

UM700

DIGITAL FREQUENCY-AGILE UHF BELT-PACK TRANSMITTER

OPERATING INSTRUCTIONS and trouble-shooting guide

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The UM200C transmitter is FCC type accepted under Part 74: 470-608MHz and 614-802MHz

INTRODUCTION

The 700 Series wireless system was designed to take advantage of the superior audio performance provided by DSP audio signal processing and the security provided by proprietary digital and encrypted digital radio operation.

Several advantages are provided by a digital wireless system and DSP technology:

- A digital radio system provides outstanding signal to noise ratio
- The signal to noise ratio of a digital radio system does not vary with the RF signal strength arriving at the receiver.
- DSP audio signal processing provides a superior limiter
- Eavesdropping is difficult and secure encryption techniques can be implemented

The UM700 is a rugged, machined aluminum package in a belt-pack configuration with a removable, spring loaded belt clip. A 5-pin input jack provides taps for any microphone or line level signal. The unit is powered by a single 9 Volt alkaline or lithium battery, or from external DC using an optional battery eliminator. The antenna is a detachable, locking 1/4 wavelength flexible bronze alloy cable that connects to a 50 Ohm SMA port on the control panel.

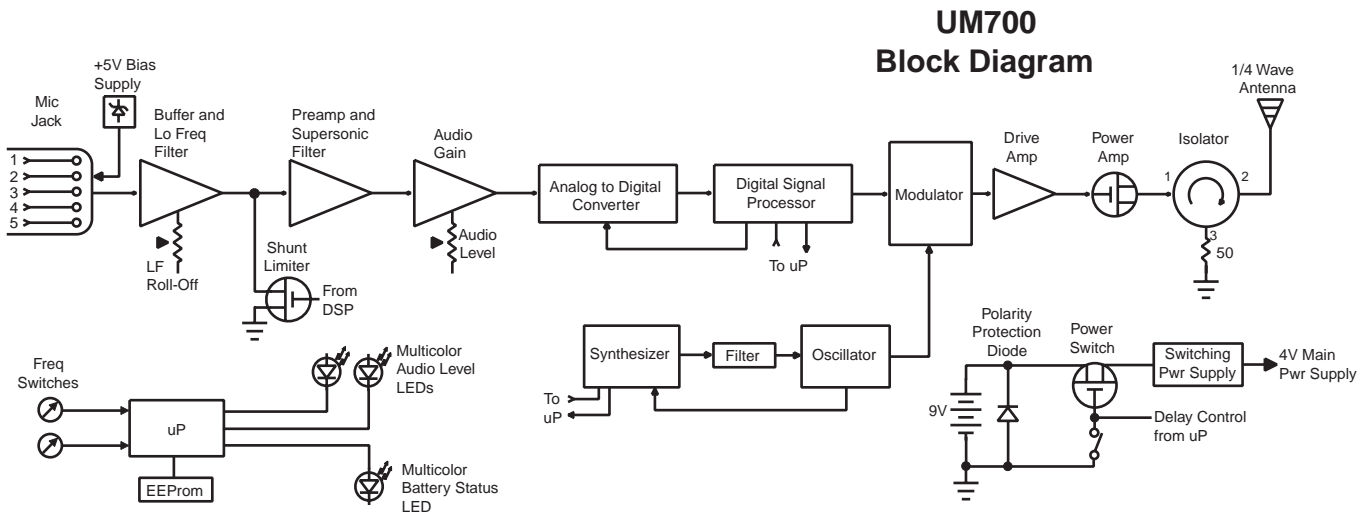
Only the UM700 transmitter is covered in this manual. Companion receivers are covered in separate manuals. The UM700 will operate with any 700 Series Lectrosonics receiver in the same frequency block.

GENERAL TECHNICAL DESCRIPTION

GENERAL

The 700 Series wireless system uses digital modulation for an extremely high signal to noise ratio and freedom from distortion and compandor artifacts. The input preamplifier uses an ultra low noise op amp for an excellent signal to noise ratio. A dual-envelope limiter is implemented by the DSP firmware to cleanly limit input signal peaks up to 30dB above full modulation. The transmitter circuits are all regulated to allow full output power from the beginning (9 Volts) to the end (5.5 Volts) of battery life.

The UM700 transmitter is comprised of a number of functional sub-systems as shown in the block diagram below.



DIGITAL MODULATION

Digital modulation is used to eliminate compandor artifacts and provide an extremely high signal to noise ratio. A proprietary compression algorithm is used to contain the RF energy into a narrower bandwidth than other digital systems to allow the 700 Series system to utilize frequencies in FCC Part 74 for broadcast and motion picture production. For applications that require secure operation that prevent eavesdropping, encryption can easily be implemented.

