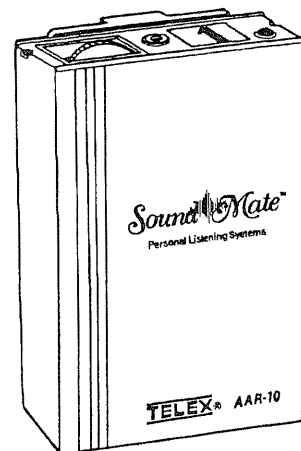
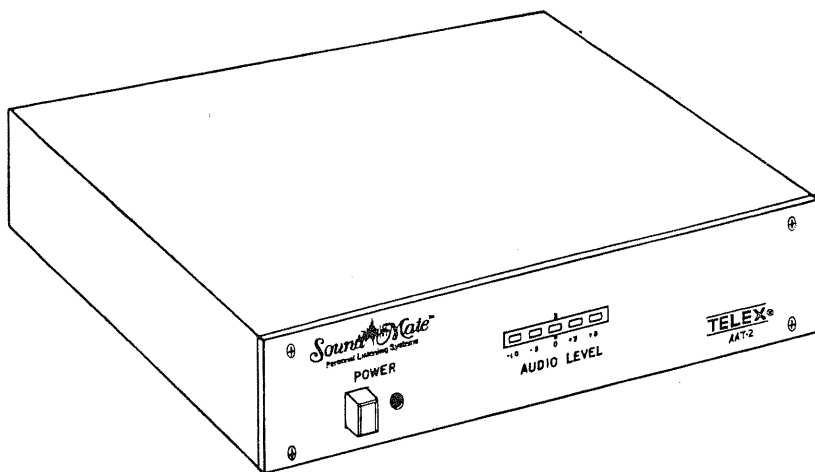


Telex

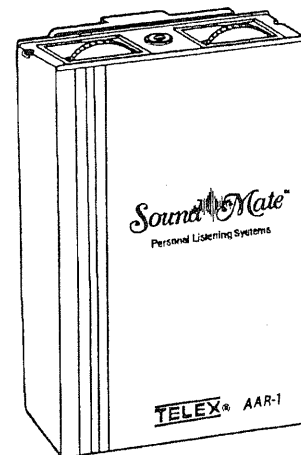
Operating Instructions



*Sound Mate*TM

Personal Listening Systems

**TRANSMITTER,
TUNEABLE RECEIVER,
SINGLE CHANNEL
RECEIVER**



TELEX[®]

INTRODUCTION

WHAT IS THE TELEX SOUND ENHANCEMENT SYSTEM?

Transmitter: The transmitter generates and amplifies an RF (Radio Frequency) carrier signal, modulates this carrier with the microphone signal, and radiates the modulated RF carrier.

WHAT FREQUENCY BAND DOES THE TELEX SYSTEM OPERATE IN?

The Telex Systems features crystal controlled transmitters and single channel or tuneable receivers operating in the VHF Band between 72-76 MHz. See Table 1 for standard frequencies available.

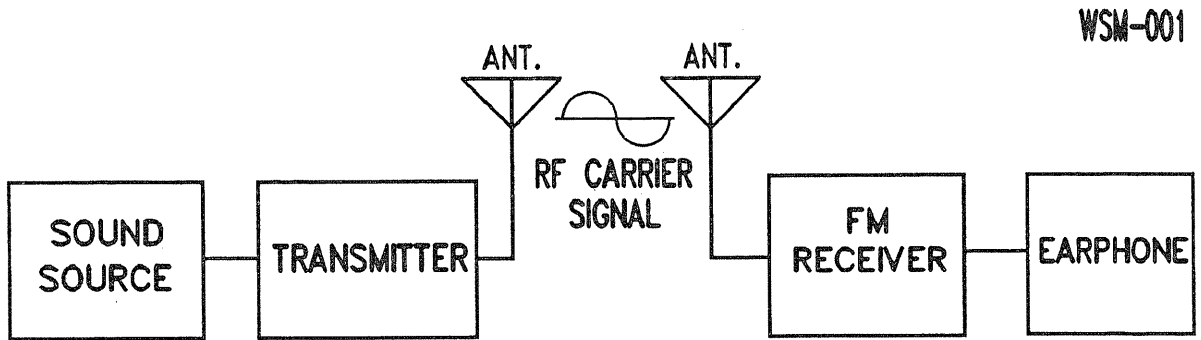


Figure 1
Block Diagram of Typical Sound Enhancement System

Receiver: The FM VHF receiver is tuned to the frequency of the transmitter. The receiver picks up the radiated RF signal from the transmitter through the antenna and converts the RF signal into audio voltages for use with an earphone, headphone, button receiver, neck-loop, etc. The receiver frequency must be matched to the transmitter frequency.

Your system operates on a fixed frequency which is factory selected to provide "interference free" operation. Up to five transmitter channels can be utilized by any number of receivers in any given area. With the narrow-band channels, (Channels A-N), up to eight simultaneous systems and with proper placement of adjacent channels, up to ten systems can be used.

OFTEN ASKED QUESTIONS

Question: Can more than one system be used simultaneously?

Answer: Yes but never on the same frequency. You will need to have different frequencies for every receiver/transmitter combination. All transmitters are factory set for specific frequencies.

Question: Is the system more sensitive in any one particular direction?

Answer: No, the transmitter's antenna radiates equally in all directions, but the signal is attenuated by your body, walls or other surrounding objects. The receiving antenna is essentially sensitive in all directions as well.

Question: Can the receiver receive other transmissions when the transmitter is turned off?

Answer: Yes it can. Telex systems operate in the VHF Band between 72-76 MHz. However, it is not susceptible to radio wave skip, CB'ers or standard FM radio transmissions.

