

T1

Multi-Frequency IFB Transmitter



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Table of Contents

Introduction	4
General Technical Description	5
Audio Input Interface	5
Audio Processor	5
Compressor Noise Reduction	5
T1 IFB Transmitter Block Diagram	5
Pilot Tone	6
Frequency Synthesizer	6
Power Delay	6
Microcontroller	6
Transmitter	6
Antenna System	6
Front Panel Controls and Functions	7
T1 Front Panel	7
OFF/TUNE/XMIT Switch	7
Power Up Sequence	7
LED Display	7
Adjusting Display Intensity	7
Freq Buttons (Up and Down)	7
Audio Level Control	7
-20/0 LEDs	7
Rear Panel Controls and Functions	8
T1 Rear Panel	8
XLR Jack	8
Mode Switches	8
12 VDC (Power Input Connector)	8
Antenna	8
Installation and Operation	9
Operating Notes	10
Accessories	10
Troubleshooting	11
Frequency Blocks and Ranges	12
Specifications	13
Service and Repair	14
Returning Units for Repair	14

Introduction

Thank you for selecting the Lectrosonics frequency agile, narrowband, T1 IFB (Interruptible Foldback) transmitter. The T1 is the result of over 80 years of engineering experience with the very latest components, in a design that addresses the most demanding professional applications.

The Lectrosonics T1 IFB Transmitter along with the companion R1 or R1a IFB Receivers allow on-air talent to monitor program audio and receive cues from directors and other production personnel.

The design of the T1 IFB Transmitter was the direct result of numerous conversations with users, production personnel and dealers across the US. The specific concerns and needs brought up in these conversations led directly to the development of the operational features offered on the T1. Two hundred fifty six frequencies are user selectable in 100 kHz steps to alleviate interference problems in travelling venues.

The T1 IFB Transmitter is a rugged, machined aluminum package. The input section is adjustable for virtually any microphone or line level audio source. Level indicating LEDs are provided on the control panel to make level settings quick and accurate, without having to view the receiver. The antenna is a detachable, locking 1/4 wavelength flexible bronze cable that connects to a 50 Ohm BNC connector on the transmitter.

Only the T1 IFB Transmitter is covered in this manual. Companion receivers are covered in separate manuals. The T1 IFB Transmitter will operate with any Lectrosonics R1 or R1a IFB Receiver in the same frequency group.

General Technical Description

The T1 IFB Transmitter is comprised of a number of functional subsystems, including Audio Input Interface, Audio Processor, Pilot Tone, Frequency Synthesizer, Microcontroller, Transmitter, Antenna System and Power Supply. (See block diagram.)

The T1 is designed to operate with the Lectrosonics R1 and R1A IFB receivers, and Lectrosonics R400A receivers, and features microprocessor control of 256 operating frequencies within any one of at least nine frequency bands.

The T1 uses 20 kHz deviation for an efficient use of bandwidth. The transmitter circuits are all regulated for frequency stability and high audio performance. The input amplifier is a discreet differential circuit which can be adjusted to allow the use of many different input sources.

Audio Input Interface

The input sensitivity and XLR pin functions can be customized using a DIP switch located on the back panel. Different combinations of gain and input configurations are possible without rewiring the mic connector. Pin 1 of the XLR input connector is normally connected directly to ground but an internal jumper can be moved if a floating input is desired.

The Audio (+) and (-) are "dry" inputs and can each withstand +/- 50 VDC.

Warning: Direct connection to a phone line can damage the transmitter's inputs.

