



hallicrafters

littlefone

2-WAY FM RADIO-TELEPHONE
144-174 MC

OPERATING and SERVICE
INSTRUCTIONS



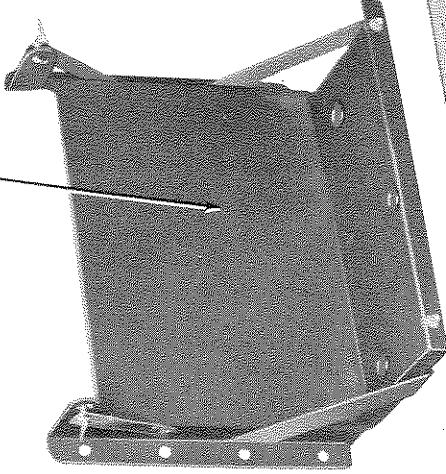
the hallicrafters co.
MANUFACTURERS OF RADIO, TELEVISION AND ELECTRONIC EQUIPMENT, CHICAGO 24, U. S. A.

"LITTLEPHONE" MOBILE UNIT MODEL HT-26

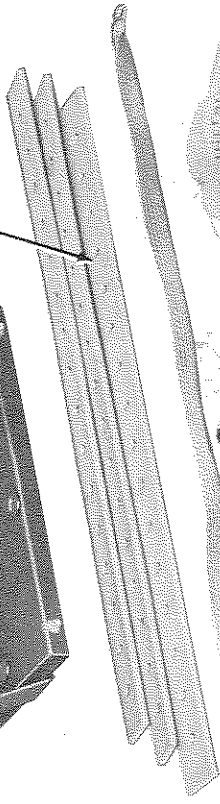
LITTLEPHONE
UNIT



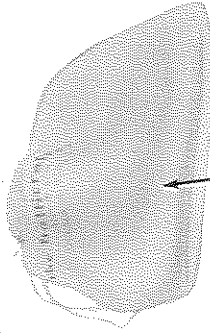
UNIT
MOUNTING
BRACKET



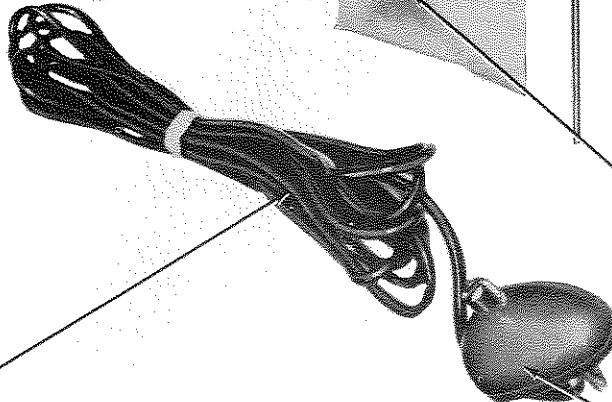
UNIT
MOUNTING
STRAPS



UNIT MTG
HDWE



ANTENNA
CABLE



ANTENNA
BASE

ANTENNA
MTG HDWE

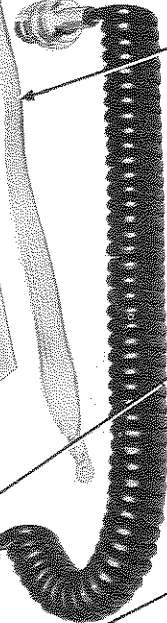
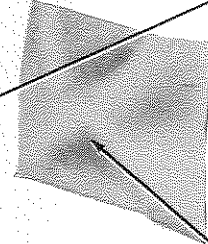
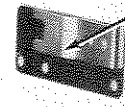
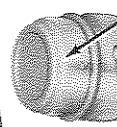
ANTENNA
ROD

ANTENNA
CONNECTOR

MICROPHONE
HOLDER

MICROPHONE

GROUNDING
BRAID



GENERAL DESCRIPTION

The HT-26 "Littlefone" is a completely self-contained 2-way FM radiotelephone for use in mobile vehicles equipped with 6 or 12 volt electrical systems. It operates on a single fixed frequency in the 144 to 174 MC range and has a radio-frequency power output of 1.0 watt. The unit is designed primarily for use with "Littlefone" portable and central station equipment or for communication with other mobile units, but may also be tied in with existing higher powered FM equipment. The unit comes fully equipped with a whip antenna (complete with cable and connector), hand microphone, built-in 4-inch PM speaker, mounting bracket, and necessary mounting hardware. Provisions are also included for connecting a remote speaker.

The FM transmitter and receiver are contained on a common chassis located in the upper section of the case while the audio output circuit and vibrator power supply are contained on a second chassis located in the lower section. All electrical connections between the two chassis are made with plugs and sockets, and each chassis is easily removable for service. A built-in squelch circuit quiets the receiver when no signals are being received. This feature plus the fact that an FM system is being employed assures virtually noise-free reception.

Where a tunable stationary receiving station is desired, use the economical Hallicrafters Model S-81 Receiver which tunes from 152 to 173 megacycles.

IMPORTANT

It is the requirement of the Federal Communications Commission that this radio equipment be licensed. The appropriate license application form (F.C.C. Form 400) can be obtained upon request from the Federal Communications Commission, Washington 25, D.C. or your local F.C.C. field office. All Littlefone equipment is on the Commission's "List of Equipments Acceptable for Licensing". The technical information requested in sections 1(d) and 1(e) of Form 400 should be filled out as follows: Emission - F3; Maximum permissible power input - 3.0 watts. Form 400 should be submitted to the Federal Communications Commission, Washington 25, D. C.

STANDARD EQUIPMENT SUPPLIED WITH UNIT

1. Transmitter, receiver, and power supply in weather-resistant metal case. Complete with tubes, crystals, and vibrator.
2. Mounting bracket for mounting case to dash, floor, or other convenient operating location.
3. Installation mounting straps (3)
4. Installation mounting hardware (packed in cloth bag)
5. Hand microphone
6. Microphone holder for case or dash mounting.
7. 18" Flexible braid for grounding case to vehicle.
8. Antenna, 20 feet of RG-58/U cable (with connector), and mounting hardware.

ACCESSORIES

Order parts by Hallicrafters Part Number and Description

Description	Hallicrafters Part Number	Cross Reference
Telephone handset, complete with cord and plug.	41X18708.	P-4197
Holder for telephone handset	41X23023.	-----

INSTALLATION INSTRUCTIONS

LOCATION AND MOUNTING - The unit may be mounted under the dash, on the floor or firewall, on the rear wall of a truck cab, or any other convenient operating location, using the "L" shaped mounting bracket supplied. The unit is held securely in this bracket by means of two wing head fasteners, one on each side of the bracket. To remove the unit for service, it is simply necessary to loosen the two fasteners, tilt the unit downward slightly, and then lift it out of the bracket.

Mount the bracket in the vehicle either by means of the three mounting straps provided, or by fastening it directly to the vehicle. Drill all mounting holes with a 7/32" drill and use the #10 machine screws and nuts (in cloth bag) to mount the bracket. Fig. 3 shows a typical "under-dash" installation.

Mount the microphone holder, supplied with the unit, to the case, dash, or other convenient location. The holder may be mounted on the case either by the bottom two screws at the left side of the case, or by the two screws on the left top of the case. To mount the holder on the dash, use two #8 self-tapping or machine screws.

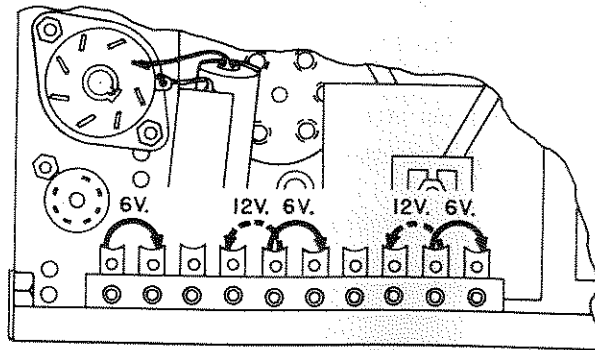
POWER SOURCE - The unit is wired at the factory for operation on either a 6 or 12 volt DC electrical system with either a positive or negative ground as specified by the customer (see tag attached to side of case). If the electrical system of the vehicle in which the unit is being installed corresponds to the tag, no electrical changes are required and it is simply necessary to connect the unit to the power source as outlined below.

CONNECTIONS TO POWER SOURCE

1. Connect power lead, at side of case, to terminal on ammeter which connects to headlights, accessories, etc. so that current drawn by unit will be indicated on ammeter.
2. Ground "Littlefone" case to vehicle with 18-inch length of flexible braid provided. (#8 lug on braid connects to any one of three screws at side of case; #10 lug connects to vehicle with screw and nut provided in cloth bag.) See Fig. 3.

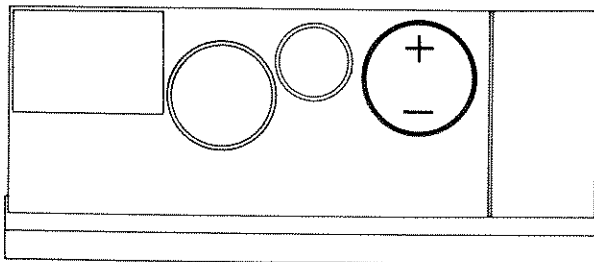
POWER CHANGEOVER

1. To change from 6 to 12 volt operation (or 12 to 6 volt operation), it will be necessary to replace the vibrator (Part No. 27B187 for 6 volts and Part No. 27B108 for 12 volts) and to change the positions of the jumpers on terminal strip TS-101 as shown in Fig. 1.
2. On vehicles with positive side of battery grounded, insert vibrator so that plus (+) sign on vibrator faces rear of case. Conversely, on vehicles with negative side of battery grounded, insert vibrator so that negative (-) sign on vibrator faces rear of case. (See Fig. 2.)

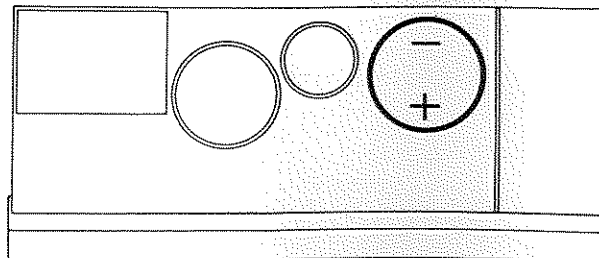


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Fig. 1. Bottom View of Power Supply Chassis Showing Power Changeover Connections



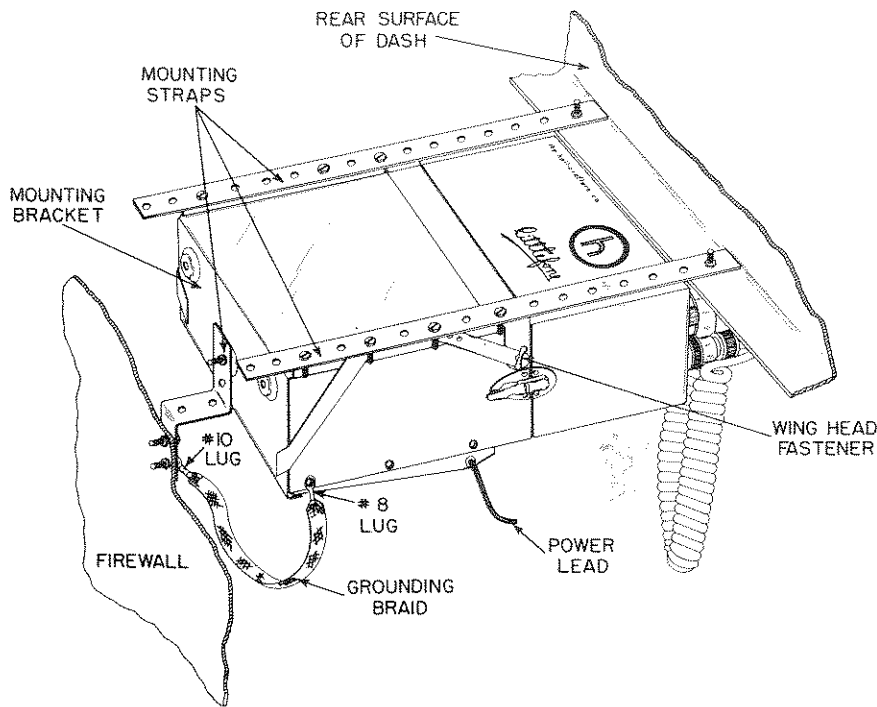
FOR VEHICLES WITH POSITIVE GROUND



FOR VEHICLES WITH NEGATIVE GROUND

Fig. 2. Vibrator Polarity Adjustment

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Fig. 3. Typical "Under-Dash" Installation

ANTENNA - The 20-inch whip antenna supplied with the unit is designed for roof-top mounting. Installation of the antenna does not require removing the upholstery from the interior of the vehicle. A single 7/8" hole drilled from the outside of the vehicle permits installation of the antenna mounting and snaking of the antenna lead to the "Littlephone". The antenna comes complete with 20 feet of RG-58/U coaxial cable and a connector. Before installing the antenna, cut it to proper length as outlined below.

CUTTING THE ANTENNA

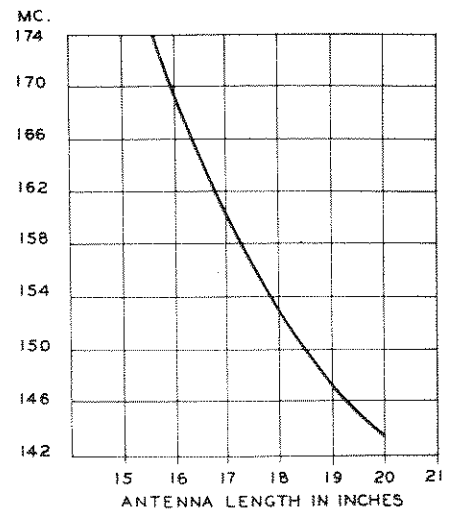
1. Using heavy duty cutting pliers or hack saw, cut the lower end of the antenna rod to the length shown in Fig. 4.

INSTALLING THE ANTENNA

1. Follow the mounting instructions given in Fig. 5, locating the antenna in approximately the center of the roof top to obtain a uniform radiation pattern. Tape, use grommets, or otherwise protect the cable wherever it passes through a hole in the body.
2. Cut off the excess cable and connect the coaxial plug, supplied with the antenna, to the cable as shown in Fig. 4a.
3. Attach the coaxial plug to the antenna connector on the "Littlephone".

FINAL ADJUSTMENTS

1. Since the output tuning and loading adjustments for the final amplifier will vary with each installation, depending upon proximity of antenna to car body, it will be necessary to readjust the output tuning and loading adjustments at the time of installation. This is accomplished as follows:
 - A. Install the unit in the vehicle and connect the antenna.
 - B. Connect a DC milliammeter (0-50 ma) between the red, single pin plug and jack on the top of the power supply chassis (lower chassis).
 - C. Remove the button plugs from the right side of the case to gain access to the two adjustments (9 and 10 on Fig. 11).
 - D. Set 9 (output loading capacitor) for maximum capacity as shown in Fig. 11. Adjust 10 (output tuning capacitor) for resonance as indicated by minimum plate current. Then decrease the value of 9 in small steps, each time retuning 10 for minimum plate current. Proper operation with rated power output is obtained with a plate current reading of approximately 40 ma.



