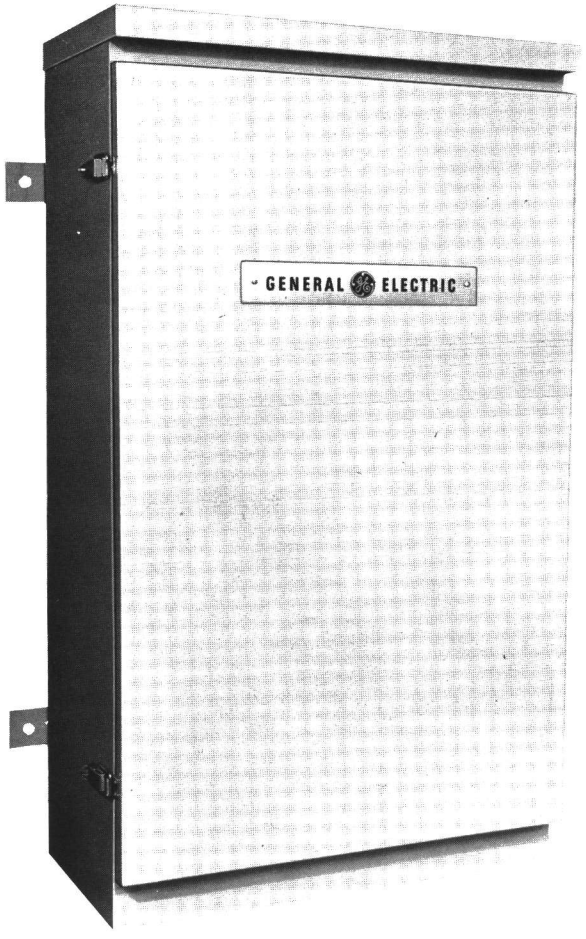
MOBILE RADIO

INSTALLATION OF 960 MEGAHERTZ
MASTR Progress Line POLE MOUNT
TWO-WAY FM RADIO STATION COMBINATIONS



Style PM: POLE MOUNT

- **Remote Control**
- **Repeater Control**

You can mount your station outdoors in remote locations regardless of rain, snow, heat or cold. Mounting brackets on the rear of the cabinet make installation possible on either a pole or a wall.

The electronic components are attached to a unique "swing-out" rack for ease in servicing either side of the rack.

Tamper-proof latches can be padlocked to prevent unauthorized entry into the cabinet.

PLANNING SPECIFICATIONS

Dimensions (H x W x D)	42" x 23" x 12¼"
Weight	Approx 200 lbs.
Shipping Weight	Approx 215 lbs.
Temperature Range	−30°C to +60°C (−22°F to +140°F)
Input Power	1.66 Amps (max) 195 W. transmit 0.8 Amps (max) 95 W. receive @ 117 VAC, 50/60 Hz

9023

GENERAL ELECTRIC

UNPACKING AND CHECKING EQUIPMENT

As you unpack the station combination, carefully inspect each item and check it off in the appropriate column below. If any damage has occurred to the equipment during shipment, file a claim with the freight carrier immediately.

EQUIPMENT	REMOTE CONTROL	REPEATER CONTROL
Base Station	☐	☐
Alignment Tool 4038831-P2	☐	☐
Antenna Cable 19B216678-G1 (Two for Repeater Stations without duplexer)	☐	☐
Military Microphone Model 4EM25A10	☐	☐
Microphone Mounting Kit 7141414-G2	☐	☐
Speaker Model 4EZ16A20 (with VOLUME control)	☐	
Speaker Model 4EZ16A21		☐

