

BTR-30N, TR-30N, TR-32N *Professional Wireless Intercom System*

Operating Instructions



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WARRANTY AND SERVICE INFORMATION

For warranty and service information, refer to the appropriate web site below:

- RTS Intercoms www.rtsintercoms.com/warranty
- RTS Digital
- RTSTW
- AudioCom
- RadioCom
- Intercom Headsets




CUSTOMER SUPPORT

Technical questions should be directed to:

Customer Service Department
 Bosch Security Systems, LLC
www.telex.com

DISCLAIMER

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THE LIGHTNING FLASH AND ARROWHEAD WITHIN THE TRIANGLE IS A WARNING SIGN ALERTING YOU OF "DANGEROUS VOLTAGE" INSIDE THE PRODUCT.	CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER-SERVICABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.	THE EXCLAMATION POINT WITHIN THE TRIANGLE IS A WARNING SIGN ALERTING YOU OF IMPORTANT INSTRUCTIONS ACCOMPANYING THE PRODUCT.
MARKING DEFINITION IF ON PRODUCT.		

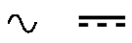
WARNING: APPARATUS SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING AND NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHALL BE PLACED ON THE APPARATUS.


WARNING: THE MAIN POWER PLUG MUST REMAIN READILY OPERABLE.

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, GROUNDING OF THE CENTER PIN OF THIS PLUG MUST BE MAINTAINED.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPRATUS TO RAIN OR MOISTURE.

WARNING: TO PREVENT INJURY, THIS APPARATUS MUST BE SECURELY ATTACHED TO THE FLOOR/WALL/RACK IN ACCORDANCE WITH THE INSTALLATION INSTRUCTIONS.

	This product is AC or DC powered.
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Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required if the apparatus is damaged in any way, such as: the power supply cord or plug is damaged, liquid is spilled or objects fall into the apparatus, the apparatus is exposed to rain or moisture, the apparatus is dropped, or the apparatus does not operate normally.

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General Description

RTS Wireless BTR-30N UHF Synthesized Wireless Intercom system offers reliable, high-performance, high-fidelity full-duplex communications delivered with minimum spectrum usage.

The BTR-30N system includes the BTR-30N frequency agile base station and up to four (4) TR-30N or TR-32N frequency agile beltacks operating in full-duplex communications. An almost unlimited number of beltacks may be used with a base station if the beltacks are in Push-To TX mode (half-duplex).

The BTR-30N system incorporates two (2) audio channel operation, permitting the beltack operator to choose between two (2) separate audio channels of communication, with the base station tracking the beltack selection. This allows the user the flexibility to create a party line and a private line within the same beltack.

The BTR-30N system is perfectly suited for standalone operation and can also interface with other RTS wired intercom systems. In addition to the external intercom systems interfaces, the system provides connections for auxiliary balanced audio input and output, as well as wireless talk-around (WTA) and stage announce (SA) features.

The BTR-30N system has been designed for reliable, efficient operation. Operating in the VHF spectrum, 174 to 216 MHz, and the UHF spectrum 482 to 572 MHz range, the units perform reliably at line-of-sight distances of 600 feet. With available antenna systems from RTS, the effective operating range can be extended. The high-efficiency beltacks provide between 8 and 11 hours of uninterrupted operation using NiMH rechargeable battery packs.

System Features

- Base RX and Beltack TX is in the VHF range, greatly reducing the system's footprint in the congested UHF spectrum.
- Frequency-agile base station and beltacks. No external computer/device required to select frequencies.
- Backlit base-station LCD allows the user to easily monitor the beltack's status and change base station frequencies.
- Squelch adjust on the BTR-30N, TR-30N, and TR-32N beltacks.
- Beltack's battery level displayed on the base station and in beltack's menus.
- ClearScan function on base station and beltack to automatically find the best channels on which to operate.
- Full-duplex (simultaneous talk and listen) or Push-to-Tx (half duplex) operation.
- Compatible with Audiocom (Telex), RTS TW and Clear-Com wired intercoms.
- Two (2) independent channels of intercom audio with the ability to operate party line and RTS matrix on the same intercom channel at the same time.
- WTA (Wireless Talk-Around) beltack control. This feature allows beltacks to talk to each other, but their audio is lifted from any wired system connected to the base station.
- SA (Stage Announce) beltack control. Allows the user to direct their audio to a jack on the back of the base for P.A. systems or other external audio systems.
- Relay contact closure on the base when the SA button is pressed.
- TR-32N features two (2) audio channel binaural operation in either stereo or mono mode.
- TR-32N has a 1/8-inch (3.5mm) jack for auxiliary input from another audio source, such as an IFB, iPod, or other similar device.
- Beltack units contained in a weather and shock resistant die cast magnesium case.
- Convenient IEC power connector on the base station so the unit can plug directly to outlets. No in-line or wall plug power supply.
- Dark mode configurable on TR-30N and TR-32N beltacks. This shuts down all LEDs.

Controls and Connections

BTR-30N – Front Panel

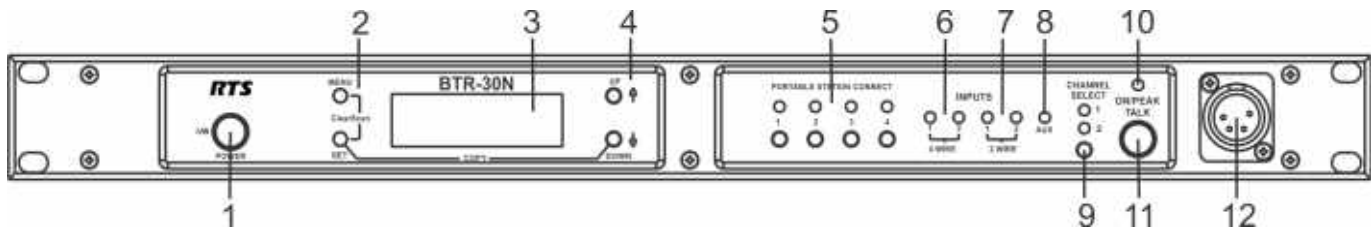


FIGURE 1. BTR-30N - Front Panel

1. **Power Switch** - Do not power up a base station within three (3) seconds of the unit being turned off. Voltages within the unit need to drop below a threshold before being repowered. If powered-up in less than three (3) seconds, the unit may boot as the wrong frequency band. Even with the unit powered down via the power switch, some circuits within the base remain energized. To completely remove power to the unit, disconnect the power cord.
2. **[MENU] and [SET] buttons** - Use to select menus and set options on the LCD.
3. **Backlit Graphics LCD (Liquid Crystal Display)**
4. **[UP] and [DOWN] buttons** - Use to select base station options on the LCD.
5. **Portable Station Connect** - Use buttons to enable or disable the respective receiver's audio. GREEN LED - Audio enabled, LED OFF - Audio disabled.
6. **4-wire Selection/Peak Input Indicators** - Displays when 4-wire intercoms are active with green indication. A red indication means the intercom input level is too high.
7. **2-wire Selection/Peak Input Indicators** - Displays which 2-wire intercoms are active with a green indication. A red indication means the intercom input level is too high.
8. **Auxiliary Selection/Peak Input Indicator** - Displays if auxiliary input is on with a green indicator. A red indicator means the intercom input level is too high.
9. **Headset Intercom Select** - Controls the intercom to which the local headset is connected. Each press of the button changes the connection to channel 1, channel 2, or both.
10. **Talk/Peak Light** - LED is green when talk button #11 is active. A normal mic gain setting causes the LED to flash red on the loudest speech levels. If the gain is too high, the LED is red at normal speech volumes.
11. **Talk Button** - Press to enable the audio path from the local handset. LED #10 turns green when enabled. A quick press and release latches button on. If the talk function is latched on, pressing the talk button again turns it off.
12. **Local Headset Connector** - Male XLR connector or female XLR connector. A dynamic electret headset microphone is automatically detected. Microphone gain and volume are configured in the software menus.

