmas to the radio amateurs of Wisconsin. Traffic: (Sept.) W9DYG 1112, K9DAC 765, W9CXY 394, NQW 154, K9DTK 90, ELT 58, W9CCO 54, KQB 52, SAA 45, OTL 24, NRP 21, CBE 14, LFK 13, SIZ 12, MWQ 11, K9DOL 8, ESN 6, GSC 6, HDL 6, IQO 6, JQA 6, W9YT 3. (Aug.) K9ELT 45, W9PJT 9, MWQ 3, HDZ 2.

WISCONSIN QSO PARTY

December 6

All Wisconsin amateurs are invited to take part in a QSO party, sponsored by the Milwaukee Radio Amateurs' Club in order to promote friendship and operating ability within the section.

Rules: 1) The party will begin at 10:00 A.M. CST and end at 5:00 P.M. CST Sunday, December 6. 2) All types of emission and all bands may be used, but a station may be worked only once regardless of mode or band. C.w.-to-phone operation is permitted but crossband work is not allowed. Stations are urged to work all bands from 2 through 160 meters to raise their scores. A station may compete on c.w. or phone or both, as desired. 3) The general call will be "CQ Wis." 4) Information to be exchanged during contact will consist of a QSO number, RS or RST report, county, operator's name and time of contact. 5) Logs should show times, station worked, signal reports sent and received, frequency, time emission, power input, QSO numbers sent and received, name, county. It is suggested that sheets from the ARRL Log Book be used for convenience and accuracy. Exchanges must be entered correctly. 6) *Scoring:* Count one point for such information sent and one point for such information received, for a maximum of two points per contact. Multiply the total contact points by the number of different Wisconsin counties worked for final score. Only contacts with other Wisconsin amateurs can be counted. 7) An engraved gold cup will be awarded to the highest scorer, regardless of whether that score has been made completely on c.w., phone, or is a composite of both. In addition, engraved gold cups will be awarded to the highest scorer in phone only, c.w. only, Novice and Mobile. These awards, donated by local radio suppliers, will be presented at the Wausau Hamfest. 8) A self-addressed stamped envelope to W9FDX will bring contest forms. Send logs, postmarked not later than January 7, 1960, to Doug Pavek, W9FDX, 5776 N. 24th Street, Milwaukee 9, Wis. Judgments of the committee, consisting of W9s DYG QYW YZG and K9s ENB CJK, will be final.

See how many Badgers you can work during the seven-hour contest period. Get on the air December 6 and meet the gang!

(Continued on page 142)

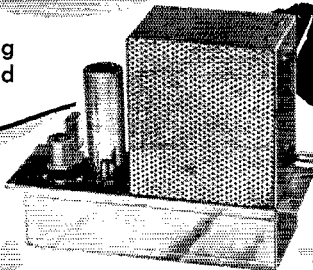
Santa's Bag is full of International gifts ...

HAMS

WANT

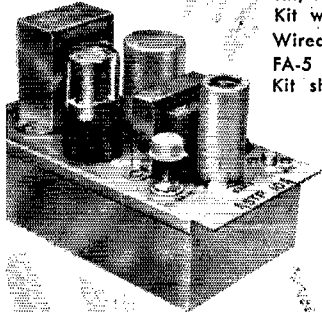
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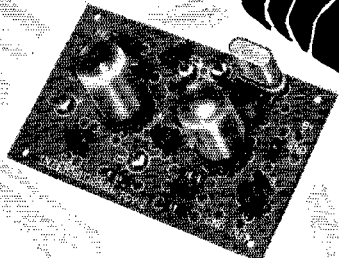
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Kit, less tubes & crystal, \$21.50
Kit with tubes, less crystal, \$26.50
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Kit shipping weight 5 lbs.



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10 WATT MODULATOR**

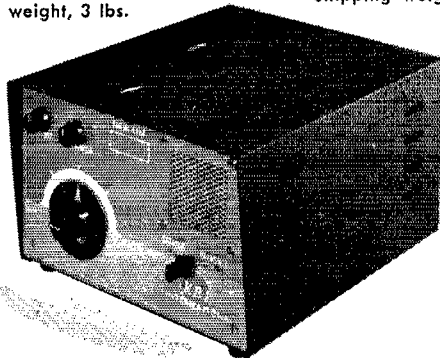
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Kit, less tubes, \$22.75
Kit, with tubes, \$25.25
Wired and tested, with tubes
\$30.50
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FCV-2 CONVERTER

Model 50, 6 meters. Model 144,
2 Meters. Kit with crystal, less
tubes, \$12.95. Wired and tested,
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KB-1 TRANSCEIVER KIT
FOR AMATEUR USE ON 6 METERS
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portion of the band for which
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portion of band desired when
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3-way power supply for
operation on 6 volts DC,
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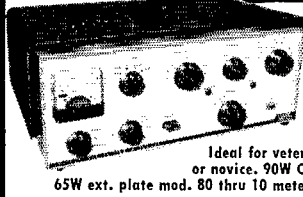
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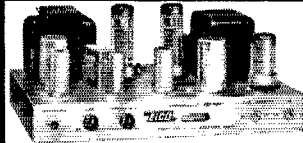
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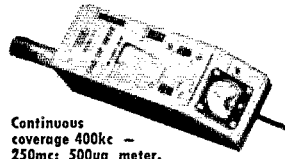
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Includes complete
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full band cover-
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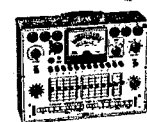
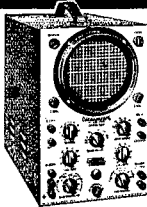
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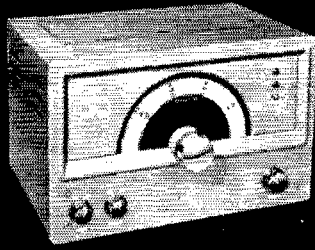
DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, W0HTVA—SEC: K0JLW, PAM: K0KJR. The NCSs for the 75-Meter Phone Net are as follows: Mon., K0LAB; Tue., K0ADI; Wed., B1F; Thurs., K0ITP; Fri., K0GRM; Sat., K0DHB; with HVA and PHC acting as Alternate Net Controls. The North Dakota C.W. Net reports 12 sessions, with a total of 30 check-ins and three pieces of traffic. We could use some more activity there, fellows. K0ADI has his 3rd-class operator's license. K0PTO reports that he exhibited his station, a Knight R100 and an Adventurer, at the Wahpeton 4H Fair in September. The station was operated by K0TPL, KN0LPJ and K0PTO. Thank you for any news reported, we appreciate it all. Traffic: K0KJR 22, W0KTZ 21, K0GRM 16, MPH 14, TYY 14, RMS 13, W0PHC 11, DNJ 10, K0PVB 9, ADI 7, W0CAQ 6, B1F 4, IHM 4, OAB 4, BHT 3, K0PL3, AJW 2, W0GQD 2, K0ITP 2.

SOUTH DAKOTA—SCM, J. W. Sikorski, W0RRN—SEC: SCT. Six activities reports were received this month from an ARRL membership of approximately 300. How about some help? SMV has disposed of his 813 rig and now uses a Courier, driven by a Ranger. New calls in Sioux Falls are KN6 WEM and WEN, Clayton and Low Wardell. At Avon, Lowell Schroeder received the call K0RCA, K1HNC/0 and K1LXC/0 are operating 50 Mc. at Gettysburg. Those receiving General Class tickets in Sioux Falls are ORH, RMI, PVL, SZJ and TDW. Newly elected officers of the SFARC are RPK, pres.; TGX, vice-pres.; SZK, secy.; and RWE, treas. I have received very few requests for renewal of appointments in answer to my letter. SCT is making progress in securing ECs for this section. Traffic: W0SCT 386, DVB 108, BAQ 103, ZVL 58, KLR 14, OFP 14, YVF 10, ZLB 10, FCR 8, FJZ 8, QPK 6, DUR 4, HVV 3, LKH 3, INZ 2, LXH 2, CWJ 1, RCA 1, SEJ 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, W0KJZ—Asst. SCM: Rollin O. Hall, 0LST, SEC: TUS, RMS: RIQ and K0JZD, PAMs: QVR, TCK and TUS. Congratulations to BUC and ZWL on their election as director and vice-director, respectively. KFN and EUI logged their 37th wedding anniversary. IRJ is employed at the Owatonna Nursing Home. The North Star YLs welcome TOP in Minneapolis. We deeply regret to report that OO-OPS WMA is in the Minneapolis General Hospital. ZMK and K0AUH renewed EC appointments; BUC his OBS and K0MNY his OPS. Three new ECs are K0MPH, IGW and K0LCG. New c.w. OBSs K0IDY and ORK send Official Bulletins on 3595 kc, at 1815 CST. K0QLM serves the Novices, WMA earned Class I OO and YAC Class II. The following appointments have been cancelled because of inactivity or no reports: LIG as OPS, K0GCN as OO, K0HNL as OBS, K0ERO and GLS as OBS, IRJ as OBS, and LUX as EC. SEC TUS compiled a Minnesota Call Book for the AREC. K0HKK, erected a 40-ft. tower for his 10-meter beam. K0LWK, KN0VPJ, K0ERQ and OJG attended the Ham-Fair in Iowa. K0MAK is wiring a "red-skin," the Apache. K0QYY puts out a dummy signal with his Valiant. A new signal heard from Braunert is keyed by KN0VGW. K0LAX reports that the Mesabe Wireless Club elected K0IBS, pres.; DCL, vice-pres.; K0LZK, secy.; KN0UBA, treas. SFU invites all of you to attend the MIRC Annual Christmas banquet to be held Dec. 12 in Minneapolis. Call DQL for tickets. Editor KEL resigned from *Splatter* because of his heavy sked at the U. of M. REA Mobile Club officers are THY, pres.; K0MVF and VZP, vice-pres.; K0PPD, secy.; K0LNE, treas. Happy to have EC-OPS TWG back on the bands. Don added a Lanpin frequency standard to his station, and put up a home-brew 15-meter two-element beam. RNY states the MARG drafted TOF as president after K0EWC moved to Minneapolis and JYC left for LeSueur. Mobiles TCK, WVT and OFT offered their services to the Blue Earth Sheriff to assist in locating a farmer in the area. KLG is keying an electronic keyer he designed and built. K0OTH has his General Class ticket and can be heard on 20-meter c.w. ALAV spent a month in the State of Virginia. Chuck received his Traffickers 1000; KJZ Traffickers 10,000. Every member on MSN gave a traffic report this month. FGP informs us that CCX, formerly of Minneapolis, became a Silent Key at his Florida home. May God's richest blessings be yours at Thanksgiving and Christmas! Traffic: (sept.) W0KJZ 283, K0IDY 136, W0TUS/VPO 116, RIQ 106, K0QLM 100, W0OPN 89, HEN 75, K0SNC 52, W0LST 49, UMX 43, KLG 41, K0MGT 38, ORK 38, W0KYG 37, BUO 36, K0LAX 31, W0VMA 30, K0ALAH 27, W0TWG 27, K0IKU 26, GIW 25, QYV 23, EPT 21, W0ALW 19, MXC 19, OFT 18, QVR 18, PET 17, OJG 16, ISJ 14, ROJ 14, K0MPP 13, OIW 11, W0QYQ 10, K0MNY 9, JYJ 8, W0NYP 8, OJK 7, K0RYK 6, RCF 6, W0VBD 5, DQL 4, K0SNG 3, W0GBG 1. (Aug.) W0FGP 14, TWG 12.

(Continued on page 144)



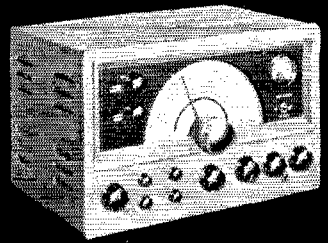
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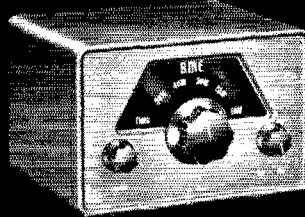


**CHECK ANY RECEIVER,
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THE RME 4350A.**

It has everything you want and need. Study and compare these features usually found in only high-priced receivers. Efficiency concentrated for ham bands only. IF curve is 2.8 kc wide without crystal, down to 100 cycles with crystal. Sensitivity one microvolt with low noise figure. Dual conversion for image rejection of at least 54 DB. Six-pound cast panel with heavy gauge steel chassis and cabinet gives maximum stability. 100 kc crystal calibrator. Single dual speed dial for easy tuning. Engineered for maximum performance on SSB, CW and Phone. Ideal for contests and DX under all receiving conditions. FCDA Item R-16. \$249.00. Amateur Net. Model 4302 Matching Speaker \$17.50 Amateur Net.

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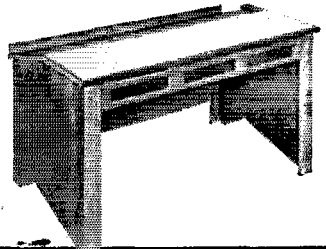
RME DB23 PRESELECTOR . . .

improves the performance of any receiver. Three 6J6 twin triodes are used as neutralized push-pull stages in a unique combination of selective and wide band RF amplifiers. You get a minimum gain of 20 db throughout all ham bands from 3.5 to 30 mc, and signal-to-noise improvement can be as much as 7.5 db over that of the receiver alone. Input circuits are accurately matched to any standard type antenna. Operation is simple; merely set band selector and adjust peaking control for maximum signal...\$49.50 Amateur Net.

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DELTA DIVISION

ARKANSAS—SCM, Ulman M. Goings, W5ZZY —SEC: K5CIR, PAM: DYL, RM: K5TYW. CAC reports the RACES program has been set up in Garland County. LVB has been appointed Radio Officer for the County. The Miss. County Radio Club had the club station set up at the County Fair and handled many messages as a public service. We all express our deepest sympathy to K5HYC, who recently lost his father. The Arkansas Hamfest, which was held recently at Conway, was a real success. This will be an annual affair. K5SMV has a new high-power linear on, FB has a pair of 813s on s.s.b. His signal sure has a lot of punch now. BUX, of Oklahoma City recently visited the hams of Arkansas. The Arkansas Emergency Phone Net meets Mon. through Fri. on 3885 kc. at 0600. The Arkansas OZK C.W. Net meets Mon. through Fri. on 3700 kc at 1900. Your support of these nets is invited. There still is a part of the State that is not covered. We would be happy to have more news items for your column in QST. Traffic: K5IPS 93, W5ZZY 92, K5TYW 77, W5DYL 4.

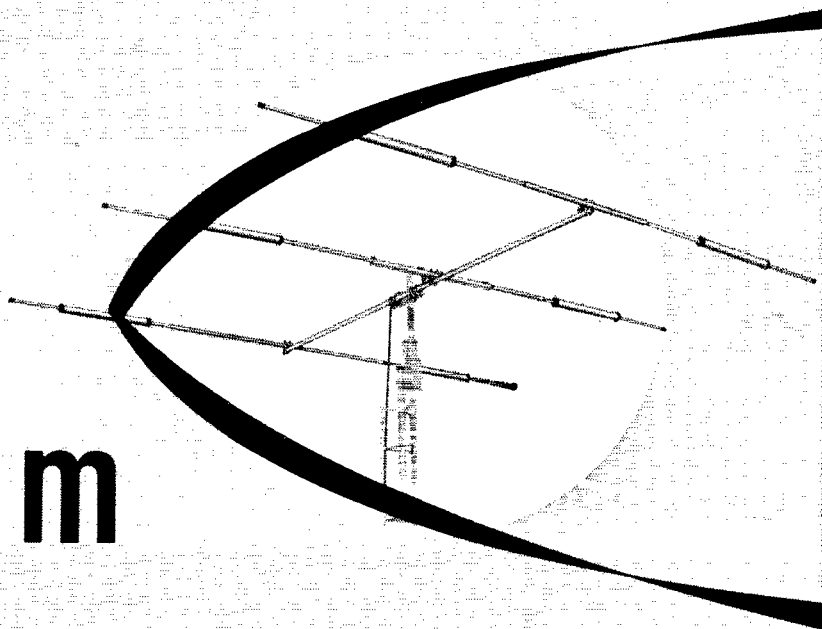
LOUISIANA—SCM, Thomas J. Morgavi, W5FMO —CEW has been reappointed PAM. While at the Division Convention he was elected pres. of the West Gulf DX Club. KC was elected vice-pres. 4MBO/5 will be active while stationed near Centerville at a commercial transmitter site until he is transferred. A Sawbones Net is in operation in New Orleans on 29 Mc. under the name of the New Orleans Medical Net. Netters include K5-USU, PNR, EOE, VAV, YAIN, JGM, STJ, UNP, SVP and JCD. EA, who says he hasn't much time to ham, regularly meets the OZK Net, Delta Net, LA MARS and 4th Army Nets. MIXQ is holding a six-week course in code for licensed Novices and Technicians. He now has a Mosley Tribander beam but curtailed the skiing for a while. AI was selected as EC for the Greater New Orleans ARC. CEZ is back in the saddle again. He banged in another BPL this month with a traffic count of 568. Carter recently installed a ground-plane antenna for 6 and 2 meters and the 6-meter gear is undergoing modifications. K5WKT, the XYL of NYK, is on all bands all day with a DX-100. New Novices are KN5WGT and KN5VAP; new Conditionals are K5RVU, K5UFO, K5URS and K5SWT. SPZ finally got back on the air on 80-75, 40 and 20 meters. One of the oldest old-timers (ham-wise not age), NO, is on single sideband. Traffic: W5CEZ 568, MIXQ 258, EA 7.

MISSISSIPPI—Acting SCM, Thomas C. Pate, K5HYO—Local amateurs stood ready for a reported tornado to strike the northwestern part of the State Sept. 26. Several of the fellows were on emergency power and ready. K5UFQ, the Cleveland ARC, can be heard using a 600-watt transmitter. We are pleased to announce the appointment of K5QNF as RN5 manager. K5VGF is on the air with a new 500C Globe King and an HQ-145 receiver. VGG and VGF are out of the hospital after suffering heart attacks. TXZ is back on duty at the Greenville AFR after a serious automobile accident. Would appreciate receiving some news from the Gulf Coast and other parts of the State. The Post Office Net is in full swing and would appreciate more of the fellows checking in on Wed. night at 2000. The Meridian ARC reported that the simulated emergency held Sept. 13 was very successful. The following hams participated, using mobiles, a DX-100 and a 75A-3: UTL, DEJ, EMM, OSA, AFA, GSK, FQ, K5TBK, KPV/4, PYS, ACJ, KVM and YCS. Their problem was an air raid. Traffic: W5SQS 61, MFY 21, HYO 19, NRU 16, RUO 5.

TENNESSEE—SCM, R. W. Ingraham, W4UO—Congratulations to EIN and FX on the first of a new series of C.W. Net Bulletins. K4AMC is a new NCS for the C.W. Net. K4KYL reports considerable interest in Knoxville on the new 145-147-Mc. band for Technicians. K4OUK reports QRP contacts with 3 watts input. TDZ says his new son is taking most of his spare time; also his DXCC score is 109/87. K4LPW says he is getting ready for the DX and contest season. Good luck to K4TYZ, who has returned to school. K4SGF has a sideband slicer but his DX-100 has broken down. OGG has a Johnson Ranger. UVU is modifying a 522 for 6-meter mobile. UVP has a rotator for his 6- and 2-meter beams. The Chattanooga Club is operating its own QSL Bureau —P.O. Box 13, Chattanooga. Congratulations to RRV and K4OUK on getting the new Tenn. Slow Net started. Look for it each Tue. and Thurs. at 2130 EST on 7075 kc. Traffic: (Sept.) W4PL 949, K4CNY 248, W4OGG 172, VJ 109, CXY 102, K4OUK 64, W4EIN 63, PQP 62, CIO 27, K4AMC 26, W4TZG 24, UVE 18, RRV 15, K4RSU 15, W4TZD 13, K4LPW 11, TYZ 8, W4UVU 8, UVP 6, VTS 5, UVV 4, PAH 3, K4KYL 2. (Aug.) W4TZG 14, K4LPW 10.

(Continued on page 146)

10
15
20 m



MOSLEY TRAPMASTER BEAMS

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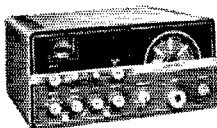
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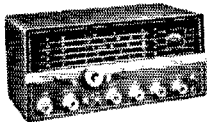
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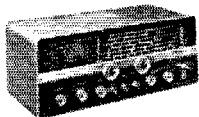
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Finely engineered—covers broadcast 540-1680 kc, 3 S/W bands 1680 kc—34 Mc. Slide rule dial bandsread calibrated on 10, 15, 20, 40, and 80 meter amateur bands. Antenna trimmer—"S" meter—crystal filter.

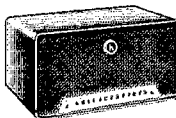
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GREAT LAKES DIVISION

KENTUCKY—SCM, R. A. Thomason, W4SUD—Asst. SCM; W. C. Alcock, 4CDA, SEC; BAZ, RM; K4CSH, PAMs; K4HCK and SZB, S.S.B. PAM; MMY, V.H.F. PAM; K4LOA, MIMW, manager and originator of the morning Kentucky Phone Net, has resigned because of changes in his college schedule. Kentucky is indebted to him for giving us another section net. SZB is the new manager and with your support he will keep MKPN one of our best nets. K4HCK is replacing GTC as manager of the evening net. Thanks to John for his help during the past year. HCK requests your cooperation in keeping KPN our largest section net. OO reports were received from EJA, SZL, K4GEZ, BUB and GAG. BUB is moving into his new home, which he built himself. Carl is Kentucky's most active OO. September BFL was earned by BAZ and K4IFB. EJA has a new job with WLVL. Larry hopes to be on 6 meters soon. V.H.F. PAM K4LOA reports 6-meter schedules are working very well. Keep Hanks posted on your v.h.f. activity. Traffic organizations by BAZ from Louisville, C.D. and Red Cross are certainly a boost to our section nets. Keep them coming. J.B. K4HTO has gone to M.I.T. ELG reports he is keeping his OBS schedules. KN7GIQ is now KN4IMF. Traffic: K4CSH 276, 1FB 259, W4ZDB 156, BAZ 137, SUD 62, CDA 41, SZL 41, K4VTV 24, DFZ 23, QHZ 22, SBZ 21, JOP 20, KIS 20, W4YY1 17, K4PNA 15, HCK 11, W4KJP 9, ELG 8, K4MPV 7, W4SZL 5, K4LOA 4, KN4IMF 3, W4EJA 2, K4HOE 1.

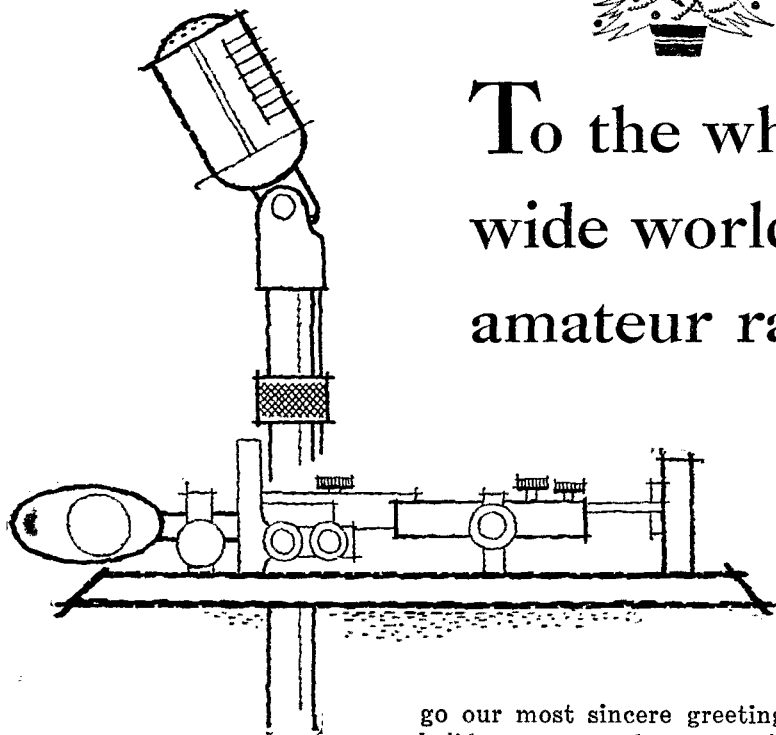
MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC; YAN, RM; SCW, OCC, QQQ and FWQ, PAMs; AQA and NOH (v.h.f.). EC appointment went to SLV, ORS to FWQ. OPS to ATB and K8KYM, OO to K8-HMD. Your ex-SCM, RAE, is now mayor of Buchanan! All Michigan nets are in full swing. JKN is using a home-brew trap antenna. RAE now is on 144 Mc. K8-JPV has a new RME receiver and home-built antenna tuner. K8CKD was married Nov. 7. NUL has a new Apache. SWN built a transistorized keyer. EMD (OO) issued 49 notices and 42 were for second harmonics. Made many c.w. contacts on 50 Mc. and says the rhombic is best if the aurora is low; the beam best if the aurora is high. NOH (V.H.F. PAM) reports JUU and PX on 144 Mc. each evening at 8 and 9 p.m. 1UJ reports Sunday-only nets in the U.P., c.w. on 7055 kc, at 10 a.m. and phone on 3920 kc, at 9 a.m. TRM is NCS. EGI reports that TXS, QQQ, GJI and K8IQW helped in the Woman's Air Race on Oct. 3. K8GJD has a new Cheyenne. PT worked 17 stations on 220 Mc. during the V.H.F. Contest. K8IWF has EC nets in Van Buren County on 29.61, 50.4 and 145.26 Mc. GKT is moving to Kalamazoo. HKT's antenna farm is about complete now. SX finally paid the SCM a visit. Traffic: (Sept.) W8OCC 154, FWQ 113, K8NAW 76, W8RTN 62, FX 57, YAN 53, NOH 49, JKN 48, QQQ 48, CNH 41, K8GJD 38, W8ILP 33, HKT 25, TBP 16, K8KMQ 14, LPV 12, AEM 11, W8AUD 11, FDO 8, SCW 8, QIX 6, SWG 6, K8HLR 4, CWI 3, CKD 2, GUE 2. (Aug.) W8JKX 43, K8NAW 20, W8AHV 14, RAE 4.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM; J. C. Erickson, 8DAE, SEC; UPB, RM; DAE and VTP, PAMs; HZJ and WYS. I want to take this opportunity to wish each and everyone of you a very Merry Christmas and a Happy New Year. The Seneca RC held a transmitter hunt. Toledo's *Ham Shack* (Gossip) named ITT as its "Ham of the Month." KIX is back in Toledo and is attending Toledo U. GOP has a homebrew mobile. NVK is on 160-meter s.s.b., BIW is back from Air National Guard training camp, FPU and NBD are on 160 meters, IWA vacationed in New Jersey, SUT vacationed in Florida. K8JDS vacationed in Pennsylvania and the Toledo RC held its picnic. Please change the call letters of the vice-pres. of the Chix on Six Net from VLS to VLF. K8s LEV and LEW (a man-and-wife team) have a new tower, a Mosley Tribander beam and a Valiant rig. K8s MZS and MZE (another man-and-wife team) have a new Valiant and a Viking 6 and 2. K8PVX is a new one on 6 meters. KN8s MRF, PTP and QHQ are new hams in the Canton Area. K8IPD has a T433 rotator and a Mosley Tribander beam. WJB has a new Globe linear amplifier. The stork brought OJZ a new baby girl. While in Cincinnati IF gave me the first *H-F Carrier* I've received in about six months and it tells us that RLE, an old club member, attended the club's latest meeting and the club is starting another code and theory class for Novices and Technicians. Columbus ARA's *Carascope* informs us that HB spoke to them on "Testing of Circuit Components," the club will start a radio school if they get enough students. K8LWB has a new G-50. K8LAW is on 6 meters. OMY received his WAC certificate. K3CXZ/8 was brought a baby boy by the stork. KN8s PNV and QBS are new Novices in Tuscarawas County. SBM is in the hospital in Akron. K8LTA received his General Class license. K8QNT has his General Class license and a new

(Continued on page 148)



To the whole
wide world of
amateur radio...



W2LAL	W9BBC
W2NRE	K9CLH
W5ZNM	K6KII
W6HV	K9KGJ
W6MEG	W9CXL
W6VNG	W9IDI
W8MTZ	W9LHF
W8NPO	W9NTL
W9BAQ	

go our most sincere greetings for the holiday season and our very best wishes for a wonderful year. Good QSO's... Good DX... and Good Fellowship to all.

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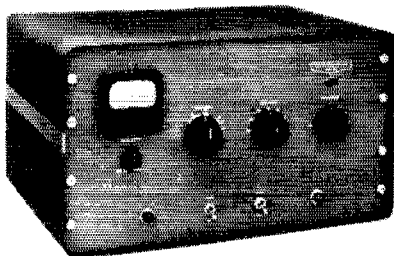


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SSB transmitter/exciter, bandswitches 80-40-20-15-10 meters. Rated 100 watts P.E.P. Operates on SSB with selectable sidebands, also PM, AM and CW. Has pi network output. Uses quartz crystal notching filter to suppress carrier. Has stable, calibrated VFO, excellent VOX system, heavy-duty AC power supply.

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Globe Scott and Hy-Gain vertical, KN8QZL is a new ham with a new Mohawk. IBX received his BERTA No. 1403 certificate. K8CTQ moved to Wisconsin. The stork brought a new baby boy to FFK, which means another brother for K8HKU. FRB has a new 10-meter beam. KN8s PVD and RBS are new hams. For the first time your SCM was all set to attend the Findlay and Cincinnati Hamfests. When the Findlay Hamfest came up I had at ten-day illness which prevented me from attending. However, I did attend the Cincinnati Hamfest, where about nine hundred amateurs registered, with 4MOP taking home the HT-32A and VJF the SX-101A. Talked to several former Buckeye Net members trying to get them back into the net before the holiday season starts. It looks very encouraging and if they would select one evening apiece, we would have no worries about Cincinnati being represented in the Buckeye Net. Watsa, boys? Please get together, set an evening and get on 3580 kc. at 1900 EST. Traffic: W8UPH 1249, DAE 324, K8DHJ 278, W8ZYU 83, LUS 69, K8IDH 61, KHS 39, W8BZX 37, CTZ 32, PMJ 27, IBX 22, BEW 14, LT 14, K8JZZ 11, W8FFK 10, K8HKU 9, W8LZE 8, K8GVV 7, ONQ 6, W8HZJ 5, PZS 4, SVD 4, WYS 4, K8EBO 2, GPI 2, W8LGR 2, LMB 2, K8MHO 2, W8UQI 2, K8BNL 1.

HUDSON DIVISION

EASTERN NEW YORK—SCM. George W. Tracy, W2EFU—SEC: W2KGC. RAI: W2PHX. PAMs: W2IJC and W2NOC. Section nets: NYS on 3615 kc. at 1900; NYSPTEN on 3925 kc. at 1800; LPN on 3980 kc. at 1530; ESS on 3590 kc. at 1800; ENY (emerg.) on 29,490 (Thurs.) and 145.35 Mc. (Fri.) at 2100; MILT (Novice) on 3716 kc. Sat. at 1300. Appointments: K2HNV at EC, W2AUC as OO, W2AKK as OES and W2ABMD as OBS. Endorsements: K2BCU and W2HO as EC. Congrats to RAI W2PLX on the new arrival in July. Her name is Carol Ann. W2SZ reports 114/10 on 6 and 77/16 on 2 meters during the Sept. V.H.F. Party. Congrats. More than 50 freshmen showed interest in the club during the R.P.I. Activities Fair. The Schenectady Club held its annual auction at its October meeting. 1959-60 officers of the Yonkers Club include K2BIG, pres.; K2SII, vice-pres.; K2HGN, corr. secy.; W2DDE, rec. secy. W2AMJ was guest speaker at the club's September meeting. K2AXM is on 2 meters with an eight-element beam. Also going on 2 meters are K2IOM, K2HGN, K2AXM, K2BIG and W2ABJS. A new Apache and an SB-10 soon will be on the air at W2U. The Hudson-Champlain Anniversary Parade on Sept. 12 in Albany was coordinated by amateur radio. With W2GTI and K2PXM as control, mobiles included K2BUY, W2FQP, W2OOJ, K2EKR, K2UMH, K2AYH and K2GNY. Lost children, traffic jams and ambulance calls were all part of the communications activity. This is excellent publicity and other groups should offer their services for these events. For specific information on how to handle this type of public service, contact W2GTI. Congrats to our two BPL winners, K2UTV and W2ALO. Traffic: (Sept.) K2UTV 3072, K2YZI 416, K2YTD 204, W2ALO 124, K2MBU 93, W2ATA 90, W2EFU 54, K2OZT 37, W2PKY 22, W2AKE 1. (Aug.) W2FVP 29, K2BIG 23.

NEW YORK CITY AND LONG ISLAND—SCM. Harry J. Dannels, W2TUK—SEC: W2ADO. RAI: W2VDT. PAM: W2UGF. V.H.P. PAM: W2EW. Section nets: NLI, 3630 kc. nightly at 1930 EST and Sat. and Sun. at 1915 EST. NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EST. NYC-LI AREC, 3908 kc. Sun. at 1730 EST. V.H.F. Traffic Net, 145.8 Mc. Tue.-Wed-Thurs. at 2000 EST. Your assistance is needed to handle the anticipated large volumes of holiday traffic. If you can devote time to a net or two your attendance will be welcomed. Contact our traffic managers or your SCM for further information. BPL cards were earned by ever-consistent W2KEB and a newcomer to the traffic ranks, K2SJF. W2AYI, representing the Eastern Area Slow Net on 3748 kc. Mon. through Fri. at 1800 EST, invites participation by all amateurs with or without traffic experience. W2IAO, nephew of W2KEB and W2KPV, is on the air from Westbury with a DX-20 and a G-43. K2QBW's traffic total covers only 15 days of operating. Ray had to report to M.I.T. W2PWI has found lots of DX on 10 meters. Many others found 10-meter openings profitable, including K2SJP who raised his ten-only country total to 58. K2TFU finished his 6-meter mobile rig. New officers of the Central Queens RC are K2AMQ, pres.; K2TPU, vice-pres.; K2QDQ, treas.; W2DMIQ, rec. secy.; and W2VCYZ, corr. secy. W2VSU nominated 3 stations for RCC. W2IVA, W2PFP's son, is seeking his M.E.E. degree at Brooklyn Poly. W2BXX, K2CFD operated in the SS with W2JGU. A new 2-kw. FED rig has been completed at K2PEV. New officers of the Stuyvesant HSRC are W2JGU, pres.; and W2TOX, vice-pres. K2UBB is operating from W8ZSQ, the University of Michigan RC station. New officers

(Continued on page 150)

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Model TBS-416 \$159.50

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Telrex Model TBS-416—tuned, matched and calibrated for easy assembly (to your favorite band sectors) and Telrex specified performance at your site—without tuning or adjustments of any kind, required, or recommended! Model TBS-416 consists of 4 medium spaced elements (two of which are "Tri-Band"® elements) on a 16 ft. boom, providing optimum 3 element 10, 15 and 20 MTR performance.

