Receive Frequency

The Receive Frequency screen displays the beltpack receiver frequency in MHz. The frequency cannot be changed in factory-defined groups, but can be changed in user-defined groups.

To **edit the RX frequency (User Groups Only)**, do the following:

1. Set the **unit** to the desired user-defined group and channels. *See Groups and Channels Instructions. The menu structure in Figure 79 indicates how to get to the receive frequency screen.*

2. Push **SET** to edit the RX frequency. *The frequency flashes.*

3. Using the UP/DOWN arrow buttons, select the **desired frequency**. T*he frequency can be changed in 25 kHz steps.*

4. Push **SET** to place the unit on the new receive frequency.

Microphone Gain

The **Microphone Gain** screen displays the beltpack microphone gain setting. There are 16 possible settings. The number zero (0) indicates minimum microphone gain, the number 15 is maximum. Each step is about three (3) dB.

To **adjust the microphone gain**, do the following:

1. Push **SET** at the microphone gain screen. *The number flashes.*

2. Using the UP/DOWN arrow buttons, to select the **desired gain**.

3. Push **SET** to place the unit at the indicated microphone gain.

Battery Display

The **Battery Display** screen indicates the current percentage of battery remaining.

Battery Percentages

100 Pct. = Fresh Battery

75 Pct. = 75% Life Left

50 Pct. = 50% Life Left

25 Pct. = 25% Life Left

10 Pct. = 10% Life Left. Low Battery Light.

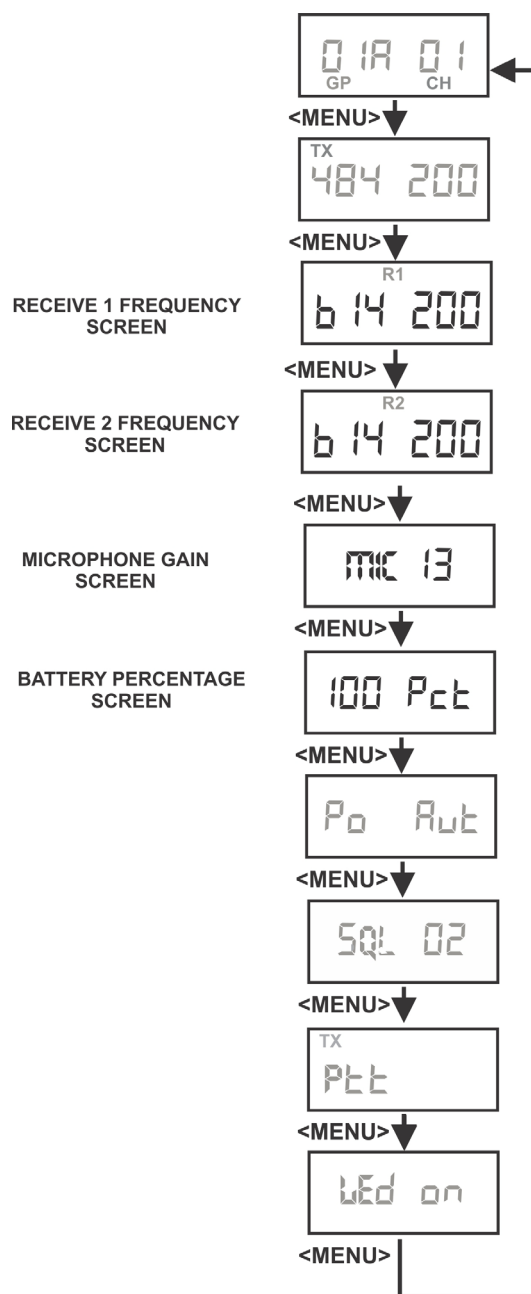0 Pct. = Battery Dead. Unit will lose communication at any time.

FIGURE 79.
Receive frequencies/Microphone Gain
Battery Percentage Screen

Low Battery Alert Tone

The beltpack sends an audio alert tone to the headset if battery life reaches 10%. The 1 kHz tone is heard for 0.5 seconds, every 30 seconds. The tone is only heard and set at the beltpack.

To **set the low battery alert tone**, do the following:

1. Press **SET** at the battery percentage screen.
    *A screen appears displaying **Lbt oFF**.*
    The low battery tone option also flashes

```
Lbt oFF
```

2. Using the UP/DOWN arrow buttons, turn the **low battery tone option** on or off.

3. Press **SET** to accept the change.
    The screen now displays with AL or ni flashing.

```
bAt AL
```

4. Using the UP/DOWN arrow buttons, select **AL or ni** for Alkaline/NiMH battery gauge calibration.

5. Press **SET** to return to the battery gauge screen.

Transmit Power

The **Transmit Power** screen displays the current setting of the beltpack transmitter's output power level. There are four (4) settings.

Transmit Power Settings

Auto (Default)	The beltpack's transmitter adjusts its output level according to information sent to the beltpack from the base station. It adjusts between tow (2) levels: 5mW or 50 mW.
5	The beltpack transmits at 5 mW
50	The transmitter is at 50 mW
100	The transmitter is at 100 mW

When the unit is set to auto, base station information tells the beltpack the appropriate power settings to use based upon the received signal strength level at the base station. By reducing the transmit power when possible, the battery life of the beltpack can be slightly extended and intermodulation products can be reduced.

To **change the transmit power setting**, do the following:

1. Push **SET** at the transmit power screen.

2. Using the UP/DOWN arrow buttons, select the **power setting**.

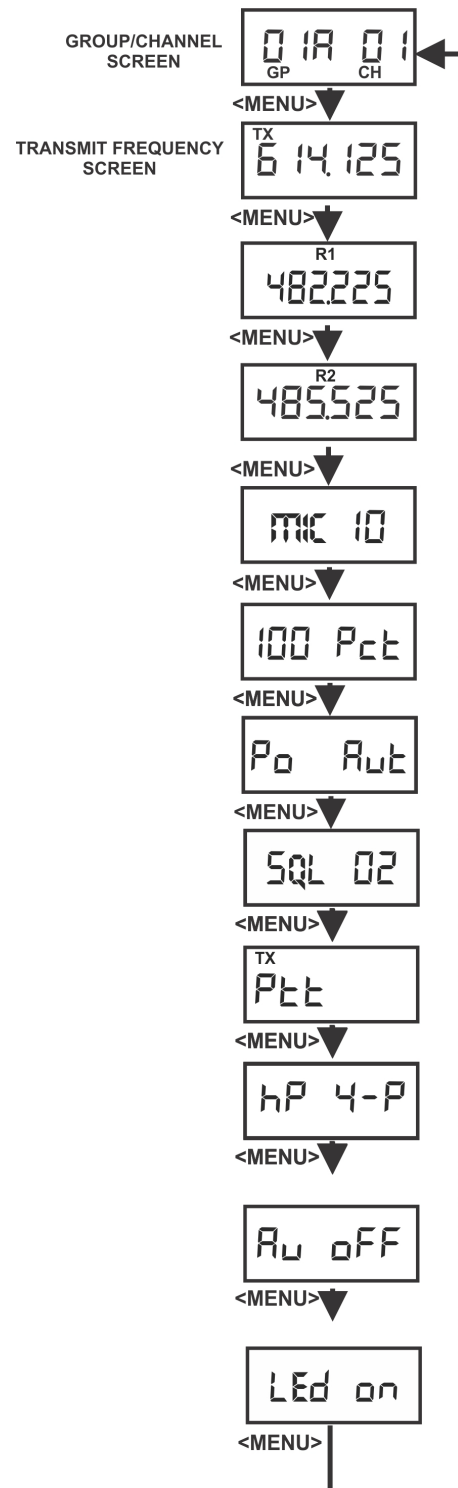3. Push **SET** to place the unit at the indicated setting.

