A MOBILE TRANSMITTER/CONVERTER FOR 3.9 MC.

When the average radio amateur considers building a mobile rig, he is faced with several questions that must be answered, such as:
1. How much power?
2. How many bands?
3. VFO or crystal controlled?
4. Space requirements?
5. Type of converter for receiving?
6. Will it please the XYL?

In my case the first three questions were easy. I knew exactly what I wanted, a low power, 2.8-megacycle crystal-controlled transmitter. Question 4 was a stickler. I had it 1968 "No-roomolls," and by solving the space problem, I answered questions 5 and 6.

The TC-75 is a 2.8 to 4.0-megacycle, 15-watt crystal-controlled transmitter and a crystal-controlled converter in a single package only 7 x 3 x 5 inches in size. The unit was painted to match the color scheme of the car's interior; this, plus the small size, cer-

(continued on page 3)

*WAQY is a design engineer in Standard Mobile Design Engineering at General Electric's Communication Products Department, Lynchburg, Virginia. This department produces the famous "Progress Line" of two-way mobile radio equipment.

Also in this issue——
Scanning the Spectrum see page 2
General Electric Enters Citizens Radio Field page 9
THE HANDY ANDY TOWER page 8
1959 Edison Award Recipient page 12

Copyright, 1960, by General Electric Company
COMING NEXT ISSUE . . .

information on new rectifier tube
types, and details on a two-network type am-
tenna tuner, and a simple accessory which
permits monitoring of transmitter signals on
almost any test oscilloscope. This issue will
be available from your C-E Tube dis-
tributor about May 1 — and if he doesn't
have copies, ask him to order a quantity for
your local radio amateurs.

73 TO FORM 73H . . .

Our well-known Log Form blank QSL card
(flabeled "Receving Tube Department Form
73B") will be discontinued when the present
stock of cards runs out. We have about a
four-month supply left, but when these are
gone, there will be no more.

The minimum quantity is 250 cards, which
sell for $1.00 postpaid. Order larger quan-
tities in multiples of 250 cards (and dollars,
too). Make checks and money orders payable
to "General Electric Company," and
address your letter to me in Greenboro, Ky.

CIRCUIT CHANGE . . .

The plate current metering circuit for the
GL-113 KROAKET GROUNDED-GROD LINEAR
AMPLIFIER (see G-E HAM NEWS, November-
December, 1939, Fig. 1, page 1) should be
changed as shown here. Color codes are
available in a bulletins, which also has
pertinent data on construction and component
information.

WANTED: HAM COLUMNISTS . . .

Does your club want continuous publicity
about the activities of radio amateurs in your
community? Try establishing a regular column
on amateur radio in your local newspa-
pers.

"For the disclosure of any information or prospects
contains data which may not appear in General
Electric Company's documents, in the opinion of an expert
in the field, contains information which is not generally
available, or contains data (incomplete in any way)
which may be of use to the end user of such information by
others."

A pioneer such column is "HAM AN-
TENNA," which appears in every Sunday
edition (circulation: over 500,000) of the
Chicago Daily News. It is compiled by
Harry A. Tumminia, W3BAI, and includes
happenings in the Chicago amateur radio
clubs in the metropolitan area, get-acquainted
information on amateur radio for the public,
and newsy items about the local scene.
Harry, incidentally, is a C-E Tube dis-
tributor, and makes several hundred copies of
HAM NEWS available to radio amateurs in his area.

If your club publishes a club paper, many of the items therein could be rewritten
into a newspaper column. Try it and let the
public know about the good works we hams
are doing in their interest.

EDISON AWARD SPECIAL CITATIONS

In addition to the principal 1959 Edison
Radio Amateur Award to W3BAE (see page
13), Special Citations were awarded to the
following radio amateurs, recognizing their
outstanding public service, in 1959:

W3BAE — William Bennett, Washing-
ton, D.C.

W3CFL — Raymond E. Meyers, San
Gabriel, Calif.


W6BQO — Mrs. Irene H. Craft, Allentown,

Chillago.