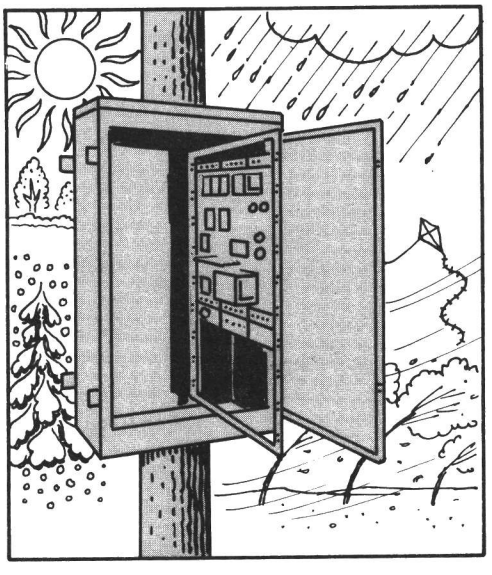
Antennas, transmission lines and towers are ordered separately from the station combination. The installer will normally provide any miscellaneous hardware as part of his installation "package". The user must provide the 117-VAC power service of adequate capacity and regulation as well as any telephone lines that may be required for "Remote Control" operation.

PLANNING THE POLE MOUNT INSTALLATION

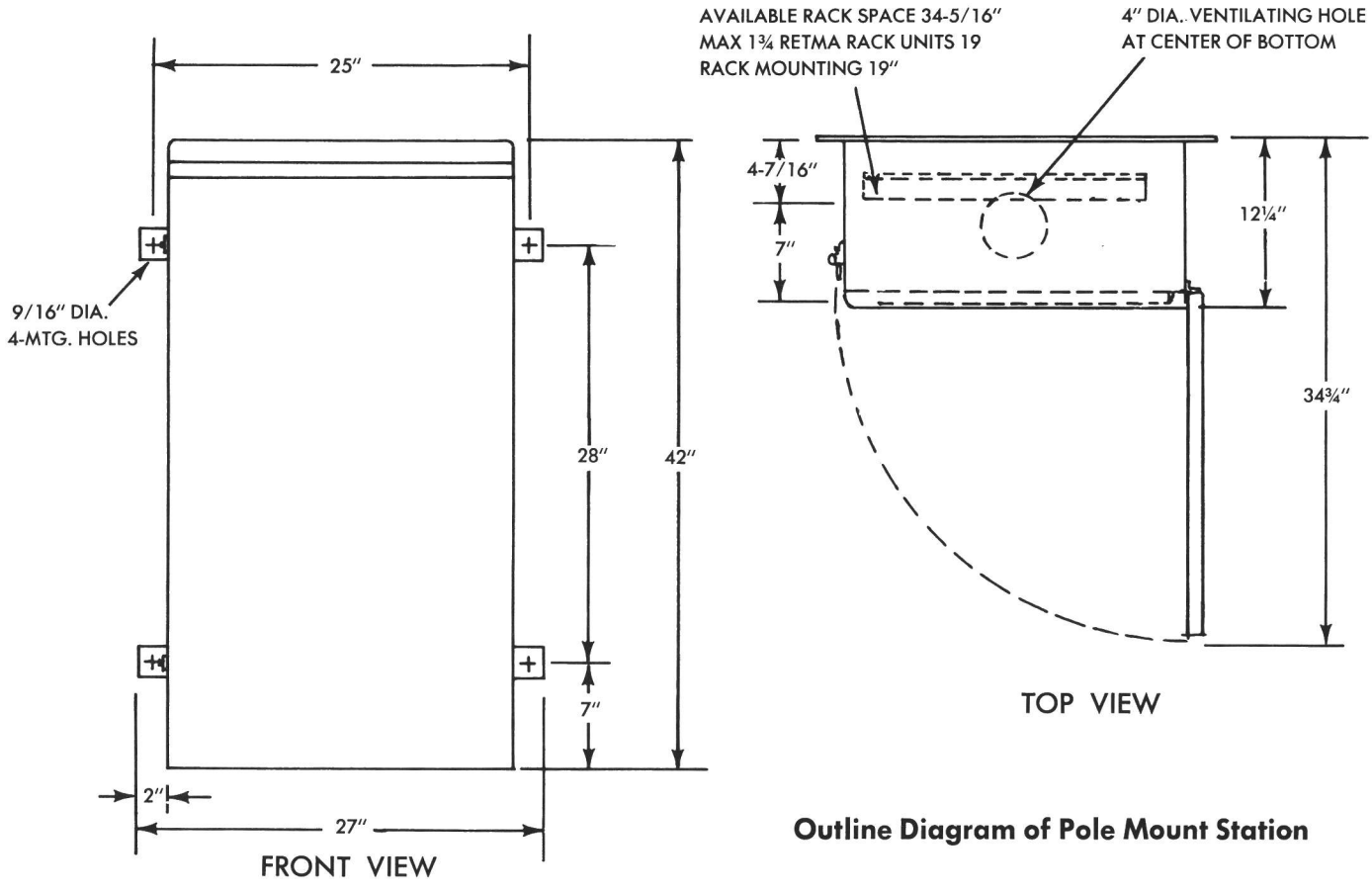
The illustrations in this manual of typical Pole Mount installations should help you in planning your installation. It is suggested that you take advantage of the experience of one of the many authorized General Electric Two-Way Radio Service Stations by having them install your new station combination and make the final adjustments.