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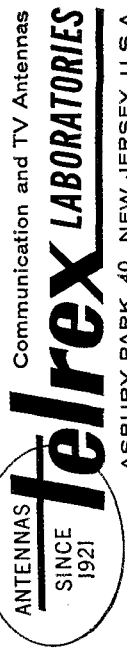
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- Bandwidth within 2/1 V/S/W/R 1.5%
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- Max. power rating 1.2 KW 100%AM
- Boom length and diameter 16 ft. x 2" O.D.
- Longest element length Approx. 30 ft.
- Turning radius approx. 17 ft.
- Support mast required 2" O.D. Seamless .125 wall min.
- Wind surface area 5.29 sq. ft.
- Wind load at 100 m.p.h.164 lbs.
- Recommended rotator—Telrex Model 175 RIS
- Design wind load rating with 1/2" radial ice load 85 m.p.h.
- Antenna net wt. 44 lbs.—Shipping wt. approx. 58 lbs.
- Shipping container size approx. 11" x 6" x 10"

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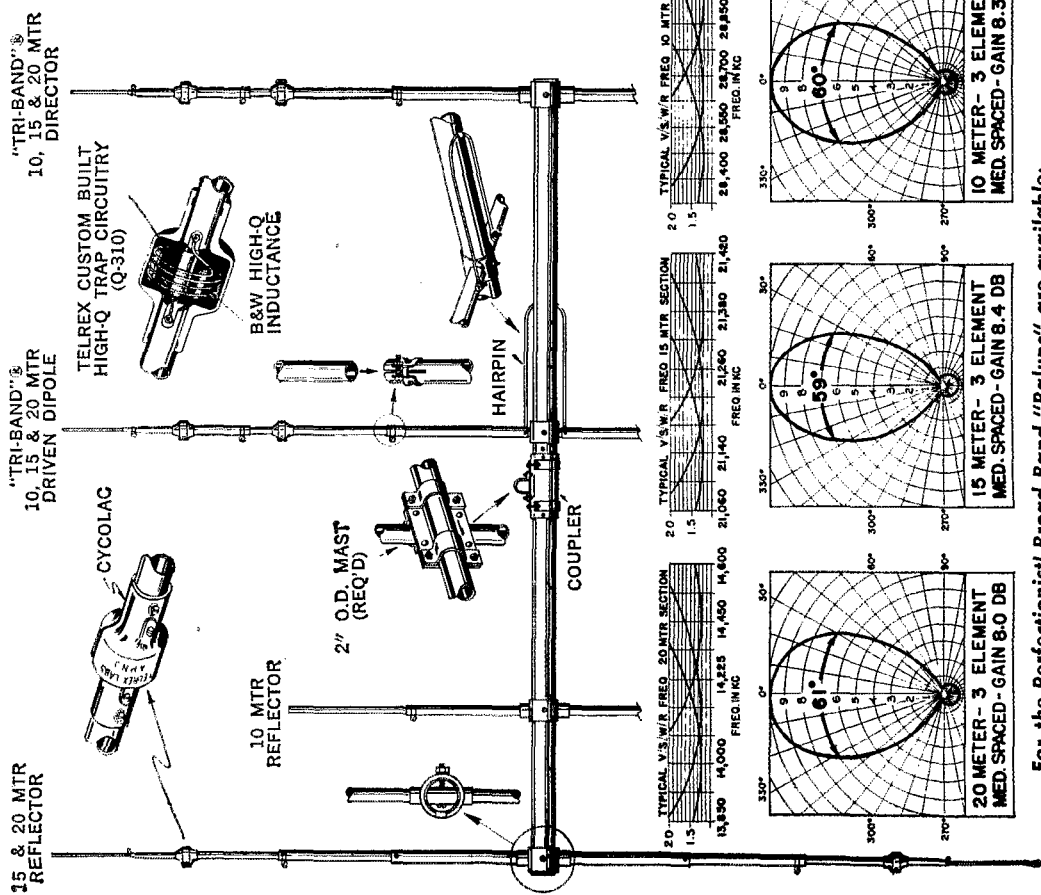
CHALLENGER TBS-308
3 Elements (8' x 2" O.D. Boom) gain 5 db.
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6 Elements (26' x 3" O.D. Boom) gain 10 db.
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CHALLENGER DTB-30
Rotatable 10, 15, and 20 Meter "Tri-Band" Dipole, unity gain bi-directional pattern. Any good TV rotator may be used or Telrex 175-RIS rotator. 435.00

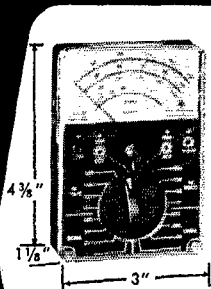


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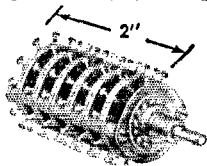


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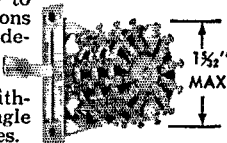
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of the 6-Meter L. I. Emergency Net are K2MGA, NCS; W2JVA and K2IXA, asst. NCSs; K2RKL, act. mgr.; W2EHP, asst. act. mgr. and K2DZA, OBS. A new Sencar is in use at W2CXP. K2SGO has a new Drake 1-A receiver. W2DYC is now using a 75A-3. A sample of our mail departs are K2MHI, to Leigh, K2JFS to Ohio State, K2DEM and K2OKJ to Cornell, K2QBW to M.I.T. and W2DYC to Emory. A new HQ-170C and a pair of 6146s is on 5 meters at K2SJP. K2UYG made DXCC, WAC and WAZ all on 20-meter c.w. or phone. W2WUQ moved to Huntington Station. The Order of Boiled Owls RC members have hit s.s.b. with a bang, with W2AYJ, W2ESO, W2HMJ, W2HQL and K2FC enjoying a new country or two on the new mode. K2QZS moved to Hillsboro, N. H., where he now signs K1MID. W2-YHP, K2IDB and K2JTW operated W2YKQ/2 atop the highest point on L. I., June Hill, in the V.H.F. Contest on 50, 144 and 220 Mc. W2GGI is on the air with a DX-40 and an SX-71. W2LTB joined OTC. Officers of the Mid-Island Net on 50.9 Mc. are K2RCP, NCS; K2RBS and W2EQK, asst. NCSs; W2HQA, secy.; W2BRY, treas.; W2DLS, act. mgr.; and W2-FLG, OBS. New officers of the Frog Hollow RC are K2VHR, pres.; W2ACH, vice-pres.; K2IGY, secy.; and W2EHA, treas. W2GIE and his XYL vacationed in Ireland, where they report on the wonderful Emerald Isle, too! The AREC organization in Kings County, as reported by Kings EC, K2CTK, finds W2JCI as Asst. County RO; K2OVN, 2-meter EC; K2AAL, 6-meter EC; and K2BDD, 10-meter EC. New officers of the Grinnam ARC are W2PCV, pres.; W2QOH, vice-pres.; W2FWW, secy.; and K2KSP, treas. K2PHG passed the General Class exam. Traffic: (Sept.) W2KEB 3676, K2SJP 384, K2QBW 266, W2VDT 218, W2EW 102, K2-DEM 50, W2UGF 45, K2YQK 39, W2DUS 38, W2JBQ 36, W2BBS 25, W2IVN 22, W2BVIH 21, K2JLD 21, K2SFS 16, K2RJO 15, K2IRS 12, W2DRD 10, W2EC 9, K2IUT 8, K2CMJ 7, K2RDP 7, K2TPU 7, W2CSE 6, W2FAV 6, K2JVB 6, W2LDC 6, W2MDM 6, W2UAL 6, K2AAW 5, K2GCE 5, W2VSU 5, W2HNG 4, K2MEM 3, K2GB 2, K2MYS 2, K2OFD 2, K2PEV 2, W2PF 2, W2DXH 1, W2JGY 1, (Aug.) W2VDT 222, K2MDI 24, K2SJP 12, K2VIX 12, K2AZT 2.

NORTHERN NEW JERSEY—SCM, Edward Hart jr., W2ZVW—SBC; W2CVW, RMs; W2RXL and W2ADE, PAMs; W2REH and K2XVY, NJN held 30 sessions with an attendance of 517 and traffic 259. NJN meets on 3595 kc. at 1900 daily. The N.J. Phone Net had 30 sessions with 420 attendance and 63 traffic. It meets on 3900 kc. at 1800 daily except Sun. and at 0900 on Sun. The Tri-State Novice Net is on 3738 kc. at 1515 Tue. and Thurs. W2NJR gave a talk on satellites at the Ridgewood ARC. K2SRD is having trouble with a chirpy v.l.o. W2REH broke 100 countries but not all are confirmed yet. K2-YBC soon will be on 6 and 2 meters but has been working DX on 20 and 10. W2AXC is building a 100-watt c.w. rig for W2CBT. K2YHZ received his Extra class ticket. K2PTI has a new SX-99 receiver. K2VVI had a bout of walking pneumonia and is off to Phoenix for a few weeks to recuperate. W2NIV received the Keystone Award. W2CWE had a visit from W2UK/KH6UK, who will be in the States for a few months. K2UCY, in the same building with K2YBC, finally hooked up on 40-meter phone after almost a year. K2AGJ has the new Collins S-Line. W2RXL faithfully puts out the NJN bulletin every month. To get on his mailing list, join the NJN. Karl also is teaching an adult education class at Phillipsburg on how to become radio amateurs. W2EWZ skeds WIFNU. W2ACOO received ORS and net certificates. W2VMX reports a new jr. operator for K2VXJ. Class ticket. K2PTI has a new SX-99 receiver. K2VVI. K2CBG is NCS on NJPN and his son is K2MGC. W2-OPB has his wings slightly clipped by school work. W2CCF has a new Johnson 6N2. K2MFF operates nets while doing homework! K2LWQ and W2SJB have received Net certificates. W2EBZ, formerly W1RWS, of Connecticut is a new ORS in No. N. J. The N. J. Slow Speed Net reports 22 sessions, 43 attendance and traffic 20. K2LXL now has a 242-ft. antenna and claims it works FB. W2GVU, who recently left No. N. J. after retiring, is now W6FB (what a call!) in Van Nuys, Calif. Look for him on 7010 kc. Traffic: (Sept.) K2ZHK 114, W2VW 113, W2COO 103, W2RXL 83, W2APY 80, W2CQB 76, W2OPB 53, K2UCY 52, W2EBG 51, W2RZO 44, K2YBC 44, K2VVL 33, K2MFF 31, K2PFG 30, W2CVW 24, K2LXL 20, W2REH 20, K2LWQ 18, K2JTV 15, K2CBG 13, W2DRV 12, K2MFX 10, W2-OXT 10, W2EWZ 7, K2SLG 7, W2ADE 6, K2AGJ 2, W2CCF 2, W2VMX 2, W2CJX 1, (Aug.) K2YBC 42, K2PVH 14, W2AKM 6, W2CJX 2.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, W6BDR—WVF, State RACES Radio Officer, organized a group of

(Continued on page 162)

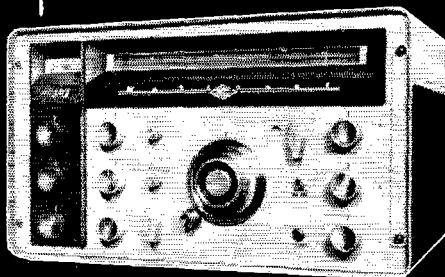
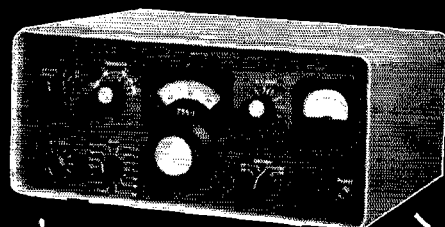
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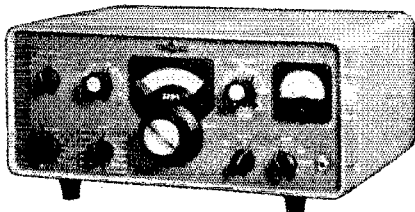


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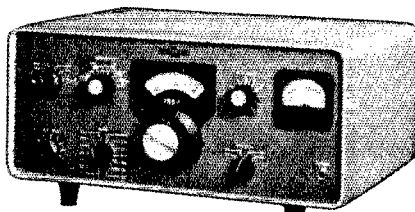
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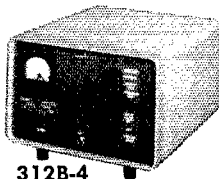
30S-1—(Not pictured) Linear Amplifier \$1,470—10% down (\$147.00)



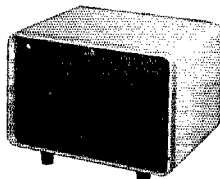
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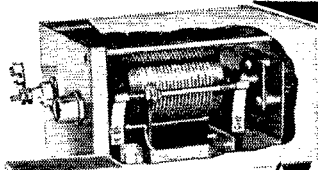
stations to furnish communications for the press when Khrushchev visited the Gurst farm at Coon Rapids. Mobiles were KJN, as NCS, NWX and K5KDA. Fixed stations were K00AH, SKW and NTA, operated by K0GXP. Claude reports that the news flowed solid for three and one-half hours and everything worked 100 per cent. The Sioux City Hamfest was attended by 285 persons. ERG, the club station, handled traffic and made BPL. The Des Moines Club station, K0HEA, had a booth at the State Fair and also made BPL. GXQ joined the Air Force. Good luck, Jerry. K0BLJ has moved to St. Louis. The Bedford Picnic was attended by 169 persons with 69 amateurs registered. New appointments: LCX as RM and K0EAA as EC; also GEY as EC. BQJ renewed his ORS appointment. Officers of the Luther College Club are K0OHE, pres.; BQV, vice-pres.; K0JVV, secy.; K0HXL, treas. and trustee. K0PDP is the new president of the Council Bluffs Club. K0QAI has the new beam up and is working DX. FKB has gone to Arizona for the winter. BDR visited NGS. SLC has an HT-32 and a 600L Traffic: (Sept.) W0LGG 1511, SCA 1361, BDR 1342, LCX 1151, K0CLS 650, HEA 425, GXP 143, W0ERG 100, GXQ 99, K0CMC 86, W0NTB 59, NGS 50, SLC 50, NYX 35, QVA 30, K0AMZ 25, W0BTX 18, REAI 18, VWF 18, K0LHC 14, W0VQX 14, K0EAA 13, W0YDV 12, K0QAI 11, W0UDT 11, HUO 10, K0SEW 9, INR 7, JGM 7, W0ADB 6, K0APL 6, W0QVZ 6, UIZ 5. K0KBX 3. (Aug.) K0HEA 89.

KANSAS—SCM, Raymond E. Baker, W0FNS—SEC: IFR, Asst. SEC: LOW, RM: QGG, PAM: VZM, V.H.F. PAM: HAJ. New appointments: K0IZM and K0OMM as OPSs; K0JYX and SYZ as ORSs; KKS as EC for Zone 12 and SYZ as EC for Zone 21. K0OWN was in the hospital after a bout with a press drill. We have a total registration in the AREC as follows: 345 members, 119 mobile units, 61 emergency radio units, 8 emergency local nets, all tied to section nets, 12 drills last month listed, BYV, OO, is active again. K0JWJ still is working with TV. ETX is now 2-meter mobile. HAW is working 6 meters. GJJ advises that 18 new amateurs are lined up for General Class tickets. DSM was in a bad auto accident but is coming along fine. K0JWD was elected president of the Federation of Clubs. OYA paid the SCM a visit, but he was in St. Louis. The KVRC operated TRG/Ø at the Topeka Fair handling over 150 pieces of traffic. KXB demonstrated his RTTY equipment at a recent KVRC meeting. The VV Radio Club holds code classes each meeting night at the Naval Reserve Building, Independence, Kans. K0GIA continues to pile up QSOs on 6 meters. Traffic: (Sept.) W0BLI 502, QGG 307, FNS 215, K0HGI 155, W0TOL 138, SYZ 116, K0BLX 98, W0RJP 82, ABJ 56, K0KMZ 52, IZM 49, W0IFR 47, K0JYX 37, W0VZI 36, UTO 34, K0GEL 26, BXF 25, W0GJG 22, FDJ 12, FHT 11, K0KED 11, TCT 11, W0VUI 11, K0EFL 10, QOB 9, JID 7, W0STC 7, K0QWN 6, W0WFD 5, K0MIL 3, GYA 2, TNW 2, W0FHU 1. (Aug.) K0EFL 8, TOA 8, W0RJP 4, K0GEL 2.

MISSOURI—SCM, C. O. Gosch, W0BUL—SEC: K0LTP, RMs: OUD and QXO, PAMs: BYL, OMIM and K0RLQ, Net reports: MEN (1800, 3885, ke. MWV), Sept., 12 sessions; QMI 377; QTC 92; NCS OHC and OMM 4 each; VFP 3, BUL 1. Congratulations are extended to K0KBD on his appointment as manager of the Tenth Regional Net (TEN). The SCM wishes to thank the following for their good reports for the month of Sept.: OVV and TOD as OBSs; WYJ and OJC as OOs. The V.H.F. Club (St. Louis) held a city-wide and county-wide transmitter hunt on 6 meters late in October. The SWMARC (Springfield) conducts an AREC Net the 2nd and 4th Mon. of each month on 29,626 Mc. at 1930. Any other AREC groups conducting or planning this type of activity, please advise the SEC or the SCM. A practical application of such activity was assistance given by mobiles HUB, BVG, HUI and K0LTK in conducting the hunt for a nine-year-old girl lost in the woods in the area recently. The Suburban RC (St. Louis Co.) conducted a display and demonstration at Kirkwood for the area c.d. Those cooperating in this effort were K0MAU, BVV, COD, IGV, ICV, FQY and IFL. Club bulletins are always appreciated. Please keep them coming. It is with deep regret that we report that DWX has become a Silent Key. Appointments: OO—K0KBD, OJC, W0QLR and K0LGG. Endorsements: RM—QXO; OBS—KLQ and PME; ORS—GBJ, PAM and QXO; OO—PME. Officers of the Ritenour HARC are K0SBJ, pres.; K0JPH, act. mgr. Officers of the Zombies are K0SBJ, pres.; K0PSQ, vice-pres.; K0MNN, secy., treas. Meetings are held at 2400 Tue. on 50.55 Mc. Traffic: (Sept.) K0ONK 1161, KBD 416, W0OMM 174, OUD 96, VPG 72, KIK 60, ZBR 59, K0PFF 52, W0VVF 50, MKJ 39, BYL 38, OVV 37, BUL 21, K0OEP 16, OJC 12, W0GEP 8, K0LGG 8, WAP 7, IHY 6, W0GBJ 2, K0LWX 1. (Aug.) K0LWX 33, W0KA 23, K0MAU 7.

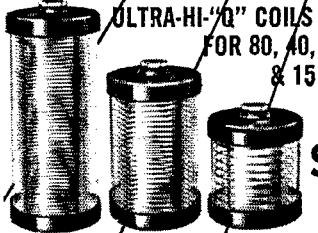
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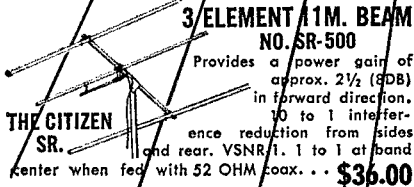
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in forward direction.
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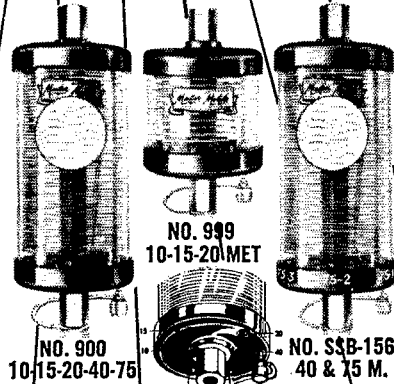
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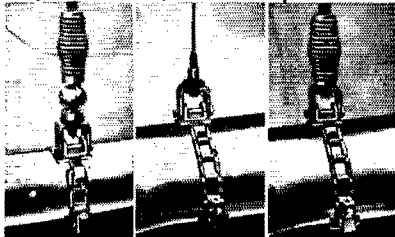
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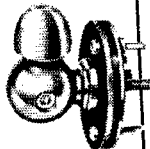


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FOR 10, 11,
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Furn. with 12"
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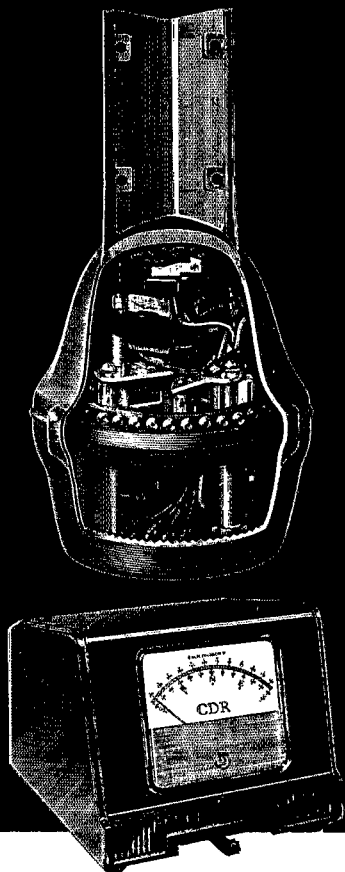
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NEBRASKA—SCM, Charles E. McNeel, WØEXP—The Western Nebraska Net reports QNI 703, QTC 79. The 75-Meter Morning Net reports QNI 689, QTC 126, with 51 on roll call. The 75-Meter Noon Net reports QNI 364, QTC 28. KØKUA and KØMRS transmit slow-speed code practice Mon. through Fri. on 3695 kc. NYU is RM for the Nebraska C.W. Net that started operation on Sept. 1. A very FB hamfest was held at Sioux City with a good attendance. KØDGW was elected net manager for the Morning Phone Net on 3993 kc. KNØVAZ is off to a good start in Curtis. KØCDG and WGA are attending Nebraska U. KØMRS is back on the air after a summer vacation. The Central Midwest Division Convention held in St. Louis was well attended with a good representation from Nebraska. After talking with Director NWX it is hoped that we can organize to put on the Midwest Division Convention in Nebraska next year. Talk it up, fellows. The August report for the 75-Meter Noon Net was QNI 250, QTC 15. Thanks to SXR for filling in for me while I was on vacation. Traffic: WØNYU 219, ZJF 123, KØKGW 88, KUA 57, LJW 58, WØRDN 38, OKO 35, NIK 32, KØCDG 23, WØHTA 26, KØDFO 24, WØUOV 24, KØBDF 22, FBD 17, WØVZJ 16, 11, KLB 10, KØTSU 8, ELU 7, WØLJO 7, KØQFK 7, URR 7, CBV 6, KJP 6, MISS 6, WØGGP 5, KØMRS 5, SCM 5, ULQ 5, WØHOP 4, KØMZV 3, WØATU 2, KØELQ 2, LXS 2, WØWGA 2, YFR 2, AVF 1, KØSLB 1.

NEW ENGLAND DIVISION

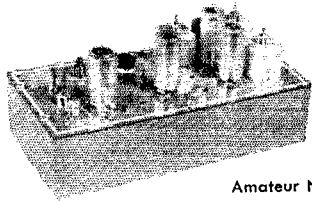
CONNECTICUT—SCM, Victor L. Crawford, W1TYQ—K1IWW, who passed the General Class exam at the Hartford Convention, is on s.s.b. with the S-Line. Cards from VQ9AIW and KS4BB bring BIH to 282 confirmed. His first 6 contacts on s.s.b. gave him WAC. KICBV has a nifty new QSL. KIBFJ visited DJIBZ and DIAUSA while on his vacation. YBEI reports that CPN met 20 times, handled 285 messages, and had an average of 27 stations daily. High QNT goes to KICBV, KICRQ, MWB, TVU, 25. KIAAE, VLY, YBH, 24. The Manchester Radio Club holds code classes Tue. nights at C.D. Headquarters. YBI is convalescing after an operation. VOL has been sampling 2 meters. PHP reports CVN handled 23 messages during 13 sessions and had 122 check-ins. The weekly 2-meter meeting of the CQ RC netted 63 stations and 4 messages. FVY has cleaned up the ignition noise on his Rambler. MWB has a new NC-125. KIHAN is NCS on HTN Thurs. KIBML and KIBMM are contemplating s.s.b. with an 8B-10 and a Ranger. K1BFS added 14 new countries and several new states. HYF is s.s.b. on 3.9 Mc. with the S-Line. ECH needs New Brunswick for WAVE. KN1MGV is a new Novice in Wethersfield. College is cutting the operating time of KICAK. QVF has built a new 32-element 220-Mc. beam. WAZAYI reports the Eastern Area Slow Net operates Mon. through Fri. at 1800 EST on 3748 kc. KIGDV has a new Mosley TA-33 on a 50-ft. tower. KYQ reports CN handled 345 messages, including 36 on the second session during 30 sessions, average attendance was 13 stations. High QNT goes to KIHWF, OBR and REJ. WJF is home after 4 months on Ice Island T-3. KUK has transferred to McChord AFB in Washington. *Nutmeg News Notes* is a bulletin put out for Connecticut hams. If interested, write your SCM for a free copy. KIDME is back at college. KNIDUW has dropped the "N." EYF has a new 6N2. MQT is in the Air Force in Texas. CHR is back handling traffic. VKZ brought his DX total up to 108/94 during the summer. ZKZ operated portable from Maine. GVT has a new 20-meter beam. MES joined the Armed Services. KIDNU has returned to Boston U. GXG was injured in an accident. GTH is home after a stay in the hospital. DNJ donated an electric frying pan to the Southampton ARA. MEZ is on s.s.b. VXJ is enjoying 10 watts and an S-85. AOS is receiving good reports with his transistor rig. UUV has 39 stations on 6 meters. KNIKSH, KN1MBH, KNILKC, KNIAFR, KNIKTQ and KNIKVR formed the GQB (General or Bust) Club. They operate on 3745 kc. New officers of the Candlewood ARA of Danbury are ADW, pres.; KIGDV, vice-pres.; K1HKK, sec.; INB, treas. WHL and NYL attended the Grave Yard Net Picnic in Lynchburg, Va. KIHAN, KIHWF, KIAAE, KIBCP, KICBV, KICWF and K1GCS have received Section Net certificates. WHL reports the 6-Meter Net handling 39 messages in July, 31 in Aug. and 37 in Sept. KIHAN has been appointed ORS. Appointments renewed: CTH and VKZ as ORS; ZYT as EC; YBH as OPS. Reports received: OES from FVY; OO from KIBNQ, KIEFF, GIX, MBX and MWB. Traffic: (Sept.) KIBNQ 309, AV 275, YBEI 161, KYQ 133, KIHWF 119, WIOJM 113, CHR 84, EFW 79, ROX 58, VLY 52, DGL 50, RFL 44, MWB 42, FHP 32, K1JAD 31, CBV 28, W1FYF 28, KIHAN 23, W1BD1 21, KIBNQ 9, W1JZA 8, K1BM 7, W1G1X 7, CUH 6, BFS 4. (Aug.) W1EFW 142, QJM 64, CUH 8.

(Continued on page 156)

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Model TR 20/144 (2 meter band or CAP) 6AU6 Osc.
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buf/-mult. -6360 buf/mult. -6360 Power Amplifier. 20
watts input.

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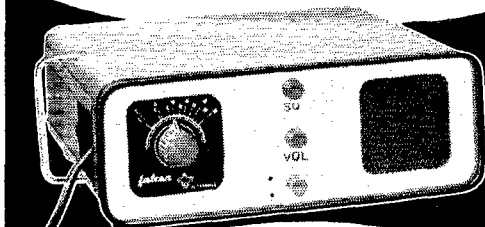
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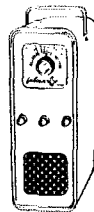
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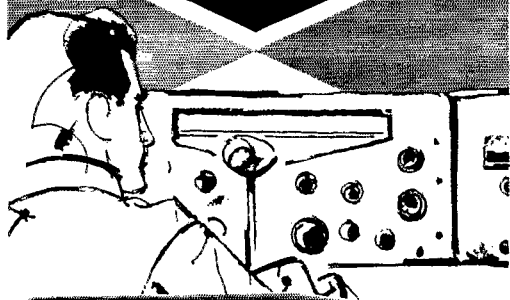
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499.50**GSB-101 SSB LINEAR AMPLIFIER**

1000 watts P.E.P. input linear uses stable, efficient grounded-grid circuitry. Has pi-network output, bandswitches 80-40-20-15-10 meter bands. Supplies for power and bias and antenna relay are built in. Linear drives by GSB-100 or other equipment supplying 60-70 watts of driving power.

GSB-101 459.50*In stock for immediate delivery***TIME PAYMENT PLAN****TRADE-IN ALLOWANCES****ALMO RADIO CO.**913 Arch St.
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MAINE—SCM, Jeffrey I. Weinstein, WIJMN—SEC: WIJMN, PAM: BXI, RM: EFR. The Sea Gull Net meets Mon. through Sat. at 1700 on 3940 kc.; the Pine Tree Net Mon. through Fri. at 1900 on 3596 kc. JMN Official Bulletin schedule: Mon. through Thurs. at 2000 on 3800 kc. New appointments: K1BXI as PAM; K1DPM and G1VQ as Asst. ECs. Renewals: K1BYE and OTQ as OPSs; K1EZ as EC. K1LCH is attending classes at the U. of Me. in Orono. KN1MBM is a new Novice in Westbrook. K1GMIW has moved to W2-Land. The Eastern Area Slow Net (EASN), which covers the 1st, 2nd, and 3rd call areas and meets Mon. through Fri. at 1800 on 3748 kc., invites all Maine amateurs to join and participate in slow-speed c.w. traffic work. Also, the Maine Slo-Speed Net meets Tue., Thurs. and Sat. on 3726 kc. at 1730. KN1JAP has dropped the "N." The Portland gang can be heard regularly chewing the rag on 10 meters. We all regret the passing away of the "Old Maine Schoolmaster," BX. Does your area have an EC? If not, and you're interested in the appointment, let your SCM know about it. Also, station appointments are available to qualified applicants. GKJ is piping r.f. out on 50 Mc. K1GVQ is on 15 meters with a rotary dipole. Best wishes for the Yuletide and Season's Greetings to all. Traffic: (Sept.) K1DPM 72, WIISO 48, UDD 40, EFR 37, JMN 10, KN1KSG 8, K1GVQ 5, WIOTQ 3, K1BYE 2. (Aug.) WIUDD 22. (July) WIUDD 17.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—New appointments: K1CIF/1 as ORS, TWG as OPS, K1BGX as OES. Appointments endorsed: MKW Dennisport, DVS Falmouth, CZW New Bedford, SS Lincoln, YWB Norfolk, KZW Westwood as ECs; K1AFA as OO; HWE, SS and WU as ORSs; SS and K1CXN as OPSs; EUJ and MEG as OESs. Ex-YV now is WA2GVU in No. Utica, N. Y. Heard on 75 meters: RBN, HOM, QLT/1 and K1GAU. K1EES and EEU are husband and wife. Heard on 2 meters: LAE, VPP, HNK, K1s AEK and MHC, who is K1GYM's son. K1BPJ is in No. Billerica. To all Radio Officers and ECs: Note that AOG is our Section Emergency Coordinator and it is his intention to assist everyone. New officers of the Chelmsford Amateur Radio Assn. are UX, pres.; K1IFV, vice-pres.; LDT, secy.-treas. K1IMP has a new 500-watt homebrew rig and a two-element beam. BGW has a three-element beam on a 40-ft. tower for 20 meters. 8HKZ/1 had a new son. TKN moved to Medway. WAJ took part in the F.M.T. NF attended the DXCC meeting and received confirmation for 140 countries. New

*(Continued on page 158)***MASSACHUSETTS QSO PARTY***December 12 and 13*

The Merrimack Valley Amateur Radio Club announces a Massachusetts QSO party in which all amateurs are invited to participate. Details follow.

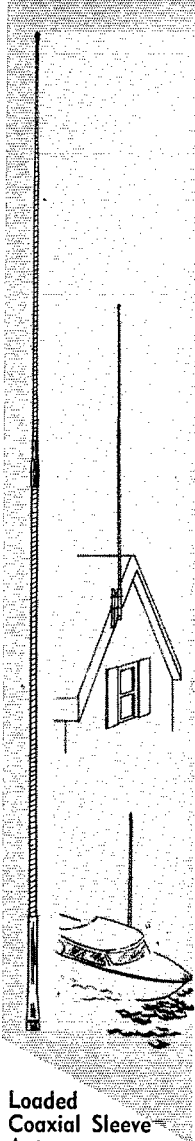
- 1) The contest begins at 6 P.M. EST December 12 and ends at 11:59 P.M. EST December 13.
- 2) Suggested congregating frequencies are 3660, 3870, 7080, 7260, 14,100 kc., 21100, 28100, and 50 and 144 Mcs.
- 3) The same station may be worked for additional credit on more than one band. Phone and c.w. are considered separate contests. Stations may enter both but must submit separate entries.
- 4) General calls: "CQ MASS." Massachusetts c.w. stations identify themselves by signing "de MASS (call) K." Phones say "Massachusetts calling."
- 5) Contact information: Mass. stations send QSO number, RS or RST and county. Others send number of QSO, RS or RST and state, province or country.
- 6) Scoring: Each completed contact counts five points. Non-Mass. amateurs will multiply by the number of Mass. counties worked; Mass. stations will multiply by total number of states, provinces and countries worked. Multiply this total by 1.5 if input power remains under 150 watts at all times.
- 7) Certificates will be issued to the highest-scoring station in each state, province, country and county in Massachusetts.
- 8) Logs must show the date, time, emission, and power input as well as the required contact information.
- 9) Contest logs should be submitted to MVARC, Box 211, Lawrence, Mass. postmarked not later than December 31, 1959.

The Worked All Massachusetts Counties certificate (p. 62, September QST) will be issued to those who succeed in working all 14 counties during the contest, regardless of the type of emission used.

27 MC citizens band FIBERGLASS antennas

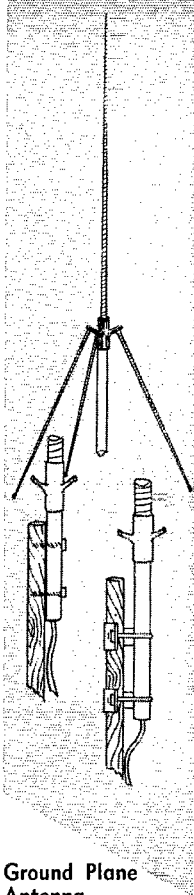
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Loaded Coaxial Sleeve Antenna

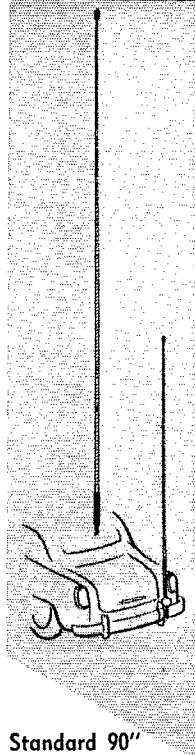
Ideal for both marine and base station application. Antenna terminated with UHF connector. - STYLE 72-0 - \$46.00



Ground Plane Antenna

High strength fiberglass radiating elements. Supplied to fit 1 1/4" water pipe. Antenna terminated with UHF connector.

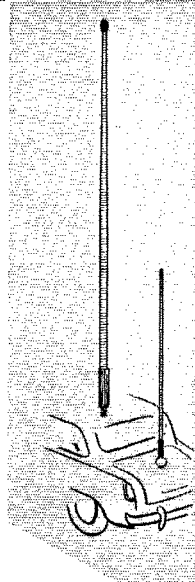
STYLE 61-0 - \$41.60



Standard 90" Whip Antenna

Light - weight, -high flexural and impact strength, corrosion-resistant.

STYLE 10-3 - \$6.95

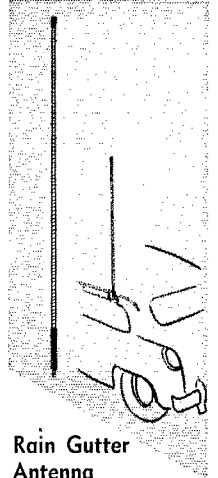


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Distributed - load antenna eliminates standard loading coils; four ft. length permits choice of mounting positions.

STYLE 62-0 Deluxe model, in white \$15.90

STYLE 73-0 Std. model, metallic gray - \$11.25



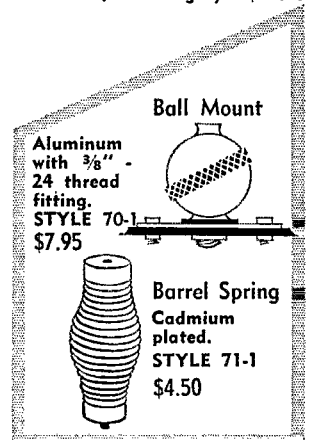
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The convenient, detachable installation with all exceptional benefits of light-weight fiberglass.

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Rugged . . . Durable!

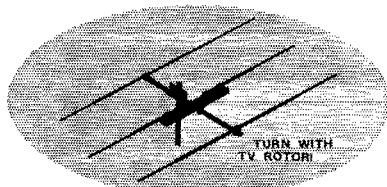
100% Rust Proof!

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Stainless Steel Hardware!

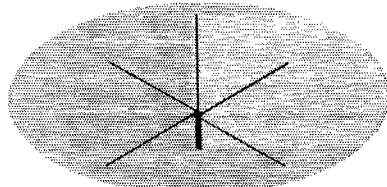
61ST6 Heavy Gauge Aluminum!

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officers of the Framingham Club are KIHTK, pres.; SON, vice-pres.; KIGYH, rec. secy.; F.Y, corr. secy.; QVK, treas.; RCJ, act. mgr. PEX is a Lt. Col in the CAP and deputy for Comm. Mass. Wing and has a Hy-Gain G-2 vertical up 70 feet, a ten-element Hy-Gain beam for 2 meters up 62 feet and a five-element beam for 6 meters up 54 feet. K1BCS visited K1GRP. K1GPH is working on a TV station. K1LQJ is working on a transmitter. GEK is putting a corner reflector on 2 meters. K1BYV is building a 15-meter beam. K1AH says YK will have a u.h.f. rig. LMZ has a new HQ-170. IIB's XYL, W4IBM, is now K1MIB and will be on 40-meter c.w. and 2 meters. NKA is on 2 and 6 meters. K1CF1, PEX and K1GRP made BPL WA2AYI, chairman of the Eastern Area Slow Net, is looking for members from this section. The net is on 3748 kc. at 1800 Mon. through Fri. The T-9 Radio Club met at WNK's QTH. K1BJZ is secy. of the Yankee Radio Club. TVZ spoke at the Framingham Club on "Transistorized Power Supplies." K1CCW has a DX-100 and an SX-71. The South Shore Club held a meeting. UGH is in So. Dakota again. KN1LWJ is new in Winthrop. CMW was elected vice-pres. of the Morse Club of America, Boston Chapter. Sorry to announce the death of UKO. IDM and NIP are Alternate ORs for Westwood. AWA spoke at the QRA on "Net Operations." A retirement open house was held for PI at his QTH. The Bramtree Radio Club held a meeting. K1HAM is ex-WV2DQX/1 in Lexington on 80 and 40 meters. KN1LU has a DX-20. EUJ is working on the rig for 2306.5 Mc. K1JME says he has received many letters thanking the group who set up a rig in a Quiney Super Market on the Six-Meter Cross Band Net with AWA and K1DGI's rig. LMZ has a 4X250-B rig on the air. K1AH has a rig on 220 Mc. New on 2 meters: K1JOV, BGH, KN1KZY and K1LPQ. K1DIO is handling traffic on 2 and 6 meters. OFK has an SX-30. The Eastern Mass. 2-Meter Net is very active. K1JME has a 55-ft. tower. ABE is mobile on 2 meters. FJJ has a GSB-100 for s.s.b. EBT is in college in N. C. K1ASV and W1EQS are at the U. of Maine. K1CWS will have a 44-element beam on an 80-ft. tower for 2 meters. EUJ has a 4X150-A on 2 meters. ALP has had his call 35 years. New officers of the El Ray Radio Club are PEG, pres.; WB, vice-pres.; Bud Lowery, secy.; AAC, treas.; HA, act. chairman; MEG, chief eng. Traffic: (Sept.) K1CF 1 714, W1PEX 670, K1GRP 577, DIO 289, W1UR 277, OFK 192, K1GYM 110, W1SSZ 84, HGN 81, EMG 71, K1BYL 64, MHC 37, W1AKN 36, KN1LU 25, K1JME 19, W1SIV 19, K1GPH 18, GQZ 18, MHM 18, W1QFO 18, JBD 16, GEK 14, NVY 14, TWG 14, ATX 12, K1CMS 9, BUF 8, BYV 8, W1TY 8, UE 6, AAR 5, FJJ 5, K1AH 4, LCQ 4, W1MIX 4, WU 4, DTB 3, K1EJW 2, W1BE 2, LMZ 2, IIB 1, (Aug.) K1BYV 20, BUF 14, W1QFO 6.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—SFC; BYH, RM; DVW, PAAL; DXS, V.H.F. PAM; RFU, WMN meets on 3560 kc. Mon. through Sat. at 7 p.m., MPN on 3870 kc daily at 6 p.m. ORS endorsements: DZV, FZY and KGJ. KGJ has entered Tufts University. K1GCV is doing an FB job as OO and is now Class II. DXS now is operating with a new Valiant. Old-timer EFN is recovering from polio at the Good Samaritan Hospital in Boston. Drop him a line. The annual picnic sponsored by the Mass. Phone Net was held in Fitchburg Sept. 20. The PAM is looking for stations interested in OPS appointment and for outlets in all parts of West. Mass. Contact DXS, 26 Richards St., Worcester. Phone Section Net certificates were issued to BYH, BWF and DXS. From the Podunk Radio Club: K1CPD is out of the hospital and concentrating on DXCC, EKO, K1CWB and K1BYM are off to college. *From the Montachusett Radio Club:* K1KBS has had 285 QSOs on 6 meters in two and one-half months. K1LLP has a new Ranger. KN1JPP dropped the "N." GUI and K1AVO are now operating new home-brew 6-meter mobiles. BYH as 200 watts to an 813 on 75 meters. OAZ is back on the air after a long illness. *From the Berkshire Country club:* K1LAG now has a Viking II. GRK is back at the U. of M. and has a 50-Mc. rig there. DPY finally has neutralized his linear. FNP is now WA2DNU. WF has a new Heath KW S.S.B. TNQ still is in Indiana. Ex-ADF now is W3WTS. GKX and AZW attended the New England DXCC meeting at Ueltham. Sorry to report that KQK lost his mother. BKX has received a letter of commendation from the FCC for the excellent work of his TVI committee. New officers of the Pittsfield Radio Club are UIS, pres.; K1DAB, vice-pres.; BKX, secy.; Jim O'Keefe, treas. News from Springfield and vicinity? Traffic: W1BVR 86, ZPB 70, DXS 43, DZV 40, DVW 39, BYH 29, AGM 14, OSK 4.