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Fig. 4. Antenna Length Cutting Chart

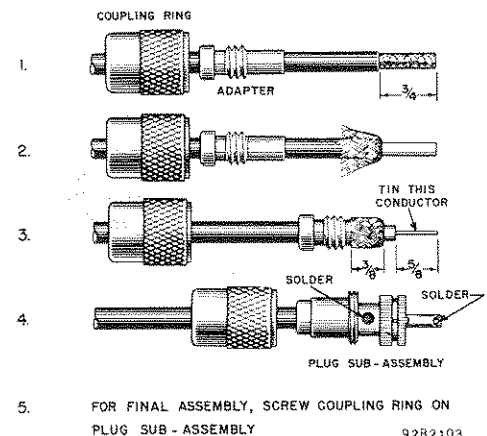
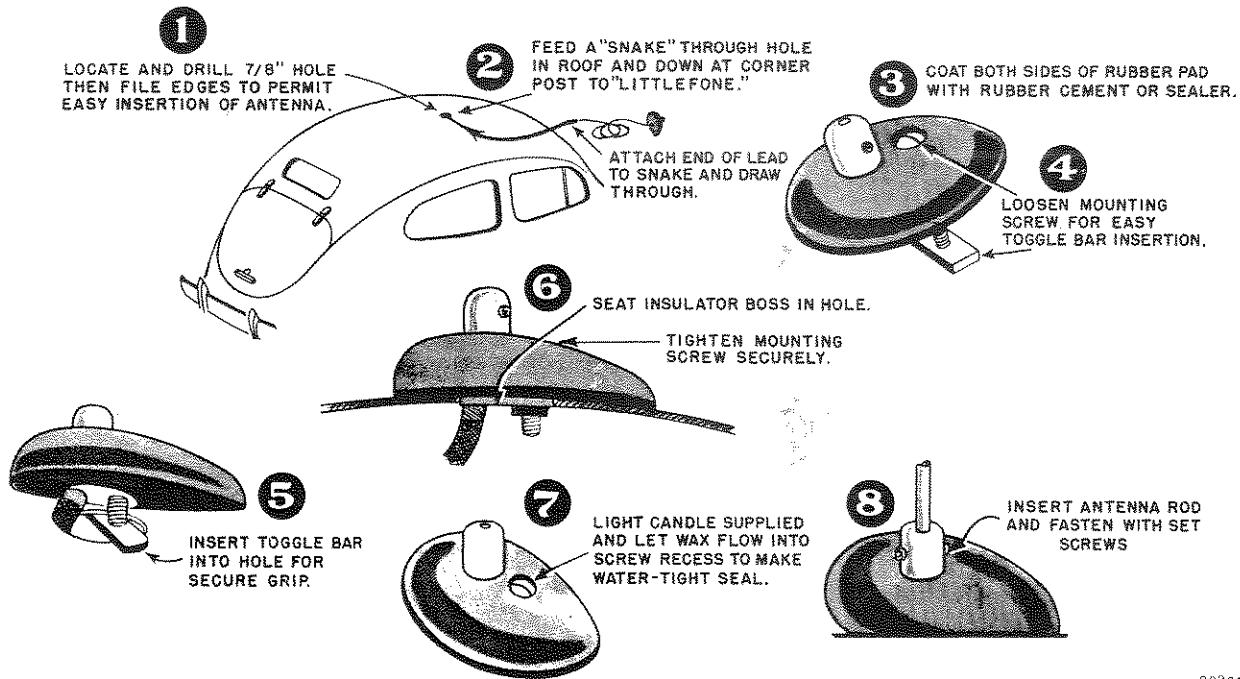


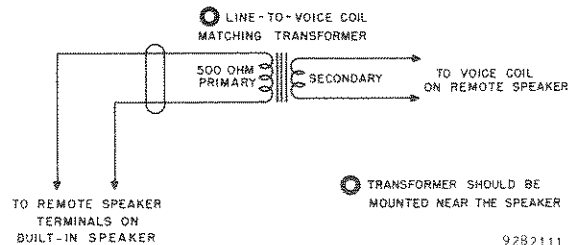
Fig. 4a. Coaxial Plug Connections



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Fig. 5. Antenna Mounting Instructions

REMOTE SPEAKER CONNECTIONS- The 500-ohm output terminals for connecting a remote speaker are located on the frame of the built-in speaker (see Fig. 9). To connect the remote speaker, first remove the button plug on the front panel and insert the rubber grommet provided in the cloth bag. The grommet will accommodate two #22 (or smaller) insulated leads. The connections to the remote speaker are as shown in Fig. 6. The leads to the remote speaker should be knotted on the inside of the "Littlefone" case to act as a strain relief. In installations where the unit may be exposed to the weather, carefully weather-proof the lead opening in the front panel.



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Fig. 6. Remote Speaker Connections

OPERATING INSTRUCTIONS

To operate the "Littlefone", place the power switch on the front panel of the case in the "on" position (up). The red jewel on the front panel will glow, indicating the unit is operating. Allow about one minute for the tubes to reach operating temperature and then rotate the VOLUME/SQUELCH control on the top of the case clockwise from the "MIN" position until the noise just disappears. (This adjustment is made with no signal input.) With the control set clockwise past "MIN", the squelch control is in operation to quiet the receiver when no signals are being received.

Since the setting of the VOLUME/SQUELCH control affects the audio intelligence on a weak signal (signal may sound choppy and distorted), it may be desirable when operating at the extreme range or "fringe area" to set the control counterclockwise from the "MIN" position. In this position, the control functions only as a volume control and does not provide the quieting feature of squelch. It will, however, permit the reception of weak signals which ordinarily might not be heard with the control set clockwise for squelch operation.

To transmit, press the button on the microphone (or handset), wait just a very short instant for the transmitting tubes to heat and then talk. To listen simply release the button. To turn the "Littlefone" off, return the power switch to the "off" position (down).

The operating range will depend upon the geographical and physical characteristics of the operating location as well as the height of the antenna on the unit with which communication is being maintained; the higher the antenna, the greater the range that can be expected. Best reception will usually be obtained over line-of-sight distances. If possible, operate the unit away from trees and foliage as they tend to absorb the signal. When operating at the extreme range or "fringe area", try various locations for best reception. In some instances, moving just a few inches may improve reception.

SERVICE

The Hallicrafters Company maintains an extensive system of authorized factory service centers where any required service can be accomplished promptly and efficiently at a nominal charge. These same service centers can also accomplish the semi-annual frequency measurement required by the F.C.C. The sign shown at the right is displayed by all authorized service centers. Any service work performed on this radio equipment must be under the supervision of an F.C.C. commercial licensed operator holding a 2nd Class Radio Telephone or higher grade of license.



The Hallicrafters Company reserves the privilege of making revisions in current production of equipment and assumes no obligation to incorporate these revisions in earlier models.

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NOISE SUPPRESSION

Most installations of the "Littlefone" will not require elaborate noise suppression of the motor vehicle. Therefore, before proceeding with the various methods of noise suppression, it is advisable to first determine the need for it. This is accomplished by moving the vehicle to a remote location at the outer limit of the equipments range. The location selected should be as free from man-made interference as possible.

While receiving the distant station, determine the source of interference by noting the noise level with the vehicle at rest and motor off, and comparing it with the vehicle in motion and motor running. If there is no difference in the noise level, noise suppression of the vehicle would be of little use; if, however, the noise generated by the vehicle is heard above the external noise, suppression of the motor vehicle will be required.

The most common types of noise interference in a vehicle are ignition noise, generator "hash", voltage regulator interference, wheel and tire static, and noise caused by loose mechanical connections. The most effective way to suppress noise is to identify and locate each source and to apply a suppression component to each one in turn. Use the information which follows as a guide. Fig. 7 shows a typical battery ignition system and the correct placement of noise suppression components.

IGNITION NOISE

Ignition noise can be identified as a regular clicking or popping noise which varies with the speed of the motor. In most installations, it can be effectively suppressed by applying one or more of the methods listed below.

a. Insert a good grade 10,000-ohm carbon suppressor at the center tower of the distributor and a 5000-ohm carbon suppressor at each spark plug tower on the distributor. Replace existing spark plugs with resistor type spark plugs or fit them with good grade 10,000-ohm carbon suppressors. The motor timing should be readjusted after installing the suppressors.

b. Place a 0.1 mfd. capacitor in the lead from the ignition switch to the ignition coil, mounted as close as possible to the coil, to prevent high frequency energy from getting back into the low voltage wiring of the vehicle. Additional noise suppression may be obtained by shielding the lead from the coil to the switch and grounding the shield at the fire wall.

c. The metal caps terminating the ignition wires at the distributor are simply clamped to the ends of the cables and depend upon uncertain pressure contact with the wire. These caps should be cleaned and then soldered to the wire to prevent sparking at these points. The cable insulation should be closely inspected for breakdown between wires and ground. Use fiber spacers to keep the cables away from ground and if necessary, reroute the cables to minimize coupling with the low voltage wiring.

GENERATOR "HASH"

Generator "hash" is caused by sparking at the commutator and can be identified as a high pitched whine which varies with the speed of the motor. This trouble can usually be remedied by connecting a .005 mfd disc capacitor, alone or in parallel with a 500 mfd electrolytic capacitor, between the generator output terminal and ground. It is important that the polarity and working voltage of the electrolytic capacitor be observed. If the noise persists or is still excessive, a parallel trap, tuned to the receiver frequency, should be inserted in series with the generator output lead.

VOLTAGE REGULATOR INTERFERENCE

Voltage regulator interference is caused by sparking at the regulator points as they operate to reduce the charging rate as the battery approaches full charge. It appears as a distinct but irregular clicking sound which tends to be less steady than that from the ignition system. Regulator interference can usually be remedied by connecting a .002 mfd mica capacitor in series with a 4-ohm carbon resistor between the field terminal of the regulator and ground. Further suppression may be obtained by inserting a 0.1 mfd coaxial capacitor in series with the voltage regulator leads to the battery and the generator armature. All components should be mounted as close to the regulator as possible for effective suppression.

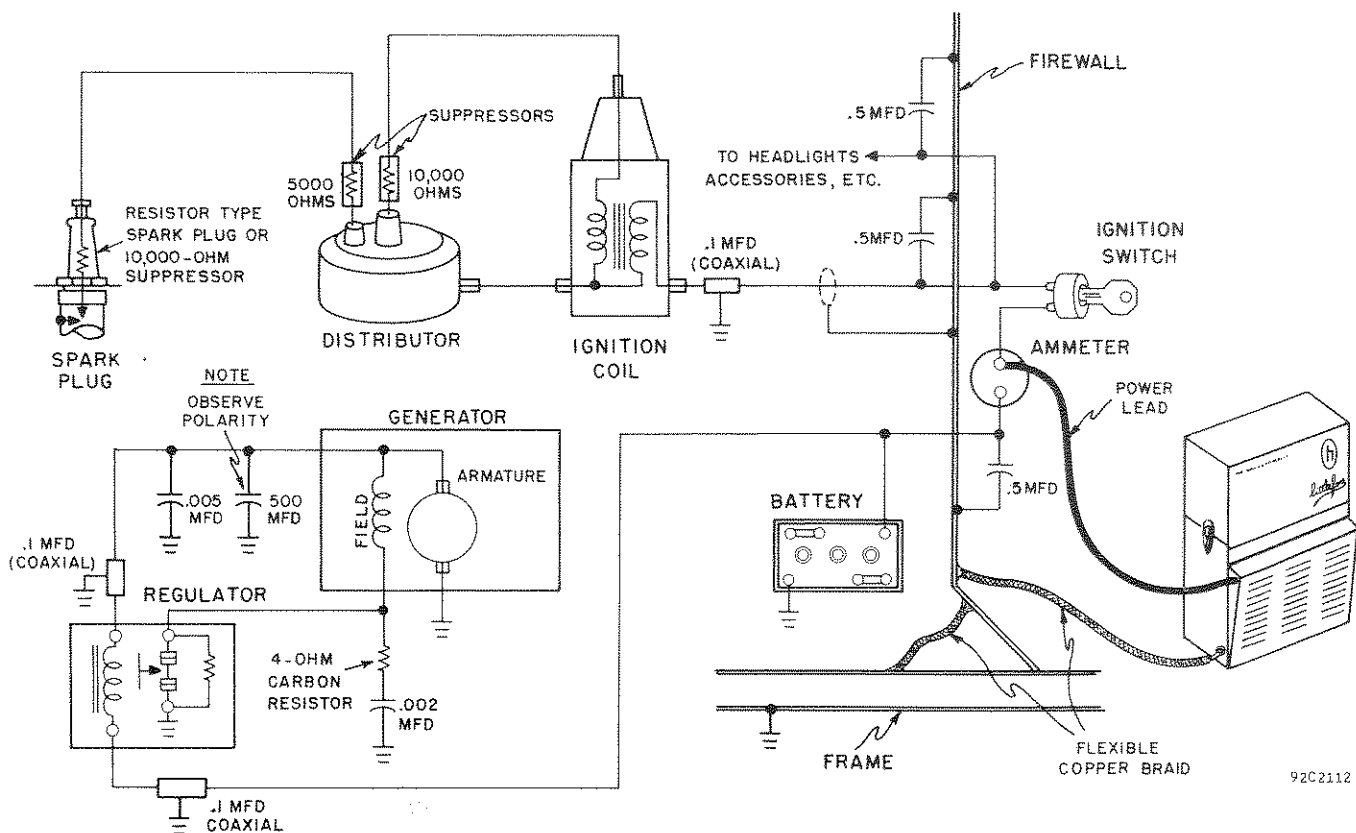


Fig. 7. Typical Ignition System Showing Placement of Noise Suppression Components

WHEEL STATIC

Wheel static is caused by grease in the front wheel bearings insulating the wheels from the chassis of the vehicle. It appears as a steady popping in the receiver at speeds over about 15 mph on smooth roads. Generally, it will not be present on dirt, gravel, or wet roads. Wheel static can be eliminated by installing front wheel static collectors available through most automotive dealers. These collectors will usually require replacement every 10,000 miles.

TIRE STATIC

Tire static causes an erratic popping noise heard only with the car in motion. This noise can usually be eliminated by injecting an anti-static powder into the inner tubes through the valve stems.

