

Synthesized Base Station Transmitter



COMTEK®

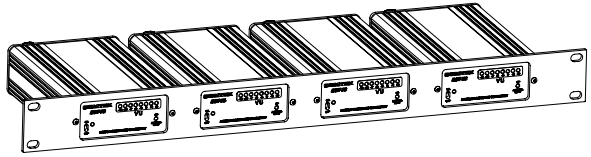
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INTRODUCTION

BST-75

Synthesized Base Station Transmitter



The BST-75 mini base station transmitter meets the highest professional standards while offering outstanding value and the most advanced technology available. This versatile and innovative transmitter is simple to use, yet it has sophisticated features such as “Flash Memory” 98-channel programmability with synthesized manual 10-channel selectable user-switch. Plus a unique multi-function R.F. indicator detects bad antenna load, RF presence, coaxial cable short or open condition for quick and easy trouble-shooting.

The compact design of this transmitter is ideal for multiple transmitter installations. Up to four transmitters can be installed in one rack space. Also, it operates in the 72-76 MHz band under FCC Regulation Part 90. This allows a greater RF power capability (120 mW) for greater range and reliability than customary FCC Part 15 systems.

The audio processing circuit produces full fidelity frequency response from 80 Hz to 10 kHz with very low residual F.M. noise and distortion. To accommodate a greater variety of receivers, the BST-75 can operate with non-companded receivers or with companded receivers for higher fidelity sound reproduction with a signal-to-noise ratio of up to 100 dB.

All this is designed into a stylish, compact, all-metal enclosure suitable for permanent rack-mount installations or for stand-alone portable applications.

OPERATING INSTRUCTIONS

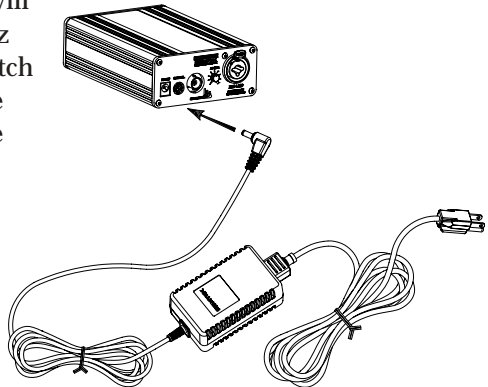
Equipment Placement

If the BST-75 base station is to be rack mounted, a remote antenna must be used. The base station should be mounted away from equipment that uses large power transformers to reduce 60 Hz hum possibilities.

Special Note: When using the base station in close proximity to other audio equipment, ensure that the audio equipment is not susceptible to RF interference. This can be accomplished by temporarily installing the base station as per above, and then while the base station is operating, checking all audio outputs for uncharacteristic noise. If a problem is found, move the base station or the remote antenna as far as possible from the affected equipment. Should you continue to have problems, contact COMTEK's Technical Support Services for assistance.

Power Requirements

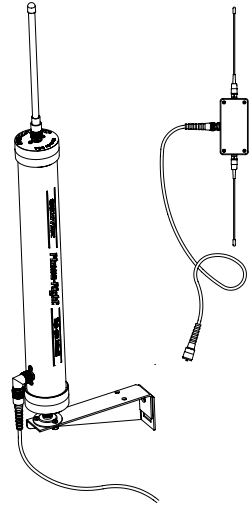
The BST-75 base station is designed to be powered by 12 volts DC. The standard barrel type power jack (5.5mm X 2.1mm) is nonpolar and will accept either plus or minus 12 volt DC on the center pin. The switching power supply adaptor supplied is a universal input type that will accept 100-240 volt, 47-63 Hz (AP-12V1B). The on/off switch on the front panel of the base station transmitter should be turned to the "off" position when the power plug is initially plugged into the transmitter.



