

*Synthesized
Base Station
Transmitter*

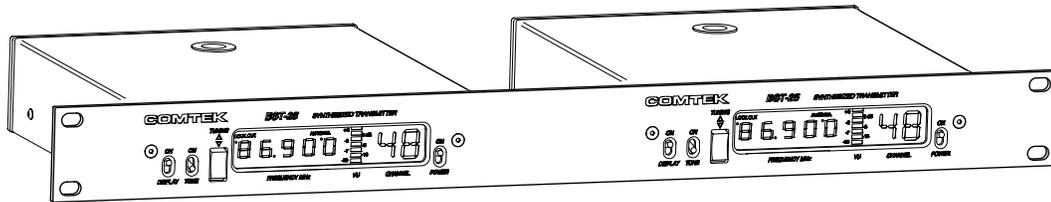


COMTEK[®]

INTRODUCTION

BST-25 / TV 5-6

Synthesized Base Station Transmitter



The BST-25 is a low power auxiliary base station transmitter designed to operate under Part 74 of the FCC Regulations in the unused TV channel 5 and TV channel 6 spectrum (76.2 to 87.8 MHz). This transmitter, along with a personal receiver, is used in a TV production studio for IFB and talent cueing. It may also be used on remote location from an ENG truck for the same application.

In motion picture production, the BST-25 is used as a low power auxiliary base station transmitter located on site with the sound recording equipment. Directors, boom-operators, and others may receive, with a personal receiver and headphone, the high fidelity transmission from the BST-25 to monitor sound track audio being recorded. This transmission, or "Confidence Channel", may also be used as an IFB for talent or crew members.

OPERATING INSTRUCTIONS

Equipment Placement

If the BST-25 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.

If the base station is to be used outside of a traditional rack-mounted environment, the screw-in whip antenna should be free of any metallic objects when fully extended.

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 application engineering department for assistance.

Remote Antenna

When the base station is rack-mounted or when greater system range is required, a remote antenna should be used. For vehicle installation, a 1/4 wave roof-mount (MO-1/4 wave or MAG-1/4 wave) should be used. For field or studio applications, the COMTEK "Phase Right Antenna" (PRA-L TV 5-6) is an easy-to-use, high performance, omni antenna. For high gain directional yagi type antennas and custom antennas, contact COMTEK's application engineering department for assistance.

Please note: Do not install screw-in whip antenna if remote antenna is used.

Power Requirements

The BST-25 base station is designed to be powered by 12 volts DC. A power adaptor is furnished for use with standard 110V AC. The on/off switch on the front panel of the base station turns on the transmitter.

Audio Input Connections

The base station transmitter has facilities for audio input from a mic, line, or speaker level source. The mic/line level audio input is a transformer balanced input and requires a standard XLR-3 male connector. Unbalanced input is accomplished by shorting pin-3 to pin-1 (audio ground), leaving pin-2 as the audio source. *Please note: when unbalanced input is used, it is recommended that all audio input cables be kept as short as possible.*

Set-up

- a. Select an appropriate location for the base station in accordance with "Equipment Placement" instructions.

- b. Set the "MIC/LINE" switch, located on the back of the base station transmitter, to the appropriate position: "MIC" position for low impedance microphones or "LINE" position for line level feed.

- c. Connect the audio source or microphone to the base station using the appropriate input. Be sure to set the audio input level adjustment on the base station to its full counterclockwise position.

OPERATING INSTRUCTIONS (continued)

d. Plug the adaptor into a standard AC outlet and plug the power connector into the DC input jack of the transmitter. Turn the display switch on the front of the transmitter "ON" to allow monitoring of the transmitter frequency. Turn the main power switch on the front of the base station to the "ON" position. The front display should now be illuminated.

e. Mount the telescoping whip antenna in the hole on top of the base station rotating it clockwise until it is firmly seated. Extend the antenna completely. During normal operation the antenna indicator should not flash. Turn on the transmitter and verify that the antenna indicator is not flashing. If the antenna indicator is flashing, shorten the telescoping whip antenna by 2 inches and again check the indicator. Continue this procedure until the indicator remains off. If you experience trouble, please contact COMTEK's application engineering department for assistance. If you are using an external type antenna, DO NOT install the telescoping antenna. Instead, connect the coaxial feed line for the external antenna to the external antenna port on the back of the BST-25.

