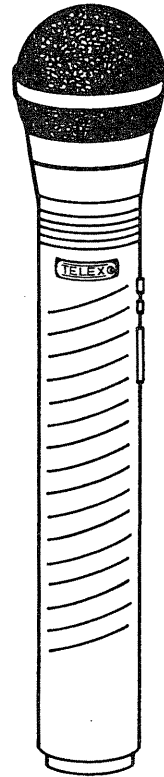


# Telex

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## Operating Instructions



**Professional Wireless  
Microphone System  
HT-100**

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**TELEX®**

# INTRODUCTION

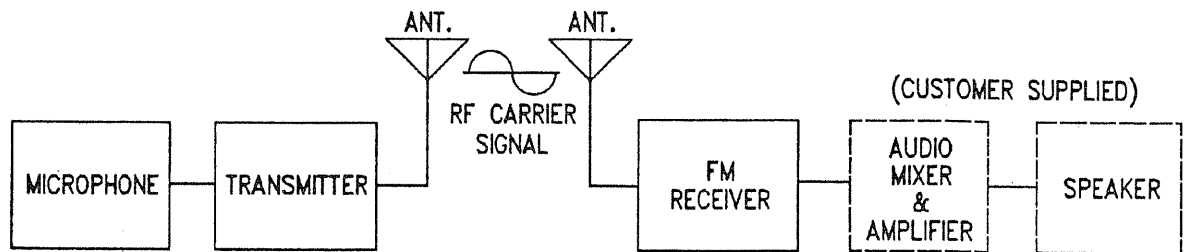
## WHAT IS A WIRELESS MICROPHONE SYSTEM?

### COMPONENTS

**Microphone:** An electro-acoustic transducer which responds to sound waves and delivers essentially equivalent electrical waves. These electrical waves are sent to the transmitter portion of the handheld unit.

**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.

**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 PA, Line, Network, etc. The receiver frequency must match the transmitter frequency.



**Figure 1**  
**Block Diagram of Typical Wireless Microphone System**

## WHAT FREQUENCY BAND DOES THE TELEX SYSTEM OPERATE IN?

The Telex System features either single or dual channel, crystal-controlled transmitters and single or four channel receivers operating in the VHF Band between 165-216 MHz. There are several standard frequencies available.

The system operates on a fixed frequency which can be computer selected to provide "interference-free" operation. Up to seven systems can be operated in a single location simultaneously, without intermodulation.

## OFTEN ASKED QUESTIONS

**Q**uestion: Can more than one microphone operate simultaneously?

**A**nswer: Yes, but never on the same frequency. You will need to have different frequencies for every receiver/transmitter combination. All units are factory set for specific frequencies.

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**Q**uestion: Is the system more sensitive in any one particular direction?

**A**nswer: 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, except when using a directional antenna.

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**Q**uestion: Can the receiver receive other transmissions when the transmitter is turned off?

**A**nswer: Yes it can. The Telex system operates in VHF band between 165-216 MHz. However, it is not susceptible to radio wave skip, CB'ers or standard FM radio transmissions.

The frequency on which your system operates can be 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, the system 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 will inevitably run into occasional frequency conflicts.

In either case, when you're not using the wireless microphone, turn the gain down on your audio mixer, just as you would a wired microphone. If a mixer control is not available, turn the receiver off when the transmitter is not in use. This will prevent the reception of undesired signals.

If a mixer control is not available and the system must be left on, the transmitter should be left on to prevent the receiver from picking up outside interference.

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# TECHNICAL INFORMATION

## HT-100

### GENERAL DESCRIPTION:

The HT-100 Series is a very versatile microphone which expands your selection to four popular microphone models. Its heavy-duty construction provides lightweight durability and its compact design assures reliability in the field.

