INSTRUCTION MANUAL
for
MODEL GT 550A
TRANSCEIVER

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SECTION I

GENERAL DESCRIPTION

1.1 INTRODUCTION

The Hy–Gain Model GT–550A Galaxy Transceiver is a compact, high performance amateur transceiver of advanced hybrid design. An optimum combination of tubes, transistors and semi–conductors in a single conversion with premixed crystal oscillator heterodyning system provides for the transmission and reception of single sideband (SSB) and continuous wave (CW) code signals in the 80, 40, 20, 15 and 10 meter amateur bands.

With the Model AC–400 Power Supply (fixed station) or G–1000 DC Power Supply (mobile) and an antenna, key or microphone, the equipment represents a complete desk top or mobile amateur station.

A desirable feature of the Model GT–550A is the Automatic Level Control (ALC) which functions in the transmit mode. The ALC circuit prevents splatter due to flat–topping of the final amplifier by providing about 10–15 DB of compression at the point when distortion begins to occur.

Other desirable features of the Model GT–550A Transceiver in–clude:

( ) Choice of VOX or PTT control for SSB operation and a choice of manual or automatic break–in control for CW operation. (When VOX–35C Accessory has been installed.)

( ) Provision for sharp selectivity audio filter for CW reception. 300 CPS Bandwidth at 6 DB (F3 Filter Accessory).

( ) Upper and lower sideband operation with common suppressed carrier frequency on all bands.

( ) Smooth ball driven tuning mechanism with five kilocycle read out display.

( ) An accurately calibrated VFO with excellent mechanical and temperature stability.

( ) Constant tuning rate on all bands.

( ) Crystal lattice 9.0 MHz filter with 6 poles for optimum sel–ectivity and single sideband response.

( ) Product detector with crystal controlled beat frequency os–cillator injection for maximum stability.

( ) Keyed sidetone for monitoring CW transmissions.

( ) Excellent cross modulation and overload characteristics of–fered by audio derived AGC system.

( ) "S" meter for receiver and plate current metering for trans–mitter tuning and operating convenience.

( ) Optional 25 KHz crystal calibrator for exact dial calibration. (Cal 250 Accessory)

1.2 TVI (TELEVISION INTERFERENCE) SUPPRESSION

The Model GT–550A Transceiver has been designed and con-structed to suppress spurious radiation that may cause televisio interference. The TVI problem was given full consideration i the design and layout of the chassis. Components have bee specifically selected to avoid undesired resonances and arrange to prevent parasitic oscillation.

There are, however, some types of TVI that cannot be prevente within the transmitter itself. This is particularly true in fring reception areas. In such cases, a good commercial low–pas filter connected at the transceiver antenna connector is recom-mended. For a more complete discussion of measures that ma be used to handle special problems of this type, refer to th "Radio Amateur's Handbook" published by the American Radi Relay League.

IMPORTANT

Do not attempt to operate the Model GT–550A equipmen before becoming completely familiar with the instructions contained within this manual.

1.3 TECHNICAL SPECIFICATIONS

TUBES AND FUNCTIONS

V1	12BZ6	Receiver RF Amplifie
V2	6HG8	Receiver Mixe
V3	6EW6	IF Amplifie
V4	12BA6	IF Amplifier
V5	6GX6	Product Detector and carrier oscillato
V6	6KE8	Premixer
V7	12AT7	Balanced Modulato
V8	6EJ7	Transmit Mixe
V9	6GK6	Transmit Driver
V10	6LB6	Transmit Power Amplifier
V11	6LB6	Transmit Power Amplifier
V12	OA2	Voltage Regulato

TRANSISTORS AND FUNCTIONS

Q1, Q2	12 Volt Regulator
Q3	Convertor Oscillator
Q4, Q5, Q6, Q7	Receiver Audio Amplifier
Q8, Q17, Q18	Receiver AVC Amplifier
Q9, Q10	Microphone Preamps
Q11	Side Tone Oscillator
Q12	VFO Oscillator
Q13, Q14, Q15	VFO Amplifiers and Buffer
Q16	Balanced Modulator Injection.

ELECTRICAL AND MECHANICAL

CONTROL CONNECTOR DATA

Front Panel --

MIC connector – 3/16'' dia 3 conductor phone plug, Switch Craft 6–260.

Rear Cabinet

KEY jack – Standard 1/4 inch two conductor phone plug.

ANTENNA connector – MIL No. PL–259 (49190) UHF series.

SPEAKER connector – Standard RCA type phone plug.

POWER connector – Cinch–Jones type S–312–CCTL (12 pin plug)

ACCESSORY connector – Amphenol type 86–PM8 (8–pin plug).

Power Supply Requirements

Model AC400 for 115/230V 50–60 Hz AC fixed station operation.

Model G–1000 for 12 VDC mobile operation.

Construction

Light weight aluminum chassis with rugged steel case.

