

LECTROSONICS IFBR1a UHF Multi-Frequency Belt-Pack IFB Receiver Instruction Manual

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LECTROSONICS IFBR1a UHF Multi-Frequency Belt-Pack IFB Receiver



Introduction

Thank you for selecting the Lectrosonics frequency agile IFBR1a receiver. The design is the result of exten-sive engineering experience with the most up to date components for demanding professional applications. The receiver will operate with any Lectrosonics IFB transmitter and any Lectrosonics wireless microphone transmitter in the IFB compatibility mode. Applications for the IFBR1a range from on air talent monitoring of program audio and producer/director cueing during live broadcasts, to on location audio track monitoring and crew communications in motion picture production. The receiver will drive earsets and headsets with a variety of impedance loads, and induction loop type listening devices. The unit can be configured as a single frequency device, or with multiple frequencies stored in memory for recall by pressing the volume control knob. The frequency set at turn on is defined by two rotary switches on the side panel. Additional frequencies are added to memory with either a scanning or direct entry (manual) procedure. The housing is a rugged, machined aluminum package designed to survive abusive environments. Only the IFBR1a receiver is covered in this manual. Transmitters are covered in separate manuals.

Safety Notes

Excessive sound levels can cause permanent hearing damage.

- 1. Always adjust the volume to the lowest level before listening to unknown transmissions.
- 2. Use the lowest reasonable level consistent with hearing safety.
- 3. Don't use high sound levels in the earphone to overcome high ambient sound levels. That is absolutely foolish!

 Demand and use high isolation earphones.
- 4. Don't expose your ears to sound levels that cause them to ring. If your ears do ring after exposure, think of it as a warning bell telling you not to do that again.

OSHA (Occupational Safety Health Administration) guidelines on the maximum allowable time exposure to sound pressure levels that will cause hearing damage are as follows:

- 8 hours at 90 dB SPL
- · 4 hours at 95 dB SPL
- · 2 hours at 100 db SPL
- 1 hour at 105 dB SPL
- 30 mins at 110 dB SPL

• 15 mins at 115 dB SPL

NEVER expose your ears to 120 dB SPL or higher! Damage will occur.

Features and Functions

The frequency agile IFB R1a FM Receiver is designed to operate with the Lectrosonics IFB transmitters and compatible Digital Hybrid transmitters. Microprocessor control of frequencies within each frequency block provides the ability to work around interference problems quickly and simply.



The unique microcontroller design in this receiver provides simple one knob and one LED operation for audio level, switching frequencies (channels), and easy on-the-fly programming. The receiver frequency can be set by manually using the two rotary HEX switches on the side of the unit or by using the automatic scan and store function, or both. When powered ON, the receiver will default to the frequency set by the switches. A nonvolatile The R1a includes a leather memory can store up to pouch with a rotating belt clip ten additional frequencies accessible by press-ing the knob. The stored frequencies remain in memory during power OFF and even with the battery removed. The IFB R1a Receiver uses 20 kHz FM deviation for efficient use of the bandwidth and includes a single band compandor to suppress noise in the audio. The Pilot Tone squelch prevents the audio output from opening when there is no signal being received from the associated transmitter. The pilot tones are different frequencies than those used in Lectrosonics wireless microphone systems to prevent the signal from an IFB transmitter from opening the squelch on a wireless microphone receiver. The receiver operates on one 9 Volt alkaline. Iithium or rechargeable battery for up to 8 hours and features a tricolor LED low battery indicator. The voltages are internally regulated for stability. The receiver is housed in a compact, rugged, light-weight aluminum enclosure. The unit features a durable removable belt clip and an integral rotating battery compartment door.

Control Knob

The single front panel control knob performs multiple functions;

- Rotate for Power ON/OFF
- · Rotate for Audio Level
- · Push quick, Channel Switching
- Push and rotate for Scan and Channel programming

LED Indicator

The three color LED indicator on the front panel pro-vides multiple functions:

CHANNEL NUMBER: The LED will blink a rapid sequence to indicate the channel number BATTERY STATUS: During normal operation, when the LED is GREEN, the battery is good. When the LED is YELLOW the battery is getting low. When the LED is RED, the battery is nearly depleted and should be replaced. PROGRAMMING FUNCTIONS: In the program-ming mode, the LED will blink at a fast rate to indicate scanning for an active frequency. It also flashes briefly to indicate a frequency has been programmed into a channel.