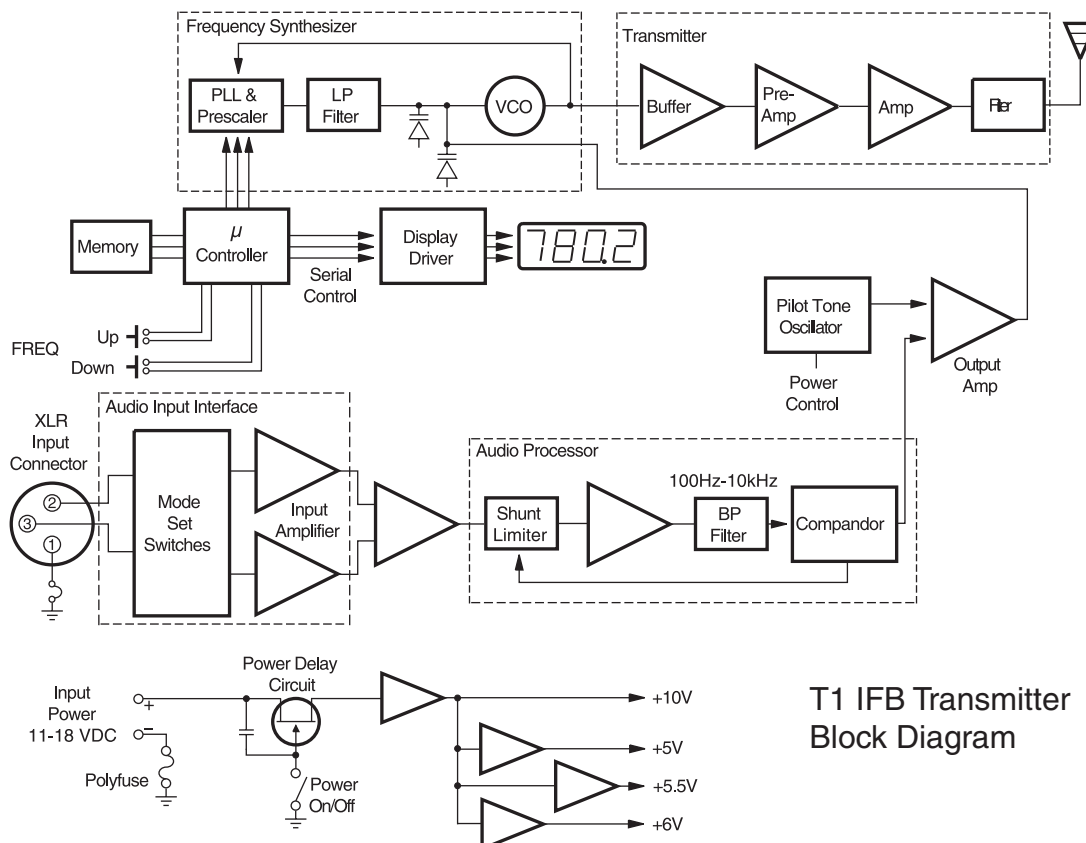
Audio Processor

The Audio Processor section has several functions, including signal limiting, filtering and companding (dynamic range compression). Audio limiting is accomplished by a Shunt Limiter placed before the filter and compandor circuits. A Bandpass Filter limits the audio bandwidth to 100 Hz at the low end and 10 kHz in the upper range. The single band compandor circuit compresses the dynamic range of the audio signal and prepares it for transmission. It is one half of a system that requires a matching receiver to decode the signal and restore its original dynamic range.

Compandor Noise Reduction

The single band compandor is a high quality audio device that processes (compresses) the input signal so that the large dynamic ranges of the input signals can be transmitted to the receiver without overload or noise. A complementary system in the receiver recovers (decompresses) the original dynamics of the signal for full audio quality. Compression and expansion ratios are complementary at 2:1. High frequency pre-emphasis is implemented in the transmitter to provide another 10 dB signal to noise improvement. Matching de-emphasis is provided in all receivers.

T1 IFB Transmitter Block Diagram



T1 IFB Transmitter Block Diagram

Pilot Tone

The T1/R1A system uses an ultrasonic tone modulation of the carrier to operate the receiver squelch. This “pilot tone” consists of a 29.997 kHz signal which is mixed with the audio signal just after the compandor. The pilot tone controls the audio output muting of the receiver and is filtered out of the audio signal immediately after the detector in the receiver so that it does not influence the compandor or various gain stages.