Dimensions (HWD)

6'' x 11 1/4'' x 12 1/2''

Net Weight

16 pounds

Shipping Weight

18 pounds

TRANSMITTER

Power Input

SSB – 550 watts PEP.

CW – 400 watts maximum. (50% duty cycle)

Output Impedance

50 ohms nominal. Adjustable, 30 to 100 ohms essentially non–reactive.

Type of Sideband Generation

Balanced modulator with 9.0 MHz, 6 pole crystal filter, (Nominal 6 DB BW 2.1 KHz)

Microphone Input

High impedance. Input sensitivity of 5 millivolts RMS or less for PEP output.

Audio Response Overall

300 to 2400 Hz (6 DB).

GENERAL

Tuning Range (Full frequency coverage of the amateur bands in six ranges as follows:

80M	3.5 to 4.0 MC
40M	7.0 to 7.5 MC
20M	14.0 to 14.5 MC
15M	21.0 to 21.5 MC
10M	28.0 to 28.5 MC
10M	28.5 to 29.0 MC

Infomation for extended 10M coverage (29.0 to 29.5) available on request.

Convertor Oscillator Crystals (Type CR-18A/U in HC-6 holder.)

Band	Frequency
7.0	21.500 MHz
14.0	28.500 MHz
21.0	35.500 MHz
28.0	42.500 MHz
28.5	43.000 MHz

Types of Emmission

SSB – Selectable USB/LSB with suppressed carrier.

CW – Keyed RF carrier.

Frequency Control

Self–contained VFO for transmit and receive modes. Separate transmitter–receiver frequency control available with Model RV–550A Remote VFO.

Transmission Control

Single Sideband Operation:

PTT – Manual (Push–to–talk)

VOX – Voice control (with VOX–35C installed)

CW Operation:

Manual (without VOX–35C)

Semi-automatic break–in (with VOX–35C)

Dial Calibration

Five KHz increments, 500 KHz tuning range.

Calibration Accuracy

Less than 5 KHz error across the dial after indexing at high frequency end of dial. Band to band calibration error less than 5 KHz.

Provision for internal 25 KHz crystal controlled calibrator, Model CAL 250.

Frequency Stability

Less than 250 Hertz drift in first hour, after a fifteen minute warm–up, and less than 100 Hertz per 15 minutes thereafter.

Tube and Semi–conductor Complement

11 tubes plus one voltage regulator, 18 transistors and 12 diodes.

Distortion Products.

Odd order distortion products 30 DB below peak output.

Unwanted Sideband Rejection

55 DB below desired output at 300 to 2400 Hz. input.

Carrier Suppression Capability

In excess of 45 DB below PEP output.

Spurious Emission

50 DB or more below PEP output.

CW Side Tone

1000 HZ nominal.

RECEIVER

Antenna Input Impedance

50 ohms nominal

Audio Output Impedance

3.2 ohms

Sensitivity

0.5 microvolt or less for 10 DB signal to noise ratio

Audio Output

Four watts with less than 10% distortion. (3.2 ohm load)

Conversion System

Pre–mixed crystal oscillators and 5 MHz VFO with 9 MHz IF (with crystal lattice filter).

Crystal Lattice Filter

Six pole, symmetrical passband. Center frequency 9.00 MHz

B/W 2.1 KC (6 DB). B/W 3.8 KC (60 DB).

AVC Figure of Merit

60 DB or more RF input change for less than 10 DB change in audio output.

In Band Tweets

Less than one microvolt equivalent CW signal.
(Except 21.2 MHz cross over)

IF Rejection.

Better than 50 DB at all frequencies.

Image and Spurious Rejection

Better than 40 DB.

SECTION II

ACCESSORIES

2.1 MODEL AC–400 POWER SUPPLY

The Model AC–400 is a heavy duty solid state supply for full operation of the GT–550A on SSB or CW. Operating input voltage is 115/230 VAC, 50/60 Hz, switch selected.

The AC-400 Power Supply can be placed inside the SC-550A speaker console by removing the bottom plate and securing the chassis to the console cabinet using the holes provided.

2.2 MODEL G–1000 DC POWER SUPPLY

The Model G–1000 DC Power Supply provides all operating voltages for mobile operation at full power SSB from a nominal 12–14 VDC/50 amp source. The supply is for negative ground systems only. It is furnished complete with primary and secondary cables.

2.3 SC–550A SPEAKER CONSOLE

The Model SC550A is a matching speaker with headphone jack for the GT–550A Transceiver. Space is provided inside the cabinet for the AC–400 Power Supply.

2.4 MODEL RV–550A REMOVE VFO

A solid state VFO, like that in the transceiver, complete with plug–in cables. The function switch selects independant remote control of receive–transceiver–transmit frequency. Complete station flexibility equal to a seperate receiver–transmitter is possible with the RV–550A.