CHICAGO AMATEUR RADIO DISASTER CORPS — a group headed by W3GAE,
Richard D. Cortwright, and Leslie E.
Tanner, WH3G, of Chicago, Ill.

Congratulations to these amateurs, and my
thanks to all persons who participated in the
Eight Annual Edison Award program.

433 MILLION TUBES . . .

... yet, that's the number of receiving
tubes manufactured in the United States by
the electronics industry in the United States
during 1959, according to a recent forecast
by L. B. Davis, General Manager of G-E's
Electronics Division.

We've been "quantumizing" how many of
these tubes go into radio equipment — and its replacements in existing
units — and a figure is over a million.

Here's a report that also reports power tube sales up to 10 percent during the past few months, and nearly 3 percent television production, and nearly 3 percent television production, and nearly 3 million television tubes.

1959, according to a recent forecast
by L. B. Davis, General Manager of G-E's
Electronics Division.

Tunnel diodes, which were first announced by General Electric in 1959, will continue to be widely discussed and experimented with during 1960, some amateurs will be limited in small quantities pending development of circuits.

G-F tunnel diodes are made by our Semi-
ceramic Products Department in Syra-
cline, N.Y.

Lighthouse Larry
TABLE 1—PARTS LIST, TC-75

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1, C2, C3</td>
<td>65-340 µfd 600 volt electrolytic (Elma 300)</td>
</tr>
<tr>
<td>C12, C13</td>
<td>275-970 µfd electrolytic (Elma 300)</td>
</tr>
<tr>
<td>R1, R12, R13</td>
<td>50 turns, 90 ohm (400-500)</td>
</tr>
<tr>
<td>R2, R3</td>
<td>5 turns, 90 ohm (400-500)</td>
</tr>
<tr>
<td>R4, R5</td>
<td>6 volt, 250 ma pilot coils (2644) and bracket.</td>
</tr>
<tr>
<td>R14</td>
<td>13 volt pilot coil (2835)</td>
</tr>
<tr>
<td>J1–J2</td>
<td>4- pole jack for microphone.</td>
</tr>
<tr>
<td>J3, J4</td>
<td>1-1/2″ Mogami type jack.</td>
</tr>
<tr>
<td>G2, G3</td>
<td>4 pole, 1 position miniature relay, 6 volt DC coil (Potter &amp; Brumfield 4680R-15).</td>
</tr>
<tr>
<td>G4</td>
<td>1-3/8-64 microphone call, slug tuned (North Hills M1-1200).</td>
</tr>
<tr>
<td>G5</td>
<td>Call, slug tuned, 20 turns, No. 20 enamelled wire,对自己的 wound (form is CIT P666).</td>
</tr>
<tr>
<td>G6</td>
<td>15 turns wound over ground end of L1, No. 30 enamelled wire.</td>
</tr>
<tr>
<td>L1</td>
<td>10 turns wound over ground end of L1, No. 20 enamelled wire.</td>
</tr>
<tr>
<td>M1</td>
<td>400 000 microhm, 1 inch diameter ferrite core (Intermagnetics 104).</td>
</tr>
<tr>
<td>X6</td>
<td>4 pole male jack plug and chassis plate (Amphenol 84982 with 12-001-02 plate).</td>
</tr>
<tr>
<td>R22</td>
<td>22 ohm, 1 watt (1-68 and 1-56 ohm, 1/2 watt resistor in parallel).</td>
</tr>
<tr>
<td>R23</td>
<td>2 ohm, 1 watt (2-6-ohm and 1-6-ohm 1/2 watt resistor in parallel).</td>
</tr>
<tr>
<td>S1, S2</td>
<td>2 pole, 2 position mini rotary switch.</td>
</tr>
<tr>
<td>S3</td>
<td>2 pole, 2 position toggle switch.</td>
</tr>
<tr>
<td>T1</td>
<td>Triode, 3 winding transformer. See footnote 1 on page 5 (distributed A-18X also suitable for T1, Tridac A-1X suitable for T3).</td>
</tr>
<tr>
<td>L10</td>
<td>Modulation transformer; primary, 10.000 ohm, center-tapped secondary, 3.000 ohm, 10 watt rating (Triad A-IX or equivalent).</td>
</tr>
<tr>
<td>X1</td>
<td>3300-3500 kc crystal (FT 243 case) for desired transmitter frequency.</td>
</tr>
<tr>
<td>X2</td>
<td>4500-5300 kc crystal (FT 243 case) for converter.</td>
</tr>
</tbody>
</table>