Note:

For optimum performance when using the telescoping whip antenna, the transmitter should be placed on a large metallic surface. Adjustment of antenna length for a "No Flash" condition on antenna indicator will ensure maximum radiation.

Audio Adjustments

In order to ensure the highest possible transmission fidelity, the transmitter must be modulating at least 50% with normal speech (-3 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 "MIC/LINE" switch located at the back of the transmitter should be switched to the appropriate setting: "MIC" for mic level or weak line level input; "LINE" level for line level input.
- c. The "LEVEL" control on the back of the base station should be set 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 meter mid-scale. Only very loud speech or music should deflect the VU meter full-scale.

Frequency Selection



The BST-25 base station transmitter has the ability to operate on one of 119 preset channels between 76.200 MHz and 87.800 MHz (TV channel 5 and TV channel 6). Channels are designated by both frequency and channel number. Channels which operate in the TV 5 spectrum are prefixed with a 5 (5-50 is 81.100 MHz), channels operating in the TV 6 spectrum are prefixed with a 6 (6-50 is 87.100 MHz). This channel rastering makes it easy to determine which TV band you are operating on.

OPERATING INSTRUCTIONS (continued)

If you are using this transmitter in a area which does not have a TV station operating on channel 5, you can use one of the channels in the TV 5 range. Conversely, if the area does not have a station on TV 6, you can operate on one of the TV 6 channels. Note: It is unlawful to operate this transmitter in a band that is already occupied by a TV station. After you have determined the channel on which you are going to operate, use the "TUNING" button to select the channel that you have chosen. See charts on pages 10 and 11 for preset selectable frequencies.

Multiple Channel Operation

Simultaneous operation of more than two channels requires coordination of the frequencies that are used to avoid intermodulation interference. To avoid this type of interference, select frequencies from one of the standard groups (see frequency group charts on page 11), or use COMTEK's frequency selection guide software to determine appropriate frequencies. Contact COMTEK to obtain a free copy of the frequency selection software or download it off the web at www.comtek.com/frequency.html

Test Tone

The BST-25 base station transmitter has an internal 400 Hz source which is transmitted when the "TONE" switch is enabled. This source is intended to be used to make technical adjustments and to verify the operation of the system. Under normal operation the "TONE" switch should be disabled.

Speech EQ

On the back of the transmitter there is a switch labeled “EQ”. With this function enabled (switch up), the audio dynamics and frequency response are processed to improve intelligibility of speech. If the primary audio source is going to be speech, you should enable this processing! If the main audio source is going to include music information, you should disable it. You may want to experiment to determine which position sounds most pleasing with the program source you intend to use.