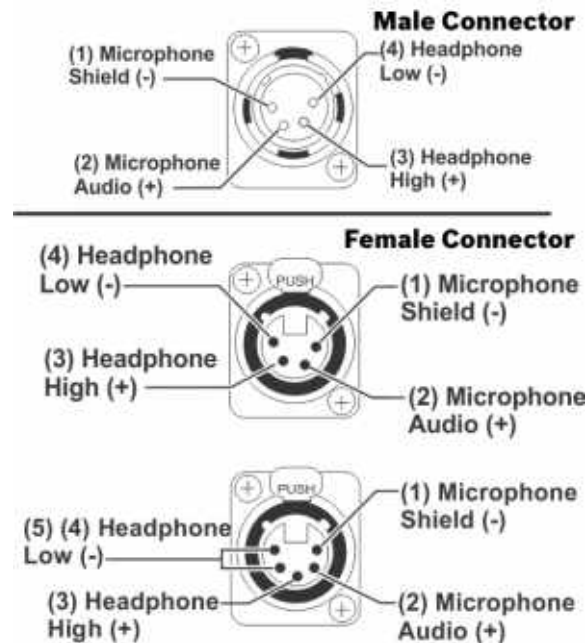


FIGURE 2. Local Headset Wiring

BTR-30N – Rear Panel

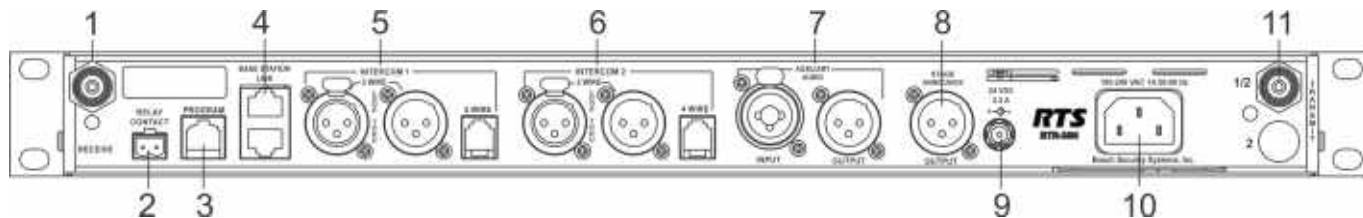


FIGURE 3. BTR-30N - Rear Panel

1. **VHF Receive Antenna** - Female “TNC” Connector. Color band on antenna must match color dot on base station.
2. **Relay Contact** - A dry contact closure which activates when a belt-pack user presses the stage announce (SA) button. Normally Open (NO). The rating is one amp at 24V maximum.
3. **Program Connector** - Used to update software in unit.
4. **Base Station Link Jacks** - When multiple base stations are connected through this jack, it allows wireless talk around (WTA) audio from the belt-packs to be routed from system to system. Also allows CAN bus data to be passed between base stations.
5. **Intercom 1** - Interface to wired intercom channel 1.
 - 2-Wire** - Male and female 3-pin XLR connectors wired in parallel. The connectors are switched to the appropriate intercom configuration via software.
 - 4-Wire** - An RJ-45 type jack compatible with Matrix type intercom systems.
6. **Intercom 2** - Interface to wired intercom channel 2.
 - 2-Wire** - Male and female 3-pin XLR connectors wired in parallel. The connectors are switched to the appropriate intercom configuration via software.
 - 4-Wire** - An RJ-45 type jack compatible with Matrix type intercom systems.
7. **Auxiliary Input/Output** - One 3-pin female XLR / 1/4-inch combination input connector and one 3-pin male XLR output connector.
8. **Stage Announce Output** - Passes the audio from any of the base station’s belt-packs that have selected Stage Announce (SA).
9. **DC Input Jack** - Accepts 24 VDC (5.5mm by 2.5mm screw on plug), 2.5 Amps to power the base station from a DC source. Base may be connected to DC and AC source at the same time. If AC source fails the base automatically switches to DC power. Inside the base there is a user replaceable fuse in-line with the DC input jack. This fuse is a 5A, 250V, 5x20mm, fast acting ceramic cartridge.
10. **Power** - IEC receptacle. Accepts 100–240 VAC, 1A maximum, 50–60Hz.
11. **UHF Transmit Antenna** - Female TNC Connector. Color band on antenna must match color dot on base station.

Specifications

Overall

RF Frequency

TX Range

482 - 572 MHz in 18 MHz TX bands

RX Range

174 - 216 MHz in two 24 MHz RX bands

Power Requirements

100 - 240 VAC, 50 - 60 Hz 1 Amp Max, IEC receptacle

DC Only

24 VDC, 2.5 Amps

Temperature Range

-4° F to 130° F (-20° C to 55° C)

Dimensions

17.5" L w/o ears, 19" L w/ears x 13.75" W x 1.75" H
(44.45 cm w/o ears, 48.26 cm w/ears x 34.93 cm x 4.45 cm)

Weight

7 lbs 8 oz (3.5 kg)

TX UHF Antenna

1/2 Wave (supplied), TNC Male Connector

RX VHF Antenna

End-fed 1/2 Wave (supplied), TNC Male Connector

Frequency Response

200Hz-4kHz

Four Wire Input

Level Adjustable (2Vrms typical)

Two Wire Input

Level Adjustable (2Vrms typical)

Telex Intercom

Input/Output Level Adjustable (1Vrms typical), Line Impedance 300Ω

RTS Intercom

Input/Output Level Adjustable (0.775Vrms typical), Line Impedance 200Ω

Clear-Com

Input/Output Level Adjustable (1Vrms typical), Line Impedance 200Ω

Auxiliary Input

Adjustable (2Vrms typical)

Auxiliary Output

Adjustable (2Vrms typical into 600Ω)

Stage Announce Output

Internally Adjustable (2Vrms typical at rated deviation into 600Ω)

Stage Announce Relay

Dry contact, rated at 1 Amp, 24V Max

Microphone Input Sensitivity

9mV

Local Headset Output

40mW output into 600Ω (1% Distortion)

Transmitter

Type

Two Synthesized Transmitters

Transmit Power (each transmitter)