FIGURE 80.
Transmit Power/Squelch Screen

Squelch Screen

The **Squelch** screen allows the user to adjust the beltpack squelch level.

To **adjust the squelch level**, do the following:

1. Push **SET** at the squelch screen.
   The squelch setting flashes.

2. Using the UP/DOWN arrow buttons, select the **squelch setting**.
   A setting of 00 holds the squelch open for testing.

WARNING: Do not set the squelch to 00 while wearing headphones with the volume turned up. White noise with no signal can be uncomfortably loud.

---

*3. Push **SET** to save the new squelch setting.*

Squelch Lvl	Approx. SINAD	Notes
00	NA	Open
01	12	
02	20	Default
03	24	
04	NA	RSSI Lvl Squelch

NOTE: The beltpack employs two (2) different types of squelches. A fast acting noise-type squelch and a slower data squelch. For audio to be received by the beltpack, both a good signal-to-noise audio signal (with a noise threshold set via the user squelch settings above) and a valid data stream must be detected.

Headphone Options:

- If the TR-82N has a 4-pin headset connector, the headphone should be set to **hP 4-P** (4-pin).

- When supplied with a 5-pin (stereo) headset connector, the settings **hP Add** should be used for Mono or **hP SEP** for channel 1 in left earpiece and channel 2 in right earpiece.

- A 5-pin single-sided headset should be set to **hP 4-P**.

Auxiliary Input:

The TR-82N has a 3.5 mm mono auxiliary input jack. Audio from this jack is heard only in the beltpack headset.

To **set the Auxiliary mode**, do the following:

1. Press **SET**.

2. Using the UP/DOWN arrow buttons, select the **AUX mode setting**.

Setting	Auxiliary Input Function
Off	Aux input disabled
1	Aux heard with Ch 1
2	Aux heard with Ch 2
12	Aux heard with Ch 1 & 2

3. Press **SET** to accept the screen setting.
   If Aux is not Off, the next screen displays Au NN *where NN is a two (2) digit number between 0 and 15. This is the volume level setting for the aux input.*

4. Press **SET**.
   The two (2) digits will flash.

5. Using the UP/DOWN arrow buttons, select the **AUX volume**.

6. Press **SET** to accept the gain setting.

Transmit Mode Screen

The **Transmit Mode** screen is used to select the following modes:

Transmit Mode	Description
Ptt	Push-to-Talk. The transmitter is always on. Pressing the TALK button un-mutes the audio. The beltpack responds to the base audio mute commands. When a user disables the beltpack Portable Station Connect button, the beltpack TALK button turns off.
Pt tr	Push-to-Transmit. The transmitter is off and audio muted until the TALK button is on. The beltpack will ignore lockout or shutdown commands from the base.
Pt trl	Push-to-Transmit Lockout Enabled. The transmitter is off and audio muted until the TALK button is on. The beltpack will respond to lockout commands from the base, such as First-On-Latch Out and Portable Station Connect disable.
Pt trn	Push-to-Transmit Lockout Enabled but no busy tone. This mode is the same as Pt trL but no "busy" tone heard in beltpack if channel is occupied.

To **change the transmit mode setting**, do the following:

1. Push **SET** at the transmit mode screen.
   The screen flashes.

2. Using the UP/DOWN arrow buttons, select the **transmit mode**.

3. Push **SET** to save the mode change.

LEDs Off/On

The **LED Off/On** screen is used to disable all LEDs. This function is useful for users who do not wish to show LEDs in the dark.

To **turn LEDs on or off**, do the following:

1. Push **SET** at the LED off/on screen.
2. Using the UP/DOWN arrow buttons, select the **desired mode**.

Software Version/Band

The **Software Revision** and **Frequency Band** of the beltpack may be displayed from any of the main beltpack screens.

To **view the software revision and frequency band**, do the following:

> In any of the beltpack main screens, press and hold **DOWN** for two (2) seconds.
>
> - The first screen indicates the frequency band of the beltpack.
> - The second screen indicates the software revision.

After displaying the information, the screen reverts back to the main screen.

The screens below indicate an E5 band beltpack with 80E052 version software.

$$\boxed{\text{bnd} \quad \text{E5}}$$

$$\boxed{\text{80E 052}}$$

ClearScan™

ClearScan™ helps you find clear RF frequencies in your area. The beltpack's receiver scans all the factory-defined groups and any set user-defined groups. The result is a list of beltpack receive groups, clear of interference.

To **enter ClearScan™,** do the following:

1. Press and hold **MENU + SET** for two (2) seconds to start ClearScan™.
   The beltpack display changes to ClrScn and the GP icon flashes. After about 12 seconds, the beltpack displays the first clear group. The group number flashes.
2. Using the UP/DOWN arrow buttons, display the **clear groups**.
3. Press **SET** to select a group.
4. Press **MENU** to bail out without selecting a group.

Clear groups are displayed first. They are in group order. You can scroll down through groups using the DOWN button. The left-half of the screen gives you an indication of interference levels as you scroll through the groups.

User-defined groups without a defined frequency for one of the receive channels display a u to indicate undefined.

The degree of interference found for R1 and R2 displays on the far-right two (2) positions on the screen.

Interference Level	Right Half of LCD Display
None	Blank
Weak	Single Bar
Moderate	Double Bar
Strong	Triple Bar

Lock Out

Lock Out allows the user to lock the top panel and menu options. The top panel buttons still work, but the TALK button options cannot be changed. Likewise, values on the LCD screen in the beltpack can be viewed but not changed.