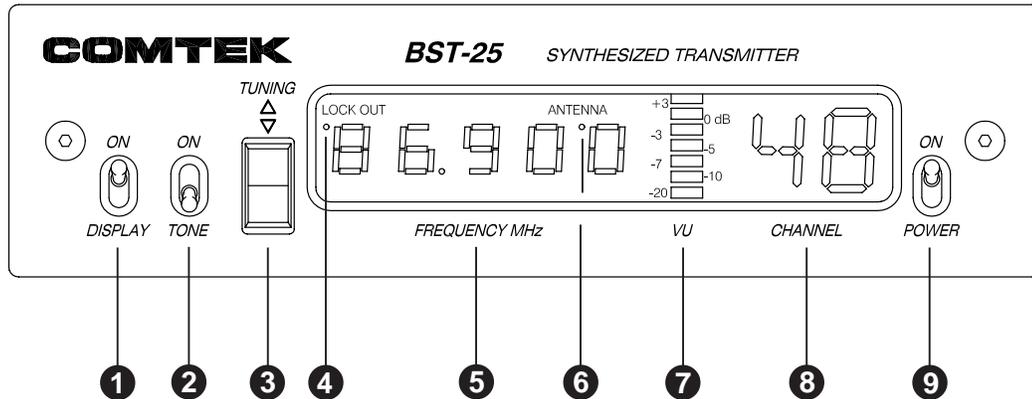
Display On and Off

The digital display can be turned on or off using the “DISPLAY” switch. Disabling the display reduces the current consumption of the transmitter for battery operation. In environments where the display could be distracting, disabling the display may also be appropriate. When the display is disabled, the tuning controls are also disabled, ensuring the transmitter frequency is not changed inadvertently. With the display disabled, one segment is turned on as a power indicator. Additionally, the “LOCK OUT” indicator is illuminated indicating the tuning is disabled. The VU meter and the “ANTENNA” indicator are unaffected.

Lock Out

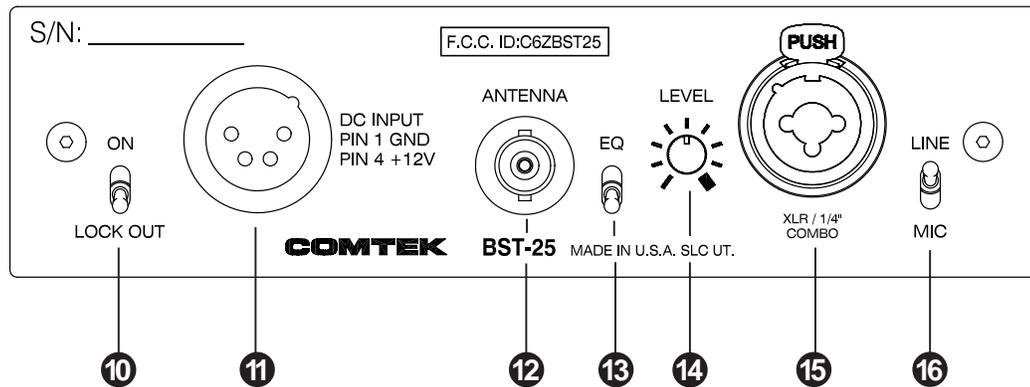
After the transmitting frequency has been determined, the transmitter tuning function can be disabled with the “LOCK OUT” switch on the back of the transmitter. This ensures that the transmitter operating frequency is not inadvertently changed. The “LOCK OUT” indicator (above the first numeric digit on the display) will illuminate indicating that the tuning has been disabled. When rack-mounting the transmitter, this switch must be accessed from behind the rack. This provides added protection from tampering.

BST-25 FRONT PANEL



- 1 DISPLAY SWITCH:** This switch disables the digital display to conserve current when used with a battery.
- 2 TONE SWITCH:** Enables/disables the internal 400 Hz test tone.
- 3 TUNING SWITCH:** Selects the frequency on which the transmitter will operate.
- 4 LOCK OUT INDICATOR:** Illuminates when the “TUNING” switch is disabled by setting the “LOCK OUT” switch (rear panel) to “ON”.
- 5 DIGITAL FREQUENCY DISPLAY:** Displays the frequency on which the transmitter is operating.
- 6 ANTENNA INDICATOR:** Flashes when the transmitter senses a deficient antenna condition.
- 7 VU METER:** Displays the level of audio being transmitted. Used to adjust the “LEVEL” (rear panel) control.
- 8 DIGITAL CHANNEL DISPLAY:** Displays the channel on which the transmitter is operating.
- 9 POWER SWITCH:** Turns the transmitter on or off.

BST-25 REAR PANEL



- ⑩ **LOCK OUT SWITCH:** Disables the front panel “TUNING” switch, locking the transmitter on one frequency.
- ⑪ **DC INPUT JACK:** Requires 12 VDC at 500 mA source (Pin-1 ground, pin-4 +12 volts).
- ⑫ **EXTERNAL ANTENNA JACK:** BNC connector provides a standard 50 ohm RF output for use with an external antenna.
- ⑬ **SPEECH ENHANCEMENT SWITCH:** Enables and disables speech enhance feature. Enable this function (switch up) for speech, and disable it (switch down) for music.
- ⑭ **LEVEL CONTROL:** This control should be adjusted so that normal audio deflects the VU meter to midscale.
- ⑮ **BALANCED AUDIO INPUT:** Accepts audio from a line level or mic level. For XLR3 or 1/4” TRS phone plug.
- ⑯ **MIC/LINE SWITCH:** Selects the desired audio input sensitivity.