FIG. 1: SCHEMATIC DIAGRAM OF THE TC-75 TRANSMITTER. Both transmitter and modulator are at the left, and the crystal-controlled converter is at the right. Capacitors are in microfarads, unless otherwise noted; all varistor resistors are marked "3M." Resistors are in ohms (1 ohm 1000). 1 watt rating is 1 watt, or 2 watts.
TOP VIEW OF THE TC-72, showing the location of major components in the cabinet. The parts placement allows sufficient room for tubes to be removed from their sockets.

REAR VIEW of the center chassis. Note the r.f. shield between the 6306 tube and the 12AT7 oscillator tube. The cathode leads at the top of the picture run to the ports and controls on the front panel. Power connections to T1 on the cabinet are indicated in this view. The antenna feed runs directly from relay contacts K₁ to L₁ on the rear panel.

FRONT VIEW of the center chassis, showing the wiring and placement of small parts around the tube sockets. The nine terminals on T₁ and T₂ can be seen through the ½ x 1/8-inch square cutouts in the chassis for these components.

FIG. 2. DRILLING DIAGRAM for the center chassis. All holes sizes identified on the diagram by letter are given in TABLE II. Overall size of the aluminum sheet should be 7/8 x 3½ inches, to allow for the ½-inch wide fillet, plus bevels.
THE TC-75

(continued from page 3)

through a matching transformer (T<sub>4</sub>). Micro-
phone voltage is obtained from the 12-volt DC supply.

The oscillator has two of the "bifilar"

"type that require only 10 volts on the plates and

and screen. A 12AF6 pentode in the RF

amplifier, and a 12AD6 pentode in the RF

amplifier. The crystal is in a Pierce type circuit with

the 12AD6 screen grid as the plate of the oscil-

lator. A filler capacitor, C<sub>6</sub>, in series with

the antenna coil, L<sub>1</sub>, provides the 3.5-mega-

cycle whip to be used as a broadcast re-

ceiver antenna.

TRANSFORMERS

T<sub>1</sub> and T<sub>4</sub> are of a surplus variety and

advertising by several firms as good for phasing type single sideband exci-

tors; phone patchers, microphone transformers, interface transformers and other uses.

They have three windings, each center tapped, one

having high impedance, one medium imped-

ance and one low impedance winding.

The relay, R<sub>2</sub>, has a 6-volt coil, connected

in series with a No. 44, 6-volt pilot lamp. L<sub>1</sub>

If a 10-volt relay is available, a pilot lamp

rated at 12 volts (No. 63), should be wired

in parallel with the relay coil.

THE CABINET

For this model this has been fab-

ricated, but any of the commercially available

7 x 6 x 3-inch aluminum boxes (LMB No. 145

interlock type; or No. 81-145 snaplock type)
can be used to house the TC-75 instead.

The 12AD7 twin triode (D-6668) Communication type an-

ode, 1271 D-6555 Triode tube is designed primarily for

class A audio voltage amplifier circuits. However, it is

completely satisfactory when used as a cathode triode and
can be used as a triode. The D-6668 takes a 12-volt screen

voltage. The 12AD7 when operated as a triode, 8 volts

more screen voltage is a must. The 12AD7 is not

The 12AD7 may have output power from the class B ratings in the

DCL, because of its high may be operated as a

The 12AD7 may be used as a 200-volt driver, or 300-volt Class B

value with output --03 volts and bias. Over 300 volts with output

The 12AD7 screen transformer (12 volt type, as shown in the schematic diagram, Fig.

The 12AD7 wire. The high-impedance winding (terminals 7 and 8) for the microphone

and the high-impedance winding (terminals 1 and 2) for the microphone transformer

and its center tap (terminal 2) drives the 12AD7 grid.