To **enable/disable Lock Out**, do the following:

1. Press and hold the **UP and DOWN buttons** for two (2) seconds.
   *The words **Loc on** appear on the screen when lock out is active.*
2. Press and hold the **UP and DOWN buttons** for two (2) seconds again to disable lock out.
   *The words **Loc off** appear.*

First Use Default

First Use Default sets the beltpack to Group 1A, channel 1 and leaves any user-programmed groups in memory. It sets units to factory-defined menu settings. It also sets the TALK buttons to their default modes.

To **activate the 1st Use Default**, do the following:

> Press and hold **MENU** while powering-up the beltpack.

Factory Reset

Factory Reset sets the beltpack to Group 1A, channel 1 and ERASES any user-defined groups in memory. It sets a unit to factory settings. It also sets the TALK buttons to their default modes.

To **activate factory reset**, do the following:

> ➤ Press and hold **MENU + SET + UP + DOWN** for two (2) seconds.

RF Monitor Screen

The **RF Monitor Screen** displays beltpack RF status.

To **display the beltpack RF status**, do the following:

1. Press and hold **MENU** for two (2) seconds to display beltpack RF status.

   • If the channel button is set to 1, then signal strength displays for R1 frequency.

   • If the channel button is set to 2, then signal strength displays for R2 frequency.

TX Power	Signal Strength
Lo = 5mW	0= NO
hi = 50mW	1= Very Weak
Hi = 100 mW	2= Weak
	3= Moderate
	4= Strong
	5= Very Strong

2. Press **MENU** again to exit RF Monitor Screen.

Setting Beltpack ID

Several functions require the beltpack to know which base and channel it is associated with.

1. Auto Power Setting: The beltpack reduces its TX power when close to the base. Beltpack transmit power must be set to Auto.

2. Portable Station Deselect: The base can disable the TALK button of a beltpack. This shuts off the mic in PTT mode and turns off the transmitter in PT TR mode.

3. First-On-Latch-Out: This locks a base receive channel so only one beltpack can transmit on the frequency at a time. A beltpack user attempting to talk on top of another beltpack on the same frequency hears a double beep in their headset.

A beltpack tries to establish its ID automatically when its group/channel changes. The base must be on for this to work.

To **check or set beltpack ID manually**, do the following:

1. Press and hold **UP** for two (2) seconds.
   The LCD displays ID Base# - Receiver#.

For example: ID 1-3 means Base 1, Receiver 3.

If the LCD displays ID--- or does not match the base and receiver, the beltpack is assigned to, Auto Power, Portable Station Deselect, and First-On-Latch Out will not work correctly.

2. If the beltpack ID is correct, press **MENU** to exit.

3. If the beltpack ID is not correct, press **SET**.
   The ID numbers flash.

4. Using the UP/DOWN buttons, select a **new ID**.

5. Press **SET** to apply the new ID.

Bases with transmitters enabled are always base #1. A second base using the first base transmitters instead of its own, and properly connected to the first base through CAN bus link cables becomes base #2, etc.

Additional Resources

BTR-80N Menu Structure

BTR-80N Menu Structure

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<MENU> or <SET>
save settings

Status Screen

Frequency Edit
(User-Programmed Groups Only)

Group 25u   Ch1   668.050
Freq Edit   2   672.100
T1   554.250   3   679.500
T2   565.350   4   685.625

<MENU>

TX Power

Tx Power: 249mW

T1:   ON   T2:   ON

<SET>

2W IC1 In:
2W IC1 Out:
2W IC2 In:
2W IC2 Out:

<SET>

4W IC2:
4W IC2 IN:
4W IC2 OUT:

On

<SET>

(Factory Groups Only)
Status Screen

Group/Frequency Select

Group 25u   R1   668.050
   2   672.100
T1   554.250   3   679.500
T2   565.350   4   685.625

<SET>

<MENU>

Local Headset

Mic Gain:
Volume :

<SET>

Squelch   R1 Open   R2 01
Level   R3 02
   R4 03

<SET>

2W Intercom: TELEX

IC1:   ON   IC2:   ON

<SET>

4W IC1:
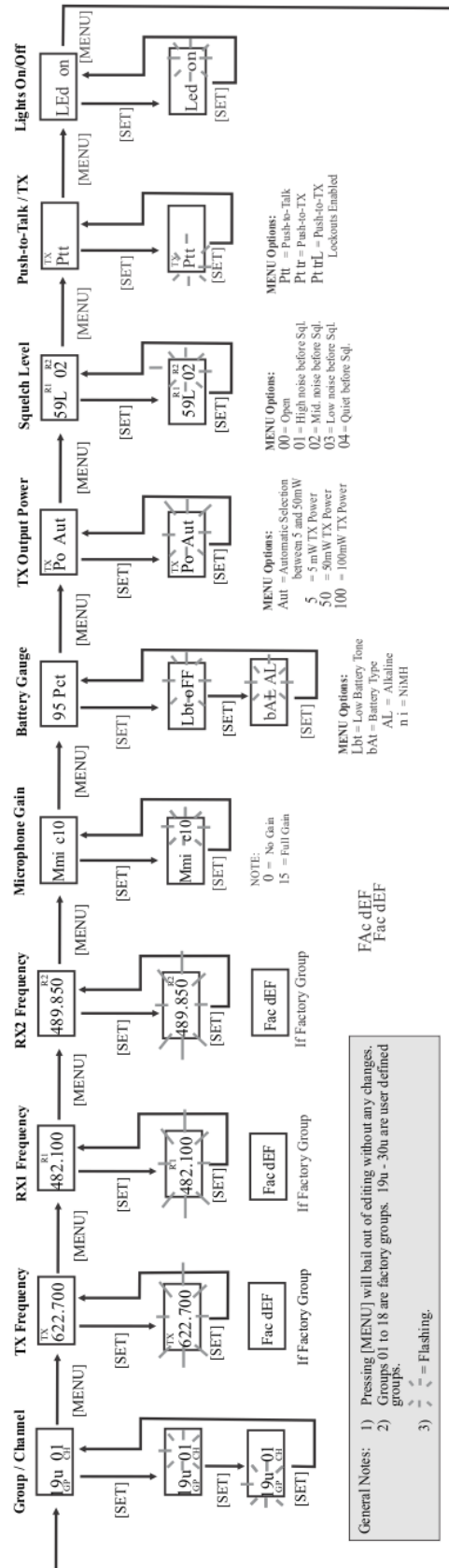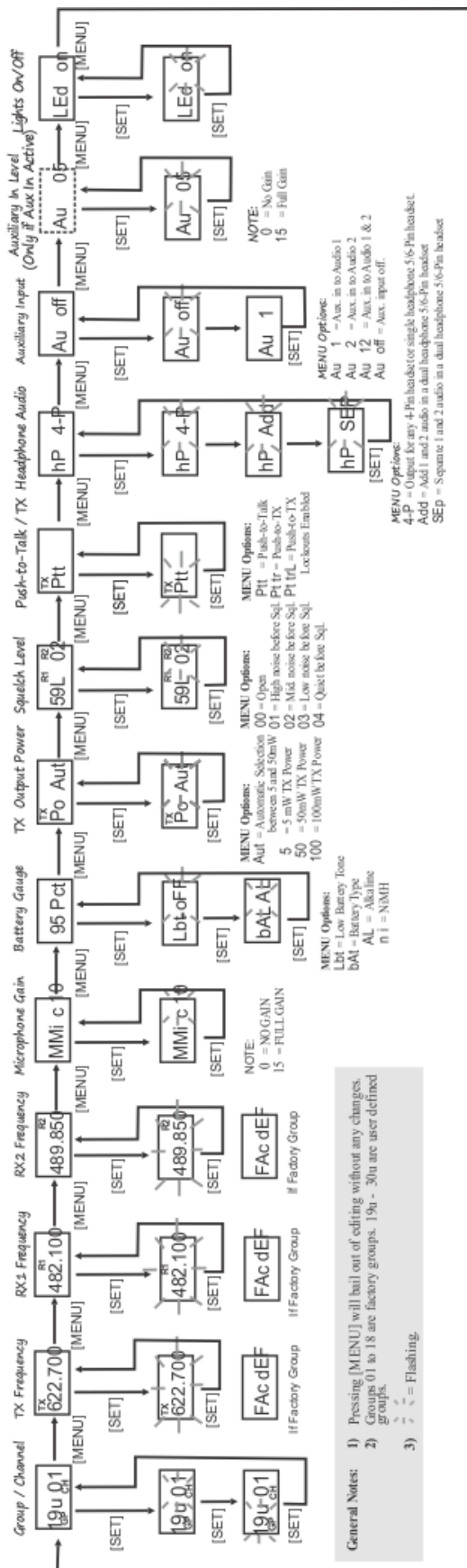4W IC1 IN:
4W IC1 OUT:

