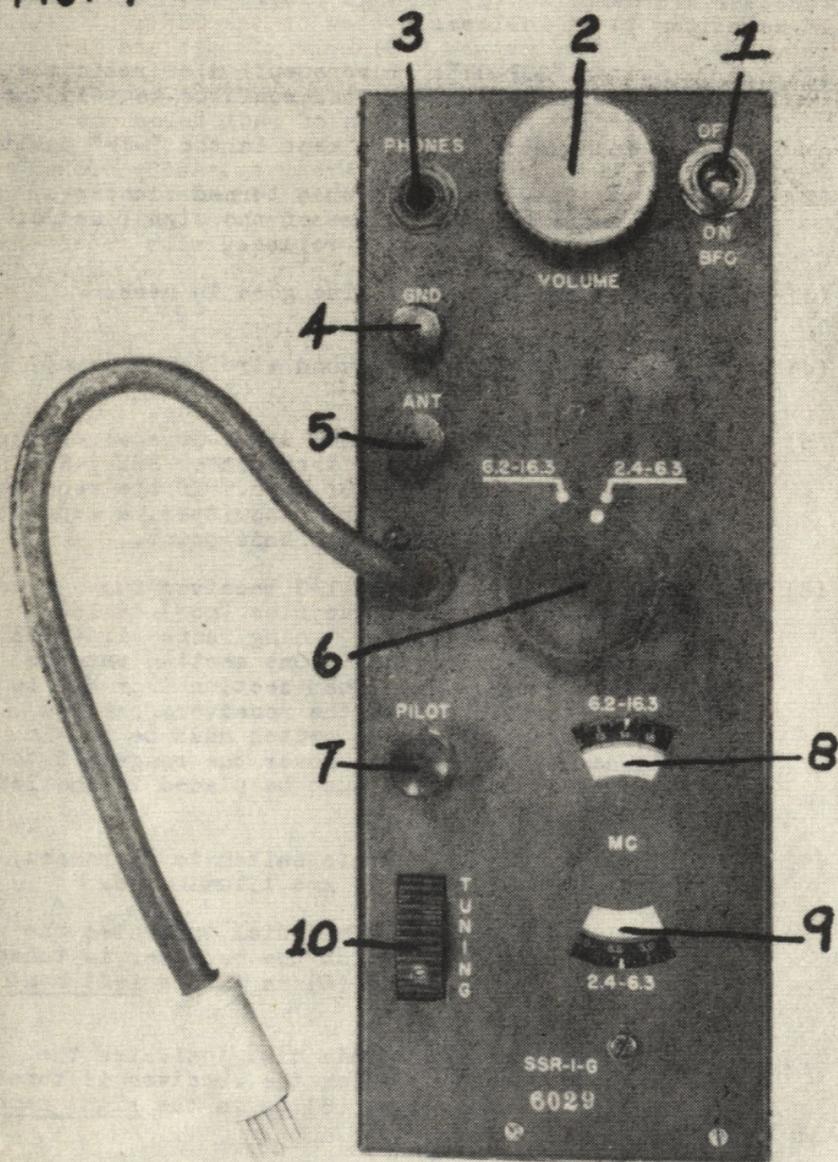


DESCRIPTION
AND
OPERATING
INSTRUCTIONS
SSTR-1

RECEIVER SSR-1-G

- A. A general view of the SSR-1-G receiver is shown in Fig. 1. Items of major interest on the front panel of this receiver are numbered (1) through (10). The significance of each item is as follows:
- (1) B.F.O. Switch "OFF-ON": For reception of radiotelegraph (CW) signals, this switch would be kept in the "ON" position. For reception of radiotelephone signals, the switch would be kept in the "OFF" position.
 - (2) Volume Control: This knob, when turned counter-clockwise decreases the volume of the signal heard; clockwise rotation increases volume.
 - (3) Phone Jack: The headphone plug goes in here.
(See Fig. 8)
 - (4) Ground Binding Post: The ground wire (when used) connects here.
 - (5) Antenna Binding Post: When the SSR-1-G receiver is used in conjunction with the transmitter SST-1-E, this antenna connection is not used. If the receiver is used alone or with another transmitter, a separate receiving antenna is brought to this point.
 - (6) Band Change Switch: The SSR-1-G receiver tunes over a frequency range of 2.4 megacycles (mcs) to 16.3 megacycles (mcs). The total tuning range (2.4-16.3 mcs) is divided into two sections. One section extends from 2.4 to 6.3 mcs. The other section from 6.2 to 16.3 mcs. In order to tune the receiver from 2.4 to 6.3 mcs., the band change switch must be put in the right hand position. To cover the range 6.2 to 16.3 mcs., the band switch must be placed in the left hand position.
 - (7) Pilot Light Switch: When this switch is depressed, the tuning dials (8) and (9) are illuminated.
 - (8) Tuning Dial 6.2-16.3 mcs: This dial indicates the approximate frequency to which the receiver is tuned when the band change switch (6) is in the left hand position.
 - (9) Tuning Dial 2.4-6.3 mcs: This dial indicates the approximate frequency to which the receiver is tuned when the band change switch (6) is in the right hand position.
 - (10) Tuning Knob: This is the control by which the receiver is actually tuned. Operation of this control is

FIG. 1



accompanied by simultaneous rotation of dials (8) and (9).

- B. Fig. 2 shows a top-of-chassis view of the SSR-1-G receiver with case removed. Clearly visible are the five vacuum tubes (electron valves) with the tube type designation printed on the tops. (i.e. 7V7, 7Q7, 7F7).
- C. In Fig. 3, a bottom-of-chassis view of the SSR-1-G is shown. Many of the small parts are very easily broken and for this reason no effort should be made to pry or push at any of these parts. Also shown is the pilot light bulb (1). The bulb may be replaced with receiver in this position.