2.5 RF–550A RF CONSOLE

The RF–550A contains a precision wattmeter with high accuracy in the range of 3.5 – 30.0 MHz. Calibrated scales are 400 and 4,000 watts full scale, switch selected for forward or reflected power. It also contains a switch to select 5 antennas plus a dummy load (not supplied). All unused connections are grounded when not in use.

2.6 VOX–35C VOICE CONTROL SYSTEM

The VOX–35C accessory is a completely solid state plug in voice control for the GT–550A transceiver. Three controls provide adjustable settings for "VOX Gain", "Anti–VOX Gain" and "Tim

Delay". All the controls are externally adjustable from outside the top cover of the GT–550A.

2.7 CAL–250 CALIBRATOR ACCESSORY

The CAL–250 accessory provides 25 KHz markers throughout the operating range of the GT–550A. It plugs into the internal provided calibrator socket and is controlled by the front panel FUNCTION switch of the GT–550A.

2.8 F3 CW FILTER

The F3 CW Filter accessory is a plug in 300 Hz audio filter for the GT–550A transceiver. It is external to the transceiver and is supplied complete with all inter–connecting cables.

2.9 PR–550 PHONE PATCH ACCESSORY

The PR–550 Phone Patch provides inter–connection of the GT–550A to any nominal 600 to 900 ohm balanced telephone circuit for phone patching. It is a hybrid circuit for voice control operation. The front panel function switch of the phone patch also selects and routes audio to an optional tape recorder to play back or record from the telephone line or the transceiver. Front controls are provided on the PR–550 for receive – transmit audio levels into and from the phone line.

SECTION III
INSTALLATION

3.1 UNPACKING

Carefully remove the equipment from its carton and packing material and examine it carefully for possible damage that may have occurred in transit. Remove the screws holding the top and bottom of the cabinet and inspect closely for any signs of internal damage. Carefully remove all tape and check to insure all tubes, crystals and transistors are seated in their sockets.

If the equipment has been damaged, file a claim immediately with the carrier, stating the extent of damage. The responsibility in obtaining reimbursement for damage rests with you. Our warranty in no way covers malfunction or damage which is a result of improper handling by a carrier. Under no circumstances should you return equipment to your dealer before instigating the necessary forms. To do so can jeopardize your investment.

Fill out the Warranty Card and mail it now to insure your warranty will be on file.

Save the packing material and carton. You may need it at a later date for shipment or storage of the equipment.

After inspection, reinstall the top and bottom cabinet covers.

3.2 LOCATION

The Model GT–550A Transceiver and Model SC–550A Speaker Console are, for operating convenience, designed to be placed side by side. The Model AC–400 Power Supply can be placed inside the SC–550A, but the bottom plate and screws must be re–removed from the AC–400.

It is important that the transceiver be placed in a position that provides good circulation of air around the sides and top of the unit. Do not place any objects on top of the cabinet which would obstruct the normal flow of cooling air.

The Model G–1000 DC Power Supply (mobile operation), is designed for engine compartment mounting close to the battery.

3.3 ANTENNA

The Model GT–550A Transceiver is designed for nominal 50–ohm unbalanced transmission lines.

While a non–reactive 50–ohm load is preferred, an antenna that has a resistive impedance from 30 to 100–ohms can be used with the GT–550A. For best results, the VSWR should be kept to a minimum, 2 : 1 maximum or 10% reflected power. Most of the popular doublet or beam antennas using 50–ohm transmission lines will give excellent results.

If the antenna system is "balanced", such as a dipole, doublet or most beam antennas, the installation of a balun transformer is recommended. A balun will couple the 50–ohm unbalanced coaxial cable feedline to the 50–ohm balanced antenna and insure there is a minimum of RF on the braid of the cable.

For more information on the subject of antennas, refer to the "Radio Amateur's Handbook" or the "ARRL Antenna Book", both published by the American Radio Relay League.

The antenna connection provided at the rear of the transceiver is a MIL No. SO–239. For connection of your feedline a MIL No. PL–259 plug is required.

CAUTION

Never operate the transmitter without a matched antenna or 50–ohm dummy load. Light bulbs do not present a constant load impedance. Damage to the tubes and Pi–network components is possible if operated unloaded. Do not operate into an antenna system having a high VSWR on its transmission line.

3.4 GROUNDS

Station equipment that is left unbonded between units or between the equipment and earth ground may assume potential differences that present a shock hazard. Therefore, it is recommended that

the Model GT–550A be connected to a good earth ground. An external chassis ground terminal is provided on the rear chassis for this purpose. A ground lead of No. 14 wire or braid is recommended.