Headphone Jack

A 3.5 mm mini phone jack accommodates a standard mono or stereo type 3.5 mm plug. The unit will drive low or high impedance earphones. The jack is also the receiver antenna input with the earphone cord acting as the antenna. The cord length is not critical but must be at least 6 inches minimum. Simple strain relief to avoid accidental disconnection can be applied with the included small Velcro hook and loop strip. Attach the adhesive strip side to the side of the receiver with the opening end of the strip up. Place the cord in the strip and secure.

Mono Plug/Stereo Plug Usage

A mono or stereo TRS (tip-ring-sleeve) plug can be used with the headphone jack. When a mono plug is inserted, the circuitry senses the ring to sleeve short and automati-cally switches off the ring amplifier to prevent excess bat-tery drain. To reset, switch the power OFF, then back ON.

Audio Level

Headphones and ear pieces vary widely in sensitiv-ity and impedance making it impossible to design a receiver with a fixed output power level that is correct for all situations. High impedance phones (600 to 2000) ohms will have an inherently lower power level due to their high impedance and likewise low impedance phones may be extremely loud.

CAUTION! Always set the audio level knob to minimum (counter-clockwise) when plugging phones into the jack, then adjust the knob for a comfortable audio level.



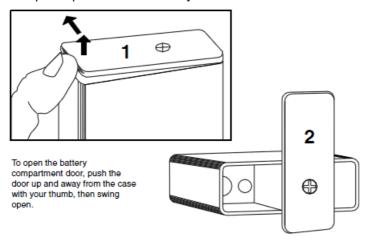
Frequency Adjustment and Tables

Two rotary switches adjust the frequency that will be set when the receiver is turned on. The 1.6M is a coarse adjustment with 1.6 MHz steps and the 100K is the fine adjustment that makes 100 kHz steps. Frequency tables are provided on the web site to list the frequencies in MHz (megahertz) that correspond to the hex numbers on the rotary switches. Go to the web site home page at: www.lectrosonics.com/US. Mouse over the Support tab at the top of the page, then click on Frequency Tables. You will be taken to the support site page with a complete listing of all available blocks.



Battery Instructions

The battery you use in the R1a receiver should be a 9 Volt alkaline or LiPolymer rechargeable type. Lithium batteries can also be used for extended operating time. An alkaline or LiPolymer battery will provide up to 8 hours of operation and a lithium battery will provide up to 20 hours of operation. Carbon zinc batteries, even if marked "heavy duty" will only provide about 2 hours of operation. A green LED corresponds to a fresh battery. The LED will change to yellow for low battery warning then to red to indicate the need for a fresh battery. To replace the battery, open the bottom battery door cover with your thumb, rotate the door until it is perpen-dicular with the case and allow the battery to fall out of the compartment into your hand. It is difficult to install the battery backwards. Observe the large and small holes in the battery contact pad before inserting a new battery. Insert the contact end of the battery first, mak-ing sure the contacts are aligned with the holes in the contact pad, and then swing the door closed. You will feel it snap into place when it is fully closed.



Normal Operation

Scan Mode (Default Function)

1. Set the Frequency of the receiver to match the frequency of the transmitter by using the two HEX rotary switches located on the side of the receiver. The 1.6M switch is for "coarse" adjustment (1.6 MHz per click) and the 100k switch is for "fine" adjustment (0.1 MHz per click). Setting both to zero (0,0) is the low frequency end of the block and set-ting both to F (F,F) is the highest frequency end of the block.

NOTE: Block 944 covers a special frequency range starting at 0,0 for 944.100 MHz through 4,E for 951.900 MHz for this limited band.

- 2. Plug an earphone or headset into the 3.5mm jack. Be sure the unit has a good battery.
- 3. Rotate the knob clockwise to switch the power ON (Do NOT hold the knob in while switching power ON). The LED will illuminate. Rotate the knob to set the desired audio level.
- 4. If channel frequency pre-sets have been stored in the memory, change channels by pressing the knob briefly and release. The LED will blink the next channel number (frequency) and the receiver will resume operation on that channel. If no channel frequencies have been stored when pressing the knob to change channels, the LED

will flash from green to red to yellow to green, indicating no stored channels and the unit will resume operation on the channel set by the switches.