OPERATING INSTRUCTIONS

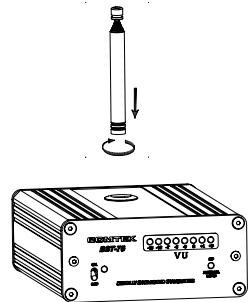
Remote Antenna

When the BST-75 base station transmitter is to be rack mounted for permanent installation, a remote antenna must be used. The RDA-2 1/4 wave remote dipole antenna (or equivalent) or the COMTEK "Phase Right Antenna" PRA-L72 high performance omni antenna should be used. These antennas must be placed vertically polarized up to twenty feet away from the transmitter with the coaxial cable supplied. The highest possible antenna placement away from any metallic objects is best. For high gain directional yagi type antennas and specialty antennas, contact COMTEK's Technical Support Services.



Integral Screw-in Whip Antenna

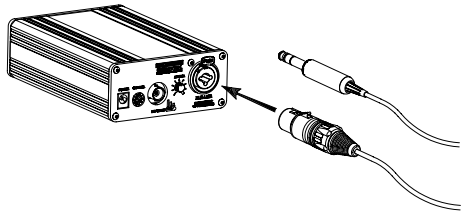
If the BST-75 base station transmitter is to be used outside of the traditional rack-mounted environment for stand-alone mobile type applications, the screw-in whip antenna (TWA-75) should be used. The transmitter should be placed on a table or platform as high as possible so the fully extended whip antenna is at least 24" away from any metallic objects. The radiated output power of the transmitter with this whip antenna will not be as great as the remote antennas. The BST-75 transmitter should only be used in the high power setting when the telescoping whip antenna is used.



OPERATING INSTRUCTIONS

Audio Input Connections

The BST-75 base station transmitter uses an XLR-3F connector with a “Combo” 1/4” phone jack. The XLR portion of the connector will accept a true balanced or unbalanced line level signal up to +20 dBm. The 1/4” phone jack portion of the connector is a dedicated input for a phantom-powered, two-conductor Electret microphone. The HM-100.25 behind-the-neck directional boom microphone is normally used for language interpretation, but any two-conductor Electret microphone may be used in this input.



Audio Adjustments

In order to ensure the highest possible transmission fidelity, the transmitter must be modulating at least 50% with normal speech (0 dB on the VU meter). This adjustment is made in the following manner:

- a. Ensure that the audio source has been optimized for best signal-to-noise ratio.
- b. The XLR-3 connector located on the back of the transmitter is used for line level balanced or unbalanced audio source (0 to +20 dBm).
- c. Set the AF Gain Control on the back of the base station to fully counterclockwise and then, while normal program information is present, slowly rotate the “LEVEL” control clockwise until the VU meter on the front panel begins to deflect. Adjustment should be made so that normal speech or music deflects the 0dB yellow LED. Only very loud speech or music should deflect the VU meter full-scale into the last red LED.

OPERATING INSTRUCTIONS

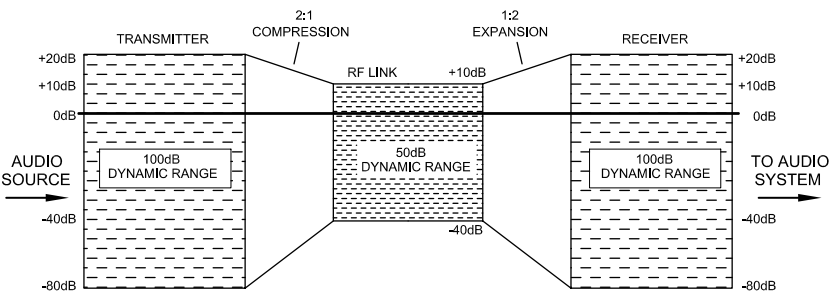
Audio Processing Circuit

The audio processing system incorporates a peak-level compressor to prevent over-modulation and reduce audio distortion at high levels. This compressor has a very fast attack time and a carefully controlled decay time to optimize the dynamic performance of the audio processing system. (The VU meter will indicate this compressor action when the red LEDs are illuminated.) The audio is also equalized to add pre-emphasis as well as a very sharp high frequency roll-off circuit to minimize high frequency noise in the audio signal. The total frequency response and performance of the system is, however, determined by the corresponding de-emphasis and equalization used in the receiver.