### FEATURES:

- Independent Power and Audio Switches
- Low Battery Indicator
- Screwdriver adjustable Gain Control
- Comporator IN/OUT Switch
- Uses Standard 9 Volt Battery

### TRANSMITTER SPECIFICATIONS:

Battery .....	9 Volt alkaline (NEDA 1604 or equivalent or 8.4 Volt NICAD Type)
Battery Life.....	6-8 hours typical on alkaline 1 1/2 to 2 hours typical on NICAD on one charge
Current Drain.....	35 mA
Modulation Limiter.....	Internal Compressor
Antenna .....	Integral to unit, omnidirectional
RF Power Output .....	45 mW typical
Range.....	1000 ft. (300 m) - Open field conditions, typical 250 ft. (76 m) - Adverse conditions, typical
Audio .....	+ \- 1 dB, 50-15000 Hz (without head)
Radiated Harmonic and Spurious Emission Minimum.....	30 dB below Carrier
Modulation .....	+ \- 12 KHz Deviation, 50 uS pre-emphasis
FCC.....	Type accepted under Parts 90 and 74

### Microphone Specifications

<b>HT-100/10</b> .....	Telex TE-10
Element Type.....	Condenser
Directional Pattern .....	Cardioid
Frequency Response .....	85-15000 Hz
Maximum SPL .....	140 dB
<b>HT-100/11</b> .....	Telex TD-11
Element Type .....	Dynamic
Directional Pattern .....	Cardioid
Frequency Response .....	50-16000 Hz
Maximum SPL .....	140 dB

## Microphone Specifications Continued

**HT-100/58**..... Shure SM-58  
 Element Type..... Dynamic  
 Directional Pattern..... Cardioid  
 Frequency Response..... 50-15000 Hz  
 Maximum SPL..... 140 dB

**HT-100/87**..... Shure SM-87  
 Element Type..... Condenser  
 Directional Pattern..... Super Cardioid  
 Frequency Response..... 85-15000 Hz  
 Maximum SPL..... 140 dB

**HT-100/757**..... Electro-Voice N/0757  
 Element Type..... Dynamic  
 Directional Pattern..... Super Cardioid  
 Frequency Response..... 50-18000 Hz  
 Maximum SPL..... 144 dB

# HT-100 CONTROLS AND CONNECTIONS

**Comparator IN/OUT Switch:** Accessed by removing the microphone head. The internal slide switch allows the user to control the HT-100 compandor operation. Must be set to match receiver operation. A screwdriver is provided.

**MIC Switch (Audio):** Located on the side of the microphone. The MIC Switch allows the user to switch the audio ON or OFF without introducing a "thump" into the sound system.

**Audio Gain Control:** Accessed thru a hole on the side of the handle near the microphone head. A screwdriver is provided.

**Antenna:** The antenna for the HT-100 is located inside the microphone handle. The antenna is efficient and is omnidirectional.

**Power OFF/ON Switch:** Located at the bottom of the microphone. A low profile slide switch is provided to allow access to power OFF/ON.

**Low Battery Indicator:** Located at the bottom of the microphone. The red LED will flash briefly when the microphone is first turned on (with a fresh battery). When the LED stays on, the user has approximately 1 hour of remaining battery life.