On

<SET>

NOTE: Group/Channel Selection to operate just like BTR-800

Group/Channel Select

Group 25u
B   50mW
T2   50mW

<SET>

Base Main
<SET>

→ Local Headset
   Tx Power
   Squelch Settings
   More...

SA Level   :
Antenna Pwr: Off
Base No : 01 Master

Intercom Settings
<SET>

↑ 2W Intercom
   4W Intercom

Aux Settings
<SET>

IC1 Aux Mode: Global
IC2 Aux Mode: Local
Aux In:
Aux Out:

<SET>

GP/CH Select
<SET>

<MENU> → GP_CH Select
   Base Main
   Intercom Settings
   Aux Settings

<MENU>

<MENU> Does
NOT set results

<SET> Does
set results

Group 01A 01 05 09   07 11
OK?=[SET] 02   10
   Prev   04 08 12
   ← Next

Display
Contrast
Adjust

↑ OR ↓

<MENU> + <UP>
For quick frequency
display / edit

Status Screen

Group 25u   M
B3   50mW
T1   50mW
T2

RSSI Screen

RSSI   R1
Level   R2   R3
     R4 OFF

Status Screen

Group 25u   R1   Ch1
   R2   Ch12
   R3   SA
   R4   OFF

B30001

screen

Held for 3
s to enter.

<MENU>
+
<SET>
hold for 3 seconds

NOTE: From any screen

ClearScan ™

Key Sequences:
Lockout: Press and hold <UP> + <DOWN> for 2 seconds.
Copy: Press and hold <SET> + <DOWN> for 2 seconds.
1st Use Default: Press <MENU> while turning on the base station.
Factory Default:Press and hold <MENU> + <SET> + <UP> + <DOWN> for 2 seconds.

E: After holding the button for 2 seconds, the screen will change to the desired screen before the
release.

NOTES:

1. If editing any screen, pressing <MENU> once, ends editing without saving changes, and displays current screen with nothing flashing. The only exceptions are the Group/CH, Group/Freq, and Freq. Edit screens where a <MENU> press does save frequencies and places unit on those frequencies.

2. Pressing <MENU> in any screen where no editing is occurring returns unit to status screen.

3. If an entry is set to "off" that has level setting values following, skip the level settings.

4. Status screen RX options: OFF, No Tx, Ch 1, Ch 2, Ch12, WT 1, WT 2, WT12, SA

5. TX power options: Off, 10, 50, 100, 249mW
6. Antenna power options: On, Off
7. 2W Intercom types: Telex, RTS, Clear-Com, Off
8. 2W Intercom channels: On, Off
9. Aux IC Mode options: Off, Local, Global
10. 4W IC1 and IC2 options: On, Off
11. All screens default to status screen after 5 minutes except RSSI screen. If RSSI screen is selected the unit stays on that screen until user switches it back.

TR-80N Beltpack Screen

Flowchart

TR-80N Beltpack Screen Flowchart

TR-82N Beltpack Screen Flowchart

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TR-82N Beltpack Screen Flowchart

General Notes:
1) Pressing [MENU] will bail out of editing without any changes.
2) Groups 01 to 18 are factory groups. 19u - 30u are user defined groups.
3) ˙¸˙ = Flashing.

Group / Channel — 19u 01
TX Frequency — 622.700 — MENU Options: If Factory Group
RX1 Frequency — 482.100 — If Factory Group
RX2 Frequency — 489.850 — If Factory Group
Microphone Gain — MMic 10 — NOTE: 0 = NO GAIN, 15 = FULL GAIN
Battery Gauge — 95 Pct — MENU Options: Lbt = Low Battery Tone; bAt = Battery Type; AL = Alkaline; nⁱ = NiMH
TX Output Power — Po Aut — MENU Options: Aut = Automatic Selection between 5 and 50mW; 5 = 5 mW TX Power; 50 = 50mW TX Power; 100 = 100mW TX Power
Squelch Level — 59L 02 — MENU Options: 00 = Open; 01 = High noise before Sql; 02 = Mid noise before Sql; 03 = Low noise before Sql; 04 = Quiet before Sql
Push-to-Talk / TX — Ptt — MENU Options: Ptt = Push-to-Talk; Pttr = Push-to-TX; PttL = Push-to-TX Lockouts Enabled
Headphone Audio — hP 4-P — MENU Options: 4-P = Output for any 4-Pin headset for single headphone 5/6-Pin headset; Add = Add 1 and 2 audio in a dual headphone 5/6-Pin headset; SEp = Separate 1 and 2 audio in a dual headphone 5/6-Pin headset
Auxiliary Input — Au off — MENU Options: Au 1 = Aux. in to Audio 1; Au 2 = Aux. in to Audio 2; Au 12 = Aux. in to Audio 1 & 2; Au off = Aux. input off.
Auxiliary In Level (Only if Aux In Active) — Au 05 — NOTE: 0 = No Gain, 15 = Full Gain
Lights On/Off — LEd on

Special Key Functions

Tx Power and Rx1/ Rx2 RSSI — Hold [MENU] for 2 seconds — h 3 5 — Press [MENU] to exit to normal menus. Function: Display current TX power of unit. H = 100mW, h = 50mW, Lo = 5mW, -- = Off. Displayed bar 1 and 2 signal strength 0 – 5. 0 = Clear, 5 = Strong Signal

Beltpack Identification — Hold [↑] for 2 seconds — d 1-1 — -d--1-1 — Press [MENU] to exit to normal menus. Function: View ID assigned to beltpack by base station. May also be used to change beltpack ID.