5. Whenever the power is switched ON, the unit de-faults to the frequency set by the switches.

Add a New Frequency to The Next Open Channel

Before operating a receiver, one or more IFB T1 or T4 transmitters must be placed in XMIT mode, with each transmitter set to the desired frequency and connected to a proper antenna, audio source, and power source. The transmitter frequency block must be the same as the receiver frequency block as marked on each unit.

- 1. Position the receiver at a location within 20 to 100 feet of the transmitter or transmitters.
- 2. With the power ON, depress the knob until the LED starts rapidly blinking, then release the knob.
- 3. The unit goes into program mode and does a scan/search. Previously programmed frequencies will be automatically skipped. When the unit stops on a new frequency audio from the transmitter will be heard in the earphone and the LED will stop blink-ing rapidly and will change to a slow blink mode. The unit is now waiting for an operator decision. You must now decide to either SKIP or STORE the frequency (step 4 or 5 below.) Switching the power to OFF without storing will delete the frequency.
- 4. To SKIP the frequency, depress the knob briefly and the scan/search will resume.
- 5. To STORE the frequency into a channel memory, depress the knob and hold it until the LED blinks the new channel number, then release the knob. The frequency is now stored in an open channel.
- 6. The unit will continue to scan/search for other fre-quencies. To store more frequencies repeat steps 4 and 5 above. (Up to 5 frequencies can be stored in memory channels in Scan Mode.)
- 7. When all desired frequencies are stored switch the power to OFF for a few moments, then switch back to ON. The unit will default to the channel number set by the switches and resume normal operating mode.
- 8. The first scan is made at low sensitivity and search-es for only high level transmitter signals to avoid intermods. If the receiver does not stop on any frequency in the first scan, that means an IFB trans-mitter was not detected. In this condition the LED will change from a fast blink to a slow blink indicat-ing the end of the scan. The complete scan should take 15 to 40 seconds.
- 9. A second scan at high sensitivity is initiated by de-pressing the knob briefly at the end of the first scan to search for low level transmitter signals. When the scan stops and the transmitter audio is heard, either SKIP or STORE the frequency (step 4 or 5 above).
- 10. If the receiver still does not stop on any frequency, check that the transmitter is ON. Also, if a frequency is not received or received but distorted, some other signal may be interfering on that frequency. Change the transmitter to another frequency and try again.
- 11. Switching the POWER to OFF during any mode simply terminates that mode and returns the unit to normal operating mode when the power is switched back to ON.

Note: If knob does not change frequencies or begin scanning when pressed, check to see if its function has been changed – see instructions on page 9.

Erase All 5 Channel Memories

- 1. With power OFF, depress the knob and turn the unit ON. Continue to hold the knob down until the LED starts rapidly blinking. The memory is now erased and the unit will go into scan/search mode.
- 2. Continue from step 3 above Add New Frequency.

When using this IFB receiver in a search mode, with 2 or more transmitters running at the same time, the receiver may stop on a false signal under the following conditions:

- 2 transmitters are on and transmitting.
- The distance from the transmitters to the IFB re-ceiver is less than 5 feet.

The false hits are caused by intermodulation or mixing in the front end of the IFB receiver. At a 5 to 10 foot distance, the two carriers are so strong at the receiver, that even this well designed front end will mix the carri-ers and produce phantom frequencies. The IFB receiver then halts its scan and stops on these false frequencies. All receivers will exhibit this type of problem at some transmitter power level and range. You notice false signals more with a scanning mode receiver since it will find them all. Prevention is simple. Do one of the following:

- Do the scan with only one transmitter on at a time.(Time-consuming)
- Increase the receiver to transmitter distance to at least 10 feet. (Preferred)

Advanced Operation

Direct Entry Mode

This mode takes away the scan capability and replaces it with the ability to program frequency channels into memory (pre-sets) directly via the knob and hex switch-es. In Direct Entry Mode, 5 additional channel pre-sets are available, for a total of 10.

Selecting the Mode

To choose and/or switch between frequency pre-set modes, follow the instructions below:

Direct Entry Mode	Scan Mode
Turn the unit on	Turn the unit on
Set hex switches to "FF"	Set hex switches to "FF"
Power cycle	Power cycle
Set hex switches to "22"	Set hex switches to "11"
Power cycle	Power cycle
Set hex switches to "00"	Set hex switches to "00"
Power cycle	Power cycle

Note: "Power cycle" means to briefly turn the unit off then on

again. This must be done quickly to work correctly.