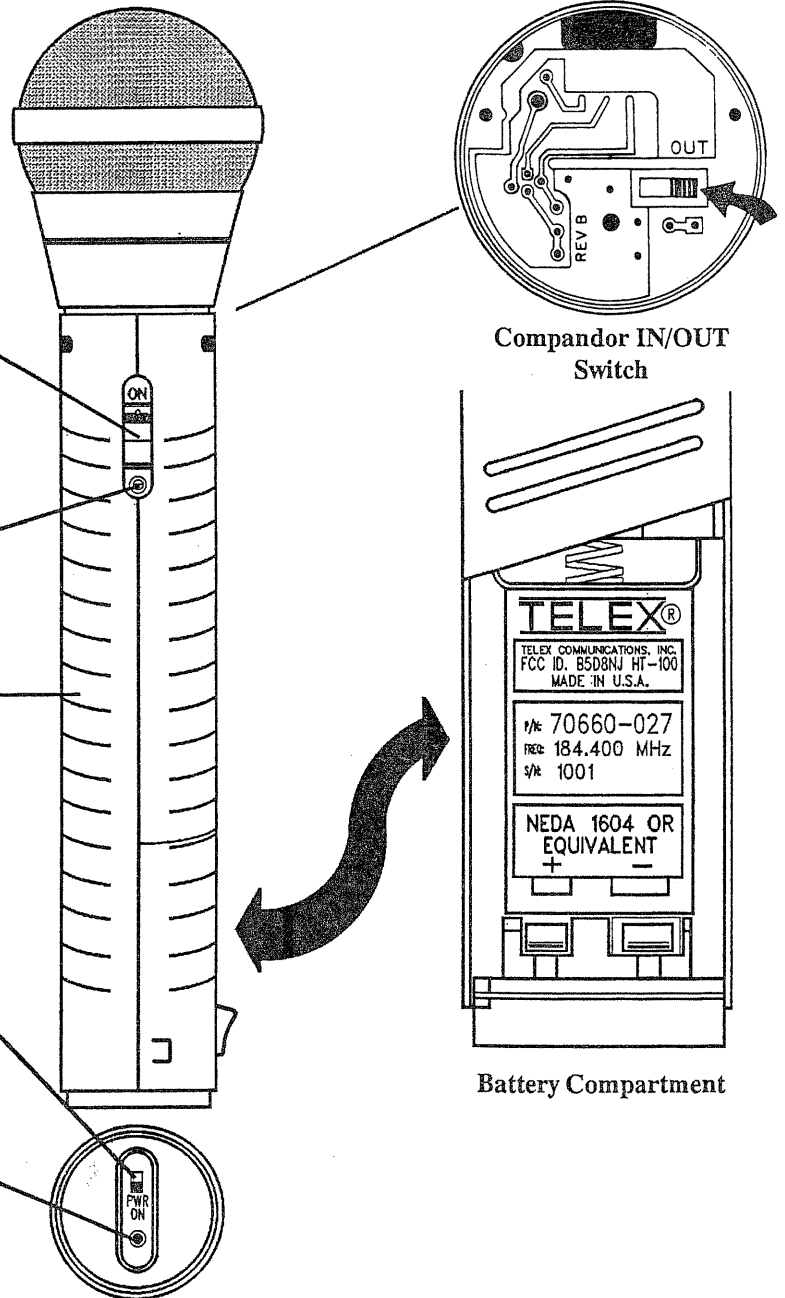


Figure 2  
Overall View - HT-100

# EQUIPMENT SET-UP

**Unpacking:** Unpack your Wireless Microphone system. If there is any damage or shortage, refer to the "Warranty Service Information" section in this manual.

## RECEIVER SET-UP

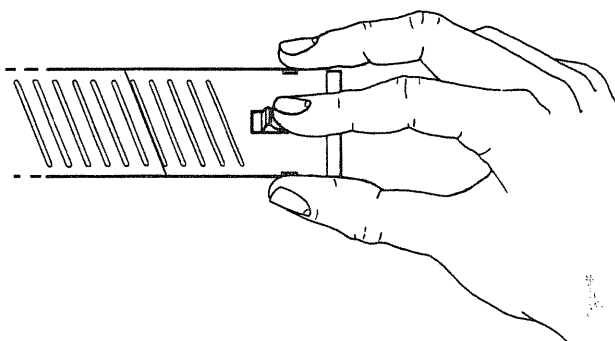
**NOTE:** Refer to the manual of the receiver you will be using. This microphone will work with the ENG-4, FMR-2, FMR-4, FMR-100 and the FMR-25/FMR-25TD receivers. Set up the receiver according to the operators manual.

## MICROPHONE SET-UP

### ALL HT-100 SERIES MODELS

**Battery Installation:** Insure that the power switch is in the "OFF" position. To open the battery compartment, place your thumb and middle finger on either side of the handle approximately 3/4 inch from the end of the microphone. Place your index finger on the exposed button and push, lifting upwards at the same time until the battery door comes off.