AUDIO PROCESSING

The input circuitry includes an adjustable low frequency roll-off filter ahead of the limiter and gain stage to customize the low frequency response for varying conditions. In controlled environments with minimal low frequency ambient noise, such as a film production set, the frequency response can be extended to 30 Hz. For applications with excessive low frequency energy, such as in a moving vehicle or rooms with HVAC noise, the low end can be rolled off as high as 150 Hz to reduce the effects of the noise.

A “dual-envelope” limiter with 30 dB of range is next in the signal chain. This special limiter is software controlled, being driven by the DSP to minimize “overshoot” and slow attack times that can occur in other types of limiter circuits. The compressor works with two different time constants to cleanly handle a wide variety of dynamics. A fast peak limiter prevents overload distortion from sharp, infrequent transients in the audio signal, and an averaging limiter with longer time constants prevents “pumping” (gain modulation) that can occur with repeated peaks that are closely spaced. Supersonic filtering is provided to prevent excessive high frequency energy from entering the A/D converter.

A/D CONVERTER AND DSP PROCESSOR

The processed audio signal enters the A/D converter to generate a digital signal for the modulator. A proprietary algorithm is used for sampling and compression to minimize noise and distortion, and provide a wide, flat frequency response. The signal then enters the modulator to generate a digitally modulated radio signal.

OUTPUT SECTION

Intermodulation (IM) occurs in the final amplifier stages of conventional transmitters when the transmitters are within a few feet of each other. This can create serious problems in multi-channel wireless systems when an IM signal falls on the carriers, IF frequencies, etc. of the systems being operated. To eliminate this problem in the UM700, the modulated radio signal passes through a circular isolator before entering the antenna. The circular isolator functions like a “one-way check valve” to allow the RF signal to pass through to the antenna, but not to pass backwards into the amplifier stage. RF signals from other nearby transmitters cannot reach the output amplifier in the UM700. This provides excellent stability and eliminates IM in the output stage of the transmitter.

LONG BATTERY LIFE

High efficiency circuits and switching power supplies throughout the design allow over 4.5 hours of operation using a single 9 Volt alkaline battery. (A 9V lithium battery will provide over 14 hours of operation.) The battery compartment is a unique mechanical design which automatically adjusts to fit any brand of battery. The battery contacts are spring loaded to prevent “rattle” as the unit is handled.

FREQUENCY AGILITY

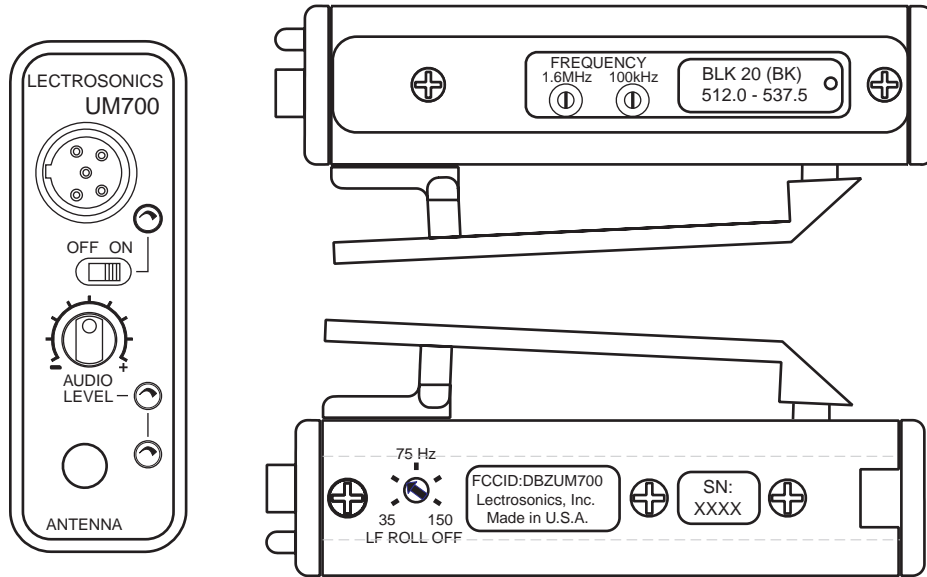
700 Series wireless systems are available on eight different “blocks” of 256 frequencies, from 537.600 to 767.900 MHz. Each of these blocks provides 256 selectable frequencies in 100 kHz steps over a 25.6 MHz bandwidth. This wide variety of selectable frequencies alleviates carrier interference problems in mobile or traveling applications. Two 16-position rotary switches on the side panel of the unit are used to select the frequency.

The UM700 transmitter section uses a synthesized, frequency selectable main oscillator. The frequency is extremely stable over a wide temperature range and over time.