TABLE II—DRILLING DIAGRAM FOR THE FRONT AND REAR SIDES OF THE CABINET BOTTOM. Hole sizes are given in TABLE II, and are for the components actually used in constructing this model.

<table>
<thead>
<tr>
<th>LETTER</th>
<th>DIAMETER</th>
<th>TOOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.150</td>
<td>No. 33 drill</td>
</tr>
<tr>
<td>B</td>
<td>0.125</td>
<td>drill</td>
</tr>
<tr>
<td>C</td>
<td>0.100</td>
<td>drill</td>
</tr>
<tr>
<td>D</td>
<td>0.095</td>
<td>drill</td>
</tr>
<tr>
<td>E</td>
<td>0.080</td>
<td>punch</td>
</tr>
<tr>
<td>F</td>
<td>0.065</td>
<td>Punch</td>
</tr>
<tr>
<td>G</td>
<td>0.050</td>
<td>Punch</td>
</tr>
<tr>
<td>H</td>
<td>0.038</td>
<td>Punch</td>
</tr>
</tbody>
</table>

FIG. 2. ASSEMBLY DRAWING OF THE CABINET TOP AND BOTTOM, SHOWING THE LOCATION OF THE CENTER CHASSIS IN THE CABINET. THE CABINET AND CHASSIS ARE FASTENED TOGETHER WITH SELF-TAPPING SCREWS.

The type of box is excellent for this application; it is not, in fact, the smallest box of this type. It is not the smallest box for this purpose.

The 12AD7, because of its high may be operated as a

The 12AD7 may be used as a 200-volt driver, or 300-volt Class B

value with output --03 volts and bias. Over 300 volts with output

The 12AD7 screen transformer (12 volt type, as shown in the schematic diagram, Fig.

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(continued on page 5)

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<td>No. 33 drill</td>
</tr>
<tr>
<td>B</td>
<td>0.125</td>
<td>drill</td>
</tr>
<tr>
<td>C</td>
<td>0.100</td>
<td>drill</td>
</tr>
<tr>
<td>D</td>
<td>0.095</td>
<td>drill</td>
</tr>
<tr>
<td>E</td>
<td>0.080</td>
<td>punch</td>
</tr>
<tr>
<td>F</td>
<td>0.065</td>
<td>Punch</td>
</tr>
<tr>
<td>G</td>
<td>0.050</td>
<td>Punch</td>
</tr>
<tr>
<td>H</td>
<td>0.038</td>
<td>Punch</td>
</tr>
</tbody>
</table>
A pioneer of three decades as a manufacturer of its own mobile radio production, General Electric Company has broadened its communications line by adding E. F. John- son’s Viking Messenger to G-E’s products sold nationally through several hundred manu- facturer’s representatives.

Announcing the action, Kent J. Worthen, VHF, national sales manager for Gen- eral Electric two-way radio equipment, ex- plained that G-E’s own current factory pro- grams at Lynchburg, Va., are aimed at providing communication devices to meet the expanding needs of governmental agencies, military services, municipalities and busi- nesses requiring maximum equipment per- formance in the commercial VHF and UHF communication bands.

"In providing a complete communications line," Worthen points out, "we feel the need to include 27 megacycle equipment to serve the growing Citizens Radio market. The Class D Citizens Band radios, of course, pro- vide for amplitude-modulated equipment, which General Electric has not produced for several years. For this reason, we elected to distribute Johnson’s Viking Messenger rather than divert production to AM devices at this time."

General Electric two-way radio sales offices in all parts of the United States, including Alaska and Hawaii, will sell the Messenger equipment and the units will be installed and serviced by General Electric’s extensive network of authorized independent service sta- tions.

H. N. McNeil, national product service manager, Mobile Communications, Electro-Motive Products Department, Lynchburg, said the Messenger will be tested in performance tests by General Electric. The Johnson firm is one of the country’s recognized leaders in the manufacture of ham radio transmitters and has a Citizens Band development pro- gram in 1956 which culminated in the in- troduction of the present Messenger.