Before starting your installation, study this manual carefully. A well-planned installation is neat and easy for the serviceman to service and offers protection for the equipment and cables.

SELECTING A LOCATION FOR THE STATION



The mounting brackets on the rear of the cabinet make the installation possible on the cross-arm of a single pole, on cross-arms between two poles, on a wall (inside or outside) on the antenna, or on some other vertical surface. Be sure the selected location is strong enough to hold the weight of the station (approximately 200 pounds). When an outside location is selected for your station, it is recommended that the cabinet be mounted so the cabinet door will face away from the prevailing wind. The station should always be accessible for maintenance and servicing. Tamper-proof latches can be padlocked to prevent unauthorized entry. Padlocks can be ordered from General Electric Service Parts.

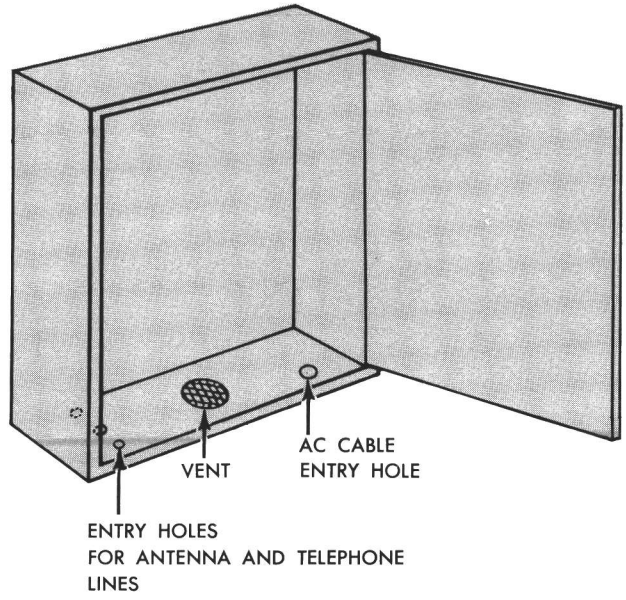


Outline Diagram of Pole Mount Station

The two mounting brackets on the back of the cabinet require four ½-inch bolts for mounting the unit.

CABLE ENTRY HOLES

Access holes must be made in the cabinet to bring in the conduit for antenna transmission lines, AC cable, telephone lines, and ground connections. A separate hole should be drilled for each line or cable entering the cabinet. After the holes have been drilled or punched through, mount strain relief cable clamps in each hole (clamps are supplied by the owner or installer). It is recommended that the hole for the AC cable be made near the bottom right side front and all other holes made along the bottom left side of the cabinet unless two antennas are used. In this case, the receive antenna cable should enter the cabinet on the same side as the AC cable. All holes should be made before the cabinet is installed.



To "swing out" chassis frame, remove bolt holding top of left mounting frame to cabinet back; remove screw or bolt and nut from bottom of left mounting frame holding frame to cabinet back bracket; grasp handle located on upper portion of left mounting frame and pull carefully to swing out the entire chassis assembly.

POWER AND GROUND REQUIREMENTS

A 15- or 20-ampere, 117-VAC 50/60 hertz electrical circuit must be provided for the station.

A 220/117 Volt AC Stepdown Transformer Kit is available when the AC input source is 220 volts.

The AC and ground connections to the station are shown in "Remote Control and Repeater Control Connections for Pole Mount Station Installations". Power cable is supplied by installer.

