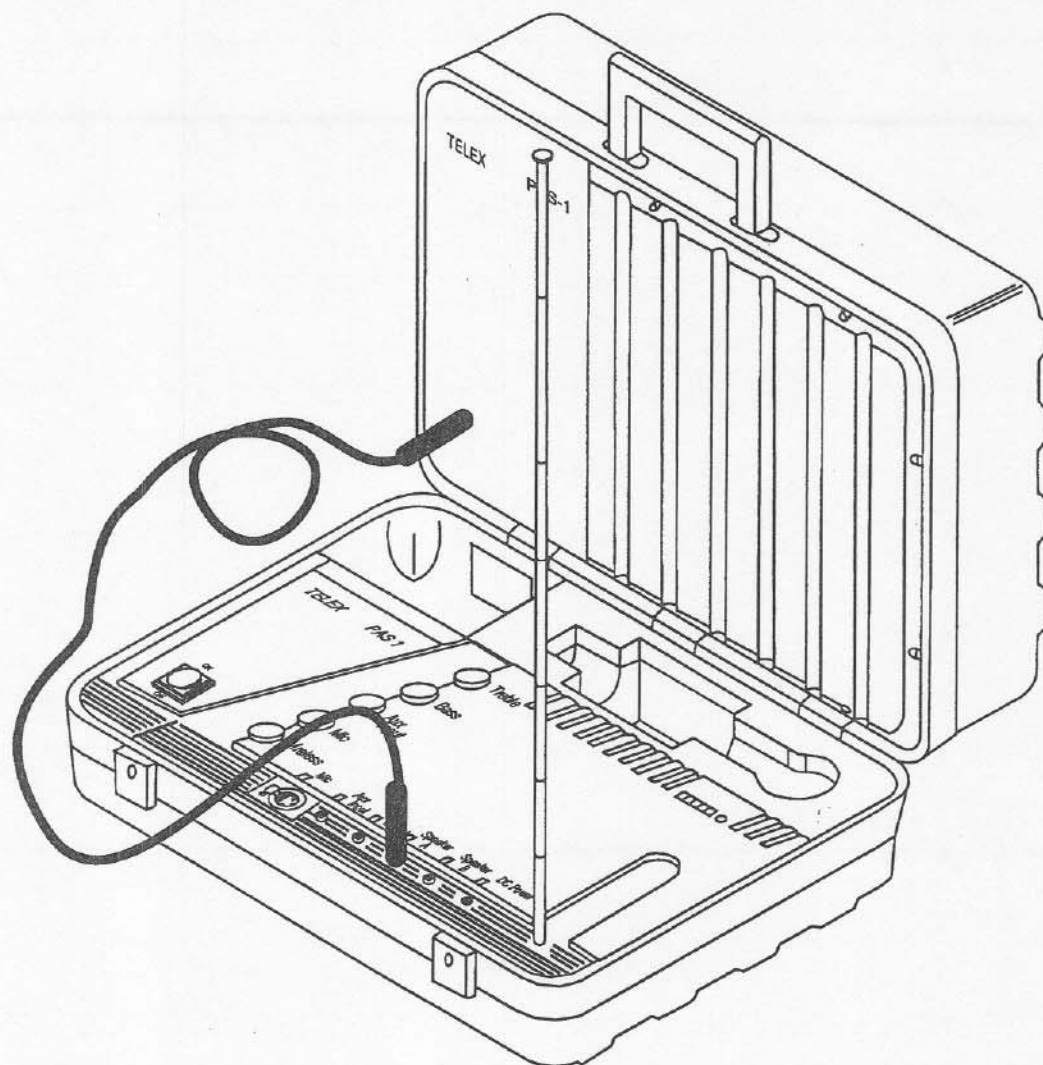


# Telex

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## Operating Instructions



### PAS-1 PA Sound System/Wireless Receiver

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**TELEX**<sup>®</sup>

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## INTRODUCTION

### WHAT IS THE PAS-1 WIRELESS MICROPHONE/PA SOUND SYSTEM?

The PAS-1 consists of an FM receiver, amplifier/mixer, and detachable speaker in a compact carrying case. It can be used with wired and wireless microphones, and with auxiliary input sources such as tape players, record players and VCR's. Separate volume controls for wireless microphone, wired microphone and auxiliary input afford complete control over the final program mix. An auxiliary output permits the program mix to be sent to a tape recorder, PA system or other external device. The PAS-1 can be powered from either an AC wall outlet or from an external car battery.