FIG. 2

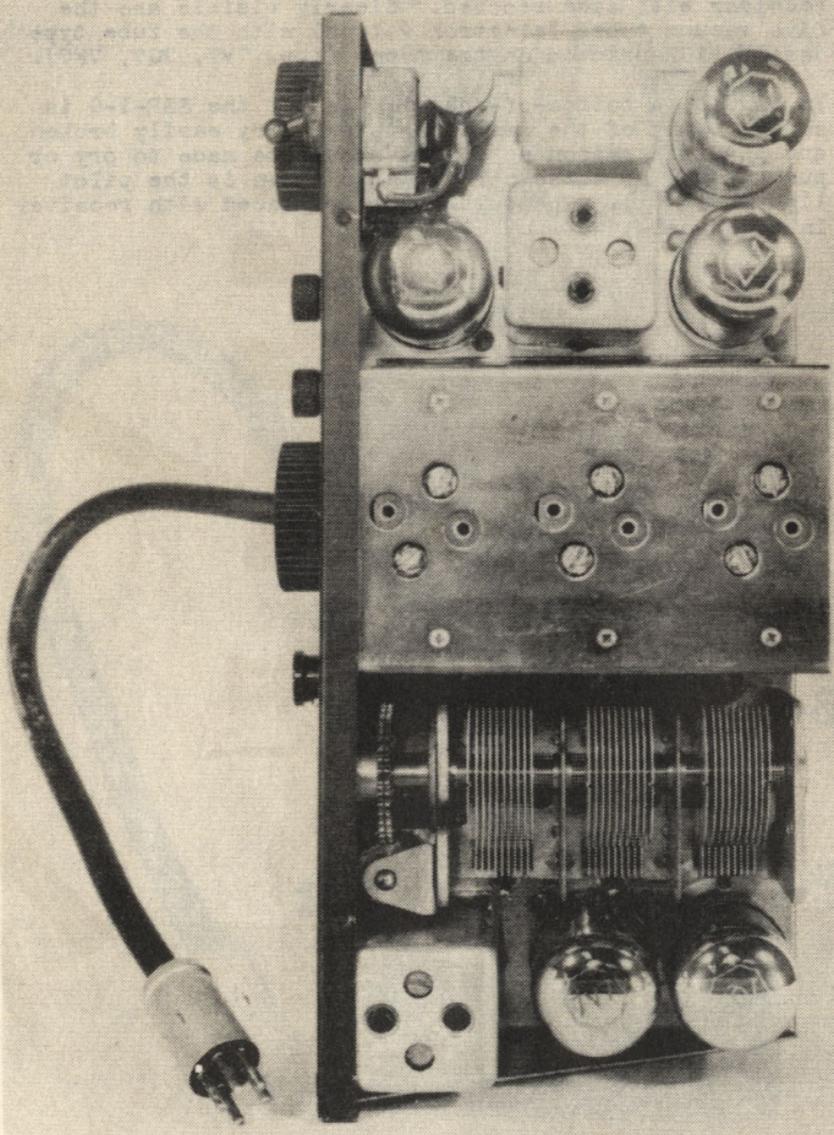
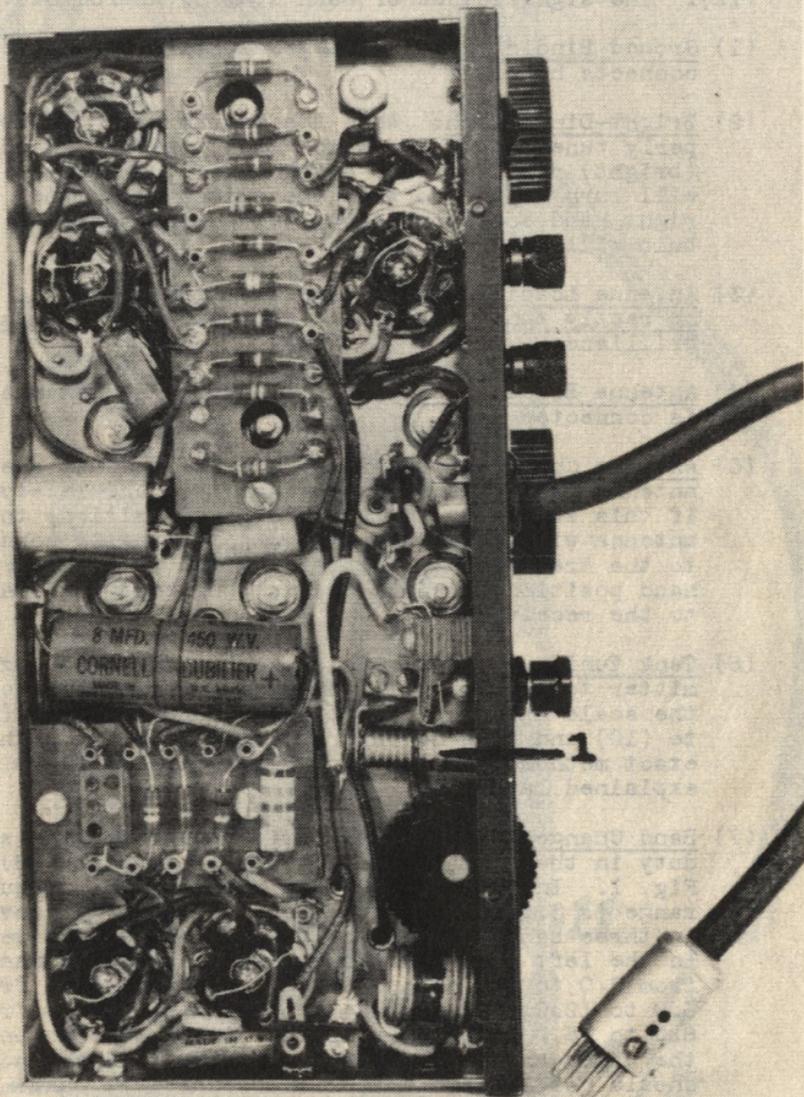


FIG. 3



(8) Crystal Socket: The crystal frequency control unit plug in the holes of this socket. Two pairs of