BST-25

TV CHANNEL 5 FREQUENCY CHART

CHANNEL	FREQUENCY
5-1	76.200 MHz
5-2	76.300 MHz
5-3	76.400 MHz
5-4	76.500 MHz
5-5	76.600 MHz
5-6	76.700 MHz
5-7	76.800 MHz
5-8	76.900 MHz
5-9	77.000 MHz
5-10	77.100 MHz
5-11	77.200 MHz
5-12	77.300 MHz
5-13	77.400 MHz
5-14	77.500 MHz
5-15	77.600 MHz
5-16	77.700 MHz
5-17	77.800 MHz
5-18	77.900 MHz
5-19	78.000 MHz
5-20	78.100 MHz
5-21	78.200 MHz
5-22	78.300 MHz
5-23	78.400 MHz
5-24	78.500 MHz
5-25	78.600 MHz
5-26	78.700 MHz
5-27	78.800 MHz
5-28	78.900 MHz
5-29	79.000 MHz
5-30	79.100 MHz

CHANNEL	FREQUENCY
5-31	79.200 MHz
5-32	79.300 MHz
5-33	79.400 MHz
5-34	79.500 MHz
5-35	79.600 MHz
5-36	79.700 MHz
5-37	79.800 MHz
5-38	79.900 MHz
5-39	80.000 MHz
5-40	80.100 MHz
5-41	80.200 MHz
5-42	80.300 MHz
5-43	80.400 MHz
5-44	80.500 MHz
5-45	80.600 MHz
5-46	80.700 MHz
5-47	80.800 MHz
5-48	80.900 MHz
5-49	81.000 MHz
5-50	81.100 MHz
5-51	81.200 MHz
5-52	81.300 MHz
5-53	81.400 MHz
5-54	81.500 MHz
5-55	81.600 MHz
5-56	81.700 MHz
5-57	81.800 MHz
5-58	81.900 MHz
5-59	82.000 MHz
TV 5 Audio	81.750 MHz

BST-25

TV CHANNEL 6 FREQUENCY CHART

CHANNEL	FREQUENCY
6-0	82.100 MHz
6-1	82.200 MHz
6-2	82.300 MHz
6-3	82.400 MHz
6-4	82.500 MHz
6-5	82.600 MHz
6-6	82.700 MHz
6-7	82.800 MHz
6-8	82.900 MHz
6-9	83.000 MHz
6-10	83.100 MHz
6-11	83.200 MHz
6-12	83.300 MHz
6-13	83.400 MHz
6-14	83.500 MHz
6-15	83.600 MHz
6-16	83.700 MHz
6-17	83.800 MHz
6-18	83.900 MHz
6-19	84.000 MHz
6-20	84.100 MHz
6-21	84.200 MHz
6-22	84.300 MHz
6-23	84.400 MHz
6-24	84.500 MHz
6-25	84.600 MHz
6-26	84.700 MHz
6-27	84.800 MHz
6-28	84.900 MHz
6-29	85.000 MHz

CHANNEL	FREQUENCY
6-30	85.100 MHz
6-31	85.200 MHz
6-32	85.300 MHz
6-33	85.400 MHz
6-34	85.500 MHz
6-35	85.600 MHz
6-36	85.700 MHz
6-37	85.800 MHz
6-38	85.900 MHz
6-39	86.000 MHz
6-40	86.100 MHz
6-41	86.200 MHz
6-42	86.300 MHz
6-43	86.400 MHz
6-44	86.500 MHz
6-45	86.600 MHz
6-46	86.700 MHz
6-47	86.800 MHz
6-48	86.900 MHz
6-49	87.000 MHz
6-50	87.100 MHz
6-51	87.200 MHz
6-52	87.300 MHz
6-53	87.400 MHz
WIDE-BAND CHANNELS (for use with FM tunable receivers)	
6-54	87.500 MHz
6-55	87.600 MHz
6-56	87.700 MHz
6-57	87.800 MHz
TV 6 Audio	87.750 MHz