ANTENNA

At UHF frequencies, where wavelengths and antennas are shorter than at VHF frequencies, a resonant length wire is preferred over using the microphone cable as the antenna. The antenna on the UM700 consists of a flexible 1/4 wavelength bronze cable, detachable via an SMA connector. The impedance of this connector is 50 Ohms.

CONTROLS AND FUNCTIONS



INPUT JACK

The input jack on the UM700 is a Switchcraft TA5M connector that accommodates virtually every lavalier, hand-held or shotgun microphone available, with positive or negative bias. The input will also cleanly handle line level signals up to 300 mV before limiting. Use a Switchcraft TA5F connector on the microphone cable or input adapter cord .





See the separate sheet titled “Transmitter 5-Pin Input Jack Wiring” regarding the correct connections for various microphones, and other sources.

ON/OFF SWITCH

Turns the battery power on and off. Even when the switch is turned off or on abruptly, the digital muting prevents “thumps” or transients from occurring.

“ON” LAMP

Glows brightly when the battery is good and the ON/OFF switch is ON. This tri-color LED will indicate the condition of the battery *in the transmitter* as follows:

-  Green - battery good
-  Yellow - battery getting low
-  Red - battery very low - change now
-  Blinking Red - battery critical - failure imminent

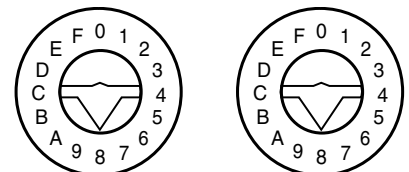
FREQUENCY ADJUST (located under the sliding door)

These two rotary switches adjust the center frequency of the carrier. The 1.6M is a coarse adjustment and the 100K is the fine adjustment. Each transmitter is factory aligned at the center of its operating range. The default position of the frequency select switches is in the center of the transmitter’s range.

Since the internal circuits are all tightly regulated and the RF output stage is powered by a regulated supply, the transmitter will continue to operate perfectly to a battery voltage of 5.5 Volts.

Please note that a weak battery will sometimes light the POWER LED immediately after turn on, but will soon discharge to the point where the LED will indicate a weak battery, just like a flashlight with “dead” batteries.

The combination of an accurate battery condition indicator and regulation of all internal circuits provides much longer battery life, as well as consistent performance over the life of the battery.



AUDIO LEVEL CONTROL

Used to adjust the audio input level for proper modulation.

AUDIO LEVEL LEDS

Indicate the proper setting of the MIC LEVEL control.

The two audio level LED's are bi-colored (red/.green) and indicate 5 levels -

●	●	Off - Off	no audio modulation
○	●	Green - Off	low audio
○	○	Green - Green	moderate audio
⊗	⊗	Yellow - Yellow	full audio
●	●	Red - Red	limiting

ANTENNA

The flexible wire antenna supplied with the transmitter is cut to 1/4 wavelength of the center of the frequency block (the frequency range) of the transmitter. It is removable via an SMA connector. The SMA connector is a 50 Ohm RF port which can also be connected directly to test equipment. Replacement antennas are available in pre-cut lengths for specific frequency blocks, or as a kit with instructions to cut the antenna for any frequency block.

ADJUSTABLE LOW FREQUENCY ROLL-OFF

A 18dB per octave low frequency roll-off is provided in the audio section, with the -3dB point adjustable from 35Hz to 150Hz. The actual roll-off frequency will vary somewhat according to the low frequency response of the mic capsule being used.

The low frequency roll-off control is used to reduce the undesirable effects of very low frequency audio often produced by air conditioning systems, automobile traffic and other sources. Excessive low frequency content in the audio input can cause overload of the program audio in recording applications. In sound reinforcement systems, excessive low frequency content can cause excessive power amplifier drain or even damage to loudspeaker systems. A common example is wind blowing across a microphone, causing very high levels of low frequency audio ("wind noise"). By rotating the roll-off control clockwise, the hinge point of the roll-off is increased to reduce the level of low frequencies. In low noise situations, such as a motion picture production set indoors where environmental noise is minimal, the control can be rotated counter-clockwise to permit low frequency audio to be captured.

THE BELT CLIP

The belt clip may be removed for special applications by removing one screw.