The frequency your system operates on is computer selected for least interference, but there is no such thing as a 100% clear channel all the time, anywhere in the U.S.A., forever!

If the system is going to be used in a permanent fixed location, it should operate interference free until such a time or date when someone else begins using the same frequency.

If the system is going to be moving among various locations, you may run into occasional frequency conflicts.

Whenever the system is in use, the transmitter should be left on to prevent the receiver from picking up outside interference.

Wideband Channels

DASH NO.	CHANNEL	FREQ. in MHz
-001	1	72.100
-002	2	72.300
-003	3	72.500
-004	4	72.700
-005	5	72.900
-006	6	75.500
-007	7	75.700
-008	8	75.900

Table 1
Standard Frequencies Available

NARROWBAND CHANNELS

DASH NO.	CHANNEL	FREQ. in MHz
-031	A	72.100
-032	B	72.200
-033	C	72.300
-034	D	72.400
-035	E	72.500
-036	F	72.600
-037	G	72.700
-038	H	72.800
-039	I	72.900
-040	J	75.500
-041	K	75.600
-042	L	75.700
-043	M	75.800
-044	N	75.900

TECHNICAL INFORMATION

AAR-10 RECEIVER

GENERAL DESCRIPTION AAR-10

The Telex AAR-10 Receiver is a component of either a wideband system which operates on one of eight or a narrowband system which operates on one of fourteen different factory preset channels in the 72 to 76 MHz frequency band. The wideband receivers are designed to be used with Telex AAT-2 and TW6 transmitters, but they can be used with other brands of transmitters in the 72 to 76 MHz band provided the frequencies match. The narrowband receivers are designed to be used with the Telex narrowband AAT-2 transmitters. Each transmitter channel can be utilized by any number of receivers in any given area.

OPERATING FEATURES

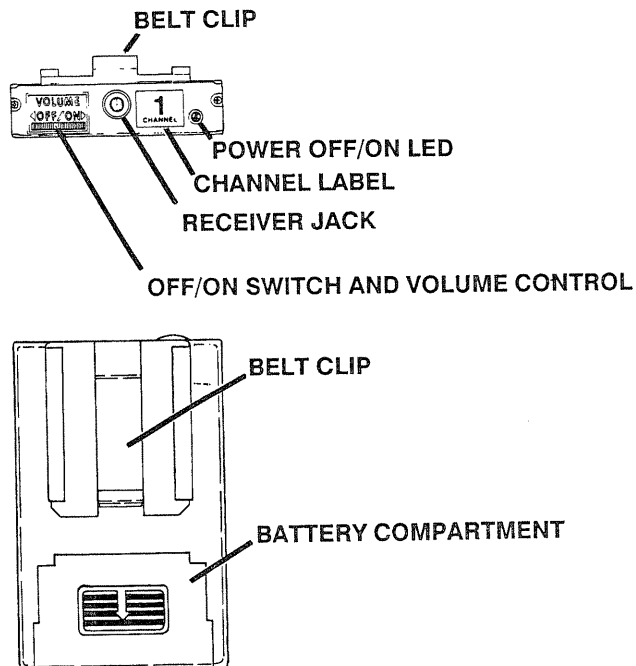
Volume OFF/ON Control: The thumbwheel control serves as both an off/on switch and as a volume control.

The receiver is turned off when the control is in the extreme counterclockwise position, when viewed from the front and the volume is loudest when the control is in the extreme clockwise position.

Receiver Jack: The receiver jack accepts a 0.140-inch (3.5 mm) diameter miniature phone plug. A variety of accessory units can be plugged into the jack for reception of the desired channel being transmitted.

Power ON LED: The Power ON LED is illuminated when the Volume OFF/ON Control switch is turned On. It remains illuminated while the receiver is on.

Belt Clip: The belt clip supplied is detachable by squeezing the tabs at the base of the clip and pushing up.



27121-A-001

Figure 2
Operating Features AAR-10

AAR-10 Specifications - Single Channel

Temperature Range	0 to + 50 degree C
Supply Voltage	2-3 Volts, (2) AAA Batteries
Quiescent Current	20 mA
Available Frequencies	Refer to Frequency Chart
Sensitivity (12 dB Sinad @ 25 KHz Deviation)	0.5 μ V typical
Adjacent Channel Rejection +/-200 kHz	More than 35 dB Down
Image and Spurious Rejection	More than 50 dB Down
Signal-to-Noise Ratio @ 1mV Input	More than 60 dB
Distortion	Less than 2%
Audio Frequency Response 100 Hz - 10 kHz	Less than 3 dB Variation
Audio Output @ 10% Distortion	

	2.0V	3.0V
8 ohm	15 mW	80 mW
32 ohm	10 mW	50 mW

Controls and Connections Volume OFF/ON Switch, Receiver Jack (Audio Output/ Battery Charger)

AAR-1 RECEIVER

General Description AAR-1

The Telex AAR-1 Receiver is a component of a wideband system which operates on eight tuneable channels in the 72 to 76 MHz frequency band. The receivers are designed to be used with the wideband Telex AAT-2 and TW-6 Transmitters, but they can be used with other brands of transmitters, provided the frequencies match.

Operating Features

Volume OFF/ON Control: This thumbwheel control serves as both an off/on switch and as a volume control. The receiver is turned off when the control is in the extreme counterclockwise position, when viewed from the front, and the volume is loudest when the control is in the extreme clockwise position.

Tuning Control: This thumbwheel control is rotated in the clockwise and counterclockwise directions to attain reception of the desired channel(s) being transmitter within the 72 to 76 MHz frequency band.