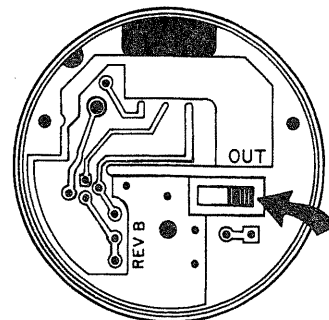
27132-A-006-A



**Figure 3**  
Battery Installation HT-100

The battery can be inserted in only one direction in order to prevent incorrect battery insertion (See Figure 2). Replace the battery door by placing the door on the handle and pressing down until the door SNAPS into place.

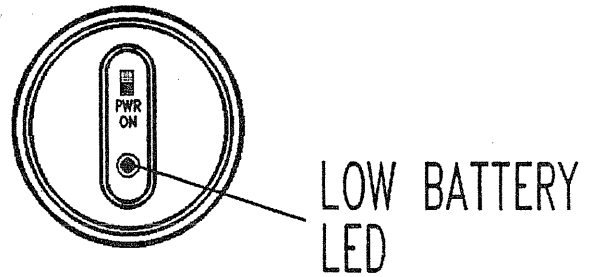
**Comporator IN/OUT Switch:** If you are using the HT-100 with the FMR-4, ENG-4, or FMR-100 Receivers, determine whether it is desired to operate with the compandor IN or OUT. Basically, this is a personal choice. Some operators prefer to operate with the compandor OUT, even at the expense of signal-to-noise ratio and the other advantages of compandor operation. Access to the compandor IN/OUT switch is obtained by removing the microphone head. Place the compandor switch (See Figure 4) to the "IN" or "OUT" position, as desired.



**Figure 4**  
Compandor IN/OUT Switch

**NOTE:** The Comandor IN/OUT Switch must match the position of the receiver Comandor IN/OUT Switch.

**Battery Check:** Set the power switch to the "ON" position. Note that the battery LED, located on the bottom of the microphone, should flash one time for a good battery. A low power battery will cause the LED to be illuminated continuously and a bad or unusable battery will not cause any illumination at all. Set the power switch to the "OFF" position.



**Figure 5**  
**Battery Check - LED Location**

**Head Assembly:** The HT-100 (Pro\*Star) Series is available with 4 different microphone models. Refer to Table 1 in the beginning of this manual.

## SETTING THE SYSTEM GAIN LEVELS

### ALL HT-100 SERIES MODELS

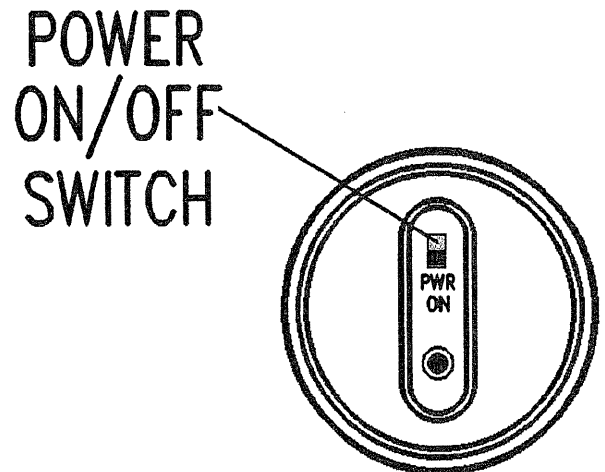
**Introduction:** If you have followed the instructions up to this point you should now be ready to turn both the transmitter and the receiver "ON" and set optimum signal gain settings on each unit.

Place the power switch on the receiver to the "ON" position. Refer to your receiver manual.

**NOTE:** Make sure the frequency of the receiver matches the frequency of the microphone transmitter.

**Transmitter Gain Setting:** To set the gain on the transmitter proceed as follows:

Set the HT-100 Power Switch to the "ON" position. The "Active Bar" of the RF field strength meter should now be illuminated GREEN in position #10 on the FMR-2 and FMR-4 receivers, and should indicate in the GREEN area on the ENG-4 meter. On the FMR-100 and FMR-25 receiver, the carrier LED should be illuminated.