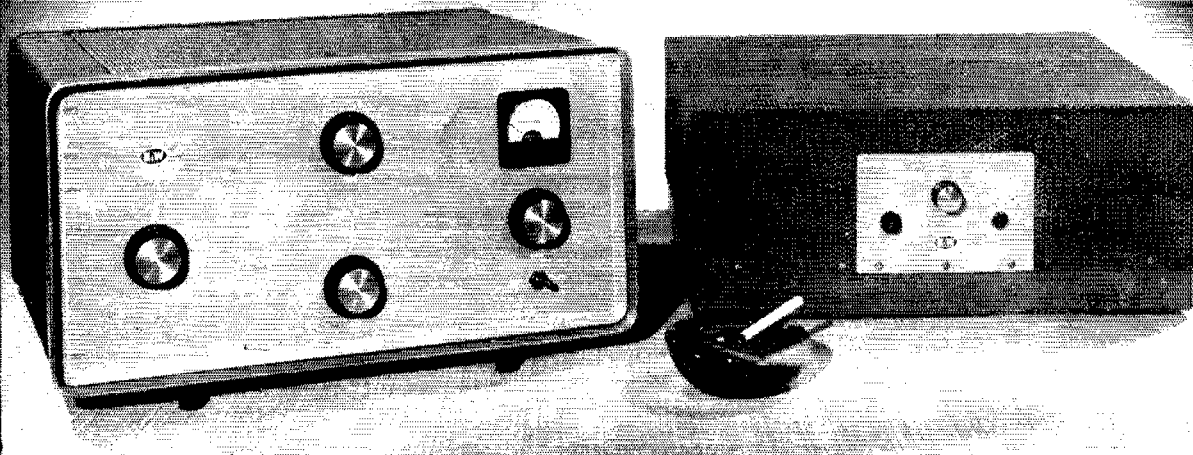
NEW HAMPSHIRE—SCM, Robert H. Wright, W1RMH—The following are the active N. H. nets: Granite State Phone Net on 3842 kc. Mon.-Sat. at 1900 and on Sun. at 0900. The NHN (c.w.) Net on 3685 kc. daily at 1830. The Northeast V.H.F. Net on 145.8 Mc. daily at 1930. ASZ (U.N.H. club station) invites all interested to

(Continued on page 160)



POWER...

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LPA-1 GROUNDED GRID LINEAR AMPLIFIER
NET PRICE \$375.00 COMPLETE WITH TUBES

LPS-1 POWER SUPPLY
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Power—a full kilowatt with this smartly designed, excellently styled version of the famous B&W linear amplifier family! New compactness . . . takes up no more space on your table than a receiver. New features . . . for greater performance and flexibility than ever before.

Separately housed LPA-1 R. F. section employs two Type 813 beam power tetrode tubes, connected as high-Mu triodes in a grounded-grid circuit. Blower, filament and bias supply are included in this section.

High voltage power supply unit LPS-1 may be remotely located. Switching control panel is removable for convenient installation at the operator's location. Circuit consists of a full wave single phase bridge rectifier, using four Type

816 mercury vapor rectifier tubes. R. F. filtering protects tubes and prevents mercury vapor hash radiation.

The LPA-1 can be driven by most exciters in the 100 watt class, such as the B&W 5100/5100B series, Vikings 1 and 2, Valiant, Collins 32V, KWM-1, 32S-1 series, Heath DX100 and others.

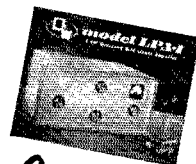
A compact impedance matching unit, the B&W LPA-MU, is separately available. It provides for operation with fixed output exciters such as the Hallicrafters HT 32 Series and similar types. A similar unit, the LPA-MU-2, is also available for use with the B&W L-1000-A and L-1001-A.

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LPA-MU MATCHING UNIT \$36.00
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Send for this illustrated brochure in full color giving specifications and detailed descriptions of the new B&W LPA-1, LPS-1 and LPA-MU.



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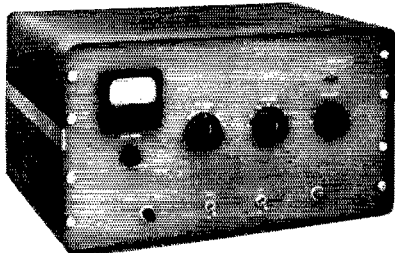


**GSB
100**

SSB 100W P.E.P. input. Transmitter/Exciter.

SSB transmitter/exciter, bandswitches 80-40-20-15-10 meters. Rated 100 watts P.E.P. Operates on SSB with selectable sidebands, also PM, AM and CW. Has pi network output. Uses quartz crystal notching filter to suppress carrier. Has stable, calibrated VFO, excellent VOX system, heavy-duty AC power supply.

499.50



**GSB
101**

SSB 1000W P.E.P. input RF Linear Amplifier

1000 watts P.E.P. input linear uses stable, efficient grounded-grid circuitry. Has pi network output, bandswitches 80-40-20-15-10 meter bands. Supplies for power and bias and antenna relay are built in. Linear drives by GSB-100 or other equipment supplying 60-70 watts of driving power.

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check into the N. H. Weather Net, Mon.-Fri. at 1800 on 3842 kc. This net was established to collect weather information for WENH-TV, Channel 11. KIMID (ex-K2QZS) is located in Hillsboro. Welcome to new hams in Concord, KNIMCM, KNIMCN and KNILZG. KN1-JCO, the XYL of MDP, is now General Class, HDQ, an active RTTYer has moved to New Hampshire. With regret I announce the resignation of KICIF as RM. Many thanks for your contributions to N. H. C.W. Net activity. The Eastern Area Slow Net, which meets Mon.-Fri. on 3748 kc. at 1800 EST, extends an invitation to N. H. hams to participate. Anyone interested, write WA2AYL. Appointments: K1CSJ and KIMID as OPSs; K1CIG as OES. Renewals: GDF as EC; EVN and IIQ as OPSs. Traffic: (Sept.) K1BCS 844, WITA 56, K1HK 49, WIQGU 46, YHF 18, EVN 13, K1CSJ 9, W1KVG 8, AIJ 6. (Aug.) W1EVN 20, K1DKD 8.

VERMONT—SCM, Harry A. Preston, jr., W1VSA—SEC: EB, RM: K1BGC. PAM: HRG. Vermont frequencies: C.W. 3520, Phone 3885, RTTY 3620 kc. Nets: C.W., M-W-F at 1830; VEPN, Sun. at 1730; VTPN, Sun. at 0900; GMIN, Mon.-Sat. at 1730. K1GBF is on s.s.b. now with an SB-10 and an Apache. K1GBE has a new 8N2, a DX-20 and an NC-98. GBE also has a central power supply and control panel and for an antenna a long wire string for 80 meters. K1-IRH has received his Conditional Class license and is on 2 meters and 75 through 10 meters. HUR is the new editor of *BARC News*. KIAUE is program director of the BARC. Civil defense has a new Radio Officer for the State in BXT. Give your emergency generator a weekly test and be sure it's working. It would be appreciated if Vermont amateurs would drop a line to the SCM and register his or her club. We would greatly appreciate news items and station activities reports. Congrats to HRG on his appointment as Phone Activities Manager. K1BGC is our Route Manager and invites stations to check into our C.W. Net. Traffic: W1OAK 168, K1GBF 151, W1ELJ 49, VSA 19, K1JG 17.

NORTHWESTERN DIVISION

ALASKA—Acting SCM, Kenneth E. Koestler, KL7BZO—There was very little activity here in Alaska in the month of September. 2 meters was pretty good for c.d. KG1DT made the BPL on Ice Island. The weather has been nice but conditions have been very poor. 10 meters has opened up a little in the Western States, so see you next month. We will get our dope in for the charter member. Traffic: (Sept.) KG1DT 423. (Aug.) KG1DT 532.

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—Club activity is starting up around the State. Send in your news! Idaho radio amateurs held a Labor Day Picnic at PCP's QTH. GOM, OA and K7AYU are getting FB DX reports on new cubical quads. K7DMZ and K7DMY are the new prexy and veep of the Magic Valley Club. The Pocatello Club viewed the c.d. film on "Atomic Attack." FARM Net elections voted JHY, manager; WEY and K7GQM, net controls. WEZ had 9 cub scouts in Hausack for a briefing on ham radio. FOF, 15Y, IRM and K7CVB are operating portable 7 in Pocatello during the college year. K7ALA and K7ENE are using DX-100s, and BQY has a new HQ-170. K7AYU invites check-ins to the Tri-State Weather Net on 3890 kc. at 0630 PST daily. K7BWV worked VE7BAV, who was operating 3 watts during the VE/W Contest. K7ANZ, K7GQE, K7GHX and FOF are on 2 meters. Traffic: W7GMC 90, K7BWV 42, W7VQC 30, GGV 16, DWE 6.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WX1—SEC: KUH. PAM: EGL. RM: K6J. The Montana Phone Net meets Mon.-Wed.-Fri. at 1800 MST on 3910 kc. The Montana Slow-Speed Net meets Tue.-Thurs.-Sat. at 1830 MST on 3630 kc. K7BKH made BPL and earned the BPL Medallion. New calls: KN7IQA and KN7JAQQ in Cut Bank; KN7JAZ in Lewistown; and KN7JBF in Great Falls. K7AIC moved to Pennsylvania from Great Falls. W7DEO moved to Kalispell from Great Falls. K7DPH moved to Great Falls from Cut Bank. INI moved to Great Falls from Baker. IHT is in FAA School at Okalahouma City. Miles City amateurs are conducting code and theory classes for prospective hams. New officers of the Harlo Radio Club are K7IUJ, pres.; K7CHA, vice-pres.; TGM, secy.-treas.; and SZR, act. mgr. Recent appointments: K7BON as EC for Billings and ZUQ as EC for Fort Shaw-Simms-Sun River. Traffic: K7BYC 307, BKH 175, EWZ 75, GHC 19, W7-CQC 8, IDK 6, YQZ 4, K7AWD 2.

OREGON—SCM, Hubert R. McNally, W7JDX—Rumor has it that OMO probably is moving out of the State. Sorry to hear that, WL. KN7JTZ is a new ham in Grants Pass who assembled her own DX-40. DIC is

(Continued on page 162)



Honoring 1958 Award winner Julius M. J. Madey, K2KGJ, spotlighted the public-service work of all radio amateurs. Here L. Berkley Davis, head of General Electric's Electronic Components Division, presents the young New Jersey ham with

his Edison trophy, earned by handling over 12,000 messages to and from isolated American personnel overseas. Looking on is Captain Robert H. Weeks, Assistant Director of Communications for the U.S. Navy, which has publicly commended Madey.

JAN. 4 LAST DAY FOR EDISON AWARD NOMINATIONS

Letters naming candidates for the 1959 Edison Radio Amateur Award must be post-marked not later than Jan. 4, 1960, to receive consideration by the panel of judges.

Award nominations come only from letters written by you and others. In view of this, you will be rendering an important service to the entire amateur group by choosing a suitable candidate and sending in a letter describing what he has done. Do this now! Time is growing short.

In doubt about what qualifies an OM or YL for the Award? Read the list of representative activities at right. For rules of the Award, see the October issue of this magazine, or write to *Edison Award Committee, General Electric Company, Electronic Components Division, Owensboro, Kentucky.*

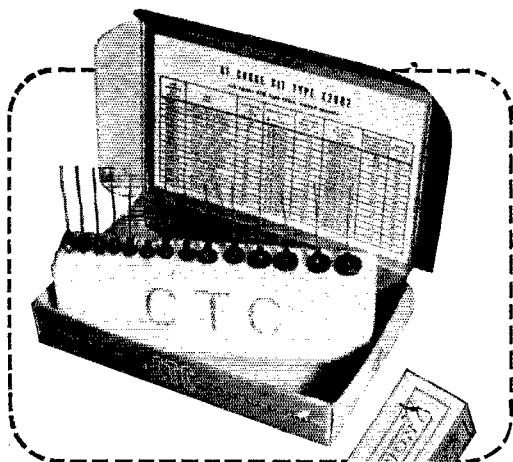
HERE ARE TYPICAL ACTIVITIES THAT CAN QUALIFY FOR THE AWARD:

- Emergency communications work in a disaster, such as a flood, hurricane, tornado, or explosion.
- Helping amateurs and others with their specialized problems, through professional knowledge and experience.
- Community service in organizing mobile and fixed communications to promote the success of fund drives and other public events.
- Helping disabled or physically handicapped persons.
- Relaying messages from remote points for the benefit of isolated servicemen and civilians.
- Designing and constructing radio equipment for use by persons in remote parts of the world, who do not have access to regular commercial communication channels.
- Civil-defense organization work; weather reporting; radio assistance to state or local traffic and police authorities; cooperation in forest-fire prevention and control.
- Teaching basic electronics to young people.

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getting out a YL-XYL column for the *OEN Netter*. ZB isn't going to lose his antenna to the new highway and everyone is happy. BDU, ZB and K7CLL made BPL. Some of you should listen in on these fellows and watch the traffic fly, especially to ZB on 20 meters. CLL has to go back to school so his total may drop but not his knowledge. HL The Council of Clubs in Portland is making good plans for the 1960 State Convention. The AREC Net is coming along fine. New ECs are to be appointed in several counties. 9SM is seeking chess players via ham radio. Anyone interested should write him direct. K7DKV reports there was no DX on 2 meters in September but local contacts were good. MTW is a new ORS. GWB reports on the V.H.F. Net and is lining up more AREC members. The OARS is renewing code classes. A swell report was received from UQI, our SEC. Each month the activity gets better. JDX has given up as a salmon fisherman and now will return to ham radio. HL Wish someone would tell us how FO8AC in Tahiti has such a c.w. signal in Portland on 20 meters. He's louder than the locals! Traffic: W7BDU 687, ZB 617, K7CLL 200, W7LT 65, ZFH 52, K7EPO 42, W7DIC 30, BWO 10, DEM 11, FIF 8, OMO 3.

WASHINGTON—SCM, Robert B. Thurston, W7-PGY—Washington nets: CBN, 3960 kc. 2000 PsT. NSN, 3700 kc. 2100 PST Mon. through Sat. WARTS, 3970 kc. 1830 PST Mon. through Sat. WSN, 3535 kc. 1900 PST Mon. through Fri. New officers of the Cascade Radio Club are ROL, pres.; PTX, vice-pres.; UGH, secy.; BLX, treas. YFO is QRL with the basement as a new ham shack. K7GNA is a new grandpa. IEU has the new station all completed and in operation. DPW is dropping most of his traffic skeds because of other commitments. AIB is waiting for a new HQ-170. AMC made a good traffic count. FIX has the RTTY converter completed and is waiting for the machine to hook it to. The VARC of Puyallup had a display booth at the Western Washington Fair with about 8000 visitors. ZMIG is mobile on 10 meters. JJK and PUA are attending U. of W. Pa. FZP put the home-brew rig on 6 meters and is back on the active list. AXT is going s.s.b. with a 20-A exciter and a pair of 813s for kw. RXT moved to Tacoma. COP has a new host. ATF has the new beam ready to install. CZK won the last two hidden transmitter hunts in the Tacoma Area. New EC appointees are ZCE for Franklin County, ZDQ Clark County and K7BIV Grant County. LFA renewed his OPS appointment. The WSN had 21 sessions with 264 QNTs and 149 QTCs for the month of August. CZY is working on RTTY gear. CWN is chasing DX. K7APJ has a new 10-meter beam. A new club has been formed on the east side of Lake, called the Lake Washington High School Amateur Radio Club, with K7EEJ, pres.; and K7ETP, vice-pres. The WSN had 22 sessions with 315 QNTs and 181 QTCs for the month of September. DNU, K7BOB and AQB are working lots of DX on 15 and 20 meters. MTX installed Heathkit mobile rigs. OEB made No. 140 and Zone 39 with JTAB. K7DDQ is starting code and theory classes. About 80 attended the Bar-B-Q held at CZY's. GSP has a new kw. JBH and REC are doing road construction work. Traffic: W7BA 2127, DPW 515, DXZ 447, QLH 234, AMC 198, EUT 174, KZ 162, APS 119, OEB 85, GIP 41, AIB 31, K7AJT 22, W7RKT 22, EHH 17, IEU 15, K7-DDQ 10, GNA 10, W7LFA 10, UW7 7, REC 5, CZY 4, EVW 4.

PACIFIC DIVISION

HAWAII—SCM, Samuel H. Lewbel, KH6AED—The Hilo Amateur Radio Club has announced that it will sponsor the Hawaiian Islands Amateur Radio Convention in 1960. Present plans call for combined efforts by the Hilo Club and the Kona Amateur Radio Club and it looks like the date will be the Fourth of July week end. Keep a watch on 40 meters for the latest information. CWW now is using a 5-band beam. BG, who also is an OBS, finally made DXCC, and CUQ has now 101 countries confirmed. KW6CGA had to slow down on net activities because of extensive traveling. Novice training on Wake still is going on and some new calls will be on from the Coast Guard station there. The Honolulu Mobile Amateur Radio Club elected the following net officers for 1960: BEJ, pres.; BYO, secy.; DQ, treas.

NEVADA—SCM, Charles A. Rhimes, W7VIU—IWT is QRL making the bedroom shack over into a nursery for the forthcoming blessed event. HJ has set up an FB AREC plan for Boulder City. MAH has a new Telrex twenty-element spiral on 2 meters; hears K6TYW and works W6GDO. W7BJR joined the MARS Two-Meter Net using an SCR-522. Special thanks goes to SDE for help on the Slide Mt. 2-meter repeater. K7AHA is buying a new home in Reno. JKV has been discharged from the Army and is attending the U. of Nevada. A 94-m.p.h. wind in Elko blew VIU's vertical

(Continued on page 164)

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SPECIFICATIONS

FREQUENCY COVERAGE: 3.5-30 mc, twelve 600 kc segments which may be set up and selected from the front panel include:

Five "Ham" ranges: 80M (3.5-4.1 mc), 40M (6.9-7.5 mc), 20M (13.9-14.5 mc), 15M (20.9-21.5 mc), 10M (28.5-29.1 mc).
Two "Ham" ranges (with accessory crystals): 10M (28.0-28.6 mc) and 10M (29.1-29.7 mc).

Five "Universal" ranges (with accessory crystals) five 600 kc ranges that may be set up between 3.5 and 30 mc by plugging in five accessory crystals chosen for the desired ranges (WWV, MARS, Sputnik, etc.).

MODE: Selectable SSB, A.M., C.W.

SELECTIVITY: 2.4 KC at 6 db — 8.5 KC at 60 db or 4.8 KC at 6 db — 23 KC at 60 db.

SPURIOUS RESPONSES: Image rejection more than 60 db, IF rejection more than 60 db on ham ranges, Internal spurious signals within ham bands less than equivalent 1 microvolt signal.

FREQUENCY STABILITY: Less than 500 cycles warm up, Less than 100 cycles after warm up, Less than 100 cycles for plus or minus 10% line voltage change.

DIAL CALIBRATION: 10 kc main dial divisions, 1 kc (approximately) vernier dial divisions, Main dial and vernier both adjustable for calibration purposes.

SENSITIVITY: Less than 1/2 microvolt for 10 db S/N.

AVC: .75 sec. or .05 sec. discharge, less than 100 micro second charge.

AUDIO OUTPUT: 1 watt maximum, .2 watt at AVC threshold.

AUDIO DISTORTION: Less than 3% harmonic, Less than 1/2% intermodulation (including product detector).

CONTROLS: "Frequency" 2 1/4" diameter with adjustable 40 divisions skirt (approximately 1 kc/division). "Preselector" tunes antenna and RF to incoming signal, calibrated 80 through 10 meters plus 0-10 scale for frequencies outside ham bands. "Band" Switch indicates ham band or other tuning range. "Sideband" used with 2.4 kc selectivity to select desired sideband by tuning passband above or below the fixed BFO (or carrier). "RF Gain" adjusts RF gain (S meter reads accurately at any setting of control which allows meter to kick). "AF Gain" adjusts audio gain. A front panel headphone jack disconnects the speaker when phones are plugged in.

SLIDE SWITCHES: "Power-Off" A.C. on or off. "Stby-Rev" standby-receive or to offset external muting when used with transmitter. "S. AVC-F. AVC", .75 seconds or .05 seconds AVC discharge time. "2.4 KC-6 KC" selectivity switch. "Prod-Diode" detector selector switch. "BFO-Off" BFO switch independent of detector switch. (BFO may be used with either Product or Diode Detector.) Also Accessory Switches: "Q Mult. Off" and "Cal. Off."

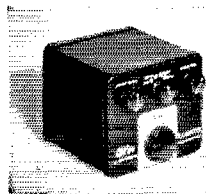
REAR CHASSIS CONNECTIONS: All connections are made to screw type terminals (provision is made for SO 239 Antenna Coax Connector). Terminals are: 50-75 ohm antenna, Muting, AVC time constant, 4 ohm AF output (to speaker, Antitrip, etc.) Socket for Q Multiplier.

10 TUBES, plus IN34 bias rectifier.

SIZE: 12" Wide x 7" High x 9" Deep. **WEIGHT:** 14.5 pounds.

POWER: 120 volts, 60 cycles, 40 watts.

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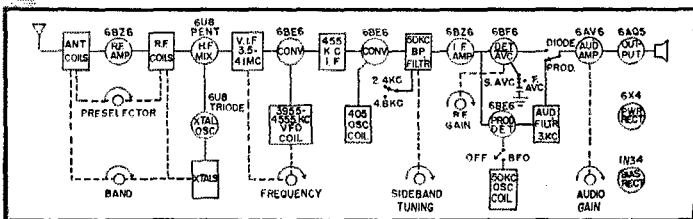


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It's a fact — 100% modulation on most ham rigs is a "sometime thing". Uncontrolled, instantaneous audio peaks can ruin an otherwise clean signal. THERE'S A SIMPLE SOLUTION — Install a P&H compressor-amplifier in the mike line of any AM, SSB, DSB or PM transmitter — Adjust audio gain for full 100% modulation and forget it! TALK POWER IS UP — FLATTOPPING IS GONE. The net result is the CLEANEST, MOST POTENT AUDIO your rig is capable of. Single knob control. Works on AVC principle — like broadcast compressors. TWO MODELS: The AFC-1 (3x3x5") requires an external power source and has a built-in 90-3500 cycle band pass audio filter . . . sells for only \$32.95. The AFC-2 (5x5x7") has a built-in power supply, a switch controlled (Broad-Medium-Sharp) audio filter and costs you only \$54.95. Also available the AFC-2CW, a sharp filter model for CW reception or mike input on filter exciters. If you are interested in what either of these "Little Grey Boxes" can do for your phone signal . . . Or what smooth, instantaneous, non-blasting phone and CW reception you can get from that older model receiver with a P&H compressor in the speaker line . . . See your dealer, or drop a card to DEPT. R-11.

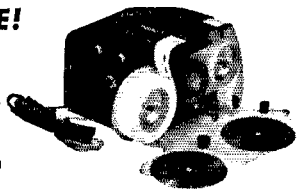
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down. VIU received a YLCC-200 sticker. YNO and his XYL are the proud parents of an 8-lb. boy — making VIU a grandpa for the first time. UPS is using his vacation to work some s.s.b. HOP is moving back to W6-Land. Send in some news, boys. Don't let your ARRL membership lapse. We need support for the ham's cause, and ARRL membership is a good way to give it. Traffic: W7VIU 35.

SANTA CLARA VALLEY — SCM, W. Conley Smith, K6DYX — W6DEF and W6ZRJ reported on the extensive S.E.T. preparations made by the SCARS and SCARA, respectively. W6QIE and his group held the drill in So. S.F. The SCARS has a contest among the members for a QSL card design for the club station, W6WWJ. The Palo Alto RC held an auction at its Oct. meeting. The Monterey Bay RC also plans an auction as the first of several projects to increase the club treasury with the purpose in mind of adding to the club station, W6UCS. K6BJ spoke at the Santa Cruz RC meeting which was also visited by our Director, W6HC, as well as your SEC and SCM to discuss League matters. Among those who "Had a fine vacation but glad to be back" are K6GID, W6OII and W6WAL. W6TJA was visited by his father, KPACH, and together they mobilized through So. Cal. They hope for a father-son skeed but the OM's main interest seems to be 6 meters. Their last QSO was by flashlight as the phone took off. Although in the process of moving, K6GZ kept the station in operation long enough to make BPL. K6HCP has a twenty-element spiral ray on 2 meters and is working on a parametric amplifier. K6SRG is working for Westinghouse in Sunnyvale. WA6BWT is DX hunting and assembling a station separate from dad, W6GGA. W6WTU has moved to Templeton. K6ZCR is new in the section, transferring her ORS and OO Class appointments from San Diego. W6EIC has a fine c.d. net on 50.5 Mc. at 1900 Mon. A new OO appointee is K6HFE of Stanford. Traffic: (Sept.) W6RSY 1053, K6DYX 348, W6ATF 159, K6GZ 125, K6ZCR 95, W6PON 74, W6HC 44, W6DEF 43, W6YBV 35, W6PLG 31, W6OII 27, K6VQK 24, W6ZRJ 19, K6GID 14, WA6CLT 2. (Aug.) K6DHO 80, W6OII 20, W6HC 5.

EAST BAY — SCM, B. W. Southwell, W6OJW — SEC: K6DQM, ECs: W6LWG, W6ZZF, K6EDN, K6JNW and K6ESZ. K6EHR is building a new v.f.o. and an exciter for 6 and 2 meters. W7SMB/6 is rebuilding his BC-610. K6ZYZ is the new manager of N.C.N. W6AKB returned from his vacation and is on MARS. WA6ABQ is a Technician and hopes to have his General Class license before leaving for KA2-Land. The Richmond Radio Club had an FB auction at its Sept. meeting. W6CBF is QRL work, but was in the F.M.T. and is on the SARO nets. W6HM is in Vallejo General Hospital. Get well, OM. The CCRC met Sept. 2 at the QTH of W6CTH. The EBRC met Sept. 11 and heard an FB talk on microwave equipment by an engineer from Hewlett-Packard. The MDARC provided communications for the Walnut Festival Parade. WA6DOV is a new General Class licensee in MDARC. W6ECP is awaiting his General Class ticket. K6ZRQ has a new QTH in El Cerrito. W6DTZ is going to the University of California at Davis to major in zoology. K6QUG is on 2 meter m.c.w. W6DOP and W6DOY took the Technician Class exam. K6EMR has a new Communicator III on 2 meters. WA6BXC is a new Technician in the MDARC. K6TFB has a new Ranger. W6EFKH was heard in VK-Land with his DX-20. W6FCM passed the Technician Class exam. K6DQM's XYL is a new Novice with the call W6HYU. Congrats. W6HSQ, W6HSA, W6HYV, W6HYW and W6HSK are new Novices and WA6GCS and WA6CNW are new Technicians in the Walnut Creek Area. K6SWY will form Novice classes in the HARC. The HARC held a big auction. K6RDD and WA6BBF vacationed in VE7-Land. Ex-KN6LNX took the General Class exam. K6TIY has a new T-bird. K6AHW and W6WSH attended the MARS Hamfest in Napa and won a scope and an SCR-522. K6SCS is the XYL of K6SWY. W6MPZ has a DX score of 144/111. W6JK has a new QTH. Communications personnel for the VIII Olympic Winter Games had a dinner meeting at the Nut Tree Restaurant on Highway 40, Vacaville. That does it for this month, gang; keep 'em coming. AREC members: Get that portable gear in shape for possible action this winter. Traffic: K6ZYZ 254, K6GK 150, WA6BKQ 3, W6CBF 3.

SAN FRANCISCO — SCM, Leonard R. Gerald, K6ANP — Asst. SCM; Jeri Bey, W6QMO. RM: K6PQG, PAM; W6PZE, ECs: K6EKC Fortuna; W6OPL San Rafael; W6CXO San Francisco. OOs: W6GQA Class I; K6OHJ Class III, ORS: W6GGC. ORSs: K6PQG, W6GGC, W6QMO, W6OPL and W6GQY. OPSs: W6PZE, W6GGC and K6OHJ. Congratulations and best wishes to W6HC and W6ZE for their reelection as Director and Vice-Director, respectively, for the Pacific Division. The Marin Radio Club has a new meeting place in Larkspur at the American Legion Hall. W6LOU did a bang-up job as head of the committee in charge of the recent Air Force Hamfest in El Verano. W6GGC is

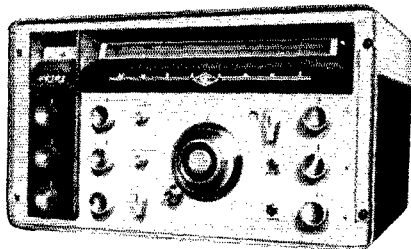
(Continued on page 166)

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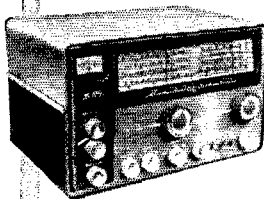


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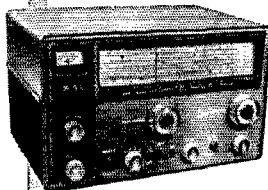
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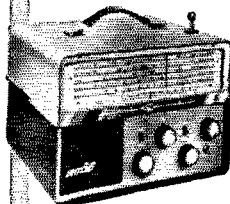
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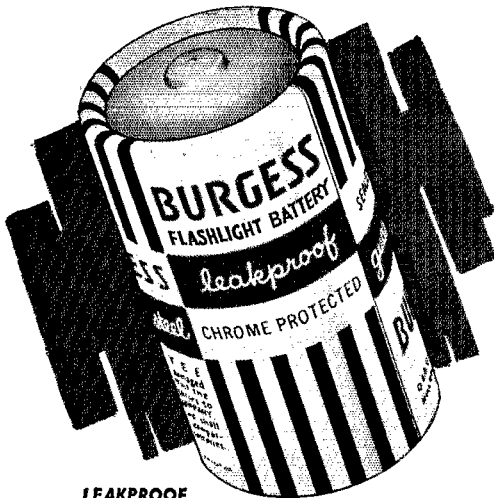
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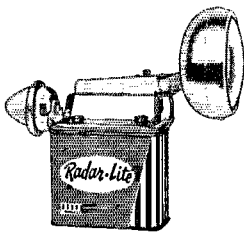
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using his new Hallcrafters SR34 for his OBS schedules on 2- and 6-meter c.w. Wally and his XYL. Rose, attended a dinner at the Nut Tree recently for the personnel who worked during the Olympic Games tryouts last February. Purpose of the dinner was to formulate final plans for the communications squad of the Olympic Meet in 1960. W6GQA is available almost every night for frequency checks, harmonic checks, etc. His San Francisco phone number is SE 1-2648. K6PQG holds steady spots in NCN as NCS and liaison to RN6. W6FEA is active on Air Force MARS Nets. W6PHS is active on Air Force RTTY and Phone Nets. Congratulations to W6FVK on his recent marriage. W6PCN is attending City College to obtain her California teaching credits. W6SLX reports from Eureka that W6GYC. W6GHL and W6GUH are new members of the club. W6GUH having barely used his call, was promptly ordered to report for two-years' active duty for Uncle Sam's Navy, and is now on the *USS Cushing*. W6QMO now is active on NCN. RN6 and Air Force MARS. W6BIP had a very nice stay in Alaska on business. Good wishes to W6NCK in his new venture into the amateur radio supply business. K6OPI will be spending the next year or so at college in Claremont, Calif., on an engineering course. W6REK has introduced a bill in the State Legislature providing that hams with call sign auto license plates not be required to pay the additional \$3.00 plate charge on annual renewal of their auto license, but that the \$3.00 cover the extra fee for a period of four years. Traffic: (Sept.) K6PQG 129, W6QMO 54, W6FEA 21, W6GGC 12. (Aug.) K6PQG 136.

SACRAMENTO VALLEY—SCM, Jon J. O'Brien. W6GDO—Asst. SCM: William Van de Kamp. W6CKV. SEC: K6IKV. RM: W6CMA. PAMs: W6EZZ and W6PIV. The Camellia Capital Chirps mobilized to Stockton for its September meeting. W6AF caught more fish than DX during the summer. K6YBV is going strong again after being off the air all summer. Bob reports a new club is being organized at San Juan High with a Ranger and an SX-101 to start out. Very sorry to report that Bob's faithful guide dog, Pukka, was killed by a car in September, but he should have a new dog by this reading as he is scheduled to go into the class beginning Nov. 15 at the San Rafael School. Guide Dogs for the Blind, Inc. W6NFH and K6CWK are now Mr. and Mrs. and are residing on their ranch near Penryn, which they call Charmon Ranch. The Sacto. Area Emergency Net, which formerly met on 3885 kc., has moved to 29.4 Mc. and meets each Tue. at 2000 PST. K6SXX totalled up a nice score in the VE/W Contest. W6HTS and W6HSB, mobiling through the U.S., say the nicest part is being able to talk to the family at home (W6GDO and K6EHD) each day and know that things are all FB while they see the country; the KWM-1 sure is working good. The Best of Season's Greetings to all. Hope you have a wonderful Christmas and that the New Year finds you happy and healthy. Traffic: K6YBV 790, K6SXX 65, W6CMA 56, W6QNI 7.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan. W6JPU—SEC: W6EHL. EC: K6BGO. ORS: K6ROU. PAM: K6EJT. EC: W6ARE. I am looking for a qualified ham as EC in Kern, Merced, Stanislaus, Mono and Kings Counties. K6AXY has moved to Livermore and is with the Radiation Lab. W6JXY bought an Elmac AF67 and is going mobile. K6LKJ has a pair of 813s driven with the S-Line. W6QFR finally got his arm out of a sling (literally speaking) and is now fitting out his new boat with s.s.b. gear. W6ARE is trying to sell the high frequencies to the gang for a valley net instead of 75 meters. K6ROU got all the cards for WAS and is now going for DXCC. K6IOW moved into Fresno from the Bay Area and is on 40-meter c.w. K6OZL made WAS. W6FRH and W6PJF are assembling Apaches. W6NKZ is experimenting with mobile coils. W6BAN and K6BCK went deer-hunting and used some walkie-talkies for coordination but no luck. K6BKZ is building a new final for s.s.b. with more power. K6LKJ attended the S.S.B. Convention in Santa Barbara. W6KTW is building a new QTH near W6JPU. W6NCG has moved down to Bakersfield. The San Joaquin Valley Net held its first picnic at Bass Lake. W6MJS is the new net manager. W6ZFN is assistant of the southern section with K6MYQ on the northern section. The SJVN had 409 check in on 26 sessions with a 118 traffic count. I'd like to wish all of you a very Merry Christmas. Traffic: K6EJT 32, W6ARE 6, K6ROU 5.

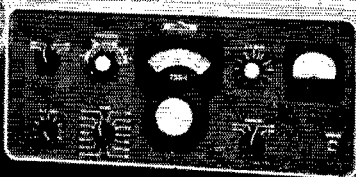
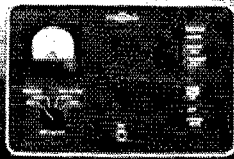
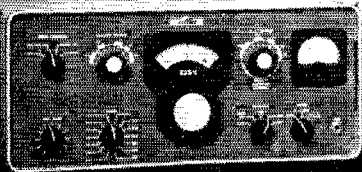
ROANOKE DIVISION

NORTH CAROLINA—SCM, R. Rife Fowler. W4RRH—SEC: HUL. PAM: DRC. V.H.F. PAM: ACY. Well "Gracie" has come and gone, and the nets in the State were READY. The Tar Heel Net operated on 3885 kc. with an information net on 3855 kc. The s.s.b. net operated on 3895 kc. Army MARS, Air Force MARS and CAP were all alerted. We are very grateful
(Continued on page 188)

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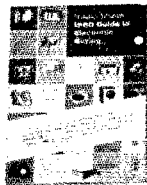
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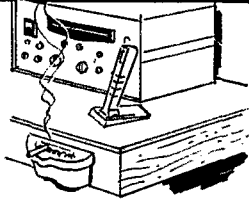


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that "Gracie" did very little damage in the State. Two-meter equipment was utilized to good advantage in all areas on a local basis. Generators were on a stand-by basis for possible dispatch to areas that might lose power. Mobile stations were in a "Ready Alert." Congratulations to all who were standing by "just in case." HUL reports an s.s.b. net is on 3895 kc. with 61 members. I believe it meets Mon.-Fri. at 7:00 P.M. This is a needed addition to our traffic system. The SCM attended two hamfests in September. The Shelby ARC put on a good meeting. There was lots of rain, but everyone enjoyed the meeting. The Asheville ARC put on a good show Sept. 27. Attendance was low but the boys did an excellent job. The MARS held a meeting at Asheville that was well attended by District One. Mr. Nelms, Deputy MARS Director, Third Army, was in attendance. These hamfests offer an excellent opportunity to discuss ham problems and should be supported by every active ham. Meet your friends and have a good "eye-ball QSO." Look for a report later giving the number participating in the "Gracie" Alert. Traffic: (Aug.) W4GXR 487.