Tuning Cover: The tuning cover (supplied) conceals the tuning dial while allowing access to the volume control and earphone jack to prevent mistuning.

Receiver Jack: The receiver jack accepts a 0.140-inch (3.5 mm) diameter miniature plug. A variety of accessory units can be plugged into this jack for reception of the desired channel(s) being transmitted.

Belt Clip: The belt clip supplied is detachable by squeezing the tabs at the base of the clip and pushing up.

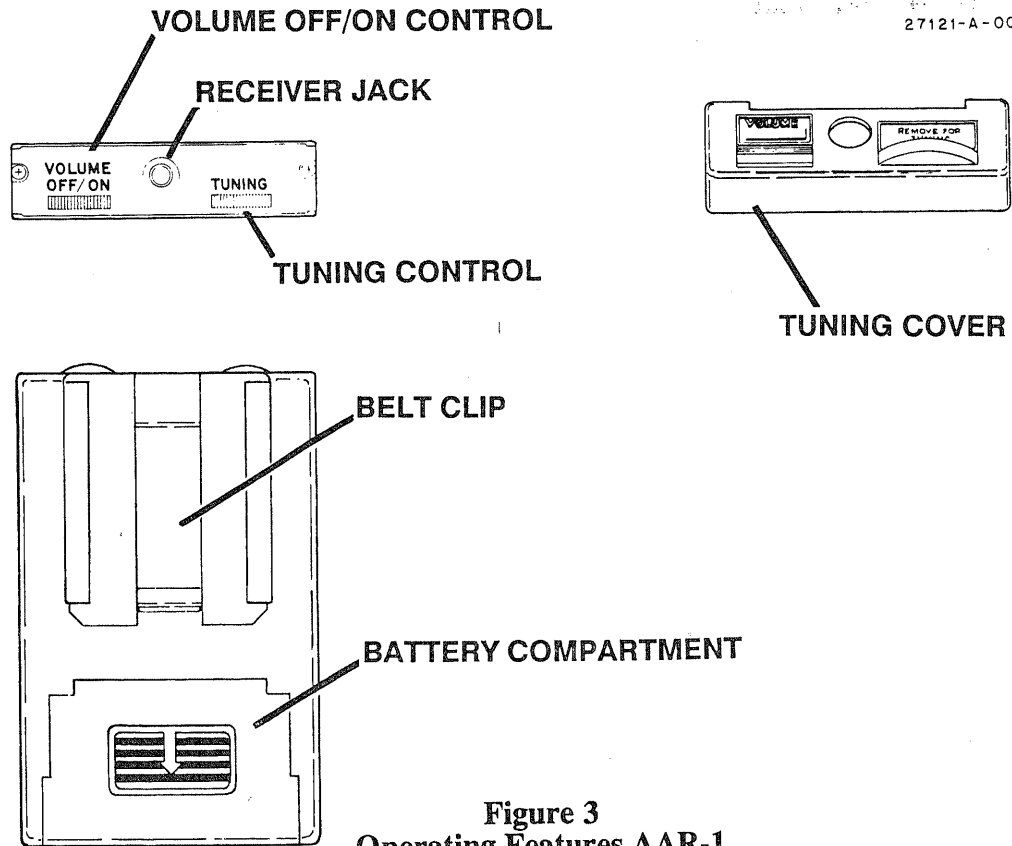


Figure 3
Operating Features AAR-1

AAR-1 Specifications - Tuneable

Supply Voltage.....	2.2 - 3.0 V
Quiescent Current.....	26 mA @ 2.6V
Tuning Range.....	72 - 76 MHz
Sensitivity.....	.7 μ V typical, 1 μ V Max, 12 dB SINAD, Δf = 25 KHz, f_m = 1kHz
Adjacent Channel Rejection.....	33 dB at 75.7 MHz
Image Rejection @ 74 MHz.....	37 dB
S/N Ratio At Output.....	48 dB
Audio Output @ 10% Distortion	

	2.0V	3.0V
8 ohm	15 mW	80 mW
32 ohm	10 mW	50 mW

Controls and Connections..... Volume OFF/ON Switch,
Tuning Control, Receiver Jack
(Audio Output/Battery Charger)

AAT-2 TRANSMITTER

General Description

The Telex AAT-2 is a portable base station transmitter which operates in the 72-76 MHz band and accepts a wide range of audio input levels.

Operating Features

Main Power Switch and Indicator LED:

The Power "ON" LED is illuminated when the Power OFF/ON switch is pressed ON. It remains illuminated while the transmitter is on.

Audio Input Connector: Accepts balanced dynamic microphones, 600 ohm line or 70 volt line.

Input Selection Switch: Selects either Dynamic microphone, 600 ohm line, or 70 volt line input level.

Input Level Control: Adjusts input level for all input modes.

Audio Level Meter: Provides visual indication for setting input levels.

Antenna Jack: Accepts 50-ohm whip (supplied).

Power Input Jack: Accepts either AC Power adaptor (supplied), or any source of 15-24 VDC.