After the ground lead from the power cable is connected to the chassis mounting rack, check for continuity between chassis mounting rack and the cabinet. Be sure cabinet and rack are grounded together to protect service personnel and to minimize hum currents.

The cabinet should be connected to a good earth ground. A #12 stranded flexible wire connected to the component mounting rack should be clamped along the pole and mounted securely to a ground rod for a good ground—or if inside, to a water pipe. Soldered terminals should never be used in grounding.

Check your local electrical code to be sure that you comply with any local ordinances.

ANTENNA REQUIREMENTS

The antenna should be located as close as possible to the Pole Mount Station, so that the antenna transmission line can be kept short. Receiving and transmitting efficiency decreases as the length of the transmission line increases.

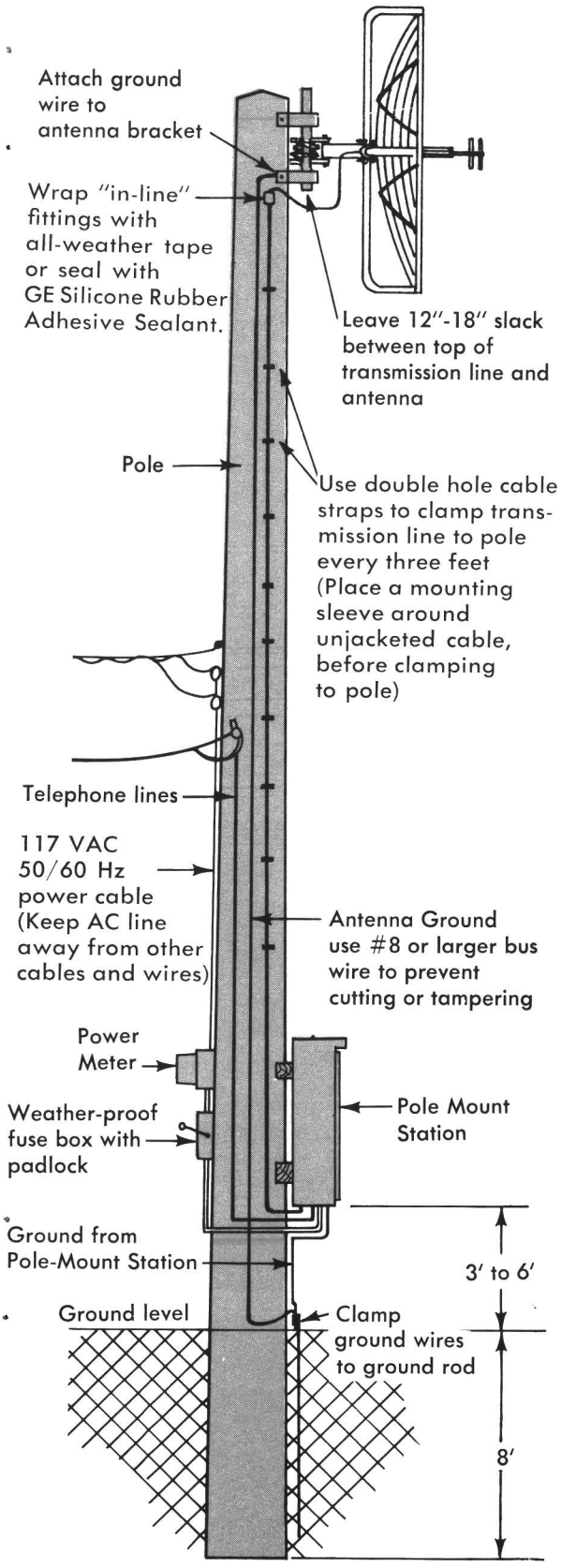
A 4-foot RG-8/U cable with Type N fittings on each end is provided for making connections between the equipment and the antenna transmission line (two cables are provided for repeater applications).

The antenna, tower, other antenna supports, and transmission line are ordered separately from the station combination, but proper installation of the antenna is essential for proper operation of the radio system. The system will not perform satisfactorily unless the antenna is installed in accordance with good engineering practice.

Install the station antenna following the instructions furnished with the antenna.