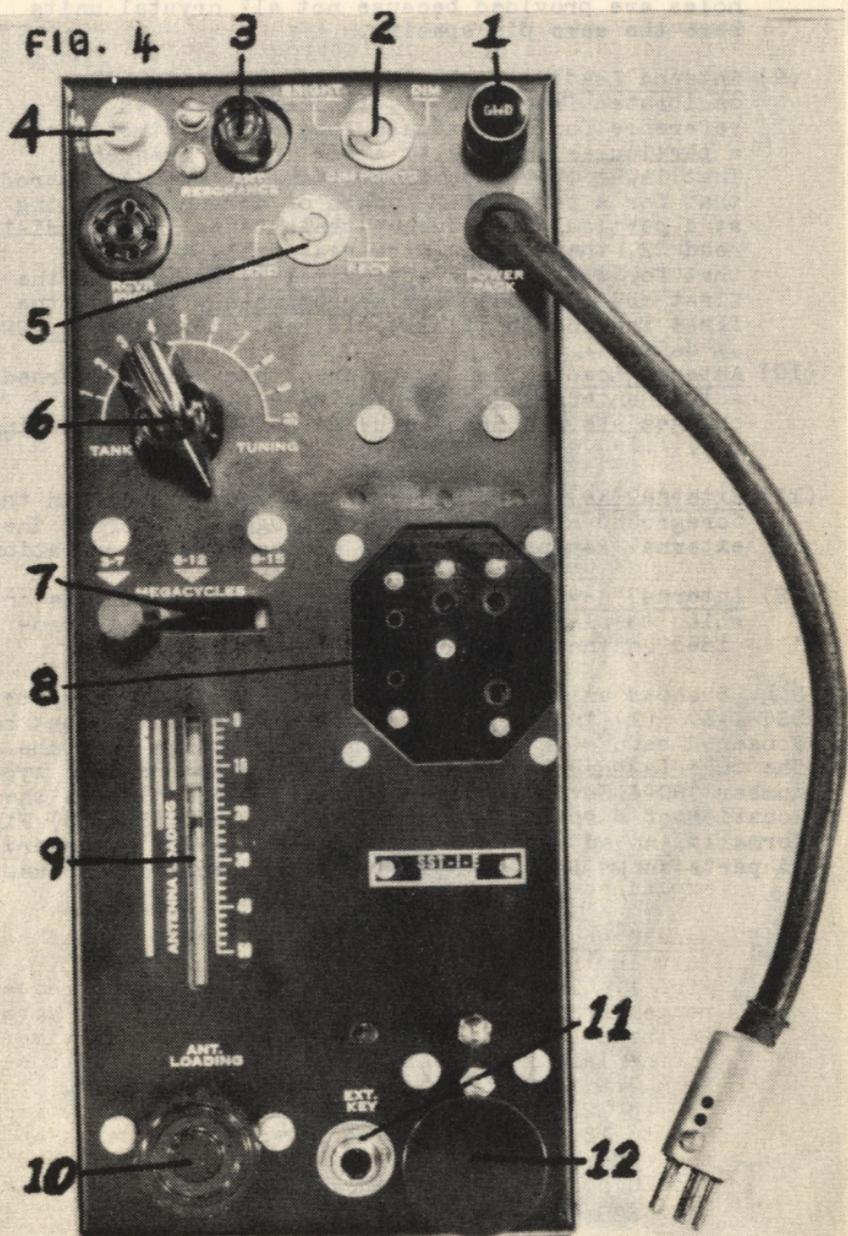
12-15 Watts Output depending on
- 3 -
Output Freq.

TRANSMITTER SST-1-E

A. A general view of the SST-1-E transmitter is shown in Fig. 4. Items of major interest on the front panel of this transmitter are numbered (1) through (12). The significance of each item is as follows:

- (1) Ground Binding Post: The ground wire (when needed) connects here.
- (2) Bright-Dim Switch: When the transmitter is properly tuned and this switch is in the left hand (bright) position, the antenna loading bulb (3) will burn brightly; when the switch is in the right hand position (dim), the antenna loading bulb will glow dimly.
- (3) Antenna Loading Bulb: When the transmitter is correctly tuned, this bulb will glow at maximum brilliance.
- (4) Antenna Binding Post: The transmitting antenna is connected here.
- (5) Antenna Change-over Switch: Normally, only one antenna is used for both transmitter and receiver. If this switch is in the left hand position, the antenna wire attached at (4) is internally connected to the transmitter. If this switch is in the right hand position, the antenna is connected internally to the receiver.
- (6) Tank Tuning Control: This control tunes the transmitter to the crystal frequency. The numbers on the scale have been arbitrarily numbered from (0) to (10) and have no reference to frequency. The exact method of adjusting this control will be explained later.
- (7) Band Change Switch: This switch performs the same duty in the transmitter as does band switch (6) of Fig. 1. In the transmitter, however, the frequency range is 3.0 to 15.0 mcs, and this range is covered in three bands instead of two as in the receiver. In the left hand position, the transmitter tunes from 3.0 to 7.0 mcs; in the center position, from 6.0 to 12.0 mcs; in the right hand position, from 8.0 to 15.0 mcs. Overlapping of frequencies on the upper and lower extremes of the middle band should not lead to confusion because the bands are arranged this way for convenient tuning.
- (8) Crystal Socket: The crystal frequency control units plug in the holes of this socket. Two pairs of

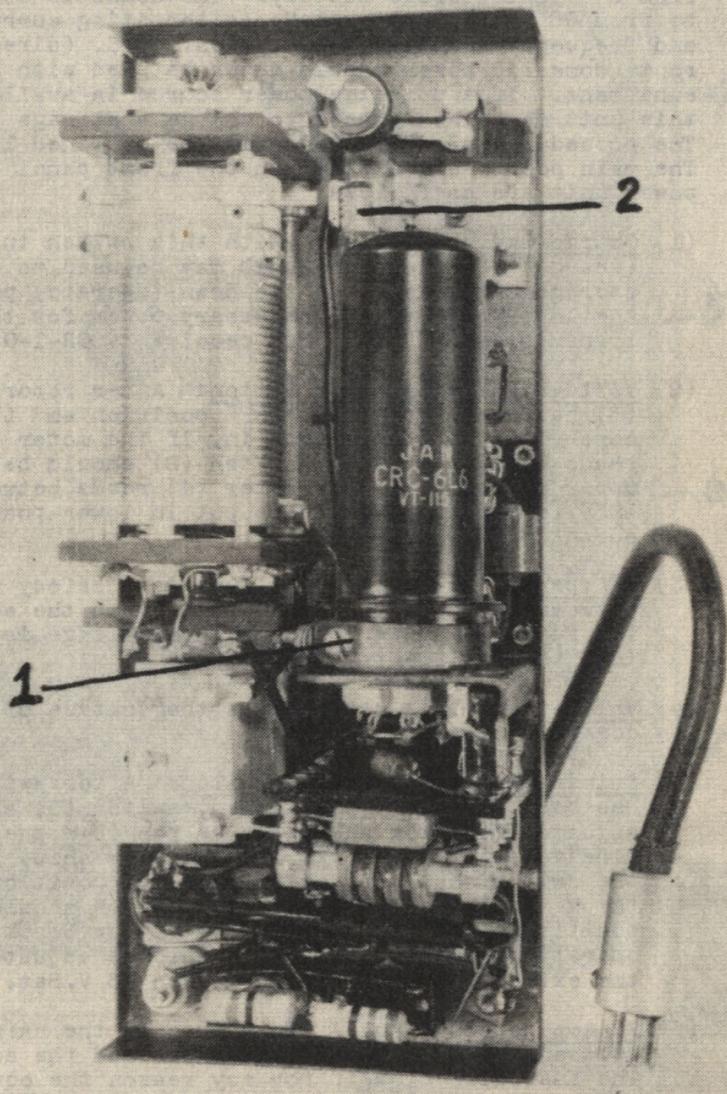
FIG. 4



holes are provided because not all crystal units have the same pin spacing.