The benefit of the pilot tone squelch system is that the receiver will remain muted until it receives the pilot tone from the matching transmitter, even if a strong RF signal is present on the carrier frequency of the system.

Frequency Synthesizer

The transmitter uses a synthesized, frequency selectable main oscillator. The frequency is extremely stable over a wide temperature range and over time. Two push-button switches, located on the front panel of the unit, provides the user with 256 frequencies in 100 kHz steps over a 25.5 MHz range. This significantly alleviates carrier interference problems in mobile or traveling applications.

Power Delay

There is a five second power-ON/OFF delay to prevent audio thumps when switching from XMIT to TUNE or from TUNE to OFF. This delay also gives the Frequency Synthesizer time to fully stabilize. When the transmitter is powered OFF, the Pilot Tone is first turned off muting the audio at the receiver before the rest of the transmitter is powered down. This prevents clicks, thumps or feedback from entering the sound system.

Microcontroller

Frequency adjustment and display are handled by the microprocessor. Nonvolatile memory is provided for holding the last frequency used, even if power is removed from the unit for any length of time. Each time the transmitter is powered up, it will display the last frequency used.

Transmitter

The T1 transmitter operates at 250 mW, more powerful than most IFB systems on the market today. The higher power ensures a clean signal free of dropouts and noise. The transmitter circuits are buffered and filtered for exceptional spectral purity. The extra clean signal that results reduces the chances for interference between multiple transmitter installations.

Antenna System

The antenna on the T1 consists of a flexible 1/4 wavelength bronze cable, detachable via a BNC connector. The 50 ohm output connector works conveniently with a variety of remote antennas for installation in studios and production trucks & vans.

Front Panel Controls and Functions

T1 Front Panel



OFF/TUNE/XMIT Switch

OFF	Turns the unit off.
TUNE	Mutes the transmitter section while enabling the up and down frequency buttons for setting the operating frequency of the transmitter.
XMIT	Normal operating position. With the switch in this position, the unit is transmitting a modulated signal to the corresponding receiver, and the FREQ buttons are limited to temporarily displaying the transmitter HEX switch settings for the operating frequency and the TV channel, before reverting back to displaying the actual operating frequency.

Power Up Sequence

When the OFF/TUNE/XMIT switch is first turned on, the front panel LED display cycles through the following sequences:

1. "TEST MODE" momentarily illuminating all display segments (8.8.8.8.)
2. Momentarily displays firmware version number, (i.e. 4.0)
3. Displays operating frequency in MHz.

LED Display

This 4-digit display indicates the channel (or operating) frequency of the unit to the nearest 0.1 MHz (100 kHz). The LED display also indicates low input power by blinking continuously when the input voltage drops below 11.0 Volts.

Adjusting Display Intensity

The LED display's brightness may be adjusted from 1 to 15, with 15 being the highest intensity. To adjust the display intensity, turn the unit off, then hold the FREQ up button while turning the unit back on. The display will show the current intensity setting. Use the FREQ up and FREQ down buttons to adjust the brightness setting. When finished, turn the unit off, wait until the display extinguishes (about 4 seconds), then turn the unit back on.

Freq Buttons (Up and Down)

The transmitter frequency is changed by pressing the appropriate button (see Note). Each push will change the frequency, up or down, in 100 kHz increments, or one channel at a time. The FREQ buttons are enabled when the OFF/TUNE/XMIT switch is in the TUNE position. Whenever a selected FREQ button is pressed for more than five seconds, the speed of change increases to about five channels per second. The T1 will "remember" the last channel selected when the unit is turned off, and it will set itself to that frequency when the unit is reenergized.