A typical antenna and Pole Mount Station with valuable installation hints is shown *on the following page*.

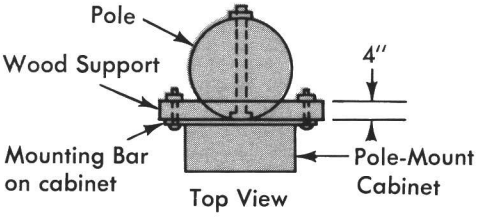
TYPICAL POLE MOUNT AND ANTENNA INSTALLATION



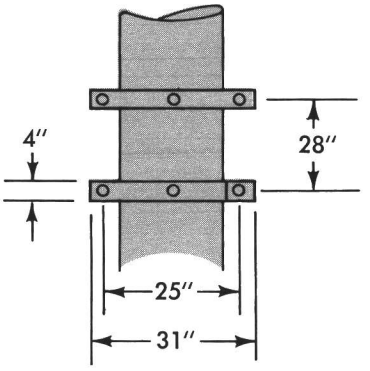
- Antenna should not be located in an area of a strong "electrical noise" field. It should be located at least several hundred feet from: high tension power lines, internal combustion engines, heavy electrical machinery, or other "radio-frequency devices".
- Check transmission line and connectors for opens and shorts before installing.
- Make a "drip-loop" in the transmission line before line enters the building, if station is mounted inside a building.
- Check continuity between transmission line ground and Pole Mount Station ground before transmission line is attached to station. Both continuity check readings must be identical.
- Keep transmission line away from all sharp edges. Do not make sharp bends.
- Be sure cabinet mounting location is above high water and flood levels.

ATTACHING POLE MOUNT STATION TO A SINGLE POLE

1. Cut horizontal mounting surfaces for two 4" by 4" wood supports on pole. Cut should be about 2" deep to allow outside surface of wood support to extend out from curvature of pole.
2. Drill a ½" hole through center of wood supports and pole. Mount wood supports with a ½" Diameter bolt. Tighten bolt securely with washer and nut. Head of bolt must be countersunk on wood support to provide flat surface for cabinet.
3. Bolt pole-mount cabinet to wood support, using four ½" bolts, washers, and nuts.



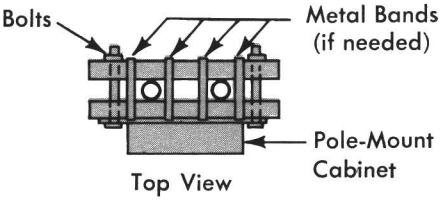
Top View



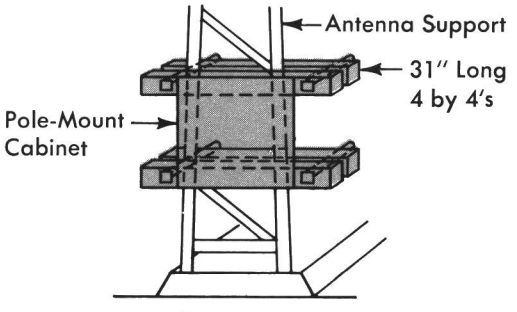
Side View

ATTACHING POLE MOUNT STATION TO ANTENNA SUPPORT (TOWER)

1. Mount 31" 4" by 4" supports on Antenna support as shown. Bolt securely and band tightly together to prevent slippage and vibration.
2. Attach Pole Mount cabinet to outside pole supports.



Top View



Front View

TELEPHONE LINE REQUIREMENTS

Remote Control Stations require the use of telephone lines between the station and the Remote Control Unit. Information for selecting the type of telephone lines to be leased is usually provided in the instruction manual for the Remote Control Unit.

There are three types of telephone lines in common use for remotely controlling a base station:

Method	Description	Advantages or Disadvantages
1	*One metallic pair:* for both audio and control voltages with control voltage simplexed from line to line.	Economical; dependable where earth currents may be large; keying clicks will be heard in paralleled Remote Control Units.
2	*One metallic pair:* for both audio and control voltages with control voltage simplexed from line to ground.	Economical; earth ground currents (encountered near power company sub-stations) may interfere with control functions; keying clicks minimized.
3	*Two telephone pairs:* one for audio voltage and one for control voltage (metallic pair).	Provides best performance; keying clicks will not be heard; least susceptible to earth ground currents which may interfere with control functions.