- (9) Antenna Loading Dial: This dial, arbitrarily calibrated from 0 to 50, is simply used as reference for approximate loading adjustments of a particular antenna at a particular frequency. That is, if, by experimentation, it was discovered that for a particular length of antenna operating at a particular frequency the antenna loading dial read 22, then it would be reasonable to assume that for any antenna approximately as long as the first and any frequency approximately that of the first the loading dial would read approximately 22.
- (10) Antenna Loading Control: When this knob is turned, actual antenna load changes take place. These changes are accompanied by a change in dial reading (9).
- (11) External Key Jack: An external key, visible in the foreground of Fig. 8, may be plugged in here. The external key provides ease and comfort of operation.
- (12) Internal Key: In the absence of a flat surface on which to place the external key, this key is provided so that the set may still be operated.
- B. Fig. 5 shows an under-the-panel view of the transmitter SST-1-E. (1) indicates the locking screw which must be loosened before an attempt is made to change the tube. The tube is the black metal cylinder with the tube type number CRC-6L6 visible on its side. (2) indicates the location of a spare loading indicator bulb (See (3) Fig. 4) Normally, no adjustments or replacements are necessary on parts shown in Fig. 5 except those mentioned above.

FIG. 5



POWER SUPPLY SSP-1-D

- A. A general view of the power supply is shown in Fig. 6. This power supply allows the over-all equipment to be operated either from a domestic lighting source or from a 6 volt storage battery. The domestic source may be from 90 to 230 volts, A.C. (alternating current), and frequency from 40 to 60 cycles. D.C. (direct current) domestic power should never be used with this equipment. If a domestic power source is available, this unit may also be used to charge a storage battery. The procedure for doing this will be outlined later. The main points of interest on the front panel of this power unit are as follows:
- (1) Charge-Operate Switch: With this switch in the upper (charge) position, the unit may be used to charge storage batteries. In the down (operate) position, the unit provides the necessary power for the transmitter (SST-1-E) and receiver (SSR-1-G).
 - (2) Voltage Range Selector Switch: After rotary switch (5) has been placed in "OFF" position and the line cord (7) has been plugged in, if the meter (4) reads between 150-230V switch (2) should be put in upper position; if the meter (4) reads between 90-125V, switch (2) should be put in lower position as shown in Fig. 6.
 - (3) 2 Ampere (2A) Fuse: This fuse is a safety link between the domestic power source and the equipment. The fuse will blow if too high a voltage is switched into the equipment.
 - (4) Voltmeter: This meter reads the voltage of the domestic power source.
 - (5) Primary Voltage Selector Switch: After switch (2) has been correctly positioned, switch (5) should be adjusted to match as nearly as possible the domestic line voltage. That is, if the meter shows 115 volts, the switch should be on the 200/110 position. If the meter reads 220 volts, the switch should be positioned on the 230/125 point. For 6 volt battery operation, this switch (5) should be adjusted to the extreme upper position marked "6 V.Bat."
 - (6) 20 Ampere (20A) Fuse: This fuse is the safety link between the 6 volt battery source and the equipment. The fuse will blow if for any reason the equipment draws more current than 20 amperes.

