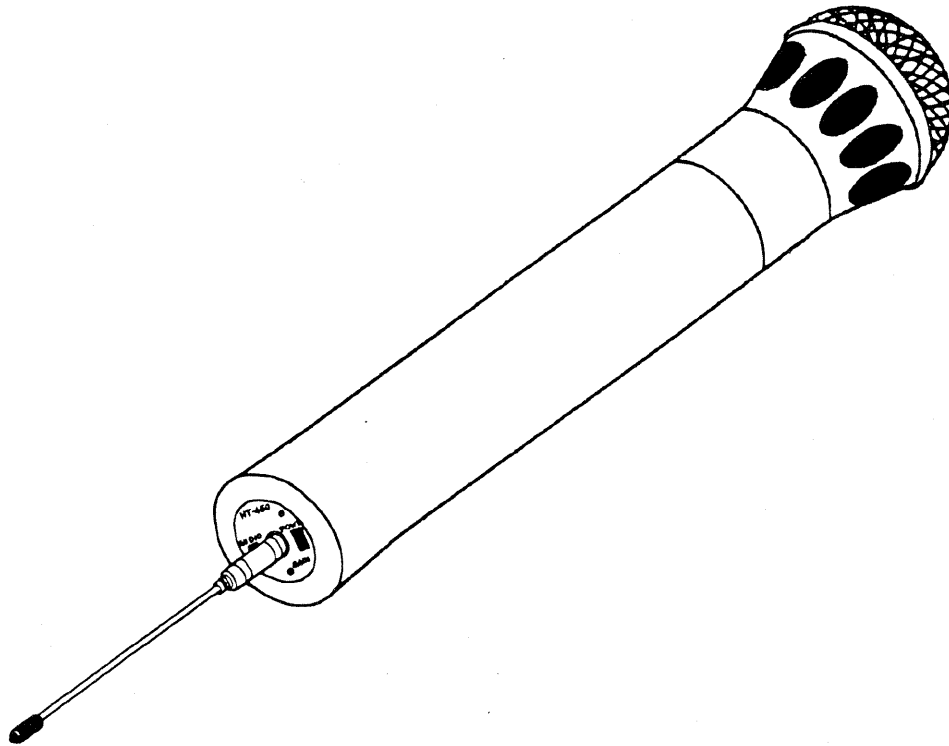


Telex

Operating Instructions



**Professional Wireless
Microphone System
HT-450**

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 UHF 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.

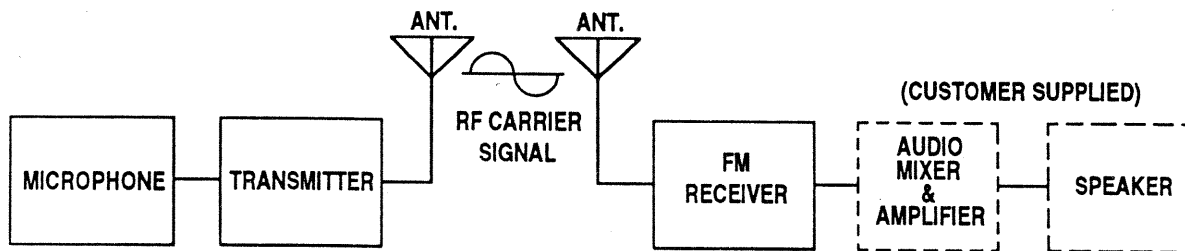


Figure 1
Block Diagram of Typical Wireless Microphone System

WHAT FREQUENCY BAND DOES THE TELEX SYSTEM OPERATE IN?

The Telex System features single channel, crystal-controlled transmitters and single channel receivers operating in the UHF Bands between 524-608 MHz and 614-746 MHz. There are several standard frequencies available.

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

OFTEN ASKED QUESTIONS

Question: Can more than one microphone operate simultaneously?

Answer: 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.

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, except when using a directional antenna.

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

Answer: Yes it can. The Telex system operates in UHF bands between 450-608 MHz and 614-806 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.