Selectable: off, 10mW, 50mW, 100mW, 249mW

Modulation Type

FM

Deviation

4kHz

RF Frequency Stability

2.5PPM

Modulation Limiter

Peak-Responding Compressor

Radiated Harmonics & Spurious

Exceeds FCC specifications

Receiver

Type

Triple Conversion Superheterodyne, four Independent IFs, FM

RF Sensitivity

<0.6 μ V for 12dB SINAD

Squelch Threshold

adjustable - 12/20/24dB SINAD

IF Selectivity

6dB at 30kHz bandwidth

Image Rejection

70dB or better

Squelch Quieting

90 dB

RF Frequency Stability

2.5 PPM

TR-30N - Top Panel

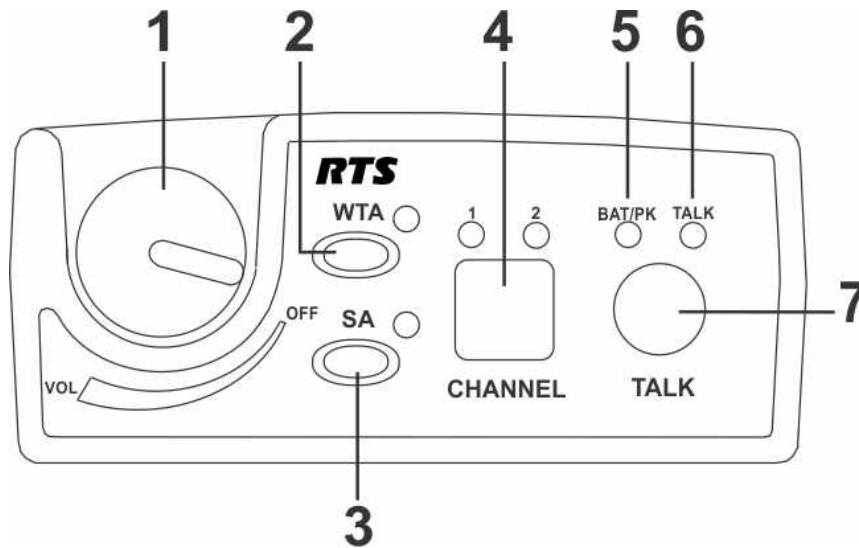


FIGURE 4. TR-30N Top Panel

1. **On/Off Volume Control** - Turns the beltpack power on.
2. **Wireless Talk-Around (WTA)** - When pressed, the user's audio disconnects from the wired intercom, auxiliary input/output and the base station's local headset. Other beltpack users on the audio channel can hear the user as normal. The button activates the nearby red LED and the TALK button.
3. **Stage Announce (SA)** - When pressed, the user's audio routes to the stage announce connector on the back of the base station. The user also loses their sidetone, indicating that stage announce is active. The other wireless beltpacks and wired users do not hear the user's audio. The button is non-latching and activates the nearby red LED and TALK button.
4. **Audio Channel Select Button** - Allows user to select either audio channel 1 or audio channel 2.
5. **Bat/Peak Light (BAT/PK)** Light flashes once when unit turns on if the battery is good. If the light stays on, the battery is low. If the light does not flash, the battery is dead. A normal microphone gain setting causes the LED to flash for some of the words at normal speech levels. If the gain is too high, the LED displays a continuous red during all words at normal speech levels.
6. **Talk Light** - LED is on when the talk button, SA, or WTA is active.
7. **Talk Button** - Press to enable the audio path from the local headset microphone. The "TALK" LED, #6, turns red when enabled. A quick press and release latches the talk function, unless latching has been disabled. Holding the button for over a half-second causes the audio path to be enabled only for as long as the button is held. If the talk function is latched on, pressing the talk button again turns it off.

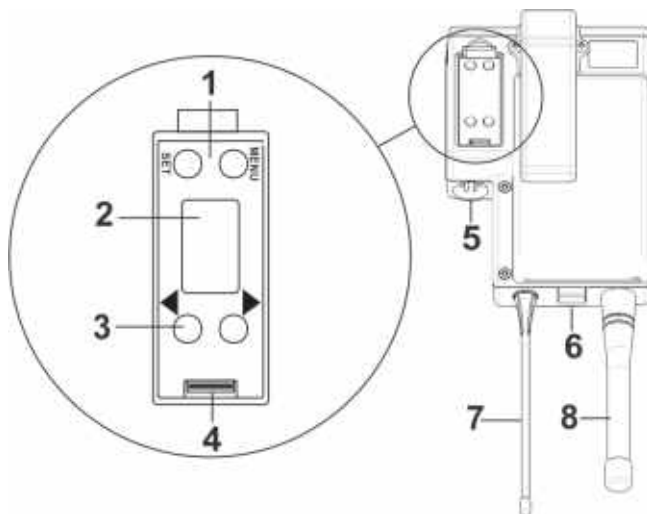


FIGURE 5. TR-30N Rear Panel/Connector/Antennas

1. **MENU and SET buttons**- Use to select menus and set options on the LCD.
2. **LCD (Liquid Crystal Display)**
3. **UP and DOWN buttons** - Use to select beltpack options on the LCD.
4. **Programming Connector** - Use to update software in unit.
5. **Headset Connector** - Male XLR or female XLR connector. A dynamic or electret headset microphone is automatically detected by the beltpack and a bias voltage supplied, if needed.
6. **Battery Latch** - Press down to release the battery pack. While holding the latch down, slide the battery pack about 1/8 inch back toward the latch until it stops, then lift it out.
7. **Receive Antenna** - Screw type 1/4-wave replaceable antenna. The color dot on the screw end of the antenna must match color dot on the antenna receptacle.
8. **Transmit Antenna** - Screw type rubber duck replaceable antenna. Color bands near the screw end of the antenna must match color dot on antenna receptacle.

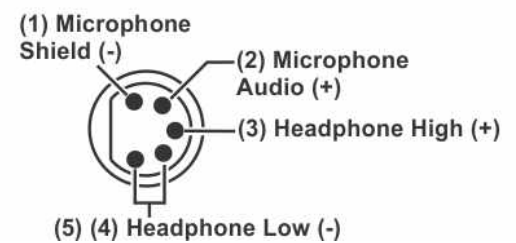
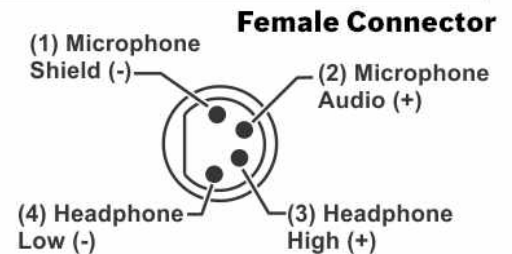
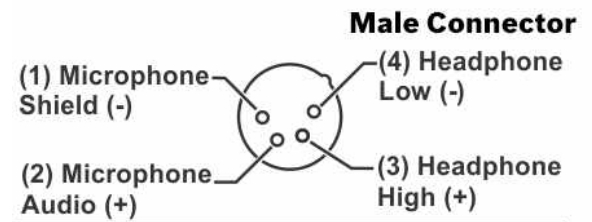


FIGURE 6. Headset Jack Wiring

IMPORTANT: Microphone gain and transmit mode is set via software menus.