FIG. 6

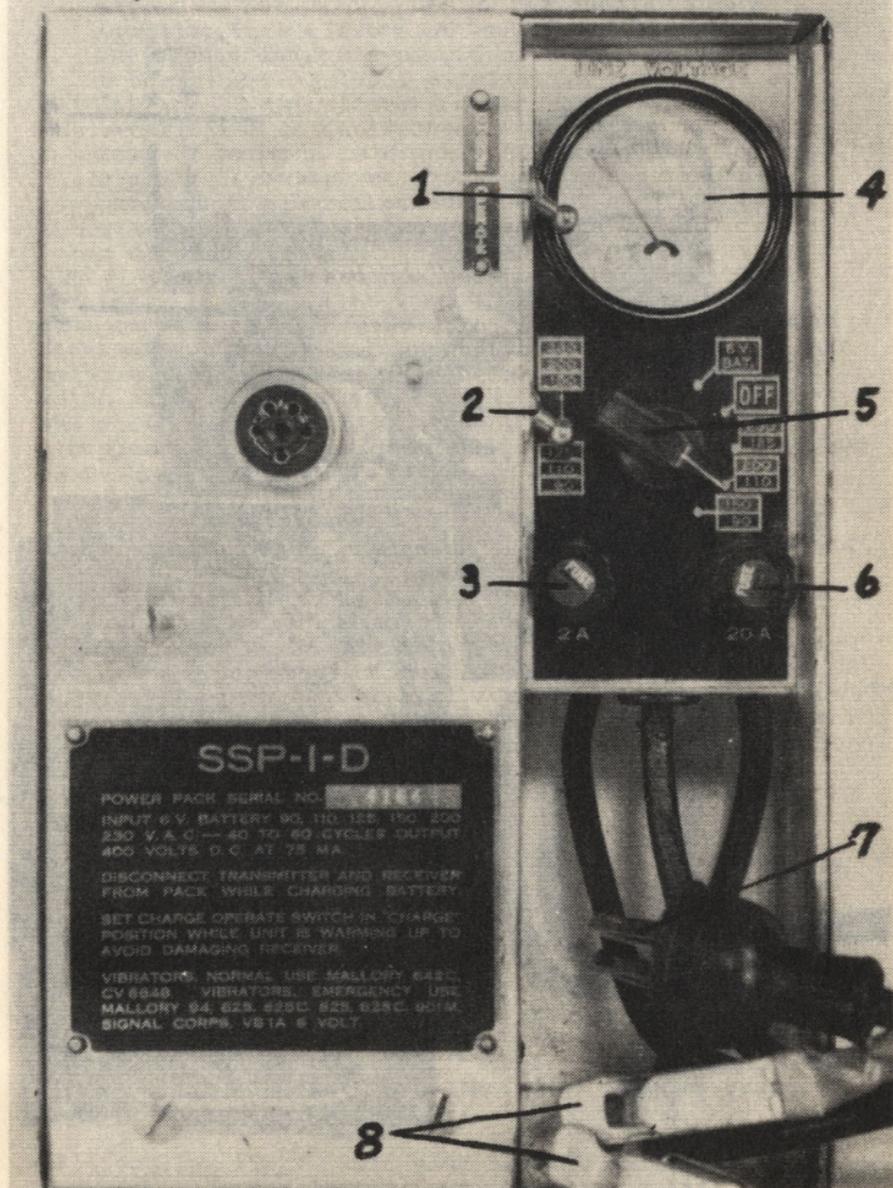
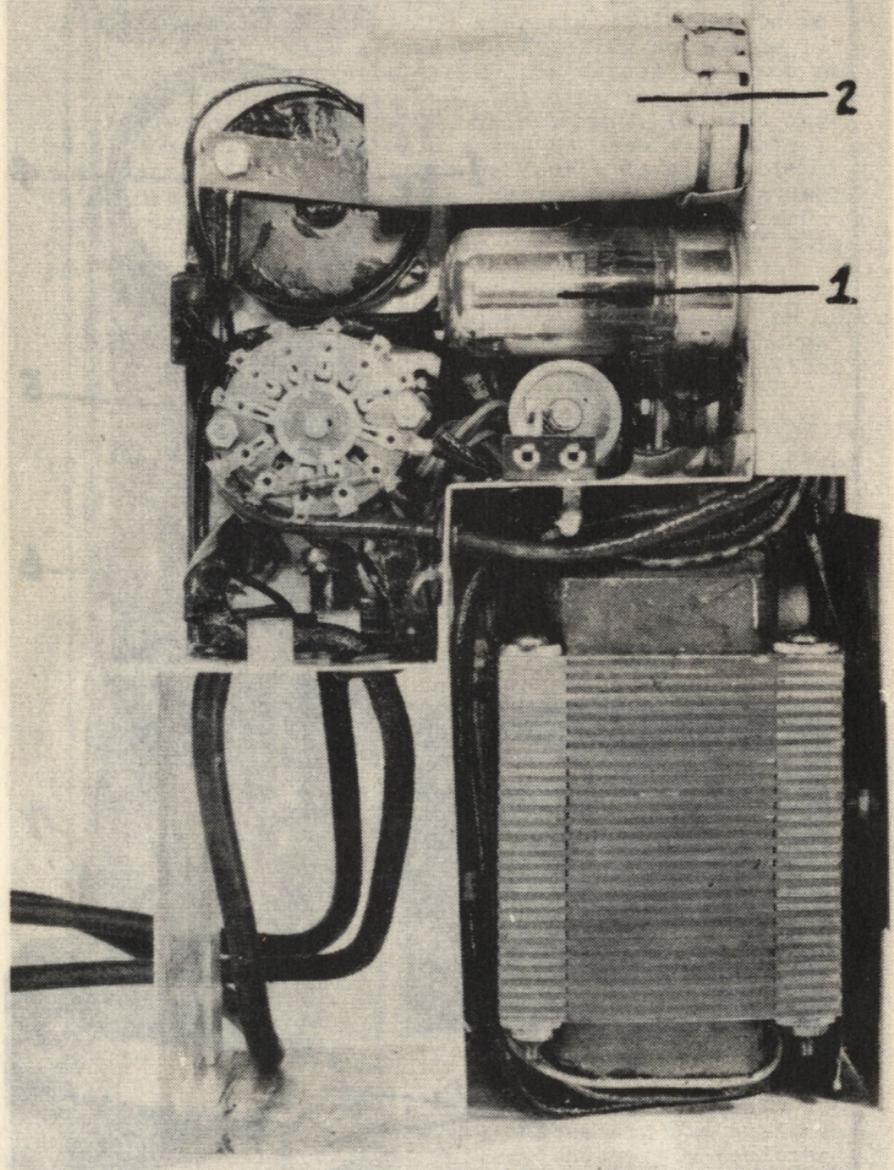


FIG. 7



- (7) A.C. Power Cord Plug: This plug is inserted either directly into the domestic outlet or, if plug and outlet do not match, one of the adapter plugs included in the spare parts box may be used to make the connection.
- (8) Battery Clamps: These clamps are connected to the terminals of a 6V storage battery when the equipment is to be so powered. The clamp with the red binding is connected to the positive terminal of the battery; the clamp with the black binding is connected to the negative terminal.

- B. Fig. 7 shows the power supply SSP-1-D with the case removed. (1) indicates the position of the vacuum tube rectifier (7Z4). This tube may be replaced, when necessary, by another 7Z4 which is included in the same parts box. (2) shows the location of the vibrator unit which plays an important role in the power supply when the equipment is being operated from storage battery. A replacement of this unit is also included in the spare parts box.
- C. Fig. 8 shows the entire equipment set up in operating position. The manner in which the power cables connect the various units together is clearly shown in the print. (1) is the external key which is included with the equipment. (2) is the headphone set likewise included. Care should be taken to see that the units are set up in the order shown, i.e., with the transmitter (SST-1-E) to the left of the power supply (SSP-1-D); the receiver (SSR-1-G) to the left of the transmitter (SST-1-E).
- D. The Spare Parts visible in Fig. 9 are all the things included in the spare parts box.
- (1) Antenna Wire: Two roles of this wire are included, and may be joined end to end if a longer antenna is needed. The wire may also be cut to any desired length and used to connect the equipment to ground.
 - (2) Antenna Insulators: Four insulators are provided. These insulators are used at each end of the antenna and are for the purpose of preventing the energy generated by the transmitter from being dissipated into the ground through the wires used to support the antenna.
 - (3) Coupling Plug: This plug is used to join the equipment with any German type domestic outlet.