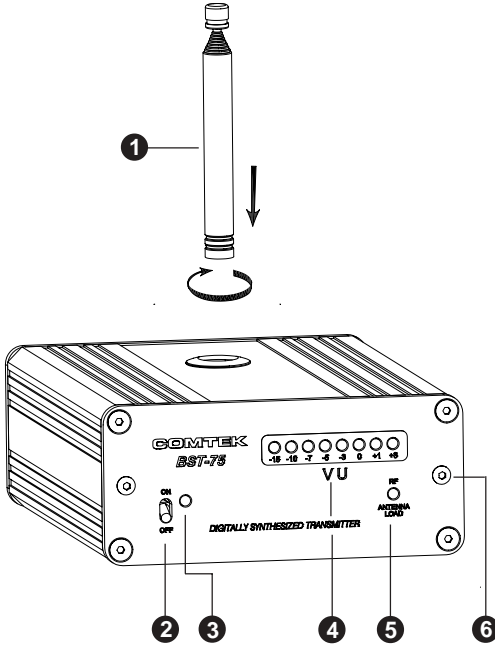
In order to accommodate a greater variety of receivers, the BST-75 transmitter incorporates the option to operate with receivers that have companded or non-companded audio processing. However, the BST-75 transmitter must operate non-companded with non-companded receivers and companded only with receivers that incorporate companding processing. A miss-match will result in unacceptable performance.

Basic Companding Theory

The dynamic range of the audio signal is compressed in the transmitter at a 2:1 ratio. The receiver then expands the audio signal at a complementary 1:2 ratio to restore the dynamic range of the audio signal to the original level and also to provide additional noise reduction when no audio signal is present.

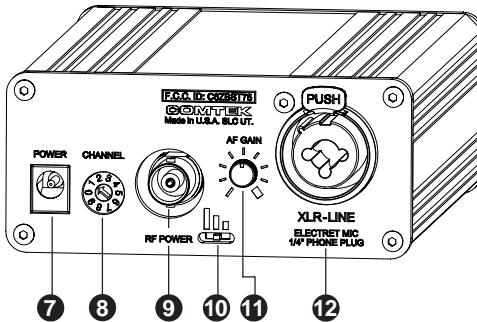


BST-75 FRONT PANEL



- ❶ **OPTIONAL ANTENNA:** Used for mobile type applications.
- ❷ **POWER SWITCH:** Turns the transmitter on or off.
- ❸ **POWER LED INDICATOR:** Illuminates when the power is on.
- ❹ **VU METER:** Displays the audio level being used for modulation. (See Audio Adjustment Section.)
- ❺ **ANTENNA INDICATOR:** Detects coaxial cable shorts and open conditions, bad antenna load, and RF presence.
- ❻ **RACK-MOUNTING SCREWS:** Used for mounting BST-75 to rack-mounting panels.

BST-75 REAR PANEL

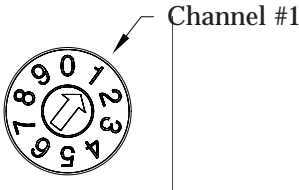


- ⑦ **DC INPUT JACK:** Requires 12 VDC at 200 mA source (Pin-1 ground, pin-4 +12 volts).
- ⑧ **TUNING SWITCH:** Selects the frequency on which the transmitter will operate. (See Frequency Information Section.)
- ⑨ **EXTERNAL ANTENNA JACK:** BNC connector provides a standard 50 ohm RF output for use with an external antenna.
- ⑩ **RF POWER SWITCH:** Adjusts the RF power output of the transmitter (High-120mW, Mid-40mW, Low-10mW).
- ⑪ **AUDIO LEVEL CONTROL:** This control is used to set the proper modulation level when referenced with the VU meter.
- ⑫ **MIC / LINE AUDIO INPUT:** XLR-3 accepts balanced line level input. 1/4" phone jack accepts 2-conductor electret microphone type only.