Software Band Software Version — Hold [↓] for 2 seconds — bnd F — O00002 — Displayed for 1 second. Displayed for 1 second or when [↓] released. Back to normal menu.

Clear Scan — Hold [MENU] + [SET] for 2 sec. — CLr Sch — 01A 01 — After 8 seconds best group selected [SET] — 01A 01 — [SET] — 01A 01 — Group / Channel Screen

Talk Button Options — Hold [SET] and press [TALK] — 1 Lon — 1 oFF — 1 on — [TALK] — Function: Talk button operation. Lon = Talk Latch on; oFF = Talk off; on = Momentary on

Stage Announce (SA) — Hold [SET] and press [SA] — SA on — SA oFF — [SA]

Wireless Talk Around (WTA) — Hold [SET] and press [WTA] — tA Pb — Options in menu: Pb = Push button; 1L = Audio 1 Latch; 2L = Audio 2 Latch; 12L = Audio1 &2 Latch; PbL = Push button Latch; oFF = WTA disabled; 1 = Audio 1 M; 2 = Audio 2 M; 12 = Audio 1&2 M

Lockout — Hold [↑] + [↓] for 2 seconds — Loc on — Hold [↑] + [↓] again for 1 second — Loc oFF — Function: Menu items can be viewed but not changed when activated.

1st Use Default — Hold [MENU] as powering-up unit — 01A 01 — Sets unit to Group 01A, Channel 01, with 01 flashing. User must set channel number. Set unit to defaults. All user defined groups retained.

Factory Reset Default — Hold [MENU] + [SET] + [↑ ↓] for 1 second — FAc rEb — 01A 01 — Sets unit to Group 01A, Channel 01, with 01 flashing. User must set channel number. Set unit to defaults. All user defined groups erased.

Frequency Bands

The BTR-80N system operates over the following frequency ranges:

North America

- Base TX: 482-608 MHz
- Base RX: 572-608 MHz, US 3 Band: 653-663 MHz

Europe

- Base TX: 482-608 MHz
- Base RX: 572-608, 614-722 MHz

The bands, US TV channels, and frequencies are shown in Figure 81. Most bands are 18 MHz wide.

Bands F to C are always base transmit bands (beltpack receive bands). Bands 1-6 are always base receive bands (beltpack transmit bands). Bands D and E can be both a base transmit or receive band, depending on the unit ordered. Thus an A2 base station is comprised of an A band transmitter and a two (2) band receiver.

Band Pairing for Systems

All band pairs cannot be made into a system. Table 3 show the available band pairings.

Base TX Bands	Base RX Bands
F	D, E, 1, 2, 3, 4, 5, 6
H	E, 1, 2, 3, 4, 5, 6
A	1, 2, 3, 4, 5, 6
B	2, 3, 4, 5, 6
C	3, 4, 5, 6
D	4, 5, 6
E	5, 6

TABLE 3. Available band pairings

In Table 3, it can be seen that a C base station transmit band can be paired with 3, 4, 5, or 6 receive bands. However, a C2 unit cannot be made. This is because a certain amount of frequency separation between transmit nad receive bands is required for good transmit and receive operation. If they are too close the RF performance of the system is reduced.

FIGURE 81. Band Names Frequencies and US TV Channels

Band	US TV	Freq. Start	Freq. End	US TV
F	16	482	488	16
	17	488	494	17
	18	494	500	18
H	19	500	506	19
	20	506	512	20
	21	512	518	21
A	22	518	524	22
	23	524	530	23
	24	560	536	24
B	25	536	542	25
	26	542	548	26
	27	548	554	27
C	28	554	560	28
	29	560	566	29
	30	566	572	30
D	31	572	578	31
	32	578	584	32
	33	584	590	33
E	34	590	596	34
	35	596	602	35
	36	602	608	36
	37	608	614	37
1 EURO ONLY	38	614	620	38
	39	620	626	39
	40	626	632	40
2 EURO ONLY	41	632	638	41
	42	638	644	42
	43	644	650	43
3 EURO ONLY & US (10MHz)	44	650	656	44
	45	656	662	45
	46	662	668	46
4 EURO ONLY	41	668	674	47
	48	674	680	48
	49	680	686	49
5 EURO ONLY	50	686	692	50
	51	692	698	51
	52	698	704	52
6 EURO ONLY	53	704	710	53
	54	710	716	54
	55	716	722	55

Frequency Plan

There are 48 groups in a BTR-80N system. The 48 groups are divided up into 36 factory-defined groups and 12 user-defined groups. A group referenced to a base station is comprised of two TX channels and up to 12 RX channels.

User-defined groups are blank initially and allow the user to enter their own frequencies.

Factory-defined groups are composed of frequencies that cannot be modified by the user. The 36 groups are composed of the following:

    Nine (9) Triplet Groups

      – Groups 1a to 9c

    Nine (9) Single Groups

      – Groups 10-18

The factory groups are organized in different ways to provide flexibility to the user on selecting frequencies. A groups is composed of intermodulation free frequencies. The triplet groups may be used together for up to three (3) systems that are intermodulation coordinated. For example, three intermodulation coordinated systems may be set up by using the following groups and channels:

- System A = Group 1a, channels: 1, 2, 3, 4
- System B = Groups 1b, channels: 5, 6, 7, 8
- System C = Group 1c, channels: 9, 10, 11, 12

A group also contains frequencies within different combinations of the TV channels. The user can select a group clear of broadcast Tv channels in the area by selecting a group(s) not using those channels.

Figure 82 indicates how the factory-defined groups used the three (3) TV channels for TX and three (3) TV channels for receive. These plans are based upon US broadcast TV channels. A darkened TV channel indicates the group has frequencies in the channel. The white TV channel indicates the group has no frequencies in the channel. For example, Group 1A uses at least one (1) frequency from each of the three (3) TV channels for RX and only the 1st TV channel for TX. However, group 18 uses only the 3rd TV channel for TX and RX.

Three band base stations and beltpacks used in the US have a reduced channel map offering due to regulatory changes that reduce the size of the three bands.