FIG. 8

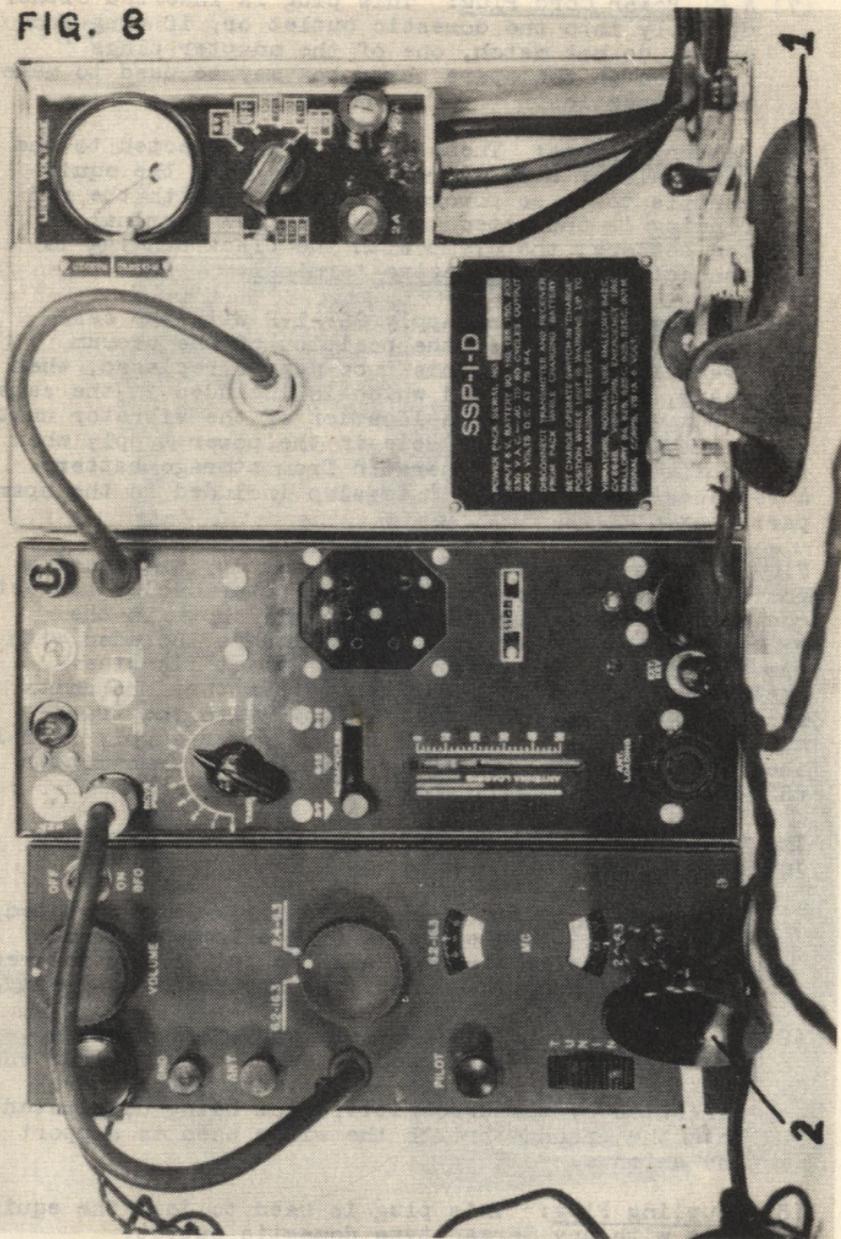
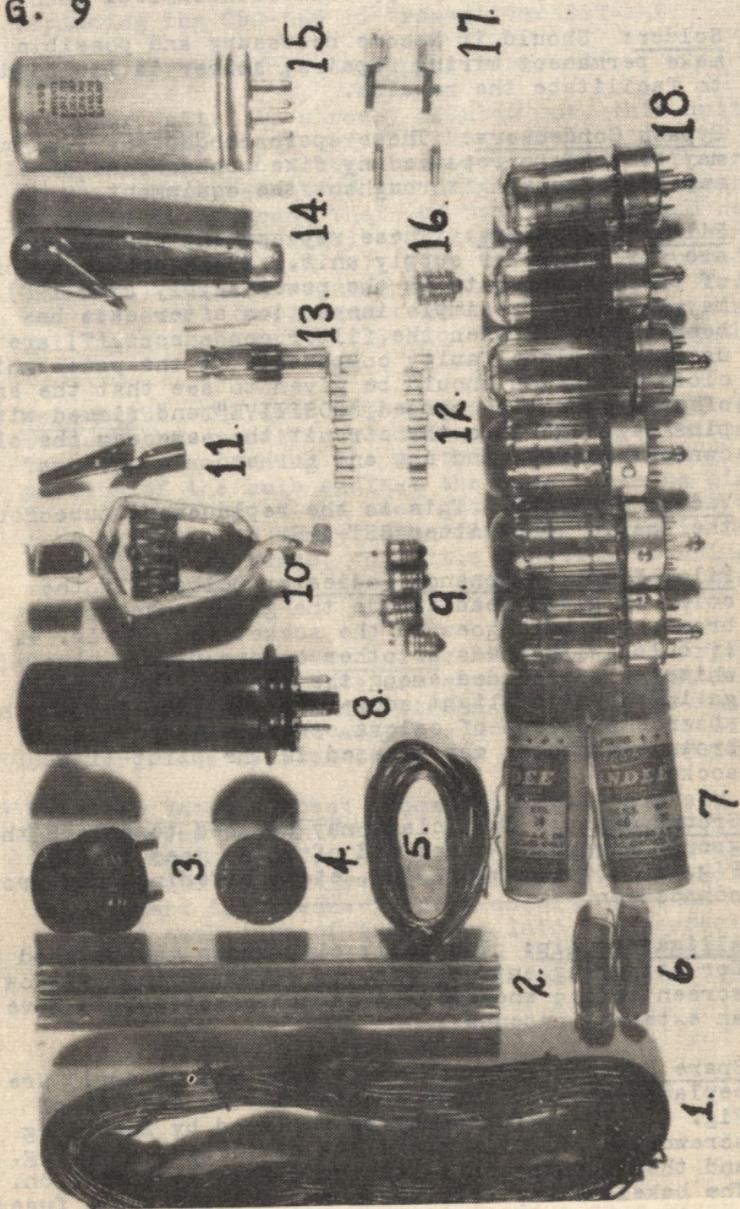