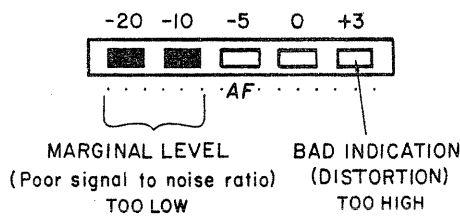


**Figure 6**  
**Power ON/OFF switch - HT-100**

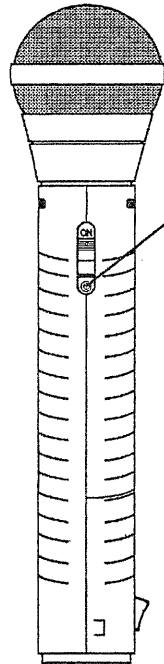
**NOTE:** Transmitter gain settings differ slightly depending on the receiver you are using. Refer to your receiver Owner's Manual.

The microphone "GAIN" Control on your HT-100 has been factory set for normal or average audio levels.

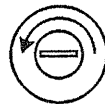




FMR 100-INDICATION



MICROPHONE GAIN ADJUSTMENT (SCREWDRIVER SLOT)

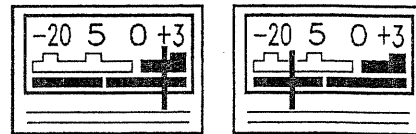


CCW - TURNS AUDIO GAIN DOWN



CW - TURNS AUDIO GAIN UP

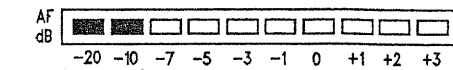
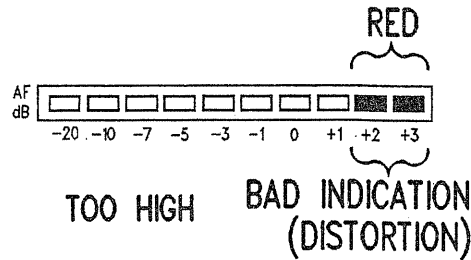
(METER - FRONT PANEL OF ENG-4)



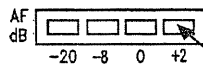
TOO HIGH

TOO LOW

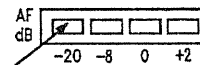
ENG-4 INDICATION



FMR-2, FMR-4 INDICATION



FMR-25 & FMR-25TD INDICATION



FMR-25 & FMR-25TD INDICATION

Figure 7  
Adjusting Microphone Gain

**High Level Setting:** If your application is in a high SPL (Sound Pressure Level) area such as singing or instrumentation, the factory gain setting is probably too high and will result in overloading your receiver which will result in distortion.

**Low Level Setting:** If your application is low level, such as a very soft spoken individual or a situation where the handheld transmitter is not going to be "close talked", the factory gain setting may be too low and could result in poor overall signal-to-noise ratio.

To correct either a too high, or too low setting, remove the plug and obtain access to the screwdriver slot on the side of the HT-100, see Figure 8. Adjust the Microphone Gain Control so that average audio causes the meter to indicate in the middle area of your meter. An occasional overshoot into the RED area is allowable.

**Receiver Gain Setting:** After the transmitter gain has been properly set, you are now ready to set the receiver gain.

**NOTE:** Insure that the Compandor IN/OUT switch on the receiver agrees with the transmitter Compandor IN/OUT switch. Set your receiver gain as per your receiver manual. Adjust the level to accommodate the mixer or other audio system.

## SYSTEM WALK-THRU

**General:** Now that you have successfully "set up" your Telex Wireless System and turned on your sound equipment (amplifier/mixer, video cam etc.), you are ready to test the overall performance by "walking" the transmitter through the areas in which you will be using it.