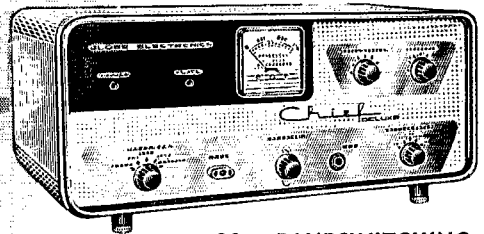
SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE. RM: K4AVU. PAM: K4ITE. Those earning SCN certificates are BWZ, QCC and K4LNJ. K4MYR has been reendorsed as OBS after a superb job for the last year on 3930 kc. K4BVX, the editor of *Scarab*, is back on the air. Hurricane Gracie kept all nets in continuous operation for over 60 hours. FFH and DAW managed to stay on the air in the path of the storm in spite of many difficulties. The outstanding stations on the organized nets were AKC, DAW, QCC, PED, K4GAT, BLF, AVU, BVX, K4PJE, FEB, YCU, CUY, FGD, BMS, MYR, W4ITU, GIF, PMZ, K4AIL, QMZ, MHK, W4HMG, FFH, TUN, TTH and HBY. A very active Charleston Area net on 3805 kc. handled "on the scene" emergencies with mobile and portable stations, and deserves great credit and recognition in the EC's report which the SCM is awaiting. The gasoline explosion in Charleston created another emergency operation which needs reporting. K4PIA is the new net manager of SCN, succeeding GAT, who has made an enviable record. Further details of recent emergencies will be given as soon as all reports are in from the ECs. Traffic: (Sept.) K4WCZ 324, GAT 296, W4FFH 187, PED 149, ARC 108, K4AVU 94, W4QCC 77, K4PIA 48, HIE 28, W4VTW 22, K4LNJ 21. (Aug.) K4LNJ 21.

VIRGINIA—SCM, John Carl Morgan, W4KX—Congrats to the Richmond gang on another fine Division Convention. Hurricane Gracie found the Virginia nets standing by. SEC K4MJZ reports good participation in the Fairfax County AREC drill Sept. 11 & 12. Participation was reported by K4s QIX, SSA, UEI and YCG and W4RZJ and AIB. Several made BPL on drill traffic, all of which was taken by K4QIX on 6 meters for relay. QIX's XYL is now Tech. Class and has been on 6 meters. OOL and ATQ are teaching a Novice class of 22 at the SVARC club house. KXY is pres. of the PVARC and K4LPR of the TMRC. The Norfolk group holds regular transmitter hunts Sun., and TMRC members again assisted with the Elizabeth City, N. C., Boat Races Oct. 3-4. K4VVK reports, "Couldn't turn beam because of tree limb. Cut off limb, fell on beam, NO beam, tsk, tsk!" BGP found his doublet works better in "hurricane position" (half-down)! Ex-ØKRN, at Staunton, now has the call W4HEU. K4ASM moved to Harrisonburg and K4QLH to Rock Springs. Among those returning to college: CXQ, AAD, K4DWP, BND and MBL. JUJ reports adding the DUF Award to his growing wallpaper collection. RHA, tired of loafing since retirement, is learning a new trade. K4ELG, VN's old faithful, is working nights but is NCSing VEN (Va. Emerg. C.W. Net, 3665 Sun., 1800 EST). All are urged to QNI. 3YOR is new to Fredericksburg from Maryland. New EC appointments: DWM for Bland, K4JRE for Bedford and K4TUE for Giles. There still are several counties without ECs. Volunteers should write K4MJZ. Your SCM continues to receive requests requiring replies without the sender's mail address. Be sure to give your full name and complete address on ALL correspondence. Traffic: K4QIX 1017, QES 549, W4SHJ 159, K4SSA 127, ZKU 114, YCG 101, JRE 72, W4OOL 58, K4KNP 44, YPR 38, W4BGP 30, K4VVK 20, W4KX 15, RHA 15, AAD 12, K4ASM 11, IIP 11, HIA 7, W4KFC 7, ATQ 6, K4LPR 4, QLH 2, W4JUJ 1, DVT 1.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—SEC: HZA. PAM: GAD. RMs: GBF, HID, PBO and VYR. The WVN C.W. Net meets on 3570 kc.; the Phone Net on 3890 kc. It is indeed a pleasure to be your new SCM and I wish to thank you for your support. Your suggestions and comments will be appreciated. Officers of the Blennerhasset Radio Club are K8JLV, pres.; K8HYE, vice-pres.; 1BF, secy.-treas.; KN8OIZ, act. mgr. K8AXU QSOed 1000 miles to Oklahoma on

(Continued on page 170)

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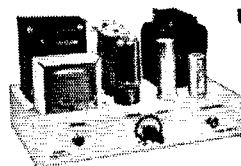
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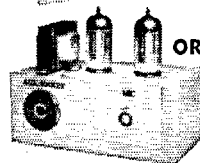
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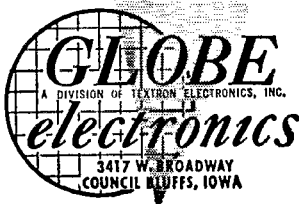


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144 Mc. ESH has a new 2-meter receiver. K8BLR watches v.h.f. openings for new states. IBF installed 6-meter mobile plus rigs for 432 and 1206. ELX, a new ORS, is active on the C.W. Net. IXG, program chairman for the 2nd Annual West Va. Hamfest, operates on 3570 and 3890 kc. to contact committees. OIV, K8LUS and TVO are active in OO work. K8BRM renewed his ORS appointment. K8JLF's regular skeds resulted in making BPL ETF has a new HQ-170. K8CNCB, K8EHD, BWK and HZA keep the W. Va. C.W. Net rolling. BOK, K8EAB, K8EEJ and JM attended the Roanoke Division Convention at Richmond. NCS received WACWV certificate No. 16. Contact VOI for reservations for the Clarksburg Radio Club Christmas Party. Traffic: K8JLF 518, HLD 55, CNB 40, W8BWK 26, K8ELX 19, BRM 18, W8TVO 9, JAI 6, GAD 5.

WEST VIRGINIA QSO PARTY

December 5-6

To aid amateurs in their pursuit of the Worked West Virginia and Worked All Counties in West Virginia awards (p. 63, September QST), the Kanawha Radio Club is sponsoring a QSO party to be held December 5 and 6.

Rules: 1) Stations outside W.Va. will work as many W.Va. amateurs as possible, using any band or mode. W. Va. to W. Va. contacts will not count for score. Outside stations will call "CQ WVA." West Virginia stations will sign "WVA" after their call. 2) Each contact will contain a QSO number, RS or RST report, and ARRL section or country. West Virginia stations will sign county. 3) Stations may be worked twice on each band, once by phone and once by c.w., and may be worked on as many bands as desired. 4) Score one point for a complete QSO exchange *per band*. Incomplete contacts do not count. 5) Time of contest 6 P.M. EST Dec. 5 to 11:59 P.M. EST Dec. 6. 6) Suggest frequencies: 3570, 3890, 7050, 7250, 14050, 14250, 21050, 21350, 28050, 28800, and 50760 kc. 7) Awards will be made to the highest aggregate score (phone and c.w.) and to the highest phone score submitted from each ARRL section and country. Awards will be made to the three highest aggregate scores and to the three highest phone scores submitted by West Va. stations. Stations wishing to be considered for separate phone award must submit separate logs. 8) Logs should be submitted to Contest Committee, Kanawha Radio Club, Box 129, Spring Hill Station, South Charleston, W.Va., postmarked no later than Dec. 31, 1959. 9) Decisions of the judges will be final.

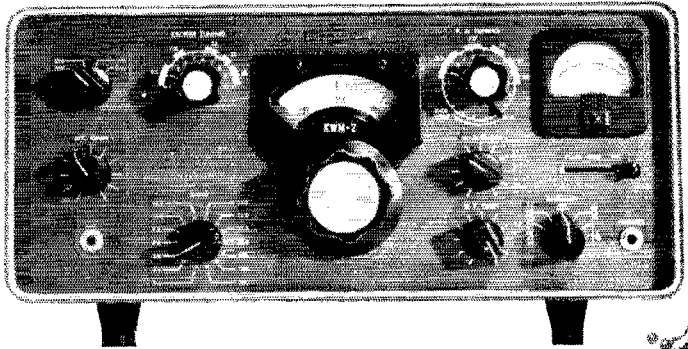
ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Carl L. Smith, W8BWJ—SEC: NIT, RMs: K8EDK and WME. PAMs: CXW and JJR. OBSs: KQD and K6DCC. The OBS skeds of KQD are on 7225 kc. Mon., Wed. and Fri. at 1230; of DCC, on 3945 kc. Tue. and Sat. and on 3700 kc. Thurs. at 1930 MST. The new Colorado C.W. Net got off to a good start Sept. 14 and in 13 sessions handled 135 messages for an average of 10 per session. There is a need for coverage in the northeast and southeast portions of Colorado. Have you checked in to CCW yet? Everyone is welcome. V.H.F. news: In the Springs, ULZ and ALH bring the active 2-meter list to eleven stations, and in the Denver Area a new 2-meter net is now in operation daily at 1300 on 146.25 Mc. From the Pikes Peak RAA *Newsletter* CVG, HHR, BTS, IRO, REP and LZP operated mobiles and handie-talkies for the weekly pigeon races. YJO, OOI and BTS are fully operational on s.s.b. and GBS and LZP have new cubical quads in operation. New officers of the Denver Club are RQI, pres.; SIN, vice-pres.; ICR, secy.; K8DCW, treas. K8SLD has received a CP-25 endorsement. MNQ reports a new triband beam and many QSOs on all bands 80 through 2 meters, and CEN has a new Globe Scout and trap antenna in operation. ANA made BPL and EDH and EDK could qualify for multi-op. BPL and keep it in the family. Traffic: W8ANA 429, K8EDH 377, EDK 304, W8WME 148, KQD 116, K8DCW 73, RTI 53, W8BWJ 48, K8DTK 32, RQF 19, TMAI 18, W8CBI 13, K8SLD 11, LCZ 8, WSIN 5, K8MNQ 1.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson. TOCX. SEC: FSC. PAM: BBN. V.H.F. PAM: SP. RM: JBV. K7BYR has received an OPS appointment. CTI has a new harmonic. HIX has

(Continued on page 172)

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No. 4 — COMPLETE AMATEUR RADIO THEORY COURSE. A complete, simplified home study theory course in radio covering the Novice, Technician, Conditional and General classes — all under one cover — with nearly four hundred typical FCC type questions to prepare you for license exam. No technical background required. You also get, FREE, a guide to setting up your own Ham station. All for the amazing low, low price of **\$3.95**

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moved to Kearns from Tooele, VEX is back in Salt Lake City. FSC has been encouraging operation on 160 meters and is finally getting some results. Stations heard nightly on 160 meters are FSC, WCF, NHY, HIX, JHI, ZSW, IBO and K7BDX. The AREC now has 78 members and has four local nets. ARFC and c.d. are working together and, contrary to popular belief, are quite compatible. QWH is portable from the home QTH with 10 watts on 80 through 10 meters. Improved band conditions have helped local nets a great deal. Traffic: W7COX 175, K7BYR 57, W7QWH 11.

NEW MEXICO—SCM, Allan S. Hargett, K5DAA—SEC: CIN. PAM: ZU. V.H.F. PAM: FPB. RM: ZHN. The NMEPN meets Sun. at 0730 on 3838 kc., Tue. and Thurs. at 1800 MST on 3838 kc. The Breakfast Club meets Mon. through Sat. at 0700 MST on 3838 kc. The TWN meets Mon. through Sat. on 3570 kc. at 1900 MST. The NMBP meets Mon., Wed. and Fri. on 3570 kc. at 2000 MST. The AREC Net meets Tue. through Sat. at 2000 MST on 3838 kc. The EC Net meets Sun. at 1900 MST on 3980 kc. Meet as many of these nets as you can. We are very sorry to lose K5VLH as EC, as he is moving to Oklahoma. We are very sorry to add AK to the Silent Keys ranks. He will be greatly missed by the hams of New Mexico. New calls in Portales are K5VVS, K5BYG and K5WRH. The Caravan Club was very busy over the Labor Day week end working with the State Police road patrol and traffic spotting using 18 mobiles in 266 hours and 7 operators on fixed stations in 130 hours. Because of pressing business of the new drug store FHL, Santa Fe, had to retire as EC after many years of faithful service. Thanks, Ruric. Traffic: (Sept.) K5WSP 1559, W5ZHN 430, DWB 269, 7AVN/5 202, K5LFE 87, DAA 63, GOJ 50, W8OME/5 45, K5DAB 9, W5BZB 9, ZU 7, VC 6, HJ 5, K5CXN 4, RXN 1, UNK 1. (July) K5WSP 1122.

WYOMING—SCM, Lial D. Branson, W7AMU—SEC: CQL. The Pony Express Net meets Sun. at 0830 MST on 3920 kc. The Wyoming Jackalope Net meets Mon. through Fri. at 1200 MST on 7255 kc. for traffic. The YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc. The Wyoming SEC has appointed HKD as EC for Laramie County with two assistants; also CQP as EC for Carbon County. BEL has been transferred as EC from Johnson County to Sheridan County. An emergency AREC drill was held Oct. 10. BHH was in Spokane recently. DTD moved from Worland to Casper. IDO was in the hospital a short time and we are glad she is home and feeling fine again. Traffic: W7GDW 5, BHH 4, YWW 3, IEC 2, K7AIY 1, W7AMU 1.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Clarke A. Simms, jr., W4HKK—SEC: WJX. PAMs: K4BTO and PHH. RM: RLG. Congratulations to K4BTO, elected as the outstanding NCS for the last quarter. Also congratulations to ZKU, K4BVD and K4EJI on qualifying for AENB certificates. Welcome to K4MIH, a new addition to AENB. ZKU, K4BVD and K4EJI have really earned their net certificates by continuing excellent participation. CIN is net mgr. and Wed. night NCS of AENO. HKK has gone mobile with Elnac units. It sure will come in handy as this will be the only equipment on hand until we have moved to the new home in Pensacola, Fla. I want to thank all the operators in Alabama for making my term as SCM such an enjoyable experience. Sorry to leave Alabama but will be back for the hamfests next year. Please continue to give your new SCM the same excellent cooperation I have had for the past two years and the Alabama section will be the best in ARRL. 73 from Clarke, Lorraine and Mike. Traffic: W4RLG 185, K4PFM 131, JDA 55, W4PVG 54, K4YGS 37, PHH 34, W4MI 22, K4AOZ 21, W4CIU 19, K4RIL 13, W4WHW 6, K4BWR 5, HFX 2, HVN 2.

EASTERN FLORIDA—SCM, John F. Porter, W4KGG—SEC: IYT. RM: K4SJK. PAMs: TAS and RMU (v.h.f.). Do you check into one of our Section nets? We have six at the present, three phone, two c.w. and one emergency. Find one to suit you and give it your support. New officers of the Fort Myers ARC are PJG, pres.; K4OBD, vice-pres.; SMK, secy.-treas. The club now puts out its own paper, *The ARC*. PJG and KET made DXCC. K4UHF has a new HQ-170 and SMK has a new GPR-90 and a GSB-1. The Missile ARS elected K4PAJ, pres.; ID, exec. vice-pres.; CEH, vice-pres.; and KN4GRF, secy.-treas. The Missile Net meets every Sat. on 7220 kc. at 0900. A new club in Gainesville is the Sperry Amateur Radio Association. The Hollywood ARC meets the 3rd Fri. of each month at the Hollywood Federal Savings and Loan Bldg. K4ODS is the new net mgr. of TPTN. GJI is net secy. GWF and CIL monitor c.d. frequencies 50.55 and 50.37 Mc. in Palm Beach County while at work during the week. New officers of the Orlando ARC are TVR, pres.;

(Continued on page 174)

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Hy-gain Trap Traveller

for 10, 15 & 20 Meters

- ★ Automatic 10, 15 & 20M operation with ENTIRE WHIP OPERATIVE all bands for MAXIMUM EFFICIENCY.
- ★ Unique 3-band circuits select proper amount of inductance for high efficiency CENTER LOADED whip operation on 15 & 20M. Loading coil automatically shorted out for full sized 1/4 wave operation on 10 meters.
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- ★ For 52 ohm Coax, SWR less than 2:1 on all bands.

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Hy-Gain telescoping base section and top whip assembly, Model TBW; fits all standard mobile mounts, 5' top whip, when used with Trap Traveller coil telescopes from 8' 4 1/2" down to 3'. Positive grip, knurled knob connections. **\$15.00**

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Automatic 3 band loading coil Model No. T-3. For any standard 3' base and 5' whip or with Hy-Gain telescoping base section and top whip assembly. Air foil design; 1 1/2" wide by 4 1/2" high.

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Adjustable screw driven clamp mechanism with 2" mast for mounting the Trap Traveller Dipole almost anywhere. Adjustable through a 90 degree arc from vertical to horizontal. Wt.: Only 2 1/2 lbs. Model UB: \$9.75.

CONVENIENT PLASTIC CARRY BAG



Attractive and convenient plastic carrying bag with full-length zipper holds Dipole when collapsed. Plenty of space for Trap Traveller coils and Mounting Bracket in addition. Model TCG: \$8.95.



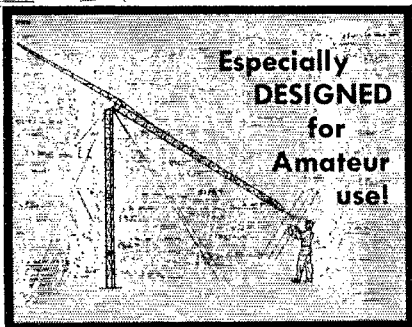
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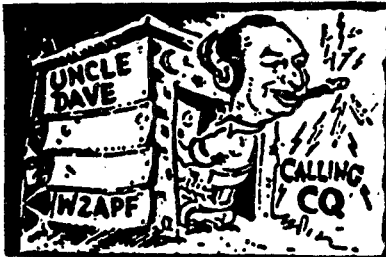
NGR, 1st vice-pres.; K4LXX, 2nd vice-pres.; K4GHL, secy.; and K4HXE, treas. Winner of the *FLORIDA SKIP QSO* Contest trophy was K4DRO. Runner-up was BIL. Have you heard about the Tropical Hamboree to be held in Miami Jan. 30-31? Watch SK7P for more details. The Florida V.H.F. Picnic was another big success with v.h.f.ers from all over Florida attending. The State c.d. communications bus was on display. If you are interested in v.h.f. how about contacting RMU, our V.H.F. PAM, to find out how you may fit into our v.h.f. statewide net. Traffic: (Sept.) K4AHA 847, SJH 809, LCF 160, ILB 146, KDN 125, RNS 121, W4GJI 102, LMT 78, K4ODS 70, LCD 66, W4DVR 64, 1YT 62, BIL 50, NGR 45, K4BY 41, W4KJG 31, FJE 28, K4EHY 22, FMA 22, KN4SR 22, K4COO 19, MTP 18, SZC 15, EFZ 14, TDT 13, MBB 11, W4TAS 10, K4JJZ 6, AHW 2, KN4GLI 2, (Aug.) K4ODS 55.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC; PQW, RMs; AXP and BVE, Pensacola; Virgil Wood, Grice's ham dept. manager, is now K4MWC. His new assistant is HKK, former SCM of Alabama. Clark replaces K4PIY, who has moved to California. The NAS Club voted to hold only one business meeting a month. Other club nights will be devoted to technical study, code practice and operating. New officers of the V.H.F. Club are K4IYQ, pres.; GSY, vice-pres.; K4LAN, secy.; K4QAC, treas. A new YL is KN4OIQ. K4HYL has traded the HQ-110 for a 75A-3. K4IVD is mobile on 6 meters with a Gonset and a halo. PAA and RSD are increasing their DX totals. Ft. Walton/Eglin AFB; ARRL Southeastern Division Director ZD was guest speaker at a meeting of the Eglin ARS. K4UBR is the new net mgr. of NWFN. Net sessions will be extended to one hour during the winter to handle increased traffic. The W. Fla. Phone Net still meets on 3840 kc. daily at 1700 CST. Defuniak Springs: 4J0Z is teaching code and theory in the high school. Tallahassee: UEU has organized civil defense nets on 75 and 2 meters and is holding regular drills. Perry: KQP, EC for Taylor County, is looking for more AREC members. PBO, Madison Co. EC, is planning monthly c.d. drills, assisted by RDQ and RCO. Traffic: (Sept.) K4UBR 411, W4GAA 3, (Aug.) K4UBR 72.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC; PMJ, PAMs: LXE and ACH. RM: DDD. GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs., at 0800 on Sun.; GSN, Mon. through Sun. at 1900 EST on 3595 kc. with DDD as NC; 75 Meter Mobile Phone Net, each Sun. at 1330 EST on 3995 kc. with K4JTC as NC; GTAN, Sat. at 1000 EST on 7290 kc.; Atl. Ten-Meter Phone Net, each Sun. at 2200 EST on 29.6 Mc. with KWC as NC; GPYL Net, Thurs. on 7260 kc. at 0900 EST with K4DNI as NC; GAN, on 7105 kc. at 1800 EST Mon. through Fri. with K4KZP as net mgr. When "Gracie" hit the Charleston, S. C., coast with all her disaster the amateurs of the Augusta, Ga., Radio Club were ready to offer their assistance. With K4AUM, president of the Augusta Club, PMJ, Georgia's SEC, AAY, K4JEN, K4KAR, K4ORV, TTH and QDM, they operated and maintained the c.d. communication van of Richmond County, which they took over to Charleston, S.C. Savannah EC KGP did an excellent job in getting his boys lined up in emergency communication. AREC members, c.d. and RACES members did an excellent job in participating in "Gracie." K4DNI did an excellent job in reporting to and working with the American Red Cross. YEK kept c.d. headquarters posted on their needs. Many hams contributed by keeping off the net frequencies. K4VHC has had big trouble. The call of radio club at Russell High School is CZG. Officers are: K4HBI, pres.; KN4LSW, vice-pres.; George Chambers, secy.; Jerry Davis, treas. The name of the club is the Wildcat Radio Club. K4TYU and KN4HTX also are officers. K4HBI's ten-year-old brother, Mason, is now K4VQG, General Class. KN4AEK is now a Technician. CXZ paid IMQ a nice visit from Black Mountain, N. C. LNG is back from four and one-half months work in Florida. Traffic: W4DDY 173, K4EJI 154, BVD 102, VTH 99, BAI 87, MIH 85, LVE 65, W4ZKU 64, K4PHA 25, VHC 10, VCM 8, HBI 7, W4FTB 4, BXV 2, K4UWJ 2.

WEST INDIES—SCM, William Werner, KP4DJ—SEC: AAA. AJN joined the AREC and has a 2.5-kw. emergency power plant. ALY built a 70-ft. welded crank-up tower. ADR is moving to Urb. San Gerardo. AMG is QRL microwave tests in Caracas for I.T.&T. MO added a DS810 to the Apache. RC is on 21-Mc. s.s.b. ATM has a new Telrex Tribander while AOO has a new TA33 Jr. KD has cards in for DXCC 246 and is awaiting cards from UIR, UJ8, YA1, EA9, Ifni and LA1/P Jan Maven for his DXCC 250 sticker. KD won first prize at the Ramey AFB MARS-Fest in the QLF contest. DJ won first prize for the fastest sending. Each received a 4-400A tube. The Ramey ARC, with ATC, pres.; and ALO, secy.; sponsored the very suc-

(Continued on page 176)



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NEW!

S-107

Covers 540 Kc-54.5 Mc. in 5 bands. Two stages IF, Separate sensitivity and volume controls, electrical band-spread for 48-54.5 Mc. band, noise limiter, rec/standby, BFO, 2 posit. tone control, built in speaker, phone jack.

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NEW!

COLLINS KWM-2 TRANSCEIVER

The latest from Collins—a transceiver that is the most modern concept of style, mobility and versatility—in SSB. At home in a car, boat, plane or at a fixed station. Freq. range, 3.4Mc to 29.7Mc. Emission: upper, lower sideband. CW-Keyed tone. RF Power input: 175 watts SSB PEP or 160 watts CW Power output: 100 watts PEP into 50 ohm load. Size: 6½" H, 14¾" W, 13" D. Weight: 16 lbs.

Less Power Supply **\$1095.00**

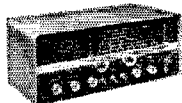


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Modern styling, band switching—10-80 meters self contained 90w transmitter for CW, 75w meter indication for novice use, selectable keying, no modification needed for Globe VFO or modulator, built-in power supply, Rotary switches used throughout. Kit contains pre-punched chassis, all parts and tubes, easy to follow instruction manual.

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Covers 540Kc-30Mc., Logging scale for 10-80 meter, separate RF and AF gain controls, noise limiter, AVC control, BFO, pitch control, rec/standby, self contained speaker.

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FINE USED EQUIPMENT

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Central Electronics 20A	225.00
Central Electronics 108	129.95
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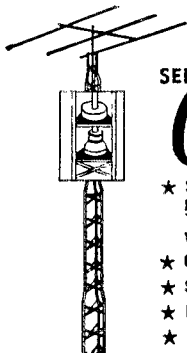
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cessful MARS-Fest on Sept. 27 with about 300 in attendance. AAN won a kw. emergency power plant. DJJ won an all-expense-paid week end at the Montemar Hotel near Ramey AFB. The PRARC plans its Annual pre-Christmas Holiday Party for Nov. 29 on the country estate of ex-4JE. The club will issue a separate WPR certificate award for 50 Mc. 50-Mc. Net members are all getting crystals for 50.9 Mc. ABN plans 2-meter tests with LU stations. The Antilles Weather Net is on 7245 kc. at 7 A.M. and 5 P.M. daily. The P.R. Amateur Emergency Net on 3925 kc. at 7 P.M. Wed. W3PWH/KP4 is now KP4AST in Hato Rey. K9PJH/KP4, a new arrival in KP4-Land, is on 21 Mc. with an Apache and an HQ-150. WT recibio un Diploma de la Academia Hispano Americana de Costa Rica como Humanista y "Abuela de los KP4." AIS and AMJ joined the AREC. The 50-Mc. gang is working LUs 3FX and 2CFD, PY3ADT, CX3AJ, CX7CO and HC1JW. Official Observer AMU advises that he has noted several violations since his recent appointment. Traffic: KP4WT 108, AMU 15.

CANAL ZONE—SCM, Ralph E. Harvey, KZ5RV—Of general interest to all the Canal Zone hams are the new frequency allocations. KZ5s are now permitted operation 50 kc. below the limits of the American phone band on 20, 15 and 10 meters effective Oct. 1. We hope that all amateurs will check carefully before they zero-beat a KZ5 station when they are operating close to the band-edge limits. The Atlantic-Side Radio Club has seven new hams as a result of its last class. A new class is starting soon. There are several new YL and XYL hams in the Canal Zone, among them KK, OA and WVN. WVN's family also is interested in amateur radio. Both the OMs in the family have Novice tickets. HG and KQ are back from Stateside vacations. BX, WF and OG have returned to the States for reassignment. UR now is in the States for a well-earned vacation. LC is building a linear with a pair of 4-400As. RV is busy assembling a Viking Valiant Kit. RM is in the market for a new transmitter. His present one has been sold and is on the way to Boquoto, where it soon will be heard under an HP3 call at an elevation of about 4000 feet. Traffic: KZ5AD 95, OB 61, SW 54, KQ 50, BL 45, US 35, VF 27, RR 26, VR 24, KA 21, CC 13, LC 10 RM 10, DH 6, JN 6, BS 2, RU 2.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—SEC: W6LIP. RMs: W6BHG and K6HLR. PAMs: W6BUK and W6ORS. The following stations earned BPL: K6MCA, W6GYH, K6HLR, W6WPP, K6OZJ, K6TJG and WA6EEO. Congrats, fellows! W6NKR and K6TPL report some fine DX to Asia and Europe on 40 meters. K6MCA has new 72-ft. towers with beams on 40, 20 and 10 meters. W6GYH made a fine trip to Fresno and Bass Lake country. K6GLS is working hard on the yard at the new home. K6MSG worked the summer in Kings Canyon Park! WA6AYF is sporting a new Globe Champion and received an OTC certificate! W6WPF has a TCC sked as Station "J." W6CK is travelling around the East. W6FXJ passed the General Class exam. K6TJG has a new Mini-Tribander up. K6VGH has the new Gonset mobile installation going. WA6DWP earned a net certificate on SCN. Congrats, John! WA6EEO is working on new 6-meter RTTY gear. W6BHG had a nice trip up to the Bay Area. W6UFJ has a new DX-40 and worked ZS6! W6LBD is getting set for DX on 80 and 40 meters. K6PLW put a new 4-250A final on the air. K6SVG built an electronic key and it works FB. K6JSD, K6TJG, K6TPL, K6PLW, K6COP, K6OJV and K6RLR are all back hitting the books at school! W6FB had a fine QSO with W6EA after 30 years! W6SYQ was QRL handling traffic. The Associated Radio Amateurs of Long Beach is planning a big Hobby Show for next March. Support your section nets: phone, the SoCal 6 Net on 50.4 Mc. at 1900 PST daily; c.w., the Southern California Net on 3600 kc. at 1900 PST daily. Traffic: (Sept.) K6MCA 2006, W6GYH 1140, K6HLR 816, W6WPF 764, K6OZJ 501, WA6EEO 225, K6JSD 164, W6SYQ 158, K6TJG 157, W6BHG 111, K6PZM 94, K6TPL 40, W6USY 33, W6CK 32, K6EA 22, W6BUK 14, WA6AYF 12, K6VGH 10, WA6DWP 5, K6PLW 4, W6UFJ 4, W6NKR 3, W6AM 2, WA6AWD 2. (Aug.) K6OJV 382, K6YRM 234, K6LJY 211.

ARIZONA—SCM, Cameron A. Allen, W70IF—PAM Copper State Net, 2880 kc.: FMZ. There was a large turnout at the Ft. Huachuca Hamfest over the Labor Day week end. Many call areas were represented. The Catalina Radio Club of Tucson is doing a fine job with its emergency net on 29,600 kc., 29,627 kc. and 145,800 Mc. The club's monthly paper, *Zero Beat*, with BVA as editor, does a fine job of keeping members posted on

(Continued on page 178)

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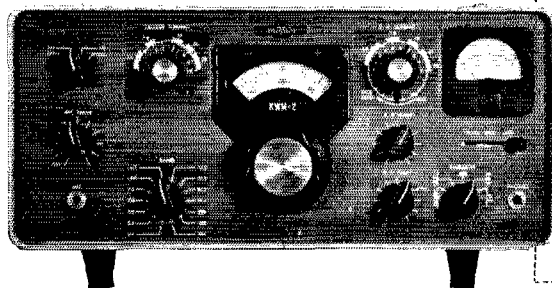
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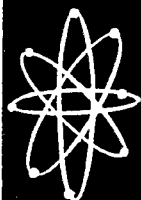
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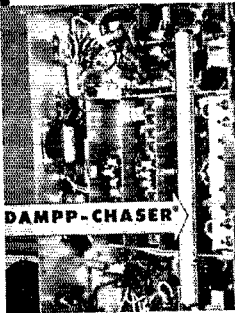
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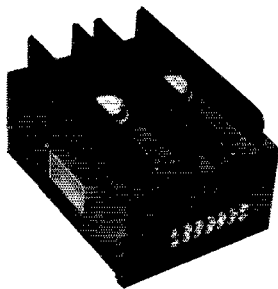
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what goes on. The Arizona Amateur Radio Club in Phoenix meets the 1st and 3rd Thurs. of each month. New officers are K7AWI, pres.; YVWF, vice-pres.; UDI, treas.; UXZ, corr. secy.; FMZ, secy.; KOY, membership; OIF, program. M.A.E. C.A.F. FMZ and K7BGG take traffic from the 12th Reg. Net. The big annual Christmas Party of the AARC will be held in Phoenix on Sat. night, Dec. 19. All who can make Phoenix on that Sat. night are invited to come. Traffic: W7OIF 10, C.A.F. 5

SAN DIEGO—SCM, Don Stansifer, W6LRU—The Newport Amateur Radio Society, which meets the 2nd and 4th Fri. of each month at the Parks and Recreation Building, elected the following officers: W6DGM, pres.; K6CQS, vice-pres.; K6RCK, secy.; and W6SRA, treas. The publicity chairman is W6WPN (ex-W2DIB), who was Assistant Director in the Hudson Division. K6ZRD, in Escondido, now has a four-element 10-meter beam. W6CAE, prexy for the San Diego DX Club, has moved about a mile to another good spot on top of Pt. Loma. K6BPI gave the San Diego DX Club a big assist when he sent nearly 100 messages to hams with over 50 cards on file in the W/K6 QSL Bureau, which sent out over 80 pounds of cards during the first month the San Diego DX Club operated the bureau. This is over 12,000 cards. W6ELQ, long-time traffic man, now has competition at home. His XYL signs WA6ABT and checks into the SCN, where she earned a net certificate. K6BX continues to knock off DX from the South Bay Area, and do outstanding work as an OO. W6DLN, in El Centro, is very active working DX, as is W6LJL in Orange County. W6BZE moved from San Diego to Mt. the FCs in the area and triggered by W6KSL, an excel-Helix. K6KGS moved to Omaha, Nebr. The SET for 1959 was a success. Organized by W6LYF, SEC, and lent job was done. Thanks to those participating. W6GBG flew to Turkey and brought back a bride. Merry Christmas to all and the best in 1960. Traffic: W6IAB 1873, K6BPI 1343, W6EOT 1211, W6ELQ 148, W7YKN/6 38, K6ZRD 31, WA6ATB 8.

SANTA BARBARA—SCM, Robert A. Henke, K6CVR—The Ventura County ARC elected officers. Motion was made and seconded that all of the present officers be retained for another term. The Fishy Hamfest held at Atascadero Lake was almost rained out but here are those who were brave enough to chance it: K6RWP, TIB, CVR, SGI, RZM, SWR, JGY, JHA, TVR, DGI, GNM, RFK, IUX, RBH, IES, LAF, SBP, HAT, GRR, HDN, W6MSW, MSG, CRZ, SSL, LJP, FSA, WIU, PET, RQU, NXT, PDD, NXW, OPP, WA6BLM, AAX, EQQ, CMD, BGL and K6VFM/K6. K6EVQ has completed a triband quad for 10-15-20 meters. W6KCD has another harmonic, a boy. Congrats, Bob. Congrats to Cpl. Raines at Point Mugu on getting his General Class ticket with the call WA6LAV. WA6BLM has a new receiver, an SX-101 Mark III-A. The Pointsetta Club's frequency is 3885 kc. Traffic: WA6BLM 441, W6FYW 2.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, 5NFO, SEC: K5AEX, PAM: BOO, RM: K5ETX. The Terry County ARC has been busy getting its portable power units in first-class shape and becoming familiar with the operation of these units. K5GEC, RACES officer in Brownfield, wants all amateurs to be familiar with the operation of these units. The General Telephone ARC and the San Angelo ARC went into emergency operation Oct. 3 to assist with communications for the Red Cross, Salvation Army, State and local Police in the evacuation of many families out of the flooded areas of San Angelo, Merton and Knickerbocker. The City Council of Richardson amended its City Ordinance and it is now legal to have a radio or TV antenna up to 99 feet in height. K5MBB has a 5-kw. emergency generator ready to go. New officers of the Central Texas ARC are LL, pres.; K5MWA, vice-pres.; K5TLT, secy.; K5TLP, treas. K5TMQ has a new HT-32. K5YHA is a new ham in Amarillo. K5IPG made SPL. Congratulations, Joan. K5NAO/5 operated a station at the Texas-Oklahoma Fair held at Iowa Park, Texas. This station was operated by GNE, ISL, K5DCB, UUS and RDE. New officers of the Mineral Wells ARC are K5QCV, pres.; GHU, vice-pres.; EBB, secy. Traffic: K5IPG 509, LZA 346, W5UTW 339, BKH 280, SMK 240, K5NAO/5 117, W5GY 102, BOO 65, K5LBB 50, AD 22, W5LR 17, VEZ 10, CF 8, OCY 4.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—SEC: UYQ, RMs: VVQ and JXAI, PAMs: K5DLP, VCJ and EJK. Your SCM visited the Northeastern Radio Amateurs at Vinita Sept. 24. K5HIV is president and K5BPV program chairman of the NORA. Also present

(Continued on page 180)

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1 1/2" square 0-500 microamperes. Bakelite case. By Dejur.
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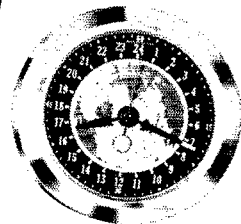
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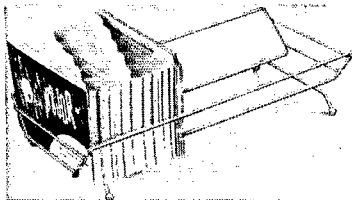


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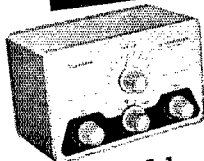
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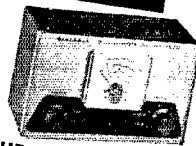


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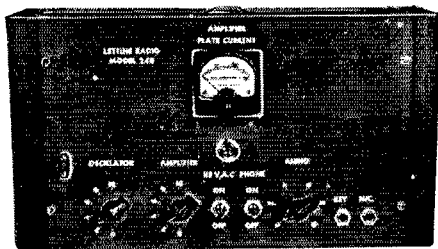
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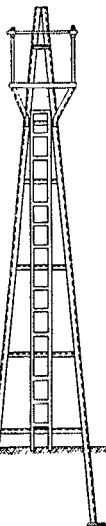
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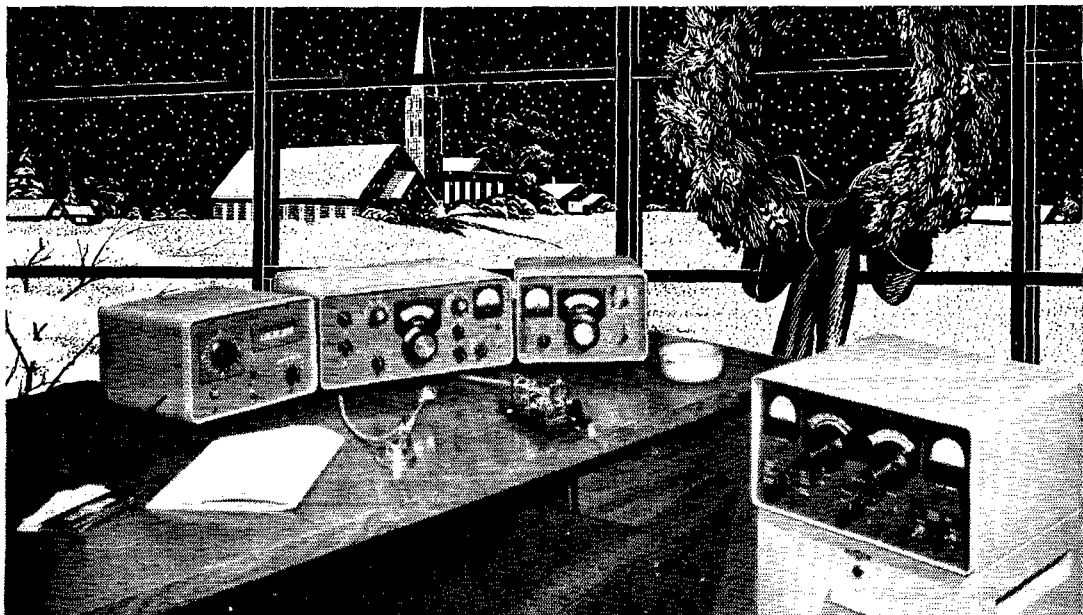
were amateurs from Miami, Chelsea and Pryor. K5LJA and ECR saw that we had a bed and something to eat. On Sept. 25 we met with K5PHR, OVR, IER, JJR and NDE in the home of SKY. These fellows are all leaders in their respective clubs. KN5TUH was the winner of the recent Novice Contest sponsored by the Electron Benders of Tulsa. Runners-up in the contest were KN5SLF, KN5TXK and KN5TTN. New officers of the North Fork Club are ZDI, pres.; K5LDN, vice-pres.; ZJP, secy. The Oklahoma Central 6-Meter group is an active bunch. The next project will be the "Ham Bazaar" at Oklahoma City. Amateurs furnished communication for the Oklahoma City Weather Bureau for a 14-hour period after rainstorms had put teletype and telephone out of commission. HHG, AZO, VAX, KBZ and many out-of-town amateurs participated. K5PGC has a new Valiant. KN5YFE is a new Novice at Bartlesville. K5CAY would like to see more 20-meter traffic men. Oklahoma's "Ham of the Month" is UYQ. Ray is doing an outstanding job in getting AREC organized. Traffic: W5EJK 149, DRZ 121, VVQ 120, K5JGZ 96, CAY 75, DLP 40, ELG 35, W5MFX 25, MGK 25, FEC 21, K5CBA 20, W5KY 20, CCK 17, K5JOA 12, QEF 12, W5WAF 12, PNG 11, K5CVU 9, W5SWJ 8, VLW 7, K5EZM 4, INC 2, LUR 2.