When the receiver powers back on, count the bursts of rapid LED blinks; two bursts = Direct Entry Mode, one burst = Scan Mode.

Operation in Direct Entry Mode

Direct Entry Mode works the same as Scan Mode except there are 10 pre-set channel options instead of 5. Each of the 10 channels can be individually pro-grammed or cleared, at any time, in any order.

Note: The first 5 pre-sets are shared with Scan Mode, so it is possible to switch to Direct Entry Mode to program the pre-sets and then switch back to Scan Mode, if desired.

Adding New Pre-Set Frequencies

- 1. Power on while holding down the knob, continuing to hold the knob for 3 seconds, until the led starts blinking rapidly.
- 2. Press the knob to navigate to the desired channel, 1 to 10 (1 push for channel 1, 2 pushes for channel 2, etc.).

 Note: If you accidentally pass the desired channel, an extra press from channel 10 wraps back to channel 1 again.
- 3. Once the desired frequency has been selected, use the hex switches to select the channel. (At least 1 hex switch must be moved.)
- 4. Press and hold the knob for 3 seconds to store the frequency into the channel.

Clearing Pre-Set Frequencies

- 1. Power on while holding down the knob, continuing to hold the knob for 3 seconds, until the led starts blinking rapidly.
- 2. Press the knob to navigate to the desired channel, 1 to 10 (1 push for channel 1, 2 pushes for channel 2, etc. **Note:** If you accidentally pass the desired channel, an extra press from channel 10 wraps back to channel 1 again.
- 3. Press and hold the knob for 3 seconds to delete the pre-set frequency.

Note: This is the same process used to add a new frequency except you are not adjusting the hex switches. Adjusting the hex switches will set a new pre-set frequency.

To simultaneously erase all 10 channels, you must be in Scan Mode and perform the "erase all" function (see page 7).

Defeating the Switch

The switch function on the knob can be defeated if so desired to eliminate the scanning function. This is done by simply removing a washer from underneath the knob.

- 1. Use the allen wrench to loosen the set-screws on the knob.
- 2. Remove the knob and the small washer P/N 28443.
- 3. Put the knob back on the shaft without the washer and slide it down flush with the housing.
- 4. Hold the knob against the housing and tighten the set screws.
- 5. Press the knob to see if it actuates the switch. You not be able to feel a detent in the switch movement.
- 6. Turn the receiver on a verify that pressing the knob does not start the scanning process.



In case you lose the tiny little washer...

Once the small washer has been removed, you can re-enable the switch by simply loosening the set screws and raising the knob up the shaft slightly, and then tight-ening the set screws.

NOTE: Frequencies can still be stored manually using the Direct Entry mode even when the switch is defeated.

Troubleshooting

Symptom Possible Cause

LED NOT LIT

• Battery not installed or depleted.

· Power not turned on.

NO SOUND IN HEADPHONE

• AUDIO LEVEL turned all the way down.

· Headphone plug not inserted fully.

· Defective headphone or connector

Transmitter not operating. (See separate transmitter manual.)

Receiver not on the same frequency as the transmitter.
 See pages 6 and 8.

DISTORTED SOUND

 Transmitter gain (audio level) is far too high. Refer to the operating instructions section in the transmitter manual for details on gain adjustment.

 Receiver output may be mismatched with the headset or earphone. Adjust audio level on receiver to the correct level for the headset or earphone.

Receiver may be tuned to an IM product. This can happen when a
frequency is added with the scanning procedure and the receiver
is close to more than one transmitter antenna. Try setting the
frequency manually using the Direct Entry mode on page 8.

HISS AND NOISE, AUDIBLE DROPOUTS

· Transmitter gain far too low.

Receiver antenna missing or obstructed. (Headphone cable is the antenna.)

Transmitter antenna missing or obstructed.

· Operating range too great.

 Transmitter antenna obstructed. Move transmitter antenna and/or receiver to a position with a line of sight between the transmitter antenna and the receiver.

 Receiver antenna (headset cord) may need to be repositioned for a line of sight to transmitter antenna

SHORT RANGE

 Receiver earphone cable is also the antenna. Make sure the cable is not coiled or wound up or wrapped around the receiver case.

KNOB DOES NOT CHANGE FREQUENCIES NOR START SCANNING

Check to see if the switch has been defeated - see page 9.