TECHNICAL INFORMATION

HT-450

GENERAL DESCRIPTION:

The HT-450 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
- Uses Standard 9 Volt Battery

TRANSMITTER SPECIFICATIONS:

Battery	9 Volt alkaline (NEDA 1604 or equivalent or 8.4 Volt NICAD Type)
Battery Life	8-10 hours typical on alkaline 1 to 2 hours typical on NICAD on one charge
Current Drain	55 mA
Modulation Limiter	Internal Compressor
Antenna	External to unit, omnidirectional
RF Power Output	25 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	+/- 40 KHz Deviation, 50 uS pre-emphasis
FCC	Type accepted under Parts 90 and 74
Frequency Range	524-608 MHz and 614-746 MHz

Microphone Specifications

HT-450/65ELE	Telex 65ELE
Element Type	Condenser
Directional Pattern	Cardioid
Frequency Response	85-15000 Hz
Maximum SPL	140 dB
Order No.	71144-XXX

Note: XXX in the Order No. indicates the selected frequency.

Microphone Specifications Continued

HT-450/SM-87.....Shure SM-87
 Element Type..... Condenser
 Directional Pattern..... Super Cardioid
 Frequency Response..... 85-15000 Hz
 Maximum SPL.....140 dB
 Order No..... 71141-XXX

HT-450/EV-757..... Electro-Voice N/D757
 Element Type..... Dynamic
 Directional Pattern..... Super Cardioid
 Frequency Response..... 50-18000 Hz
 Maximum SPL.....144 dB
 Order No..... 71142-XXX

HT-450/SM-58.....Shure SM-58
 Element Type..... Dynamic
 Directional Pattern..... Cardioid
 Frequency Response..... 50-15000 Hz
 Maximum SPL.....140 dB
 Order No..... 71143-XXX

Note: XXX in the Order No. indicates the selected frequency.

ANTENNA COLOR CODE: The antenna color code for the HT-450 antenna may not match the antenna color code of the FMR-450 antenna. Refer to the following chart for matching antenna color codes for receivers and transmitters.

Frequency Range	Transmitter Antenna Color Code	Receiver Antenna Color Code
524-527.9	Blue	Blue
528-539.9	White	Blue
540-564.9	White	Blue
565-580.9	White	Yellow
581-594.9	Yellow	Yellow
595-614.9	Yellow	Yellow
615-632.9	Yellow	Red
633-644.9	Red	Red
645-659.9	Red	Red
660-689.9	Red	White
690-691.9	Red	Green
692-724.9	Green	Green
725-746	Green	Orange

HT-450 CONTROLS AND CONNECTIONS

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 one hour of remaining battery life.

Audio Switch: Located at the bottom of the microphone. The Audio Switch allows the user to switch the audio ON or OFF without introducing a "thump" into the sound system. A high profile slide switch is provided for easy identification.

Antenna Connector: Located at the bottom of the microphone. A LEMO jack is provided for easy removal when replacing batteries and for storage.

Antenna Color Dot:

Matches color band on antenna.

Audio Gain Control: Accessed thru a hole at the bottom of the handle. A screwdriver is provided.

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.

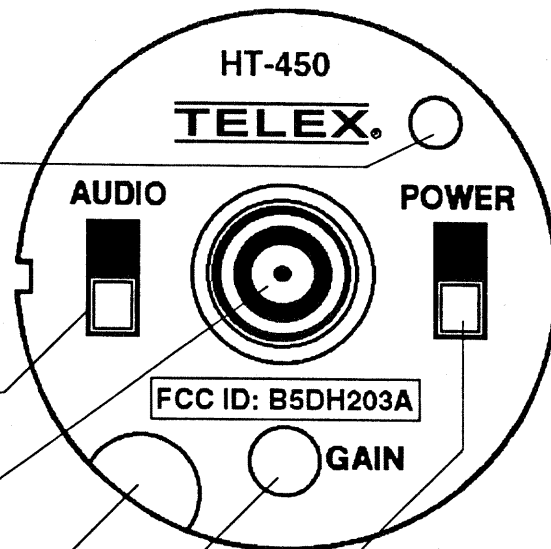


Figure 2
Bottom View - HT-450

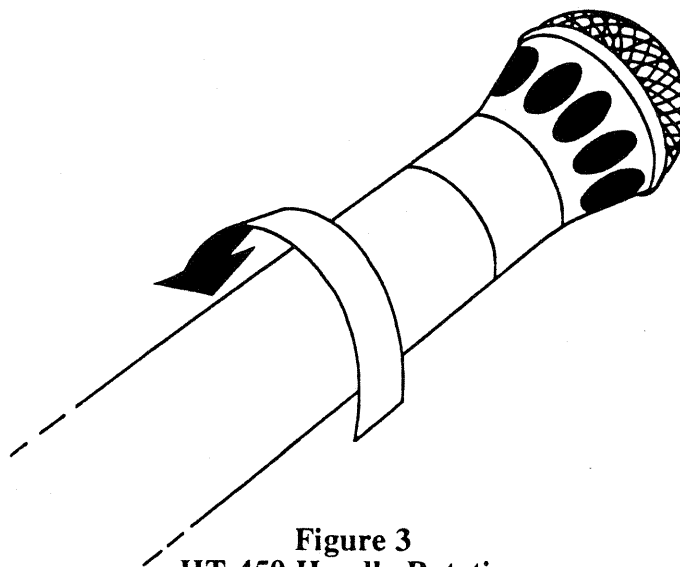


Figure 3
HT-450 Handle Rotation

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 FMR-450 receiver. Set up the receiver according to the operators manual.