In choosing one of these methods, consider *both* cost and performance. One of the methods will usually have a decidedly lower rate. Local telephone companies will sometimes offer no choice of these methods, but will provide an audio pair and a control pair (Method 3). Instructions for connecting the Pole Mount Station using any one of the three methods are provided on the following page.

BLOWER OPERATION

A blower is mounted under the transmitter to air-cool the transmitter. The blower will operate continuously as long as the power switch is ON. If it is desired to have the blower operate only while the transmitter is keyed, remove the jumper lead between terminals 1 and 2 on TB12, located on Transmitter-Receiver Shared Power Supply Chassis, Model 4EP38A10.

An Optional Heater Kit is available for climates that may require the use of a heater in the station.

INSTALLING YOUR POLE MOUNT STATION

Make the cable connections to the Pole Mount Station as described on Page 7 or Page 8.

REMOTE CONTROL CONNECTIONS

1. Connect ANT. jack to transmission line using 4-foot RG-8/U cable provided.

2. Make power connections:
   117VAC { hot wire to TB706-2.
   neutral wire to TB706-1.
   ground wire to chassis mounting rack.

3. Clamp ground wire to chassis mounting rack.

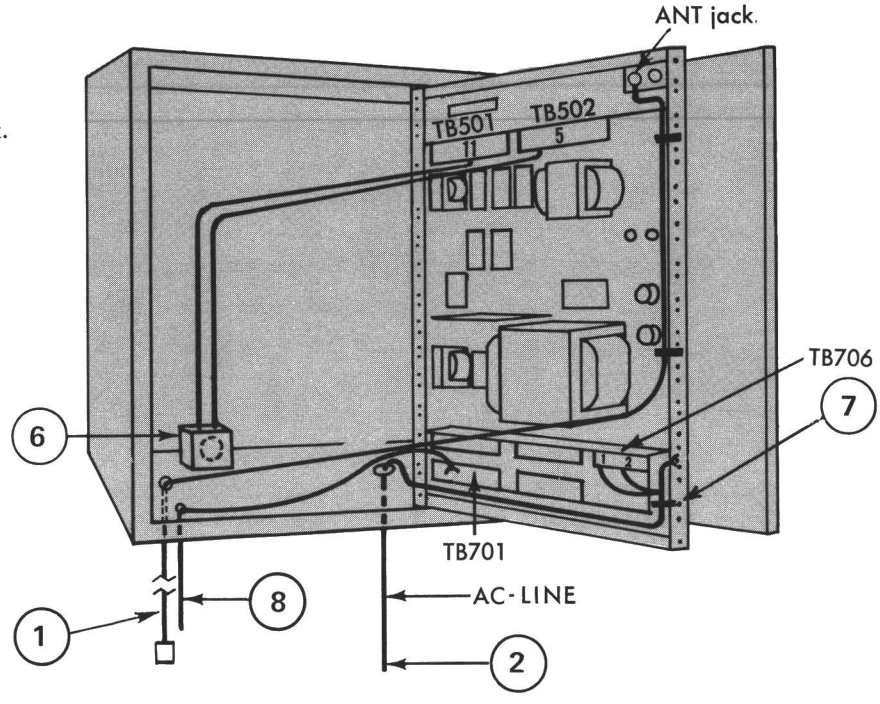
4. Connect mike cable to J902.

5. Screw mike holder bracket to rack.

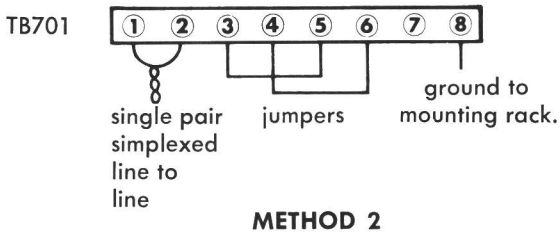
6. Connect speaker or a 3.5 ohm, 10-watt resistor from TB501-11 to TB502-5.