3.5 ACCESSORY CONNECTOR

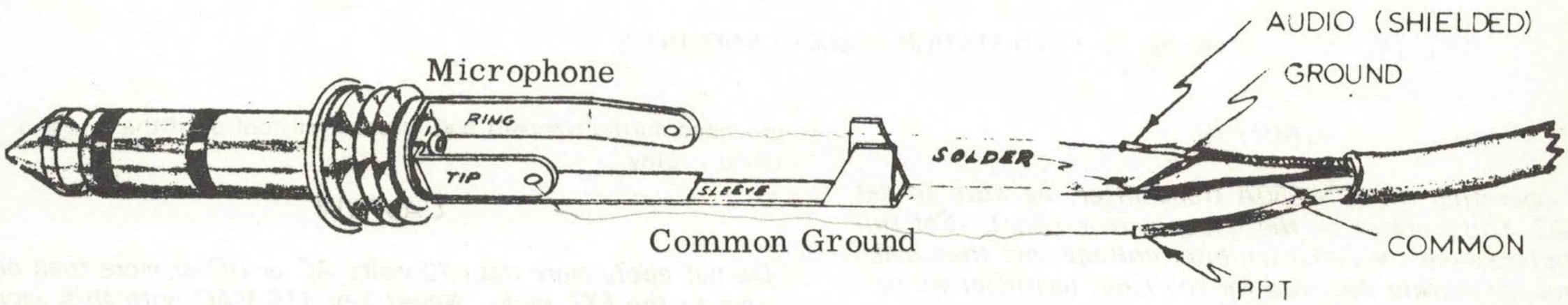
As shipped from the factory, the EXT VFO (J1) will have a jumper plug installed to permit normal operation of the transceiver. Do not remove this plug unless the RV–550A Remote VFO or XO–550 Crystal Adapter accessories are used.

3.6 MICROPHONE REQUIREMENTS

The microphone jack is located on the front panel. The microphone cable must be fitted with a 3/16" diameter 2 circuit phone plug, such as Switchcraft S–260 or equivalent.

The microphone input is high impedance. Any good crystal, ceramic, or dynamic microphone can be used. A flat frequency response microphone is preferred for "natural" sounding transmissions.

The best VOX (voice control) operation will be realized using a cardiod pattern microphone. The directional pattern reduces reverberation, echoes, and noise pick up and allows higher volume level from the station speaker.



MICROPHONE CONNECTION

NOTE

Some mikes have a PTT switch wired so the microphone element is shorted out when the PTT switch is in the OFF condition. When using this type of microphone for VOX operation the SHORT must be eliminated or the VOX will not operate.

3.7 KEY CONNECTION

The station telegraph key or keyer connects to the transceiver at the KEY jack location on the rear chassis. The KEY jack accepts a standard 1/4" phone plug.

NOTE

The key circuit must be closed for normal operation in the TUNE or SSB modes. Therefore, always close the shorting switch on the key when not in use.

3.8 HEADPHONE CONNECTION

Headphone reception may be had by plugging low impedance headphones into the PHONE jack location on the front panel of the SC–550A Speaker Console. A standard 1/4" plug is required.

The speaker is disabled when headphones are in use.

3.9 SPEAKER REQUIREMENT

The audio output from the Model GT–550A requires a 3.2 ohm speaker. The speaker connection is an RCA phone jack on the rear chassis. The Model SC–550A is recommended. The SC–550A matches the GT–550A styling and will also house the AC–400 power supply.

3.10 FIXED STATION INSTALLATION

The Model GT–550A may be operated with or without a linear amplifier.

The AC–400 Power Supply or an equivalent power supply is required to operate the GT–550A from 115/230 volts 50/60 cycle AC. Connect the 12 pin power plug from the power supply to the POWER receptacle at the rear of the transceiver.

With the antenna system and ground wire connected, the key or microphone plugged in, a speaker plugged in, and the line cord connected to a wall outlet, the station is ready for operation.