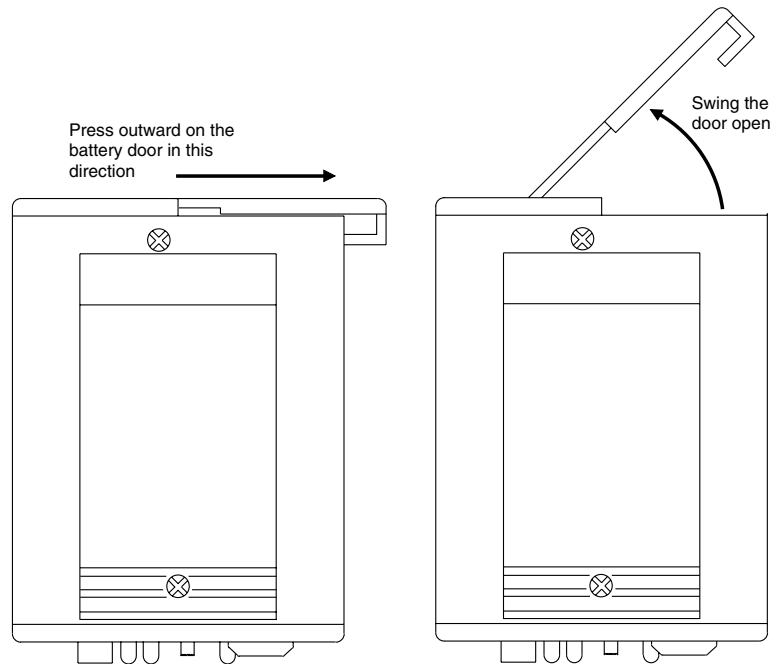
USE ONLY THE SCREW THAT IS SUPPLIED

The circuitry is tightly packed into this unit. A longer screw will permanently damage the transmitter! Use only Lectrosomics PN:28528 which is a Phillips head, 4-40 x 3/16", FL100 screw.

BATTERY INSTALLATION

The transmitter is powered by a standard alkaline or lithium 9 Volt battery. It is important that you use **ONLY** an **ALKALINE** or **LITHIUM** battery for longest life. Standard zinc-carbon batteries marked “**heavy-duty**” or “**long-lasting**” are not adequate. Ni-cad rechargeable batteries will only provide 1.5 hours of operation, or less, and will run down quite abruptly. Unless it is cold, alkaline batteries provide over 4.5 hours of operation. Lithium batteries can be used to provide up to 14 hours. Care should be taken not to leave a fully discharged lithium battery in the transmitter, as swelling of the battery can make it difficult to remove from the compartment. The battery status circuitry is designed for the voltage drop over the life of alkaline batteries.

To open the battery compartment, press outward on the cover door in the direction of the arrow as shown in the drawing. Only firm, sliding pressure is needed to open and close the battery door. Swing the door open and take note of the polarity marked inside showing the location of the positive (+) and negative (-) terminals. You can see the large and small contact holes inside the battery compartment with the door open.



Insert the battery correctly and close the cover by pressing the door closed and across, reversing the opening procedure illustrated above. If the battery is inserted incorrectly, the door will not close. Do not force the door closed.

OPERATING INSTRUCTIONS

- 1) Install a fresh battery according to the instructions above.
- 2) Insert the microphone plug into the input jack, aligning the pins; be sure that the connector locks in.
- 3) Attach the antenna to the SMA connector on the top of the transmitter.
- 4) Mute the sound system.
- 5) Turn the transmitter power switch to the “ON” position.
- 6) Position the microphone in the location you will use in actual operation.
- 7) While speaking or singing at the same voice level that will actually be used, observe the MODULATION LEDs. Adjust the AUDIO LEVEL control knob until the LEDs begin to light. Start at a low setting where neither LED lights as you speak.

OPERATING NOTES

The AUDIO LEVEL control knob should not be used to control the volume of your sound system or recorder levels. This gain adjustment matches the transmitter gain with the user's voice level and microphone positioning.

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

If the audio level is too low — neither LED will light, or only one LED will flicker Green. This condition will reduce the signal to noise ratio of the system.

The input limiter will handle peaks up to 30dB above full modulation. Occasional limiting is desirable, indicating that the gain is correctly set and the transmitter is fully modulated for optimum signal to noise ratio.

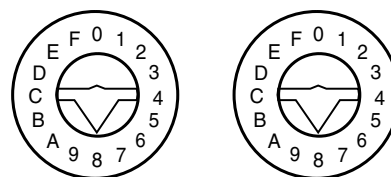
Different voices will usually require different settings of the AUDIO LEVEL control, so check this adjustment as each new person uses the system. If several different people will be using the transmitter and there is not time to make the adjustment for each individual, adjust it for the loudest voice.

ADJUSTING THE TRANSMITTER FREQUENCY

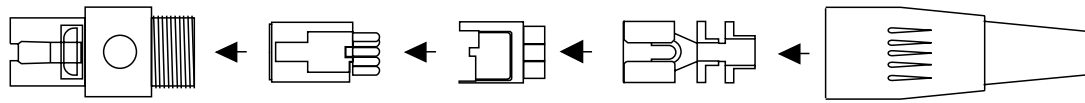
If you are experiencing interference from another signal on your frequency, you may want to change the operating frequency of your system. The left switch changes the operating frequency by 1.6 MHz per step and the right switch changes it 100 kHz per step. If you are experiencing interference, change the operating frequency in 100 kHz steps to find a clear channel. If it is not possible to find a clear channel using the 100 kHz switch, return it to its original position and change the 1.6 MHz switch by one click then try the 100 kHz switch again.