For more information, see "Three (3) Band Base Stations" on page 86.

	Base TX Freq.			Base RX Freq.		
	TV1	TV2	TV3	TV4	TV5	TV6
1a	■			■	■	■
1b	■			■	■	■
1c	■			■	■	■
2a		■		■	■	■
2b		■		■	■	■
2c		■		■	■	■
3a			■	■	■	■
3b			■	■	■	■
3c			■	■	■	■
4a	■			■	■	
4b	■			■	■	
4c	■			■	■	
5a		■		■	■	
5b		■		■	■	
5c		■		■	■	
6a			■	■	■	
6b			■	■	■	
6c			■	■	■	
7a	■			■		■
7b	■			■		■
7c	■			■		■
8a		■		■		■
8b		■		■		■
8c		■		■		■
9a			■	■		■
9b			■	■		■
9c			■	■		■
10	■			■		■
11		■		■		■
12			■	■		■
13	■			■	■	■
14		■		■		
15			■		■	
16	■				■	
17		■				
18			■			■

FIGURE 82.
Groups and Tv Channels Used

Dark = TV used
Light = TV not used

Troubleshooting

PROBLEM	SOLUTION
DISTORTION - System's audio quality seems distorted at medium to high input levels	Reduce microphone gain by adjusting microphone gain control in software.
HISS - System seems to produce a hiss which is undesirable.	Check the gain setting on all beltpacks and the base. They may be too low or too high. Check to make sure you are still well within range of the base station.
LOW OUTPUT - System produces a low output level.	Check the gain setting on both the beltpacks and the base. They may be too low.
FEEDBACK - Moving around are of use produces squeal or howl in various locations using the ext. speakers.	Reduce the gain settings on both the beltpacks and the base. They may be too high. If in 2-wire mode, the intercom channel you are on may be unloaded.
DROPUOUTS - When moving around the area of use there seem to be locations where the signal swooshes or completely disappears.	Make sure both antennas on the base and beltpack are connected and follow the location suggestions. Change the location of the base unit and antennas or avoid the bad areas with the remote beltpacks.
INTERFERENCE - System picks up signals other than wireless intercoms.	Make sure the Telex beltpack(s) are on. If there are any unused receivers at the base, turn the audio off from those receivers by deselecting the appropriate Portable Station Connect button. If problems persist with the beltpack on, you will probably need to change the group. Make sure the base and beltpack match after any Group/Channel change.
NO AUDIO - from base of beltpack headsets.	Check transmitter setting on base and beltpack. Check talk LED to ensure it is on. Make sure beltpack batteries are OK.
BASE and BELTPACK'S Frequencies Don't Match - In the display frequencies screen of the base and the menu of the beltpack the frequencies don't match.	Ensure the units are on the correct Group and Channels. If three (3) band base and beltpack units and in the US, make sure you have switched the base station to the US channel map. See "Three (3) Band Base Stations" on page 86.

IMPORTANT: Reread the sections of this manual to make sure you completed system set-up properly.
            If you are unable to solve the problem, contact the dealer from whom you purchased the system for assistance

Battery Information

Improper battery selection, use, installation, and care are the cause of numerous wireless systems failures.

Alkaline Batteries: Alkaline batteries such as Eveready's ENERGIZER and ENERGIZER INDUSTRIAL provide the most reliable operation in wireless transceivers.

The use of low cost carbon-zinc batteries is NOT recommended.

Nickel-Metal Hydride Batteries: These batteries can save you money in the long run, as they can be recharged. Typical battery life is a little less than the length of time alkaline batteries last.

Battery Warnings

- Do not place alkaline battery packs in any battery charger. Severe charger and battery pack damage may occur!

- Batteries that have been dropped, or otherwise damaged, should not be used and should be discarded properly. Dropping batteries can crack the internal casing causing leakage or rupture resulting in personal injury or property damage!

- Insert batteries properly, with the plus (+) and minus (-) terminals aligned correctly!

- Do not mix old and new batteries, batteries of different types, or batteries of different brands. This can cause leakage or rupture, resulting in personal injury or property damage!

- Immediately remove exhausted batteries from the battery pack and dispose of properly.

- Replace all used batteries in your device at the same time.

- Do not put batteries or battery-powered devices in very warm places. Extreme temperatures reduce battery performance and may also lead to leakage.

- Use only high quality AA sized alkaline batteries in the battery packs.

- When not in use, disconnect battery pack, remove and store batteries in a cool, dry place at normal room temperature until ready to use.

- Keep battery contact surfaces clean by gently rubbing with a clean pencil eraser or cloth.

Battery Life

TR-80N

Alkaline, 11-13 hours typical

Nickel-Metal Hybrid, 10-12 hours typical

TR-82N

Alkaline, 8-10 hours typical

Nickel-Metal Hybrid, 7-9 hours typical

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Cold Temperatures and Batteries

The battery life times listed in this section are at room temperature. Alkaline and Nickel-Metal Hydride battery service hours fall off significantly at low temperature due to battery chemistry. Alkaline batteries typically have less than half their room temperature service life if used at freezing 32° F (0° C). If you use Alkaline and Nickel-Metal Hybrid batteries at low temperatures, you need to change them more often.

Another solution is using Lithium AA cells if beltpacks are to be used in very cold temperatures. Lithium batteries, like the Energizer ultimate Lithium AA cells, are excellent batteries for cold temperatures. At 15° F (-9° C), Lithium AA cells will last about seven (7) times longer than Alkaline batteries. This equates to two (2) hours for Alkaline vs. 14 hours for Lithium. However, the trade off is Lithium batteries cost more and are less environmentally-friendly than Alkaline batteries.

2-Wire Systems Specification

RTS

Input Impedance: 200 Ω
Output Level: 0.775 Vrms nominal
Bridging Impedance: >10kW
Call Signaling:
    Send: 20kHz ±100 Hz, 240 mVrms
    Receive: 20kHz ±800 Hz, 100 mVrms
Power Voltage: 28.0 VDC nominal