BST-75 FREQUENCY INFORMATION

USER-SWITCHABLE SELECTED CHANNELS (STANDARD PROGRAM)

CHANNEL	FREQUENCY
#1	72.100 MHz
#2	72.300 MHz
#3	72.500 MHz
#4	72.700 MHz
#5	72.900 MHz
#6	75.500 MHz
#7	75.700 MHz
#8	75.900 MHz
#9	74.710 MHz
#10	75.310 MHz



Frequency Selection

The BST-75 transmitter can operate on any 10 channels that have been programmed from the available 72-76 MHz frequencies of the Business Radio Service under FCC Regulation Part 90. After you have determined the channels on which you are going to operate, position the rotary switch to indicate that channel.

AVAILABLE 72-76 MHz “FLASH MEMORY” PROGRAMMABLE CHANNELS

FREQUENCY	FREQUENCY	FREQUENCY
72.020 MHz	72.700 MHz	75.390 MHz
72.040 MHz	72.720 MHz	75.420 MHz
72.060 MHz	72.740 MHz	75.440 MHz
72.080 MHz	72.760 MHz	75.460 MHz
72.100 MHz	72.780 MHz	75.480 MHz
72.120 MHz	72.800 MHz	75.500 MHz
72.140 MHz	72.820 MHz	75.520 MHz
72.160 MHz	72.840 MHz	75.540 MHz
72.180 MHz	72.860 MHz	75.560 MHz
72.200 MHz	72.880 MHz	75.580 MHz
72.220 MHz	72.900 MHz	75.600 MHz
72.240 MHz	72.920 MHz	75.620 MHz
72.260 MHz	72.940 MHz	75.640 MHz
72.280 MHz	72.960 MHz	75.660 MHz
72.300 MHz	72.980 MHz	75.680 MHz
72.320 MHz	74.610 MHz	75.700 MHz
72.340 MHz	74.630 MHz	75.720 MHz
72.360 MHz	74.650 MHz	75.740 MHz
72.380 MHz	74.670 MHz	75.760 MHz
72.400 MHz	74.690 MHz	75.780 MHz
72.420 MHz	74.710 MHz	75.800 MHz
72.440 MHz	74.730 MHz	75.820 MHz
72.460 MHz	74.750 MHz	75.840 MHz
72.480 MHz	74.770 MHz	75.860 MHz
72.500 MHz	74.790 MHz	75.880 MHz
72.520 MHz	75.210 MHz	75.900 MHz
72.540 MHz	75.230 MHz	75.920 MHz
72.560 MHz	75.250 MHz	75.940 MHz
72.580 MHz	75.270 MHz	75.960 MHz
72.600 MHz	75.290 MHz	75.980 MHz
72.620 MHz	75.310 MHz	
72.640 MHz	75.330 MHz	
72.660 MHz	75.350 MHz	
72.680 MHz	75.370 MHz	

BST-75 FREQUENCY INFORMATION

Frequency Selection

The BST-75 transmitter comes from the factory on 10 standard manually selectable channels. Other group frequencies are available from the 98 “Flash Memory” programmable channel list and have been coordinated for simultaneous operation. These group frequencies can be programmed for use with the manual 10-channel selectable user-switch. Frequency coordination and after-sale programming for different compatible frequency groups can be done through COMTEK’s Technical Support Services.