Parts and Accessories

PR1A Leather Pouch w/belt clip



ON/Off/Volume knob and parts



Specifications and Features

Operating frequencies (MHz):

• US E02

- Block 470 470.100 495.600 779.125 787.875
- Block 19 486.400 511.900 797.125 805.875
- Block 20 512.000 537.500 806.125 809.750
- Block 21 537.600 563.100
- Block 22 563.200 588.700
- Block 23 588.800 607.900 and 614.100 614.300
- Block 24 614.400 639.900
- Block 25 640.000 665.500
- Block 26 665.600 691.100
- Block 27 691.200 716.700*
- Block 28 716.800 742.300*
- Block 29 742.400 767.900*
- Block 944 944.100 951.900

E01

- Block 470 470.100 495.600
- Block 19 486.400 511.900
- Block 20 512.000 537.500
- Block 21 537.600 563.100
- Block 22 563.200 588.700
- Block 23 588.800 607.900 and 614.100 614.300
- Block 24 614.400 639.900
- Block 25 640.000 665.500
- Block 26 665.600 691.100
- Block 27 691.200 716.700*
- Block 28 716.800 742.300*
- Block 29 742.400 767.900*
- Block 30 768.000 793.500
- Block 31 793.600 819.100
- Block 32 819.200 844.700
- Block 33 844.800 861.900
- Block 606 606.000 631.500
 - *Available for export only

NOTE: It's the user's responsibility to select the approved frequencies for the region where the transmitter is operating.

- 1. Number of frequencies: 256 per block (79 in block 944, 172 in block 33)
- 2. Channel spacing: 100 kHz
- 3. Frequency control: Crystal Controlled Phase Locked Loop
- 4. Sensitivity: 1 uv (20 dB SINAD)
- 5. Signal/Noise ratio: 95 dB A-weighted
- 6. Squelch quieting: 90 dB
- 7. AM rejection: 50 dB, 10 uv to 100 mv
- 8. Modulation acceptance: ±20 kHz

9. Spurious rejection: Greater than 70 dB

10. Third order intercept: 0 dBm

11. Frequency response: 100 Hz to 10 kHz, (±1db)

12. Pilot tone: 29.997 kHz, 4.5 kHz deviation (fixed crystal controlled)

13. Audio output, headphone: 1 Volt RMS into 50 ohms minimum

14. Antenna: Headphone cable

15. Min. headphone impedance: 25.6 Ohms

16. Programmable memory: Switches set default frequency; up to 10 additional

17. frequencies can be stored in memory

18. Front panel controls: Single knob controls Audio Output Level,

19. Power on, programming and Scan Frequency Selection

20. Indicators: 1 tricolor LED Indicator for power on, blinks to

21. indicate channel number, blinks fast during scan,

22. and turns yellow or red for low battery

23. Battery Requirement: 9V alkaline battery lasts about 8 hours

24. 9V lithium battery lasts about 20 hours

25. Power consumption: 60 mA

26. Allen wrench for knob: 0.035" (Lectro part number: 35854)

27. Weight: 7.3 oz with battery

28. Size: 3.6 x 2.4 x 0.8 inches (91.44 x 60.96 x 20.32 mm)

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 at-tempt 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 e-mail 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 dam-age to equipment that you ship. Of course, we insure the equipment when we ship it back to you.

Lectrosonics USA:

Mailing address: Lectrosonics, Inc.

PO Box 15900

Rio Rancho, NM 87174 USA **Web:** <u>www.lectrosonics.com</u>

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 liablility 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.

FCC Notice

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pur-suant to Part 15 of the FCC Rules. These limits are de-signed to provide reasonable protection against harmful interference in a residential installation. The equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encour-aged to try to correct the interference by one or more of the following measures:

- · Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that which the receiver is connected
- Consult the dealer or an experienced radio/TV tech-nician for help
 Changes or modifications to this equipment not ex-pressly approved by Lectrosonics, Inc. could void the user's authority to operate it.

Documents / Resources



<u>LECTROSONICS IFBR1a UHF Multi-Frequency Belt-Pack IFB Receiver</u> [pdf] Instruction Ma

IFBR1a, UHF Multi-Frequency Belt-Pack IFB Receiver, IFBR1a UHF Multi-Frequency Belt-Pack IFB Receiver, IFBR1a E01, IFBR1a E02

References

• X Lectrosonics: Quality wireless microphone, encrypted digital wireless and DSP audio processing systems

Manuals+,