When the switch is in the XMIT mode, pressing the FREQ up/down buttons will not disturb the frequency or the transmitter signal output. In XMIT mode, momentarily pressing the up FREQ button momentarily displays the HEX switch settings (shown with an Fr prefix), to the TV channel, then automatically reverts to the operating frequency display after 3 seconds unless the button is held. Momentarily pressing the down FREQ button displays the TV channel first, the HEX switch settings next, and then reverts back to the operating frequency.

Note: When the highest or lowest frequency is reached, the unit will wrap around and continue in the same direction at the other end of the range.

Audio Level Control

The Audio Level Control is used to adjust the audio input level for proper modulation. The gain range is +/-15 dB. The reference for this control can be changed with the rear panel MODE switches. See the INSTALLATION AND OPERATION section for more information on the MODE switches.

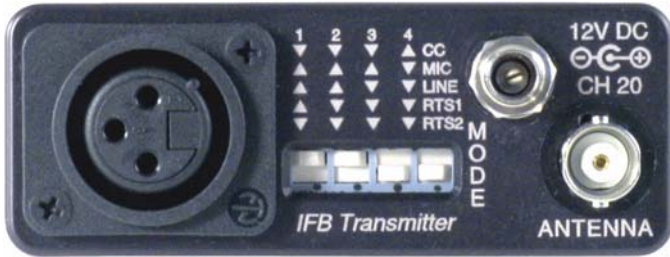
-20/0 LEDs

These two LEDs are used to set the MIC LEVEL control and provide a visual indication of audio gain levels during normal system operation.

- 20 LED** Flickers when audio level is -20 dB below full modulation.
- 0 LED** Flickers when the input level is high enough to cause limiting. The input limiter has a very high overload threshold. Generally speaking, some limiting is desirable in normal operation to improve the signal to noise ratio of the system. The limiting action is not audible and does not create distortion.

Rear Panel Controls and Functions

T1 Rear Panel



XLR Jack

A standard XLR female jack accepts a variety of input sources depending on the setting of the MODE dip switch. XLR pin functions can be changed to suit the source depending on the positions of the individual switches. For detailed information on the setting of these switches see the INSTALLATION AND OPERATION section.

Mode Switches

These dip switches configure the XLR input jack to accommodate a variety of audio sources. The rear panel is marked with the most common switch combinations.

The MODE switches allow the T1 to accommodate a variety of input sources by changing the input sensitivity and the pin functions of the input XLR jack. Marked on the rear panel are the most common settings. Each setting is detailed below. Switches 1 and 2 adjust the XLR pin functions while switches 3 and 4 adjust the input sensitivity.

12 VDC (Power Input Connector)

The T1 is designed to be used with the CH20 external power source, which is plugged into the 12 VDC external power input connector. The nominal voltage to operate the unit is 12 VDC; although it will operate at voltages as low as 11 VDC and as high as 18 VDC.

A suitable alternate power source must be able to handle 250 mA continuous consumption.

Antenna

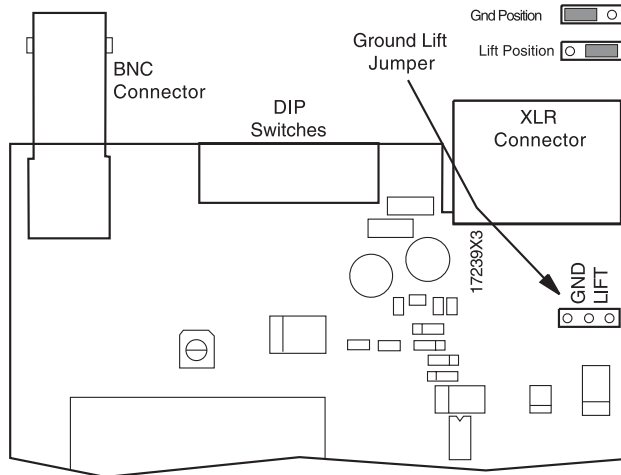
The T1's ANTENNA connector is a standard 50 ohm BNC configuration, which can accept an integral whip or a cable to a remote antenna.