Specifications

Overall

RF Frequency

TX Range

174 - 216 MHz in two 24 MHz TX bands

RX Range

482 - 572 MHz in 18 MHz RX bands

Power Requirements

6 “AA” Cells Alkaline (NiHM Optional)

Current Draw

200mA (Push-To-Talk, Talk On)

Temperature Range

-4°F to 130°F (-20°C to 55°C)

Dimensions

5” L x 6.38” W x 1.5” H

(12.7 cm x 9.22 cm x 3.81 cm)

Weight

0.95 lb (0.43 kg) with batteries

TX Antenna

Rubber duck (supplied), Screw Type, Replaceable

RX Antenna

1/4 Wave (supplied), Screw Type, Replaceable

Frequency Response

200Hz–4kHz

Microphone input sensitivity

7mV

Local Headset Output

40mW output into 600Ω (1% Distortion)

Transmitter

Type

Synthesized

Transmit Power

Selectable: auto (10 or 50 mW), 10 mW, or 50 mW

Modulation Type

FM

Deviation

4kHz

RF Frequency Stability

2.5PPM

Modulation Limiter

Peak-Responding Compressor

Radiated Harmonics & Spurious

Exceeds FCC specifications

Receiver

Type

Triple Conversion Superheterodyne, Synthesized FM

RF Sensitivity

<0.6 μ V for 12dB SINAD

Squelch Threshold

adjustable - 12/20/24dB SINAD (about 1.0 μ V)

IF Selectivity

6dB at 30kHz bandwidth

Image Rejection

70dB or better

Squelch Quieting

90dB

RF Frequency Stability

2.5 PPM

TR-32N – Top Panel

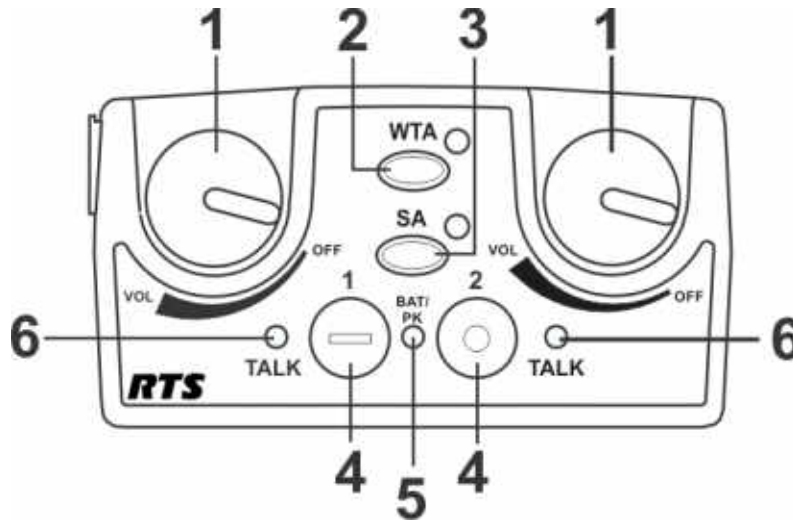


FIGURE 7. TR-32N Top Panel

1. **On/Off and Volume Control** - Turns beltpack power on and controls headset volume for intercom channels “1” and “2”. Either knob, “1” or “2”, turns the beltpack on. Both knobs must be off to turn the beltpack off. If only one knob is on, the intercom channel “1” or “2” is on for both transmit and receive.
2. **Wireless Talk-Around (WTA)** - When pressed, the user’s audio disconnects from the wired intercom, auxiliary input/output, and the base station’s local headset. Other beltpack users on that audio channel can hear the user as normal. The software can select which intercom channel(s)—1, 2, 1+2, or the currently selected channel—is activated with the WTA button. The WTA button activates the nearby red LED as well as the software-selected intercom channels TALK LED if not already active.
3. **Stage Announce (SA)** - When pressed, the user’s audio routes to the stage announce connector on the back of the base station. The user also loses their sidetone, indicating stage announce is active. The other wireless beltpacks and wired users do not hear the user’s audio. The button is non-latching and activates the nearby red LED and TALK button.
4. **Talk Button** - Press to enable the audio path to intercom channels 1, 2, or 1+2, from the local headset microphone. The associated TALK LED #6 turns red when enabled. A quick press and release latches the talk function, unless latching has been disabled. Holding the button for over 1/2 second causes the audio path to be enabled only for as long as the button is held. If the talk function is latched on, pressing the talk button again and it turns off.
5. **Low Battery/Peak (BAT/PK) Light** - Light flashes once when unit is turned on if the battery is good. If the light stays on, the battery is low. If the light does not flash, the battery is dead. A normal microphone gain setting causes the LED to flash for some words at normal speech levels. If the gain is too high, the LED displays red during all words at normal speech levels.
6. **Talk Light** - Turns red when enabled by associated TALK or WTA button.

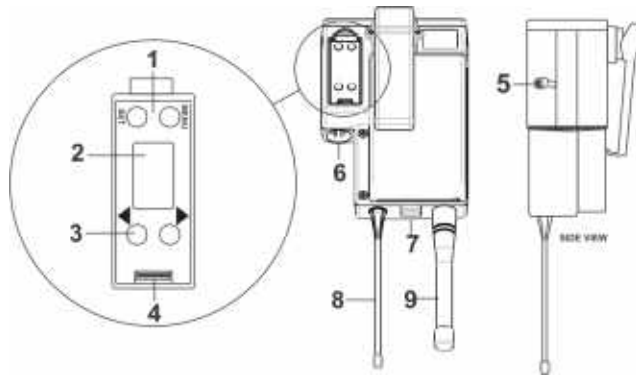


FIGURE 8. TR-32N Rear Panel/ Connector/Antennas

1. **MENU and SET buttons** - Used to select menus and set options on the LCD.
2. **LCD (Liquid Crystal Display)**
3. **UP and DOWN buttons** - Used to select beltpack options on the LCD.
4. **Programming Connector** - Used to update software in unit.
5. **Auxiliary Input Audio Jack** - 1/85" (3.5mm) mono input jack. Local only to beltpack.
6. **Headset Connector** - Male XLR connector or female XLR. A dynamic or electret headset microphone is automatically detected by the beltpack and a bias voltage supplied, if needed. 4-pin RTS units are monaural. 5-pin RTS units have a software setup to select if XLR pin 3 or 5 is the channel 2 output and if pin 3 is ground.
7. **Battery Latch** - Press down to release the battery pack. While the latch is held down, slide the battery pack about 1/8 inch back, toward the latch, until it stops, then lift it out.
8. **Receive Antenna** - Screw type 1/4-wave replaceable antenna. The color dot on the screw end of the antenna must match color dot on the antenna receptacle.
9. **Transmit Antenna** - Screw type rubber duck replaceable antenna. The color bands near the screw end of the antenna must match color dot on the antenna receptacle.