GROUP 1	GROUP 2	GROUP 3
FREQUENCY	FREQUENCY	FREQUENCY
72.020 MHz	72.080 MHz	72.260 MHz
72.220 MHz	72.180 MHz	72.580 MHz
72.720 MHz	72.720 MHz	72.790 MHz
74.610 MHz	74.770 MHz	74.250 MHz
75.620 MHz	75.580 MHz	75.840 MHz
75.720 MHz	75.920 MHz	75.960 MHz

Multiple Channel Operation

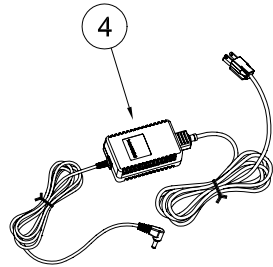
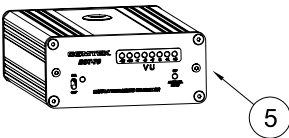
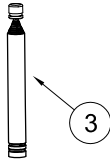
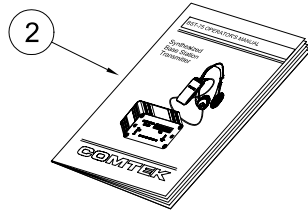
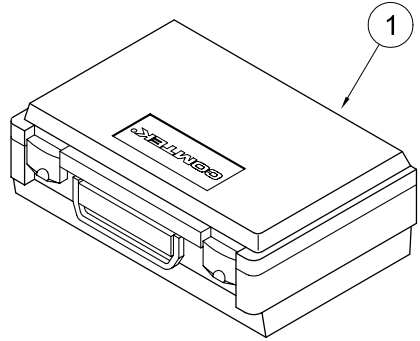
When multiple transmitters (more than two) are used in the same proximity, intermodulation interference often occurs. This condition is common to all radio receivers to some extent when multiple transmitters are used in the same operating area. The RF signals will “MIX” together generating additional signals. If these product frequencies are too close to a frequency to which the receiver can also respond, you will experience intermodulation interference which may cause undesirable operation.

To avoid this type of self-interference when multiple transmitters are used in the same proximity, transmitting frequencies must be coordinated by selecting from frequencies in the same group.

BST-75 ACCESSORIES

Included Accessories

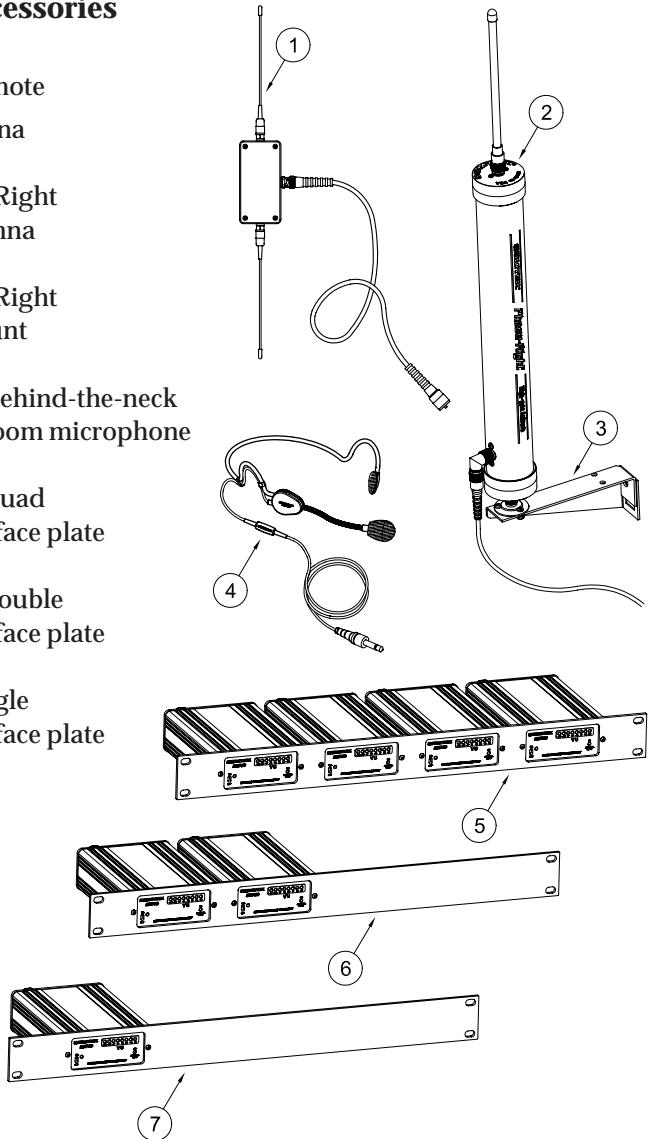
1. C-16 Carrying case
2. BST-75 Operator's manual
3. TWA-75 Telescoping whip antenna
4. AP-12V1B Power adaptor (115 VAC Input)
5. BST-75 Base station transmitter