MISCELLANEOUS

1. When mounting the noise suppression components, thoroughly clean the contacting surfaces and use external tooth-type lockwashers under all mounting nuts or bolts.
2. The battery leads to the ammeter, gasoline gauge, ignition switch, headlights, taillights, and any accessories should be bypassed to ground with 0.5 mfd metal-case capacitors.
3. The fire wall should be bonded to both the frame of the vehicle and the motor block with flexible copper braid. If the exhaust pipe and muffler are insulated from the frame, ground them to the frame with flexible copper braid.
4. The steering post, as well as any control rods, metal tubes, etc. which pass through the fire wall should be securely bonded to the fire wall with flexible braid.
5. Tighten any loose bolts, especially bumper and fender bolts, and use external tooth-type lockwashers to insure good electrical contact.

CIRCUIT DESCRIPTION

RECEIVER

The receiver is a crystal controlled, double conversion type FM receiver employing thirteen tubes and two crystal diodes. All tubes are of the sub-miniature type and are socket mounted. The tube complement is given in the Service Parts List.

A signal at the operating frequency is received at the antenna and is amplified by the 1st and 2nd RF amplifiers, V-1 and V-2. This amplified signal is applied to the 1st mixer, V-3, where it is mixed with the output of the multiplier, V-12. The multiplier supplies mixer voltage to the 1st mixer at the 16th harmonic of the crystal frequency. The resultant first intermediate frequency is less than the crystal frequency by 1.7 megacycles. This IF signal is amplified by the 1st and 2nd IF amplifiers, V-4 and V-5, and then applied to the grid of the 2nd mixer, V-6. Here it is mixed with the output of crystal oscillator, V-11, obtaining the second intermediate frequency of 1.7 megacycles. This IF signal is amplified by the 3rd IF amplifier, V-7, and the 1st and 2nd limiters, V-8 and V-9. After limiting, the signal is applied to the discriminator where the audio is then recovered.

The audio signal is amplified by the audio amplifier V-10, and fed through the black, single pin plug, PL-3, to the audio output stage, V-101, on the power supply chassis. The signal is also applied to the primary of output transformer T-9. The secondary of T-9 connects to pin 4 of microphone socket SO-2 to supply an audio output of approximately 5 milliwatts for operating the earpiece of a telephone handset which may be used in place of the hand microphone normally supplied.

A squelch circuit is provided to quiet the receiver when no signal is being received. The center-tapped volume/squelch control, R-20, provides squelch action if the arm of the control is set above center tap (clockwise from center); with the arm below center tap (counterclockwise from center), the control functions only as a volume control. The non-squelch portion of the control is provided for fringe area reception where squelch is usually undesirable from the standpoint of signal reduction. V-13, a diode-pentode, is used as a noise amplifier and rectifier. Noise voltage is taken from the grid of the 1st limiter, V-8, amplified, rectified and applied to the grid of the audio amplifier, V-10, biasing it to cut-off. When a signal is received, the limiter grid voltage increases and cuts off the noise amplifier. Thus the cut-off voltage is removed and the audio amplifier operates normally.

The "Littlefone" is normally in a ready-to-receive condition; i.e., the receiver filaments are "on" and the transmitter filaments are "off". When the button on the microphone is depressed, power is applied to the filament changeover relay, RY-1. This relay in turn transfers the filament voltage from the receiver to the transmitter, thus placing the "Littlefone" in a ready-to-transmit condition.

TRANSMITTER

The transmitter is a standard crystal controlled FM transmitter. All tubes are of the sub-miniature type and are socket mounted. The tube complement is given in the Service Parts List. The crystal oscillator, V-14, supplies RF voltage at the crystal frequency to the grids of the modulators, V-15 and V-16. Phase modulation is developed in the grids of these tubes. The output of the modulators is multiplied 48 times through a series of four multipliers, V-17, V-18, V-19 and V-20, and then applied to the buffer-driver, V-21, which drives the final amplifiers, V-22 and V-23. A pi network serves both as the final tank circuit and as the coupling circuit to the quarter wave whip antenna. The microphone supplied is a single button carbon type with press-to-talk button.

POWER SUPPLY AND AUDIO OUTPUT

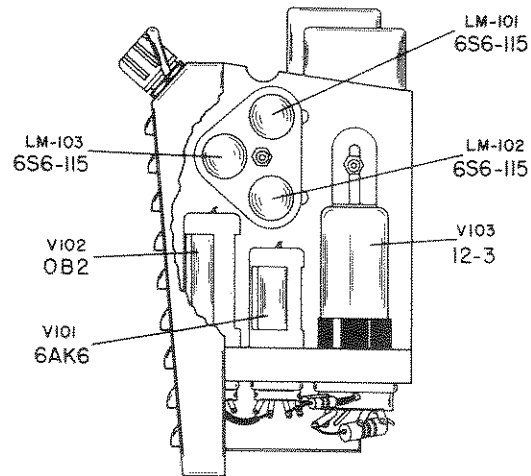
The audio output stage and power supply are contained on a common chassis located in the lower compartment of the case. The power supply is of the synchronous vibrator type and is designed for operation on both 6 and 12 volt DC supplies. Power changeover is accomplished by replacing the vibrator and changing the positions of the jumpers on terminal strip TS-101.

The rectified AC voltage developed across the high voltage secondary of vibrator transformer T-102 is filtered by a dual section capacitor, C-105, and regulated by means of current regulating lamps, LM-101 and LM-102, to provide the +135 volt plate supply for the transmitter buffer and final amplifiers. Current regulating lamp LM-103 and a type OB2 voltage regulating tube (V-102) provide the regulated +105 volt supply for all tubes in the transmitter and receiver, except the transmitter buffer and final amplifiers.

The low voltage winding of vibrator transformer T-102 feeds a full-wave rectifier circuit employing a dual section selenium rectifier, SR-101. The rectified output is regulated by a series "Amperite" current regulating tube, V-103, and filtered by capacitors C-111 and C-112 to supply the regulated +2 volt filament supply for all tubes in the transmitter and receiver. R-3 and R-49, connected from the filament changeover relay, RY-1, to the receiver and transmitter filament strings respectively, drop the voltage from +2 volts to +1.25 volts for proper filament operation. Current equalizing resistor R-31, connected in parallel with the receiver filament string is used to improve the regulation between the transmit and receive positions.

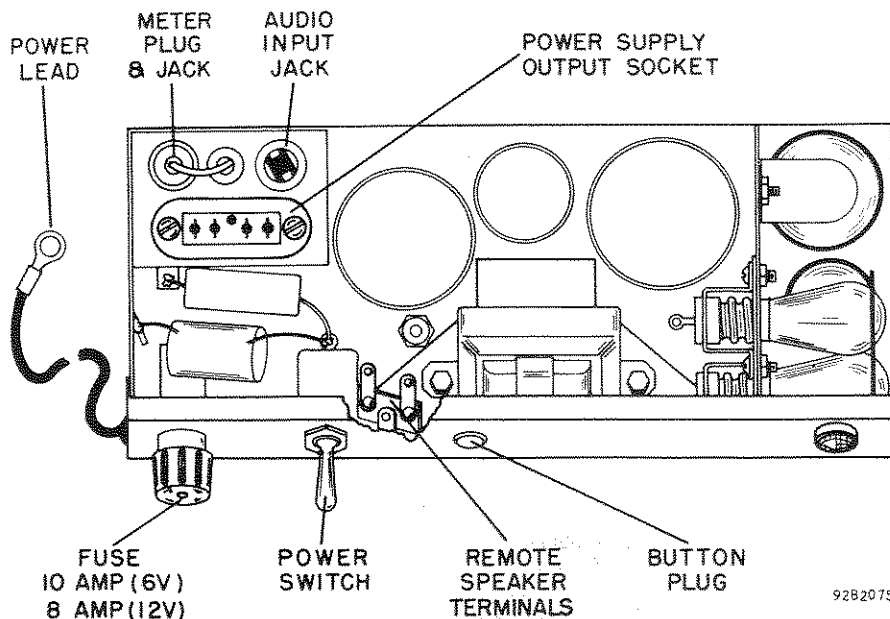
The audio output signal from the audio amplifier, V-10, on the transmitter-receiver chassis (top chassis) is fed through a single pin plug, PL-3, to the audio input jack, J-101, on the power supply chassis. (See Fig. 9.) The signal is applied to the audio output tube, V-101, which provides the power to drive the built-in speaker LS-101. The secondary of output transformer T-101 provides a 500-ohm output for connecting a remote speaker.

PL-101 and J-102 and a single pin plug and jack for connection to a DC milliammeter when tuning the transmitter. They are located on the power supply chassis. (See Fig. 9.)



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Fig. 8. Side View of Power Supply Chassis Showing Tube Location



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Fig. 9. Top View of Power Supply Chassis

PREVENTIVE MAINTENANCE

A regular preventive maintenance procedure should be followed to prevent unnecessary interruption in the operation of this equipment. This maintenance procedure should include the following:

- (1) Make a semi-annual check of the operating frequency as required by the F.C.C. to assure that it is within .005% of the assigned operating frequency.
- (2) Take periodic meter readings and, in case of abnormal readings, check tubes.
- (3) Periodically check the receiver sensitivity. (Normal sensitivity is approx. -3 volts at P (1st limiter grid resistor) for 1 microvolt at the antenna input.)
- (4) If the receiver sounds distorted, check the discriminator setting against a transmitter on the receiver operating frequency. (See Step 8 under Receiver Alignment on page 14.)
- (5) Check the antenna loading by observing the combined buffer and final amplifier plate current. This is accomplished by connecting a 50 ma. DC milliammeter between the red, single pin plug and jack on the power supply chassis (see Fig. 9.) Proper operation with rated power output is obtained with a plate current reading of approximately 40 ma.

ALIGNMENT INSTRUCTIONS

EQUIPMENT REQUIRED

1. Laboratory type signal generator covering 6.8 - 8.7 MC and 144 - 174 MC and having excellent frequency stability and accurate microvolt calibrated output attenuator (output attenuation to 0.1 microvolt). Measurements Corp. Model 80 or equivalent.
2. 1.7 MC Crystal controlled oscillator or other stable, accurate 1.7 MC signal source for alignment of receiver IF and discriminator stages. A suitable crystal oscillator circuit which may be readily constructed is shown on page 16.
3. Vacuum tube voltmeter with 0-3 and 0-30 volt DC ranges.
4. DC milliammeter (0-50 ma) with connectors for connecting to red, single pin plug and jack on power supply chassis. (See Fig. 9.)
5. Frequency meter with calibration and measurement accuracy of at least .005% for measuring transmitter output frequency. Lampkin Micrometer Frequency Meter Model 105-B or equivalent.
6. Absorption wavemeters covering 3 to 174 megacycles for checking alignment of multiplier stages in transmitter and receiver. Measurements Corp. "Megacycle Meter" Model 59 or James Millen Mfg. Co. Midget Absorption Frequency Meter Models 90604, 90605, 90606, 90607, 90608, and 90609 (six units required to cover frequency range).
7. RF wattmeter for power output measurements (0-2 watts in frequency range of 144 - 174 megacycles. Bird Electronics Corp. "Termaline" RF Wattmeter Model 61 or equivalent. Wattmeter cable should be equipped with Amphenol Plug 83-1SP to mate with the antenna connector on "Littlefone".
8. 1.0 megohm resistor connected in series with VTVM probe to minimize loading and detuning.

PRELIMINARY ADJUSTMENT

Before starting alignment, measure the transmitter and receiver filament voltages. The filament changeover relay (see Fig. 10) is normally in the "receive" position. To place it in the "transmit" position, merely depress the button on the microphone (or handset). To measure the filament voltages, connect the VTVM to the center terminal on the changeover relay. The filament voltage reading in both the transmit and receive positions should be approximately +2 volts. If the reading in the receive position differs from the transmit position, adjust 29 (tap on current stabilizing resistor, see Fig. 10) until the receiver voltage is equal to the transmitter voltage. When making the adjustment, wait until the reading stabilizes before readjusting.

NOTE: Refer to Figs. 9, 10, and 11 for the location of all alignment adjustments and test points. The adjustment and test points are also shown on the schematic diagram.

CRYSTAL TYPES

To facilitate crystal procurement during production, units were supplied with either JAN type CR-18/U or James Knight type H-17 crystals. (The crystal type is marked on the crystal case.) Replacement should be made with the same type crystal if possible, since circuit modifications and realignment of the associated oscillator circuit are required when replacement is made with a crystal type different from the one in the unit. The circuit modifications required when replacing the H-17 crystal with the more readily available CR-18/U crystal are listed below.

TO REPLACE THE H-17 CRYSTAL WITH THE CR-18/U CRYSTAL

Receiver Crystal

1. Add C-43, a 5-25 mmf trimmer (Part No. 44B430) across the receiver crystal socket.

Transmitter Crystal

1. Add C-67, a 5-25 mmf trimmer (Part No. 44B430) across the transmitter crystal socket.
2. Change the value of R-35, grid resistor for V-14, from 100,000 ohms to 33,000 ohms (Part No. 23X20X333K).
3. Change the value of R-36, screen dropping resistor for V-14, from 100,000 ohms to 22,000 ohms (Part No. 23X20X223K).

TRANSMITTER ALIGNMENT

Before proceeding with the transmitter alignment, remove the plate voltage from the buffer and final amplifier stages by disconnecting the red, single pin plug on the power supply chassis (see Fig. 9). Then connect a short circuiting jumper between terminals 1 and 2 of the microphone socket to place the filament changeover relay in the energized or "transmit" position.

1. On units with JAN type CR-18/U crystal:

Set 30 (crystal trimmer) in the middle of its tuning range as shown in Fig. 11. Connect the VTVM to T (oscillator grid) and adjust 1 (oscillator plate) for max. neg. voltage at the oscillator grid. Back out 1 (oscillator plate) until the oscillator grid voltage drops to -5.5 volts. This sets the proper "drive" for the transmitter oscillator.

The transmitter oscillator is operating properly when the VTVM reading at A or B (grid of either modulator) is between -2.5 and -3 volts. Because of differences in crystal activity, it may be necessary to slightly readjust 1 (oscillator plate) until the proper modulator grid voltage is obtained.

On units with James Knight type H-17 crystal:

Connect the VTVM to A or B (grid of either modulator) and adjust 1 (oscillator plate) for max. neg. voltage at the crystal frequency (marked on top of crystal). Approx. -3 volts.

2. Connect the VTVM to C (quadrupler grid) and adjust 2 (modulator plate) for max. neg. volts. Approx. -15 volts.
3. Connect the VTVM to D (tripler grid) and adjust 3 (quadrupler plate) for max. neg. volts. Approx. -5 volts. Then touch up 2 (modulator plate).
4. Connect the VTVM to E (1st doubler grid) and adjust 4 (tripler plate) for max. neg. volts. Approx. -8 volts. Then touch up 3 (quadrupler plate).
5. Connect the VTVM to F (2nd doubler grid) and adjust 5 (1st doubler plate) for max. neg. volts. Approx. -7 volts. Then touch up 4 (tripler plate).
6. Connect the VTVM to G (buffer grid resistor) and adjust 6 (2nd doubler plate) for max. neg. volts. Approx. -7 to -10 volts. Then touch up 5 (1st doubler plate).
7. Remove the plate voltage from the final amplifiers by disconnecting wire jumper H (see Fig. 11). Then apply plate voltage to the buffer stage by connecting the milliammeter between the red, single pin plug and jack on the power supply chassis.
8. Adjust 7 (buffer plate) for dip in buffer plate current as indicated on milliammeter.
9. The buffer stage has been neutralized at the factory and should normally not require readjustment. To determine if adjustment is necessary, first remove the plate voltage from the buffer stage by disconnecting the milliammeter. Then connect the VTVM to J (final grid resistor). If the stage is properly neutralized, an indication of approximately -.2 volt or less will be obtained on the VTVM. If neutralization is required, follow the procedure outlined under BUFFER NEUTRALIZATION on page 13.