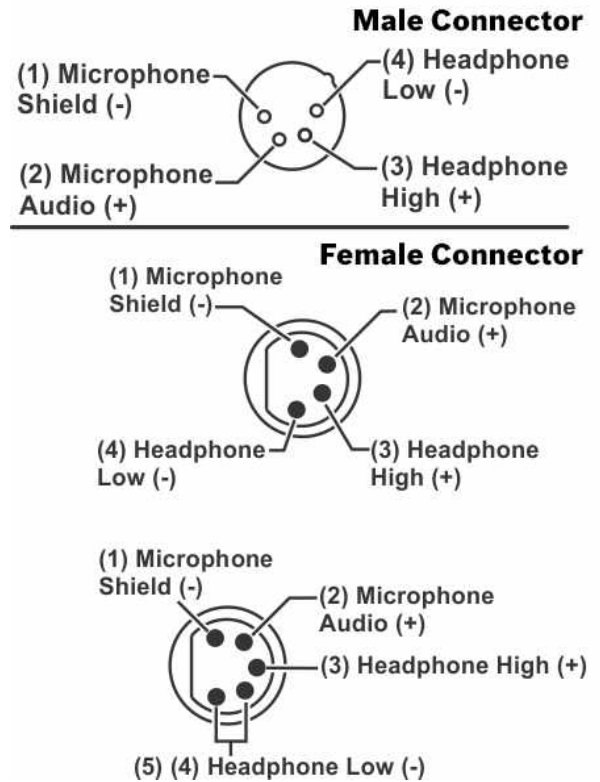


FIGURE 9. Handset Jack Wiring

IMPORTANT: Microphone gain and transmit mode is set via software menus.

Specifications

Overall

RF Frequency

TX Range

174 - 216 MHz in two 24 MHz TX bands

RX Range

482 - 572 MHz in 18 MHz RX bands

Power Requirements

6 "AA" Cells Alkaline (NiHM Optional)

Temperature Range

-4° F to 130° F (-20° C to 55° C)

Dimensions

5" L x 6.38" W x 1.88" H

(12.7 cm x 9.22 cm x 4.78 cm)

Weight

1 lb 10 oz (0.50 kg) with batteries

TX Antenna

Rubber duck (supplied), Screw Type, Replaceable

RX Antenna

1/4 Wave (supplied), Screw Type, Replaceable

Frequency Response

200 Hz–4 kHz

Microphone input sensitivity

7 mV

Local Headset Output

40 mW output into 600 Ω (1% Distortion)

Transmitted

Type

Synthesized

Transmit Power

Selectable: auto (10 to 50 mW), 10 mW, 50 mW

Modulation Type

FM

Deviation

4kHz

RF Frequency Stability

2.5 PPM

Modulation Limiter

Peak-Responding Compressor

Radiated Harmonics & Spurious

Exceeds FCC specifications

Receiver

Type

Two, Triple Conversion Superheterodyne Receivers, Synthesized, FM

RF Sensitivity

<0.6 μ V for 12 dB SINAD

Squelch Threshold

adjustable - 12/20/24 dB SINAD

IF Selectivity

6 dB at 30 kHz bandwidth

Image Rejection

70 dB or better

Squelch Quieting

90 dB

RF Frequency Stability

2.5 PPM

Unpacking

Unpack your RTS System. Below are the items that should come with your base station and each backpack.

Contact the shipper or your dealer immediately if anything is damaged or missing.

BTR-30 N

Quantity	Description
1	BTR-30N Base Station
1	Power Cord
2	Antennas (one Transmit and one Receive)
1	Warranty and Website Information Card
1	2 terminal plug (for SA Relay)
4	Rubber feet
1	Packaging Checklist
1	Simplified Declaration of Conformity

**TR-30N,
TR-32N**

Quantity	Description
1	TR-30N or TR-32N with Antennas
1	Battery Pack
1	Quick Start Card
1	Warranty and Website Information Card
1	Belt Clip
1	LCD Cover
1	Packaging Checklist
1	Simplified Declaration of Conformity

Antenna Connection

The base station is supplied with two (2) antennas. One 1/2-wave antenna for UHF transmit and one end-fed 1/2-wave for VHF receive. The antennas have TNC male connectors.

The frequency range of the antennas should match the receiver and transmitter of the base station. Match the color code on the antenna with the color code on the base station.

Attach the transmit 1/2-wave antenna to the antenna input receptacle labeled Transmit on the right side of the rear panel. The antenna should be vertically aligned.

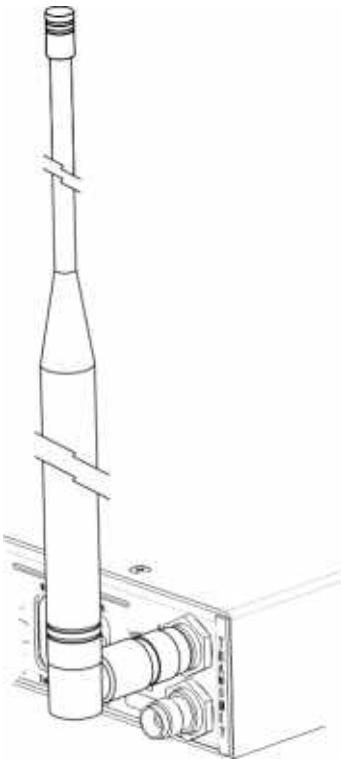


FIGURE 10. Attaching Transmit 1/2-Wave Antenna

Screw the two VHF antenna halves together. Attach the receive end-fed 1/2-wave antenna to the antenna input receptacle labeled Receive on the left side of the rear panel. The antenna should be vertically aligned.

NOTE: If needed, adjust the set screw that is near the 90 degree elbow of the antenna to keep the antenna upright.

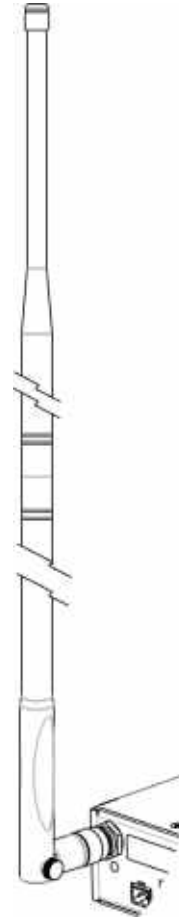


FIGURE 11. Attaching Receive End-fed 1/2-Wave Antenna

Antenna Polarization

The RTS Wireless Intercom System is vertically polarized. This means both the transmitting and receiving antennas should operate in the vertical position.



FIGURE 12. Vertically Polarized Antennas

Distance between Antennas

The distance between the base station's receive and transmit antennas is not adjustable when the antennas are connected directly on the back of the unit.

The antennas can be remotely mounted for a better signal path. An RTS coax assembly with remote antennas may be required. See "Accessory" section for ordering information.

NOTE: If your base station is to be located in a shielded rack mount enclosure or other poor RF locations, you must remotely mount the antennas with coax assemblies. See "Accessories and Replacement Parts, for remote mounting hardware.

Antenna Placement

Proper antenna placement probably has the most effect on your RTS Wireless Intercom System's overall performance. The following suggestions result in optimum performance.

Proper placement of the beltpack can be critical. The antennas should be in the open. Bending the antennas up and placing the beltpack in a pocket, etc., reduces the system's distance. The unit should be worn on the belt with both antennas vertical for best operating range and performance.