To gain access to these switches, slide the access door sideways with a fingernail.

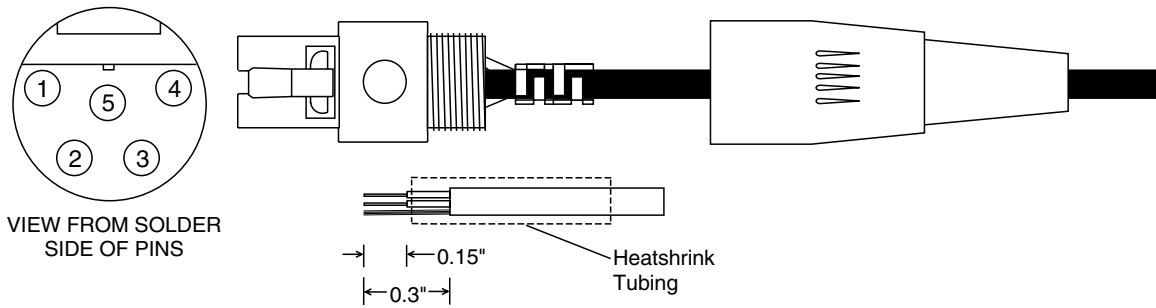
The UDR700 receiver front panel will indicate the correct switch settings to match the receiver frequency.



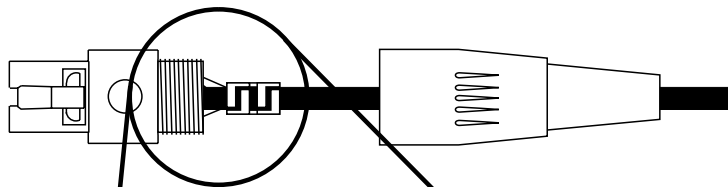
MICROPHONE CORD TERMINATION



TA5F Connector Assembly



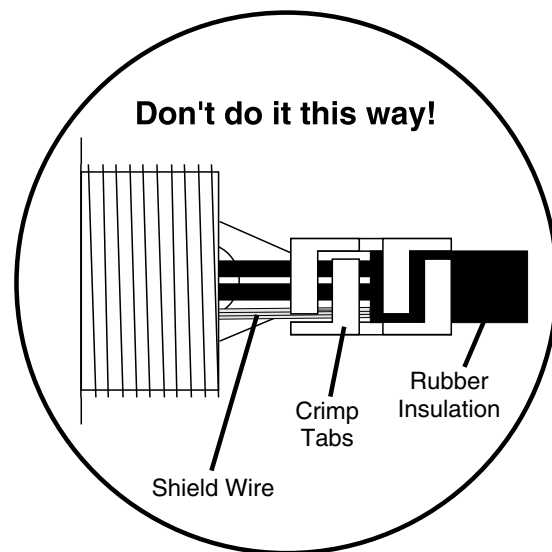
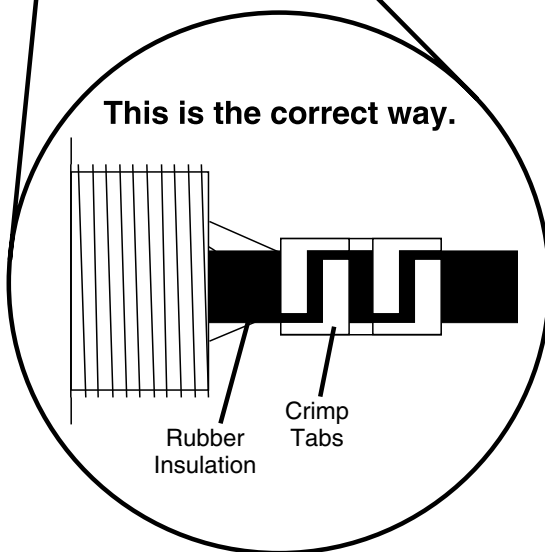
Mic Cord Stripping Instructions



Caution!

Do not allow the shield wire to touch any metal part of the connector shell.

The shield wire is the antenna on VHF models and poor operating range will result.



5-PIN INPUT JACK WIRING

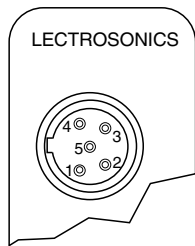
The wiring diagrams shown on the next page represent the basic wiring necessary for the most common types of microphones and other audio inputs. Some microphones may require extra jumpers or a slight variation on the diagrams shown.

Caution - When wiring the connector, do not use the connector body for any electrical connections.