BST-75 ACCESSORIES

Optional Accessories

1. RDA-2B Remote dipole antenna
2. PRA Phase-Right coaxial antenna
3. PRA Phase-Right antenna mount
4. HM-100.25 Behind-the-neck directional boom microphone
5. RMK 75-4 Quad rack-mount face plate
6. RMK 75-2 Double rack-mount face plate
7. RMK 75 Single rack-mount face plate



BST-75 SPECIFICATIONS

Audio Inputs:

- Line level balanced input
0 dBm for 80% modulation
(+20 dBm max)
- Electret mic unbalanced input
-25 dBV at 5 k for 80% modulation

Connectors:

- XLR-3F Combo with 1/4" phone jack
- Barrel type 5.5mm X 2.1mm DC power jack
- BNC type RF output

Operation Indicators:

- LED bargraph VU meter
- LED antenna load and coaxial cable condition indicator
- LED DC power indicator

Antenna:

- 19" Telescopic antenna mounts directly into top of transmitter
- BNC RF output connector for optional external antenna

FCC Compliance:

Type Accepted under FCC Part 90

Power Requirements:

12 Volts DC, 200 mA max

Frequency Response:

80 Hz to 10 kHz

Audio Distortion:

Less than 0.5% at 80% modulation

Modulation Limiter:

Peak compressor type with high linear overload protection (25 dB). Attack time less than 1 ms, recovery time 10 ms

Audio Processing:

Companded and non-companded to accommodate a variety of receivers

Audio Gain Control:

Limited to 20 dB

Frequency Modulation:

10 kHz deviation

RF Output Power:

Maximum power output for FCC Part 90 (120mV)

Frequency Stability:

Better than 0.002% digitally synthesized, crystal controlled

Operating Frequency:

72.020 to 75.980 MHz
(98 channels)

Harmonic and Spurious Emissions:

Better than 50 dB below carrier

Dimensions:

3 3/4" X 1 5/8" X 5 1/4" deep

Weight:

15 1/4 oz.

NOTE: Specifications subject to change without notice

WARRANTY

COMTEK warrants this product to be free from defects in workmanship and material under normal use and conditions for a period of one year from date of original purchase. Items such as batteries, neckloops, and cords are not covered by the warranty. Damage due to misuse, ill treatment and unauthorized modification and repairs are not covered by this warranty. COMTEK is not liable for consequential damages arising out of any failure of the equipment to perform as intended. COMTEK shall bear no responsibility or obligation with respect to the manner of use of any equipment sold by it. COMTEK SPECIFICALLY DISCLAIMS AND NEGATES ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF SUCH EQUIPMENT INCLUDING, WITHOUT LIMITATION, ANY WARRANTY THAT THE USE OF SUCH EQUIPMENT FOR ANY PURPOSE WILL COMPLY WITH APPLICABLE LAWS AND REGULATIONS.

Service Policies

Warranty repairs must be done by COMTEK. Only factory technicians are authorized to perform warranty service on the BST-75 transmitter. Before returning the BST-75 for service, a Return Authorization Number should be obtained from the service department by calling 1-800-496-3463 or 1-801-466-3463. Return the unit to the factory with the original or comparable packing. COMTEK will pay for insurance and ground return shipping costs in the United States for all warranty service.

COMTEK®

First Quality in Wireless Sound

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