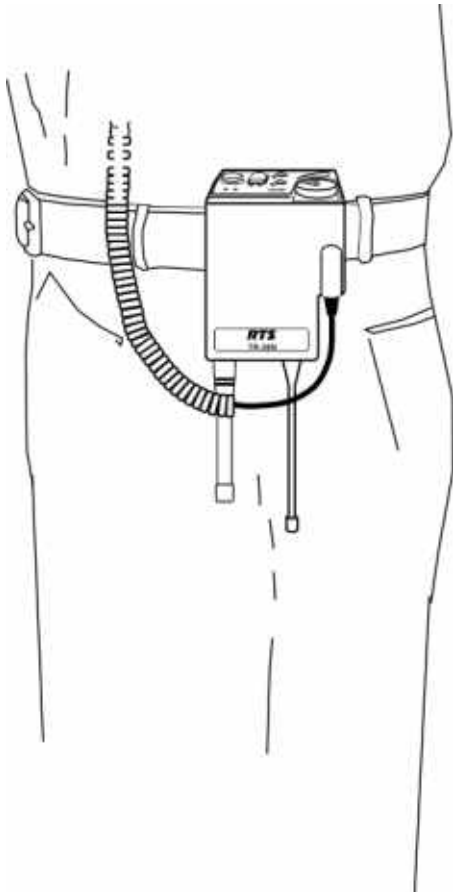


FIGURE 13. Proper Dressing of the Antenna

Keep the distance between the base station and the beltpacks as short as possible. The greater the distance, the weaker the signal. Make sure the "signal paths" between the base station and beltpacks are unobstructed. You should be able to visibly locate the base station antennas at all times for best performance.

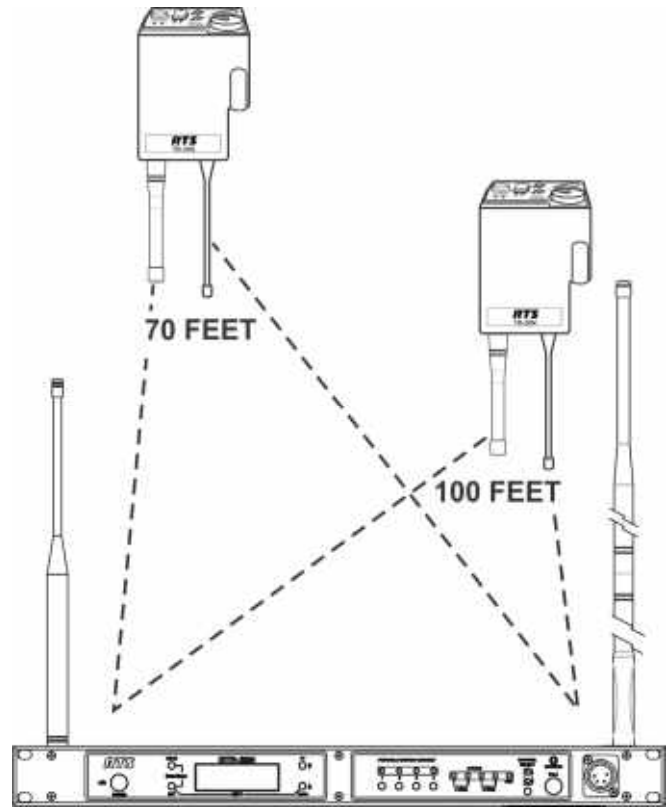


FIGURE 14. Distance Between Base Station and Beltpack

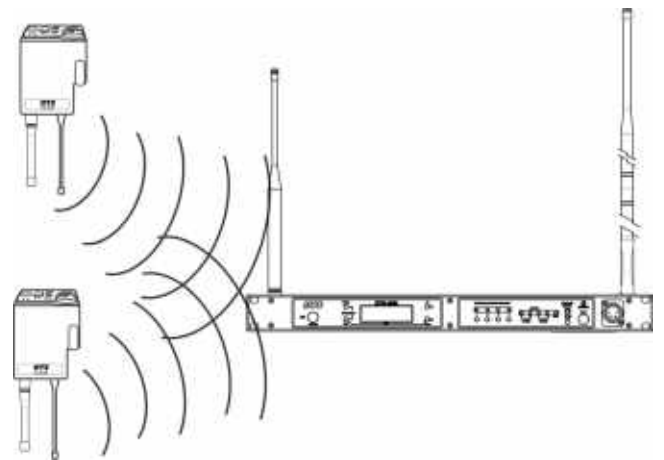


FIGURE 15. Keeping Site Clear to Antenna

Attempting to operate the wireless intercom system through or around walls, ceilings, metal objects, etc. reduces system range and performance.



FIGURE 16. Operating System Near Obstructions

IMPORTANT: DO NOT mount the base station antennas on or next to: metal, such as beams; walls with metal studs; or equipment racks, etc. This also applies to antennas assembled directly to the Base Station. Mounting antennas near metal detunes the antennas, which can result in noise or loss of RF signal at the Base Station. See Figure 17.

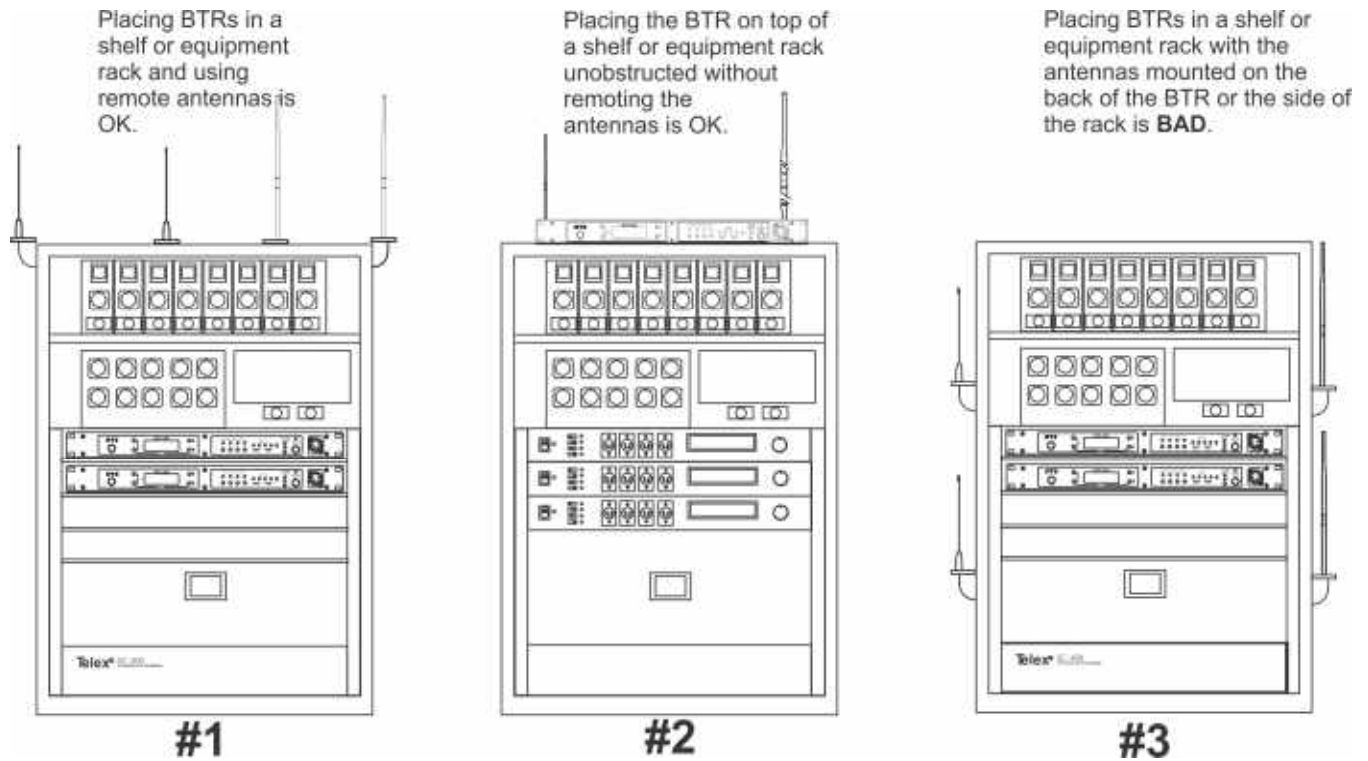


FIGURE 17. Antenna Placement

Improving Reception and Increasing Range

Keeping the distance from the base station and beltpack as short and unobstructed as possible produces the most reliable antenna performance.