MICROPHONE SET-UP

ALL HT-450 SERIES MODELS

Battery Installation: Insure that the power switch is in the "OFF" position. To access the battery compartment, turn the handle of the microphone counter-clockwise (Refer to Figures 3 and 4A) and slide the handle down to expose the battery compartment.

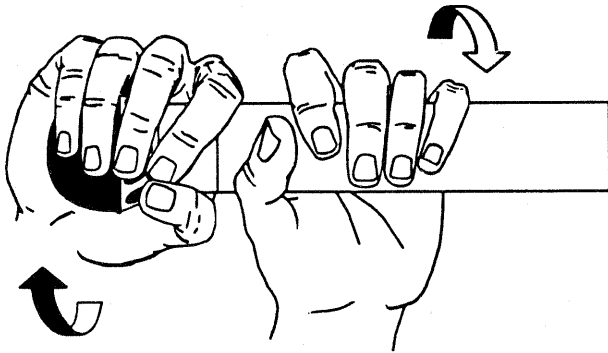


Figure 4A
Battery Compartment

The handle will "lock" into place, allowing convenient battery compartment access (See Figure 4A).

The battery can be inserted in only one direction in order to prevent incorrect battery polarity.

Antenna Installation and Removal: Install the antenna by aligning the antenna plug with the jack on the bottom of microphone. Push the plug into the jack until the plug "snaps" into place.

To remove the antenna, grasp the antenna plug and pull as shown in Figure 4B.

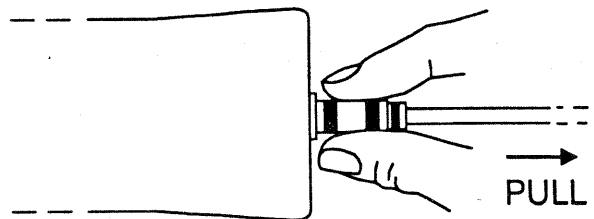


Figure 4B
Antenna Installation and Removal

NOTE: The Compandor IN/OUT Switch on the receiver, if applicable, must be set to the "IN" position.

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.

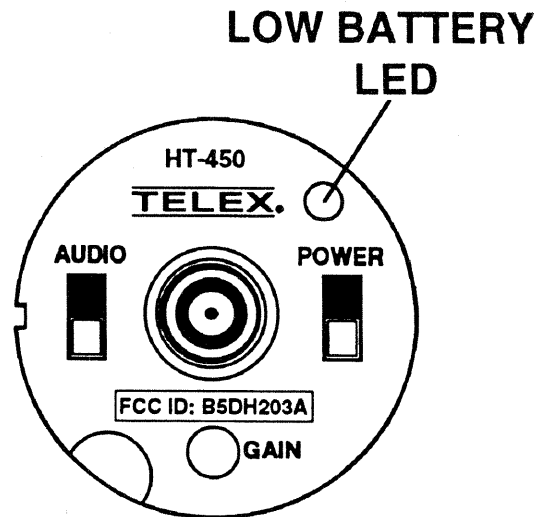


Figure 5
Battery Check - LED Location

SETTING THE SYSTEM GAIN LEVELS

ALL HT-450 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-450 Power Switch to the "ON" position. The "Active Bar" of the RF field strength meter should now be illuminated GREEN in position #5 on the FMR-450.

**POWER
ON / OFF
SWITCH**

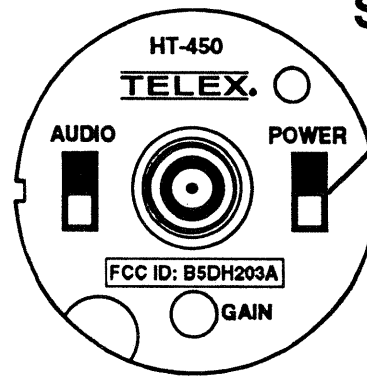


Figure 6
Power ON/OFF switch - HT-450

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-450 has been factory set for normal or average audio levels.