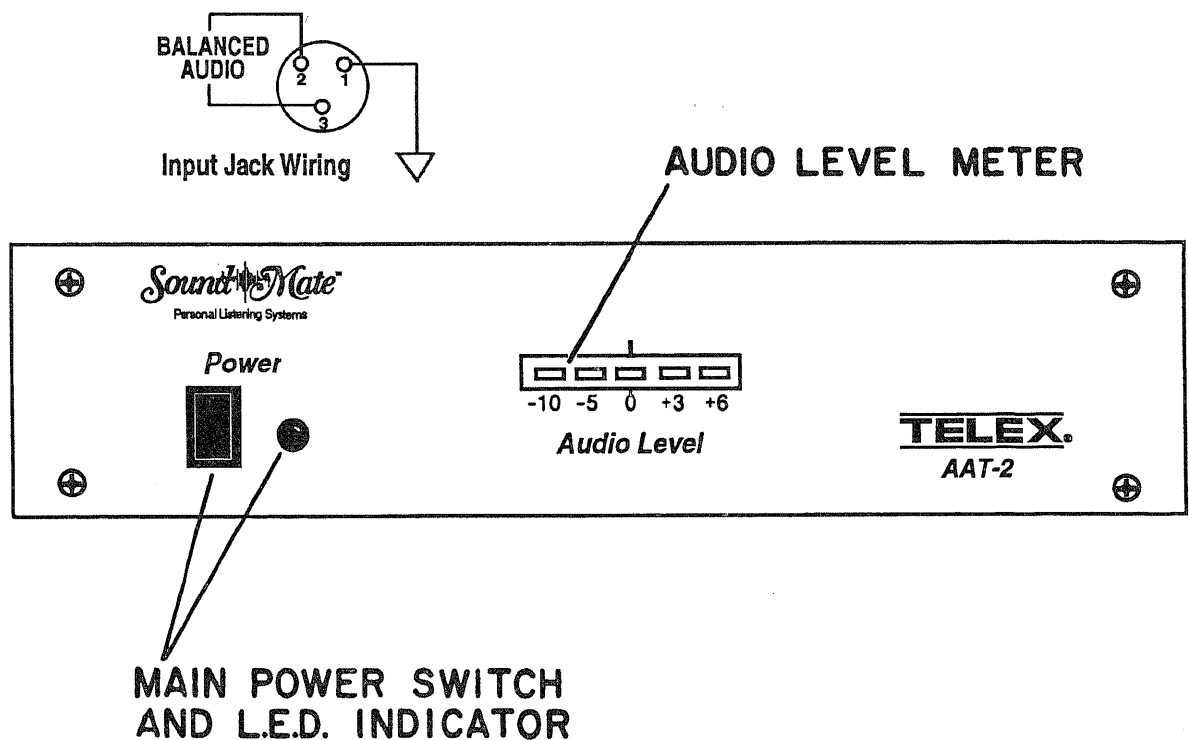


Figure 4
Operating Features AAT-2
Front Panel

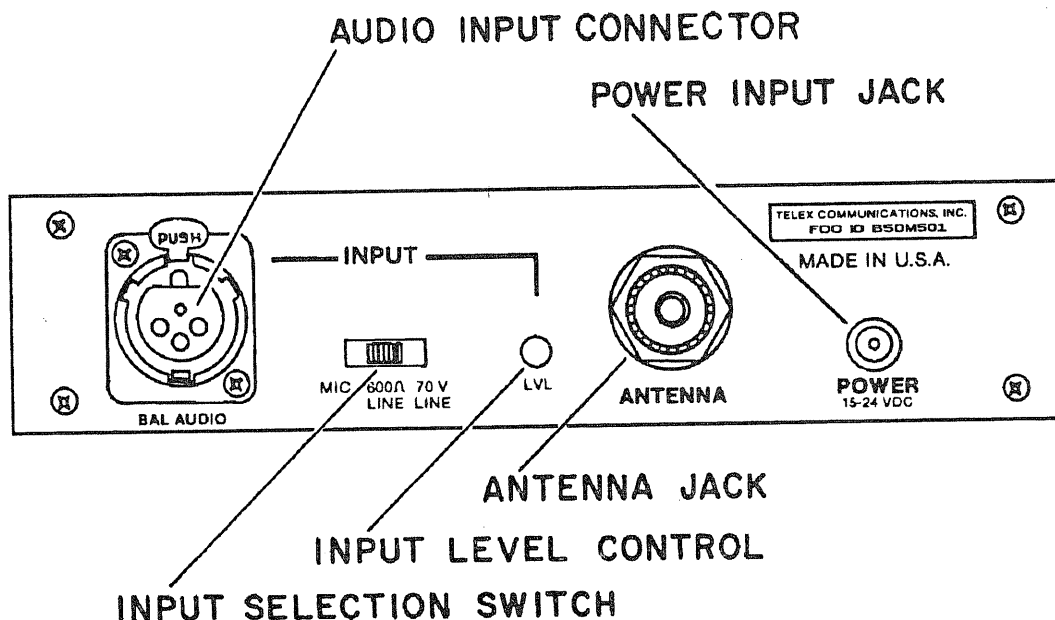


Figure 5
Operating Features AAT-2
Back Panel

AAT-2 Specifications

Audio Input: Balanced Female XLR

Mic Selected	200 ohm input impedance/0.5 mV-70 mV input range
Line Selected	600 ohm input impedance/70 mV-7 Volt input range
70 Volt Line Selected	66 kohm input impedance 7 V-70 V input range
AGC Range	30 dB
Signal-to-noise Ratio	58 dB
Pre-Emphasis	100μS
Maximum Deviation	±75kHz
Frequency Control Crystal	+/- .005% tolerance
Available Frequencies	See Table 1, page 3
Max. Radiated Power	80 mV/m at 3m
Power Requirements	13 VAC @ 300 mA or 15-24 VDC @ 300 mA
Dimensions	7 1/2"W x 1 3/4"H x 6 7/8"D
FCC ID	B5DM501

EQUIPMENT SET-UP

AAT-2 Transmitter

UNPACKING: Unpack your sound enhancement system. If there are any damages or shortages, refer to the "Warranty Service Information."