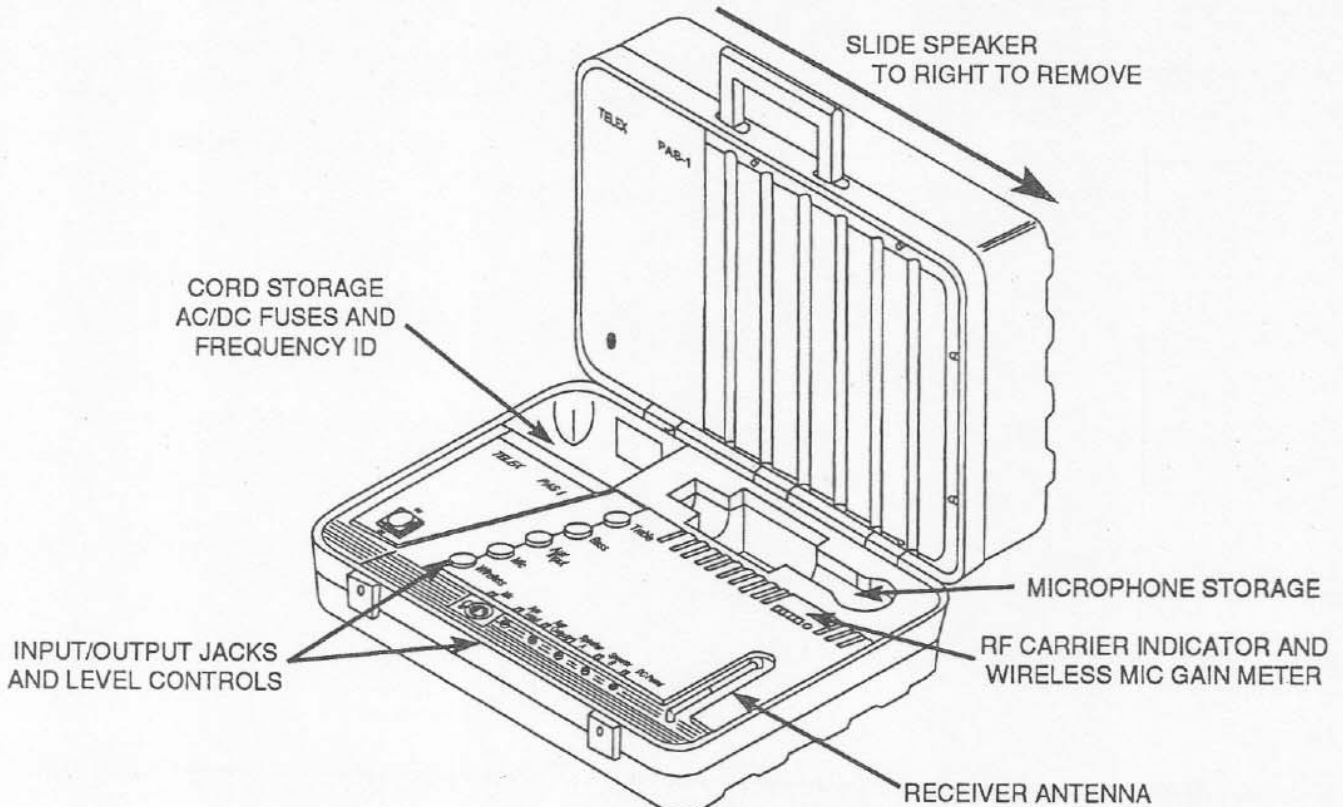


Figure 1.  
PAS-1 Sound System / Wireless Receiver

## OFTEN ASKED QUESTIONS

**Question:** How does a wireless microphone system work?

**Answer:** A wireless microphone system consists of the microphone, a transmitter (often part of the microphone), and a receiver. In the case of the PAS-1, the receiver is built in. The wireless microphone can be ordered as an optional accessory.