10. The final amplifier stage has also been neutralized at the factory and should normally not require readjustment. A check may be made to determine if adjustment is necessary as follows:
 - (a) Set 9 (output loading capacitor) for maximum capacity as shown in Fig. 11.
 - (b) Connect the VTVM to J (final grid resistor).
 - (c) Apply plate voltage to the buffer stage by reconnecting the milliammeter. Retune 7 (buffer plate) for dip in plate current.
 - (d) Tune 10 (output tuning capacitor) through resonance. If the final amplifier stage is not neutralized, a corresponding dip in grid voltage will be noted as 10 is tuned through resonance; if properly neutralized, no change in grid voltage will be noted. If neutralization is necessary, follow the procedure outlined under FINAL AMPLIFIER NEUTRALIZATION below.
 11. Set 9 (output loading capacitor) for maximum capacity as shown in Fig. 11. Apply plate voltage to the final amplifiers by connecting wire jumper H.
 12. Connect the VTVM to J (final grid resistor). Tune 10 (output tuning capacitor) for minimum plate current (approx. 30 ma). Slightly retune 7 (buffer plate) for maximum grid voltage as indicated on the VTVM. Repeat the procedure several times, tuning 10 for minimum plate current and 7 for maximum grid voltage. Correct adjustment of the final amplifiers is indicated by a VTVM reading of approx. -30 volts.
 13. Connect the antenna.
 14. Adjust 10 (output tuning capacitor) for resonance as indicated by minimum plate current. Then decrease the value of 9 (output loading capacitor) in small steps, each time retuning 10 for minimum plate current. Proper operation with rated power output is obtained with a plate current reading of approx. 40 ma.
 15. The power output of the transmitter may be measured by connecting the RF wattmeter to the antenna input connector and adjusting 9 (output loading capacitor) and 10 (output tuning capacitor) as indicated in Step 14. Normal power output is 1.0 watt.
 16. Align the receiver if required.
 17. On units with JAN type CR-18/U crystal:

Set the transmitter on frequency by adjusting 30 (crystal trimmer). Recheck the "drive" as outlined in Step 1 and then recheck the operating frequency. If necessary, touch up all tuning adjustments except the oscillator adjustments.

On units with James Knight type H-17 crystal:

Set the transmitter on frequency by adjusting 1 (oscillator plate). If necessary, touch up all tuning adjustments except the oscillator adjustment.
- NOTE: The operating frequency must be within .005% of the assigned operating frequency to comply with F.C.C. regulations.
18. Place the chassis in the case and then install the complete unit in the vehicle. Connect the antenna and repeat Step 14. To gain access to the output tuning adjustments, 9 and 10, remove the button plugs from the right side of the case.

BUFFER NEUTRALIZATION

1. Before neutralizing the buffer, follow the instructions given in Step 9 on page 12.
2. To neutralize the buffer stage, adjust 8 (buffer neutralizing coil) for a minimum reading on the VTVM. Then retune 7 (buffer plate) and 6 (2nd doubler plate) to provide a maximum reading on the VTVM. Repeat the procedure until a VTVM indication of approximately -.2 volt or less is obtained.
3. Apply plate voltage to the buffer stage by reconnecting the milliammeter. Connect the VTVM to G (buffer grid resistor) and touch up 8 to maximize buffer grid voltage.

FINAL AMPLIFIER NEUTRALIZATION

1. Before neutralizing the final amplifiers, follow the instructions given in Step 10 above.
2. To neutralize the final, make small adjustments of 11 (final neutralizing coil) for minimum reaction in grid voltage as 10 (output tuning capacitor) is tuned through resonance. With each small adjustment of 11, retune 7 (buffer plate) to maximize the VTVM indication. When neutralization is complete, tuning 10 through resonance will not have any appreciable effect upon the VTVM indication.

RECEIVER ALIGNMENT

1. On units with JAN type CR-18/U crystal:

Set 31 (crystal trimmer) in middle of its tuning range as shown in Fig. 11. Connect the VTVM to K (oscillator grid) and adjust 12 (oscillator screen) for max. neg. voltage at the oscillator grid (approximately -17.5 volts). Back out 12 (oscillator screen) until the oscillator grid voltage drops to approximately -14 volts.

The receiver oscillator is operating properly when the VTVM reading at N (2nd mixer grid resistor) is between -3 to -4 volts. Because of differences in crystal activity, it may be necessary to slightly readjust 12 (oscillator screen) until the proper reading at N is obtained.

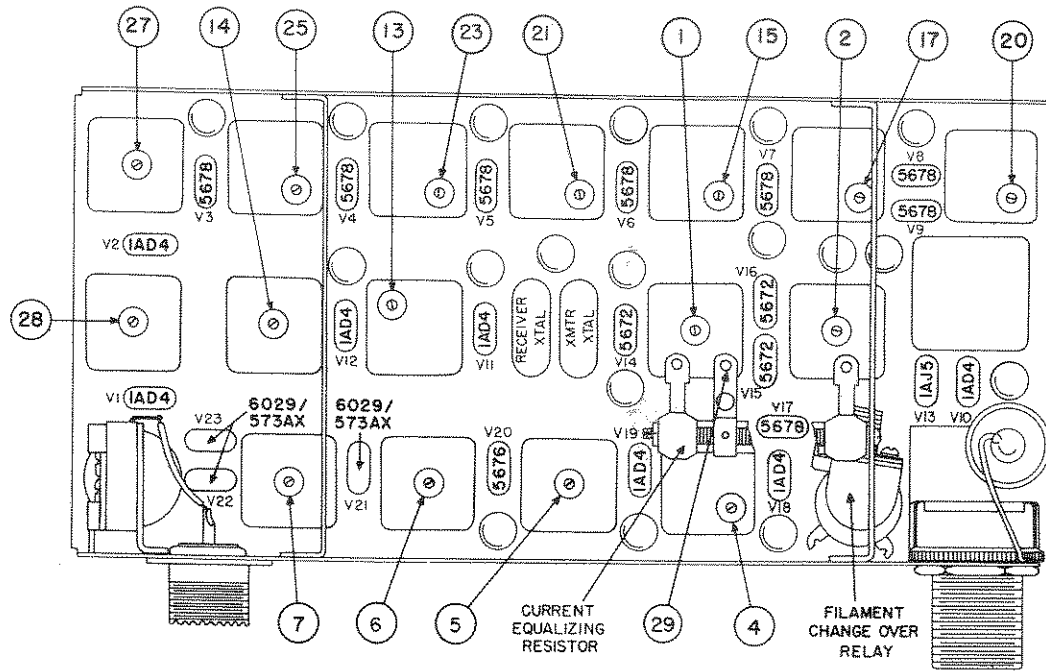
On units with James Knight type H-17 crystal:

Connect the VTVM to K (oscillator grid) and adjust 12 (oscillator screen) for max. neg. voltage. Approx. -25 volts.

It should be noted that the magnitude of the bias voltage developed at the 1st and 2nd mixers by the oscillator injection signal will depend to a large extent upon how 27 (2nd RF plate) and 21 and 22 (2nd IF plate) are tuned. When the entire receiver is properly aligned, these voltages will be different (usually lower) than the values indicated in the alignment instructions.

2. Connect the VTVM to L (multiplier grid) and adjust 13 (oscillator plate) to the 4th harmonic of the crystal. Approx. -10 volts.
 3. Connect the VTVM to M (1st mixer grid) and adjust 14 (multiplier plate) to the 16th harmonic of the crystal. Then touch up 13 (oscillator plate). Approx. -1 volt.
 4. Connect the 1.7 MC signal source to N (2nd mixer grid resistor).
 - a. Connect the VTVM to P (1st limiter grid resistor). Adjust 15 and 16 (2nd mixer plate) and 17 and 18 (3rd IF plate) for maximum indication. Approx. -12 volts for 1 volt input.
 - b. Connect the VTVM to R (disc. input) and adjust 19 (disc. primary) for maximum indication. Approx. -10 volts.
 - c. Connect the VTVM to S (disc. output) and adjust 20 (disc. secondary) for zero reading on the VTVM. The correct zero point is between a positive and negative maximum.
 5. Set the signal generator at the 1st IF frequency (1st IF = Crystal Freq. - 1.7 MC) and connect it to N. Connect the VTVM to S (disc. output). Carefully adjust the signal generator frequency for a zero reading on the VTVM.
 6. Disconnect the generator and connect it to M (1st mixer grid). Disconnect the VTVM and connect it to P (1st limiter grid resistor). Adjust 21 and 22 (2nd IF plate), 23 and 24 (1st IF plate) and 25 and 26 (1st mixer plate) for maximum indication. Approx. -1 volt for 25 microvolt input.
 7. Set the signal generator at the operating frequency and connect it to the antenna input. Connect the VTVM to P (1st limiter grid resistor). Adjust 27 (2nd RF plate), 28 (1st RF plate), 14 (multiplier plate) and 13 (oscillator plate) for maximum indication. Approx. -3 volts for 1 microvolt input.
 8. Attach the antenna and check the discriminator setting against a transmitter on the receiver operating frequency. The VTVM indication at S (disc. output) should be zero volts, plus or minus .1 volt. If not, readjust 20 (disc. sec.) until a zero reading is obtained. Then connect the VTVM to P (1st limiter grid resistor) and touch up 14 (multiplier plate) for maximum indication.
 9. If lower than normal sensitivity is noted, the receiver crystal may be operating at a frequency just slightly different from that indicated on the holder. To remedy such a condition, follow the procedure outlined below.
 - a. Set the signal generator on the receiver operating frequency with the frequency meter. An alternate method is to use a tunable receiver such as the Hallicrafters S-81, zero beating the signal generator with a transmitter on the receiver operating frequency.
 - b. Connect the signal generator to the antenna input and the VTVM to R (disc. input).
 - c. On units with JAN type CR-18/U crystal:

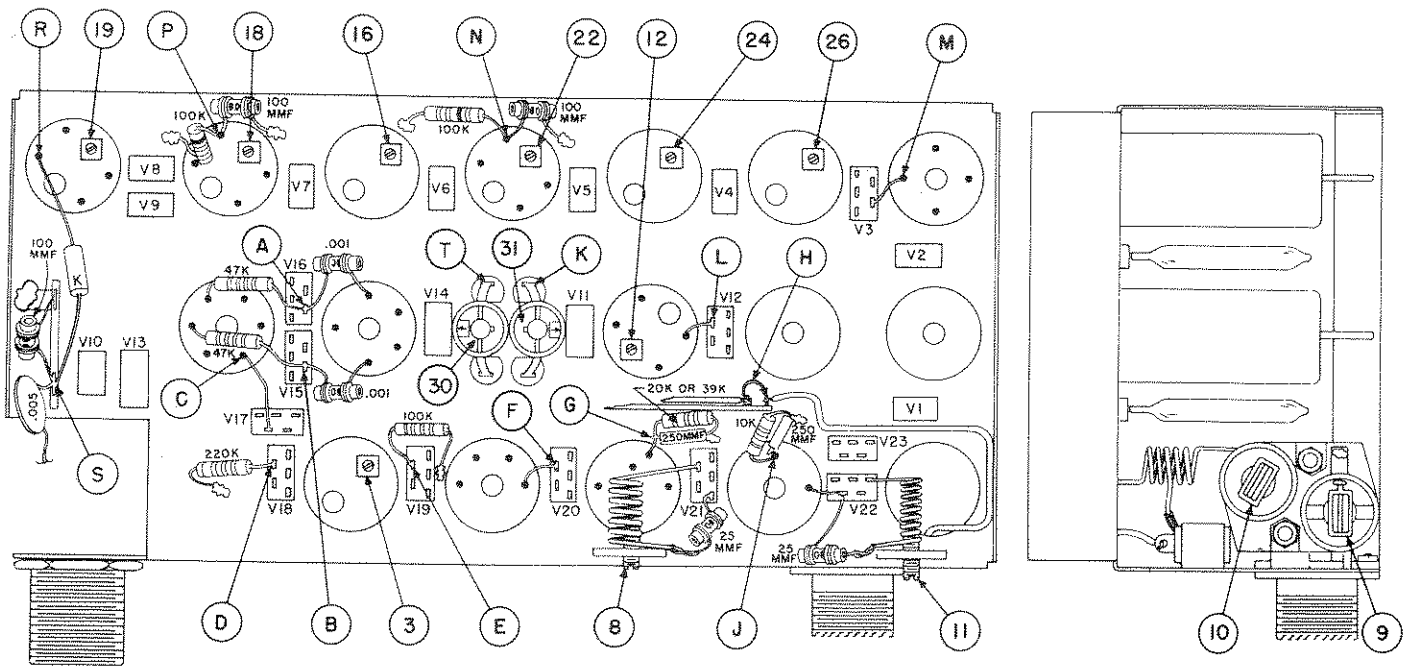
Touch up 31 (crystal trimmer), 13 (oscillator plate), and 14 (multiplier plate) for max. neg. voltage, keeping the generator output as low as possible.
- On units with James Knight type H-17 crystal:
Touch up all IF adjustments including the disc. primary for max. neg. voltage. Keep the generator output as low as possible.



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NOTE: ON SOME SETS, TYPE 2E32 TUBES WERE SUBSTITUTED FOR TYPE 5678 FOR V-4, V-5, AND V-7. WHEN MAKING REPLACEMENT ON THESE SETS, EITHER TUBE TYPE MAY BE USED. IF POSSIBLE USE THE SAME TUBE TYPE FOUND IN THE SET. WHEN REPLACING TYPE 2E32 WITH TYPE 5678, IT MAY BE NECESSARY TO SLIGHTLY LOOSEN THE COUPLING OF THE GIMMICK CAPACITOR IN THE PLATE CIRCUIT OF THE TUBE BEING REPLACED TO PREVENT OSCILLATION CAUSED BY THE SLIGHTLY HIGHER GAIN OF TYPE 5678. DO NOT USE TYPE 2E32 TO REPLACE TYPE 5678.