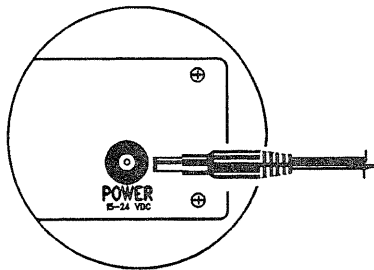
AAT-2 TRANSMITTER LOCATION: Select a suitable location for the AAT-2 Transmitter. Try to keep a clear, unobstructed path between the transmitter and receiver and allow plenty of free space around the Transmitter antenna.

CAUTION

Avoid heat sources when selecting a location for the Transmitter. The heat given off by radiators or direct sunlight may eventually damage the unit.

POWER CONNECTION: Plug the supplied AC power adaptor into a standard 120 vac (U.S.A.) electrical outlet. Plug the other end of the cord into the power input jack on the rear panel of the AAT-2 **DO NOT TURN UNIT ON AT THIS TIME.**

PSE-002



FROM
PLUG-IN
ADAPTOR

Figure 6
Connecting Power

ANTENNA CONNECTIONS: Connect the telescoping whip antenna to the rear panel ANTENNA jack.

For best results, the antenna should be vertically aligned. Tighten the screw clamp to hold the antenna in place, and extend the antenna to full length.

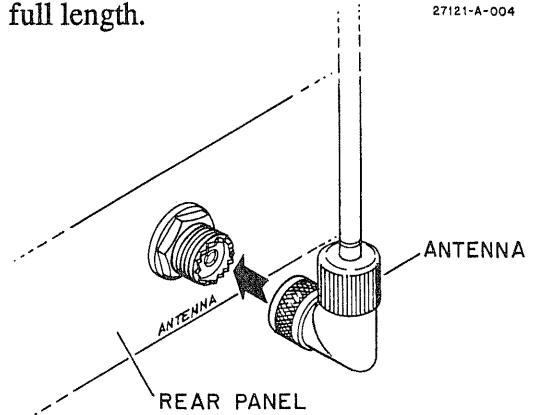


Figure 7
Antenna Connection

AUDIO INPUT: Select the appropriate input on the rear panel switch depending on the expected input level. See Page 7. Then connect the audio input to the rear panel XLR Jack.

CAUTION

Permanent damage can result if 70V line is used with Audio Input Selection Switch improperly set.

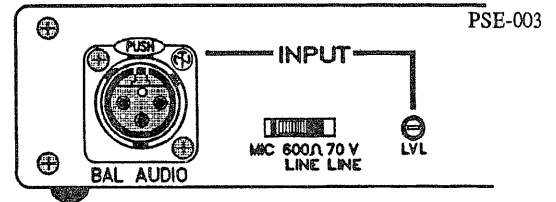


Figure 8
Input Jack, Switch and Level Control

Turn the input level control fully counterclockwise.

Depress the POWER switch to the ON position: the POWER indicator LED should illuminate.

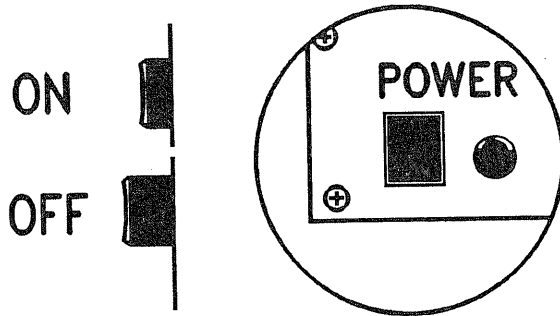
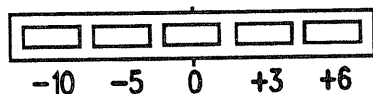


Figure 9
Power Switch and Indication

Adjust the input level control so that the AUDIO LEVEL Meter, located on the front panel, reads in the -10 to 0 (green) range with occasional +3 peaks (red). Avoid +6 peaks as these will result in distorted audio at the receiver.

WSM-009



AUDIO LEVEL

Figure 10
Audio Level Meter

MULTIPLE SYSTEM

INSTALLATIONS: As with any radio device, interference can occur at any time. The frequencies offered are shared with other legitimate users. The severity of interference varies with the distance to the interfering station. Multiple systems further complicate installations. The following steps are suggested in order to achieve best results in your installation.

1. In order to determine whether your selected frequencies have minimum interference, Telex recommends that you first temporarily install the receivers only, in your proposed setting, and monitor the channel for interference. To do this, with fresh batteries installed, turn on your receiver, but **DO NOT** turn on any other receiver or transmitter at this time. Audible interference may be present, indicating another user on the channel. Monitoring should be repeated for each channel that you propose to use.

2. Next, you must decide on the placement of the various channels. This is best accomplished by placing adjacent channel operating areas as far apart as possible.

3. For best results, each transmitter should be installed separately in its own service area.

The Transmitter should now be ready for use.

NOTE: When not in use, return the POWER switch to the OFF position and unplug the transmitter.

EQUIPMENT OPERATION

AAR-10 Receiver

Operation of the AAR-10 Receiver

Try to keep a clear, unobstructed path between the transmitter and receiver antennas for clear reception.

Plug in a unit such as an earphone, headphone button receiver, induction coil neckloop, or audio-input hearing aid into the receiver jack (the cord acts as a receiving antenna).

Rotate the VOLUME OFF/ON control slowly in the clockwise direction while monitoring the volume level. The Power LED will illuminate indicating the receiver is operating.

When satisfied with the volume level, place the Receiver in a pocket or clip it to your belt for convenience.

Always return the VOLUME OFF/ON control to the OFF position when the receiver is not in use to preserve battery life and prevent battery leakage.