BST-25
TV CHANNEL 5
FREQUENCY GROUPS

GROUP ONE

CHANNEL	FREQUENCY
5-3	76.400 MHz
5-6	76.700 MHz
5-10	77.100 MHz
5-15	77.600 MHz
5-21	78.200 MHz
5-34	79.500 MHz
5-42	80.300 MHz
5-56	81.700 MHz

GROUP TWO

CHANNEL	FREQUENCY
5-5	76.600 MHz
5-7	76.800 MHz
5-13	77.400 MHz
5-33	79.400 MHz
5-38	79.900 MHz
5-47	80.800 MHz
5-54	81.500 MHz
5-57	81.800 MHz

GROUP THREE

CHANNEL	FREQUENCY
5-2	76.300 MHz
5-8	76.900 MHz
5-11	77.200 MHz
5-16	77.700 MHz
5-18	77.900 MHz
5-29	79.000 MHz
5-41	80.200 MHz
5-58	81.900 MHz

BST-25
TV CHANNEL 6
FREQUENCY GROUPS

GROUP ONE

CHANNEL	FREQUENCY
6-4	82.500 MHz
6-7	82.800 MHz
6-9	83.000 MHz
6-13	83.400 MHz
6-20	84.100 MHz
6-30	85.100 MHz
6-38	85.900 MHz
6-50	87.100 MHz