FIG. 9



- (4) Coupling Plug: This plug is used to join the equipment with any French type domestic outlet.
- (5) Solder: Should it become necessary and possible to make permanent wiring repairs, solder is included to facilitate the repairs.
- (6) Bypass Condensers: These spare condensers (.01 mfd.) may be used to replace any fixed condensers of like capacity occurring throughout the equipment.
- (7) Filter Condensers: These replacement condensers are for the power supply unit. The exact location of these components in the power supply (SSP-1-D) may be found by simple inspection after case has been removed. When the filter condensers (7) are used to replace faulty components in the power unit, close attention should be given to see that the end of condensers (7) marked "POSITIVE" and rimmed with plus signs go into the circuit the same way the old condensers did, and not end for end.
- (8) Vacuum Tube 6L6: This is the replacement tube for the one in Transmitter SST-1-E.
- (9) Pilot Light, Resonance Indicator Bulbs: If the color of glass bead inside the glass envelope is brown, the bulb goes in the socket (3) of Fig. 4. If bulbs with beads of other colors (i.e., blue, white) are included among the spares, these bulbs go in the pilot light socket (1) of Fig. 3. In the absence of beads of colors other than brown, the brown bead bulbs may be used in the pilot light socket.
- (10) Ground Clamp: This clamp may be used to attach the ground wire, the other end of which goes to (1), Fig. 4, to any water pipe, etc., offering good ground connection.
- (11) Alligator Clip: The small clip shown may be used for attaching antenna wire to a bed spring, window screen, etc., whenever it is not practical to have an external antenna.
- (12) Spare Fuses: These fuses (2 amp. and 20 amp.) are replacements for those located at (3) and (6) of Fig. 6. These fuses may be replaced by inserting screwdriver (13) in the slots at (3) and (6), Fig. 6, and then turning in a counter-clockwise direction. The bakelite cap will screw out and the blown fuses can then be detached and new ones inserted.

- (13) Screw Driver: This tool is necessary for replacing fuses as indicated above. It also must be used for replacing the CRC-6L6 in transmitter SST-1-E.
- (14) Knife: For cutting, stripping wire, etc.
- (15) Vibrator Unit: As already pointed out, this unit plays an important part in the operation of the equipment when a storage battery is used as power source. Replacement of the unit is only necessary after it is apparent that (a) heavy background noise is present in the receiver after battery has been connected and switch (5), Fig. 6, has been turned on or (b) when no regular humming sound comes from the vibrator. Replacement is accomplished by simply pulling out old unit (2), Fig. 7, and plugging the new one in.
- (16) Neon Bulb: The neon bulb affords a visual indication of the operating condition of the transmitter. That is, when tuning the unit, by holding the glass portion of the bulb against the metal antenna binding post (4) of Fig. 4 the neon gas within the bulb will glow brightly or dimly depending upon how well the transmitter is tuned. A little practice in using the bulb in this manner will prove it to be a most useful tool.
- (17) Crystal Socket Adapter Units: Occasionally crystal frequency control units are encountered which have greater or less spacing between contact pins than usual. These socket adapters are provided to make such crystals applicable to the transmitter (SST-1-E)
- (18) Receiver Vacuum Tubes: Shown in Fig. 9 are six glass topped vacuum tubes. There are three 7V7's, one 7Q7 and one 7F7. All five of these tubes are replacements for the receiver (SSR-1-G). When replacement is necessary, care should be taken to see that each type of tube goes into its correct socket (i.e. a 7V7 will not work in a 7F7 socket). Also shown is one 7Z4 vacuum tube rectifier. This tube goes in the power unit (1) of Fig. 7.

OPERATING INSTRUCTIONS

As far as it is possible, the operating instructions for this communications equipment will be given in step by step form beginning with unpacking suggestions and carrying through until the station is completely set up.

A. Preliminary Steps

- (1) This equipment has all been checked a number of times from an operation point of view. This, however, does not insure the equipment against breakage while it is enroute to the field. For this reason it would be wise, before connecting the individual units together, to physically check each unit for loose or damaged parts. This can best be done by first removing the cases from the units and then checking each tube to see that it is in its socket tightly. Obviously, broken parts should be replaced wherever possible. Unless the case itself has been smashed, it will be very seldom that any more than loose or broken tubes are found inside.
- (2) Connect the units together as shown in Fig. 8. The headphones and external key are stored in the spare parts box.
- (3) For test purposes, attach a length of wire (20 to 30 meters) to antenna binding post (4) Fig. 4. Place switch (5) Fig. 4 in righthand (receive) position.

B. Power Supply Adjustments

- (1) Place switch (1) Fig. 6 in down (operate) position.
- (2) If the equipment is to be powered from a domestic power source (other than D.C.), choose the correct type of coupling plug from those in the spare part box (See (3) and (4) Fig. 9). The correct one should then be attached to line plug (7) Fig. 6.
- (3) Before the coupling mentioned above is plugged into a wall outlet, switch (5) Fig. 6 should be placed in "OFF" position.
- (4) Plug in the power cord and read the line voltage on the meter (4) Fig. 6. If the meter reads between 90 and 125 volts, place switch (2) Fig. 6 in down position. If the meter reads between 150 and 230 volts, place switch (2) up if the indicated voltage is nearer 150v and down if the indicated voltage is nearer to 125v.
- (5) The next step is to slowly move switch (5) Fig. 6 down

until the pointer indicates most closely the voltage read on the meter (4) Fig. 6. This procedure should be followed and no regard given to the fact that each switch stopping point has associated with it two voltages which are widely separated. Regard it as incidental that some voltage other than the one looked for appears on the same switch position.

After these adjustments have been made, the power supply should be performing correctly.

C. If the equipment is to be powered from a 6-volt storage battery, the correct procedure is as follows:

- (1) Place switch (5) Fig. 6 in "OFF" position.
- (2) Connect one lead (8) Fig. 6 which has the red binding above the clamp to the positive (plus sign usually stamped on terminal) battery terminal. Connect the other lead (which has a black binding above the clamp to the negative (minus sign usually stamped on terminal) battery terminal.
- (3) For battery operation, switch (1) Fig. 6 is kept in down (Operate) position. Switch (2) is out of the circuit when battery power is used. It can, therefore, be either up or down.
- (4) The above steps having been completed, switch (5) Fig. 6 can be placed in the upper "6V.Bat." position after which the power unit should function normally.