The wireless microphone picks up the voice audio and converts it to an FM radio signal which is then broadcast to the receiver. The receiver is tuned to the same frequency as the microphone. It converts the FM radio signal back to audio, amplifies it and sends it to a speaker.

**Question:** Can more than one wireless microphone operate simultaneously?

**Answer:** Yes, but never on the same frequency, and a separate receiver (PAS-1) is required for by your body, walls or other surrounding objects. The receiving antenna is essentially sensitive in all directions as well.

**Question:** When the transmitter is turned off, can the receiver pick-up other transmissions?

**Answer:** Yes it can. However, wireless microphone systems operate on a special set of channels in the VHF Band between 165-185 MHz, and they are not susceptible to radio wave skip, CB radios or FM radio station transmissions. The frequency your system operates on has been computer selected for least interference in your area, but there is no such thing as a 100% clear channel all the time, anywhere in the world.

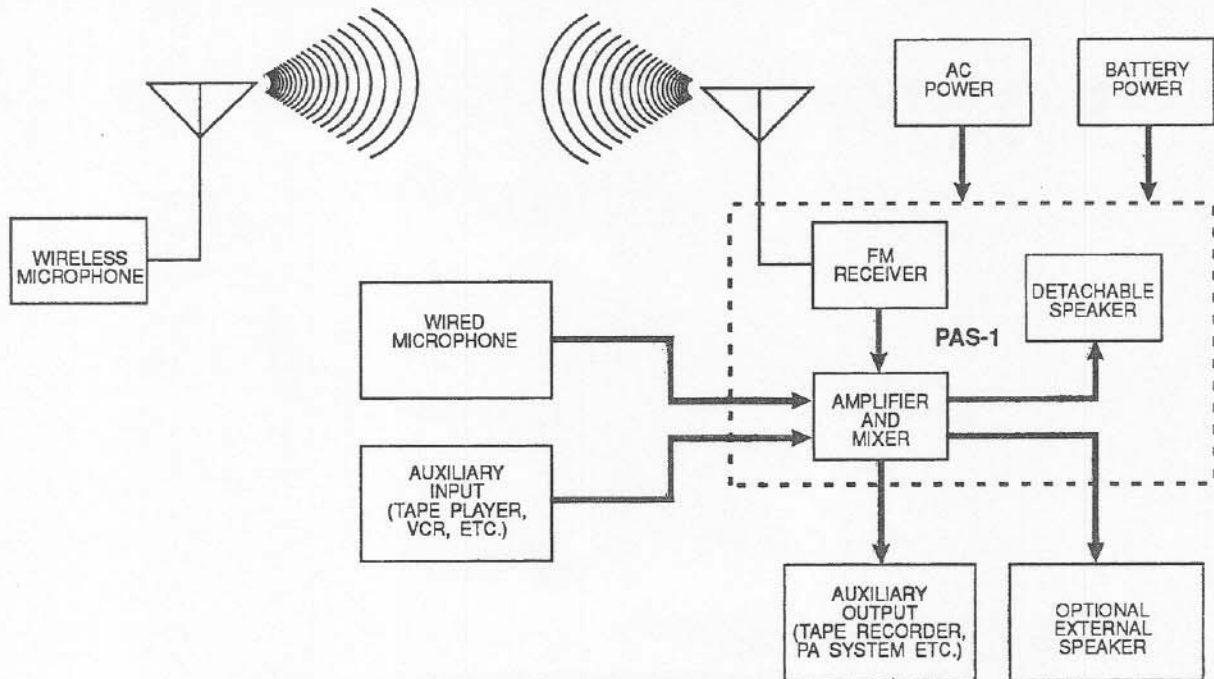
If the system is used in a permanent location, it should operate interference-free unless someone else begins using the same frequency.