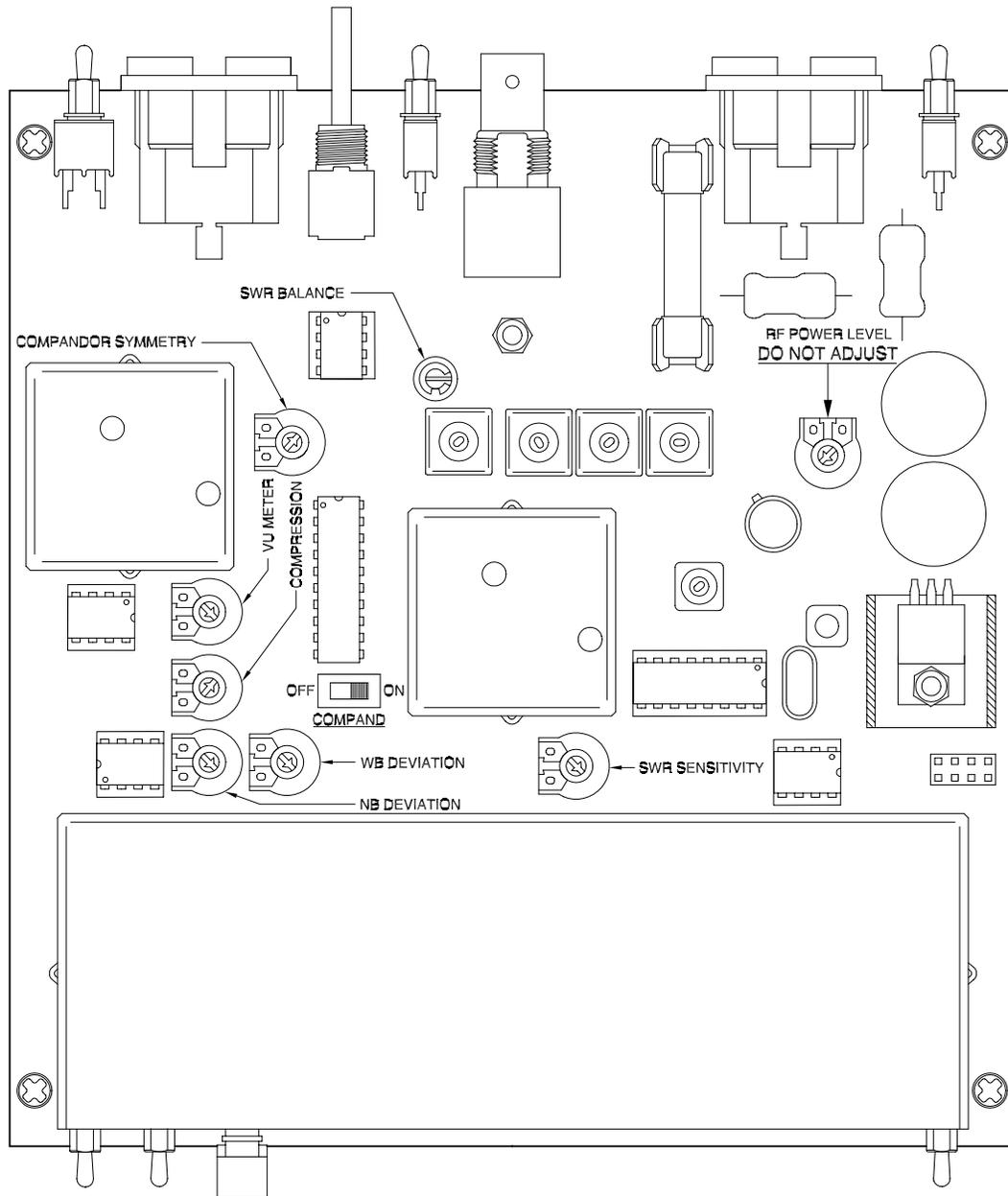
GROUP TWO

CHANNEL	FREQUENCY
6-2	82.300 MHz
6-5	82.600 MHz
6-28	84.900 MHz
6-34	85.500 MHz
6-42	86.300 MHz
6-44	86.500 MHz
6-49	87.000 MHz
6-53	87.400 MHz

GROUP THREE

CHANNEL	FREQUENCY
6-1	82.200 MHz
6-3	82.400 MHz
6-6	82.700 MHz
6-10	83.100 MHz
6-16	83.700 MHz
6-24	84.500 MHz
6-36	85.700 MHz
6-52	87.300 MHz

BST-25 INTERNAL ADJUSTMENTS

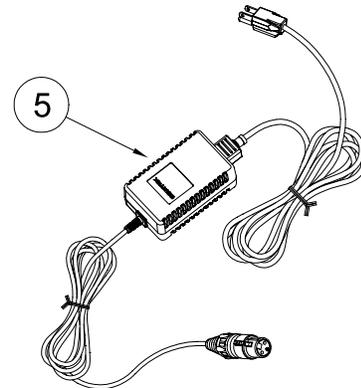
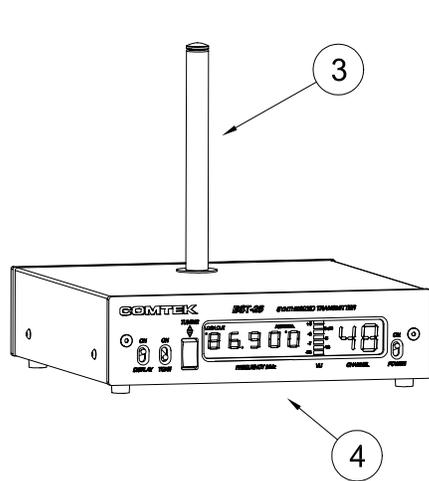
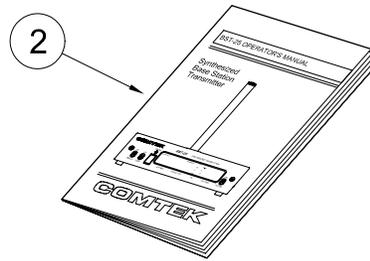
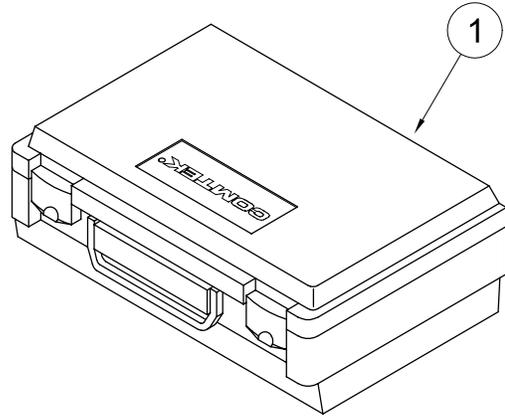


NOTE: The COMPAND switch must be set to the OFF position for use with "Walkman" FM band type receivers and TV monitors. Must be set to the ON position for use with PR-25 and PR-216/TV 5-6 receivers.