"Our experience with the Messenger to date," McNeil says, "is that its ability is outstanding. Because there have been no previous mobile or broadcast applications for the equipment, in most instances our in- dependent service stations will be able to provide maintenance at a routine minimal charge, since in most cases this will be known to them immediately what the costs will be."

In type FCC rules, Class D Citizens Band chan- nels are available in the 27 megacycle range. Equipment may be obtained G-E personal or business use by any U.S. citizen 18 years of age or older, subject to FCC licensing.

Regulations for Citizens Band differ from Ham bands in that we permit transmitting must be attempting to call a specific person and not trying to stimulate conversation with anyone who happens to be on the air. Each message must meet a specific communica- tions need. However, personal talk between auto and home, between home and boat, or similar points is allowable. It is in this area of communications that much of the equip- ment manufactured to date has been used.

The Messenger is compact, lightweight and exceptionally easy to install anywhere. The complete transceiver measures just 5 1/2 inches high, 7 inches wide, 11 1/2 inches deep.

Space is included in the unit for five of the 29 available Citizens Band channels. By simply moving the selector switch on the front panel to the desired position, any one of the five may be selected for operation.

The equipment as designed is not operative in ham bands. However, the E. F. Johnson Company says the Messenger can be adapted to a 10-watt 28-megacycle transmitter with some changing. It involves some coil retron- ning, changing two resistors and adding one wire. (Further information on this subject can be obtained by writing directly to Cus- tomer Service Dept., E. F. Johnson Company, Waukesha, Wis.)

Normallly, crystals for one Citizens Band channel are supplied with the standard Mes- seenger package at $125.75, which includes the unit, furnished with microphone and cord and necessary power cords.

However, as a special introductory offer for readers of G-E HAM NEWS, the Gen- eral Electric Communication Products De- partment will offer the following standard package (Model 2452-128, 12 volts DC/115 volts AC; or Model 2452-127, 7 1/2 volts DC/115 volts AC at $137.85 with four extra crys- tals and a high efficiency short-collapsible chrome-plated antenna that mounts on the back of the Messenger. Three other crystals and antenna will be included at no extra cost on cash orders sent directly by ham to the General Electric Communication Products Department, Box 4197, Lynchburg, Va., with postmarks as late as March 31, 1966.

Checks should be made payable to General Electric Company. Model 2452-128 (12 volts DC/115 volts AC) should be specified. Full quantities should be included with orders (No C.O.D.’s, please).

The Messenger comes equipped with Crys- tal 2550-918 (Channel 18), as standard. On orders received in Lynchburg before May 31, antenna 2373-856 will be included plus crys- tals for Channels 1, 5 and 7.

—Lighthouse Carey
At Lynchburg, Va., national headquarters for the General Electric Communication Products Department, Product Service Engineer Harry Close checks battery drain of high-performance Transistorized Progress Line manufactured by G-E and now being shipped in quantity. Receiver and power supply are fully transistorized. Four tubes are used in transmitter. On standby, ready to receive a call with full volume, the unit drains only 0.040 amps from the battery — the lowest drain achieved in communications industry to date. The same sites and service outlets which handle the Progress Line nationally will also handle Messenger Citizens Band equipment.

Approximately 900 authorized independent General Electric mobile communications service stations in all parts of the nation are participating in General Electric's new Citizens Band service program. The years of experience gained by this group in servicing G-E's transcribed Progress Line, used in low-band, high-band and 450-megacycle frequencies, will be carried over to the Viking Messenger, being distributed by G-E for the 27- megacycle Citizens Band.

For homes who act fast, there's a special introductory offer on this Viking Messenger Closet Citizens Band unit. Orders received by G-E Communication Products Department, Lynchburg, Va., prior to May 31, 1960, G-E will include crystals for four extra channels plus a collapsible antenna at the standard price of $9.75, which normally includes a crystal for only one channel, plus wire and necessary power cord. (See start of left.)
NEED A LOW-COST, easy-to-build, serviceable antenna support? Read how W4QDL has designed a simple 32-foot high tripod mast which will solve many amateurs' skywire problems.