If the system is used in various locations, you may run into occasional frequency conflicts.

When you're not using the wireless microphone, turn the Wireless volume control on the PAS-1 control panel all the way down. This will prevent the reception of undesired signals.

**Question:** Is feedback a problem?

**Answer:** As with all microphones used in PA applications, feedback can be a problem. Specific instructions on preventing feedback are included on page 5.



**Figure 2.**  
**PAS-1 Block Diagram**

**Table 1. Available Operating Frequencies**

Frequency	Catalog Number		
	Model WT-25	Model HT-100/10	Model PAS-1
171.905 MHz	70735-065	70660-065	70995-065
171.045 MHz	70735-066	70660-066	70995-066
170.245 MHz	70735-067	70660-067	70995-067
169.505 MHz	70735-068	70660-068	70995-068

**SPECIFICATIONS**

**Rated Audio Output Power (continuous average power):**

When used with AC wall outlet: 50 W  
 When used with car battery: 10 W

**Maximum Sound Pressure Level (1 meter):** 109 dB

**Frequency Response:** 200 Hz to 12 kHz

**Tone Control Response:**

Treble (at 10 KHz): ±10 dB  
 Bass (at 100 Hz): ± 10dB

**Signal-to-Noise Ratio (at rated output):** 90 dB

**Damping Factor (1 kHz):** 200

**Slew Rate:**

Preamplifier: 13 V/μs  
 Power Amplifier: 30 V/μs

**Auxiliary Output (600 ohm load):** Line level (2 V RMS Maximum)

**Input Sensitivity (for rated output):**

Microphone: 1.6 mV (-56 dB)  
 Auxiliary: 0.165 V (-15.6 dB)