COMMON

1   2   AUDIO 1 PLUS POWER

3   AUDIO 2

MALE

**Telex/
AudioCom**

Input Impedance: 300 Ω
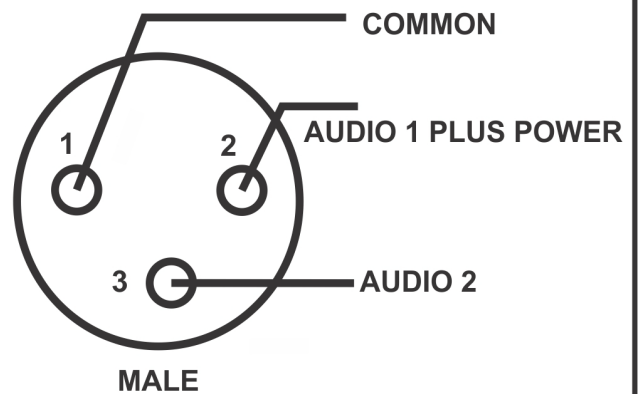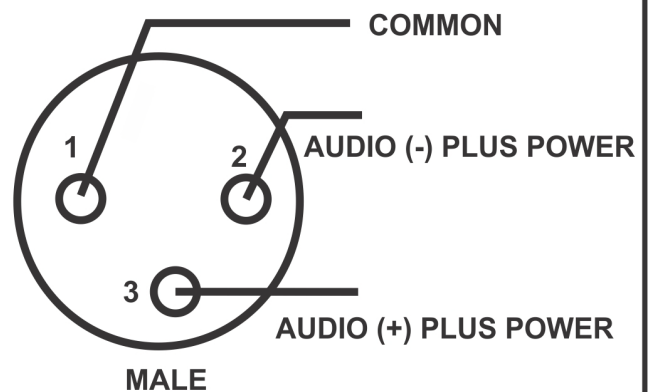**Output Level:** 1.0 Vrms nominal
Bridging Impedance: >10kW
Call Signaling:
    Send: 20kHz ±100 Hz, 0.5 mVrms
    Receive: 20kHz ±800 Hz, 100 mVrms
Power Voltage: 24.0 VDC nominal

COMMON

1   2   AUDIO (-) PLUS POWER

3

AUDIO (+) PLUS POWER

MALE

ClearCom

Input Impedance: 200 Ω
Output Level: 1.0 Vrms nominal
Bridging Impedance: >10kW
Call Signaling:
    Send: 12 ±3 VDC
    Receive: 4 VDC Minimum
Power Voltage: 30.0 VDC nominal

COMMON

POWER

1   2

3   AUDIO

MALE
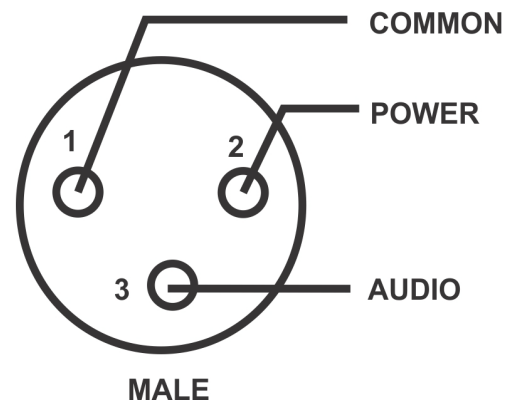
Certificate Information

FCC

The RTS BTR-80N, TR-80N, and TR-82N Transmitter/receiver are type accepted under United States (FCC) Federal Communications Commission Part 74, Licensing of this equipment is the user's responsibility and licensability depends on the user's classification, user's application, and frequency selected. RTS strongly urges the user to contact the appropriate telecommunications authority for any clarification.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This wireless microphone system can be configured for both FCC Part 15 (unlicensed) and FCC Part 74 (licensed) operation. When shipped from the factory, this wireless microphone system is configured for unlicensed operation, and will operate at a power level not to exceed 50 milliwatts, which meets FCC Part 15 requirements. If unlicensed users operate this device in excess of 50 milliwatts, harmful interference may result and the unlicensed user will be subject to substantial monetary forfeitures and other FCC sanctions. The wireless microphone system may be operated by holders of a valid FCC license in the Low Power Auxiliary Radio Service under Part 74 of FCC Rules, at power levels between 50 milliwatts and 250 milliwatts.

CAUTION: Changes or modification of equipment made by the user could void the user's authority to operate this equipment.

The beltpack is intended to be worn on the belt of the user with both antennas vertical for best operating range and performance. Placing the beltpack in other locations on the body may reduce performance and void the user's authority by the FCC to operate the equipment.

Mandatory Safety Instructions
to Base Station Installers and Users.

1. Use only a manufacturer or dealer-supplied antenna. Antenna minimum safe distance, for a base station, as set by the FCC is 20cm. Antenna gain: zero (0) dBd referenced to a dipole.
2. The FCC has adopted a safety standard for human exposure to RF (Radio Frequency) energy, which is below the OSHA (Occupational Safety and Health Act) limits.
3. To comply with current FCC RF Exposure limits, the antenna must be installed at or exceeding the minimum safe distance (20cm) and in accordance with the requirements of the antenna manufacturer or supplier.
4. Antenna substitution: do Not substitute any antenna for the one supplied by or recommended by the manufacturer or radio dealer. You might expose people to harmful radio frequency radiation. You can contact your radio dealer or manufacturer for further information.

WARNING: Maintain a separation distance from the antenna to person(s) of at least 20cm.

You, as the qualified end-user of this radio device, must ensure the minimum separation distance of 20cm between the antenna and nearby people to satisfy RF Exposure compliance.The operation of the transmitter must satisfy the requirements of the General Population/Uncontrolled Exposure Environment for work-related use. Transmit only when people are at least the minimum distance from the properly installed, externally mounted antenna.

Industry Canada

The BTR-80N, TR-80N, and TR-82N Transmitter/receiver are certified to Industry Canada RSS-123 rules.

Licensing of this equipment is the user's responsibility and licensibility depends on the user's classification, user's application, and frequency selected. RTS strongly urges the user to contact the appropriate telecommunications authority for any clarification.

Pour se conformer aux exigences FCC et Industrie Canada l'exposition aux RF sur une distance de séparation d'au moins 20 cm (7,9 pouces) doit être maintenue entre les antennes de la station de base BTR-80N et toutes les personnes.

CAUTION: Any changes or modifications to the equipment could void the user's authority to operate the equipment.

ATTENTION: Tout changement ou modification non expressément approuvée par la partie responsable de la conformité pourraient annuler l'autorité de l'utilisateur à utiliser cet équipement.
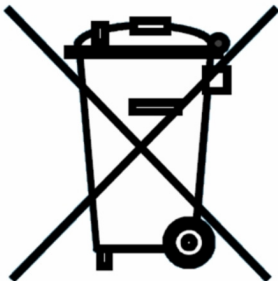
Europe

This equipment is in compliance with the following directives:

2015/863 RoHS Directive
2012/19/EU WEEE Directive
2014/53/EU RED Directive

Please dispose of the base station and beltpacks at the end of their operational life
by taking them to your closest collection point or recycling center.
DO NOT throw in the trash.

This equipment is intended for use in professional audio intercom applications.

Some countries in the EEA (European Economic Area) have restrictions placed on this equipment. Listed below are these restrictions:

The equipment requires a license in the following countries: AT, BE, BG, HR, CZ, EE, FI, DE, EL, IS, IE, IT, LV, LI, LT, LU, MT, PL, PT, SK, SE, CH, UK.