VERBALITY IS THE NICKNAME for the HANDY ANDY TOWER, since it can be used to support the end or center of dipole and long-wire antennas, keep a vertical antenna aimed skyward, or support a beam and rotator weighing up to about 25 pounds. Several masts, identical to that in the picture on this page, have been put up at stations in W2land. All have withstood severe weather conditions with no failures.

This tower can be assembled and installed by one person in almost any location over a weekend, including time for the paint to dry.

The overall assembly of the tower is shown in Fig. 1. Note the similarity to the famous "A-frame" mast, with a third base leg added. In addition, W4QDL has devised simple but effective underground base anchors which are essential if the tower will not be gusted. The overall load of the tower is equally divided among the three legs. Materials and hardware required for construction are listed in TABLE 1.

THE TOWER CAN BE CONSTRUCTED with simple hand tools: a ¾-inch diameter wood bit and brace; dave hammer, screwdriver, pliers, hand saw and tape measure. For best results, good straight lengths of wood for the legs and top section (parts 1, 2, 3 and 4), free of knots, cracks and other imperfections, should be selected. Of course, the brace and short pieces usually can be cut from between imperfections in the 1 x 2-inch x 16-foot pieces.

A fairly flat working space about 36 feet long and 30 feet wide is desirable for assembling the tower. Start with the assembly of the front support legs (parts 1 and 2) and the upper mast section (part 4). Lay two of the twenty feet 2 x 2's and the 16-foot 2 x 2 on the working surface so that they overlap as shown in Fig. 2.

Clamp the pieces together and drill one ¾-inch diameter holes through all three pieces. Run a ¾ x 6-inch carriage bolt through the hole, put on a washer and tighten up the other carriage bolts, washers and nuts. Draw up tightly on all three nuts to firmly seat the washers in the wood. Next, assemble the third 20-foot log 2 x 2 (part 3) on top of the 20-foot 2 x 2 as shown in Fig. 3, and tighten all carriage bolts nuts tightly.

The bottom ends of the three base legs can now be spread apart with temporary wedges of wood about 2½ feet long, so that the points where the permanent bolts (parts 5) will be assembled are 4 feet apart. Notice that legs Nos. 1 and 2 must have a tendency

FIG. 1 ASSEMBLY DRAWING for the tower. Dimensions of all wood parts are given in TABLE 1.

*W4QDL is an engineer with the Terminal Equipment Engineering group at General Electric's Communications Products Department, Lynchburg, Virginia.
to twist, due to the tri-directional tension on all three legs when spread out.

Cut the base spreaders to fit, trimming the ends of the two spreaders running to the No. 3 leg to the proper angle, as shown in the over-all view, Fig. 1. (Remember the old story about the man who built his boat in the basement — ed.) Nail small blocks of wood on the base legs to support each spreader before nailing them in place. Add triangular spacers (part 6) made from ¼ inch thick firring plywood at the junctions of the spreaders and base legs.

The cross braces can be assembled next, using either the notched wood joint shown in Fig. 4A, for braces nailed to the outside of the legs; or, a block of wood at the point where the spreaders cross, shown in Fig. 4B, where one cross spacer is nailed to the inside of the legs.

Next, add the rear braces (part 10) to the third base leg, as shown in Fig. 5. An extra set of cross braces (part 8) can be added to the mast about 10 feet up from the ground for added rigidity, if desired. After the base spreaders and cross braces are assembled, balance the mast horizontally across a saw horse or other support. Jiggle one end of the mast up and down and the amount of sway in a strong wind can thus be determined. Additional cross braces can be assembled; however, the bracing shown is sufficient to allow only a little flexibility in strong winds. Three stay-brace wires should be added to the mast, running from near the top, over the spreaders (part 9) and down to about 9 feet from the bottom end. If the tower will support one end of a wire antenna, install a pulley at the top on the side away from the No. 3 leg. It will be most convenient to insert

![FIG. 3. EXPLODED VIEW of the middle joint between the legs and top section (parts 1, 2, 3, and 4). Bolt to holes are spaced 17 inches apart.](image)