**Input Impedance:**

Microphone (balanced): 1K ohm (low impedance)  
 Line (unbalanced): 20K ohm

**Speakers:**

One 8-inch high-compliance woofer  
 One high-frequency horn tweeter

**Acoustic Equalization:**

Tuned port

**RF Frequency Range:**

Operates on selected channels between 165-185 MHz

**RF Sensitivity:**

0.7 μV for 12 dB SINAD

**Image Rejection:**

70 dB

**Intermediate Frequency:**

10.7 MHz

**FCC Approval:**

Receiver notification under FCC Part 15

**FCC ID:**

B5DPAS-1

**Power Requirement:**

120 Vac, 60 Hz; 12-40 Vdc

**Fuse Rating (Type 3 AG, 250 V):**

AC, 1.5A; DC, 5A

**Dimensions (H x W x D):**

8.25 x 18.25 x 14.38 in

**Weight:**

22 lbs

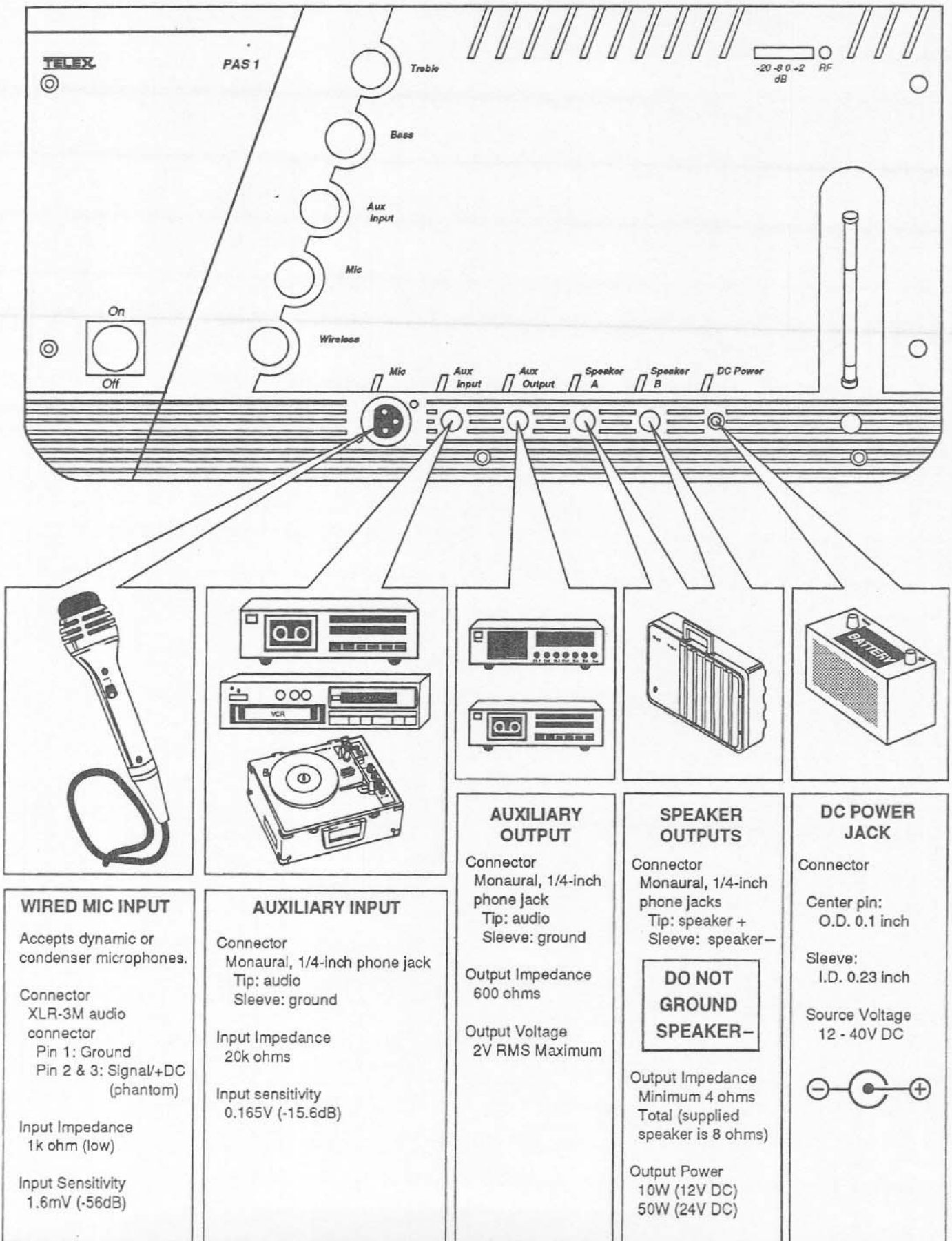


Figure 3  
PAS-1 Connections

## SETTING UP

### INITIAL CONSIDERATIONS

#### SPEAKER PLACEMENT

Speaker placement is probably the most important consideration in setting up a sound system. The following are general guidelines for effective speaker placement:

1. The sound should come from in front of the audience. This is especially true when a microphone is used for a person speaking or performing. Even when a recorded program is played through a sound system, audience comfort dictates that sound should come from a front-visual point of origin.
2. If possible, elevate the sound system above the audience so the sound will be projected over the front listeners and toward the rear of the audience.
3. Always be aware of speaker location with respect to microphones to prevent feedback.

#### WARNING

Do not attempt to use external speaker jacks to drive a P.A. system with grounded speakers. Damage to equipment will result.

#### FEEDBACK

Feedback is the ringing, howling or shrill sound that is self-generated by a sound system. It is the result of sound from the speakers being picked up by the microphone(s) and then being re-amplified. If corrective action is not taken, feedback will rapidly regenerate itself to higher and higher volume levels. The volume is limited only by the maximum power output of the amplifier or destruction limit of the speakers.