D. Receiver Adjustments

- (1) The preceding steps having been taken, the receiver is now ready for operation. Push down pilot light switch (7) Fig. 1 and see if dials (8) and (9) Fig. 1 are illuminated. Light will go out when switch (7) is no longer depressed.
- (2) Place earphones over temples - not over the ears.
- (3) If the frequency to be listened to lies between 2.4 and 6.3 megacycles (mcs.), turn switch (6) Fig. 1 to right hand position. If the frequency desired lies between 6.2 and 16.3 mcs., turn switch (6) to left hand position.
- (4) B.F.O. switch (1) Fig. 1 is placed in down ("ON") position for code reception; up ("OFF") for voice reception.
- (5) Volume control (2) Fig. 1 is turned clockwise until desired volume is attained.
- (6) Rotate tuning knob (1) Fig. 1 until approximate desired frequency appears under pointer of dial (8) or (9) Fig. 1.

E. Transmitter Adjustments

- (1) To operate the transmitter, first place switch (5) Fig. 4 in left hand "SEND" position.
- (2) Place switch (2) Fig. 4 in left hand "BRIGHT" position.
- (3) Plug crystal in socket (8) Fig. 4.
- (4) If crystal lies between 3.0 and 7.0 mcs., place switch (7) Fig. 4 in left hand position; between 6.0 and 12.0 mcs., place switch (7) in center position; between 8.0 and 15.0 mcs., place switch (7) in right hand position.
- (5) The scale (9) is the dial for antenna loading control (10) Fig. 4. On the left hand side of this scale colored lines are drawn. The colors of these lines correspond to the colors of the little triangles under the band limit numbers above switch (7) Fig. 4. The longest line to the left of dial (9) indicates that, when switch (7) is in the left hand position (3.0 to 7.0 mcs.), the dial indicator located in the slot at (9) tunes throughout the length of the scale (0-50). When switch (7) is in the center position (6.0 to 12.0 mcs.), the second colored line to the left of the dial (9) indicates a tuning range from about 0 to 22. For the right hand position or switch (7) (8.0-15.0 mcs.), the first short line to the left of dial (9) indicates a tuning range from about 0 to 14.

With these facts in mind, after the crystal has been plugged in and switch (7) properly set, the antenna loading control (10) should be varied until the dial indicator at (9) is approximately in the center of the corresponding range. (i.e. (7) set to 6-12 mcs., dial indicator set at approximately 11).

- (6) Depress external key, or attached key (12). While holding key down, vary control (6) Fig. 4 slowly until indicator bulb (3) glows at maximum brilliance. Then, continuing to hold key down, vary antenna loading control (10) for maximum in same indicator bulb (3). It may be advisable to shift back and forth several times between control (6) and control (10) each time tuning for maximum brilliance in bulb (3). This completed, the transmitter should be properly tuned.

It is worth noting here that, for a given length of antenna, the indicator bulb does not necessarily glow with the same maximum brilliance for all frequencies employed.

F. Battery Charging

The power supply unit (SSP-1-D) may also be used to recharge the 6 volt storage battery. The process is as follows:

- (1) Place switch (5) Fig. 6 in "OFF" position.
- (2) Disconnect power cable which goes from power unit to transmitter.
- (3) Plug in power cord (7) Fig. 6.
- (4) Connect clamps (8) to storage battery plus to plus and minus to minus.
- (5) Read meter (4).
- (6) Set switch (2) up or down depending on reading of meter (4).
- (7) Place switch (5) on "6V.BAT."
- (8) Place switch (1) in up "CHARGE" position. The battery should now be charging.

ANTENNAE

The most appropriate antenna for this equipment is illustrated in the diagram below.

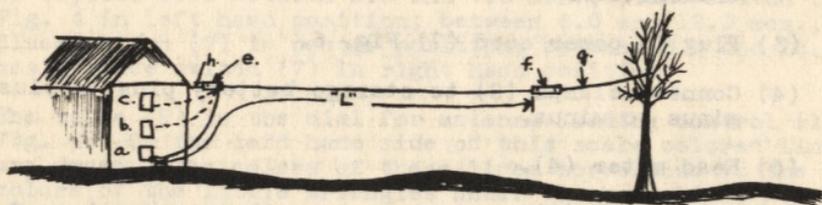


Fig. 1

(1) Fig. 1 shows a typical outdoor antenna. The length "L" should be between 20 and 30 meters in length measuring from the transmitter to the insulator (f). The supporting sections of the antenna (g) and (h) are isolated from the antenna proper by insulators (e) and (f); these sections can therefore be made of wire, rope, cord, etc.

Dotted lines going to windows (b) and (c) indicate that the antenna lead-in could come in to any one of the three windows so long as the overall length does not decrease much below 20 mtrs. nor increase much above 30 mtrs.

Antenna support (g) should be long enough so that tree limbs will not touch any portion of the antenna to the left of insulator (f). Enough slack should be left in the horizontal portion of the antenna to prevent breakage of the wire due to the swaying of the tree in the wind.

The antenna shown in Fig. 1 is to be used whenever permissible. Frequently, however, no such antenna arrangement is possible in which case the wire may be lowered out of a window until the greatest length is attained without actually dragging the lower end on the ground.

(2) Where an outdoor antenna is not practical, an indoor arrangement may be used. In this case, the wire could be run around two adjacent sides of a room, or along the eaves in an attic.

Finally, it is possible to carry on some degree of communications by connecting a short length of wire from the antenna binding Post (4) Fig. 4. to a bed spring, window screen, or other metallic object which is not ground.

GENERAL SUGGESTIONS

(1) Accurate time may be had by listening to broadcast stations, or to "time ticks" occurring on frequencies of 5.0, 10.0, 15.0 mcs.

The time ticks are so arranged that before the hour a tone disappears. The hour is indicated by the precise instant that the tone reappears.

(2) The following tubes may be used as replacement for the CRC-6L6 vacuum tube: 6L6G, 6F6, 6F6G, 6V6, 6V6G.

(3) Lead-acid storage batteries should be kept filled with pure water to a height of about 1 cm. above the tops of the plates.

It is possible to tell approximately when a lead-acid battery is charged by observing the gassing (bubbling) process taking place in the cells while they are being charged. In general, when the bubbling ceases the battery may be left on slow charge for about an hour thereafter.

(4) This equipment is not made to operate from a domestic direct current (D.C.) source. If it is plugged into such a source, a considerable damage may result.

For this reason, one should inquire, and investigate thoroughly by checking light bulbs, electric meter, electric motors, etc. to see whether the power line is A.C. or D.C.