BST-25 ACCESSORIES

Included Accessories

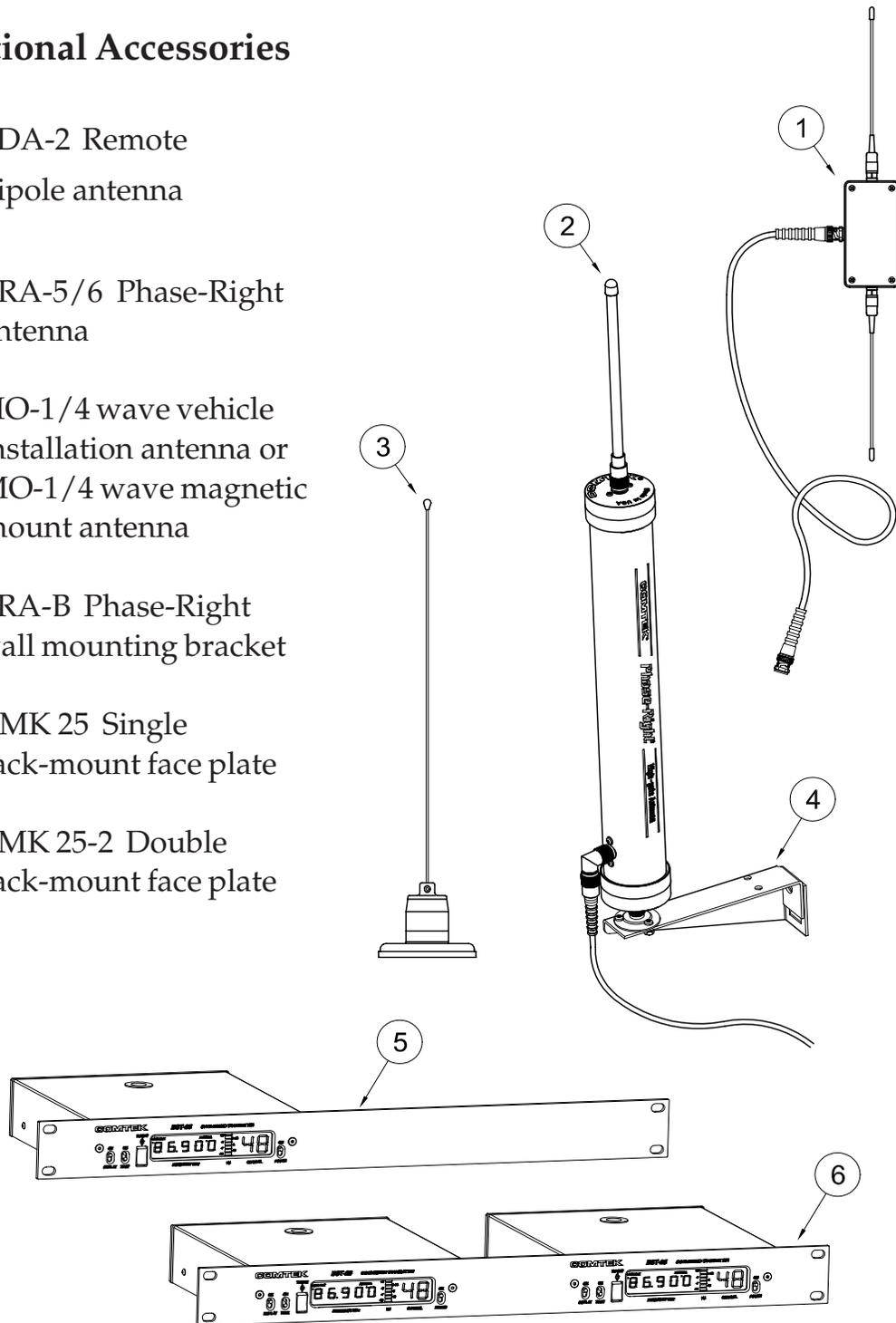
1. C-16 Carrying case
2. BST-25 Operator's manual
3. TWA-72 Whip antenna
4. BST-25 Base station transmitter
5. AP-12V1 Power adaptor (115 VAC Input)