#### WARNING

Feedback can be hazardous to hearing and can damage equipment! To avoid feedback, make sure volume controls are at minimum before turning on equipment. If feedback occurs, immediately direct microphone(s) away from speakers and reduce volume.

To prevent feedback, always observe the following precautions:

1. Microphones (wired or wireless) should always be positioned behind speakers so that sound from the speakers is not projected directly onto the microphones.
2. Square, circular and reverberant rooms are troublesome due to reflective surfaces which can cause feedback and poor intelligibility. Attempt to position speakers to minimize sound reflections back into microphones, and to permit operating at minimum required sound levels. Also attenuate bass and boost treble for improved clarity.

#### TRAFFIC HAZARDS

A professional installation should be neat and inconspicuous. Try to position the speaker system where it will not be a traffic hazard. In most rooms, it may be placed next to a side wall at the front of the audience. This provides several advantages: it is less conspicuous, it is less likely to be bumped by passers-by, and the sound is acoustically reinforced by the wall.

Dress all cables so they are out of the way and out of sight if possible. Avoid running microphone cables alongside external speaker or power cables. If cables must be run across an aisle, tape them down with gaffer's (duct) tape to prevent tripping or injury.

#### WIRELESS INTERFERENCE

When using the wireless microphone, make sure that a line-of-sight path exists between transmitter and receiver antennas for best reception.

## OPERATION

1. Check that all connections have been securely made, and cables have been safely routed.
2. Make sure all volume controls are set to minimum to avoid feedback or other noises when the power is turned on.
3. Turn on the PAS-1 power switch.
4. To use the PAS-1 with a wireless microphone, extend the antenna full-length and point it straight up. For best results, keep a line-of-sight path between the wireless microphone and the PAS-1 during operation. Turn on the wireless microphone; the green *RF* indicator on the PAS-1 should illuminate. If the *RF* indicator is not lit, no signal is being received. Possible causes include weak batteries in the microphone, microphone too far away from receiver, or obstruction between the microphone and receiver antennas. If the wireless microphone is too far from the receiver or there are intervening walls or other barriers, the signal from the microphone may intermittently drop out, causing a sipping or sputtering sound.

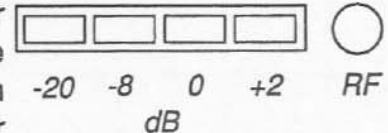


Figure 4  
dB Bar Meter and RF  
Level meter

Check that the microphone gain is properly set using the *dB* bar meter (see the next section, *Wireless Microphone Gain Adjustment*). Adjust the *Wireless* level control to the desired volume.

5. If using a wired microphone, have someone speak into it, and adjust the *Mic* level control to the desired volume.
6. If using an auxiliary input, activate the auxiliary source and adjust the *Aux Input* level control to the desired volume.
7. Turn the level controls for unused inputs all the way down to prevent picking up extraneous noises.
8. Adjust the *Bass* and *Treble* controls as desired. Speech can sometimes be made more intelligible by cutting the bass and boosting the treble. Music may sound richer by boosting the bass. Cutting the treble helps reduce background noise on noisy records and tapes.

### NOTE

Since it is good practice to turn all volume controls down before turning on the sound system, you may want to mark control level settings (using removable tape) after setup so that proper settings can be restored prior to performance. This is also good practice if the system is to be left unattended for some time prior to performance.