AAR-1 RECEIVER

Operation of the AAR-1 Receiver

Try to keep a clear, unobstructed path between the transmitter and receiver antennas for a clear transmission.

Plug in a unit such as an earphone, headphone button receiver, induction coil neckloop, or audio-input hearing aid into the receiver jack (The cord acts as a receiving antenna).

Rotate the VOLUME OFF/ON control slowly in the clockwise direction while monitoring the volume level.

Rotate the TUNING control back and forth until the desired transmitter channel is clearly received.

To secure the selected channel, snap the tuning cover over the top of the receiver to prevent mistuning.

When satisfied with the channel selection and volume level, place the receiver in a pocket or clip it to your belt for convenience.

Always return the VOLUME OFF/ON control to the OFF position when the receiver is not in use to preserve battery life.

BATTERY REPLACEMENT

The AAR-10 and AAR-1 Receivers use two (2) AAA batteries. When the batteries are low the sound will be distorted. Replace weak batteries with two fresh AAA batteries, and position them in the battery compartment as illustrated in Figure 11.

For additional information refer to the "Battery Information" Section.

NOTE: If the unit is to be stored for any length of time make sure you remove the batteries from the unit.

The life of rechargeable nickel-cadmium batteries is 6 to 8 hours per recharge, and life of replaceable alkaline batteries is approximately three times as long.

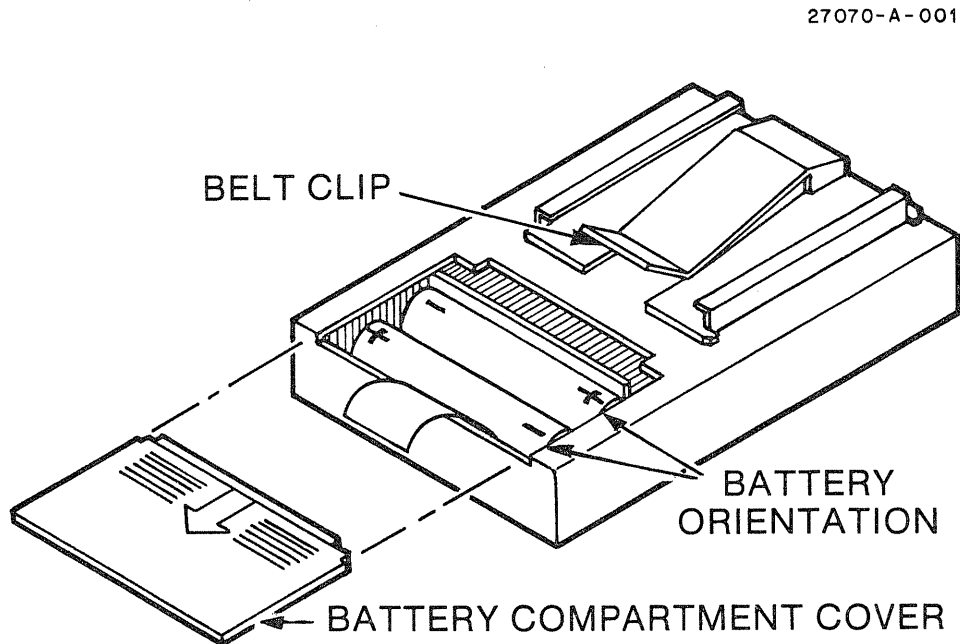


Figure 11
Battery Installation - AAR-10 and AAR-1

SETTING SYSTEM GAIN

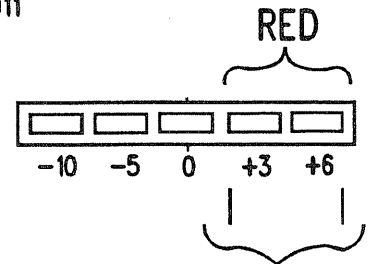
If you have followed the instructions up to this point you should now be ready to turn both the transmitter and the receiver "ON" and set optimum signal gain.

Place the power switch on the AAT-2 Transmitter to the "ON" position. The red LED should now be lit. Turn your microphone on or line input equipment on and the AUDIO LEVEL Meter will now respond to your equipment.

Normal Level Setting: The "Audio Gain" (Input Level Control) will adjust the audio output of the transmitter and for normal readings this is in the green area between -10 and 0. Readings in this area of the meter give the highest dynamic range and no overload.

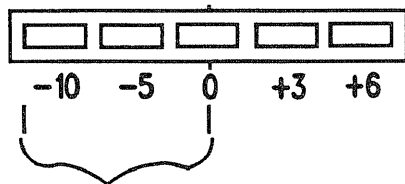
High Level Setting: If your input equipment has a high output, you will have to adjust the Input Switch or Input Level Control to the green area of the AUDIO LEVEL Meter or you will overload the AAT-2 indicated by one or more red LED's resulting in distortion.

WSM-011



**BAD INDICATION
(WILL CAUSE DISTORTION)**

WSM-010



NORMAL APPLICATION

**Figure 12
Ideal Audio Level Meter Reading**

**Figure 13
High Level Setting**

TESTING THE SYSTEM

PRE WALK-THRU CHECKLIST

Following the instructions fully to this point you have successfully completed the following checklist:

- Located the Transmitter properly.
- Connected power to the AAT-2 Transmitter.
- Connected the antenna to the AAT-2 Transmitter.
- Connected your PA System, Tape recorder, VCR, etc. to your transmitter.
- Installed the batteries in your receiver, either AAR-10 or AAR-1.
- Set the Transmitter Audio Gain

If you missed any of the above instructions, go back and complete that instruction before going on.