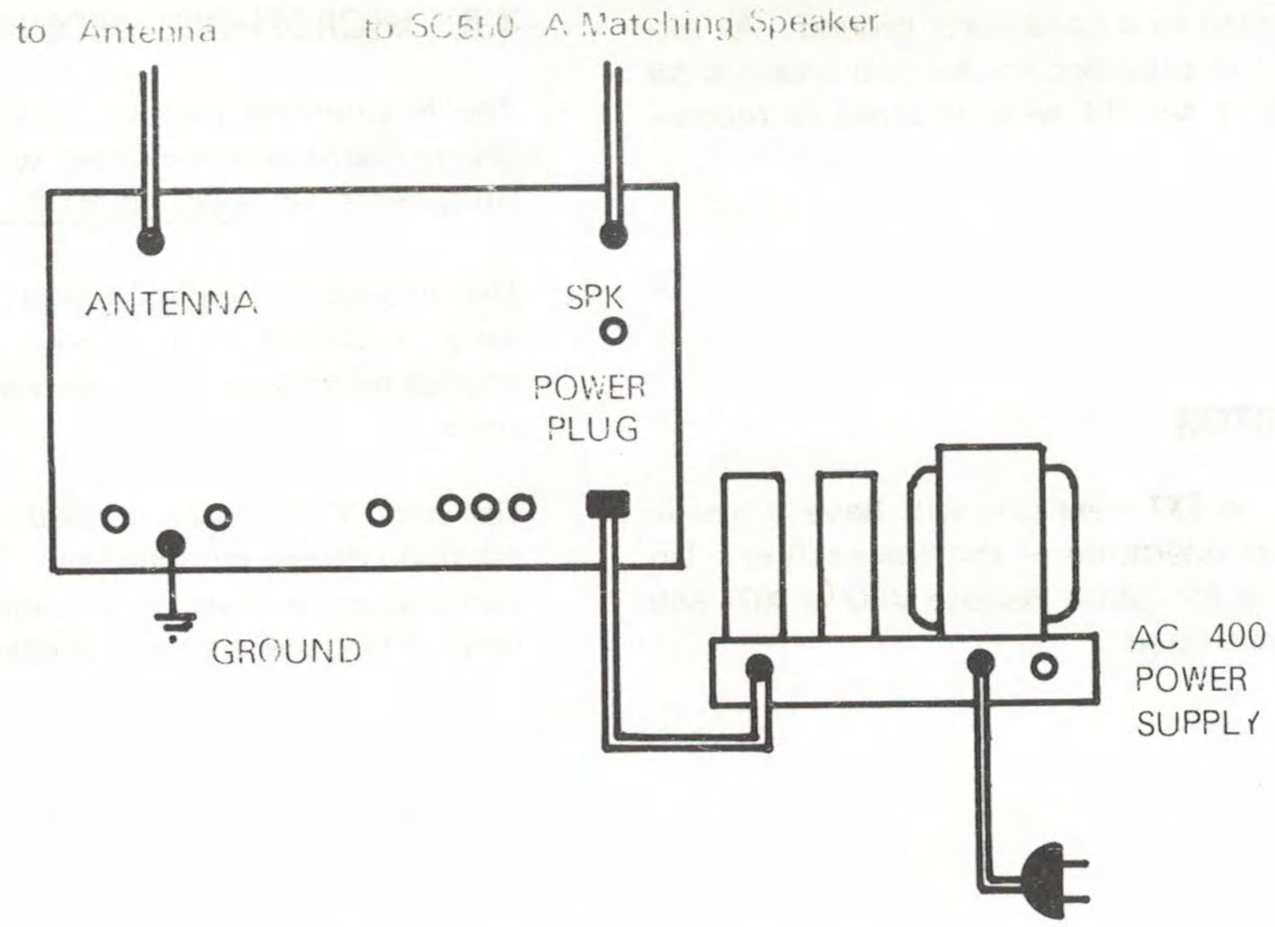


FIGURE 2. FIXED STATION CABLE CONNECTIONS

CAUTION

Before operating the GT–550A transmitter, be sure to set the BIAS ADJ Control on the chassis rear panel. Set full counterclockwise for maximum bias voltage and then make the bias adjustment required for the final amplifier as described in paragraph 7.4 or 10.3.

Figure 3 represents a typical installation of the GT–550A with a linear power amplifier. The EXT jack is connected to the internal contacts of the VOX relay in the transceiver. The center pin is grounded during transmit and is used for control of the linear antenna relay.

CAUTION

Do not apply more than 70 volts AC or DC or more than one amp to the EXT jack. Never key 115 VAC with this jack.

The ALC jack provides an input to the GT–550A ALC circuitry to control exciter gain to prevent overdrive and "flat–topping" of the linear.