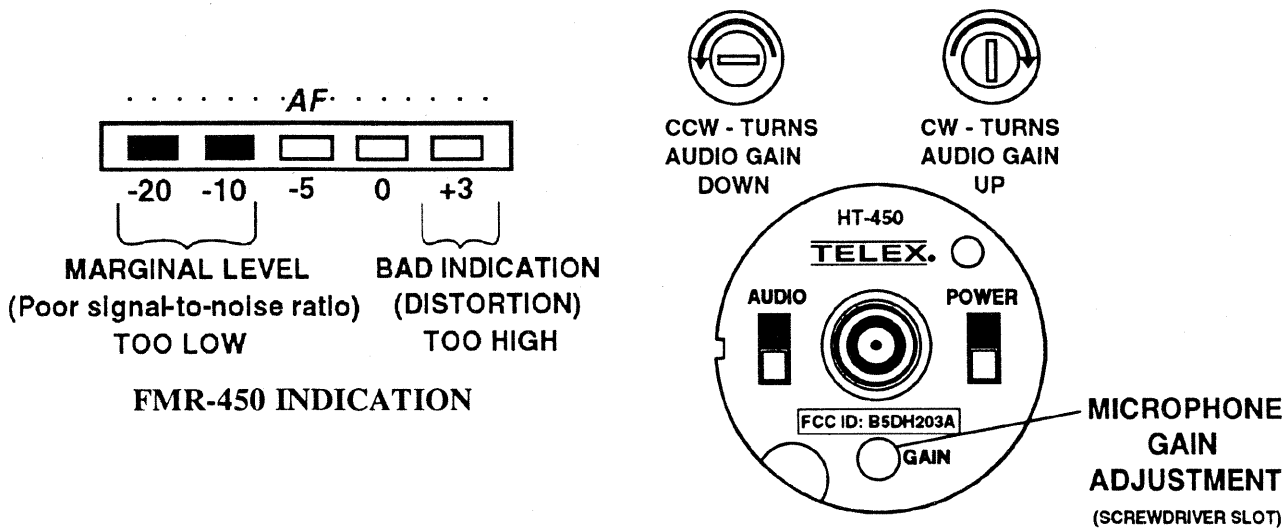


Figure 7
Adjusting Microphone Gain

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, obtain access to the screwdriver slot on the bottom of the HT-450, see Figure 7. 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 Comandor IN/OUT switch on the receiver is in the “IN” position. 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.

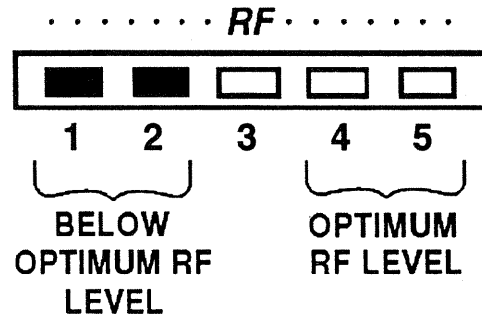


Figure 8
Optimum and Below Optimum RF Level
on the FMR-450 Receiver

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® or Eveready's Energizer® 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® or Radio Shack® are only capable of providing 7.2 volts, which is not sufficient to power the Telex HT-450 transmitter.

Battery Type	Volts	Expected Life
Conventional "RAY-O-VAC" Carbon Zinc	9	Not Recommended
Alkaline "MALLORY" MN1604 or Equivalent	9	8 to 10 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 to 2 Hours per charge

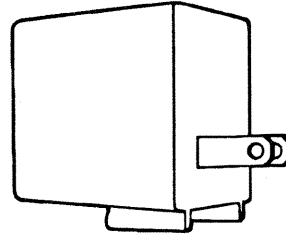
Table 1
Battery Information for HT-450

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.

ACCESSORIES

Nickel-Cadmium Battery - For HT-450
Mic/Transmitter 8.4 Volts
Order No. 63912-000

BC-2 Battery Charger - For charging nickel-cadmium battery used in HT-450. Order No. 64267-000



HT-450 REPLACEMENT ANTENNA:		
Frequency Range	P/N	Color
524-527.9	870601-2	Blue
528-580.9	870601-3	White
581-632.9	870601-4	Yellow
633-691.9	870601-5	Red
692-746	870601-6	Green

FCC REGULATIONS

The Telex HT-450 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.

TELEX®

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.

TELEX[®]

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