SYSTEM WALK-THRU

Now that you have successfully "set up" your Telex Wireless System and turned on your sound equipment, you are ready to test the overall performance by "walking" the Telex receiver through the areas in which you will be using it.

The "system walk-thru" can detect the following problems:

- Weak signal strength caused by:
- Power Transmitter location
- RF "Trouble Spots"
- Operating distance beyond system capability
- Malfunctioning system.
- Mistuned Receiver

Under normal conditions the AUDIO LEVEL Meter, located on the front panel of the AAT-2, should show a reading in the -10 to 0 (green) range with occasional +3 peaks (red). Avoid +6 peaks as these will result in distorted audio at the receiver. See "SETTING SYSTEM GAIN".

BATTERY INFORMATION

General

Improper battery selection, use, installation and care are the cause of numerous wireless system failures.

Alkaline Batteries

Alkaline batteries such as Mallory's DURACELL® or Eveready's ENERGIZER® provide the most reliable operation in wireless transmitters and receivers. The use of low cost carbon-zinc batteries is NOT RECOMMENDED.

Nickel-Cadmium Batteries

These batteries can save you money in the long run, as they can be recharged, but they can also cause disappointing wireless performance. If you want to use rechargeable nickel-cadmium batteries you must select a heavy duty nickel-cadmium.

Nickel-Cadmium Memory Effect

For maximum performance and longer life from nickel-cadmium batteries you should completely discharge them whenever possible. This can be done by simply leaving the Telex receiver turned on overnight. If nickel-cadmiums are not discharged on a regular basis they will remember how long you use them for each performance and will not have the ability to retain their original performance.

TC-100 Multi-Unit Battery Charger

To recharge more than one AAR-10/AAR-1 receiver at a time, use the Telex TC-100 charging unit. The TC-100 will simultaneously charge up to 10 AAR-10 or AAR-1 receivers at once.

*ENERGIZER® is a registered trademark of Union Carbide Corporation.

*DURACELL® is a registered trademark of Duracell Inc.

ANTENNA INFORMATION

Antenna Alignment

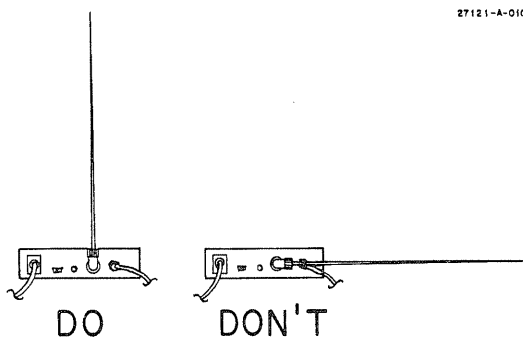


Figure 14
Antenna Alignment
Do and Don't

Antenna Placement

Proper antenna placement probably has the biggest effect on your TELEX Wireless System's overall performance. Following the suggestions that follow should result in "dropout free" performance.

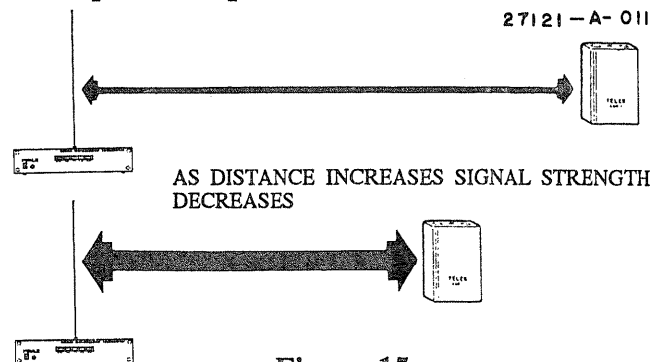
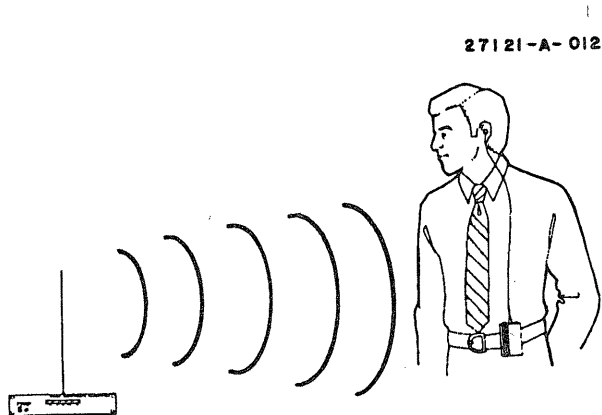


Figure 15
Distance Between Transmitter and Receiver

Keep the distance between the transmitter and the receiver(s) as short as possible. The greater the distance the weaker the signal.

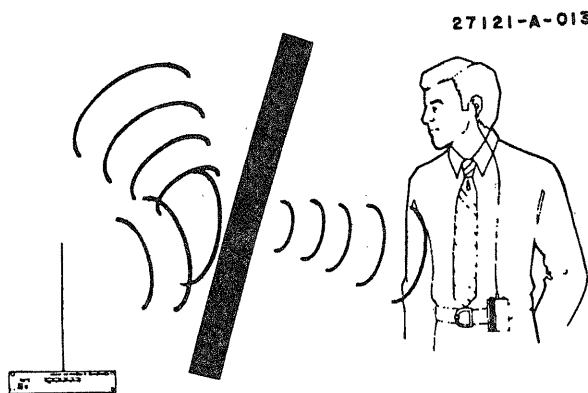
Make sure the "signal path" between the transmitter and receiver(s) is unobstructed. You should always be able to visually locate the antenna of the transmitter at all times.



SIGNAL REACHES ANTENNA AT FULL STRENGTH WITH NO OBSTRUCTIONS.