Name	Switch Positions				XLR Pins	Balanced?	* Input Sensitivity
	1	2	3	4			
CC	▼	▼	▼	▲	3 = Audio 1 = Common	No	-6 dBu
MIC	▲	▲	▲	▼	2 = Hi 3 = Lo 1 = Common	Yes	-40 dBu
LINE	▲	▲	▼	▼	2 = Hi 3 = Lo 1 = Common	Yes	+4 dBu
RTS1	▲	▼	▼	▼	2 = Hi 1 = Common	No	+4 dBu
RTS2	▼	▼	▼	▼	3 = Hi 1 = Common	No	+4 dBu

Installation and Operation

- 1) The T1 transmitter is shipped with pin 1 of the XLR input connector tied directly to ground. If a floating input is desired, a Ground Lift Jumper is provided. This jumper is located inside the unit on the PC board near the rear panel XLR jack. If a floating connection is desired, open the unit and move the Ground Lift Jumper to the desired location.

Location of Ground Lift Jumper:



- 2) Set the MODE switches on the rear panel to match the specific input source to be used. (See Mode Switches.)
- 3) Insert the power supply plug into the 12 VDC jack on the rear panel.
- 4) Insert the microphone XLR plug into the input jack. Ensure the pins are aligned and that the connector locks in.
- 5) Attach the antenna (or antenna cable) to the BNC connector on the rear panel.
- 6) Mute the sound source connected to the T1.
- 7) Set the OFF/TUNE/XMIT switch to TUNE.
- 8) Adjust the transmitter to the desired frequency with the front panel FREQ up/down buttons.
- 9) Position the microphone. The microphone should be placed in the position in which it will be used during the program.
- 10) While speaking at the same voice level that will be used during the program, observe the front panel "0" and "-20" Modulation LEDs. Set the AUDIO LEVEL control to minimum (maximum counter-clockwise), then adjust the AUDIO LEVEL control until the "-20" LED begins to flicker. Gradually, increase the gain until the "-20" LED glows and the 0 LED begins to flicker. The "-20" LED lights when the audio level is about 20 dB below full modulation. The "0" LED lights when the limiter begins to operate. There is over 15 dB of limiting range without overload above the "0" LED. It is desirable that it glows about 5-10 percent of the time during use.
- 11) Once the transmitter audio gain has been set, the receiver and other components of the system can be energized and their audio levels adjusted. Set the power switch on the T1 transmitter to the XMIT and adjust the associated receiver and sound system level as required.

Note: There will be a delay between the moment the transmitter is energized and when audio will actually appear at the receiver output. This intentional delay eliminates turn on thumps, and is controlled by the pilot tone squelch control.

Operating Notes

The AUDIO LEVEL control should not be used to control the volume of the associated receiver. This gain adjustment is used to match the T1 input level to the incoming signal from the sound source to provide full modulation and maximum dynamic range.

If the audio level is too high — both LEDs will light frequently or stay lit. This condition may reduce the dynamic range of the audio signal.

If the audio level is too low — neither LED will light, or the -20 LED will glow dimly. This condition may cause hiss and noise in the audio, or pumping and breathing in the background noise.

The “-20” LED turns on approximately 20 dB below full deviation. The “0” LED turns on at full deviation and

indicates that the input shunt compressor is operating. The input limiter will handle peaks over 15 dB above full modulation, regardless of the gain control setting. The limiter uses a true absolute value circuit to detect both positive and negative peaks. The attack time is 5 milliseconds and the release time is 200 milliseconds. Occasional limiting is desirable, indicating that the gain is correctly set and the transmitter is fully modulated for optimum signal to noise ratio. Different voices will usually require different settings of the AUDIO LEVEL control, so check this adjustment as each new person uses the system. If several different people will be using the transmitter and there is not time to make the adjustment for each individual, adjust it for the loudest voice.