SOUTHERN TEXAS—SCM. Roy K. Eggleston, W5QEM—SEC; QKF, RM; K5BSZ, 9EIG and KN5VIC are two new members of the El Paso Amateur Radio Club. K5TLO has dropped the "N" from his call. I understand that K5RYS is doing an FB job as Net Control out in West Texas. Keep up the good work, Virgil. Congratulations to Jack Stuart, who has just been reissued his old call, SG. We are sorry to lose 8LIM and 8ABS from Southern Texas. They have gone back to Yankee-Land. ETA, QKF and QEM attended a meeting with the SCMs and SECs of Northern Texas, Oklahoma and Southern Texas, with the director of OCDM at Denton. K5OPQ has his new General Class license. Congratulations to K5BJU, CWL, K5MXO and K5MIZ on the excellent job they did with many who assisted after the "Mad Man Bombing of Poe Elementary School in Houston." The Gaylarks are studying First Aid with K5MXO as instructor, SGA/4 and family visited in El Paso. The Novice Class has been completed by the El Paso Amateur Radio Club with all members passing. The next class will be held to help them get their General Class licenses. K5EJU is gone—s.s.b., that is. K5HUI is attending school in Las Cruces, N. M. We are very sorry to lose ZIN as PAM. Hubert has done an excellent job and will be hard to replace. Traffic: W5ZIN 85, K5BJU 78, W5BHO 52, K5MXO 38.

CANADIAN DIVISION

MARITIME—SCM. D. E. Weeks, VE1WB—Asst. SCMs: A. D. Solomon, VE1OC, and H. C. Hillyard, VO1CZ. SEC: BL. New appointments include CB as EC for Sunbury and Kings Co., N.B. Newly-elected officers of the NSARA are GA, pres.; FR, 1st vice-pres.; XK, 2nd vice-pres.; ADM, secy.-treas.; VN, registrar. Successful 2-meter communications have been established between Middleton, N. S., and St. Stephen, N. B. Contact was first made between CL and MA. Deepest sympathy is extended to relatives and friends of VOIDZ, who passed away recently. Members of SONRA, as part of their S.E.T. exercises, provided communications and transportation for the fund-raising campaign of the CNIB. Those assisting included VO1s AO, BL, BU, CZ, DE, EX and FD, also K0THB/VO1 and K9THQ/VO1. The HARC operated a demonstration station at the Lord Nelson Hotel, Halifax, during the recent Maritime Boy Scout Convention and FO/1 also was active during the Boy Scout Jamboree-on-the-Air. OM reports that the Maritime Keyers Net is back in operation. It meets daily at 2000 AST on 3530 kc. ADH reports making 345 contacts in the W/V E Contest. Traffic: VE1ADH 9.

ONTARIO—SCM. Richard W. Roberts, VE3NG—Many appointments are available to members of the League. If you wish a list of those available, drop me a QSL card for same. The SEC, KM, reports that the S.E.T. was a big success. Four hams participated in the October S.E.T. at Meaford: SCM NG, AJA, DVG and DZA. Maritime-mobile, mobile, portable and fixed stations were in excellent working order. I would like to hear from more of the maritime-mobile stations in the Province. TX, DZA, NG and AMN have reported in so far. DUU is on 2 meters. DTO was a visitor to Atlantic City. EII has a second jr. operator. Congrats, Millie and Jim. DPO is trying to keep his local net together. Keep up the good work, Reg. DVM is at Bowmanville. DUY is a new OPS. AVS was in the hospital. The AREC in Ontario is on the rise. More and more are joining the ARRL. The Hamilton ARC is in
 (Continued on page 182)



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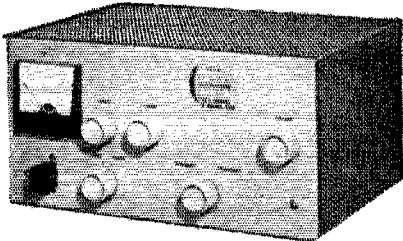
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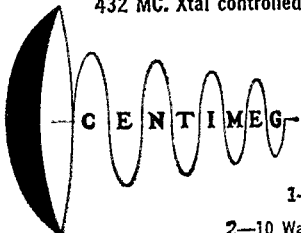
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with the local Red Cross. The 1960 Convention may be held in Ottawa. K1AYA was a visitor to Sarnia. TX is back on 75 meters. The Scarborough ARC still holds its hidden transmitter hunts on Sundays. It looks like Nortown ARC (Toronto) may again have won the Field Day Trophy. Runners-up will receive their SCM-sponsored certificates. Traffic: VE3BUR 124, KM 124, NG 105, DPO 73, DCX 58, AUU 47, CFR 31, DZA 27, EAM 14, DLC 7, ELC 8, AVS 3, DH 2, VD 2.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—TQ, now located on Magdalen Islands, runs 75 watts to a home-brew 6146. IY also is there. The South Shore Club deserves a bouquet for an exceptionally well edited *Skywave!* The editor, KG, is moving to St. Rose. Many VE2s dusted off the bugs and dragged the ol' fists out of the mothballs and enjoyed the VE/W Contest. LO returned from Newfoundland after five months and now is off to Vancouver. GE also visited the West Coast. YA is back from G-Land. ABE enjoyed his holiday in FP8; operator FP8BG and 8JC and made 1901 QSOs. IC entertained ham friends at his summer camp near Perth. CJO's code classes have started and are held at 7400 St. Lawrence Blvd. at 2 p.m. sharp Sat. AGN still is building the 2/4-125 final. AJP moved to Quebec City. ANR was married. The Lake Shore Club now meets at Green Hornet, Valois, the first Tue. of each month. Many new VE2 calls have been issued. Newcomers are invited to send news to the SCM. New local clubs: VE2VC, "D" Co., 4th Squad., Royal 22nd Regiment ARC.; VE2RW, R.E.T.S. ARC.; VE2BAW, Sir George Williams College. AVC, at St. Hubert, is ex-DL4SY, VE3DDU, VE4KR and VE8KJ. AUB, with visitor VK3AMH, keeps weekly skeeds with VK3HW. WT keeps rolling traffic-wise. 2-meter activity is perk-ing up. DS, ASZ, ZG, VE, TI, AIM, HO and OX are on the varied equipment. Traffic: (Sept.) VE2WT 712, DR 56, EC 15. (Aug.) VE2EC 7.

ALBERTA—SCM, Gordon W. Hollingshead, VE6VM—Nominations as SCM for the Alberta section are being solicited. Now is the time to consider the candidate of your choice. Let's put an end to the "returned by acclimation" routine. The Alberta (ACWV) C.W. net still requires additional coverage to provide a useful service. Let's hear from you at 1830 MST Tue., Thurs. and Sat. on 3600 kc. An amateur radio beginners' course commenced during October and there still may be time to enroll. VE6WT, QS and IQ are providing the instruction. GD has moved to Vancouver and will be sorely missed. The last issue of *RF* will be published shortly. EH is now making daily schedules on RTTY for testing purposes. VM is checking the BCEN regularly and will take traffic for British Columbia. Traffic: VE6VM 56, CA 26, YE 21, OY 18, TT 8, SE 7, OC 6, ES 4, SF 3, FS 2, YQ 2, PS 1, UK 1.

MANITOBA—SCM, James A. Elliott, VE4HF—The first fall meeting of the ARLM was held Sept. 28. VE4WS, TX, YW and SH are working fine DX when 6 meters is open, which has been quite frequently this summer. VE4EH, of Wabodan, is on 75 meters. We wish to extend our congratulations to Larry and his XYL on the birth of their son. QD spent considerable time in the hospital this summer and his recovery will take some time. CB and BR, Ethel and BR, had their transmitter struck by lightning so are QRT for the time being. They are now the proud possessors of a DX-100B and a 20-meter beam plus tower. 5AW/M4 has been posted to his northern station and hopes to be on 20 and 75 meters with a VE3 call shortly. KP is rebuilding his home station and also making changes in the mobile rig. HI was down from Fin Flon to Finiwa Dam with the Army on the Labor Day week end. LF, GE and PE visited him, making the trip from their summer cottage on Lee River by boat. LF is in the hospital with a heart condition. GB is on 75 meters fairly often and works 20 meters when time permits. HI has been busy helping his brother build a summer cottage, and now is building a boat. IW received his Advanced Class amateur radio license. CX is back on 75-meter mobile after a vacation in California. Traffic: VE4GB 18, PA 10, HL 8, PE 6, MW 2, RR 2.

ARE YOU LICENSED?

• When joining the League or renewing your membership, it is important that you show whether you have an amateur license, either station or operator. Please state your call and/or the class of operator license held, that we may verify your classification.

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EFFECTS OF NUCLEAR RADIATION ON MEN AND MATERIALS by T. C. Helvey (Director of Biophysics and Astrobiology Branch, Radiation, Inc.). Nuclear power for propulsion of military and civilian vehicles has become a reality. However, the application of nuclear energy in mobile units has presented a great many unexpected and unheard of technological and biological problems. This book discusses the basic nature of nuclear radiation—alpha, beta and gamma rays—and their physicochemical and biochemical effects. Radiation effects on man deals with details of ionizing radiation, dose tolerance, genetic effects of radiation, and air ionization and its biological effects. In covering radiation effects on materials, the author discusses the effects of nuclear particles on materials such as textiles, adhesives, plastics, fuels, and inorganic materials such as metals, ceramics and glass. #243, \$1.80.

SHORTWAVE PROPAGATION by Stanley Leinwoll (Radio Frequency and Propagation Mgr.—Radio Free Europe). Of special interest to those concerned with radio communications, this text provides a modern, up-to-the-minute analysis of shortwave propagation. Ionosphere characteristics are discussed together with the nature of radio waves. The book then carries the reader into the sky wave, measuring the ionosphere, ionospheric variations, the sunset cycle, and abnormal phenomenon. Sky wave propagations are covered and the preparation of MUF curves are discussed. There is considerable material of interest to amateur radio operation. #231, \$3.90.

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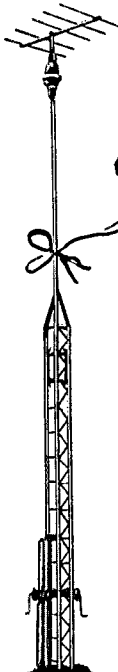
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How's DX?

(Continued from page 28)

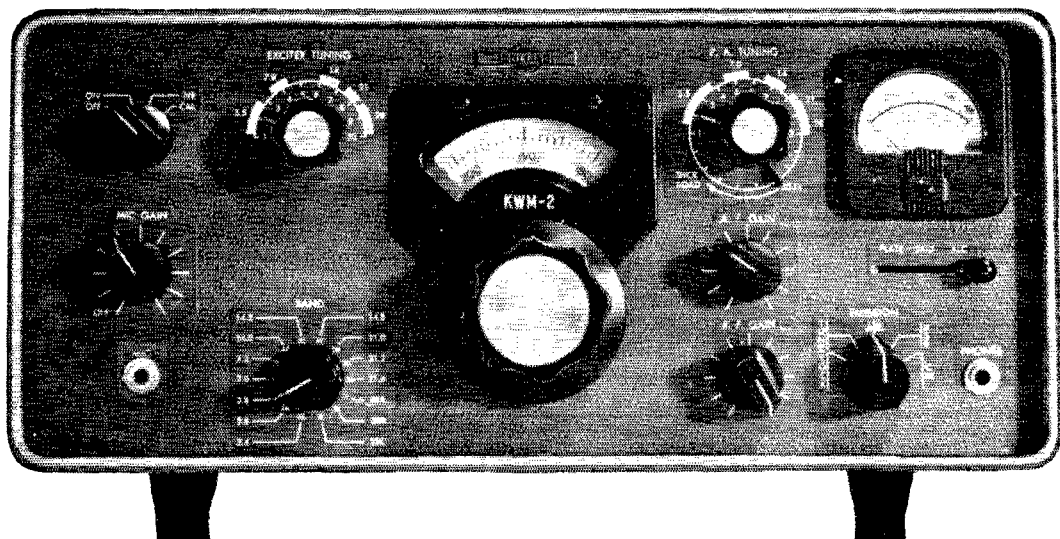
rocked and socked 21 Mc. with the OM's (KX6BQ's) KWM-1 on c.w. and s.s.b. KM6BT now attends school in Hawaii where he hopes to put KH6s CSN and DDB through DX paces on 40 meters when homework breaks permit QST author W4JA currently works out of Honolulu on a giant Pacific scatter-prop project. Gil reports KC6PF already active at the system's Ponape base, with a Koror activation in immediate prospect. This scatter business is buzzing busily in advance of the sunset minimum ahead More from the Pacific strands via VERON and WGDXC: ex-V85JA is analyzing Iran's oil and reports negative progress toward ham authorization over BQ-EP way. . . . YJ1DL's c.w. and FUSAC's a.m. keep the New Hebrides condominium workable on 20 and 15.

Europe — "SV0WT/Crete is on the air occasionally," writes chief op SV0WY (K2RYP), "but we are undergoing some changes in the rig and the shack, and it will be some time before we are again on the air full time. Our favorite bands are 15 and 20 with activity mostly on the latter. We have a BC-610 running 350 watts, receive with an SP-600, and radiate with a 14-Mc. beam. Watch for SV0WT/Crete at night our time and on week ends." Hey, OM, it's Europe working the rest of the world in the Fifth Annual European (WAE) DX Contest sponsored by DARC (Germany) and scheduled for the 9th-10th and 23rd-24th of next month, c.w. only. Participation particulars in January's column K4QIJ visited hams in England, France, Italy and Monaco this summer and advises, "The RSGB boys have a luncheon on the third Friday of each month, visitors invited." W9IOP's projected operational venture to the Vatican last month tickled the fancies of grapeviners near and far DXing is fine across the water. SV0WP returned to W3JTC after a whopping 246/237 DX splurge, and DL4ME (K6YTF) is already up to 66 countries with a DX-35 and attic antenna in Kassel. According to W6KG, G3CQE is in the mood for U. S. contacts via 21-Mc. radioteletype. From K6JC: "HB9IH, with 156 countries confirmed, still needs Montana and North Dakota for WAS. You'll find his 807s on phone, 10 through 80 meters." GM3ICS writes, "From letters and QSOs it appears that many stations interested in obtaining WAGM (Worked All GM), sponsored by the Aberdeen Amateur Radio Society, are finding it rather difficult to meet the qualifying conditions; in particular, making contact with some of the rare GM calls. So we would like to mention that, in common with other countries, activity here is at a higher level during local holiday periods, and this year, with New Year's Day falling on a Friday, the majority of Scottish amateurs will be on holiday from December 31st to January 3rd inclusive. We have taken steps to give this as much publicity as possible in our magazines and meetings. If conditions are reasonable it is hoped there will be even more GM stations active than usual in this period, particularly the GM2-4-5-6-8 prefixes." We dig you, mon! F9IL of REF points out that some minor modifications have occurred in DUF certification rules, stressing for one thing that Saarland and Tangiers QSOs must date before 1957. Check with Edmond for the up-to-date fine points before applying. Rundown on several U.S.S.R. DX certificates now available world wide, data thanks to Ks 3CUI and 4EX, R-2-K, Worked Six Continents, calls for contacts with each of the continents plus European and Asiatic Russia, either c.w. or phone, since June, 1956. Certificates are endorsed for each of 40, 20 and 15-plus-10 meters or for any combination of hands. R-150-S, Worked 150 Countries, which must include contacts with each of the 15 soviet republics, is awarded for either phone or c.w. operation since June, 1956. R-15-R, Worked 15 Republics, requires QSOs with each of the fifteen within a 24-hour period (1). R-100-O, Worked 100 Oblasts, is merited by contacts with 50, 75 or 100 of Russia's nearly 200 administrative areas within one calendar year, any bands. W-100-U is offered this year in centennial commemoration of radio pioneer Popov's birth and may be earned by working any 100 U-stations in 1959, five of which must be located in Popov's birthplace, Sverdlovsk oblast. Application details are not crystal clear, so we suggest inquiries to Central Radio Club, Box 88, Moscow, as K3CUI puts it, "Cyrillic wallpaper, anyone?" Club Continental comment, thanks to IRLI, NCDXC and WGDXC: IADW/HV's admonishments to pursuers of DXpeditionary stations is universally applicable. (1) Stay away from the rare one's frequency by 10 kc. or so, (2) don't ask him to listen for your phone, facsimile or RTTY, (3) avoid tailing unless the guy buys such rudeness, and (4) limit your yak if a queue exists. That roving Czech geographical expedition failed to score in Turkey but managed a few QSOs as OK7HZ/OD5. Next comes Syria, Saudi Arabia, possibly Yemen, then Iraq, perhaps Iran and Afghanistan which will bring the itinerary into April. HA5BI mentions "HA DX Days" as occurring in mid-November, doubtless a Sweepstakes casualty. G3MRC visited New London, Conn., aboard British sub *Adamant* in October.

(Continued on page 186)

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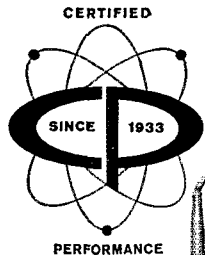
Hereabouts — K4RJN discloses that something's afoot in Memphis. Kingpin DXers W4s DQH GD and K4LNM are said to be organizing a DX-type club that may well spell perilous pressure for near-by Yankee combines. . . . Could be that someone still uses the call YN4CB but K4TEA and others note Pat now preparing for the contest wars as TG5HC. . . . In case you wonder why YN1WW works so many zeroes around 28,900 kc., W6NKE has it that Tommy's XYL hails from Omaha. . . . We regret to hear through W9JFT that 28-Mc. specialist HP2ON is in for extensive hospitalization. . . . Regarding the WANA sheepskin briefed here last month, W3AYD adds that PJ2CE periodically puts rare Bonaire on the air as PJ2BC. . . . Shattering all miles-per-watt records, W9HPJ receives 28-Mc. s.w.l. reports from Siberia on no watts at all. Phonetic failurization, no doubt. . . . WAP No. 146 falls to KL7PI, and Joe also anticipates a shiny new WAVKCA diploma at any time. . . . W2JBL finds old 7-Mc. stalwart VE7AMI now trying 20 meters as VE8DM, Bathurst Inlet, N.W.T. . . . HH2Z writes of DXploits by the International Gang, a pack of fearless phones that made 21,210 kc. hum this summer. This world-wide net featured such long-haul stand-bys as PZ1AP, VPs 1EE 6ZX, VR2BC, VU2NR and ZL4BO with about 75 stations participating all told. It convened nightly from June 10th through mid-July when conditions began deteriorating. HH2Z found the propagation involved, transequatorial and otherwise, a most intriguing study as conditions cycled through daily and seasonal progression. One-way skip and multipath confusion were not unusual developments and an interesting DX fling was enjoyed by all. . . . K7AWH, W9TUI and some other regular "How's" operatives now find their DXing curtailed by heavy school sessions. . . . VP2VB continues *Yasme III* preparations after a sizzling VP7VB session in October. KV4AA maintains liaison on 20. . . . W7GBW steps down as Willamette Valley DXC DX editor and a task well done. . . . Now to aid your perspective and jog your recall, let's see what transpired.

Ten Years Ago in "How's DX?" — It's a regular five-ring DX circus in December, 1949, with plenty of action from 3.5 through 28 Mc. . . . Eighty's regulars make away with KV4AA, PY7WS and TG9RB. . . . Sporty forty-meter men busy themselves with CM4MH, FK8AB, TA3GVU, VPs 4TAQ 5B1 5BE of the Caymans and 5BF on Caicos. . . . Twenty e.w. teams with AC4NC, AP2N, CR10AA, EK1AO, FESAB, FN8AD, HE1EO, HZ1KE, MDs 2GO 4GC 7DC, M3ZZ, MP4BAD, PK4KS, ST2RF, VK1FE, VR4AA, VU7AH and ZD3D. . . . Phone fun on 14 Mc. is famous enough: AR8AB, CR5UP, HL1BJ, M1D, M18US, MP4BAC, PK6NQ, TA3BS, VK1ADS, VR4AC, W5FYV/VR4 and YK1AC. . . . If 10-meter phone is your favorite, dial for FQ88N, LX1DC, M13s NC SC, MP4BAE, PKs 4DA 5HL, ST2AM, TA3FAS, VSTPS, W2EJV/PK3, ZB2s A H, ZSs 8A 8B and 9F. . . . Matters for chatter: 11SN readies for more San Marino fun. . . . EQ1RX returns to the U. S. after a 55-country Iran DX kick. . . . JA3AA comes back to W6ZQZ burdened by a 3000-to-4000 QSL backlog. . . . Jeeves demonstrates some perfectly preposterous levitation, as photos of outstanding DXers CT1CZ, G2PL and VQ8AY wrap up the round-up. Yes, indeed, DXwise it's a very Merry Christmas as Jeeves & Co. prepare for a whopping new DX year. QST

I.A.R.U. News

(Continued from page 97)

Peru: R.C.P., Box 538, Lima
Philippine Islands: P.A.R.A. QSL Bureau, 67 Espana Extension St., Quezon City
Poland: PZK QSL Bureau, P.O. Box 320, Warsaw 10
Portugal: Rua de D. Pedro V., 7-9, Lisbon
Rounmania: A.R.E.R., P.O. Box 95, Bucharest
Saar: via Germany — D.A.R.C.
Salvador: YS10, Apartado 329, San Salvador
Singapore: via Malaya
South Africa: S.A.R.L., P.O. Box 3037, Cape Town
Southern Rhodesia: R.S.S.R., Box 2377, Salisbury
Spain: U.R.E., P.O. Box 220, Madrid
St. Vincent: VP2SA, Kingstown
Sweden: S.S.A., Stockholm 4
Switzerland: U.S.K.A., Knutwil
Syria: P.O. Box 35, Damascus
Trinidad: John A. Hoford, VP4TT, Box 554, Port-of-Spain
Tunisia: Francois DeViechi, 5 Rue Can Robert, Tunis
Uganda: P.O. Box 1803, Kampala
Uruguay: R.C.U., P.O. Box 37, Montevideo
U.S.S.R.: Central Radio Club, Postbox N-88, Moscow
Venezuela: R.C.V., P.O. Box 2285, Caracas
Virgin Islands: Richard Spenceley, Box 403, St. Thomas
Wake Island: T. D. Musson, P.O. Box 127
Yugoslavia: S.R.J., P.O. Box 324, Belgrade



BASE STATION MONOPOLE GROUND PLANE UNITY-GAIN ANTENNA

Cat. No. 128-509 Antenna has a folded radiating element and is intended for service in installations requiring a ground plane configuration. All features are in conformity with CP Quality Line Standards.

SPECIFICATIONS

Cat. No.
128-509

- Input impedance 50 ohms
- Max. power input
 - 25-100 Mc 750 watts
 - 100-175 Mc 500 watts
- VSWR 1.3:1
- Bandwidth 4%
- Direct ground lightning protection
- Element material 6061-T6 aluminum
- Weight
 - 25-100 Mc 40 lbs.
 - 100-175 Mc 25 lbs.
- Rated wind load
 - 100 mph at 30 mc
 - 125 mph at 150 mc
- Type N male termination

25-175 MC
Frequency
Range

THE QUALITY LINE
BEST ENGINEERED BEST MANUFACTURED

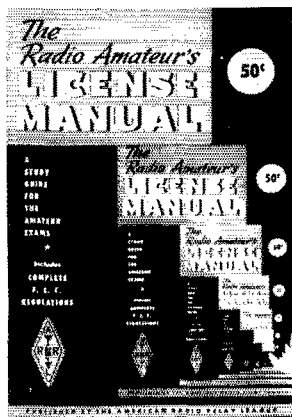
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Telephone Freehold 8-1880

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WEST HARTFORD 7, CONN.

YL News

(Continued from page 90)

Alamo YTs (Alamo Ladies Amateur Microphone Organization) — a new club of San Antonio YTs. Net conducted Friday at 0900 CST on 7235 kc. A two-meter net is planned for Novices and Technicians. Interested YTs please contact K5OPT.

Los Angeles YLRC — New custodian of the Lads 'N Lassies certificate is Irma Weber, K6KCI, 762 Juanita Ave., Santa Barbara. Club meetings are held monthly at 720 South Hill St., Los Angeles — new members welcome.

Washington Area YLRC — New officers are Pres, W4-TVY; V.P. W3CDQ; Treas. W3RXJ; Secy. W3UTR.

Young Ladies Radio League — K5YIB is the new W5 call on ex-K0LYV. Barbara Houston, custodian of the WAC-YL award. Applications for the award should be sent to K5YIB at Route 2, Box 178, Garland, Texas.

GAYLARK — K5PFY replaced W5EGD as President upon Lillian's move to Maryland. W5ERYH has been named v.p. and custodian for the GAYLARK certificate. Betty's new QTH is Box 45-588, Houston, Texas. A Red Cross course conducted by K5MIXO is open to all GAYLARKS, and plans are being made for an advanced instruction class to follow. QST



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**THE AMERICAN RADIO
RELAY LEAGUE, INC.**
West Hartford 7, Connecticut

World Above 50 Mc.

(Continued from page 86)

VK9XX, Port Moresby, Papua, found the band dead only on Sept. 1 and 4. JAs were in every day other than these, and KH6s 13 days. VK6BK, Perta, makes us drool with a report of working 9M2DQ, Malaya. The latter works VS6CJ, Hong Kong, about 3 nights weekly. All these fellows hear the propagation test station on Okinawa (49.68 Mc.) regularly and well, but there is no sign of KR6s on 50 Mc. K6HGP/KH6 logs VKs nightly, usually beginning around 2300 HST.

While most Ws were hearing nothing our friends in Latin America were busy. LU3EX, one of the busiest, worked PY ZP LU OA KP4 CX CO XE YV CE VP5FP VP6PV HR2DK TI2CV KH6 CT3AE and W6PUZ K5DCG K6SQH K6UMG K4JWC and K6SUS in September — a total of 17 countries. Incidentally, if you wonder whether there are South American 50-Mc. operators who can read code, LU3EX is one who can. Several of the above were on c.w.

220 Mc. and Up

Fellows working with parametric amplifiers may want to check on a tip from W6AJF, author of the article "Experimental Parametric Amplifiers" in *QST* for August. Frank got a pleasant surprise when he tried Clevite CTP-592 computer diodes (price \$1.50) in his amplifiers. He says that no fixed bias or "grid leak" is needed; just a good d.c. blocking capacitor in series with the diode. Their "zero bias" capacitance is about 1.6 $\mu\mu\text{f}$.

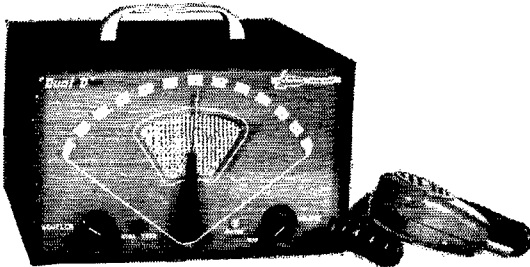
There has been a marked upsurge in 432-Mc. interest along the northeastern seaboard in recent weeks, and we've received more mail and comments about this band of late than in several years previously. W2OTA, Wantagh, N. Y., says he has worked 35 different stations, from Rhode Island to Maryland and Delaware. He is on 432.1 Mc. every Tuesday and Thursday at 2200, looking for business. K2UUR, Parlin, N. J. (near Raritan Bay) says that he has worked K3EH, Levittown, Pa., regularly, and W3GGR, Pleasant Hill, Md., occasionally. W3GGR and W3RQT have a detailed record of 432-Mc. stations in mimeographed form, giving the call, location, operating frequency, power, antenna type, receiver and other pertinent information on every known active station in the Northeast. This is available from W3RQT, 74 Amstel Ave., Newark, Del. Better send him a stamped self-addressed envelope if you're interested — and include the information on your setup. Data on more than 60 stations are included in the current list.

W9OJI, Wheaton, Ill., writes that he has been working W9GAB, Beloit, Wis., 80 miles to the northwest regularly. He would like week-end skeds for 432 during the winter months, using the maximum power and c.w. He has a 2C39 grounded-grid amplifier and a 416B converter.

(Continued on page 190)

The "DUAL D" by LAKESHORE

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- * Automatic noise Limiter
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- * May be used for Personal or Business purposes.

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GSB-100 SSB TRANSMITTER/EXCITER

SSB transmitter/exciter, band-switches 80-40-20-15-10 meters. Rated 100 watts P.E.P. Operates on SSB with selectable sidebands, also PM, AM and CW. Has pi network output. Uses quartz crystal notching filter to suppress carrier. Has stable VFO, excellent VOX, heavy-duty AC supply.

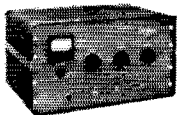
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1000 watts P.E.P., input linear uses stable, efficient grounded-grid circuitry. Has pi network output, switches 80-40-20-15-10 meter bands. Supplies for power and bias and antenna relay are built in. Linear drives by GSB-100 or other equipment that supplies 60-70 watts drive power.

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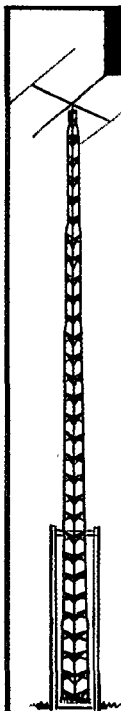
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Amateur net . . . \$176.21 includes prepaid shipping anywhere in the USA! Howcome? Well they are made right here in Frankfort—which saves transshipping costs—and you always get a better deal from "Doc" Dossett, W9BHV.

Write, wire or call "Doc."

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Memo . . .

To: XYLS and YLS
Subject: Xmas Suggestion

ARE his 1959 QSTs scattered around the shack and other areas of an otherwise orderly home? Why not have a shiny, new new QST Binder under the tree for him Christmas morning? He can file those valuable copies neatly for future reference. While you're at it, better get him two Binders so that he can start off the New Year right with a file for those interesting 1960 issues to come.

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With the Clubs and Nets

The 51.30 Club of Framingham, Mass., has a well-equipped mobile unit available for emergency and contest work. Largely as the result of intensive effort by W1LHF and K1CNU the truck now has built-in operating facilities and all the comforts of home, including a space heater. Gear and lights can be operated either from the truck's 6-volt system, or from an emergency generator. A 40-foot push-up mast is welded to the side. A 2-meter groundplane is permanently mounted on the roof, and there are lead-ins for all three antennas and rotator cables.

In this month's mail we have the first edition of *Static*, the publication of the Northeastern Ohio V.H.F. Group. Devoted entirely to the welfare of v.h.f. men of the area, it is available from K8CHE, 242 East Park Blvd., Akron 5, Ohio. Price is \$1.00 for 12 issues.

A certificate is being offered to anyone working 5 or more members of the Kansas City V.H.F. Club according to K8ITF. George says that over half of the v.h.f. enthusiasts in the Kansas City area are members, so there is a good chance that you are well on your way toward qualifying already. Contacts must have been made since July 1, 1959. Send confirmations to P.O. Box 973, Kansas City 41, Mo.

The Mt. Airy V.H.F. Club of Philadelphia is proud to announce the obtaining of the call W3CCX, to be used in club operations as a memorial to a deceased member, Matthew A. Gelardi.

K4PKK announces the formation of the Greater Atlanta V.H.F. Society. Purpose of the organization is the study and advancement of the v.h.f. art in the Atlanta area. More information from K4PKK, 3607 Orchard Circle, Decatur, Ga.

OES Notes

W1HDQ, Canton, Conn. — Following arrangements made at the Syracuse V.H.F. Roundup, 220-Mc. stations in W1 aim toward Syracuse area at 2200 nightly, transmitting for 5 minutes and listening for 5. This station will keep the sked Tuesdays and Sundays, using c.w. on 220.03 Mc.

W3FEY, Lancaster, Pa. — Keeping nightly skeds with K2CBA on 220 Mc. at 2130. Signals are usually weak, but consistent work has been possible over the 225-mile rough path. Also keeping skeds with W3ARW on 220 and 1296 Mc. Contact is made on 220, followed by shift to 1296. First QSO on 1296 was made during September V.H.F. Party. Distance is 100 miles. W3ARW has exceptional location, but path is far below line-of-sight. Activity on 220 and 432 Mc. increasing locally.

W4FNR, Ft. Lauderdale, Fla. — Worked LU1DCK Sept. 24 for first South American on 50 Mc. this fall. LU4DEN and CX9AJ worked Sept. 26, and XE1GE heard via backscatter. Worked 23rd KP4 this month.

W4LTU, Springfield, Va. — Measured loss in length of surplus RG-10/U coaxial cable that had 4 years of use outdoors. Found loss had increased from 3 db. to 5.5 db. per 100 feet in this time.

K6HCY, San Jose, Cal. — 50-Mc. CD net now operating on 50.5 Mc. at 1900 Mondays. Anyone interested see WA6EIC.

W7MAH, Reno, Nev. — Replacing 15-element long Yagi with 20-element spiral array brought up 144-Mc. signals from Sacramento Valley 2 to 3 S units. Have copied K6TYW, San Mateo, 200 miles over very mountainous path. Now using FSK to work W6GDO; much better than AFSK, which was tried first.

K9PGK, Indianapolis, Ind. — Many locals seem surprised at what can be done with moderate power and medium-sized antennas on 144 Mc. Reliable range of 175 miles is not uncommon.

KP4ABN, Bayamon, Puerto Rico — LU3EX CX7CO and PY3ADT worked Sept. 11, beginning at 2012. Other South American openings Sept. 18, 20 and 25. Only U. S. signal heard was W4HAE, Sept. 4. QST

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For Hams who TRAVEL . . . live in APARTMENTS
the Mosley TOTE-TENNA
THREE BAND OPERATION 10-15-20

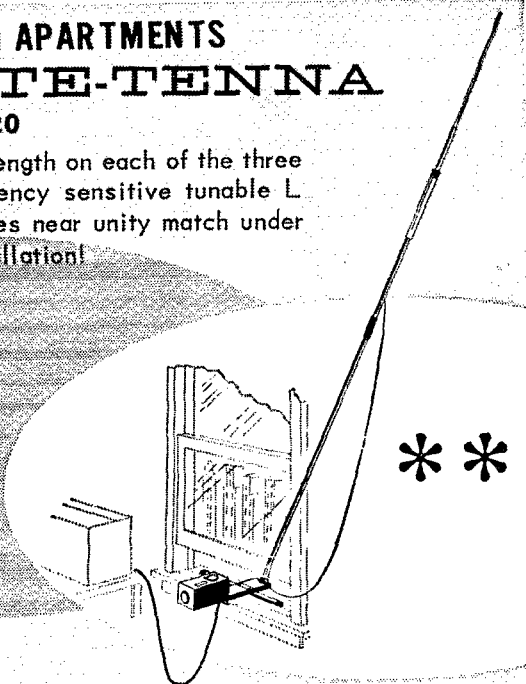
TOTE TENNA is a full electrical 1/2 wavelength on each of the three bands and is voltage fed through a frequency sensitive tunable L network. Tunes out reactance and achieves near unity match under almost every conceivable condition of installation!

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MODEL TT-31, with Tuning Unit, coax line and window mount.