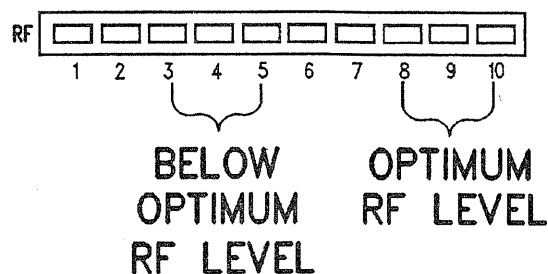
The "system walk-thru" can detect the following RF problems:

Weak signal strength caused by:

- Poor antenna location
- RF "Trouble Spots"
- Operating distance beyond system capability
- Old or used transmitter batteries

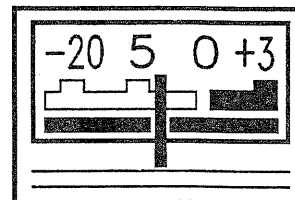
**Carrier Indication:** Under normal conditions the active bar RF field strength meter should show a reading in the upper portion of the scale.

"Weak Signal" conditions will result in low meter indication with the potential of actually "hearing" this in the sound system.



**Figure 8**  
Optimum and Below Optimum RF Levels on the FMR-4 and FMR-2 Receivers

If you are using an ENG-4 Receiver, under normal conditions with the rotary function switch in the "RF" position, the carrier indication on the meter should always be center scale or higher (green area) with the transmitter "ON".



**Figure 9**  
Optimum RF Level on the ENG-4 Receiver

**Audio Feedback:** The system walk-thru can also uncover locations in the performing areas which are prone to audio feedback (usually sounds like a "squeal" or a "howl"). Feedback can be a problem for any microphone - whether wired or wireless. To eliminate feedback, observe placement of the microphone and any nearby loudspeakers.

In 99% of all instances you will set up your Telex Wireless System, walk it through and achieve error-free performance. If in the rare instances your Telex System does not "pass" during your walk-thru evaluation, refer to the last two sections of your receiver manual which deal with Antenna Information and System Troubleshooting.

## 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 (R) or Eveready's Energizer (R) provide the most reliable operation in wireless transmitters. 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. Conventional 9 volt size such as GE (R) or Radio Shack (R) are only capable of providing 7.2 volts, which is not sufficient to power the Telex HT-100 transmitter.

**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 transmitter turned on overnight. If nickel-cadmium 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.

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

**Table 1**  
**Battery Information for HT-100**

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

Warranty Service Department  
TELEX COMMUNICATIONS, INC.  
Hy-Gain Division  
8601 East Cornhusker Highway  
P.O. Box 5579  
Lincoln, Nebraska 68505-5579 U.S.A.  
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 repairs.

Include all information requested by the Service Department. 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 and 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 Warranty Service Department.

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 products 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 REGULATIONS

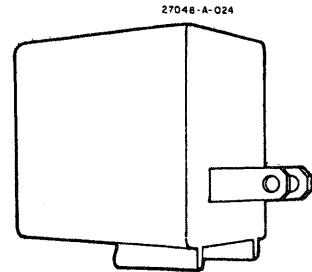
The Telex HT-100 Transmitter is Type Accepted under United States Federal Communications Commission Parts 90 and 74. Licensing of Telex equipment is the user's responsibility and licensability depends upon the user's classification, user's application, and frequency selected. Telex strongly urges the user to contact the appropriate telecommunications authority for any desired clarification. **CAUTION:** Any changes or modifications made to the above equipment could void the user's authority to operate the equipment.

## ACCESSORIES

**Nickel-Cadmium Battery** - For HT-100  
Mic/Transmitter 8.4 Volts  
Order No. 63912-000



**BC-2 Battery Charger** - For charging nickel-cadmium battery used in HT-100. Order No. 64267-000



**TELEX®**

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TELEX COMMUNICATIONS, INC. 9600 • Aldrich Ave. So., Minneapolis, MN 55420 U.S.A.

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