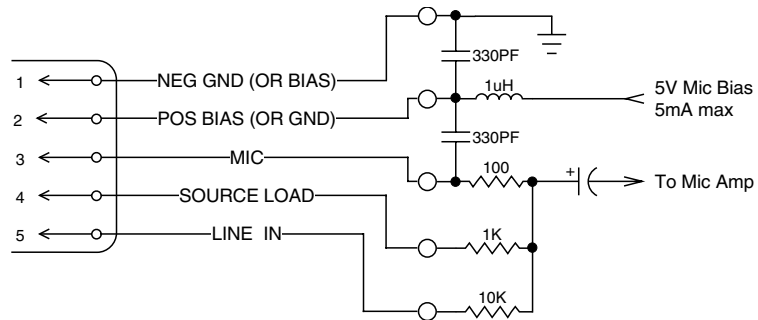
A common mistake is to use the connector body as an audio ground. The connector body is already used as an RF ground on VHF models and no other use is permitted.

It's virtually impossible to keep completely up to date on changes that other manufacturers make to their products. It is possible that you may encounter a microphone that differs from these instructions. If this occurs please call our toll-free number listed in the back manual. Our service department can answer your questions regarding microphone compatibility.

When used on a wireless transmitter, the microphone element is in the proximity of the RF coming from the transmitter. The nature of electret microphones makes them sensitive to RF, which can cause problems with the microphone/transmitter compatibility. If the electret microphone is not designed properly for use with wireless transmitters, it may be necessary to install a chip capacitor in the mic capsule or connector to block the RF from entering the electret capsule. This modification is shown on the next page.



**Transmitter
Input Jack**



UHF Transmitter Equivalent Input Circuit

VHF transmitters use the shield of the microphone cord as the antenna. The UM700 uses a 1/4 wave flexible wire to radiate the RF signal. There is really not much difference between these two approaches, with respect to the effect of the RF on the microphone capsule. Even in transmitters that utilize a "dangling wire," the microphone is still part of the "ground plane" and is therefore still in the antenna circuit.

- PIN 1** Shield (ground) for positive biased electret lavalier microphones. For the increasingly rare negative biased electret lavalier microphones, it is the bias voltage source. It is also the shield (ground) for dynamic microphones and line level inputs.
- PIN 2** Shield (ground) for negative biased electret lavalier microphones. Bias voltage source for positive biased electret lavalier microphones.
- PIN 3** Low impedance microphone level input for dynamic microphones. Also accepts hand-held electret microphones that have their own battery or power supply.
- PIN 4** 1K Ohm source load for non-Lectrosonics electret microphones. Use in conjunction with other pins to provide attenuation of high level input signals.
- PIN 5** 10k high impedance, line level input for tape decks, mixer outputs, musical instruments, etc.

RF BYPASSING

Some mics require RF protection to keep the radio signal from affecting the capsule, even though the transmitter input circuitry is already RF bypassed (see schematic diagram).

If the mic is wired as directed, and you are having difficulty with squealing, high noise, or poor frequency response; RF is likely to be the cause.

The best RF protection is accomplished by installing RF bypass capacitors at the mic capsule. If this is not possible, or if you are still having problems, capacitors can be installed on the mic wires inside the TA5F connector housing.

Install the capacitors as follows: Use 330 pF capacitors. Capacitors are available from Lectrosonics. Please specify the part number for the desired lead style.

Leaded capacitors: P/N 15117

Leadless capacitors: P/N SCC330P

All Lectrosonics lavalier mics are already bypassed and do not need any additional capacitors installed for proper operation.

BODY GROUND

Caution - When wiring the connector, do not use the connector body for any electrical connections. A common mistake is to use the connector body as an audio ground. The connector body is already used as an RF ground on VHF models and no other use is permitted.