BST-25 ACCESSORIES

Optional Accessories

1. RDA-2 Remote dipole antenna
2. PRA-5/6 Phase-Right antenna
3. MO-1/4 wave vehicle installation antenna or MO-1/4 wave magnetic mount antenna
4. PRA-B Phase-Right wall mounting bracket
5. RMK 25 Single rack-mount face plate
6. RMK 25-2 Double rack-mount face plate



BST-25 / TV 5-6 SPECIFICATIONS

Audio Inputs:

- Mic XLR, 600 ohm balanced -40 dBV (nominal)
- Line XLR, 10 k ohm balanced 0 dBV (nominal)

Connectors:

- XLR-3 Female audio input connector for mic and line input
- XLR-4 Male power input 12 volts
- BNC type RF output connector

Operation Indicators:

- LED Bargraph VU Meter displays audio input (modulation)
- Two-Digit Alpha Numeric Display shows operating channel
- Five-Digit Numeric Display shows operating frequency
- Antenna Indicator displays deficient antenna condition
- Lock Out Indicator shows tuning has been disabled

Antenna:

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

FCC Compliance:

Type Accepted under Part 74

Power Requirements:

12 Volts DC, 300 mA max

Frequency Response:

80 Hz to 15 kHz

Audio Distortion:

Less than 0.5% at 80% modulation

Modulation Limiter:

Soft compressor type with high (25 dB) linear overload protection, attack time less than 1 ms, recovery time 10 ms

Audio Gain Control:

Greater than 40 dB

Test Tone Generator:

400 Hz 0.05% distortion

Frequency Modulation:

- 10 kHz deviation for narrow band channels,
- 75 kHz deviation for wide band channels

RF Output Power:

Set for 50 mW for FCC Part 74

Frequency Stability:

Better than 0.002%. digitally synthesized, crystal controlled

Operating Frequency:

76.2 to 87.8 MHz

Harmonic and Spurious

Emissions:

Better than 55 dB below carrier

Dimensions:

6 1/2" wide x 1 3/4" high x 5 5/8" deep

Weight:

44 oz.

NOTE: Specifications subject to change without notice.

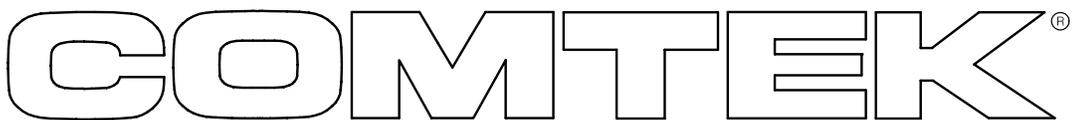
WARRANTY AND SERVICE

Warranty

COMTEK transmitters and receivers are warranted to be free from defects in workmanship and material under normal stand-alone use and conditions for a period of **two years** from date of original purchase. Items such as headphones, earphones, neckloops, and cords are warranted to be free from defects in workmanship and material for a period of 90 days from the date of original purchase. Batteries are not covered by this warranty. Damage due to abnormal use, extreme conditions, misuse, use of the product as a component of another product, ill treatment and unauthorized modification and repairs are not covered by this warranty. COMTEK is not liable for any consequential or punitive 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 OF THE PRODUCT FOR A PARTICULAR PURPOSE INCLUDING, WITHOUT LIMITATION, ANY WARRANTY THAT THE USE OF SUCH EQUIPMENT FOR ANY PURPOSE WILL COMPLY WITH APPLICABLE LAWS AND REGULATIONS.

Service Policy

Warranty repairs must be done by COMTEK. Only factory technicians are authorized to perform warranty service on the BST-25 transmitter. Before returning the BST-25 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.

The logo for COMTEK is displayed in a large, bold, outlined font. The letters are white with a black outline. A registered trademark symbol (®) is located at the top right of the letter 'K'.

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