## WIRELESS MICROPHONE GAIN ADJUSTMENT

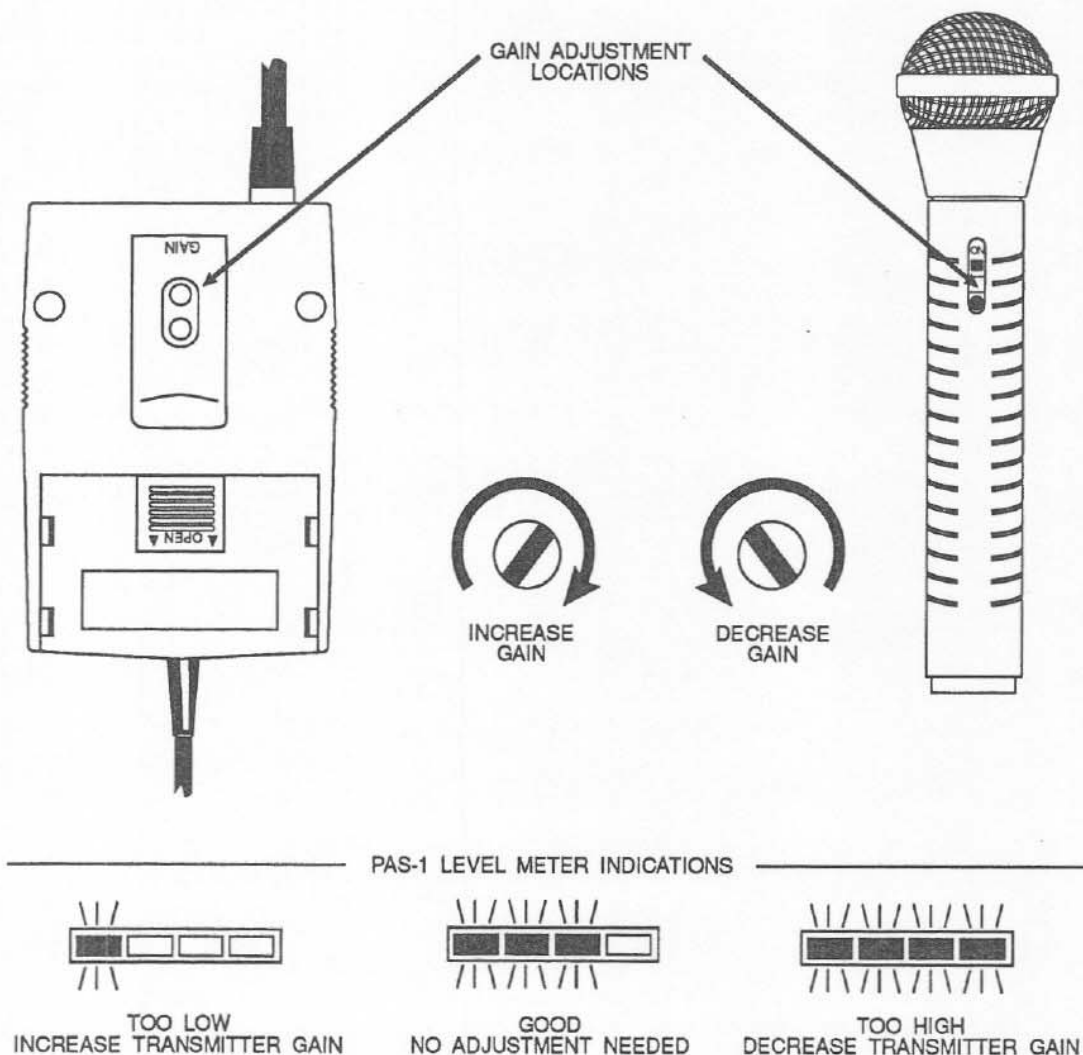
The four-segment *dB* bar meter provides a quick visual check of wireless microphone gain when speaking or singing into the microphone.

The gain potentiometer on your transmitter has been factory set to provide readings in the middle area of the bar indicator for typical speaking applications. Readings in this area give highest dynamic range and no overload. Some applications, however, may require readjustment of transmitter gain:

**High SPL (Sound Pressure Level) Setting:** Singing and "close talking" the microphone produce high SPL's. The factory gain setting may be too high, resulting in distortion.

**Low SPL Setting:** If your application is low SPL, such as a very soft spoken individual or a situation where the microphone is not "close talked", the factory gain setting may be too low, resulting in poor overall signal-to-noise ratio.