**TABLE 1 — BILL OF MATERIALS**

<table>
<thead>
<tr>
<th>Material</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood: 1 — 2 x 2-inch x 30 feet, fir or white pine (Parts 1, 2, 3)</td>
<td>1 — 2 x 2-inch x 16 feet, fir or white pine (Part 4)</td>
</tr>
<tr>
<td>2 — 1 x 2-inch x 16 feet, fir or white pine (Parts 5, 7, 8, 9, 10)</td>
<td>1 — 2 x 4-inch x 14 feet, fir (for base anchors)</td>
</tr>
<tr>
<td>1 — 6 x 48 x ¼ inch thick marine plywood (Part 6)</td>
<td></td>
</tr>
</tbody>
</table>

**HARDWARE:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 — ¼ x 6-inch long carriage bolts</td>
<td>2 — ½ x 4-inch long carriage bolts</td>
</tr>
<tr>
<td>6 — 3/8-inch washers</td>
<td>6 — 3/8-inch nuts to fit carriage bolts</td>
</tr>
<tr>
<td>18 — 3/8 x 1½ inch head bolts with nuts and washers</td>
<td>2 — strap hinges 1½ inches wide</td>
</tr>
<tr>
<td>1 — medium size hemp, ½ inch wide</td>
<td>1 — eye nails</td>
</tr>
<tr>
<td>2 — No. 6 gauge 3/4-inch wire</td>
<td>1 — pound each, No. 4 and No. 8, rust coated</td>
</tr>
<tr>
<td>1 — quart white house paint</td>
<td>15 — feet No. 12 stranded galvanized steel guy wire</td>
</tr>
<tr>
<td>50 — feet plastic covered nylon core clothesline</td>
<td></td>
</tr>
</tbody>
</table>

![FIG. 4. CROSS BRACE DETAILS, showing A — top, notched brace; and B — bottom, simple brace with block between pieces.](image)
small turnbuckles in these wires and adjust them to hold the top section straight after the mast is vertical.

**THE COMPLETED MAST** should be given about two coats of silicone house paint in your favorite color. While the paint is drying, the ground stakes, cut from the 2 x 4 lumber, should be prepared. If the ground is quite hard, pointed stakes (style B in Fig. 4) can be driven in and should provide adequate anchorage.

For soft ground, or where you want to be sure that the mast will remain anchored even in high winds, make the anchors with cross plates at the bottom (Style A in Fig. 4). For the latter, dig a hole for the anchor and fill it up with rocks and dirt, packing it down tightly. The two front legs can be hinged either with shed door hinges, or with bolts run through holes in the legs, as illustrated. Locate the positions of the anchors for the two front legs by laying the mast on the ground, front side down, with the base at the desired location. Fasten the hinges to the anchor posts with the 3/4 x 2-inch long bolts. To keep the wood from splitting, place strips of 3/8-inch thick metal on the tower legs.

After the legs are fastened, raise the mast up to a vertical position and mark the position of the third anchor. Lower the mast, install the third anchor, raise the mast again and fasten the hanger to the anchor and tower leg with 3/4 x 2-inch bolts.

Standing off from the mast about 30 or 40 feet, check the mast for vertical alignment in all three directions, and, if necessary, drive one of the stakes a bit further into the ground until the mast is vertical. Of course, if ground anchors with the cross pieces are being used, they should be leveled with each other before filling up the holes.