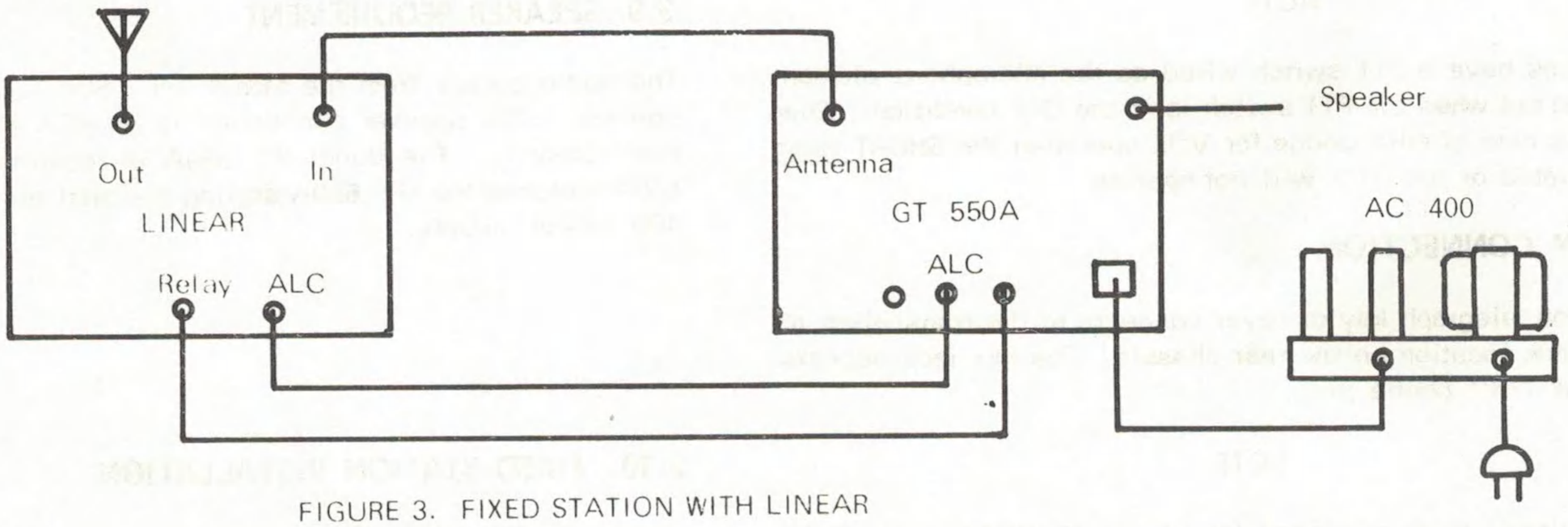


FIGURE 3. FIXED STATION WITH LINEAR

3.11 MOBILE INSTALLATION

The Model GT–550A Transceiver can be installed in vehicles having a 12 volt DC negative ground power source capable of supplying up to 50 amperes with good regulation. To complete the installation, a Model G–1000DC power supply, mobile antenna and speaker will be required.

The G–1000DC Power Supply is designed for Negative ground and is supplied with a power cord and plug wired for the GT–550A. The G–1000DC Power Supply should be mounted as near to the battery as possible. DO NOT mount the supply in a location that would require extension of the primary cables supplied with the supply.

The G–1000DC should be mounted high on the inside of the fender, near the battery. This will position it out of the direct water splash in most cases and also in the best position for ventilation. DO NOT mount the supply near the firewall––this is a ''heat trap'' in the motor compartment.

The worst condition for the power supply is to operate the GT–550A while driving at high speed, building up considerable heat in the motor compartment, then stop for gas, etc., and turn off the motor. If it is necessary to stop and turn off the motor, the transceiver and the DC Power Supply should be turned off until the heat level has been reduced by opening the hood, or starting the motor for added ventilation from the motor fan.

CAUTION

NEVER start the motor with the DC Power Supply in operation! Turn off the DC Power Supply until the motor is running.

Run the multi–conductor power cable from the transceiver to the power supply. Since this cable is weather–proof, it may be threaded underneath the vehicle, but care should be taken to insure it will be protected from mechanical damage and flying rocks Cut the cable to the desired length and attach to the terminal strip in the power supply. (See the G–1000 manual for additional details.