If necessary, adjust the microphone gain control so that average audio levels cause the meter to indicate in the middle area as shown below. An occasional overshoot into the "+2" area is allowable.



**Figure 5.**  
**Wireless Microphone Gain Adjustment**



## SYSTEM WALK-THRU

Walking the microphone (either wired or wireless) through the area where it will be used can reveal RF reception or feedback problems:

### RF TROUBLE SPOTS (Wireless Microphone)

The system walk-thru can detect weak RF signal problems caused by:

Obstructions between transmitter and receiver antennas.

Operating the wireless microphone too far from the receiver.

Weak batteries in the wireless microphone.

Under normal conditions the RF carrier LED should always be lit when the wireless microphone is on. Weak signal conditions will result in intermittent flickering or no illumination of the green RF LED.

### AUDIO FEEDBACK (Wired or Wireless Microphone)

The system walk-thru can also uncover locations in the performing area which are prone to audio feedback. Feedback can be a problem for any microphone, whether wired or wireless. To eliminate feedback, observe placement of the microphone and any nearby loudspeakers.

### BATTERY INFORMATION (Table 2)

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

#### ALKALINE BATTERIES

Alkaline batteries, such as Mallory's DURACELL® or Eveready's ENERGIZER®, provide the most reliable operation in wireless microphones. Carbon-zinc "bargain" batteries often produce inferior results.

#### NICKEL-CADMIUM BATTERIES

Nickel-Cadmium 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 nickel-cadmium batteries, you must select a "heavy duty" type. Some, such as GE® or Radio Shack®, are only capable of providing 7.2 volts, which is not sufficient to power the microphone.

Nickel-Cadmium "Memory" Effect: If nickel-cadmium batteries are not discharged on a regular basis between charges, they will "remember" how long you use them for each performance and will not have the ability to retain their original performance. For maximum performance and longer life from nickel-cadmium batteries, completely discharge them between charges. This can be done by simply leaving the microphone on overnight.

**Table 2. Typical Operating Time for Various Batteries**

Battery Type	Volts	Expected Life
Conventional RAY-O-VAC Carbon Zinc	9	Not Recommended
Alkaline MALLORY MN1604 or Equivalent	9	6 to 8 Hours
GE or Radio Shack Nickel-Cadmium Rechargeable	7.2	Does Not Work
Varta or Gould "Again and Again" Nickel-Cadmium Rechargeable	8.4	1-1/2 to 2 Hours per charge

ENERGIZER® is a registered trademark of Union Carbide Corporation.

DURACELL® is a registered trademark of Duracell Inc.

GE® is a registered trademark of General Electric Company

Radio Shack® is a registered trademark of the Tandy Corp.

## WARRANTY SERVICE INFORMATION

If the PAS-1 should need servicing under the warranty, please contact:

Warranty Service Department  
TELEX/Hy-Gain  
TELEX COMMUNICATIONS, INC.  
8601 East Cornhusker Highway  
P.O. Box 5579  
Lincoln, Nebraska 68505-5579  
Phone: (402) 467-5321

All claims of defect or shortage should be addressed to the above address. You must furnish model number, date, place, and proof of purchase, such as a copy of the sales receipt to establish warranty. Your letter should include all pertinent details along with part or item numbers involved. Do Not return anything until requested to do so. Any returned items must have prior authorization. Unexpected returns are greatly delayed in handling. These delays can be avoided by writing in advance and furnishing the necessary information.

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

Telex Wireless Microphones are type accepted under United States Federal Communications Commission Parts 90 and 74. The PAS-1 receiver is authorized under Part 15 of the Federal Communication Commission. Licensing of Telex wireless equipment is the user's responsibility and depends upon the user's classification and frequency selected. Telex strongly urges the user to contact the appropriate telecommunications authority before ordering and choosing frequencies other than factory preset frequencies.

**CAUTION:** Changes or modifications made by the user could void the user's authority to operate the equipment.