Figure 16
Keeping Site Clear to Antenna

Attempting to operate the sound enhancement system through or around walls, ceilings, metal objects, etc., will reduce system range and performance.



SIGNAL REFLECTION OFF A METAL OBSTRUCTION CAUSES REDUCED SIGNAL AND "MULTIPATH"

Figure 17
Operating Through Obstruction

DO NOT - Mount the transmitter on, or next to, metal such as beams, walls with metal studs, etc. This will "detune" the transmitter antenna which can result in loss of signal at the receiver.

PSE-005

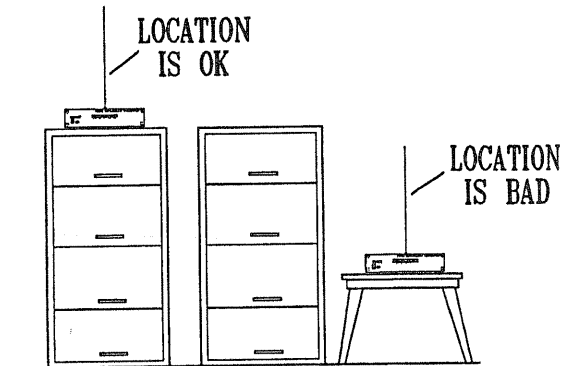


Figure 18
Transmitter Antenna Placement

TROUBLESHOOTING

Reread the sections of this manual to make sure you have completed system set-up properly.

If you are unable to solve the problem, contact the dealer from whom you purchased the system for assistance.

PROBLEM	SOLUTION
DISTORTION - System's audio quality seems distorted at medium to high input levels.	Reduce audio gain on transmitter by adjusting the gain control as suggested on page 11.
HISS - System seems to produce a "hiss which is undesirable.	Check the gain setting on the transmitter and the volume control on the receiver. They may be too low.
DROPOUTS - When moving around the area in which you will be using the system there seem to be locations where the signal "swooshes" or completely disappears.	Make sure the antenna is connected and fully extended. Follow the location suggestions on pages 15 and 16 Change the location of the transmitter antenna or avoid the bad area with the receivers.
INTERFERENCE - System picks up signals other than wireless transmitter.	Make sure the Telex AAT-2 is turned on - this will usually eliminate the interference signal. If problem persist with the transmitter "ON", you will probably need to have your system's frequency changed to another channel.
REDUCED DISTANCE - System doesn't operate as far as it once did. System doesn't operate as well as you think it should.	Receiver Battery is possibly in need of replacement. Transmitter antenna possibly located incorrectly. Receiver not tuned properly.
BATTERIES DON'T LAST	If using "throw away" batteries make sure they are alkaline. If using nickel-cadmium batteries make sure they were fully charged when you are using them and fully drained when you are done before recharging them.
HUM - Audio System emits hum or Buzz thru speakers and sound enhancement receiver.	Locate Transmitter away from the audio equipment.

WARRANTY SERVICE INFORMATION

If your receiver or transmitter should need servicing under the warranty, please contact:

Warranty Service Department
TELEX COMMUNICATIONS, INC.
8601 East Cornhusker Highway,
P.O. Box 5579,
Lincoln, Nebraska 68505-5579 U.S.A.
Phone: (402) 467-5321 or 465-7021

All claims of defect or shortage should be sent to the above address. When returning items for service, you must provide date and proof of purchase, such as a copy of the sales receipt, to establish warranty. A letter should be included outlining all symptoms and claimed defects. Information on how the equipment was installed and used is very helpful. Please include your phone number and return address in case our service technicians need to contact you.

Units that have been modified cannot be accepted for repair.

Include all information requested by the Service Center. Then pack the unit as follows:

Check the unit to see that all parts and screws are in place. Then wrap it in heavy paper or put it in a plastic bag. If the original carton is not available, place the unit in a strong carton that is at least six inches bigger in all three dimensions than the unit. Fill the carton equally around the unit with resilient packing material (shredded paper, excelsior, etc.). Seal it with gummed paper tape, tie it with a strong cord, and ship it by prepaid express, United Parcel Service or insured parcel post to the Hy-Gain Service Center.

It is very important that the shipment be well-packed and fully insured. Damage claims must be settled between you and the carrier and this can delay repair and return of the unit to you.

Telex reserves the right to make changes in design and improvement on its product without assuming any obligation to install the same on any of its products previously manufactured. Further Telex reserves the right to ship new and/or improved products which are similar to the form, fit and function of products originally ordered.

FCC INFORMATION

The Telex AAT-2 Transmitter, AAR-10 Receiver, and AAR-1 Receiver are authorized under part 15 of the FCC Regulations. Changes or modifications to this equipment could void the user's authority to operate the equipment.

ACCESSORIES

Rack Mounting Kit

RM-S For mounting one AAT-2.....71081001

RM-D For mounting two AAT-2's.....71081002

Earphone (For AAR-1 and AAR-10)

(single)59840-005

Headphone (For AAR-1 and AAR-10)

(dual).....59840-001

Button Receiver

(8-ohm)63699-006

Button Receiver Cord

(30 inch).....35796-011

NL-3

Induction Coil Neckloop17703-006

System Carrying Case

(with room for 1 AAT-2 Transmitter,
1 transmitter antenna, 3 AAR-1 or 3 AAR-10 Receivers,
6 AAA batteries, and 3 button receivers)..... 59848-000

TC-100 Charger

For charging ten AAR-1's or AAR-10's

(120 Volt Model).....19720-002

(240 Volt Model).....19720-003

Antenna, Telescoping

For AAT-2877960-1

Replacement Parts

Belt Clip.....19728-000

Tuning Cover (AAR-1 Only)19778-000