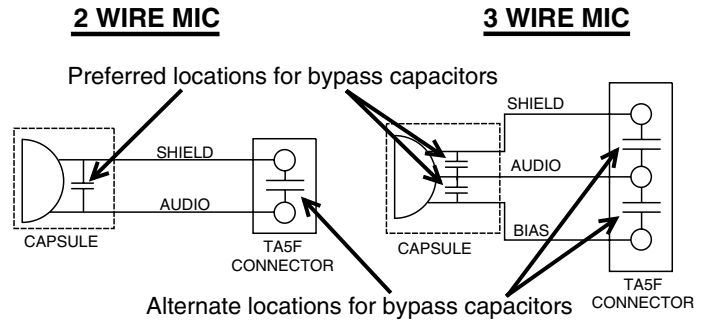
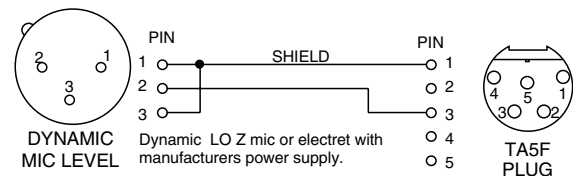
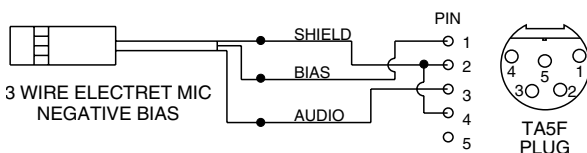
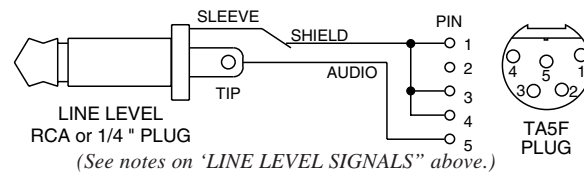
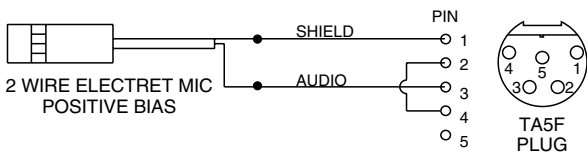
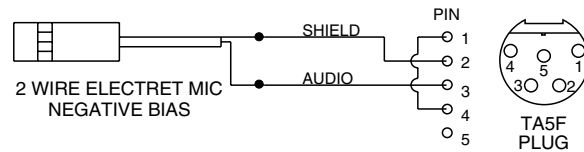
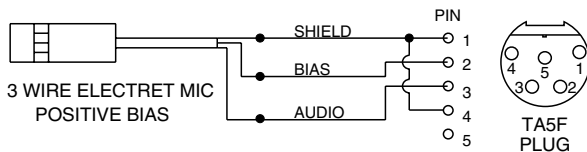
LINE LEVEL SIGNALS

The normal hookup for line level signals is: Signal Hot to pin 5, Signal Gnd to pin 1, pin 4 jumped to pin 1, and pin 3 jumped to pin 1. This gives a 40dB attenuator that allows signal levels much higher than 3V to be applied without limiting.

If more headroom is needed, insert a 100k resistor in series with pin 5. Put this resistor inside the TA5F connector to minimize noise pickup.

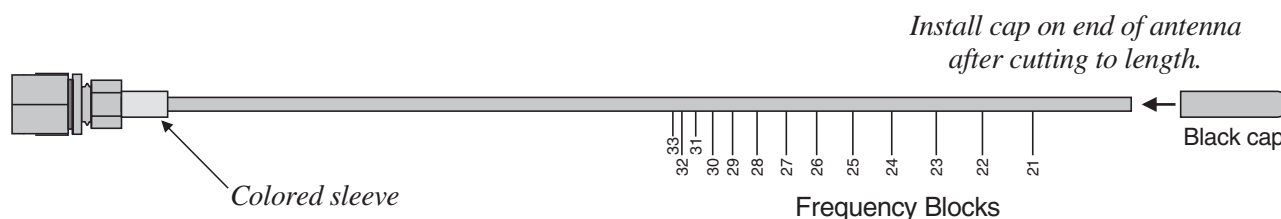
If lower than normal line levels (less than 1V) are expected, use this hookup: Signal Hot to pin 5, Signal Gnd to pin 1, and pin 4 jumpered to pin 1. This provides a 20dB attenuator allowing signals as high as 3V to be applied without limiting.

WIRING HOOKUPS FOR DIFFERENT SOURCES



A6U UHF ANTENNA

This is a full size cutting template. Lay the actual antenna on top of this drawing and cut at the mark for the desired frequency group.

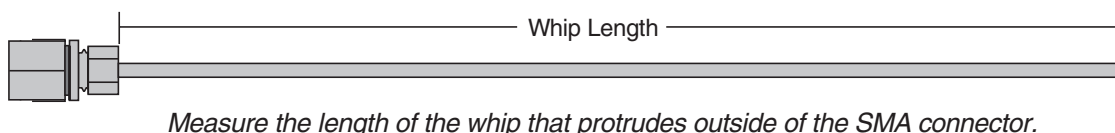


Kits are shipped from the factory with caps of the various colors plus a black cap. After cutting the antenna to the desired block length, select the properly colored cap and cut off the closed end to make the colored sleeve. Slide the colored sleeve onto the antenna as shown above then slide the black cap onto the cut end of the antenna.

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	Orange/Black	3.08"
31	793.600 - 819.100	Orange/Brown	2.99"
32	819.200 - 844.700	Orange/Red	2.92"
33	844.800 - 865.000	Orange/Orange	2.87"

The sleeve color follows the standard resistor color code for the second numeral in the group number.