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* SWR Indicator and Deluxe Carrying Case available at extra cost.



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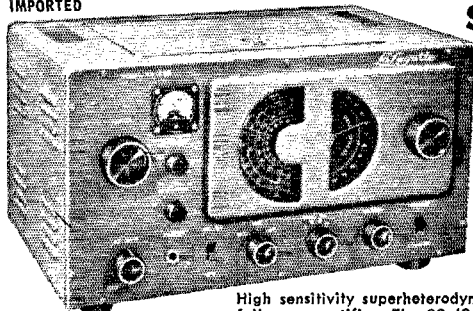
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-ENGINEERED FOR THE AMATEUR
Superheterodyne Circuit Utilizing 8 Tubes & Rectifier Tube

IMPORTED



- BAND SPREAD FOR EASY TUNING
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- ACCESSORY POWER SOCKET PROVIDED
- EXCELLENT SELECTIVITY • ALL TRIMMERS PRE-ALIGNED
- COVERS 455KC. to 31MC. IN FOUR BANDS
- VARIABLE BFO AND RF GAIN CONTROLS
- BUILT IN PRE-CALIBRATED "S" METER
- SWITCHABLE AVC AND AUTOMATIC NOISE LIMITER

High sensitivity superheterodyne circuit utilizes 8 miniature tubes plus rectifier tube and transformer input, full wave rectifier. The 80-40-20-15 and 10 meter amateur bands are clearly indicated on the illuminated dial face, and can be easily tuned with the pre-calibrated band spread. The receiver has complete band switching, thus eliminating the need for bothersome plug-in coils. Band spread is laid out on easy-to-read 0-100 scale, and features a weighted control knob which offers smooth, precise tuning. Coverage of from 455 KC to 31 MC is obtained through the use of four switchable ranges (455-1600 KC/1.6-4.8 MC/4.8-14.5 MC/10.5-31 MC). All controls, switches and phone jack are located on the front panel, while an optional accessory socket delivering 360 volts DC and 6.3 volts AC is located in the rear of the receiver. Signal to noise ratio is 10 DB at 3.5 MC with 1.25 microvolt signal. Selectivity is - 60 DB at 10 KC, image rejection is - 40 DB at 3 MC. Panel is grey metal with white lettering, and controls are black bakelite with aluminum trim. Hinged top makes inside of receiver readily accessible to operation. 7 7/8" H x 15" W x 9" D. Shpg. wt., 22 lbs.

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64.50 6.45
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St. Louis 1, Missouri

V.H.F. Party Results

(Continued from page 51)

PACIFIC DIVISION

Santa Clara Valley
K6TJL/6 (multiple-operator)
6304-274-21-ABC/D
W7LHL/6 (W7s LEE VMP)
738-82-9-AB

East Bay
W6ASH. 2613-193-13-ABC
K6TPO...477-53-9-AB
WA6AGA/6 (4 oprs.)
3210-321-10-AB

Sacramento Valley
K6YII...231-33-7-AB
K6KDU...220-44-5-B
K6LEK...155-31-5-A
WY6GNB.100-...-1-B

San Joaquin Valley
W6PZA/6.705-42-15-ABCD
K6QEZ/6 (6 oprs.)
760-76-10-AB

ROANOKE DIVISION

North Carolina
W4ZXL...1140-56-20-ABC
W4CAF...85-17-5-AB
W4VHH...85-17-5-B
K4KSM...24-8-3-A
W4BUU...5-1-1-B
W4NC/4 (8 oprs.)
729-81-9-AB
W4GNF/4 (W4s ACY ULX,
K4HQAD)
503-57-9-A

South Carolina
W4TLC...340-32-10-ABC
W4VW...256-32-4-AB
W4FAN...12-6-2-A

Virginia
W4LTU.3807-141-27-AB
W4AOS.2900-125-3-B
K4RAY1 2322-118-18-ABC
W4WUX/4
1224-101-12-AC

W4AUR...132-33-4-B
K4VWH...108-27-4-A
K4EUS...100-20-5-B
K4RTG...75-25-3-A
K4PUD...12-6-2-A
K4SRA/4 (K4s IEY SSA, W3-
WVA)...608-76-8-A
W3ML/4 (W3ML, W3QIQ)
72-18-4-B

West Virginia
K8AXU/8.279-28-9-BC
K3EJL...1-1-1-A
W3PGA/8 (7 oprs.)
3743-197-19-AB
W3QLP/8 (W3DHO, W3-
QIP)...340-34-10-AB
K3ELZ/8 (2 oprs.)
2-2-1-A

ROCKY MOUNTAIN DIVISION

Colorado
K0LSL...32-32-1-A
K0LSL...32-32-1-A
W0VYX...32-32-1-A
K0BTO...30-30-1-A
W0LVL...7-7-1-A
K0KKW...5-5-1-A

New Mexico
W5VJO.140-35-4-AB
W5RKE/5.86-22-3-AB
W5MVL/5.64-16-4-AB
K5UYF/5.24-8-3-AB
K5IQL...16-8-2-AB
W5FAG/5.14-7-2-AB
K5TQP...7-7-1-B

Wyoming

W7UFB...1-1-1-A
W7VTB...1-1-1-A

SOUTHEASTERN DIVISION

Alabama
K4GQK...80-16-5-AB

Eastern Florida
W4RMY.65-13-5-AB
K4PPX...60-60-1-A
K4IQ8...53-53-1-A
K481J...52-52-1-A
W4HGT...37-37-1-A

Georgia
W4FWH...260-26-10-ABC
K4MDF...85-17-5-B
K48JF...36-12-3-B
K4YMC...23-23-1-A

SOUTHWESTERN DIVISION

Los Angeles
W7TNJ...845-169-5-AB
W8NLZ.144-13-9-ABCD
WA6DHH.42-21-2-B
K61EA (7 oprs.)
1265-263-5-AB
K6KDE/6 (4 oprs.)
584-69-8-ABCE

Arizona
W7QLZ/7.6-6-1-A
K7JTG/7 (K7JTG, W78 VLN
VMQ)...94-47-2-AB

San Diego
K6COF...141-36-4-AB

WEST GULF DIVISION

Northern Texas
W5FEG...370-74-5-AB
K5WFD/4.184-92-3-
K5PDD...64-32-2-A
K5KWB...25-14-2-A
K58XU...27-27-1-A
K5KVP...26-26-1-A
K5KVE...23-23-1-A
K5BAK...22-1-1-A
K5TX...12-6-2-AB
W5GMA...10-10-1-A
K5PCN...10-10-1-A
K5VQC (K58 BKC VQK)
45-45-1-A

Southern Texas
W5JLY...111-37-3-A
W5MVL/5.64-16-4-AB

CANADIAN DIVISION

Ontario
VEEDIR.2784-110-21-ABC
VE3AIB.1547-116-12-ABC
VE3AQG.1104-92-12-B
VE3ELA/3

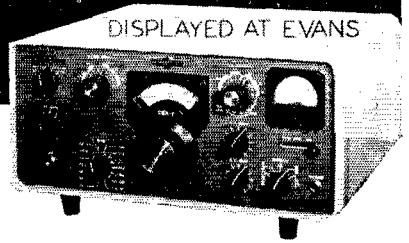
568-71-8-B
VE3HW...462-66-7-B
VE3CIT...450-90-5-B
VE3NW...392-49-8-AB
VE3DUU.262-63-4-B
VE3BQP...162-54-3-B
VE3CJL...120-40-3-B
VOIDS/VE3.2-1-B
VE3ONA.3 (multiple-opera-
tor)...244-81-4-B
VE3BAF/3 (VE3s BAF BNZ)
78-26-3-A

Quebec
VE2TT...548-53-16-B

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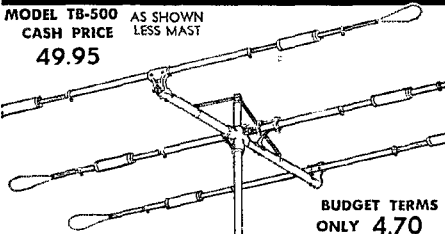
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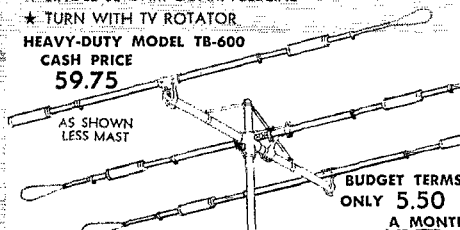
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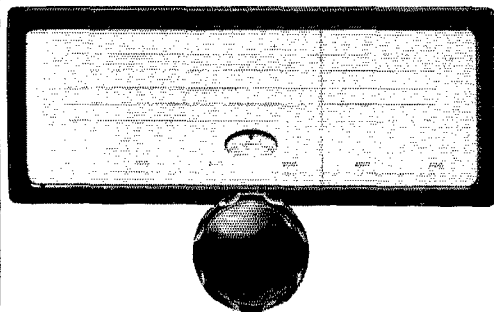
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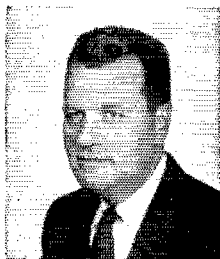
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"Medium-Power" Kilowatt

(Continued from page 41)

out some sort of plate suppressors. A bit of juggling may be required to find the right combination of suppressor choke and resistor which will kill the parasitic without overheating the suppressor resistor. Various combinations of resistors can be tried if heating is excessive; the ARRL *Handbook* contains helpful suggestions on this point.

Sum-Up

Well, there is the case of "medium-high" power. Aside from listing specific power output figures for each band, no performance claims are considered necessary. Everyone knows that with 600 or 700 juicy watts of r.f. output tied to a really good antenna, the determining factor is the operator hooked into the circuit—the sky's the limit!

QST-

Choosing Transmission Line

(Continued from page 45)

handle any amateur transmitter.

Summing up, the important points to remember are that open-wire line can be operated at a high standing-wave ratio but coax should be kept reasonably "flat" (a line is said to be "flat" if the s.w.r. is 1 to 1 or close to it) if good efficiency is desired. Because the antenna impedance is a fixed quantity which depends on the antenna type and can't be altered to any great extent, while the characteristic impedance of the feed line is also a fixed quantity, it is sometimes necessary to install a matching device between the antenna and line in order to bring about a match between the two. This brings up the subject of matching, which will be taken up in the second part of this article.

Part II of this article will appear in an early issue.

QST-

Strays

VE3CMK would like to hear from other amateurs who are using family crests on their QSL cards.

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... the most exhilarating project in ham radio by subscribing to the YASME NEWS, journal of the Yasme Foundation, and follow the famous forthcoming DXpedition into the rare and exotic DX spots on the itinerary of the YASME III.

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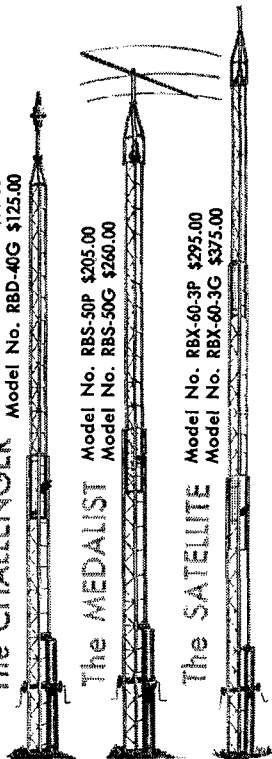
E-Z Way Towers are the most talked about towers on the air — for these reasons . . . Sturdy Steel Construction, Requires No Guys, Wonder Ground Post (no concrete needed), tilts over, cranks up and down. See your nearest ham distributor or write for free literature.

that are designed for ease of operation! Featuring Tilt Over Action with "WONDER GROUND POST" The original tilt-over tower

The CHALLENGER Model No. RBD-40P \$90.00
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The MEDALIST Model No. RBS-50P \$205.00
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The SATELLITE Model No. RBX-60-3P \$295.00
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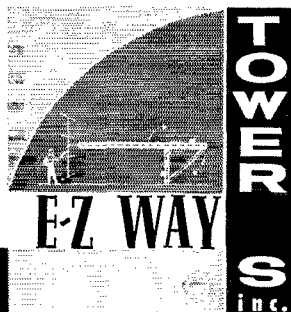


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*PAT. PENDING

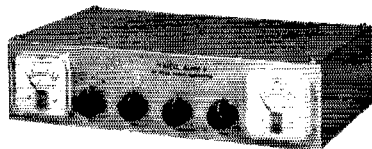
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MICHIGAN CITY, INDIANA

Correspondence

(Continued from page 98)

to send more than about 45 w.p.m. in Continental. More in Morse, of course, with reduction in dashes.

Maybe Nose intended it to be 30 and it came out 60.

How 99 44/100% of amateurs would copy 60 w.p.m. I don't know. I know it would be so far beyond me that I'd fold.

— W. Ross Carruthers, VE3CEA

BOSCH HORN PORTABLE?

941 Caledonia Avenue
Cleveland Heights 12, Ohio

Editor, *QST*:

In answer to W6BUK's letter on page 192 of the Sept. issue, regarding the "Bosch Horn." I yield to him by date, but maintain he was operating fixed-portable at the Convention.

When SADA and myself took that trip in the Ford, we were truly mobile, with the key on the seat in between us. Hi.

— J. Clifford Erickson, W8DAE

OUTBOARD IGNITION

1140 Donaghey Building
Little Rock, Arkansas

Editor, *QST*:

I read your article October 1959, entitled "Vehicular Interference Conference." Another source of interference pertaining to vehicular interference, and not mentioned, is that of outboard motors.

I operate 35 Mc. maritime mobile from a 14-foot aluminum boat powered by a 35 h.p., 59 model Johnson. Passing boats several hundred feet away have given me all kinds of grief, besides that of my own motor.

With the event of direction finders, depth finders, broadcast, and two-way ship to shore, amateur and citizens bands, the manufacturers of these motors are turning to fiberglass covers for audible quietness, thus giving less ignition radiation protection. They use no bypasses of any type, nor shielding of the ten- or twelve-foot ammeter and ignition leads to the front of these boats. Addition of generators to the newer models creates more trouble from generator whir.

... on a small lake, a craft with interference doesn't pass you once, he is a continual source of interference.

— Dr. George B. Bean, W5DV1/K5KUR

BREAK . . . BREAK

1527 Almo Avenue
Burley, Idaho

Editor, *QST*:

Would someone explain this to me? It seems that no one on 75 or 40 s.s.b. fone will answer a CQ, (well, hardly any one).

You find as many as 50 in a QSO with half of them unable to copy the others, still the "break-break" goes on. The log becomes a mess, not to mention the conversation. No one knows who is talking to whom, let alone what they are trying to say.

Unable to raise anyone on a CQ, I decided to experiment. Instead of calling CQ, I carried on an imaginary conversation with myself, and sure enough within a minute came the expected "break-break." I dunno, it seems that hams are nutty enough without compounding the situation.

— Harry Zadorozny, W7TCL

LICENSE FEES

1041 Meadowbrook SE
Warren, Ohio

Editor, *QST*:

The October *QST* issue brought some interesting comments on the FCC Notice of Inquiry in regard to Extra Class Status.

However, I must take exception to the complaint of W3VNE, who complains about the requirement to send ". . . an original and 14 copies."

Well, I don't see that that is much of a hardship for anyone interested in the matter.

As I see it, our hobby is not only legally non-profit, it is also non-sustaining as far as government finances are concerned.

(Continued on page 198)



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Terry W9DIA

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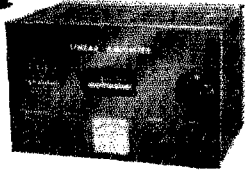


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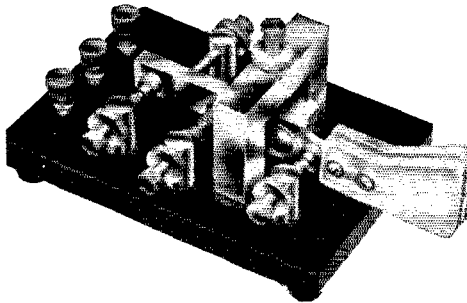
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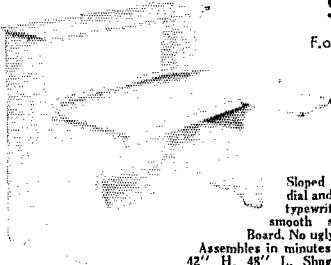


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Then along comes a guy who complains when FCC asks us to share the clerical load.

I won't argue the fact that red tape being what it is, 14 copies, plus original, is probably more than really needed.

But if that is what they want, what can you do?

In fact, in the interest of better service I would suggest that FCC set up nominal fees for original and renewal license service. This would provide them with more clerks and cut down on the time (I waited many weeks last spring) to process applications.

I know that by proposing license fees, I am inviting the wrath of 90 per cent of the letter-writing hams, but who cares.

A 50-cent fee everytime I renew would be much less than watts I burn in the same period with my rig.

(I also hope the guy next door never learns that part of his tax payments have helped to provide me with my General ticket.)

Incidentally, I did make comments to that Notice of Inquiry and I duly sent along the original and 14 copies. I have to admit however that the XYL did all the typing.

— Dick Ellers, K8JLK

NOVICE BAND FOR NOVICES?

Eagar, Arizona

Editor, QST:

We realize that your mail-bag is full of complaints from the "youngsters" who are trying to get started in ham radio, but we think we should have an even break. We who are limited to 75 watts and crystal control are having to contend with those Novices who get their General and then "swish" around with 500 watts or so across the Novice bands when we are trying our best to get some "DX" for our "WAS." We hear a luscious CQ from some far corner of the earth and think this is our chance to make that addition to WAS. But what happens? Some high-powered General comes in and nabs him. We don't have a chance. Isn't there a way that the Novice bands could be for Novices? After all, the Generals may have friends on these frequencies, but they can move around now. At least there should be some respect for us on their part and keep their power down to Novice limitations and use crystal just like we have to. We feel that this kind of practice is unfair to the great fraternity of the "rock-hound" low-power Novice.

Speaking of courtesy, it should be one of the first considerations for both Novice and General. When one is trying his best to get his WAS by the directional CQ method, trying to contact a certain call area or a certain state, it should be a matter of mere decency for all other call areas and all other states to refrain from answering. If you are calling "CQ New Jersey" and Oregon answers you have lost any answers you might have from New Jersey. How about adopting one of the popular highway slogans for amateur operation — "COURTESY PAYS"?

— Harold Richard, KN7HOF

KIDS BACK HOME

612th AC&W Sqdn
Box 274
Ajo, Arizona

Editor, QST:

I would like to quote part of a letter that I received some time ago from my uncle stationed with the U. S. Marines in Okinawa.

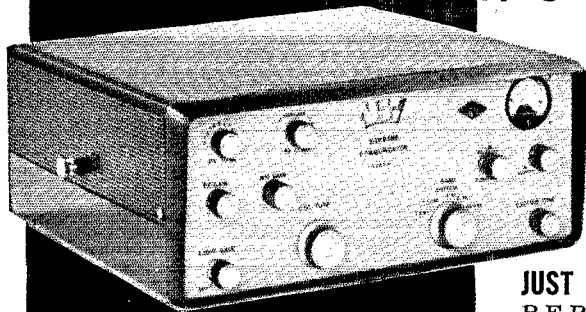
"... About three weeks ago I called Freda and the kids by ham radio and had a most wonderful five-minute conversation with them. Their voices were a little distorted, but it was fabulous to hear them. It sure was a thrill. I have another call scheduled . . . depending on Christmas traffic. I'm almost afraid to go on the air. My first call was a tremendous boost to my morale and if all goes well with my second call I will be making a call home every three or four weeks. All I can say is: "God bless the ham operators!"

I hope this will make a few more of us realize the importance of putting our hobby to use in constructive public service. Keep up the good work.

— A2C Gary Vogel, W8FMX/7

(Continued on page 266)

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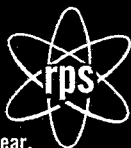
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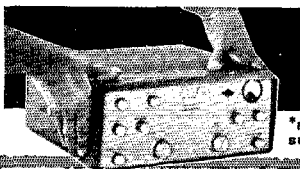


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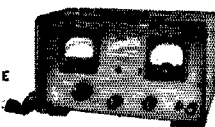
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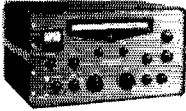
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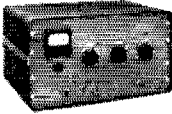
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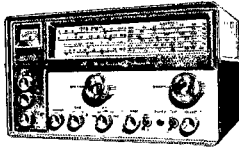
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... AW, GEE WHIZ

3475 North 58th Street
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Editor, QST:

... I really think that W3SUR was kidding about the 10 kw. I think he was pulling our legs to get us to thinking. His article sure started the cobweb cleaning in my gray matter.

— W. H. Wing, W9EPO

CALL BOOKS FOR DX

1001 N. El Pase
Russellville, Arkansas

Editor, QST:

For the past 18 months, I have undertaken a personal project that pays off in some very nice letters, pictures etc. from DX contacts. I pass this along to other fellows I work, and I think all of us could do the same thing.

When I buy a new *Call Book* each time they come out, my dealer gives me one that just passed out of date. That one, with my old one, makes two that I wrap up, along with a USA map, also a map of the W5 area. When I've made a good DX contact with an operator that likes to visit, I wind up the QSO telling him I will mail him a *Call Book*. The day I mail it, I also send him an air mail letter so he knows it's on the way.

Believe me, the fellows across the waters really can use them. They cost so much when they convert their money to ours, that they just don't have access to *Call Books* as we do. I get some wonderful letters in return, and for the last 18 months I have been able to mail out 12 books. Some of the fellows can't write English, and they take the time and trouble to look up some one that will, and you get a very interesting letter and pictures in return.

There is a special parcel post rate for printed matter, books etc., that isn't very expensive. The most it has cost me to mail a *Call Book* was 52¢, to Australia — and it was worth it to read the letter I got in return.

Early this year I had a very good QSO with DL6EQ. I mailed him a *Call Book*. This operator and his brother have a printer's plant, and in return he sent me 500 QSL cards!!

Why let those books rot away? This would be a good project for all the clubs to engage in.

— Jack Minor, W5WFSM

P.S. I have also turned in several of the fellows for membership in RCC, and do they get a kick out of that!!

CIRCLE REALLY COMPLETED

Geneva
Switzerland

Editor, QST:

I've just finished reading "Circle Completed" in QST for November; I had to leave for the conference before the copy came in. It's correct so far as it goes but it doesn't go far enough. Ray says Paul, K6AK (whom I have known for nearly 40 years) and I were excited enough to call him at 1:30 A.M. He doesn't give his end, which went substantially like this:

(Bud) Ray, sorry to wake you at this hour but do you remember the *Nautilus* transmitter-

(Ray, still not fully awake): Oh . . . huh? . . . (loud yawn) . . . oh yeah . . . (mumble, mumble).

(Bud) Well, do you remember a note you put in it? (Ray, suddenly coming alive) Say! Sure I remember it but what do you know about it?

(Bud) Well, I have the guy who bought the rig on the extension 'phone and he still has the note and would like to meet you and give it to you; take it away, Paul.

(Continued on page 207)

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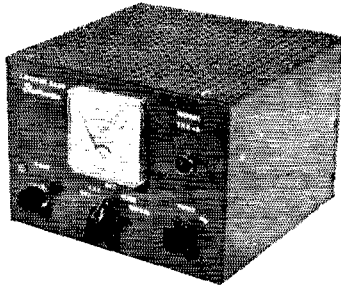
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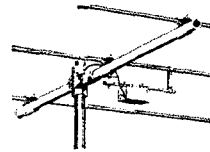
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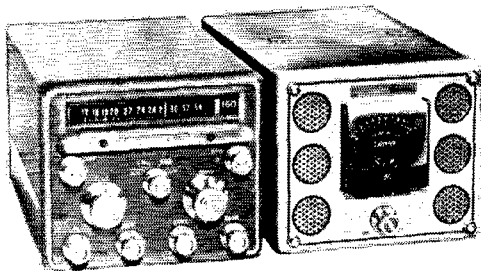


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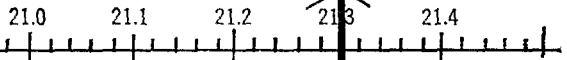
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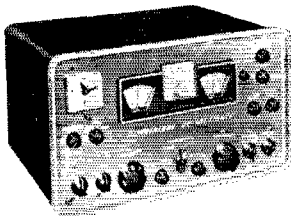


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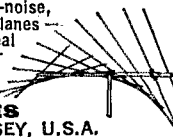
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ON LETTERS AND PACKAGES

So Paul took it away but for the next five minutes all that came out of Ray was a bewildered series of comment:

(Ray, muttering) Unbelievable . . . this is unbelievable . . . it's unbelievable . . . I can't realize it . . . this is unbelievable."

But he eventually did, and he and Paul set up the lunch. I wish I could have been there!

— A. L. Budlong, W1BUD

ROTTEN QRM

3009 Clinton St., N.E.
Washington, D. C.

Editor, QST:

How poignant are my memories of the "good old" under-200-meter days — from Ford coil, straight spark gap, home-brewed condenser (capacitor to the young squirts), etc., to the sweet little tweet emanating from my first 5-watt bottle purchased with lettuce earned the hard way after school hours!

My inner self shudders when I recollect the many miles traveled between hardware stores negotiating bargains on shelf-aged Columbia Hot-Shots for that 200-volt B supply and the many visits to good old friendly Jake, the auto repair wizard three blocks down the alley, to barter hours of hard, dirty work for a recharge of a well-sulphated battery! All for a Saturday night on the air, static crashes permitting. But with fellow hams ten dial divisions apart, who cared about this new talk of QRM!

Need I tell you the story of this rotten QRM? Nope — the store-bought receiver is prime evidence of our bitter struggle against that dirty demon. What with Q multipliers, notch filters and all the other necessary expensive accessories we have hanging on our Armstrong circuits these days even the Old Man (love his memory) would, or should, have a dry feline. Now we can almost, or should I say must, spread ten fellow hams over one dial division.

What really gives our most sacred Wouff-Hong the jitters these days are the bug-key squirts and the CQ DX exponents. Why do our 15 w. p.m. friends insist on using bugs adjusted to do 45? And why do some of the high-powered DX hounds bang out "CQ DX" for five minutes, occupying the middle of a choice DX channel, only to end up QSOing a guy in an adjacent state?

Tell me, OT, before I am tempted to bite the business end of my fired-up final!

— Harry R. Schulte, sr., W3LQ

P.S. This is just to let off steam, OB. A CQ DXer just caused me to lose a beautiful contact with a CR7 and my cat does not trust me any longer.

HAVE YOU TRIED A.M.?

2910 Eastern Pkwy
Owensboro, Kentucky

Editor, QST:

For years I've had the feeling there is something wrong with s.s.b. Now I know what it is. And believe me, it's serious.

First I ought to mention that I started in s.s.b. after numerous hectic rounds with 75-meter tone in the hey-day of CD organizational work in 1950 and 1951. For a year I worked 75 s.s.b. around the nation and a little DX, from Schenectady, with only a piddling little 6AG7 final ("a barefoot 10-A," is the term, I believe.) In 1955 I added a single 811A and by 1957 was leisurely trailing George Bailey's record-making WAS on 75 s.s.b. (In fact, he gave me some leads on who to look for in the tough states — after he'd made it, of course!) I moved here to 4-land before making the WAS, and in sporadic s.s.b. work here in the past year reports on my linear like "Sounds like a gallon, OM" have not been uncommon.

(Continued on page 204)

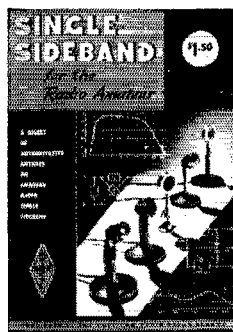
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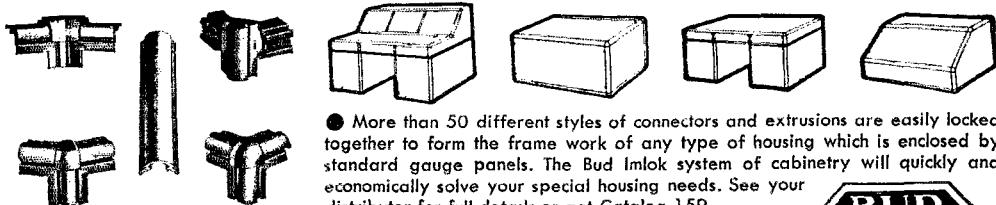
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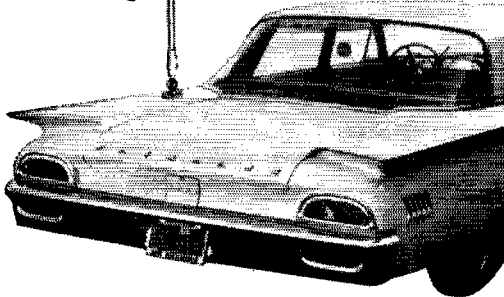
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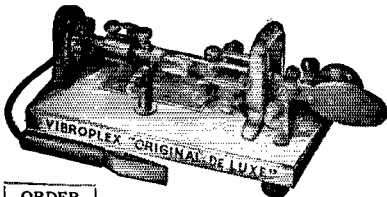
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FREE
Folder

Now to the point at hand: Slightly bored and wearying of the big, big sideband round-tables et al, I began to work over a piece of surplus a.m. gear — a Bendix TA-12C — that I'd won as a door prize a couple of years ago. After the usual hassling involved in converting surplus, I got on 75 a.m. after lo these many years — with about 100 spanking watts input to the parallel 807's in the TA-12C.

Well, sir, I'd forgotten the sound of the angry snarls of roving heterodyne packs. I'd forgotten how to tune and re-tune continually to avoid the enemy by carefully picking your way through blurps, squeals, chatter and transformer smoke.

The garbled words, the half-sentences, the fills ("sorry, OM, you are 35 over 9, but please say again") the memory of these flooded back as I dove again in the seething, churning mass of signals.

Too, I'd forgotten the helpless agony of impatience in waiting out the windy ones — like: "Well, let's-see-now-I-must-have-a-pencil-around-here-somewhere-I-want-to-get-this-in-the-log-I-guess-the-junior-op-took-the-pencil-oh-here's-one-stand-by-a-minute-till-I-sharpen-it-a-bit-now-we're-ready-to-get-this-in-the-log-book-now-what-was-it-you-said-about-wanting-a-signal-report-I-remember-talking-with-someone-with-call-like-yours-about-8-months-ago-but-I-guess-it-was-another-call-area-because-I-used-to-be-in-w-8-land-and-moved-here-about-six-years-ago-and-have-been-on-the-air-continuously-ever-since" — and apparently all six years making one transmission!

And again I fumed with frustration trying to check into some a.m. round-tables and nets that went merrily on their way with hair-trigger switching of steam-roller carriers — in a manner which effectively prevented any break-in.

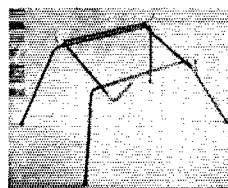
Two evenings of wondering whether the station came back to me, of frantically searching for the lad whose carrier shifted when he turned on the power — two nights of just plain tough "hand-on-the-dial" operating. And Sunday night as I wearily crept into the sack it came to me in a flood of realization that for years s.s.t. had robbed me of the soul-satisfying catharsis of complete exhaustion without which no hobby is or sport is worthwhile. Down with s.s.b. — unless, of course, you want to communicate.

— S.W. McCallum, K4URX (ex-W2ZBY)

Strays

Elmer E. Tafinger, W9GRN, Indianapolis artist, plans a unique fountain as a setting for his city's statue of white, Negro and Oriental figures working together. Tafinger's fountain would send a 40-minute Morse code message — an American prayer of hope for the preservation of freedom — in two 100-foot sprays.

W4AWY is somewhat amazed at the response to the Stray carried on page 10 of the November issue. Within three days he had over 100 letters, and these were all from people in the eastern part of the country — the western mail hadn't arrived yet. The moral of this story is, be sure that you always include a stamped, self-addressed envelope when you write to a QST author or when you write concerning a Stray, because a good many other people will be doing likewise, and we want our authors to get an even break.

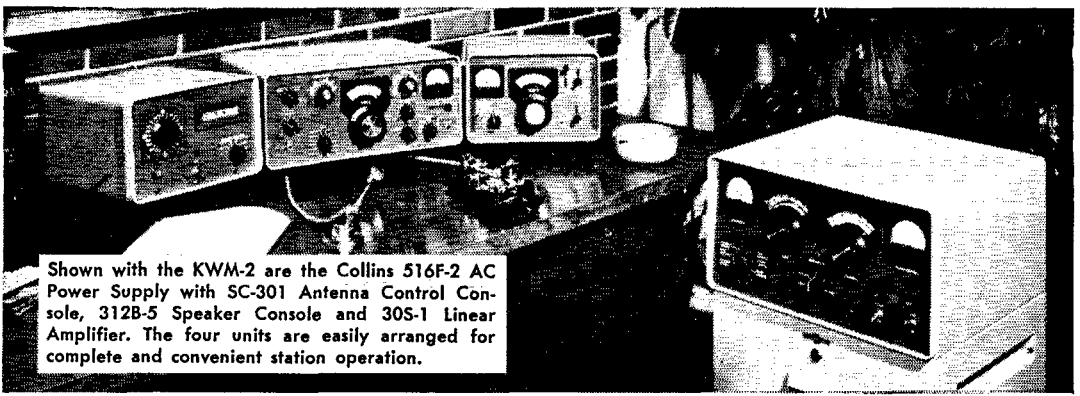


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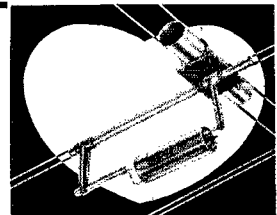
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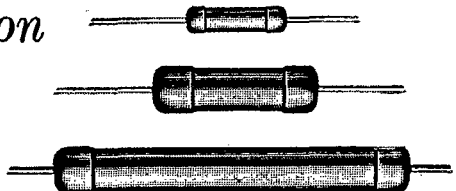
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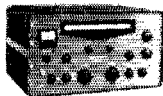
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Technical Correspondence

(Continued from page 81)

adjusted for maximum output. With these changes the filter operation is greatly improved and the gain is increased approximately 12 db. A 24,000-ohm resistor should be added between the +12-volt line and the emitter of Q_8 to increase the a.g.c. range.

Mr. Zilm has informed me that amateurs may buy direct from Collins Radio Company in Burbank any filter type which is offered for sale. The F455Y-31 is available at a unit price of \$38.00, in quantities of 1 to 4. The only difference between the F455Y-31 and the F455F-31 is the case; either type will fit easily in the space allotted.

— H. F. Priebe, jr., W2TGP

THE 715 TETRODE

Box 291, R. D. 1
Greenfield Center, N. Y.

Technical Editor, QST:

For the better part of a year I have been using a 715-B on 50 Mc. in a single-tube amplifier running up to five hundred watts input. The 715-A, -B, and -C appear quite similar, with the A showing slightly more grid-to-plate capacitance. Here are the parameters which have been used:

E_f — 26 v. ± 2.5 v. at 2.1 amp. (3 minutes heating time)

C_{gp} — 2 μ f.

C_{in} — 37.5 μ f.

C_{out} — 7.5 μ f.

E_p — 1500 v. (at 300 ma.) or 2000 v. (at 250 ma.).

R_g — 10,000 ohms.

I_g — 10 ma.

E_g — -100 v.

Grid dissipation — 1 watt

E_{sc} — 150 v.

I_{sc} — 15 ma., approx.

R_{sc} — 75,000 ohms approx., at $E_p = 1500$ v.

Screen dissipation — 8 watts

It usually is a good idea to include a base shield to prevent the input pin from "looking at" the plate circuit.

The high input capacitance which has foiled earlier experimenters can be overcome by using series tuning in the grid circuit. It is then only necessary to tap the bias resistor at the zero-r.f. point. One constructor, W2OKF, used the interesting twist of a push-pull series-tuned grid tank to apply drive to his pair of 715s.

The tubes in stock form have a ceramic wafer at the base in which pins are set. When inserted in its socket, this wafer just fits. To allow cooling the tubes, I have removed this ring with a torch, broken the pins free from the ceramic, and replaced them on the tube. Care must be used in plugging the tube in, but it is well worth it, considering the volume of air which can now pass the tube.

Clamping the screen for protection during c.w. is not sufficient, as the 715 will draw several hundred ma. with the screen grounded. Clamping combined with fixed bias appears to be the answer.

The socket for the 715 is termed "Jumboid four pin," and is the same as that used with the 705A rectifier (Johnson 122-234 and Western Electric D-4A-10).

All bypassing and grounding should, of course, be made with short, heavy connections. Higher values of screen voltage than indicated above do not appear to improve performance, but off-resonant plate current will soar to several amperes.

The main consideration in setting up the 715 is to avoid anode color. These tubes will slowly deteriorate if run far into the red region. Proper adjustment of your favorite tank circuit, be it pi-net or parallel tuned, should allow inputs to 500 watts per tube.

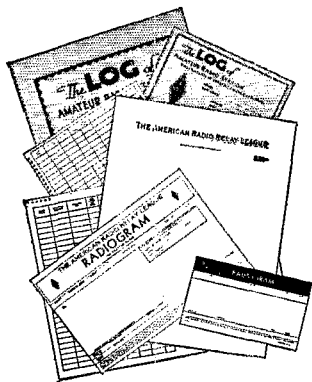
— W. S. Baker, K2LZF

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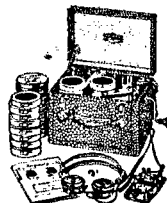
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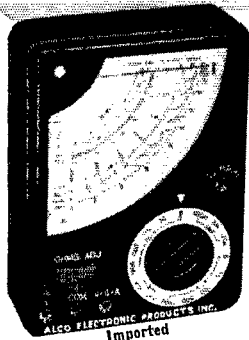
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W1, K1 — G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.

W2, K2 — North Jersey DX Ass'n, Box 55, Arlington, N. J.
W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.

W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.

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W6, K6 — San Diego DX Club, Box 16006, San Diego 16, Calif.

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W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.

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VE6 — W. R. Savage, VE6EO, 833 10th St., North Lethbridge, Alta.

VE7 — H. R. Hough, VE7HR, 1684 Freeman Rd., Victoria, B. C.