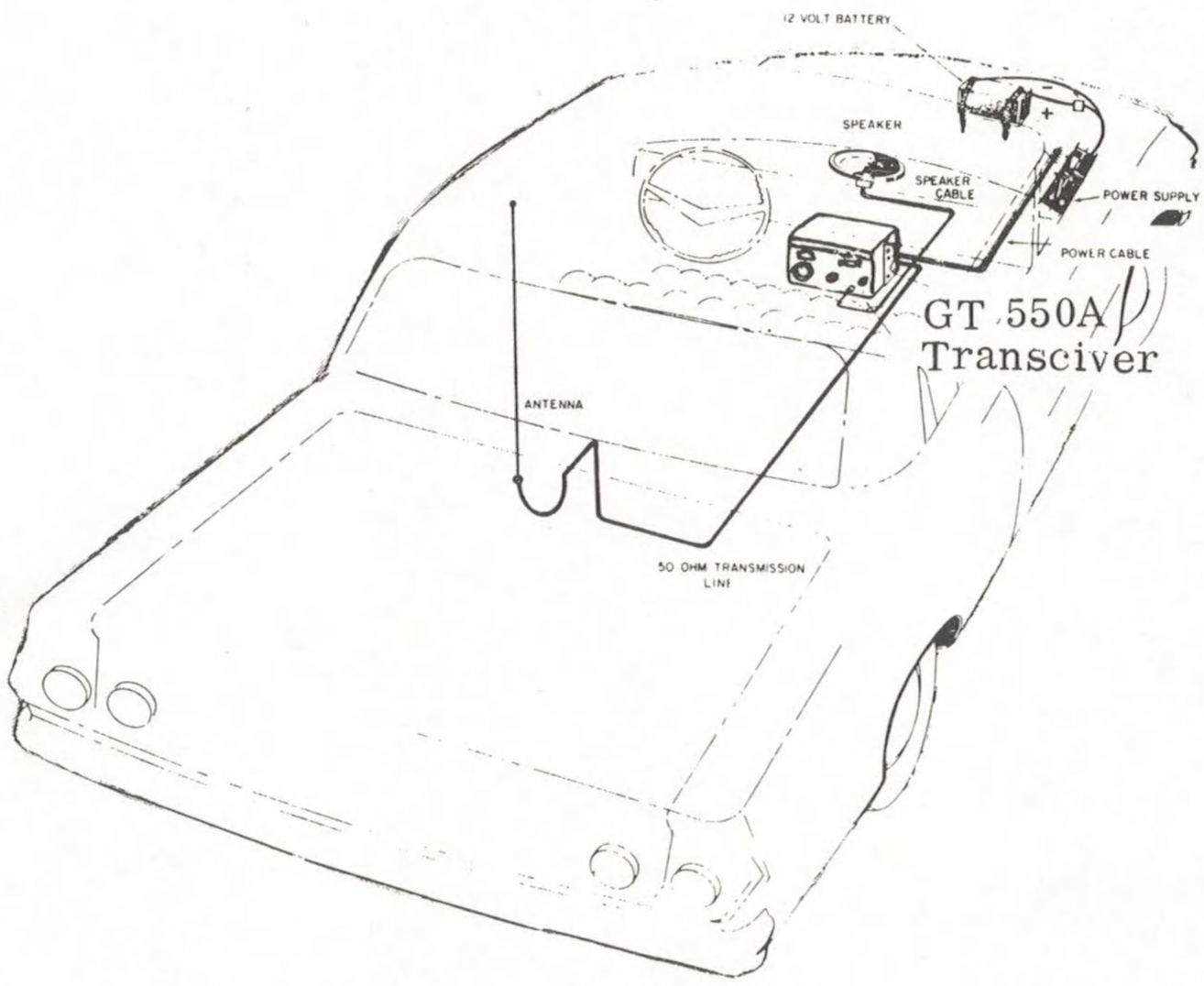
NOTE

The cable carrying power from the DC supply to the GT–550A should not be over 10 feet in length. If slightly more length is necessary, then an added #18 wire should be paralleled with the wire that carries the filament power. (Pin 6 on the power plug.)

Install a mobile antenna system that will present a nominal 50–ohm load for the transceiver. The VSWR must be 2 : 1 or less. The feedline should be RG–58/U and terminated with a PL–259 connector for attachment to the GT–550A.

A seperate mobile speaker is required for the GT–550A. It should be mounted for operator convenience. Use of the auto radio loudspeaker is not recommended.

Connect a suitable microphone to the MIC jack on the front panel of the transceiver. It is important that the wiring of the microphone conform to paragraph 3.6.



Wiring Diagram of Mobile Installation.

Only after familiarizing yourself with the controls and their functions, as outlined in Section V and VI should you perform an operational check. It is recommended the engine be running while in operation to prevent draining the battery to a voltage too low for proper operation of the car.

IMPORTANT

Before operating the GT–550A Transceiver as a transmitter, set the bias control full counterclockwise and make the bias adjustment as outlined in paragraphs 7.4 or 10.3.

NOTE

For proper adjustment of the 12 volt DC series regulator in the GT–550A, the following should be performed after installation of the transceiver for mobile operation.

To properly adjust the 12 volt DC series regulator, a high quality vacuum tube voltmeter must be used. The Hewlett–Packard 410B or equivalent is suggested.

Locate the 12 volt DC jack on the rear panel of the transceiver. This jack is located in the upper center of the transceiver's back panel between the FILTER IN and FILTER OUT jacks. Exercise caution when inserting the DC probe in this jack to prevent possible shorting of the regulated 12 volt DC to ground. If this should happen, the Q1 regulator transistor will be damaged. With the DC probe properly connected and the ground clip attached to the transceiver chassis, adjust the voltmeter to a range which will read 12 volts at approximately center scale.

On the underside of the transceiver chassis you will find a small printed circuit board, #200–48, approximately 1 inch by 3 inches in size. This printed circuit board is located close to the VOX socket on the underside of the transceiver chassis. On this printed circuit board is a small blue screwdriver adjust potentiometer, R15, used to set the 12 volt DC regulator to its proper level. Before making any adjustment, start the automobile engine and turn on the headlights and air conditioner or heater if your automobile is so equipped. Then place the GT–550A in an operating condition in the receive mode. Now adjust the small blue control to read a minimum of 11.5 volts DC and maximum of 11.7 volts DC on the VTVM. After this adjustment is completed, disconnect the vacuum tube voltmeter and transceiver is ready for operation.