*IMPORTANT



TROUBLESHOOTING

Before going through the following chart, be sure that you have a good battery in the transmitter. It is important that you follow these steps in the sequence listed.

SYMPTOM	POSSIBLE CAUSE
TRANSMITTER BATTERY LED OFF	<ol style="list-style-type: none"> 1) Battery is inserted backwards. 2) Battery is dead.
NO TRANSMITTER MODULATION LEDS	<ol style="list-style-type: none"> 1) Gain control turned all the way down. 2) Battery is in backwards. Check power LED. 3) Mic capsule is damaged or malfunctioning. 4) Mic cable damaged or mis-wired.
RECEIVER RF LAMP OFF	<ol style="list-style-type: none"> 1) Transmitter not turned on. 2) Transmitter battery is dead. 3) Receiver antenna missing or improperly positioned. 4) Transmitter and receiver not on same frequency. Check switches/display on transmitter and receiver. 5) Operating range is too great. 6) Transmitter antenna not connected
NO SOUND (OR LOW SOUND LEVEL), RECEIVER MOD LEVEL LEDs ARE ON	<ol style="list-style-type: none"> 1) Receiver output level set too low. 2) Receiver output is disconnected; cable is defective or mis-wired. 3) Sound system or recorder input is turned down.
DISTORTED SOUND	<ol style="list-style-type: none"> 1) Transmitter gain (audio level) is far too high. Check mod level lamps on transmitter and receiver as it is being used. (refer to pages 8/9 for details on gain adjustment) 2) Receiver output may be mis-matched with the sound system or recorder input. Adjust output level on receiver to the correct level for the recorder, mixer or sound system. 3) Excessive wind noise or breath "pops." Re-position microphone and/or use a larger windscreen. 4) Transmitter is not set to same frequency as receiver. Check that frequency select switches on receiver and transmitter match.
HISS AND NOISE -- AUDIBLE DROPOUTS	<ol style="list-style-type: none"> 1) Transmitter gain (audio level) far too low. 2) Receiver antenna missing or obstructed. 3) Transmitter antenna missing. 4) Operating range too great.
EXCESSIVE FEEDBACK	<ol style="list-style-type: none"> 1) Transmitter gain (audio level) too high. Check gain adjustment and/or reduce receiver output level. 2) Transmitter too close to speaker system. 3) Mic is too far from user's mouth.

SPECIFICATIONS AND FEATURES

Operating Principle:	Proprietary digital modulation with encryption
Operating frequencies:	525.000 to 870.000 MHz depending upon local regulations
Frequency selection:	256 frequencies in 100kHz steps
RF Power output:	50 mW (nominal)
Frequency stability:	± 0.001%
Equivalent input noise:	-126 dBV
Input level:	Nominal 2 mV to 300 mV, before limiting.
Spurious radiation:	70 dB below carrier
Input Level:	Nominal 2 mV to 300 mV before limiting Greater than 30 V maximum with limiting
Input impedance:	Taps provided for 100, 1k, 10k Ohm
Input compressor:	Dual-envelope limiter; 30 dB range
Gain control range:	43 dB; semi-log rotary control
Modulation indicators:	Dual multi-color LEDs indicate modulation level in 5 steps at -20, -10, -5, 0, +5 dB with green, yellow and red indications
Low frequency roll-off adjustment:	-18dB/octave; 35Hz to 150Hz
Controls:	2 position "OFF-ON" slide switch for noiseless turn on/turn off operation. Front panel knob adjusts audio gain. Recessed control on side panel adjusts low frequency rolloff. Rotary switches on side panel adjust transmitter frequency.
Audio Input Jack:	Switchcraft 5 pin locking (TA5M)
Antenna:	Detachable, flexible 1/4 wave cable. 50 Ohm port allows connection to test equipment.
Battery:	Precision compartment auto-adjusts to accept any known alkaline 9 Volt battery. (We've tried over 150 different ones!)
Battery Life:	4.5 hours (alkaline); 14 hours (lithium)
Weight:	6.3 ozs. including battery
Dimensions:	3.1 x 2.4 x .75 inches
Emission Designator:	180KQ2E

Specifications subject to change without notice.

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 out the interconnecting cords and then go through the TROUBLE SHOOTING section in the 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

You will save yourself time and trouble if you will 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 am to 4 pm (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

Telephones:

Regular: (505) 892-4501
Toll Free (800) 821-1121
FAX: (505) 892-6243

World Wide Web: <http://www.lectrosonics.com>

Email: sales@lectrosonics.com

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

This warranty applies only to items returned to us, shipping costs prepaid, within one year from the date of purchase.

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

LECTROSONICS, INC.

581 LASER ROAD
RIO RANCHO, NM 87124 USA
www.lectrosonics.com

March 26, 2001