Accessories

CH20

Power supply for IFB base transmitters with locking LZR power jacks; 110 VAC input, 12 VDC regulated output; 400 mA max.

21586

DC16A Pigtail power cable, LZR to strip & tin

SNA600

Collapsible dipole antenna that adjusts over a wide frequency range. Ideal for situations where a full 360 degree receiving pattern is required as opposed to a directional pattern.

ALP600

Shark Fin style Log Periodic Dipole Array (LPDA) that provides a useful directional pattern over a broad frequency bandwidth. Ideal for portable applications including temporary setups for field production.

ALPKIT

Stainless steel kit for mounting SNA600 and ALP600 antennas on photo and video tripods, lighting equipment, and standard microphone stands.

ARG15/ARG100

Coaxial cables for remote antennas available from Lectrosonics in a variety of lengths from 2 to 100 ft.

RMP195

4 channel rack mount for up to four T1 IFB receivers. Rocker switch installed to work as a master power switch if desired.

CH20



SNA600



ALP600



ARG15/ARG100



RMP195



Troubleshooting

Symptom:

Possible Cause:

Display Dead or Blinking On and Off

- 1) External power supply disconnected or inadequate.
- 2) The External DC power input is protected by an auto-reset polyfuse. Disconnect power and wait about 10 seconds for the fuse to reset.

No Transmitter Modulation LEDs

- 1) AUDIO LEVEL turned all the way down.
- 2) Sound source off or malfunctioning.
- 3) Input cable damaged or mis-wired.

No Received Signal

- 1) Transmitter not turned on.
- 2) Receiver antenna missing or improperly positioned. (The headset cable is the antenna.)
- 3) Transmitter and receiver not on same frequency. Check on transmitter and receiver.
- 4) Operating range is too great.
- 5) Transmitter antenna not connected.
- 6) Transmitter switch in the TUNE position. Switch to XMIT mode.

No Sound (or Low Sound Level), and Receiver LED is On

- 1) Receiver output level set too low.
- 2) Receiver earphone cable is defective or mis-wired.
- 3) Sound system or transmitter input is turned down.

Distorted Sound

- 1) Transmitter gain (audio level) is far too high. Check mod level lamps on transmitter as it is being used. (Refer to Installation & Operation section for details on gain adjustment.)
- 2) Receiver output may be mismatched with the headset or earphone. Adjust output level on receiver to the correct level for the headset or earphone.
- 3) Excessive wind noise or breath "pops." Reposition microphone and/or use a larger windscreen.

Hiss, Noise, or Audible Dropouts

- 1) Transmitter gain (audio level) far too low.
- 2) Receiver antenna missing or obstructed. (The headset cable is the antenna.)
- 3) Transmitter antenna missing or mismatched. Check that the correct antenna is being used
- 4) Operating range too great.
- 5) Defective remote antenna or cable.

Frequency Blocks and Ranges

The table below lists the factory designated frequency ranges available for the T1 IFB Transmitter.

Each T1 transmitter is built to cover a pre-selected range of frequencies (a "block") as shown below. The transmitter will tune to any of 256 different frequencies within this factory assigned block.

The block number is determined by this formula:

$$25.6 \times \text{Freq. (MHz)} = \text{Lowest freq. (MHz) in the block}$$

To determine a block number from a frequency:

$$\text{Freq. (MHz) divided by 25.6} = \text{Block number}$$

It is handy to remember these formulas, in case you do not have a copy of the table. For example, suppose you need to know which block covers 685.500 MHz, which is in the middle of the Block 26 frequency range.

$$685.500 \text{ divided by } 25.6 = 26.77734375$$

The first two digits left of the decimal are the block number. In this case, 685.500 MHz falls within block 26.

The T1 IFB transmitter antennas are color coded to indicate the frequency block that they operate within. The length of the antenna varies with the frequency block. The actual length of the antenna is not as critical as it might appear in the table below. The usable bandwidth of the detachable antenna is +/- 50 MHz from the block's center frequency, so it is acceptable to use an antenna from an adjacent block above or below the operating frequency if some loss in range can be tolerated.