Fig. 10. Top View of Transmitter-Receiver Chassis Showing Location of Alignment Adjustments and Tubes

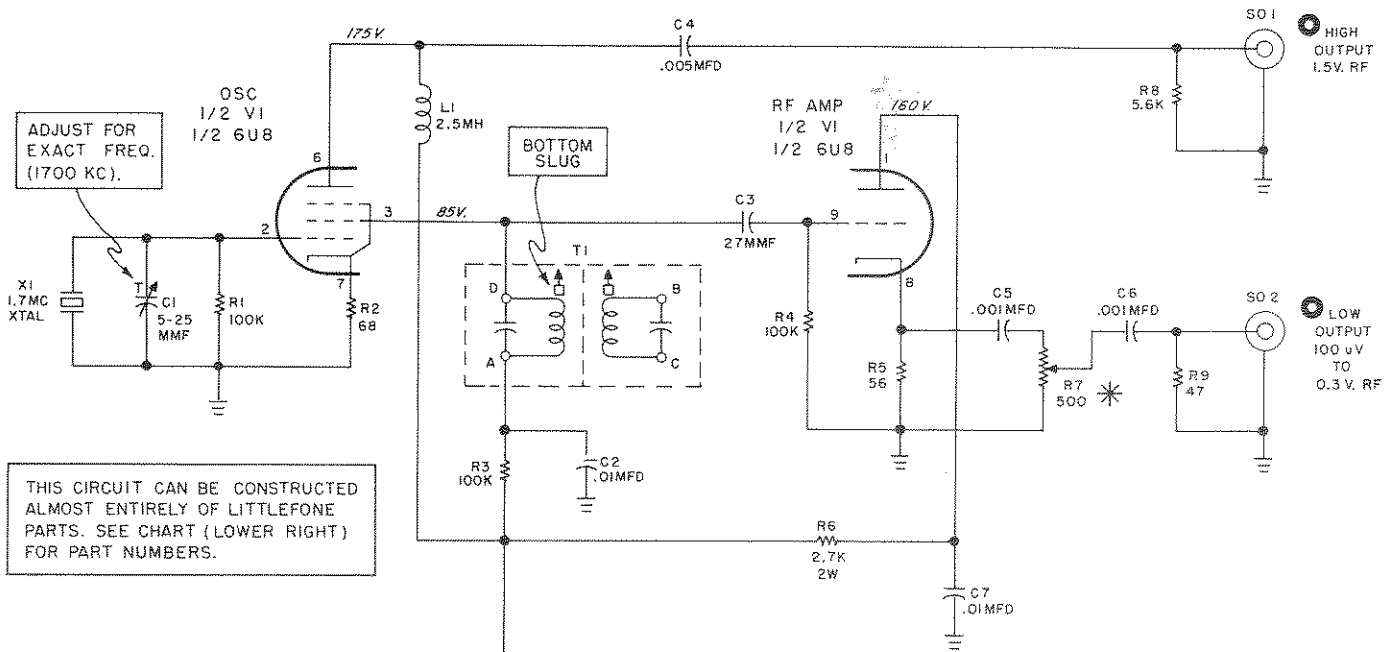


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Fig. 11. Bottom and Side Views of Transmitter-Receiver Chassis Showing Location of Alignment Adjustments and Test Points

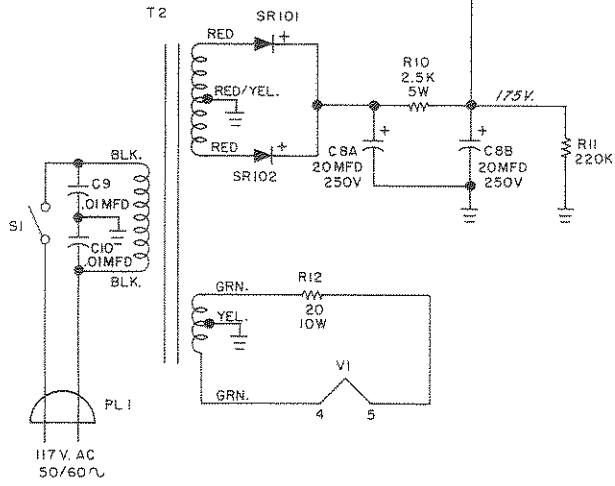
1.7 MC CRYSTAL OSCILLATOR

(Used for alignment of receiver
IF and discriminator stages)



ADJUST FOR EXACT FREQ. (1700 KC).

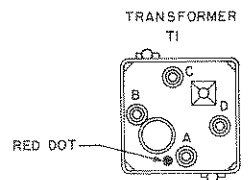
THIS CIRCUIT CAN BE CONSTRUCTED ALMOST ENTIRELY OF LITTLEFONE PARTS. SEE CHART (LOWER RIGHT) FOR PART NUMBERS.



NOTES

1. RESISTOR VALUES ARE IN OHMS. K=1000
2. RESISTORS ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED.
- ⊙ OUTPUT VOLTAGES SHOWN WERE MEASURED ACROSS 2ND MIXER GRID RESISTOR IN RECEIVER, SIGNAL BEING FED THRU 50-OHM CABLE.
- * USE CARBON TYPE ONLY

PART	HALLICRAFTERS PART NUMBER
C-1	44B430
C-8	45A202
L-1	53B033
SR-101	27A181 (75 MA)
SR-102	27A181 (75 MA)
T-1	50C536
T-2	52C255
X-1	19B1888 (1700 KC)



MODEL HT-26

SPECIFICATIONS

TYPE: Mobile FM Transmitter-Receiver

FREQUENCY RANGE: 144 to 174 MC

TRANSMITTER:

1. Power Output 1.0 watt
2. Frequency Stability 0.005% from -20° to + 70° Centigrade. Crystal controlled. Crystal frequency multiplied 48 times.
3. Modulation Phase. ± 15 KC deviation (no modulation limiter).
4. Antenna Quarter wave flexible whip for roof-top mtg. 52 ohm impedance.
5. Spurious Radiation 60 db down.
6. Pre-emphasis Standard 6 db per octave.
7. Distortion 9% with 100% modulation at 1000 cps.
8. Power Requirements Filament: 1.25 volts at 1.36 amps.
Plate: 135 volts at 34 ma.; 105 volts at 23 ma.
9. Power Input to Final 135 volts at 22 ma.
10. Duty Cycle 1 minute on, 1 minute off.
11. Microphone Single button carbon microphone with press-to-talk button.
12. Tubes 10

RECEIVER:

1. Sensitivity 1 microvolt or better for 20 db signal to noise ratio.
2. Selectivity 60 db at 45 KC. 95 db at 60 KC.
3. Frequency Stability 0.005% from -20° to + 70° Centigrade.
4. Receiver Type Superheterodyne. Double conversion crystal controlled local oscillator.
5. Spurious Response All more than 75 db down.
6. Audio Output (for earpiece of telephone handset) 5 milliwatts with 15% distortion. 3 milliwatts with 5% distortion.
7. Receiver De-emphasis Standard 6 db per octave.
8. Antenna Same as for transmitter.
9. Squelch 0.5 microvolt to open.
10. Power Requirements Filament - 1.25 volts at 1.36 amp.
Plate - 105 volts at 21 ma.
11. Tubes and Rectifiers 13 tubes and 2 germanium crystal diodes

POWER SUPPLY & AUDIO OUTPUT

1. Power Input 6.3 or 12.6 volts DC (Power changeover accomplished as outlined on page 4).
2. Current Drain

	at 6.3V	at 12.6V
Receive -	5.5 amps	2.9 amps
Transmit -	6.7 amps	3.8 amps
3. Output Voltages Regulated + 135 volts at 34 ma.
Regulated ± 105 volts at 22 ma.
Regulated + 2 volts at 1.36 amps.
4. Audio Input Impedance High Impedance
5. Built-in Speaker 4-inch PM; 3.2-ohm voice coil
6. Audio Output Impedance 500 ohms (for remote speaker)
7. Audio Output (built-in speaker) 1.0 watt
8. Tubes and Rectifiers 1 tube plus voltage regulator, current regulator and selenium rectifier.

WEIGHT: 14-3/4 lbs. with unit, mtg. bracket, and microphone.

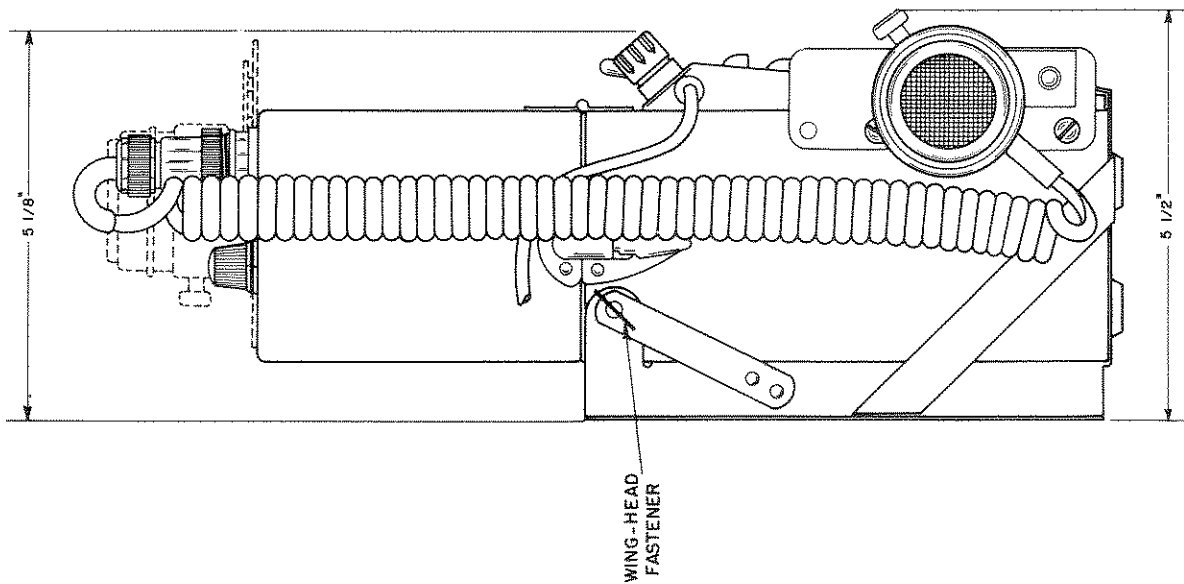
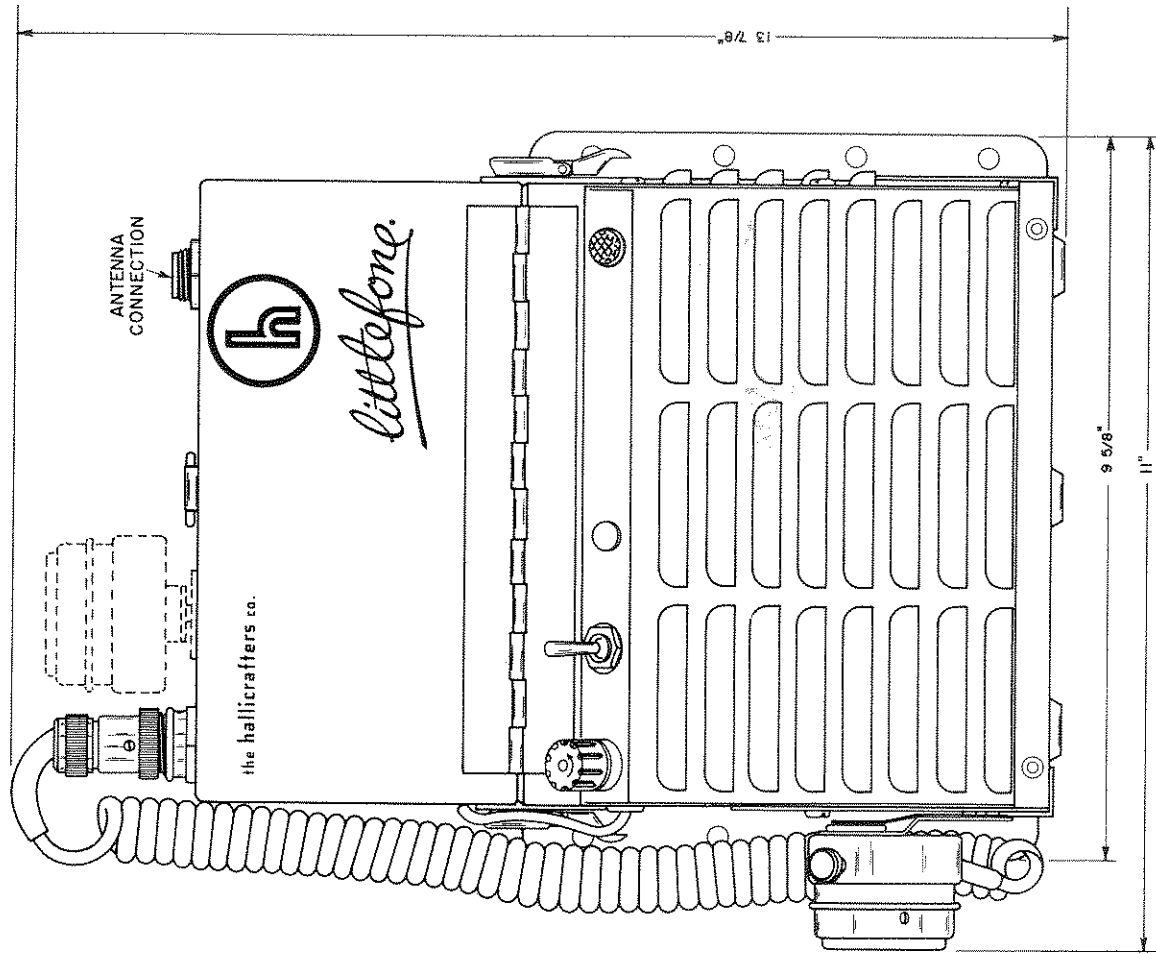


Fig. 12. Front View of Unit (In Mtg. Bracket) Showing Dimensions



NOTE
WHEN UNIT IS MOUNTED HORIZONTALLY, MICROPHONE AND HOLDER MOUNT ON TOP LEFT OF CASE AS INDICATED BY THE DOTTED LINES.

Fig. 13. Side View of Unit (In Mtg. Bracket) Showing Dimensions

SERVICE PARTS LIST

Replacement parts may be obtained through Hallicrafters territorial and local distributors, or through Hallicrafters Service Division, 823 S. Tripp Avenue; Chicago 24, Illinois. When ordering parts, specify Hallicrafters Part Number and Description.