VE8 — J. A. E. Williams, VE8JW, P.O. Box 534, Whitehorse, Y. T.

VO1 — Ernest Ash, VO1AA, P.O. Box 8, St. John's, Newfoundland.

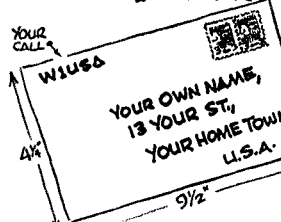
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(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham Ads is the 20th of the second month preceding publication date.

(6) A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GJH, 1010 Monte Dr., Santa Barbara, Calif.

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ANTENNA 80-40-20-15-10, \$21.95. Patented. Lattin. W4JRW, Box 44, Owensboro, Ky.

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DELUXE Call letters: engraved polished black phenolic laminated 2 1/8 inch white letters on 3 1/2 x 14 x 1/8 in. beveled blank, \$1.95 P. J. Mudie, W8LWW, 3701 Germaine Ave., Cleveland 9, Ohio.

MOBILE Hams! Stop generator whine ignition noise regulator clicks, \$5.25 postpaid. Specify frequency. Gerald Electronics, 19 Salem St., Cos Cob, Conn.

CITIZENS Band vertical antenna. \$12.95; Ham 6-80 meter vertical antenna, \$16.95; 11,000 sold; DX on low power, guaranteed; send check or money order, shipment immediately express collect. Valuable antenna catalog free. Gotham, 1805 Purdy, Dept. CB, Miami Beach, Fla.

OSLS-SWLS. Finest and largest variety samples, 25¢ (refunded). Callbooks (winter), \$5.00 postpaid. Religious QSL samples, 10¢; subscriptions and renewals to all radio publications appreciated. "Rusty" Sakkers, W8DED, P.O. Box 218, Holland, Mich. "Your Best Contact" free on request.

OSLS. Samples, dime. Printer, Corwith, Iowa.

OSLS, SWLS, unique designs. Paye, W4ZKK, 824 Avondale, Cocoa, Fla.

OSLS. Stamp brings samples, Eddie W. Scott, W3CSX, Fairplay, Maryland.

C. FRITZ Says "If it's worth a QSL, let's do it right!" **OSL-SWLS.** In '59 try mine! Samples 25¢ deductible. 1213 Briargate, Joliet, Ill.

OSL Glossy 2 and 3-colors. Attractive, distinctive, different, 48-hour service. Samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

OSLS. "Brownie," W3CJL, 3110 Lehigh, Allentown, Penna. Samples, 10¢ with catalog, 25¢.

OSLS-SWLS. Samples 10¢. Malco Press, 1937 Glensdale Ave., Toledo 14, Ohio.

OSLS. Twenty exclusive designs in 3 colors, Rush \$3 for 100 or \$5 for 200 and get surprise of your life, 48-hour service, Satisfaction guaranteed. Constantine Press, Bladenburg, Md.

OSL. Reasonable, 10 days delivery. Catalog dime (coin), Dick Crawford, K6GJM, Box 607, Whittier, Calif.

OSLS-SWLS. 100, \$2.85 and up. Samples 10¢. This 13 year old well established QSL printing business is for sale complete with equipment and stock. We're still in business. Write inquiries and requests for samples to: Griffeth, W3FSW, 1042 Pine Hgts. Ave., Baltimore 29, Md.

CREATIVE QSL and SWL Cards. Are you proud of your card? If not let us print your next order. Write for free samples and booklet. Personal attention given to all requests. Bob Wilkins, Jr., K5ZMT Creative Printing, P. O. Box 1064-C, Atascadero, Calif.

OSLS-SWLS. Samples free. W4BKT Press, 123 Main, McKenzie, Tenn.

OSLS. 3-day service, samples 10¢. Don. K5OWT, 738 Gardenia, Ada, Okla.

OSLS. Reasonable, nice designs, samples dime. W2DJH Press, Warrensburg, N. Y.

OSLS Samples dime, Sims, 3227 Missouri Ave., St. Louis 18, Mo.

OSLS-SWLS. High quality, reasonable prices. Samples. Bob Teachout, W1FSV, 204 Adams St., Rutland, Vt.

OSL Samples, 10¢. Refundable. Also net award certificates and membership cards. W3KJP Press, 1806 Water St., Wesleyville, Penna.

OSLS: Fast service, send stamp for samples, Koster, K2UAX Press, 2941 Ewell Place, Wantah, L. I., N. Y.

OSLS-SWLS. 100 \$2.50. Samples 10¢. QSO File cards, \$1.00 per 100. Ruspritt, Box 7507, Kansas City 16, Mo.

OSLS. Taprint, Union, Miss.

SUPERIOR. OSLS samples 10¢, Ham Specialties, Box 3023, Bellaire, Texas.

OSLS. 3-color glossy, 100—\$4.50. Rutgers VariTyping Service, 7 Fairfield Rd., New Brunswick, N. J.

OSLS samples, free, Spicer, 4615 Rosedale, Austin 5, Texas.

PICTURE QSL. Cards of your shack, home, etc., Made from your photograph. 1000, \$12.00. Raum's, 4154 Fifth St., Philadelphia 40, Penna.

OSLS. Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

OSLS. Get the best from DX. Samples 25¢. Pavne, 2 Kulik St., Clifton, N. J. Shop telephone GRegory 3-4779. Home: GRegory 1-7885.

QUALITY OSLS. Samples and prices, 10¢. Best deal all around, Savory Press, 172 Roosevelt Rd., Weymouth, Mass.

OSLS WAT, Box 1, Brecksville, Ohio.

OSLS. High quality, low prices. Fast service. Samples 10¢. Dave, 601 E. Maude, Sunnyvale, Calif.

GLOSSY OSLS. 100, 4 colors, \$3.50. Others less. Samples 10¢. Dick, W8VXK, 1018 Arthur, Mt. Pleasant, Michigan.

OSLS. Cartoons, colors, something different. Samples, 25¢. Chris, W9PPA, 365 Terra Cotta, Crystal Lake, Ill.

OSLS-SWLS that are different! Colored, embossed card stock and "Kromekote." Samples 10¢. K8AIA, Turner, Box 953, Hamilton, Ohio.

RUBBER Stamps. OSLS stamps. Free catalog. Bolles, 7701 Tisdale, Austin 5, Texas.

OSLS. \$1.00. Riesland, Del Mar, Calif.

OSLS. Lapel pins, samples dime. Kephart W2SPV, 4309 Willis, Merchantsville, N. J.

RUBBER Stamps for hams, sample impressions, W9UNY, 542 North 93, Milwaukee, Wis.

OSLS. SWLS. XYL-OMS (sample assortment approximately 9 3/4¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, protopal, snazzy, unparagoned carls (Wow!). Rogers, KOAAB, 737 Lincoln Ave., St. Paul 5, Minn.

OSLS. SWLS, samples 5¢. Novice special one-color, \$2.95 per 100. Nicholas & Son Printery, P.O. Box 11184, Phoenix, Ariz.

OSLS: Quality samples, 25¢. (Tatum). W6LJK, 1451 Raymond Ave., Glendale, Calif.

DELUXE OSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

PROTECT Your receiver and transmitter from scratches, dust and lint with attractive Burch Gear Covers. These covers are made from a soft grey colored canvas. Be assured of higher trade-ins by protecting your gear with Burch Gear Covers. Specify make and model: 75-1, 75-1, 75-1B-3, 75A-4, KWS1, KWM1, SX-101, HT-32, 75A-3, 32V, NC300, NC303, HQ-140-145-150-160-170-140X, GSB-11, Pacemaker, Viking 500, Navigator, Ranger, Adventurer, Thunderbolt, Courier, Send make, model number and dimensions if your gear is not listed, \$3.95 prepaid in U.S.A. Burch Manufacturing Co, 1220 Locust, Des Moines, Iowa.

CANADIANS! Selling out HF32, 75A3, Johnson Courier, Matchbox, Gonset, Mobile converter, Jennings vacuum capacitor, J. A. Masterson, 82 Cherovan Dr., Calgary, Alberta, Can. "PIG-IN-A-POKE"? Not if you visit Ham Headquarters, USA and see and choose from the hundreds of "Like-New" bargains in the world-famous Harrison Trade-in Center. More for your money, because tremendous turnover makes lower overhead! Terms, trades, Send postcard for mouth-watering photograph and price list Q-6. For the best in all new and used equipment, it pays to come to "Ham Headquarters, USA" BCNU, 73, Bill Harrison, WZAVA, 225 Greenwich St., New York City, N. Y.

LEPCE-NEVILLE 6 volts 100 amp. system-alternator regulator and rectifier, \$25. LEPCE-NEVILLE 50 amp. system, \$50; 12 volt 100 amp. system, \$85, guaranteed no ex-police car units. P. E. 75 D gas generator 2500 watt a.c. 120 volt, 60 cycle used 10 hrs., \$250. Herbert A. Zimmermann, Jr., K2PAT, 115 Willow St., Brooklyn 1, N. Y. Telex ULSTCR 2-3472 or JACSON 2-2158.

TORIDS: Uncased 88 mhy. like new. Dollar each. Five, \$4.00. P. P. DaPaul Co., 101 Starview, San Francisco, Calif. HAM TV Equipment bought, sold, traded. Al Denison, W1BXX, Rockville, Conn.

CASH for your gear. We buy, trade or sell. We stock Hammarlund, Hallicrafters, National, Johnson, Gonset, Globe, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. Ham Electronic Supply, Inc., 506-510 Kishwaukee St., Rockford, Ill.

DX. QSL Co-op, Box 5938 K. C. 11, Mo. Save time and \$\$\$, DX QSL'ing. Only 2¢ per card after membership. \$2.00 for 5 years.

SEND For list of good buys at bargain prices. Box 575, New York 8, N. Y.

SIX Meter kilowatts: page 24 July 1959 QST; parts, kits, complete; Richcraft Engineering, Sterling, Va.

SWAP Or sell over 2000 back issues QST and CO, 1926 to present. Want receiver and transmitter, all-band VFO AM/CW or will sell all 25¢ each (take 'em all) WØDVN, Box 5938, Kansas City 11, Mo.

WANTED: Trades new and used: KWS-1, \$1250; 32S-1, \$590; 75S-1, \$495; 32V2, \$350; HQ100, \$149.50; HQ-110, \$209; HQ-119, HQ-145, \$269; HQ-160, \$370; HQ-170, \$350; Johnson mobile, \$975; Thunderbolt, \$89.50; Valiant, \$439.50; Johnson Citizen Messenger, \$139.75; Courier, \$289.50; Hallicrafters 101 Mark III, \$395; HT-33, new, \$495; SX-99, \$119; SX-100, \$295; HT32A, \$695; S107, \$94.95; NC-125, \$139; NC183D, \$319.50; NC-173, \$139.50; NC-57, \$69; SW54, \$35; CB 100 Citizen, \$129.95; Globe-King, \$99.50; 90 Chig, \$49.50; 90A, \$54.95; 680, \$94.95; 89A, \$129.50; D5B100, \$49.50; 99, \$42.95; NC300, \$299.95; NC2400, \$169.50; CE20A, \$195; 10B \$139.50; A-8 slicer, \$37.50; WO multiplier, \$59.95; Heath DX-35, \$54.95; AT-1, \$23.50; DX-20, \$34.50. Easy terms, Ken-Els Radio Supply, 428 Central Ave., Ft. Dodge, Iowa, or 128 31st St., N.E., Cedar Rapids, Iowa.

SELL: Telux full size Triband beam, one transmission line, \$110; 32S-1 pwr supply, \$609; 75S1, \$435; E-V 600D mike; 10; WRL speech; 8; 8; E-V electro compressor amp, \$30; field phones, \$30; Tri-Ex Tower, 56 ft. cost \$250, sell for \$150.00; Magnacordette stereo recorder, \$325; Atlas mike stand; UTC S-12, \$46, \$62, R. Lamb, 1219 Yardley Rd., Morrisville, Penna.

SELL: Complete operating mobile rig. Elmac AF-67, Gonset G-66B, James Power Supply, Johnson loading coil, Turner mobile mike, WØNOZ, Oslo, Minn.

WANTED: One Kilowatt commercially-built transmitter, like Collins KW-1 or equivalent. Al T. O'Neil, Lake City, Minn.

FOR Sale: Novice rig, top shape, \$38E and Globe Chief 90 with xtals, key, etc. \$100 F.o.b. Glens Falls, N. Y. Landau, 21 Bay St., N. Y.

SAN Francisco & vicinity: Communications receivers repaired and realigned. Guaranteed work. Factory methods. Special problems invited any equipment. Assoc. Electronics, 38 So. P. St., Livermore, Calif. W6KF, Skipper.

FOR Sale: HT-33, used less than 60 hours. Has been completely checked by professional. Shipped prepaid for \$450.00. Will be happy to arrange terms. Contact: James R. Howerton, M.D., P.O. Box 86, Columbia, No. Carolina.

KW Plate transformers 3000-0-3000 VAC, 1.2 amp, 115V Pri. Wt. 140 lbs. Stancor; also 1500-0-1500 VAC, 1.5 amp, 220V, pri. Wt. 140 lbs. Amertran \$35. F.o.b. K9HXV, Carl Shogren, 5916 N. Artesian Ave., Chicago 45, Ill.

HALLICRAFTERS SX-77 in perf. condx, all new tubes, \$150, with R-46A speaker and 100 Wc oscillator in speaker cabinet, \$165.00 or make an offer. S. B. Hall, 2225 Randolph Street, Florence, Alabama.

WANTED: 6 to 12 304TL tubes. Callanan, W9AU, P.O. Box 155, Barrington, Ill.

WANT 1925 or earlier ham and broadcast gear. Personal collection. No dealer. W4AA, Wayne Nelson, Concord, N. C.

76A4, with 0.8 Lc, 3.1 Kc and 6 Lc filters, serial 2533, perfect condx. \$620.00. W6WZD, P.O. Box 761, Menlo Park, Calif.

BARGAINS. All in good condition, unless noted. Polaroid picture of any item. \$50.00 will take first check for my 7550 or your best offer. All inquiries will be answered: Collins 75A4 w/spkr and Pan-adaptor 3958, \$625; Pacemaker \$400, both for \$925; Hallicrafters D1-1 dual diversity receiver, complete \$250; pocket HF revr RBR, \$2, no tubes; Drake low-pass filter, needs work, \$40; Eico 320, 100 watt, 188, 2 small in. speed drills, \$4 \$20; Eico 2304TLs, \$2 ea. w/ 100 watt chassis, \$10 ea. w/ 250 watt. See Dec. CO classified or write your needs, Tom Perera, K2DCV, 912 Fifth Ave., New York City 21, N. Y.

SELL: Communicator 11b, excellent condx, \$175, Richard Axelrod, W3DEG, 125 Edgell Rd., Baia-Cynwvd, Penna.

G-28 GONSET 10 M. Communicator for sale. Excellent condition. used only 3 hours total. Hy-Gain 3-cl. beam for 10 M. Best offer over \$270. KØLZT, 4015 Eaton, Kansas City 3, Kansas.

FOR Sale: Hickock signal generators #610A, \$140; #288X, \$95; Sylvania oscilloscope #132, \$125; RCA voltohmvst, #WV-97A, \$20; Corrat test speaker #620 \$15; Solar capacitor analyzer, #CB-1-60, \$15. Electronic designs VTCVM #100, \$20; contact Dan Gravereaux, KIDMG, 46 Carter St., New Canaan, Conn.

HALLICRAFTERS S-85 with Hallicrafters S-meter (excellent condition), \$85. K1AJL, 35 Terrill St., Rutland, Vt.

SELL: Motorola 6M xmttrs and 2M xmttrs, \$9.95. A. Hatfield, P.O. Box 502, Chesterford, Ind.

75A2, \$289; HT-32A \$595, NC-300 \$245, AR88, \$125; HRO-511, \$65; SX-100, \$255, 51J2, \$45. Teletype converters, R274 (40 Kc thru 54 Mc) \$295, 75A-1 \$249, 75A-2 \$595, 51J-3 \$650, SX-101 \$255, 51J2, \$495. Teletype converters, printers, perforators, etc. Write Tom, W1AFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. (Richmond 2-0048) (Store: 60 Spring, Newport, R. I. Fred WIJFF).

2500 volt 1 amp. pwh. supply on castor dolly, caged, plenty capacity, swinging and smoothing chokes, \$725, \$125. Not surplus pole pig. #13 final amp. on relay panel, coils 10-20 40 mtrs. fil. strng, etc. Inc \$ 50. 2 FM xmttrs w/ dynamos. Motorola, 30-50 Mc., comp. w/tubes, 100 watts input, \$30 ea. Lampkin freq. mtr., Ser. 981 and deviation mtr. model 205A, \$300 pair. Rack & panel mounted SSB mtr., VFO, toroid filter, self cont. pwr. supp., VOX, 300 watts P.E.P. Final is QW all band exciter uses plug-in coils, \$225, W9DSV, Box 87, Webster, Wis.

FOR Sale: HQ140X, \$150, 10B, \$125; both in top condition. Jim Connor, KØADD, 33 Middle Road, Bedford, Mass.

FOR Sale: Globe King 500A used only 18 hours. In A-1 condx. \$400. F. Ciulini, W9MLZ, 6359 So. Keeler, Chicago 29, Ill. PO 7-8938.

HT-32, in excellent condx; \$500. W8KBT, Box 1486, Huntington, W. Va.

THUNDERBOLT, factory-wired, in orig. carton: \$460; HT-32, in orig. carton, \$525. Both units used but very little and are in excellent condx. Johnson attenuator for above; 75A-3, best condx, matching speaker, \$365. George E. Dominick, W4UWC, 1025 Nokomis Circle, Knoxville 19, Tenn.

FOR Sale: National NC-57 receiver, in perf. condx. Best offer. Jack Hall, 316 Sneed, Texas Tech, Lubbock, Texas.

MOBILE: Viking mobile, factory-wired, and VFO, \$100, Elmac PMR-6A and pwr supply, \$75, 135 watt BC-654 transceiver complete, hand generator, PE-103 dynamotor, cables, and manual, \$95. Viking Ranger, factory-wired, \$159, W9RQK.

MILLEN 90901 oscilloscope and home-brew power supply, \$25; 300 W (new), \$5. Armecc Radio theory course, \$4; practice tape 1200", 13 wpm and 15 wpm, two hours, \$4; KETMA Novice code course with five LP records (to 10 wpm), \$7. Calder, 6351 Oakland, Phila., Penna.

SELL: Factory-wired Valiant; HRO 60 four trays and xtal calibrator, \$310 each or both \$600; Johnson low pass filter. Heath SWR bridge, D-104 mike with G-1 stand. No time to operate. W3YHQ, 500 Hudson Ave., Altoona, Penna.

FOR Sale: Heathkit TX-1 "Apache" transmitter in perf. condx, with JT-30 xtal mike. Best offer over \$200. Charles S. Hines, S.50GN, Rte. 2, Box 266-A3, Jacksonville, Arkansas.

SELL: Heathkit VFO, like new condx, \$13.00. Wilbur H. Rau, WØNUI, Henderson, Minn.

FOR Sale: SX-101 Mark III, in ex. condx. \$310. Bob Yarnus, K2RGZ, 532 Lefferts Ave., Brooklyn 25, N.Y.

SELL: 32S-1 and 75S-1. Best cash offer over \$875 for both only. Perfect condition. Will ship in original cartons. Serial Nos. over 500. K2MHI, 58 Vesper Rd., Hartsdale, N.Y.

SELL: R&W Grid Drive \$30; Eideco KW linear, \$325, Millen Bridge 90672, \$30; MM 2 RF analyzer, \$110; Heath HT-32 w/ tower with platform and bearing, \$150 (cost \$247); 75A-4, \$650, all like new condx. K. W. Matchbox, \$95, Lamb, W3VDE, 1219 Yardley Rd., Morrisville, Penna.

18-AV vert., 80M-10M, 52 ohm B&W lo-pass, 40 ft. RB-8/U, make an offer. W1DWB, Westford, Mass. Tel. MY 2-8986.

MERRY Xmas and a Happy New Year from WØCVU! Thanks for making these awards possible on Two-Way SSB: DXCC, CO 100, WPX, WAC, BERTA, 101, TPA, WAA, DRD, 150 countries confirmed on Two Way SSB using Collins KWS-1, 75A-4 and Telux beams.

SELL: Motorola FMTR-41V(AF) 1D single case front mount 30 to 50 Mc. with mike and cables. Ralph Villers, P.O. Box One, Steubenville, Ohio.

SX-99, \$95 or trade, in perfect condx. KØMUK, 457 York-shire, St. Louis 19, Mo.

FOR Sale: 32V2, perfect, \$385; 75A-1, best factory reconditioned, with 3 Kc mech. filter, \$265. Heath BC-1A AM tuner, \$20; Powerstat 115, 15 amp, \$20; transformer, 220v/900v at 1.0 amp, new, \$85; 220/440/3800V ct. at 2 amp, \$75. Collins 310B-3, excellent, \$165; vacuum variable, 20-675 µfd, 7500 w.v., new, \$35; choke, 30 oh, at 1.0 amp, 50 ohm, \$35; Elmac A54H with 6v/600v dynamotor supply, \$100. Power supply, 115V AC, 2000V DC at 500 Ma., \$60; VFO-matic, Mod. 80-20, new, \$35; James Craig, 172 W. Third, Foru, Ind. Phone Gridley 3-9306.

SALE: KWM1 and AC, \$725 or KWM1, AC, DC, rack and cord and mike, \$950. First money order or certified check. Will RR exp. collect. Dr. E. Gooch, 704 S. Scottsdale Rd., Scottsdale, Va.

HQ-170 with clock; brand-new condition, \$265. C. L. Romberg, 182 W. 18th Austin 1, Texas.

SX-99: Like new in every detail! Only \$120. W2BAC, 4 Bayard St., Larchmont, N. Y. TE 4-2640.

SELL: National 183-D. Best offer over \$225. New Allied Knight deluxe 60 watt, 8-watt stereo amplifier and Knight deluxe stereo preamp, \$195. Pietropaolo, 344 Main St., Medford 55, Mass. EXport 6-6172.

VIDICONS: Used 6326 Vidicons for ham TV. Best offer \$40. K9CPO, 2 Drexel, LaGrange, Ill.

CLEANING House: two new 4-250s, all enclosed for TVI suppression. Needs a few more hours' work, \$69; Vikings I cabinet, \$7; KW bandswitch two sections, \$7; electronic switch and sine wave oscillator, \$15, misc. KW power supply components (pole transformers, relays, meters, etc.). Write for details. William Madigan, WIUGE, 159 Noit Street, Wethersfield, Conn.

SELL: "Apache", best bid over \$200; Hy-Gain 15 mtr. Gammaxial AR-22 rotor, HQ-100, Globe 90, all in good condx, make bid. K2HQA, Mike Farberman, 8 Borden Terrace, Maplewood, N. J.

FIBREGLASS Quad Arms! Quad users, replace the bamboo fishing poles with our lightweight weatherproof fiberglass quad arms. Set of eight 9 ft. arms, \$44.95; set of eight 12 ft. arms, \$59.95. Set of eight 15 ft. arms, \$74.95. No. Co.s. Shipped express collect. Send check or money order to L & L Electronics Co., Box 455, Midlothian, Ill.

COMPLETE Ham Station for sale: DX-100, NC-98, rotary beam, vertical antenna, many extras, \$350 takes it all. Twin lens reflex with light meter, \$45. W1VSS.

FUN in the sun at greatest of all Florida Hamfests, the Tropical Hambozee, Jan. 30 & 31, Write Box 104, Miami 1, Fla. for details and hotel reservations.

FOR Sale: Heathkit: Conelrad Alarm, \$10; 0-5 oscilloscope with probe, \$40; six meter converters, National, \$40; International xtal, 210 rat, Hewlett-Packard, \$35; complete mike, VFO, APS-50 power supply, low-pass, coax relay, \$110; Super Six converter with noise clipper, \$40; Carter 6-volt dynamotor 400 volt, 200 Ma, \$20; pair 115 volt AC selsyns, \$10; 115 volt AC blower, \$8; TR switch \$8; Transon 10-meter mobile converter, transmitter, \$60; Mobilcon 6 or 12 volt power supply, 350 volt, 125 Ma, and 200 volt, new, \$25; Eimac 4X150A, new, not surplus, \$25. Don Lovett, 3629 Northwood, Warren, Ohio.

FOR Sale: NC-125, gud condx, \$110. Globe Chief, \$45. Jim Cadien, 629 W. Lexington, Glendale 3, Calif.

WANTED: Collins R388-51J, R390/VRR, R220, SX-42 and Jab test equipment. Cash or trade original articles of your choice. George Lee, P.O. Box 95001, Los Angeles, Calif.

LOWEST PRICES: Latest amateur equipment. Factory fresh sealed cartons. Self-addressed stamped envelope for lowest quotation on your needs. HDH Sales Co., 919 High Ridge Road, Stamford, Conn.

GLOBE Chief 90, \$45; S-85 with Hallcrafters S-meter and Knight crystal calibrator, \$110; HQ-120, just paid \$60 having it rebuilt, \$125; Hewlett Wells TBS-50 with homebrew power supply and 210 rat, \$65; Wella TBG55W complete, mike, VFO, all in perfect shape, K9LTU, 10219, S. Green St., Chicago 43, Ill.

AIR conditioner! Cool your shack next summer. Swap 220V, 2HP window Amana worth \$550 new for ham gear of equal value. Want a good receiver, SSB exciter, etc. Will crate and ship or deliver within 250 miles. T. J. Gordon, W4TEC/6, 29327 Heathercliff Rd., Malibu, Calif.

SELL: Hallcrafters SR 3, six and two meter transmitter, 110 volt AC, 6-12 volt DC, slightly used; \$400. J. G. Roberts, W2UO, 7 Dolphin Green, Port Washington, N. Y.

FOR Sale: New condition, four months old HQ-160 receiver and speaker; BW5100-B transmitter with BW 51SB adapter; 20 meter Shortbeam 50 ft. mast; AR22 rotor; coaxial relay; M 18 freq. meters pwr supply, DB23 Preselector; 1000 W P.E.P. linear amp and relay, 100W RMT; lots of extra parts, surplus and commercial. All in fine condx. \$1000 or your best offer. D. E. Hawkins, RR 1, Box 176, Green Cove Springs, Fla. Phone 6582 after 6 PM, W4ETX.

CALIFORNIANS and interested foreigners: Complete 80-10 meter station and lots of junk, \$500. Send 4¢ stamp for list. Percy, 111 East Deodara Vacaville, Calif.

HEATH, Q-multiplier, \$7.50; push-to-talk dynamic mic, \$7.50; T-17 mic, \$2; pair RCA 815s, \$10. E. Reardon, 347 Highland Ave., Columbus, Ga.

HOPPED UP SX28 with instruction manual, \$89.95, F.O.B.; 304TH, \$15; pair balun coils, \$5. W3HTF, 909 Glenview St., Phila. 11, Penna.

WANTED: Eimac VVC60-20 vacuum capacitor. Bob Turner, Box 252, Accokeek, Maryland.

SELL: Proceedings of the IRE, 1953 thru 1959, \$6 per year or \$35 for complete run, plus shipping. W9GJR, 5256 Fairmount Ave., Downers Grove, Ill.

TWO Like new receivers, HQ-170, \$285; NC-300, \$235; sideband slicer, \$32; Sola regulating transformer 180 VA \$17; pick up complete 813 linear three ft. cabinet, \$145. W2HFZ, 465 Ft. Lee Rd., Leonia, N. J. Tel. WI 4-1974.

FOR Sale: HRO 60T with 15 meter coil, \$385; Eldico SSB 100A, \$450; Tapetone XC-144, \$65; Tecraft 6m, 2m, 1.4m converters, \$27 each; Rock mounted power supply, 250 volt 500 millis, \$50. Homebuilt 6m RF unit described in Handbook with 4-400 final tube, best offer over \$80; 4-400 in box \$28. Robert Coburn, WI1JO, 111 Blaine Street, Springfield, Mass.

FOR Sale: HQ-100, in exc. condx, \$139. Want low pass filter. Jim Rankin, Box 161, Co-Lin, Jr. College, Wesson, Miss.

WESTERN Radio Amateur: Third largest ham magazine in the U. S. 1 year, \$2.00; 2 years, \$3.50; 3 years, \$5.00. Also publisher "Surplus Handbook", over 90 pages schematics and photos of popular surplus receivers, transceivers, \$3.00 ppd. California, add state tax. Western Radio Amateur, 10517 Haverly St., El Monte, Calif.

FOR Sale: 20-A, OT-1 w/BC458 VFO Deluxe case, \$225; Globe LA-1 linear, \$80. All in A-1 condx. Walt Isbert, K2ZOB, 21 Glenroy Road, Caldwell Township, N. J. CA 6-3547.

KW Parts needed: Plate xfmr at least 2500V DC at 1/2 amp, or more, chokes, filter condensrs to go with it. B&W butterfly cond type, CX40A or CX49A, complete with coil mountings and N3 neutralizing cond. HDV1 coils for all bands, MB-150 tuner, Johnson KW matchbox Model 250-30-3. Send asking price in first letter. Will OSL all letters. Angel M. Zarakozza, W6ZPR, 1356 Olive St., San Bernardino, Calif.

SELL: DX-100 with Cardax model 950 mic and coax antenna relay, \$180; SX-96 test with speaker, \$185. All are in excellent condx. Contact K6JAY, 280 South Ave., Alamo, California.

WANTED: Tapetone converters, 2 meter XC144C4 and 6 meter XC50C4 in gud condx. KN5VUL, Box 100, Ft. Worth, Texas. GLOBE Scout Model 66 VFO, Mod. 755 Heathkit, balun coils, 11 ft. switch, LP filter all in spotless condx. \$135 W0PRM, 304 North Park Independence, Kansas.

DOUBLESIDE BAND: Unused Globe doublesidebander w/VOX and VFO, sacrifice for \$150, complete. Also Regency ATC-1 converter, \$50. Write Ralph Marler, W-226 Arlington Towers Apts., Arlington, Va.

NEED PAIR 4-400s, 872s, 810s. Lewis West, 3514 West St. Louis. Wichita 3, Kans.

KWS-1 Serial 669, like new, Hy-Gain Tribander, 100 ft. RG8U, all for \$1350.00 Virgil Schaffer, 3165 Grove Court, Cedar Rapids, Iowa.

SELL: 6M Communicator III, \$185; Heath SB-10, new, wired, never used or aligned, \$75. K0TFM, Erwin H. Meier, Gordonville, Mo.

FOR Sale: Genset GSB100, SSB Exciter; purchased new in April and used very little in last few months. \$400. C. L. Jenkins, K9KAJ, McLeansboro, Ill.

BAND RECEIVER, \$50; factory-built 27 mcg. transceiver, \$100; Tecmo 75GA factory sealed, \$400. Box 211, Olive, Calif.

10A, 600L, Mohawk receiver, W2PSG, E. MacFaul, R. 1, Lewiston, N. Y.

DX-100, \$175; two element 20 mtr. Gonset beam, 21" G-B TV, Writter-Fuller, aet only. Call OX 6-643. Tom Gillen, K6VMV (ex W8YNZ), 13003 S. Biola, La Mirada.

FOR Sale: 75A3 with 6 and 3 Kc. filters, \$375; Johnson 500, 2 mos. old, in first class condx, \$725. Will not ship. Arthur J. Dunning, Rte. 2, New Sharon, Iowa.

FOR Sale: OST magazine, 256 copies, 1926 thru 1945; 1933 thru 1945 are complete; 17 ARRL binders; CO magazine, 69 copies April 1946 thru December 1951. Best offer. Why compromise? 10, 15 and 20 meter 3-element antennas, separate and complete with CESCO Gamma Match, full size providing maximum gain and front-to-back ratio, \$100 for all three. Pick up deal. SR, will not ship. W8JRG, R. Littler, 640 Snowhill, Springfield, Ohio. Tel. FAIRfax 2-8722.

FOR Sale: Hammarlund SP600 SJ receiver with latest modifications. \$465. M. E. Smith, K8GDR, 5760 N. High St., Worthington, Ohio. Tel. TU 5-6886.

SWAP New Ham-M rotor for small commercial transmitter W3LVY, Phone RE 9-1753.

PRINTED Circuits photo-etched from your drawing. Ray Megirian, Box 385, Huntington Station, N. Y.

COMPLETE Station: FW Valiant, 75A2 and speaker, Dow antenna relay, \$650. All excellent and now on the air. Will not sell as separate items. H. Smith, W5WEA, 827 Marilyn, Oklahoma City, Okla.

FOR Sale: Complete Collins SSB station: 32S-1, 516F-2, 75S-1, \$900 (original cartons) or, separately, 32S-1 and 516F-2 for \$480. E. Thompson, W2U00, Edgewood Park, Rumson, N. J.

I Have 4-BC342 for \$50 w/O homebrew pwr supply in gud wkg order when shipped. Will try to answer all letters. Might trade. KN5VYY, Jim Beistle, 43 So. Osage, Ponca, Okla.

SELL: Gonset Linear 6M amp, Excellent condx, white cabinet model. Best offer over \$100. Donald Klein, 1725 Westover Road, Clark, N. J.

SELL: KWS-1, in exc. condx; \$1100. W2AEV, Ray Jones, 111 Hillside Rd., Farmingdale, N. Y.

FOR Sale: Viking II transmitter with VFO; HQ129X receiver, George A. Rossettli, 1515 Hopmeadow St., Simsbury, Conn. Tel. OL 8-4880.

GRID Dip Meter, Millen Model 90651 1.7-300 Mc. plus low frequency coils 46702, 46704 and extension probe 46721. \$50. W2FTY, 738 Parker Blvd., Buffalo 23, N. Y.

FOR Sale: SX-71 with spkr, \$75; Gonset II, \$70. Str, will not ship. J. Ressegione, 209 Prospect Pl., Brooklyn 38, N.Y., Tel. ST 3-2264 after 4:30 PM.

B & W 5100-B, \$325; SX-100, R46B, \$200. Both in exc. condx. C. Sherman, Jr., W1PNM, 74 Purinton Ave., Augusta, Me. or Glen Cove, Me.

VIBROPLEX Bugs, \$6.00. K5ENL, Grandview, Texas.

4X250B Eimac Brand new, in sealed bag. With air socket. \$40. Bonney, W8JUV, Muskegon, Mich.

NATIONAL Converters for NC-300. Set of three plus matching case, \$100; also B&W 5100B, \$350. Both items in like new condx. John Doremus, W3ADE, 47 Condit Rd., Mountain Lakes, N.J. Tel. DEERfield 4-3331.

WANTED: Wireless and radio equipment, tubes, books, etc. 1920 or older. Please describe fully and price. R. Husted, W3OCX, 105 N. Chester Pike, Glenolden, Penna.

SELL: 75A-2 less spkr, \$200; DX-100 with grid block keying, \$150. Both are in exc. condx. F.o.b. Tucson, W1NPA, Jim Miller, Jr., 24 Polo Village, Tucson, Ariz.

SELL: 75A4, \$3894, 3 Kc and 500 cycle filters, \$595; Ranger factory wired and tested, \$64964, \$195; Telrex 20M-56-112 3-cl. beam, \$75; 40 ft. Rohm pyramid tube tower, \$49; Model 80 Turner xtal miker, R-46A spkr, Johnson low-pass, Dow-key relay, TR-4 rotor. Make offer. All equipment in excellent condx. No trades! Allan Dreier, K9BEV, 1915 N. Ullman St., Appleton, Wis.

SALE: Generator, hi-voltage, DC voltage 3000/1500/1200/115, coupled to 4 HP motor. Excellent, \$250. Chas. Ryzdewski, 750 Stocking, Grand Rapids, Mich. Also, transmitter, Navy TAJ-18, exc. 250/500 watts, \$200.

\$195: RME 4350, Knight VFO and xmtr, TR switch and Vibroplex Bug. San Geise, 3201 Bella Vista, Midwest City, Okla.

ANTIQUE Radios: Atwater-Kent, Breadboard, Westinghouse RC. Make offer. Western Radiola One, Grebe, Paul Gizanti, 2429 San Carlos Ave., San Carlos, Calif.

GPR 90 WITH Slicer, \$500; original carton. UTC CVM5. 600 watt modulation transformer, used 3 months. W2STW Rt. 40, Newfield, N.J.

SELL: Gonset G37A xmtr. G66B rcvr; both with Universal power supplies. 505C mike; Mosley MA-3 whip with mount; cables and manuals. Like new condx. \$425. Ralph Jordak, W8UXP, 6006 Gerald Ave., Cleveland 29, Ohio. Phone TUx-20 5-4018.

WANTED: Universal Model 200A carbon microphones, complete or nickel cases only. WIBB.

SELL: SX-101 rcvr and matching R-46B spkr. Both for \$330. Contact Morgan, K9BCX, 3621 Newark St., N.Y., Washington, D.C., Apt. #101, Tel. EM 9-2107.

SELL: DX-40, VFI; Ameco oscillator. Allied code records. All excellent. Any offers? K11IK, Newport, N.H., 55 Pinnacle Rd.
MEASUREMENTS Model 67 peak voltmeter, \$100; Ferrer Model 701 sig. gen., \$20; RCA Mod. 44BX velocity microphone, \$110; Kay electric dial megamarker \$75; Kay electric Megapipier, \$50; Millivac Mod. MC-133 vacuum tub voltmeter A.C., \$125. WA2FZH, 238 No. Park Drive, Woodbridge, N.J.

RECONDITIONED Equipment: Terms-Trials-Trades! New Guarantee! Transmitters: Aerotron CAP 500 \$159.00; \$100 \$299.00; \$100-R \$379.00; CE-10A \$99.00; CE-10B \$139.00; CE-60L \$349.00; 32V-3 \$485.00; SSR-100 \$395.00; Elenco \$7 \$69.00; Gonset 100W linear \$199.50; SR-34AC \$325.00; TRS-30 80-Watt \$59.95; DX-35 \$49.95; VF-1 \$19.95; Pacemaker \$385.00; 6N2 \$129.00; Phasemaster II \$199.00; Lyco 600 \$69.00; AF-67 \$139.00; GLOBE Scouts, Chiefs, Champs, Kings, Etc. Receivers: Gelo 209 \$199.00; S-53A \$69.95; SX-88 \$429.00; SX-96 \$189.00; SX-101 \$319.00; HO-129X \$149.00; HQ-140X \$179.00; HQ-150 \$229.00; P.O.-10 \$449.00; HR2-60T \$385.00; NC-98 \$114.00; NC-139 \$139.50; MG-132 \$109.00; NC-300 \$269.00 Leo. W6GFO, Box 811, Council Bluffs, Iowa.