The base station is supplied with two (2) antennas. This provides satisfactory system performance in most applications. System range can be enhanced by remotely mounting the antennas. The antennas are ground plane independent, so a ground plane is not required for good performance.

BTR-30N

Operation

This section discusses the operation and features of the BTR-30N base station, opening with base operation and quick system setup. It then discusses basic interfacing and setup of a base station, then ends with the connection of multiple base stations and discussion of the links between them.

Basic Operational Description

The BTR-30N narrow band wireless intercom system offers the most comprehensive, user-friendly, and versatile set of features available in wireless intercom systems anywhere in the world.

The base station accommodates up to four (4) full-duplex TR-30N or TR-32N beltacks, and can be used with an unlimited number of beltacks in push-to-TX (half-duplex) operation. In push-to-TX mode, the unit provides a First On Latch Out feature which allows only one beltack transmitter to be active at a time when multiple users are on a single base receive channel.

The base station, via the beltacks or its local headset, allows communications with other wireless or wired users. The 2-wire and 4-wire intercoms may even be used at the same time. The wired audio interfaces to the base are:

- 2-Wire (Telex, RTS, Clear-Com) - 2 intercom channels
- 4-Wire - 2 audio channels
- Auxiliary (both input and output)
- SA (Stage Announce) (output)
- WTA (Wireless Talk-Around)/ 2 channels of private 2-wire intercom among TR-30N and TR-32N beltacks
- Local base station headset

The base station also features:

- A relay closure activated when the SA button is pressed at any beltack
- Four (4) easily accessible portable connect buttons on the front panel. Use the buttons to turn off the audio from any of the four (4) base receivers while at the same time killing the talk/transmitter at the associated beltack
- 36 engineering selected, intermodulation avoiding, factory-defined groups
- The ability for users to enter frequencies of their own via 12 user-defined groups

System Quick Start

The following is a list to quickly get a base station and beltacks operating.

1. Unpack **the base**.
2. Connect the **power cord and antennas**.
3. Connect **the base** to audio interfaces, such as: 2-wire, 4-wire, SA, Auxiliary, or local headset.
4. Press and hold **MENU** while powering up the base station.
5. When the base station displays **FACTORY SETUP**, release **MENU**.
6. Unpack **the beltacks**.
7. Press **MENU** while powering up the beltack(s).
8. Using the UP and DOWN arrow buttons, change the **beltack channel** to an unoccupied receive channel on the base station.
9. Press **SET** twice to set channel and group.
The base should now display the audio channel of the beltack and a battery symbol appears shortly.
10. Plug a **headset** into each beltack.
11. Adjust the **microphone gain** in the software menu so the overmodulation light flashes only on some of the words at normal speech levels.

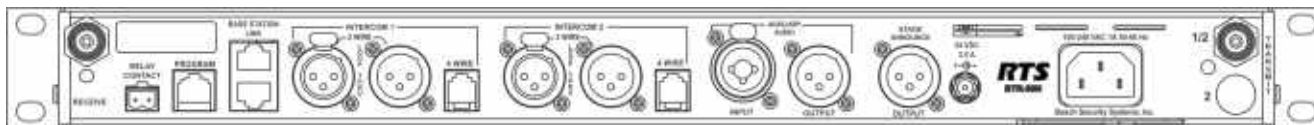


FIGURE 18. BTR-30N Rear View

Transmit and Receive Antennas

The TNC transmit jack and receiver jack are both labeled on the rear of the unit. The base station comes with two (2) antennas. Always match the color dot on the rear panel of the base station with the colored band on the antenna.

2-Wire Intercom Ports

The base station has the ability to interface with two (2) 2-wire external audio intercom systems. These XLR jacks are designated intercom 1 and 2 on the rear panel.

They accept Telex, RTS, and Clear-Com types of intercom systems. The pinouts of these standard types of intercom are shown in Figure 19.

The base station does not require wet intercom lines for operation. Wet intercom lines are those with D.C. voltages on them for powering 2-wire devices. The base loops through wet intercom lines with currents up to two (2) Amps.

WARNING: Do not loop through more than two (2) Amps of current. Damage to the base station may result.

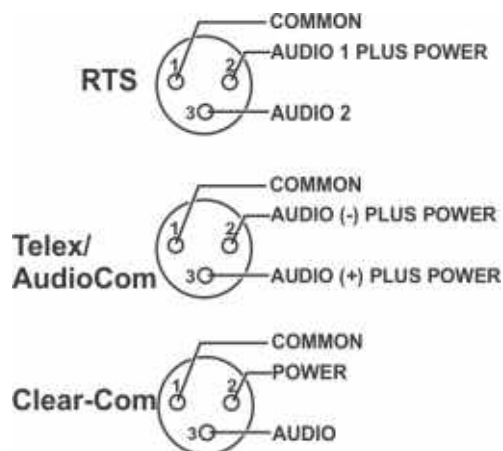


FIGURE 19. Pinouts of RTS, Telex, and Clear-Com Intercoms

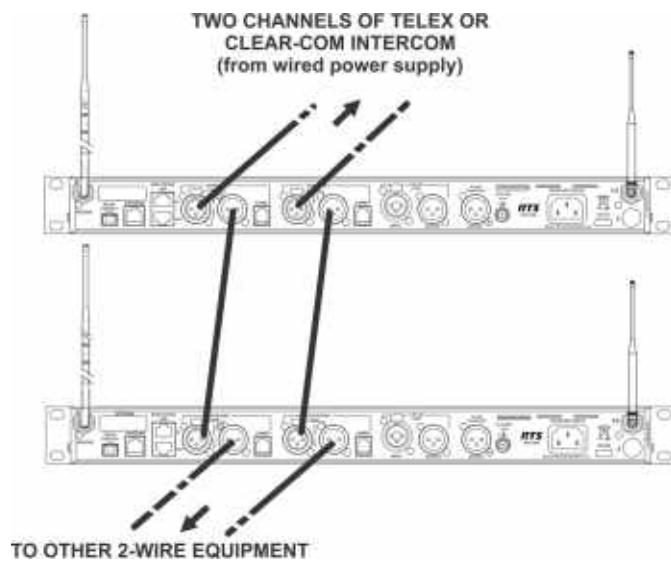


FIGURE 20. Loop-through of two base stations connected with Telex/Audiocom or Clear-Com Intercoms