UPPER COMPARTMENT PARTS

(TRANSMITTER-RECEIVER CHASSIS)

Schematic Symbol	Description	Hallicrafters Part Number	Cross Reference
CAPACITORS			
C-1,29,54,59,63	25 mmf. 500 V., ceramic	47A285	174-0010-00
C-2,3,4,5,20,57,58, 61,62,64,65	250 mmf. 500 V., mica; toothpick type	47A279	172-5000-00
C-6,9,11,13,15,16, 25,31,33,38	.02 mfd. 400 V., tubular	47A277	173-5003-00
C-7,8,10,12	.1 mmf. wire gimmick	-----	-----
C-14,18,28,36	100 mmf. 500 V., ceramic	47X30UK101K	174-0017-00
C-17,35	1 mmf. 500 V., gimmick	47A160-2	174-0001-00
C-19,46	2.2 mmf. 500 V., gimmick	47A160-4	174-0002-00
C-21	500 mmf. 500 V., ceramic	47A278	174-0018-00
C-22,23,40,42	.01 mfd. 450 V., ceramic disc	47A217	174-0021-00
C-24,47,50	1000 mmf. 500 V., ceramic	47A280	174-0019-00
C-26,34,37,45,52,53, 55,56	.002 mfd. 400 V., tubular	47A276	173-5000-00
C-27,41,48,49	.005 mfd. 450 V., ceramic disc	47A168	174-0020-00
C-30	10 mmf. 500 V., ceramic	47X20CK100F	174-0005-00
C-32	5 mmf. 500 V., ceramic	47A289	174-0022-00
C-43,67	5-25 mmf. trimmer	44B430	-----
C-51	250 mfd. 6 V., electrolytic	45A201	170-0003-00
C-60	50 mmf. 500 V., ceramic	47A284	174-0012-00
C-66A & B	Capacitor, variable; 7-45 mmf. each section	44A413	171-0007-00
C-68	1.5 mmf. 500V., ceramic	47X20CH1R5C/D	-----
C-69,80,82,83,84, 85,86,87	1.0 mmf. 500V., ceramic	47X20CH010C/D	-----
C-70	2.0 mmf. 500V., ceramic	47X20CH020C/D	-----
C-81	3.0 mmf. 500V., ceramic	47X20CH030C/D	-----
RESISTORS			
R-1	2 megohms 1/2 watt, carbon	23X20X205K	160-0167-00
R-2,4,13,37,38,41,43	47,000 ohms 1/2 watt, carbon	23X20X473K	160-0128-00
R-3	.868 ohms; #26 nichrome wire (4-9/32")	87A2431	P-4690-1
R-5,14,16,17,18	560,000 ohms 1/2 watt, carbon	23X20X564K	160-0154-00
R-6,7,28	33,000 ohms 1/2 watt, carbon	23X20X333K	-----
R-8,10,23,24,25,27,44	100,000 ohms 1/2 watt, carbon	23X20X104K	160-0136-00
R-9,15,40	150,000 ohms 1/2 watt, carbon	23X20X154K	160-0140-00
R-11,12	1 megohm 1/2 watt, carbon	23X20X105K	160-0160-00
R-19	270,000 ohms 1/2 watt, carbon	23X20X274K	-----
R-20	Volume/squelch control; 1 megohm, center tapped	25B1032	-----
R-21,22,26,33,42	220,000 ohms 1/2 watt, carbon	23X20X224K	160-0145-00
R-31	5 ohms 10 watts, adjustable wirewound	24A964	-----
R-32	1200 ohms 1/2 watt, carbon	23X20X122K	-----
R-35	100,000 ohms 1/2 watt, carbon (on units with James Knight type H-17 crystal)	23X20X104K	160-0136-00
R-35	33,000 ohms 1/2 watt, carbon (on units with JAN type CR-18/U crystal)	23X20X333K	-----
R-36	100,000 ohms 1/2 watt, carbon (on units with James Knight type H-17 crystal)	23X20X104K	160-0136-00
R-36	22,000 ohms 1/2 watt, carbon (on units with JAN type CR-18/U crystal)	23X20X223K	-----
R-39	27 ohms 1/2 watt, carbon	23X20X270K	160-0001-00
R-45,47	470 ohms 1/2 watt, carbon	23X20X471K	-----
R-46	39,000 ohms 1/2 watt, carbon	23X20X393K	160-0126-00
R-48	10,000 ohms 1/2 watt, carbon	23X20X103K	160-0112-00
R-49	.56 ohms; #26 nichrome wire (2-15/16")	87A2432	P-4690-2
COILS AND TRANSFORMERS			
L-1,3	Choke, RF	53A256	P-4686-5
L-2	Coil, buffer neutralizing	51A1517	P-4688
L-4	Choke, RF	53-257	P-4447
L-5	Coil, final neutralizing	51A1518	P-4689
L-6	Coil, final plate	51A1516	P-4686-1
T-1	Transformer, 1st RF	50C533	P-4380
T-2	Transformer, 2nd RF	50C534	P-4381

UPPER COMPARTMENT PARTS (Cont.)

Schematic Symbol	Description	Hallicrafters Part Number	Cross Reference
COILS AND TRANSFORMERS (Cont.)			
T-3,4,5	Transformer, 1st mixer, 1st IF, and 2nd IF	50C535	P-4374
T-6,7	Transformer, 2nd mixer and 3rd IF	50C536	P-4382
T-8	Transformer, discriminator	50C537	P-4383
T-9	Transformer, modulation and audio output	55C211	-----
T-10	Transformer, oscillator; receiver	50C538	P-4384
T-11	Transformer, multiplier; receiver	50C539	P-4385
T-12	Transformer, oscillator; transmitter	50C540	P-4401
T-13	Transformer, modulator plate	50C541	P-4402
T-14	Transformer, quadrupler and tripler	50C542	P-4682
T-15	Transformer, 1st doubler	50C543	P-4683
T-16	Transformer, 2nd doubler	50C544	P-4684
T-17	Transformer, buffer	50C545	P-4685
PLUGS AND SOCKETS			
PL-1	Plug and cable assembly, power supply	87B3679	-----
PL-2	Plug, microphone (part of microphone MI-1)	-----	-----
PL-3	Plug, audio output; single pin (black)	35A027	-----
SO-2	Socket, microphone	10A491	145-0003-00
SO-3	Socket, antenna	10A490	P-4261
	Socket, crystal	6A417	141-0012-00
	Socket, tube; 6 pin	6A418	141-0006-00
	Socket, tube; 5 pin	6A419	141-0004-00
TUBE COMPLEMENT			
V-1,2,10,11,12,18,19	1AD4: 1st RF amplifier, 2nd RF amplifier, audio amplifier, oscillator (receiver), multiplier, tripler, and 1st doubler	90X1AD4	140-0002-00
V-3,4,5,6,7,8,9,17	CK5678: 1st mixer, 1st IF amplifier, 2nd IF amplifier, 2nd mixer, 3rd IF amplifier, 1st limiter, 2nd limiter, and quadrupler	90XCK5678	140-0015-00
V-13	1AJ5 (1AG5/2E41): squelch	90X1AJ5	-----
V-14,15,16	CK5672: oscillator (transmitter), modulators	90XCK5672	140-0013-00
V-20	CK5676: 2nd doubler	90XCK5676	-----
V-21,22,23	6029/573AX: buffer, final amplifiers	90X3029/573AX	140-0012-00
MISCELLANEOUS PARTS			
	Antenna assembly (complete with cable, connector and mtg. hdwe.)	57-198	-----
	Button plug	17A123	123-0006-00
GR-1,2	Crystal diode, germanium	19A1879	149-0005-00
*X-1	Crystal, receiver; JAN type CR-18/U (specify frequency)	19B1887	-----
*X-1	Crystal, receiver; James Knight type H-17 (specify frequency)	19B1880	Knight Type H-17
*X-2	Crystal, transmitter; JAN type CR-18/U (specify frequency)	19B1888	-----
*X-2	Crystal, transmitter; James Knight type H-17 (specify frequency)	19B1881	Knight Type H-17
	Dial plate, Volume/Squelch control	13B1109	-----
	Gasket, rubber; 5/16" id, 9/16" od	12A067	P-4260-1
	Gasket, rubber; 47/64" id, 1-1/8" od	12A068	P-4260-2
	Gasket, rubber; 39/64" id, 51/64" od	12A069	P-4260-4
	Knob, Volume/Squelch control	15A502	126-0001-00
	Latch, case (upper section)	30A248	P-4276-1
MI-1	Microphone (includes cord and plug)	81B090	-----
	Operating and Service Instruction Book	94X1163	-----
	Pin, hinge	74A554	P-4702-3
RY-1	Relay	21B139	150-0001-00
	Ring, retaining; for mtg. 6 pin tube sockets	76A917	130-0004-00
	Ring, retaining; for mtg. 5 pin tube sockets	76A918	130-0003-00
	Top compartment of case	66C824	P-4758

* See crystal type and frequency marked on crystal.

LOWER COMPARTMENT PARTS (POWER SUPPLY CHASSIS)

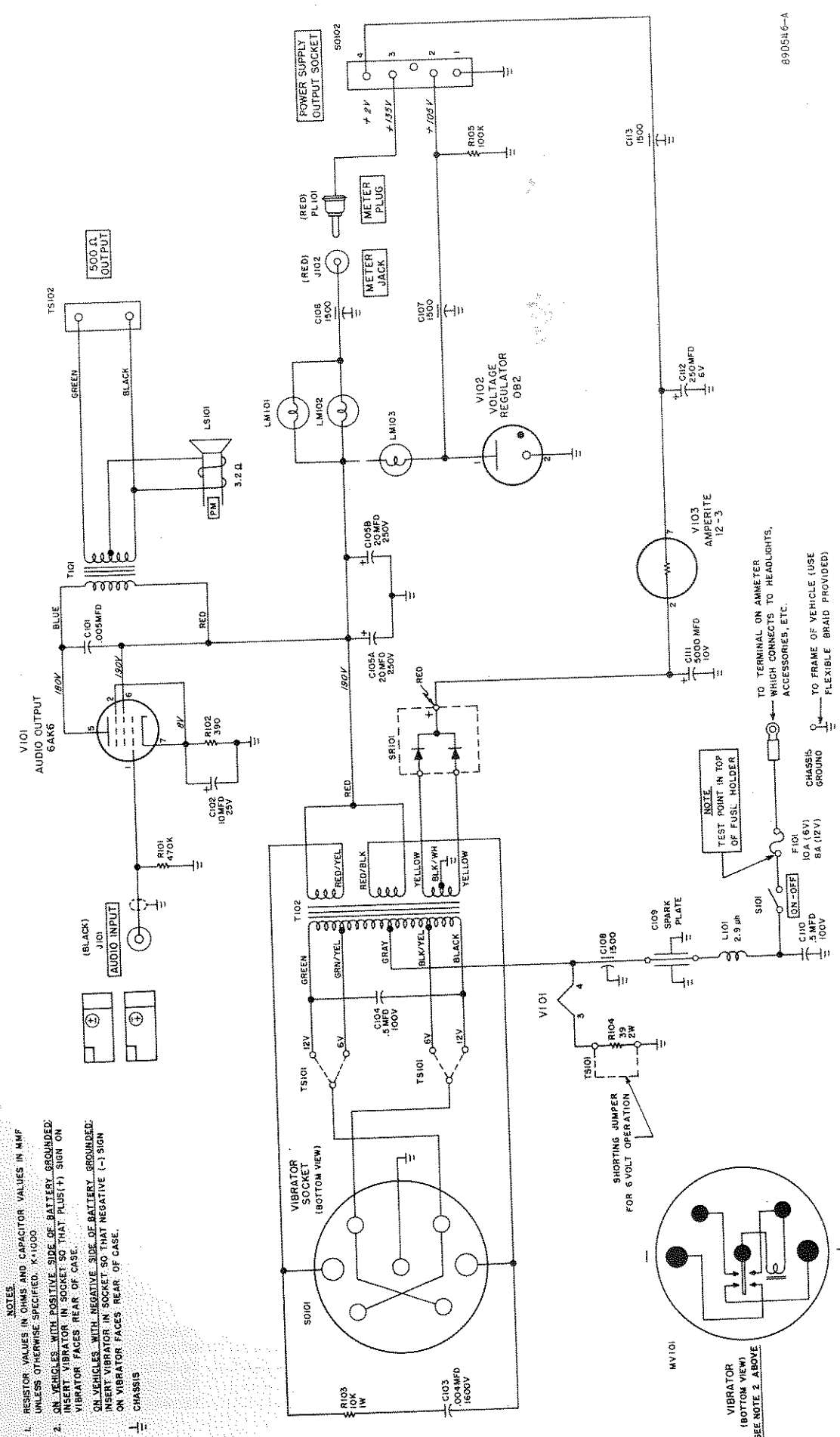
Schematic Symbol	Description	Hallicrafters Part Number	Cross Reference
CAPACITORS			
C-101	.005 mfd. 450 V., ceramic disc	47A188	174-0020-00
C-102	10 mfd. 25 V., electrolytic	45A121	-----
C-103	.004 mfd. 1600 V., oil filled tubular	46A195	-----
C-104, 110	.5 mfd. 100 V., tubular	46A196	173-0005-00
C-105	20-20 mfd. 250 V., electrolytic	45A202	170-0002-00
C-106, 107, 108, 113	.0015 mfd. 500 V., ceramic feed-thru.	47B382	-----
C-109	Spark plate (see Miscellaneous Parts for part numbers of mica insulators)	-----	-----
C-111	5000 mfd. 10 V., electrolytic	45B205	P-4788
C-112	250 mfd. 6 V., electrolytic	45A201	-----
RESISTORS			
R-101	470,000 ohms 10%, 1/2 watt; carbon	23X20X474K	-----
R-102	390 ohms 10%, 1/2 watt; carbon	23X20X391K	-----
R-103	10,000 ohms 10%, 1 watt; carbon	23X30X103K	-----
R-104	39 ohms 10%, 2 watt; carbon	23X40X390K	-----
R-105	100,000 ohms 10%, 1/2 watt; carbon	23X20X104K	160-0136-00
COILS AND TRANSFORMERS			
L-101	Choke, RF; 2.9 uh, 12 amps	53A261	-----
T-101	Transformer, audio output (part of speaker LS-101)	-----	-----
T-102	Transformer, vibrator	52C254	-----
PLUGS AND SOCKETS			
J-101	Jack, audio input; black	6A479	-----
J-102	Jack, meter; red	6A424	141-0001-00
PL-101	Plug, meter; red	35A023	144-0001-00
	Socket, lamp	86A148	-----
SO-102	Socket, power supply output; 4 pin	6A426	P-4756-1
	Socket, tube; miniature 7 pin	6A483	-----
	Socket, tube; octal	6B296	-----
SO-101	Socket, vibrator	6A084	-----
TUBES AND RECTIFIERS			
V-101	6AK6; audio output	90X6AK6	-----
V-102	OB2; voltage regulator	90X0B2	-----
V-103	12-3; current regulator	90X12-3	-----
SR-101	Rectifier, selenium; dual section @ 1.5 amps	27B188	-----
MISCELLANEOUS PARTS			
	Bottom compartment of case	66C917	-----
	Button plug	17A123	123-0006-00
	Clip, vibrator mtg.	76B1087	-----
	Fastener, spring; female (for locking case in mtg. bkt.)	76B1095	-----
F-101	Fuse, 10 amp 250 V.; type 3AG (for 6 volt operation)	39A380	-----
F-101	Fuse, 8 amp. 250 V.; type 3AG (for 12 volt operation)	39A365	-----
	Grommet, rubber; 3/16" id x 7/16" od	16A012	-----
	Grommet, rubber; 5/32" id x 7/16" od (for power lead)	16A018	-----
	Grommet, rubber: (for remote sprk. lead opening)	16A050	-----
	Holder, fuse	6A451	-----
	Insulator, mica; 2-1/16" x 1-3/4" (part of spark plate C-109)	8A2146	-----
	Insulator, mica; 1-11/16" x 1-11/16" (part of spark plate C-109)	8A2147	-----
	Jewel	86A140	-----
LM-101, 102, 103	Lamp, type 6S6-115; 6 watt, 115 volt; candelabra base	39A002	-----
	Latch, case (lower section)	30A249	P-4276-2
	Microphone holder	41X23047	-----
LS-101	Speaker, 4-inch PM; includes output transformer T-101	85C149	-----
S-101	Switch, on-off; spst toggle	60A484	138-0001-00
MV-101	Vibrator (6 volt)	27B187	-----
MV-101	Vibrator (12 volt)	27B108	-----
MOUNTING BRACKET PARTS			
	Bumper, rubber	16A339	-----
	Mounting bracket	67D1936	-----
	Pin (for wing-head fastener)	74A601	-----
	Retainer, spring	76A1090	-----
	Wing-head fastener (less pin)	73A844	-----