The BTR-80N, TR-80N and TR-82N must be set to meet the 50 mW ERP maximum output power in the following countries: AT, BE, CY, CZ, DK, EE, FL, FR, DE, EL, HU, IS, IT, LV, LI, LT, LU, MT, NL, NO, PL, RO, SK, SI, ES, SE, UK.

France (FR): The use of the equipment requires a license if not a professional user.

Austria (AT), Belgium (BE), and Germany (DE): Equipment may only be used in the 470-703 MHz band.

Czech Republic (CZ), Finland (FI) and Iceland (IS): Equipment may only be used in the 470-694 MHz band.

Netherlands (NL): Equipment may NOT be used in the 556-558 MHz band.

Norway (CO): Equipment may only be used in the 510-790 MHz band.

Always consult your national authority before placing equipment into operation as requirements and spectrum usage can change.

The full EC Declaration of Conformity for the BTR-80N, TR-80N and TR-82N products may be found at the following website: www.rtsintercoms.com.

Antenna Cables
Special low loss antenna
cables with TNC Connectors

Model No.	Length
CXU-10	10 ft. (3 m)
CXU-25	25 ft. (7.6 m)
CXU-50	50 ft. (15 m)
CXU-75	75 ft. (23 m)
CXU-100	100 ft.(30 m)

APS1 COMB_SPLT
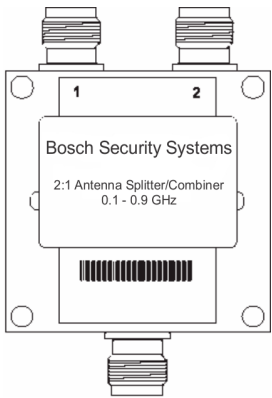
Model (CTN) No. APS1 COMB_SPLT

AB-2
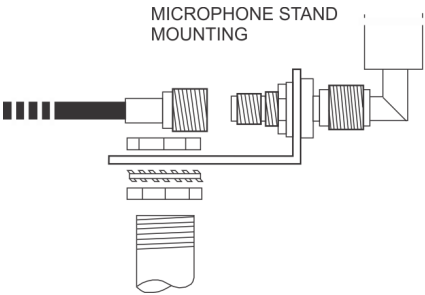
Bracket for 1/2 wave antenna with 10 ft. of coax

Model (CTN) No. AB-2

BTR Power Cords

North America	Model (CTN) No. PC-USA
U.K.	Model (CTN) No. PC-UK
European	Model (CTN) No. PC-EURO

BTR Intercom Dummy Load

Telex type	Model (CTN) No. TP-3
RTS type	Model (CTN) No. TP-3R

2TX80N Dual transmit connector kit for BTR-80N — Model (CTN) No. 2TX80N-KIT

SA Relay plug adapter — CONN, PCB 2-PIN 2MM, BLK, Printed 1-2 2862046

DC-LP Locking D.C. plug — Plug D.C. 5.5 X 2.5 650102

BLC, BTR-80N Link Cable — Model (CTN) No. BLC

CTC, BTR-80N CAN BUS Termination Cable — Model (CTN) No. CTC

CTC, BTR-80N CAN BUS 120 Ω Termination — Model (CTN) No. CAN-T

BP-700 TR Battery pack, alkaline (batteries not included) — Model (CTN) No. BP-700

BP-800NM Rechargeable 2200mAhr Nickel-Metal hydride battery pack — Model (CTN) No. BP800NM

BC-800 NM4 4-Slot Smart Charger with four (4) BP-800NM battery packs

North America	Model (CTN) No. BC800NM4
Euro	Model (CTN) No. BC800NM4E

BC-800NM Single-slot Smart Charger with BP-800NM battery pack

North America	Model (CTN) No. BC800NM
Euro	Model (CTN) No. BC800NME

Beltpack: 1/4 - Wave Antenna

Model (CTN) No.	Band Color	Frequency Coverage of Antenna	Frequency Band Designators												
			F	H	A	B	C	D	E	1	2	3	4	5	6
BPA-1	Violet	425.0 - 488.0 MHz													
BPA-2	Black	485.0 - 553.9 MHz	X	X	X	X									
BPA-3	Yellow	554.0 - 635.9 MHz					X	X	X	X					
BPA-4	Green	636.0 - 725.9 MHz									X	X	X	X	X
BPA-5	Red	726.0 - 826.0 MHz													
BPA-6	Blue	826.0 - 930.0 MHz													

Base Station: Flexible Ground Independent Dipole Antenna

Model (CTN) No.	Band Color	Frequency Coverage of Antenna	Frequency Band Designators												
			F	H	A	B	C	D	E	1	2	3	4	5	6
FA-RW-RS	Red/White	470 - 550 MHz	X	X	X										
FA-YW-RS	Yellow/White	525 - 610 MHz				X	X	X	X						
FA-GW-RS	Green/White	610 - 710 MHz								X	X	X	X	X	
FA-BW-RS	Blue/White	710 - 880 MHz													X

Three (3) Band Base Stations

Identifying a Three (3) Band Unit

Three (3) band base station normally have an 18MHz wide receive range of 650-668MHz. These three (3) band base stations are designated by having a "3" in the second digit of the two digit band code that is on a label on the rear panel of the unit.

Regulatory Changes and the Three Band

There are two channel map configurations in a three band base station. One for the US/Canada and one for the rest of the world. At one time (before October, 2018) there was only one channel map for a three band unit. but due to regulatory changes in the US/Canada an additional map was produced and installed in three band base stations. The result of the FCC incentive auction in regard to wireless intercom was the following:

- Only 10MHz (653-663MHz) may be used for wireless intercom in the range 616MHz to 698MHz.

- Three band beltpack transmit power must be reduced to 20mW EiRP for US and Canadian units.

Since the three band units are made for worldwide customers, the 18MHz range is the default shipped, therefore a US or Canadian user must set a base station to the new US channel map in order for the base's channel map to match the US three band beltpack's channel map. The US three band beltpacks only have the new US channel map in them.

NOTE: Only Canadian users of the three band base station needs to change the channel map of the base station to the US channel map!

Changing Channel Maps

A three band base station may be changed from a normal channel map to a US channel map and back again with the press of a couple of buttons. The current channel map setting is remembered by the unit even if power is removed.

1. At the base station's main operating screen press and hold [SET]+[UP] buttons until the switching band text is displayed.
    The three band map the unit is switching to will be displayed.

2. Release the buttons when switching three band text is shown.
    Unit will reboot and display one of the following channel map versions on boot:

    X30001 = Normal three band channel map

    X3U001 = US three band channel map

    (where X is the current transmit band of the base station.)