Part of block 23 is not used since it covers a 608 to 614 MHz band that is illegal for use with wireless micro-phones.

BLOCK	FREQUENCY RANGE	ANT SLEEVE COLOR	ANTENNA WHIP LENGTH
21	537.600 - 563.100	Brown	4.74"
22	563.200 - 588.700	Red	4.48"
23	588.800 - 614.300	Orange	4.24"
24	614.400 - 639.900	Yellow	4.01"
25	640.000 - 665.500	Green	3.81"
26	665.600 - 691.100	Blue	3.62"
27	691.200 - 716.700	Violet (Pink)	3.46"
28	716.800 - 742.300	Grey	3.31"
29	742.400 - 767.900	White	3.18"
30	768.000 - 793.500	Black	3.08" (Export Only)
31	793.600 - 819.100	Black	2.99" (Export Only)
32	819.200 - 844.700	Black	2.92" (Export Only)
33	844.800 - 865.000	Black	2.87" (Export Only)

Specifications

Operating Frequencies:	Block 21	537.600 - 563.100	Block 25	640.000 - 665.500
	Block 22	563.200 - 588.700	Block 26	665.600 - 691.100
	Block 23	588.800 - 607.900	Block 27	691.200 - 716.700
		614.100 - 614.300	Block 28	716.800 - 742.300
	Block 24	614.400 - 639.900	Block 29	742.400 - 767.900
Frequencies (Channels per block):	256			
Channel Spacing:	100 kHz (0.1 MHz)			
Spurious & Harmonic Suppression:	1 uW at freq. above 1 GHz			
	4 nW at freq. below 1 GHz			
Frequency Stability:	±0.02% (20 ppm) @ 25° C			
Temperature Stability:	±0.005% (50 ppm) from -30° C to +50° C			
Channel Selection:	Momentary pushbutton switches, TUNE Up and Down			
Pilot Tone:	29.997 kHz			
Modulation:	FM, ±20 kHz deviation			
Audio Response:	100 Hz to 10 kHz, ±1 dB, -3dB (system response)			
Audio Compressor:	2 to 1			
RF Power Output:	250 mw (nominal)			
Output Impedance:	50 ohms			
Audio Input Levels:	+4 dBu, -6 dBu, and -40 dBu, dry inputs, +/-50Vdc max, rear panel selectable for Line, Mic, RTS 1, RTS 2, and Clear Comm			
Audio Input Config:	Balanced and Unbalanced, rear panel selectable for Line, Mic, RTS 1, RTS 2, and Clear Comm			
Audio Input Impedance:	Greater than 2 K balanced, greater than 1 K unbalanced at any gain setting			
Gain Control Range:	43 dB, Semi-log Rotary control			
Audio Input Jack:	Standard XLR female connector			
Input Power:	12 to 14 VDC typical, 250 ma. max.; Max. Input Range 11 to 18 VDC			
Power Input Jack:	Coax type, locking LZR RL26AE			
Indicators:	LED for -20 dB modulation			
	LED for 0 dB modulation			
	4 Digit 7-segment LED displays for frequency and power on with adjustable brightness			
Front panel controls:	Audio Level rotary knob Power OFF-TUNE-XMIT, 3 position slide switch TUNE Up momentary pushbutton switch TUNE down momentary pushbutton switch			
Rear panel controls:	Mode Select, 4 section DIP switch			
Weight:	9 oz.			
Size:	5.25" long (including connectors) x 3.25" wide x 1.25" high			

Specifications subject to change without notice.

Emission designator: 80KOF3E

The T1 IFB transmitter is FCC type accepted under Part 74: 470 - 608MHz and 614 - 806MHz

The FCC requires that the following statement be included in this manual:

This device complies with FCC radiation exposure limits as set forth for an uncontrolled environment. This device should be installed and operated so that its antenna(s) are not co-located or operating in conjunction with any other antenna or transmitter.