Before the mast is stood up for the last time, be sure to feed the plastic underground antenna braid through the pulley; it's much easier than trying to do it after mast is up. If the mast is to support a rotator of the TV antenna type, fasten it to the top section and mount the beam on it after the base is set in place. Beams with a boom length up to 12 feet can be safely supported. Beams with boom lengths up to 30 degrees or more have been found good insulators of wind, and with the wire antenna, as it is installed, tiny wires may not be necessary for wire antennas less than 150 feet long.
THE TC-75  
(continued from page 5)  
The center chassis (bolted to the cabinet by two bolts) holds most of the wiring and parts. Parts should be mounted so they (tubes, transformers and coils) project toward the rear and the adjusting screws face the front panel. In line with the adjusting holes in the panel. When mounting the chassis, be sure and leave enough room between the center chassis and the rear so the tubes can be removed and inserted. Tuning holes in the front panel are normally covered by tuning plugs except the final tuning plug adjustment. For this, a 1/4" shaft is drilled and tapped for the slug's 6-32 thread and a 1/4" nut is used for a lock nut. This 1/4" shaft projects through a hole in the front panel and becomes the only control normally used. C4, however, is easily accessible on the bottom of the cabinet, just under S4.

Wiring is short and direct, making use of tie points where necessary. Filter F4 is mounted on the center chassis, also by tie points. A small header holds the relay (R5) over the antenna loading capacitor (C5).

The converter turn-up is started by tuning the broadcast receiver to the portion of the 3.6-4.0-megacycle band that is used the most. The RP and mixer plugs are adjusted for maximum signal from a nearby station on about 3.3 megacycles. One of the neat things about a crystal-controlled converter is that the push buttons on the car radio can be set to the best frequencies you use. No tuning is necessary; just push the button.

The padder capacitor C5 is peaked on the broadcast band to some weak station about 1500 kilocycles.

THE TRANSMITTER - oscillator is tuned by adjusting the slug in L4 maximum grid current in the final stage, then backing the slug out (lowering inductance) to about 80 percent of the peak value. This should be about 1 milliamperes or more. Switch the meter to the plate current position and adjust the slug in L4 for minimum plate current. Adjust the loading control (C4) for 50 milliamperes plate current, at 300 plate volts. Make sure to re-adjust L4 for resonance after loading the final with C5.

A GOOD ANTENNA is the key to good results with this or even a more powerful converter on the 3.5-megacycle band. Every amateur has his own opinion about the best type of mobile antenna—base-loaded whip, center-loaded whip, helical type whip, etc.  but this little rig has been operated successfully for several months with a base-loaded whip antenna. Normal transmitter working range seems to be about 15 miles on ground wave and up to 350 miles on sky wave propagation (assuming no interference at the receiving end, of course). A larger cabinet would be desirable for the TC-75 if the components to be used are larger in size than those chosen for this model. An 8 x 6 x 4-inch boxing box (LMD No. 146) is available; or the 8 x 6 x 3/4-inch and 10 x 6 x 3 1/2-inch Minchey type enclosures should be a suitable housing.

Some constructors may even prefer to construct the TC-75 in three connecting units with the power, audio, metering and control circuitry in the middle; the transmitter r.f. unit on one end, and the converter on the other end. This construction technique is particularly adaptable to having separate transmitters r.f. units and converters for 3.5 and 7.5-megacycle operation.

Whatever your choice constructionwise, you'll find the TC-75 ideal for starting in amateur radio mobile work.
Walter Ermer, Sr., W8AEU

RECIPIENT — 1959

EDISON RADIO AMATEUR AWARD

chosen by the judges to receive the Eighth Annual Edison Radio Amateur Award, in recognition of his outstanding organizational and administrative ability in providing Cleveland, Ohio, with a 350-man voluntary Amateur Radio Emergency Corps.

During 1939, this Corps provided vital radio communications on 23 occasions — including emergencies such as flood, storm and tornado warning alerts, and searches for lost children. Radio communications for fund drives, and spectator and traffic control at boat and sports car races and parades also were furnished by this group.

The Corps has 504 licensed radio amateur operators, 197 radio-equipped automobiles, 77 walkie-talkies, and 26 emergency power generators. The modules at left are being assigned storm emergency patrols by Ermer.

The success of this emergency communications corps is directly attributed to Mr. Ermer's organizational ability, plus demonstrating outstanding initiative, diplomacy, tact, imagination and leadership. He has devoted long hours to consulting and planning with officials of the municipal governments, services, safety, civil defense and amateur radio groups in the Cleveland area.

Mr. Ermer received the award trophy and $500 check at a ceremony in Washington, D.C., on February 25, 1960.