MODEL HT-26

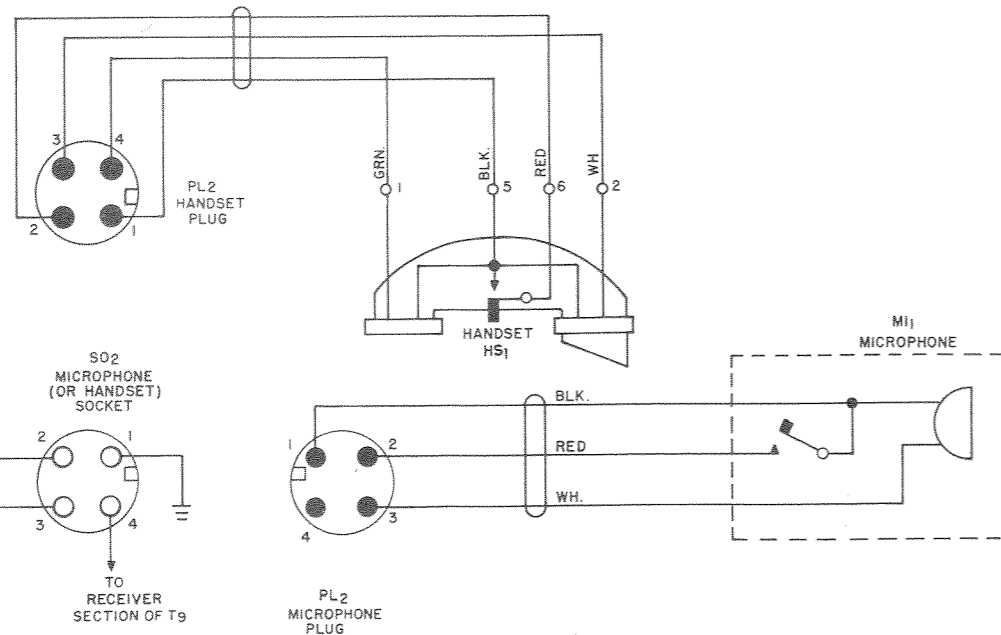
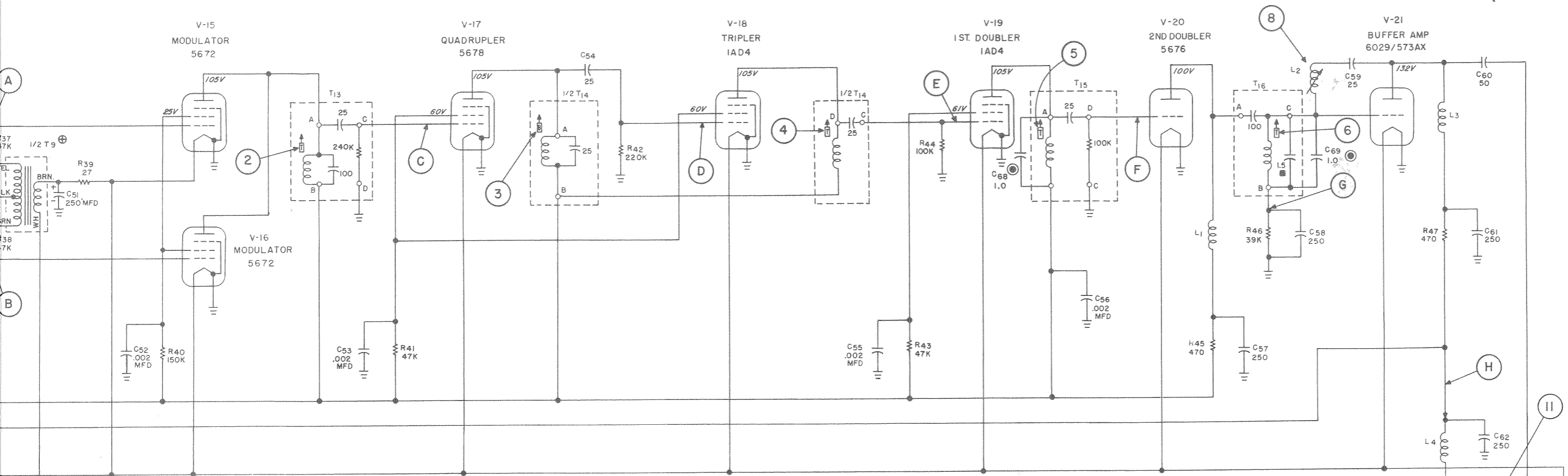
RUN 1

(POWER SUPPLY & AUDIO OUTPUT)

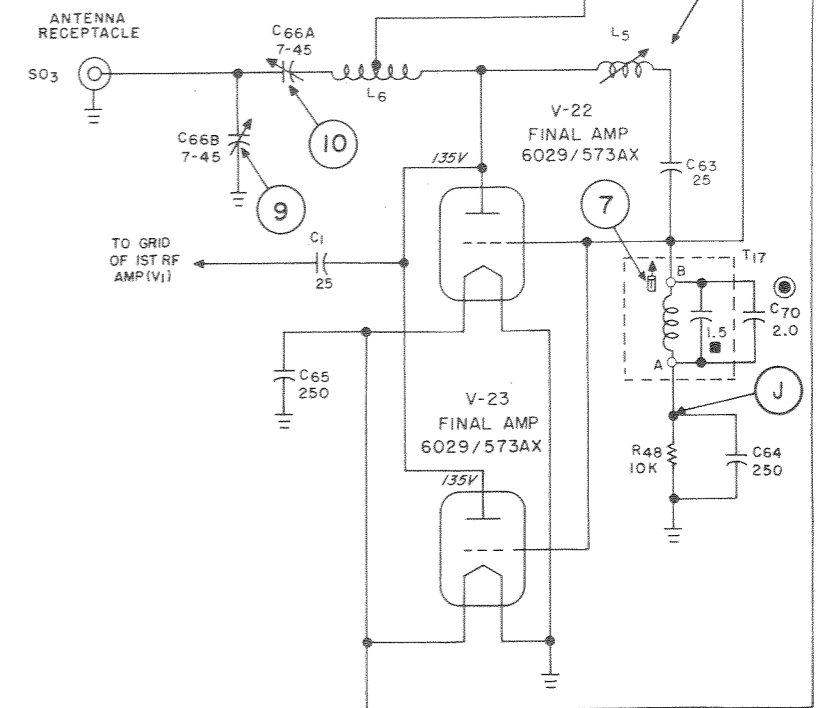
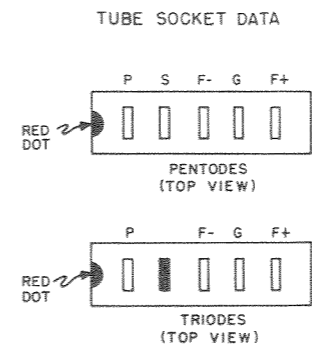
- NOTES**
1. RESISTOR VALUES IN OHMS AND CAPACITOR VALUES IN MUF UNLESS OTHERWISE SPECIFIED. K=1000.
 2. ON VEHICLES WITH POSITIVE SIDE OF BATTERY GROUNDED, INSERT VIBRATOR IN SOCKET SO THAT PLUS(+) SIGN ON VIBRATOR FACES REAR OF CASE.
 3. ON VEHICLES WITH NEGATIVE SIDE OF BATTERY GROUNDED, INSERT VIBRATOR IN SOCKET SO THAT NEGATIVE (-) SIGN ON VIBRATOR FACES REAR OF CASE.



VALUES AND TOLERANCES SHOWN ARE NOMINAL AND VARIATIONS MAY BE FOUND. IT IS RECOMMENDED THAT THE VALUE OF ANY REPLACEMENT CORRESPOND TO THE NOMINAL VALUE OF THE PART BEING REPLACED.

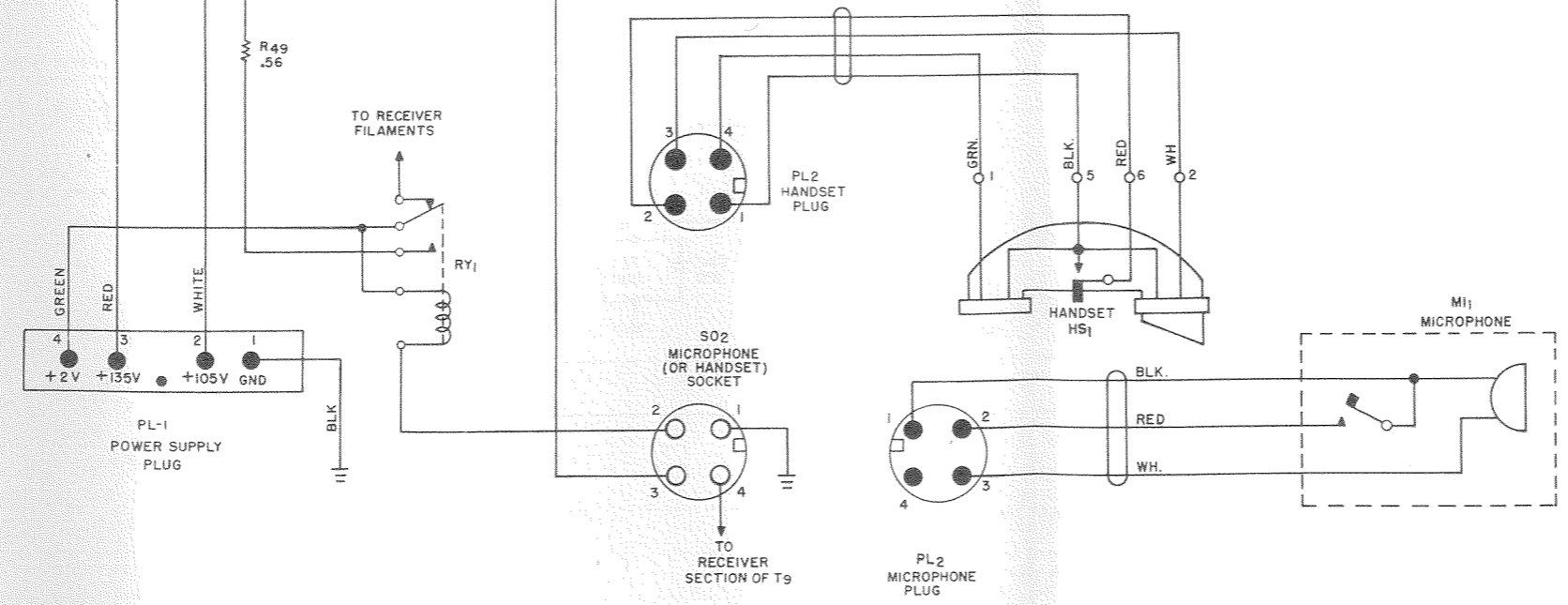
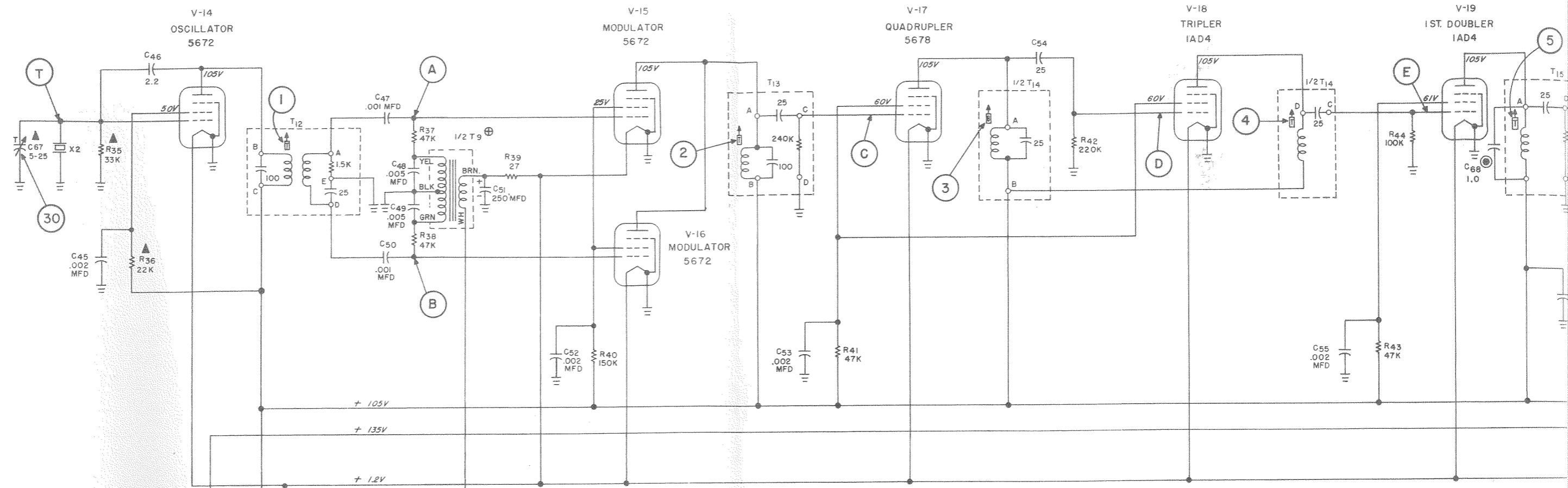


- NOTES**
- RESISTOR VALUES ARE IN OHMS AND CAPACITOR VALUES IN MMF UNLESS OTHERWISE SPECIFIED.
 - K=1000
 - TERMINAL A ON ALL TRANSFORMERS IS MARKED WITH RED DOT. PINS B,C ETC. FOLLOW IN A CLOCKWISE DIRECTION.
 - ⊕ THE OTHER SECTION OF T9 SERVES AS THE AUDIO OUTPUT TRANSFORMER IN THE RECEIVER. SEE RECEIVER SCHEMATIC DIAGRAM.
 - USED ONLY FROM 144 TO 159 MC.
 - ▲ ON MODELS WITH JAMES KNIGHT TYPE H17 CRYSTAL, C67 IS DELETED, AND R35 AND R36 ARE 100K. SEE "CRYSTAL TYPES" ON PAGE 12.
 - ↑ TOP SLUG
 - ↓ BOTTOM SLUG
 - USED ONLY FROM 144 TO 152 MC.