Service and Repair

If your system malfunctions, you should attempt to correct or isolate the trouble before concluding that the equipment needs repair. Make sure you have followed the setup procedure and operating instructions. Check the interconnecting cables and then go through the TROUBLESHOOTING section in this manual.

We strongly recommend that you **do not** try to repair the equipment yourself and **do not** have the local repair shop attempt anything other than the simplest repair. If the repair is more complicated than a broken wire or loose connection, send the unit to the factory for repair and service. Don't attempt to adjust any controls inside the units. Once set at the factory, the various controls and trimmers do not drift with age or vibration and never require readjustment.

There are no adjustments inside that will make a malfunctioning unit start working.

LECTROSONICS' Service Department is equipped and staffed to quickly repair your equipment. In warranty repairs are made at no charge in accordance with the terms of the warranty. Out-of-warranty repairs are charged at a modest flat rate plus parts and shipping. Since it takes almost as much time and effort to determine what is wrong as it does to make the repair, there is a charge for an exact quotation. We will be happy to quote approximate charges by phone for out-of-warranty repairs.

Returning Units for Repair

For timely service, please follow the steps below:

- A. DO NOT return equipment to the factory for repair without first contacting us by letter or by phone. We need to know the nature of the problem, the model number and the serial number of the equipment. We also need a phone number where you can be reached 8 A.M. to 4 P.M. (U.S. Mountain Standard Time).
- B. After receiving your request, we will issue you a return authorization number (R.A.). This number will help speed your repair through our receiving and repair departments. The return authorization number must be clearly shown on the **outside** of the shipping container.
- C. Pack the equipment carefully and ship to us, shipping costs prepaid. If necessary, we can provide you with the proper packing materials. UPS is usually the best way to ship the units. Heavy units should be "double-boxed" for safe transport.
- D. We also strongly recommend that you insure the equipment, since we cannot be responsible for loss of or damage to equipment that you ship. Of course, we insure the equipment when we ship it back to you.

Mailing address:

Lectrosonics, Inc.
PO Box 15900
Rio Rancho, NM 87174
USA

Shipping address:

Lectrosonics, Inc.
581 Laser Rd.
Rio Rancho, NM 87124
USA

Telephone:

(505) 892-4501
(800) 821-1121 Toll-free
(505) 892-6243 Fax

Web:

www.lectrosonics.com

E-mail:

sales@lectrosonics.com

LIMITED ONE YEAR WARRANTY

The equipment is warranted for one year from date of purchase against defects in materials or workmanship provided it was purchased from an authorized dealer. This warranty does not cover equipment which has been abused or damaged by careless handling or shipping. This warranty does not apply to used or demonstrator equipment.

Should any defect develop, Lectrosonics, Inc. will, at our option, repair or replace any defective parts without charge for either parts or labor. If Lectrosonics, Inc. cannot correct the defect in your equipment, it will be replaced at no charge with a similar new item. Lectrosonics, Inc. will pay for the cost of returning your equipment to you.

This warranty applies only to items returned to Lectrosonics, Inc. or an authorized dealer, shipping costs prepaid, within one year from the date of purchase.

This Limited Warranty is governed by the laws of the State of New Mexico. It states the entire liability of Lectrosonics Inc. and the entire remedy of the purchaser for any breach of warranty as outlined above. NEITHER LECTROSONICS, INC. NOR ANYONE INVOLVED IN THE PRODUCTION OR DELIVERY OF THE EQUIPMENT SHALL BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL, OR INCIDENTAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THIS EQUIPMENT EVEN IF LECTROSONICS, INC. HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL THE LIABILITY OF LECTROSONICS, INC. EXCEED THE PURCHASE PRICE OF ANY DEFECTIVE EQUIPMENT.

This warranty gives you specific legal rights. You may have additional legal rights which vary from state to state.