7. Tighten all cable clamps. (supplied by installer)

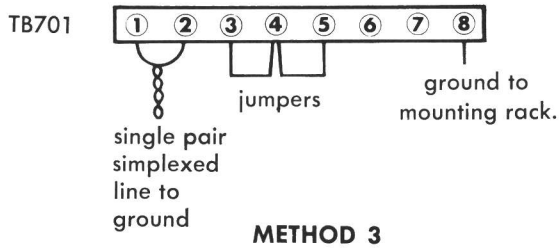
8. Connect telephone lines using AWG #16 double-jacketed polyurethane wire. (supplied by installer)



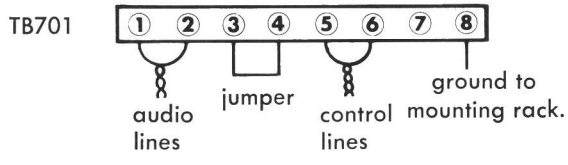
METHOD 1

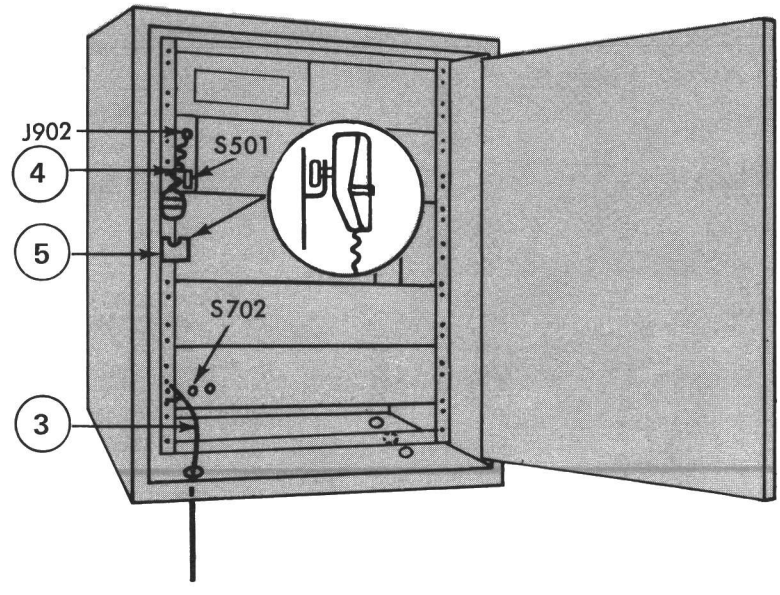


METHOD 2



METHOD 3

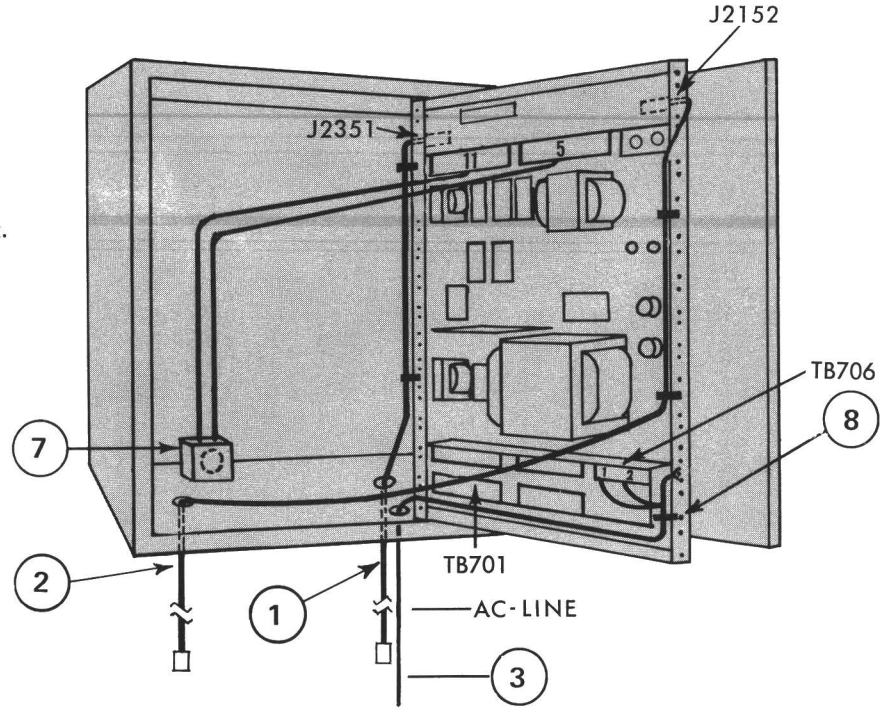




RECHECK ALL CONNECTIONS BEFORE TURNING POWER ON.

REPEATER CONTROL CONNECTIONS

1. Connect receive antenna to J2351 using 4-foot RG-8/U cable provided.
2. Connect transmit antenna to J2152 using 4-foot RG-8/U cable provided.
3. Make power connections:
   117VAC { hot wire to TB706-2.
   neutral wire to TB706-1.
   ground wire to chassis mounting rack.
4. Clamp ground wire to chassis mounting rack.
5. Connect mike cable to J902.
6. Screw mike holder bracket to rack.
7. Connect speaker or a 3.5 ohm, 10-watt resistor from TB501-11 to TB502-5.
8. Tighten all cable clamps. (supplied by installer)



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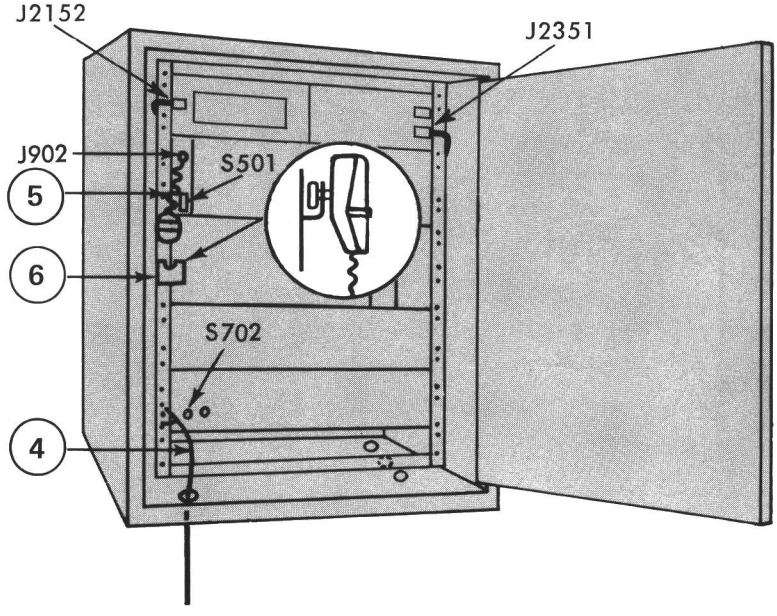

FINAL CHECKS BEFORE PLACING YOUR "PM" STATION IN OPERATION

After completing the installation of your Pole Mount Station, the following final operations should be performed:

• Final adjustments should be made to the receiver, transmitter and power supply—Transmitter adjustments must be made by a 1st or 2nd Class Radiotelephone or Radiotelegraph licensed electronic technician. Instructions for making these adjustments are included in the Pole Mount Maintenance Manual. The adjustments include:

Transmitter—
- final tuning and loading
- deviation and frequency checks
- plate power input

> Transmitter measurements should be entered in the permanent station records along with the signature and license number of the technician.

Receiver—
- matching to antenna and netting frequency to transmitter

Power Supply—
- VOLUME and SQUELCH controls
- Turn Switch S501 ON

Control Panels—
- 4KC7C1—Remote—adjust transmitter input level control. Turne Switch S702 ON.
- 4KC16A10—Repeater—adjust audio input level control. Turn Switch S701 ON.

- Be sure the station license is displayed as required by FCC rules.
- A transmitter identification card (FCC Form 452-C or G-E Form ECP-82A) must be attached to the transmitter.
- Give the alignment tools to the maintenance technician.
- Give the Operator's Manual to the station operator.

Progress Is Our Most Important Product

GENERAL ELECTRIC

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