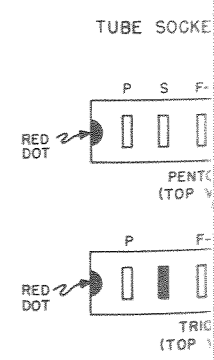


VALUES AND TOLERANCES SHOWN ARE NOMINAL AND VARIATIONS MAY BE FOUND. IT IS RECOMMENDED THAT THE VALUE OF ANY REPLACEMENT CORRESPOND TO THE NOMINAL VALUE OF THE PART BEING REPLACED.

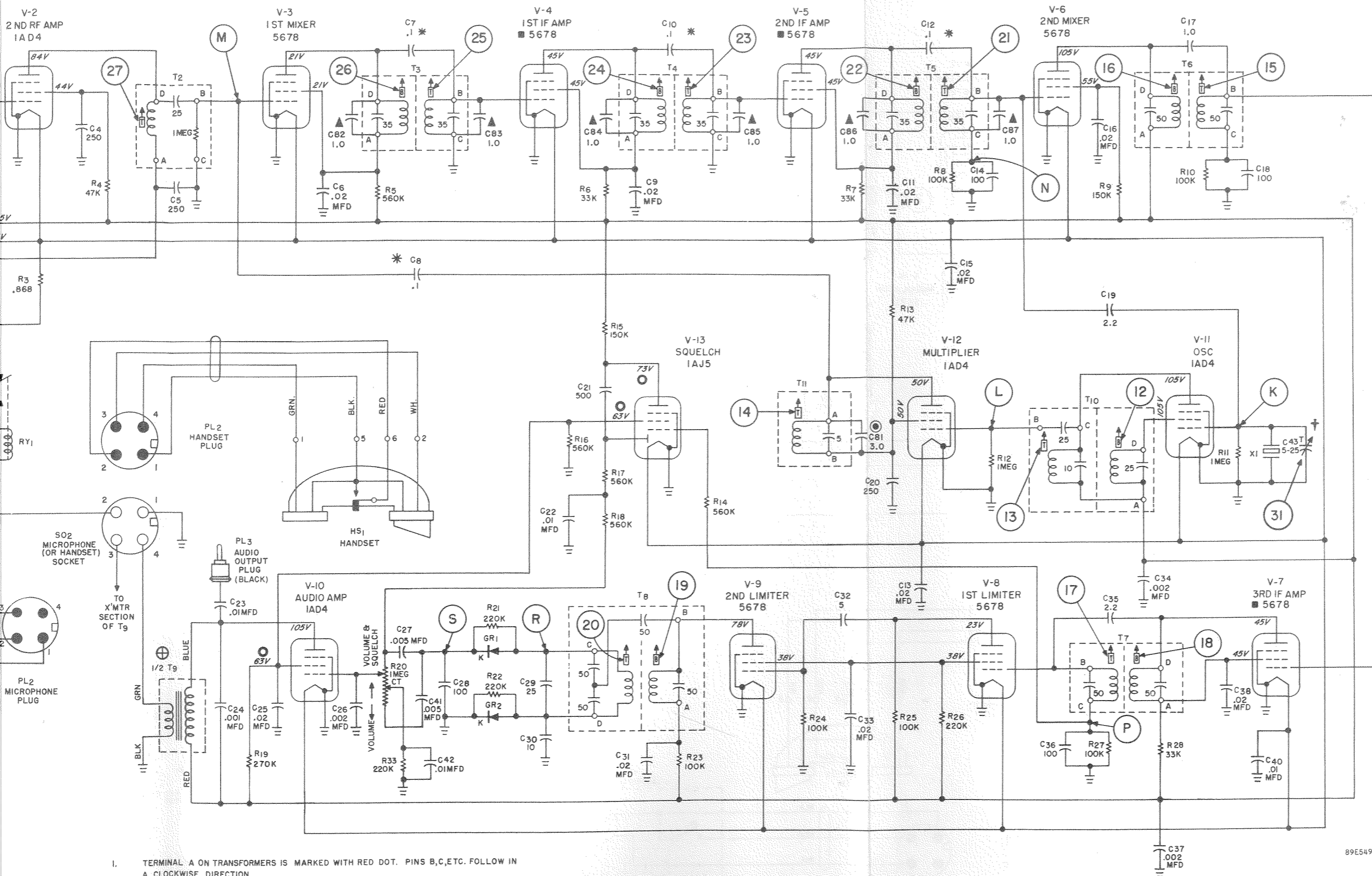
OF THE PART BEING REPLACED.



- NOTES**
1. RESISTOR VALUES ARE IN OHMS AND CAPACITOR VALUES IN MMF UNLESS OTHERWISE SPECIFIED.
 2. K=1000
 3. TERMINAL A ON ALL TRANSFORMERS IS MARKED WITH RED DOT. PINS B,C ETC. FOLLOW IN A CLOCKWISE DIRECTION.
- ⊕ THE OTHER SECTION OF T9 SERVES AS THE AUDIO OUTPUT TRANSFORMER IN THE RECEIVER. SEE RECEIVER SCHEMATIC DIAGRAM.
- USED ONLY FROM 144 TO 159 MC.
- ▲ ON MODELS WITH JAMES KNIGHT TYPE H17 CRYSTAL, C67 IS DELETED, AND R35 AND R36 ARE 100K. SEE "CRYSTAL TYPES" ON PAGE 12.
- ↑ TOP SLUG
- ↓ BOTTOM SLUG
- USED ONLY FROM 144 TO 152 MC.



VALUES AND TOLERANCES MAY BE FOUND IN ANY REPLACEMENT OF THE PART BEING



1. TERMINAL A ON TRANSFORMERS IS MARKED WITH RED DOT. PINS B,C,ETC. FOLLOW IN A CLOCKWISE DIRECTION.
2. RESISTOR VALUES ARE IN OHMS AND CAPACITOR VALUES IN MMF UNLESS OTHERWISE SPECIFIED.
3. K=1000
- * GIMMICK
- ⊕ THE OTHER SECTION OF T9 SERVES AS A MODULATION TRANSFORMER IN THE TRANSMITTER. SEE TRANSMITTER SCHEMATIC DIAGRAM.
- WITH VOLUME/SQUELCH CONTROL SET FULLY CLOCKWISE.
- ▲ USED ONLY FROM 144 TO 145 MC.
- USED ONLY FROM 144 TO 152 MC.

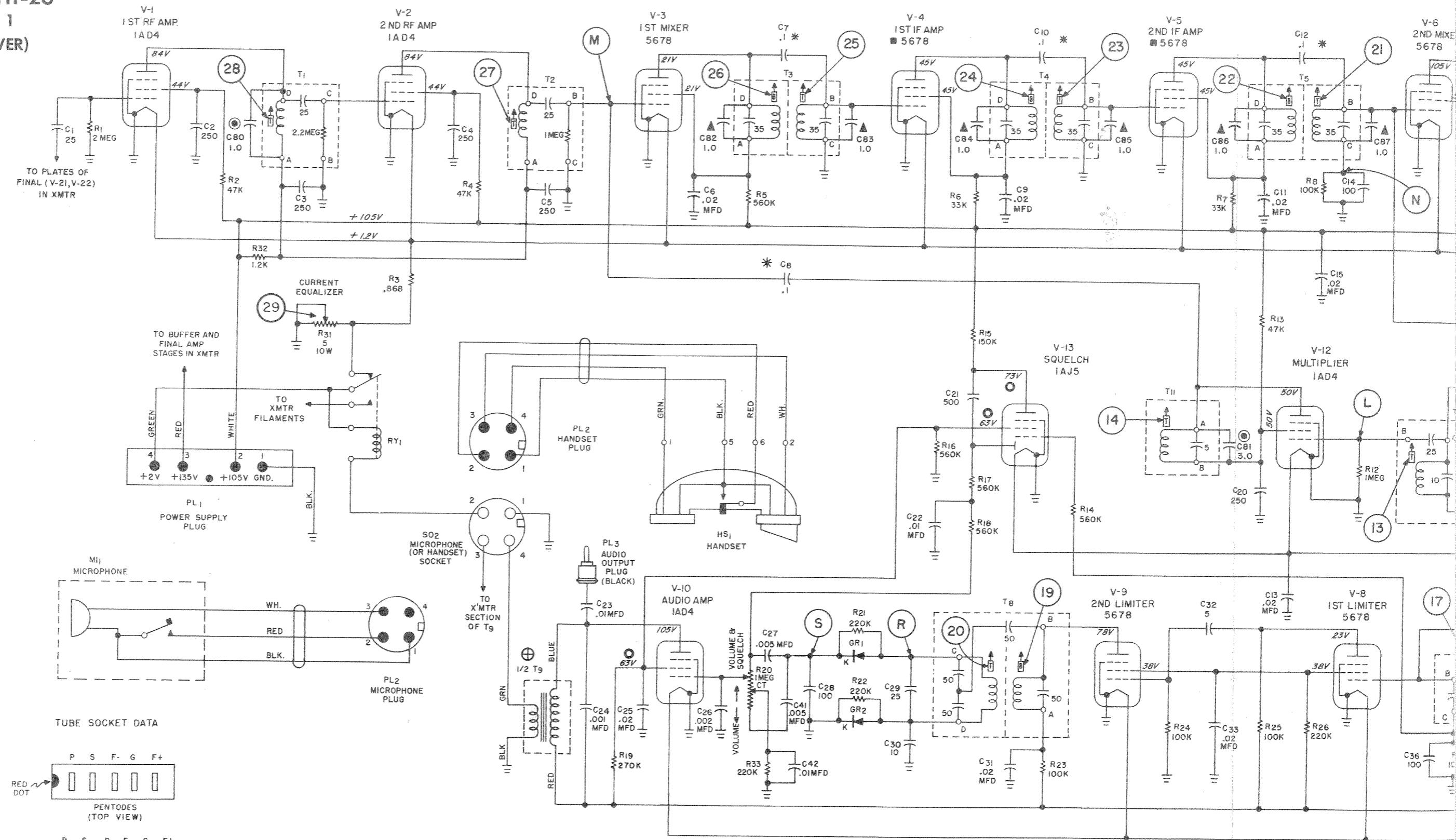
† C43 NOT USED ON MODELS WITH JAMES KNIGHT TYPE H-17 CRYSTAL.

■ NOTE: ON SOME SETS, TYPE 2E32 TUBES WERE SUBSTITUTED FOR TYPE 5678 FOR V-4, V-5, AND V-7. WHEN MAKING REPLACEMENT ON THESE SETS, EITHER TUBE TYPE MAY BE USED. IF POSSIBLE USE THE SAME TUBE TYPE FOUND IN THE SET. WHEN REPLACING TYPE 2E32 WITH TYPE 5678, IT MAY BE NECESSARY TO SLIGHTLY LOOSEN THE COUPLING OF THE GIMMICK CAPACITOR IN THE PLATE CIRCUIT OF THE TUBE BEING REPLACED TO PREVENT OSCILLATION CAUSED BY THE SLIGHTLY HIGHER GAIN OF TYPE 5678. DO NOT USE TYPE 2E32 TO REPLACE TYPE 5678.

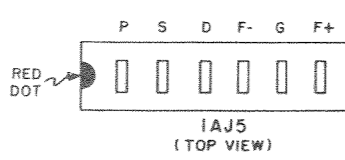
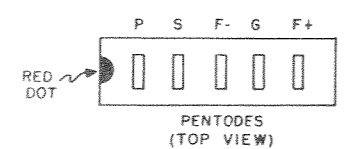
1ST IF = XTAL FREQ - 1.7 MC
2ND IF = 1.7 MC

MODEL HT-26

RUN 1 (RECEIVER)



TUBE SOCKET DATA



VALUES AND TOLERANCES SHOWN ARE NOMINAL AND VARIATIONS MAY BE FOUND. IT IS RECOMMENDED THAT THE VALUE OF ANY REPLACEMENT CORRESPOND TO THE NOMINAL VALUE OF THE PART BEING REPLACED.

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- * GIMMICK
- ⊕ THE OTHER SECTION OF T9 SERVES AS A MODULATION TRANSFORMER IN THE TRANSMITTER. SEE TRANSMITTER SCHEMATIC DIAGRAM.
- WITH VOLUME/SQUELCH CONTROL SET FULLY CLOCKWISE.
- ▲ USED ONLY FROM 144 TO 145 MC.
- USED ONLY FROM 144 TO 152 MC.

⚡ C43 NOT USED ON MODELS WITH JAMES KNIGHT TYPE H-17 CRYSTAL.

■ NOTE: ON SOME SETS, TYPE 2E32 TUBES WERE SUBSTITUTED FOR TYPE 5678 FOR V-4, V-5, AND V-7. WHEN MAKING REPLACEMENT ON THESE SETS, EITHER TUBE TYPE MAY BE USED. IF POSSIBLE USE THE SAME TUBE TYPE FOUND IN THE SET. WHEN REPLACING TYPE 2E32 WITH TYPE 5678, IT MAY BE NECESSARY TO SLIGHTLY LOOSEN THE COUPLING OF THE GIMMICK CAPACITOR IN THE PLATE CIRCUIT OF THE TUBE BEING REPLACED TO PREVENT OSCILLATION CAUSED BY THE SLIGHTLY HIGHER GAIN OF TYPE 5678. DO NOT USE TYPE 2E32 TO REPLACE TYPE 5678.

NOTES

Warranty

"The Hallicrafter's Company warrants each new radio product manufactured by it to be free from defective material and workmanship and agrees to remedy any such defect or to furnish a new part in exchange for any part of any unit of its manufacture which under normal installation, use and service discloses such defect, provided the unit is delivered by the owner to our authorized radio dealer, wholesaler, from whom purchased, or, authorized service center, intact, for examination, with all transportation charges prepaid within ninety days from the date of sale to original purchaser and provided that such examination discloses in our judgment that it is thus defective.

This warranty does not extend to any of our radio products which have been subjected to misuse, neglect, accident, incorrect wiring not our own, improper installation, or to use in violation of instructions furnished by us, nor extend to units which have been repaired or altered outside of our factory or authorized service center, nor to cases where the serial number thereof has been removed, defaced or changed, nor to accessories used therewith not of our own manufacture.

Any part of a unit approved for remedy or exchange hereunder will be remedied or exchanged by the authorized radio dealer or wholesaler without charge to the owner.

This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our radio products."

Form No. 94X622

the Hallicrafters co.