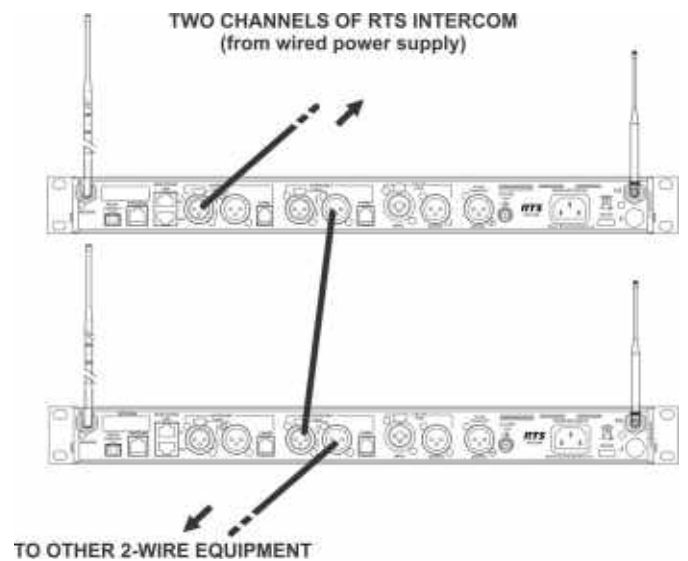


FIGURE 21. Loop-through of two base stations connected with RTS Intercoms

If multiple base stations are connected via 2-wire intercom and no 2-wire power supply is involved to terminate the 2-wire, then termination plugs for the type of 2-wire system used must be at one end of each intercom line.

Since RTS-TW carries both channels of audio on one (1) cable, the four (4) intercom **XLR connectors are connected in parallel** when RTS is selected. Thus any one (1) of the four (4) intercom XLRs may be used for RTS input. Looping through of the audio, shown in Figure 21, may also be accomplished via any of the rear panel XLRs when in FTS mode. For a description of how to set up the 2-wire ports, refer to Intercom Settings in this section. The 2-wire intercom may be used at the same time as the 4-wire intercom.

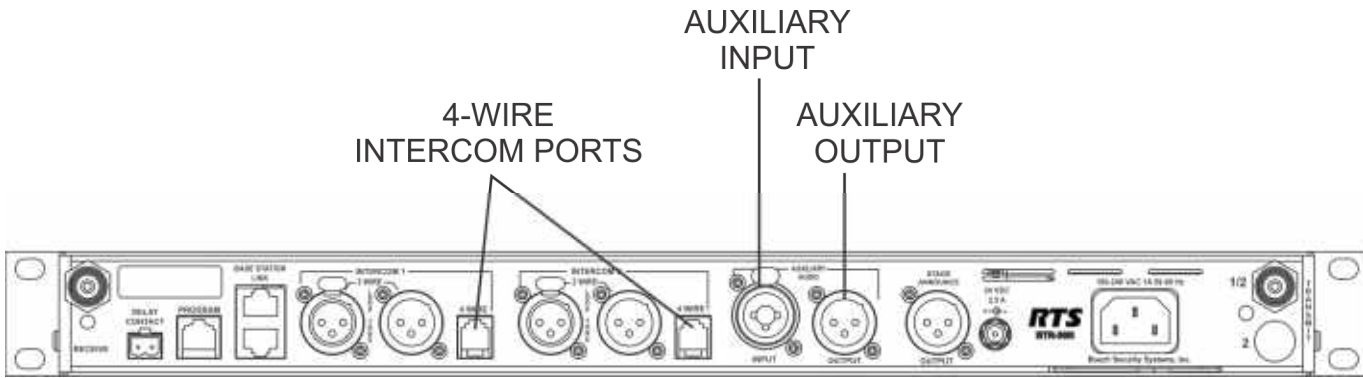


FIGURE 22. BTR-30N Rear View

4-Wire Intercom Ports

The BTR-30N can connect to two (2) 4-wire audio intercom systems. These 8-pin modular jacks (RJ-45) are designated 4-wire under intercom 1 and 2 titles on the rear panel. (See Figure 22). The jack’s pinout is shown in Figure 23.

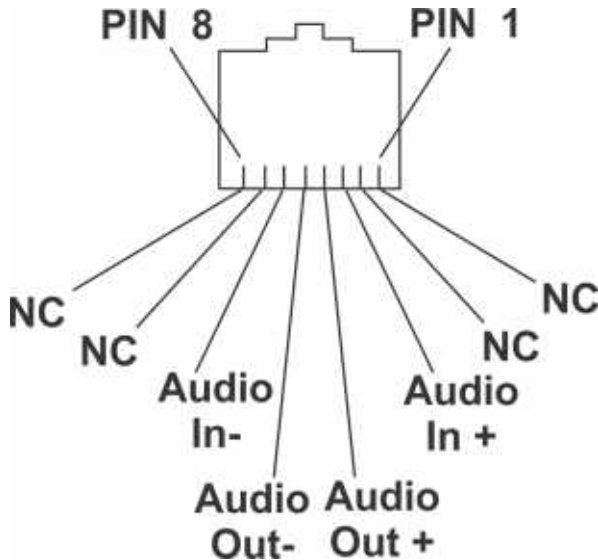


FIGURE 23. Pinout of the 4-Wire Jack

The 4-wire intercom may be used at the same time as the 2-wire intercom.

Auxiliary Input/Output

The auxiliary input jack is a combination jack. It accepts either a 3-pin XLR or a 1/4” (6.3mm) plug. The expected input is a balanced line level input. Shown in Figure 24, the XLR plug and 1/4” plug are wired in parallel

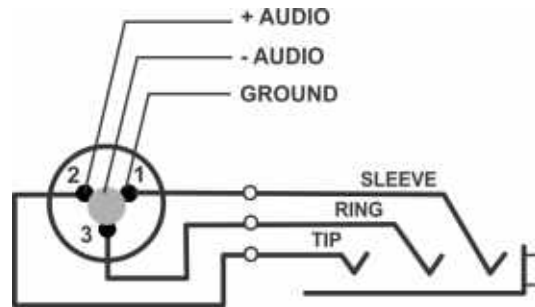


FIGURE 24. Auxiliary Input XLR and 6.3mm Jack Pinouts

The auxiliary output jack is a 3-pin XLR jack. It produces a line level balanced output. Please refer to Figure 25.

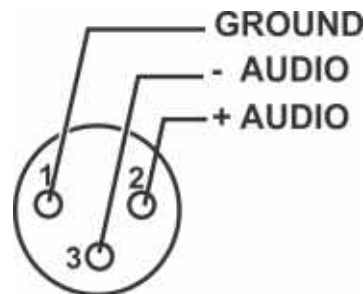


FIGURE 25. Pinout of the Auxiliary Output Jack

The auxiliary input/output can be set to local, global, or off. (See the Aux Settings menu in the base). The output level is configured in the software.

- Local Aux Input - The input audio is only heard at the base station’s local headset and beltpacks.
- Local Aux Output - The output audio is only heard at the base station’s local headset and beltpacks.
- Global Aux Input - The input audio is heard at the base station’s local headset and beltpacks and is placed on the 2-wire/4-wire intercom.
- Global Aux Output - The output audio is heard at the base station’s local headset and beltpacks and is placed on the 2-wire/4-wire intercom.
- Off - the auxiliary input and output is off.