SELL: Globe Chief, factory-wired, in exc. condx, manual, novice xtals, \$40 and shipping. Lavern Smith, 3104 Catherwood, Indianapolis, Ind.

SELL: Mosley 2-element Tribander, in perf. condx. \$25.00 F.o.b. Roosevelt, L.I., N.Y. K2MYW, Dr. Mortimer D. Solomon, 41 Westbrook Lane.

COLLINS 75A4 with 3 Kc-6 Ke mech. filters, speaker, also HT 32A. Both 7 months old. Like new condx, \$550 each. P. Colman, 47-25 215th St., Bayside 61, L.I., N.Y. Tel. BA 9-2313.

THUNDERBOLT: Factory-wired, beautiful condx, about thirty hours use. Johnson T-R switch, power attenuator included. Now have Collins S-line. Asking \$485. W2HOH, IV 1-1875. Inter-continental SSB net to be formed. If you live outside U.S., write, giving bands, suitable hours, L. Rosencrans, 644 Wildwood Road, West Hempstead, L.I., N.Y.

RECEIVER SX-100 new condition with speaker. \$200; 20A offer for sale with VFO F.V. in exc. condx, \$150. Robert C. Dunham, 12 Fenwood Place, Yardley, Penna. Tel. CY 3-5564.

VIKING Valiant xmtr for sale; factory-wired, in excellent condx, new tubes. Send offer to J. R. Little, K9DLU, Elwood, Ill.

FOR Sale: Viking Adventurer, \$45; Viking II (factory-wired) with VFO, \$195; Hallcrafters HT-18, VFO and NBFM exc., \$55; Heathkit AT-1, \$25; Heathkit DX-20, \$29.50; Heathkit DX-35, \$45; Meissner Signal Shifter, \$26.50; Collins 32V2, \$39.00; Central 10B, \$125; Central Elec. 10B with 458 write, 4150; Morrow Conelrad Monitor, \$29; National NC-66 (new), \$90; Hallcrafters S-95, \$35.90; Central Elec. Sideband slicer (with "Q" mult.), \$49.95; Elmac PMR-6A with PSR-6 pwr sup., \$99.95; Millen 92105 SSB selector, \$30; Hammarlund HQ-140XA, \$175; RME 4350 with spkr, \$195; Drake I-A, \$210; National NC-300, \$75; National HRO-50T1, \$300; Hallcrafters SX-101, \$250; BC-221 freq. meter, \$50; Gonset C-37 mobile xmtr (exc.), \$195. Write Art Brown, W9IHZ, Brown Electronics, Inc., 1032 Broadway, Ft. Wayne, Ind.

DX-100, \$150; DSB100, factory-wired, \$100; NC-125, \$120. Jack Hall, K4AEG, 921 Temple, Knoxville, Tenn.

HOMEBREWERS! Don't miss this one! Send for list. Like-new surplus parts. Digging deeper into gold pile. Want that new rig. Meters, \$2.00, 866A, 75c; transformers and chokes, 25c/16. W9HNV, 3113 Rocky Point Rd., Bremerton, Wash.

PE-103A, brand new, cables, plugs, relays, filters, shock-mount BASE: \$28. K7DAL, 219 S. Hillcrest Ave., Yakima, Wash.

SELL: Collins 75A-3, needs minor repairs for best operation. Also, new UTC voltage adjuster, input 40-160V, output 115V, 300 watts. Cannot ship, sry. H. E. Benton, New York City, UN 4-6262, Ext 2F.

HRO-60, with nine coils, AA, AB, AD, CD, F,G,H,J. \$500. Margolis Audio, 28 High St., Hartford, Conn.

QSTS: Complete: 1935, 1936, 1953 through 1958 incl; partial 1931, 1934, 1937 to 1941 incl; 1943, 1944, 1945, total 158 issues. Also Handbooks, 1934, 1935, \$25 for all. F.o.b. W2YUQ.

SELL: Stancor Multimatch modulation transformer A-3899, 500 mil 600 watts list \$199.63 net \$199.20, never used, \$60; BC221 freq. meter, condx with book, \$50. All letters answered. P. A. DeClavie, W6GIB, 6646 MacArthur Blvd., Oakland, Calif.

SELL: NC88, pr. 254s, 833A, 7-2 and 4 Henry 550 Ma, chokes; all in good condx. Want: Matchbox Variac, 20-4 Henry, 400 Ma, choke, 3500V CT xfmr. Available only from 12/13 to 1/5. K9BFI, 125 Hillcrest, Hinsdale, Ill.

RANGER for sale, like new condx, \$200 or your best offer. Also NC-183. Make offer. Dennis Royal, 852 E. Aurora, Des Moines, Iowa.

HUFFALO, Rochester Area! KWS-1, Ser. #992, with 4-250Bs. In perf. condx. Aug. weekly use for 2 years, 1/2 hour. All sensible offers considered. Phone to inspect. K2HKP 1510 Genesee, BA 7206.

WANTED: Military or Industrial laboratory test equipment. Electrocrafter, Box 399, Mt. Kisco, N. Y.

FOR Sale: Meck T60-1 transmitter, 60 watts input, phone and cw. 10 and 75 meter coils; A-1 condx, \$45. WIKLD, 49 Abbott St., Nashua, N. H.

HALF Gallon CW rig. June 1954 QST: 1955 Handbook. \$13 final. Fil. & bias supplies integral. Less H. V. supplies: \$75. W3MCB, RD 4, Box 163, Gibsonia, Penna.

NATIONAL NC-125, immaculate condx, seldom used: \$100. John Pixley, W4YKA/CA, 116 Aikens Pl., State College, Penna. HT-32, like new, \$500; 600L linear, like new, \$300. Made DXCC and WPX SSB in eight months with pair. K2HEA/K2MGE, Lynbrook, L. I. Tel. LY 9-2356.

NEW Leece-Neville rectifiers, 50 amp., \$5.00; 100 amp. \$7.50; 110 volt selsyns, \$3.00; 50 volt, \$1.50; 500 watt isolation transformer 110 volt \$7.50; Western Electric condenser mike, broadcast type, \$35. B. J. Kucera, W8CKR, 10615 So. Highland Ave., Garfield Heights 25, Ohio.

WANTED: Johnson 6N2 and 100w. Multimatch modulation transformer, K2ZSP, 67 Russell Ave., Rahway, N. J.

FOR Sale: Johnson dual 3-element 10 and 20 m. beam with tilt head, \$50. Also Space Raider 3-element 15 m. beam, \$20. Southern California only. Dick Fossett, W6FTA, 10931 Allon Drive, Garden Grove, Calif. Tel. TE 4-3360.

TRANSISTORIZED Six meter converters. Small, sensitive, crystal controlled. Free information, \$29.95. Also limited quantity VHF transistors at experimenters prices. Guaranteed minimum alpha cut-off 100 Mcs. \$2.65 each. Robin Radio, 13229 Red Fern, Dallas 30, Texas.

FOR Sale: Johnson KW, speech amplifier, power reducer and spare tubes, \$1100. Collins 75A4 with 3 Kc, 6 Kc and IF can. \$300, HRO-60 with spkr, regular coils and 6 meter coils, \$450. All above in first class condx. Collins 310B exciter bandswitching, \$175. W5DYL, Forrest City, Arkansas.

WANT: Old QST and CQ Binders, 500 cycle filter for 75A4. B&W model 850 pi-net coil, vintage 1914 crystal detector. Cash only. Al Marcy, W4ID, 461-3rd Ave., Sea Park, Eau Gallie, Fla.

CASH For used Short-wave ham receivers, transmitters and accessories. Tregor, W9IVJ, 2023 N. Harlem Ave., Chicago 35, Ill. Tel. TUx-20 9-6429.

SSB Transmitter, Johnson Matchstick, MM-1, Gates compression amplifier, TR switch, transistor course, QSTs, CQs, etc. Stamp for list. W4APL, 1420 South Randolph, Arlington 4, Va.

DSB-100 for sale, double sideband, c.w. and AM xmtr, in new condx, used only a few hours. VOX included; \$85 cash. Take it or leave it. No offers of deals. W2ADB, 27 Grayson Pl., Teaneck, N. J. Tel. TE 7-0004.

SAVE OR Electronic, Radio and Communications components and equipment for Ham and commercial use. See thousands of parts in stock—many more coming in daily, all at unusual savings. If you live in or near Philadelphia, visit our new warehouse at 31st and Grays Ferry, or send for free catalog. Teletype perforator paper oiled tape, yellow 11/16" wide, 8" O.D. roll, 1 in. E.D. Sold only in seal boxes containing 40 rolls each. Shipping weight 46 lbs. \$16 per box. RTV clubs write for quantity discounts. Selectronics, 1206 S. Napa St., Phila. 46, Penna.

VIKING II complete with VFO, LP filter, relay, xtal mike, like new condx, \$225. HQ150 with spkr, like new condx, \$235. Rev. C. R. Wilson, Rt. 1, Jonesville, S.C.

REQUIRE Late model SX101A, SSB equipment and rotor. Will sell or trade Viking II, v.v. clean w/new tubes recently installed. What offers? John, 20 Belmont, Brunswick, Me.

SELL like new KW SSB station 75A4, \$450; Eldico SSB-100A, \$325; HT-33 KW amplifier, \$550; RF analyzer, Electronic Key, beam rotor, etc. Complete station, \$1400. W2OZQ Hal Richter, Wolf Chapel Gate Lane, Glen Head P.O. N. Y., Tel. MC 6-1099.

SELL: CE20A, QT-1, Deluxe 458 VFO, \$180. W2OJG, 54 Charles St., Clifton, N. J. Tel. PR-200 9-0639.

DX100: Professionally wired, in good condx, spare 6146s, \$165. Need: Approximately 1500V DC 350 Ma, 150 W modulation transformer, Warren Nissen, Ashokan, N. Y.

NC-183 rack model, 16 tube all-band receiver, \$99.00, K6TWL. HAMMARLUND HO110C, matching speaker. In original carton. \$200. F.o.b. Syracuse, N. Y. Allen Kier, 516 Hillsboro Parkway, Syracuse 3, N. Y.

SACRIFICE Collins 75A4 almost brand new, original carton. Ser. 4913 with spkr, \$295; 6 Kc filter, \$29 extra; Collins 32S1 xmtr, 0478 (in perf. condx); A.C. supply, \$89; Electro-Voice 664 microphone and stand, \$35; Collins 40S-1 linear amplifier, used 17 hours (perfect) order. Money back guarantee. Quin LaFargue, Jr., W5BQJ, 214 North Adams St., DeWitt, Arkansas.

SALE: Elmac A-54 (12V), 5BR-1 conv., James C-1450 PS, Johnson Whipload-6, \$170. Major J. R. Hansen, W4DTU, MOQ, 3567, Camp Lejeune, N. C.

Two Collins 75As, Sericals 1097 and 2500, perf. condx, \$495 and \$525; Collins transmitter 32S1, demonstrator, \$489; receiver, 32S1, demonstrator, \$419; Cr. demonstrator Collins 30S-1 Linear amplifier, \$500. Advance on HT-33 or Thunderbolt or others. Collins KWM-2 immediate delivery, \$1095. Will trade. Terms: cash, money back guarantee. Moory's Wholesale Radio, 12th Jefferson, Phone WH 6-2820, DeWitt, Arkansas.

FOR Sale, HQ140X, w/xtal calibrator, \$185. EX Viking II, W/VFO, \$195. Both \$375. W6FGV, 108 S. Orchard, Northfield, Minn.

SALE: Homebrew 150 w. fone, 200W c.w. Built-in VFO. Pair 807 modulators, pair 807 final bandswitching 40-10 meters, \$85. Julius Countess, K2VYD, 64-04 217St. Bayside 64, L. I., N. Y.

SELL: Collins 75A4 ser. No. 7005, \$560; new condx, used approx. 75 hours. Factory manuals, cards and packing case. E. H. Welch, 10730 Stubbs Lane, Culver City, Calif. Tel. VE 7-5425

SIX Meter transmitter, Lettine, like new, \$60. K9DUQ.

SELL QSTs, 1920-1959, 466 issues, 11 binders, in gud condx. March 1920 and August 1921 missing. Best offer takes all. Ralph Carlson, 6111 Kent Road, Ft. Wayne, Ind.

HRO50T, \$250; NC173 and spkr, \$135; in exc. condx, 172H sig. gen., \$15. W3GCZ, P.O. Box 389, Glen Burnie, Md.

SX-24, \$50; Meissner Ex Shft., \$14; Eico sig. generator, \$9; Eico tube tester, \$14; Heathkit 0-12 scope, \$44; 10M converter, \$9; KV power supply, \$18; Telrex 20M 3-el. supermini, \$30; Gotham 4-el. 10M \$19; Micor V-4-6 vertical, \$14. Many other items. Wanted Hi-Fi components. Will trade. WIABJ, 40 Salisbury Rd., Brookline, Mass. Tel. LO 6-0230.

WANTED: For immediate cash, a 75A4 Collins receiver with ser. no. 5000 or more which is clean and in good cond. Also, immediate cash for Hy-Gain RBX-1 rotor with control system using wedge of light on great circle world map for central U.S.A. State lowest cash price, condition and approximate express shipping cost in your first letter. George E. Clark, KN4EKW, P.O. Box 308, Brandenburg, Ky.

SELL, cash: Hallcrafters S-72, \$45; BC-348-R, S-meter, xtal-controlled 135 Kc sharp IF, power supply, \$100; Heath AT-1 (converted 70 watts), VF-1 and AC-1, \$60; QST 1944-46 complete, \$6. All in A-1 condx. Local sale desired. Herbert Ley, ex-W3VYN, 104 Schuyler Rd., Apt. 304, Silver Spring, Md.

FOR SALE: 75A4, Ser. No. 3973, brand new condx, electronically and appearance matching speaker, \$375. Need KWM-1 and AC supply. Ed Schofield, Autumn Acres, Limekiln Pike and Dillon Rd., Jarrettsville, Penna.

SELL: Central Electronics 20A, Matching VFO, QT-1, excellent, \$190; also 40 ft. telescoping tower, Hy-Gain 3-el. 15 M beam, Heath SWR meter, Johnson Signal Sentry, coax relay, W2GIM, 455 Oakridge Dr., Rochester 17, N. Y.

HALLICRAFTERS SX-99, \$115; R-46B spkr, \$10; DX-35, \$50; VF-1, \$15; \$175 takes all. W3KFI, George Hockenbrocht, 365 South Broad St., Lancaster, Penna.

COLLINS 75A4, immaculate, \$575. W8WGA, 3451 Ridge Ave., Dayton 14, Ohio.

NEW Service for amateurs. List your equipment for sale, let us know your needs. No charge to buyer, small brokerage fee to seller after transaction. 2FE, Herbert Greenberg, 821 Rutgers Road, Franklin Square, N. Y. IVanhoe 6-0809.

CALL Letters: Gold or Silver may be applied on any surface. Set of 2" 656, 3, 856. A & B Services, Box 147C, Kittery, Maine.

FUBES, New Guaranteed, 4-65As \$12.50, 4-125A's \$18.50, 4-250A \$29.50, 4-400A \$37.50, 5-12B/4E27A \$19.50, 4X-250B \$32.00, 4D32 \$22.50, 810 \$12.50, 9811 \$3.00, 813 \$8.00, 829B \$6.50, 832A \$5.50, 833A \$37.50, 866A \$1.50, 872A \$1.50, 3B28 \$1.75, 75T1 \$12.00, 250TH \$15.00, 304T1 \$18.50. Command Receivers, all tubes, 190-550Kc \$12.00, 3-5MC, \$10.00, 6-9.1 \$8.00, tuning knobs \$1.00, 85KC I.F.'S \$1.25, command transmitters, all tubes, 3-4MC, 4-5.3MC, 5.3-7MC \$6.50 each, racks single \$2.00, double \$2.75, URC-4 VHF-UHF walkie talkie \$37.50, less batteries. ART-13 transmitters \$45.00, ART-13 modulation transformer with driver \$10.00. Add postage. C.O.D.'s OK, all guaranteed. Bill Step Company, Box 178, Ellenton, Florida.

JOHNSON VFO, \$25; Viking II, \$175. Original owner. Factory-wired. John Ward, Jeffrey Rd., Greenwich, Conn.

SELL: Convention won GSB-1 sideband adaptor, never used, with warranty card, \$120. Ross Randolph, KIATS, 92 Savage Hill Rd., Berlin, Conn.

COLLINS 75A-3 with matching speaker and calibrator, \$375. Jack Fry, 5136 W. Nelson St., Chicago 41, Ill. Avenue 2-1898.

COLLINS 32V3 xmt in excellent condx. no scratches. Good for use in fringe TV area where TVI is a problem. \$425. R. Bartel, W2AWS, 198 O'Neil St., Kingston, N. Y. FE 1-1321.

FREE Flyer monthly, Electronic surplus, Kurtz, 702D Bay, Staten Island, N. Y.

20A in top condition, QT-1 and BC458 VFO with Feb. 1957 QST conversion, \$175. WAYNY, 2712 Springmont, Jacksonville, Fla.

SELL Gonset 3156, Covers 112-132 Mc. in gud condx, used less than 35 hrs. 60 or 90 ad police revr. Jim Russell, 596 Rutland W, Englewood, N. J.

SELL: NC-173, matching speaker, and NFM unit, \$140. Also Knight VFO \$25.00. All are in FB shape throughout. Fred Matthews, 107 E. Rockwell St., Fenton, Michigan, K8LJU.

SELL: National NC181D with spkr, \$200; F.o.b. Cincinnati. Double conversion—Brought me 250 countries! W8EV.

SALE: NC-109 with matching speaker and 6-meter converter, \$150; three months old DX-20, \$30; 24 hour wall clock, \$9. Gary Cooper, K4PLZ, 318 Hemlock Rd., West Palm Beach, Fla.

DX100, all modifications, \$165; HRO5 complete with power supply and spkr, \$100; T47/ART-13, latest model, just like new, \$50; BC221AK, new, \$75; DB23 Prescaler, \$30; Gonset Triband Converter, \$25. All items in excellent condx. M. D. Haines, W5OCB, 1316 S. W. Military Dr., San Antonio 21, Texas.

NC-181D for sale, with matching speaker, in excellent condition. \$239. F.o.b. W2COY, 222 Johnston Circle, Sidney, N. Y.

ATTENTION Hams! Receivers and transmitters serviced and calibrated by professional personnel. Low prices. All work guaranteed! Also kits wired to order at 33 1/3% of list price. Write: Monarch Engineering, 3058 Lehman St., Hantramck, Mich.

SALE: Good DX-100, \$145. 15 meter beam and rotator, \$25. Robert Trostle, Avondale, Penna.

DSB100, new, \$95; 1.5 KVA pole xfmtr with auto xfmtr, to 3 KVDC, output 108, Masco 40W VA amp., \$15; Millen Rtr. 4 coils, \$10; 6V2, PTO, \$35; 6 ft. open file, \$5. Joe Gillison, WGAU, 109 Mullin Rd., Wilmington 3, Del.

SELL: SX101/spkr, Viking Valiant W/T, D-104 mike, PTT stand, co-ax relay; all in exec. A-1 condx. Only \$600. Leaving for college. Will ship. Dave Dahan K2TTA, 87-06 63rd Ave., Rego Park 74, N. Y.

SELL: Hallcrafters S20R, gud condx, \$30. K4YFC, Rt. 8, Kinnsport, Tenn.

HALLICRAFTERS SX-99 receiver, R-46B matching speaker; seldom used, excellent, \$115. John Parker, 38 Ellison Hills Dr., Rochester 10, N. Y.

QSLs, 100 two-color cards, \$2.00, plus postage. One style. Sample \$6. Onondaga Press, Onondaga, Mich.

SUPERB Eico 720 and 730 combination with Heath VFO and low pass filter. Push-to-talk incorporated. Owner in service and unable to use this fine rig. Will sell as package only due to interfering control switching, \$175. Write now to L. S. Fisher, W3VMK, 1020 Olive St., Scranton, Penna.

QSLs-SWLS 3-colors, 100, \$2.00. Samples, dime. Bob Garra, Lehighton, Penna.

TAPETON XC-50 six meter converter with power supply, output 14-18 Mc., brand new, \$47; W2OOG, David Hershkowitz, 1835 East 52 St., Brooklyn 34, N. Y.

SELL: Like new Rubicon decade box. Units, tens, hundreds, ohms. .05% accuracy. \$20. W7QJN, 21429-68 W., Lynnwood, Wash.

JOHNSON Ranger, excellent condition, will ship express in original carton. First check for \$175 takes it. Joseph Bau, W8IEH/O, 4060 Vine Ave., S.E., Cedar Rapids, Iowa.

WIREP has HT32A almost new. Will sacrifice at \$595. Also NC-300 with spkr at \$250. DX-100 perfect at \$150. Prefer local deal but will ship if necessary. Bob Gibbons, Everett St., Canton, Mass.

75A4, perfect, \$550; HT32 perfect, \$495. Also 75A2, \$295, buying KWM-2, W2BNE, Box 105, Kearney, Nebr.

FOR SALE: Viking II with BC459 VFO, \$190. On the air now on 10 and 20. Stop for list of misc. parts. FOR SALE: 20 meter CrushCraft ground plane, \$10; Link 250 watt output FM transmitter receiver suitable for six meters, complete or units, final, exciter, receiver power supply, some miscellaneous meters, condensers, tubes. Send stamp for complete list. Al Rac, 5 Oakbrook Rd., Ossining, N. Y.

B & W 5100 B and 51S-B perfect condition, original owner, \$500. Also P. 813 final, not TVI'd, \$40, no P.S. Chas. Horn, W5KCD, 38 Redhill Dr., Huntington, N. Y.

FOR SALE: Viking II, VFO, LP filter, excellent, \$215; 6 meter VFO, \$15; 6 meter xtal converter, power supply, 26-30 IF, \$25; 60 watt modulator, pwr supply, \$39; 100 watt C and 2 meter separate RF sections on single chassis, \$40. Send for photos W. J. Moulton, W9DSD, RFD 4, Chippewa Falls, Wisconsin, Tel. PA 3-3000.

DX-40, \$60; CA-1, \$10. Wanted: 20A, K9LON, 3000 Lexington, Hazelcrest, Ill.

20A, QT-1, 458 for sale. Factory-wired serial E7855. Very clean, \$200. Local preferred. George Scott, W2LFX, 6 Stuart Dr. West, Little Cove, N. Y. Phone ORiole 6-2088.

QSTs, 1930 through 1956 for sale at 20 cents each for all. Eugene Bitt, Box 369, Kerrville, Texas.

FOR SALE: Collins 3251, SSB xmt, with power supply. Latest modifications. Buy factory, \$385. K5GVP, Basil R. Wilson, 446 Royston, San Antonio, Texas.

SSB Station, New CE 20A with OTI and deluxe 458 VFO, Astatic D104 mike, Viking low pass filter, and HRO50T1 equipped with CE Model "B" Sideband slicer. All new or guaranteed operating condition with instruction books, \$600 or best offer. Takes all or part, W5KXD, 6511 Aberdeen Street, Dallas 30, Texas.

CRYSTALS: Airmated: SSB, Novice, CD, Commercial, Net, Citizens, NARS, etc. FT-23 Custom finished 01% any kilocycle 3500 to 8600 \$1.49. (10 or more 96¢). Novice 99¢, 1700 to 30,000 \$1.95. All frequencies 60¢ additional per crystal for hermetic holders. SSB "Package" June 1958 QST, SSB Handbook, crystal fundamental mixer sets, FT-243 \$9.95, HC-671 \$12.95, matched filter sets \$6.90. Citizens, 0.05% overtones FT-243 \$2.45. HC-671 hermetics \$2.95. Airmating 9¢ per crystal. Crystals? Ask us, we have them all. Crystals since 1933. C-W Crystals, Box 2065Q, El Monte, California.

SALE: DX-40, exc. condx, \$65; VF-1 new, \$20; SG-8 signal generator, \$15; OM-3, 5th oscilloscope new, \$30 without probe. Derek Duplantis, 100 N. Washington St., Battle Creek, Mich.

WORLD's finest reconditioned equipment at lower prices. On trial, Trades. World's best terms financed by us. \$38 \$29.00, S34 \$59.00, S85 \$89.00, SX-99 \$119.00, SX-96 \$159.00, SX-100 \$199.00, SX-01 \$299.00, SX-88 \$349.00, SX-84 \$40.00; HQ100 \$129.00, HQ170 \$299.00, NC-57 \$59.00, NC-98 \$99.00, NC-75 \$99.00, NC181D \$225.00, NC300 \$279.00, NC303 \$379.00; Globe 755 VFO \$29.00, Globe Chief \$39.00, Globe Scout \$59.00; DX-100 \$179.00; Viking II \$179.00; 75A2 \$325.00; 75A4 \$549.00; KWM1 \$595.00, KWV1 \$195.00, AF-67 \$129.00. Hundreds of other items. Write for list. Special discount for all cash. Henry Radio, Butler, Mo.

LOW Capacity filament transformer for maximum efficiency in Ground Grid Amplifier, 5 volts at 30 amps, sec. 115 to 125 volt pri., \$10. C. Brooner, P.O. Box 261, Morton, Ill.

FOR SALE: Heathkit Apache transmitter, \$195. A Verne Roberts, WOGML, 5520 Porter, Wichita, Kans.

SELL or Trade: Mobile rig consisting of Gonset Super 6 converter, Commander transmitter and VFO, PE103, whip, controls, cables, \$150; James C-1050 power supply, \$25; BC221, book, power supply, \$60; remote control 6 position coax switch, new 110, \$24; 1600 150 microamp meter, \$4; 110v, selvsys, \$7 each; dynamotor, new, \$24; 225v, 75 mA, out, \$5; Johnson variable condenser, new, 100D70, dual 9v mmt., \$5; T126/ARC5 transmitter with tubes, \$10; WE plate transformer, oil, 3000V, CT, 23A, choke, 4 mid, 1500V, cond., \$20. All FOB. A. Kimmeldorf, 127 Nesbit Trace, Irvington, N. J.

FOR SALE: Receivers: NC-57 and SX-43, W8WV, 1753 Kensington Ave., Youngstown 4, Ohio.

BUFFALO, Rochester area: Wanted: to rent, from February 1 until Mar. 15th or from now until March 15th, Ranger 32V, B&W, or any exciter capable of driving KW. Your rig will receive best of care. K2GX1, 120 Yorktown, Buffalo 26, N. Y.

MUST SELL: HBR 14 tube double conversion rcvr with 40 and 15M coils. All parts for other bands. Bud cabinet, matching speaker and phones. See QST for July 1957, \$135. Parts for 800V 300 Ma pwr supp., oil condx., 25 watt CW xmt, 40M coil, xtal controlled, Heath grid dipper, 4-65A with socket; E-V model 637 dynamic mic, each \$15. W5OFU, Sam Accardo, 4943 Arthur Dr., New Orleans, La.

FOR SALE: Globe King 500 and HT18 VFO, \$415; Harvey-Wells Z match coupler, \$50; SX-100 and R46B spkr, \$215. All in gud condx. Clayton Smith, W1CYE, New Milford, Conn.

SIDEBAND Inexpensively: 20A factory-wired exciter, QTI, deluxe VFO, 350 watt pair 811A linear with power supply, microphone. Will deliver and place into operation within 200 miles Boston. First check for \$280 takes this bargain. W1KIB, Dr. James Martin, Shrewsbury, Mass.

FOR Sale: Heath Apache, all inquiries answered. In exc. condx. A. McGowen, 833 North Ave., Macon, Ga.

SELL: Hammarlund HQ100 for \$100; Heath DX35 for \$38. Alliance "Tennarotor," \$18. Am going mobile, J. Turner, WINHE, 39 South Quaker Lane, West Hartford 7, Conn.

FOR Sale: Hallicrafters S76 receiver and R46 speaker. Has 15 meter bandspread. Best offer over \$90. Shipping charges collect. Ken Voth, W0CZL, Route 4, Newton, Kans.

LEADING Radio-Television operation has opening for two young apprentice engineers. Professional experience not required, but must have First Class License and ability to learn quickly under guidance of Chief Engineer. Write Station WSAV, Savannah, Georgia.

KITS Wired. Write for price. J. C. Anderson, Jr., K5GCM.

WANTED: VHF152 also 1 KW band switching final. W4VB, Duke's Trailer Court, Raleigh Rd. Ext., Rocky Mount, N. C.

CANADIANS! Complete station NC98, TBS50, AC pwr. supple. Mic, W.P. filter. Worked 50 countries on lone last winter. What am I offered? VE2AYE, 105 Orchard St., V. LaSalle, Que., Canada.

MANSFIELD 16mm camera, lists at \$59.50, excellent condition. Need ARC5 7-9 transmitter, 450th, 6C21 or what have you? K8QYK, 1250 Center Drive, Wooster, Ohio.

FOR Sale: Knight Communications receiver, 54 to 30 Mc., 50 watt transmitter, VFO, for \$175. Modulator (24 watt home brew) free. In like-new condx. Prefer Georgia area deal. K3DFW, Bob McCracken, 13 West 57th Apt. A, Savannah.

2 Pair 4X250Bs. brand new, \$50 pr. Pair 813s, \$15; 6X99 built-in xtal calibrator, \$125. Improved 6X17, best offer! K0AQX, Richard Robinson 4324 Farnam, Omaha, Nebraska.

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FOR Sale: Johnson Viking 1, \$105; VFO 21, \$25; SX-25 with spkr, recently factory reconditioned, \$65; S-38, \$20. All items in gud condx and shipped F.o.b. Vermillion, S.D. Russell Voorhees, W0BPH, 208 University Park, Vermillion.

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HQ129X with speaker, built-in 100 Kc oscillator. Looks like new. First \$125.00 takes it! H. F. Vinel, 4240 Loubell Lane, Cincinnati 5, Ohio.

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WANTED: Set of 15, or some tapes for a TG-34A Keyer. W3RSB.

WANTED: Unmodified HRO-60, NC-183D or 75A4 in top condx, state serial number and price please. All replies will be answered. G. H. Anderson, 7537 Meadowair Drive, Sacramento 22, Calif.

SELL: Collins 32K3, \$390; Collins 74A1, \$180. In perfect condx. W0WTM, 9808 Allendale, St. Louis 23, Mo.

MICHIGAN Hams! See the Collins "S" line and KWM-2 at Purchase Radio Supply, 327 E. Hoover Ave., Ann Arbor, Michigan. Telephone Normandy 8-8262. Roy J. Purchase, W8RF.

RUBBER Stamps. QTH and Call, \$2. 1408 Dial, Springfield, Ill.

ALLIED R-100 revr. S-meter and factory checked, \$100. Kenneth Manabe, WA6FYS, 10708 Foothill Blvd., San Fernando, Calif.

HRO-60 A, B, C, D coils, matching speaker, product detector, xtal calibrator, practically brand new, used very little, A, B, and D coils, never used; \$395. Wallace Prinz, W2KAN, 1177 East 14th St., Brooklyn 30, N.Y. Tel. DE 8-8343.

SALE Or trade: Heathkits VTVM 7A, \$20; SG-7, \$15; AM-1, \$11; CA-1, \$11; Gonset Super Six 12 volt, \$35; 6 volt dynamors \$3 each; latest Q & A, \$3; Leeco-Neville 6 volt, less rectifier. Will consider trades on S-85 or equivalent. All letters answered. Sell: Collins 75A2A, 3.2 and 800 cycle filters, 100 Kc xtal calibr., spkr, ranger push-to-talk. In exc. condx. \$550. cash. K2LHW.

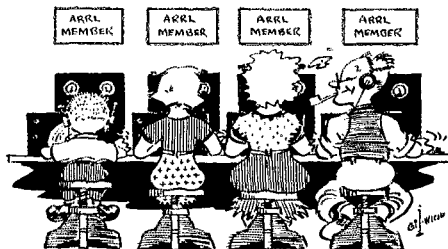
DX100 converted 100B, in perf. condx, \$159; HQ140X, \$149. Dave Goggio, 2671 Barron, Memphis, Tenn.

300 W. Cw xmtr. 813 final, new parts throughout; Par-Metal rack, \$60; high and low voltage power supplies for the above, unwired, \$25; 125 W. modulation trans. U1C GVM3 and driver trans. SR unused, new, both for \$15. W2ADC, Box 201, Elmont, N.Y.

ONLY Used two months. HRO60T, complete with coils, calibrator, and spkr, \$400; also 6 & 2 Hi-Bander completely new, \$100 or both \$475 cash. Write or call SARatoga 7-0074, Hai Steward, K3IFN, 1711 Belt St., Baltimore, Maryland.

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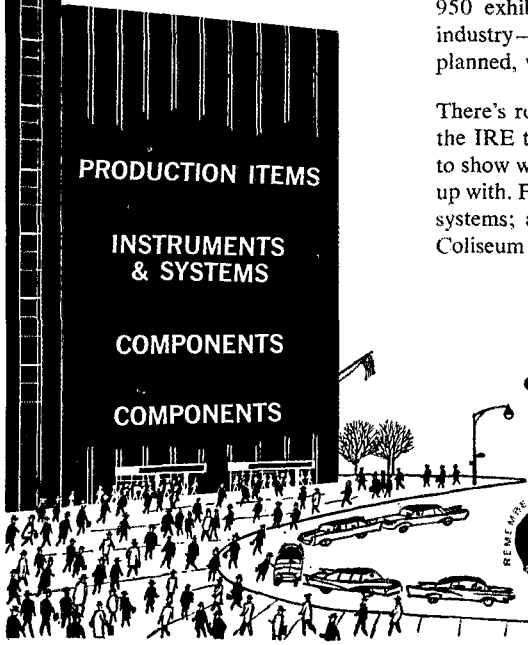
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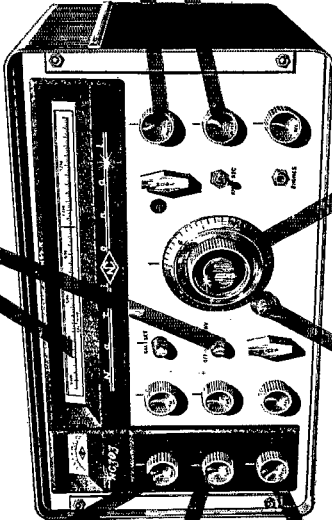
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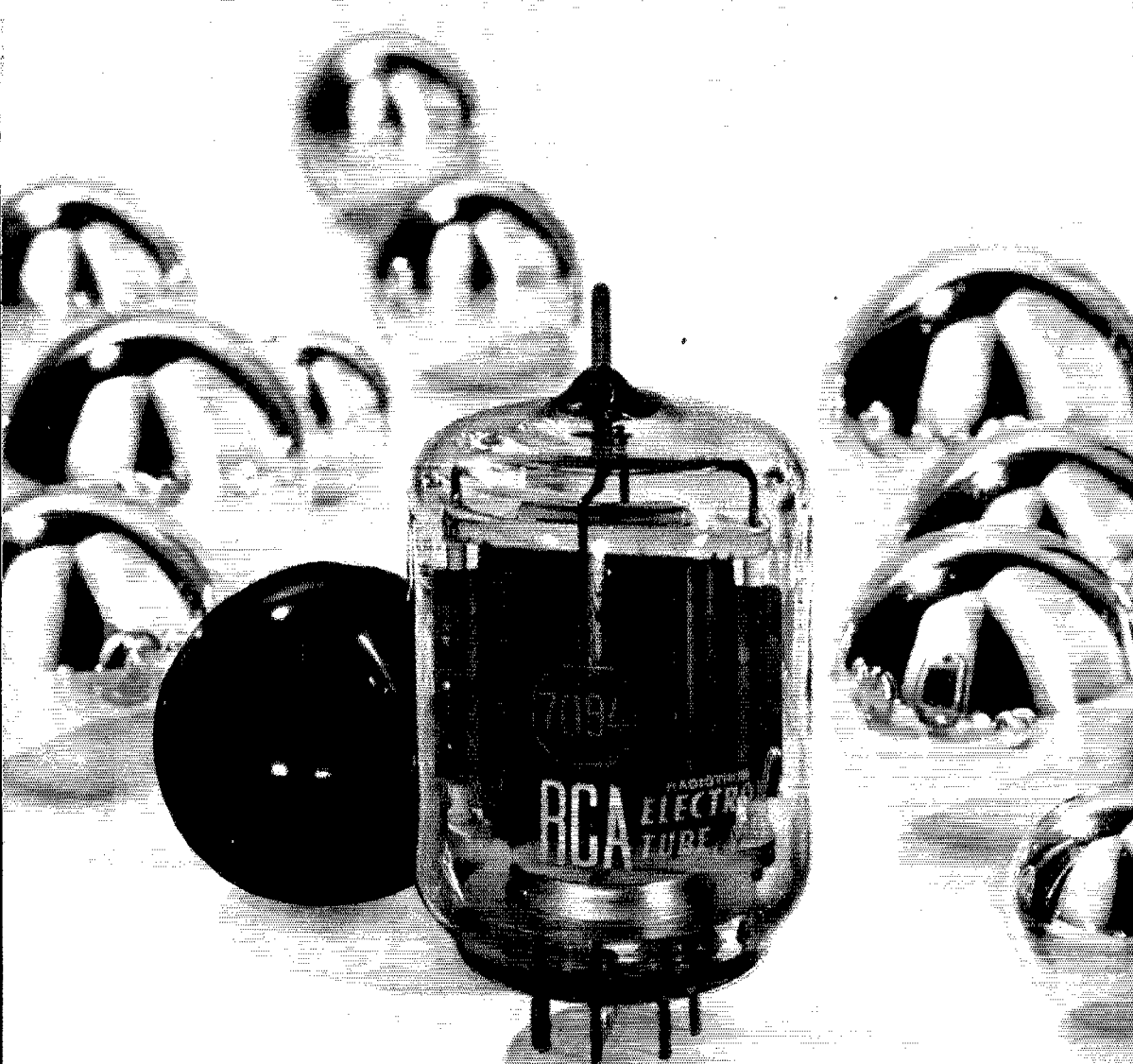
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