If the 12 volt DC regulator is not properly adjusted, you can experience low drive on the higher frequencies, FMing in the VFO, a distortion in the transmit signal or other possible problems.

3.12 MOBILE NOISE SUPPRESSION

In most mobile installations, ignition noise is a problem. Installation of resistor–type spark plugs and coaxial bypass capacitors in the ignition coil primary and generator armature leads is recommended. An alternator filter is recommended for cars equipped with alternators.

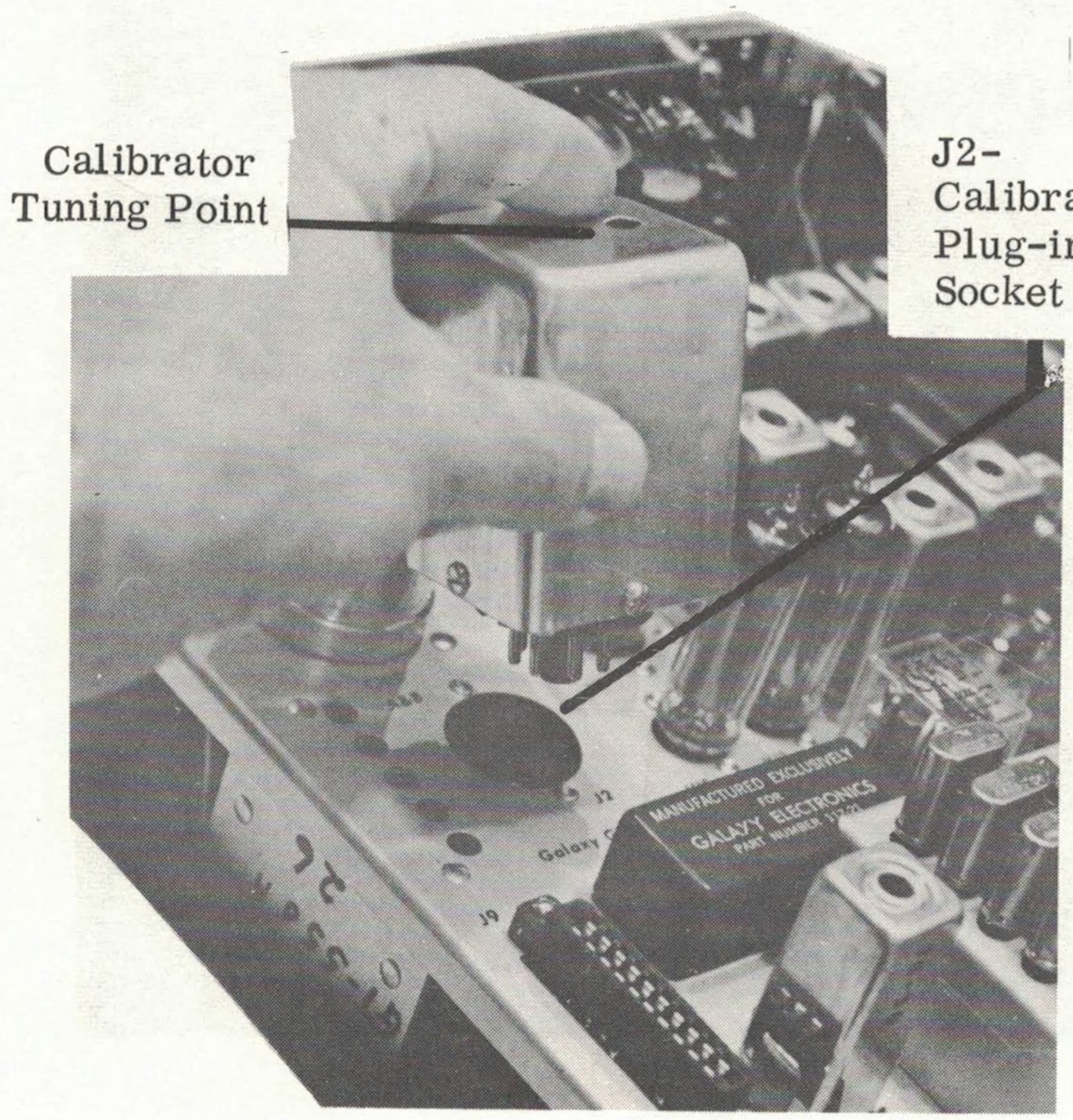
To suppress voltage regulator noise, install bracket–mounted coaxial capacitors in the armature and battery leads to the regulator and connect a series connected 0.002 ufd mica or disc capacitor and 5–ohm resistor from the generator field lead to ground.

Additional information is available in the Mobile Manual for Radio Amateurs published by the ARRL.

SECTION IV
ACCESSORY INSTALLATION

4.1 CAL 250 INSTALLATION

To install the 25 KHz calibrator, remove the top cover from the GT–550A and plug the calibrator into octal socket J2 as shown in the illustration.

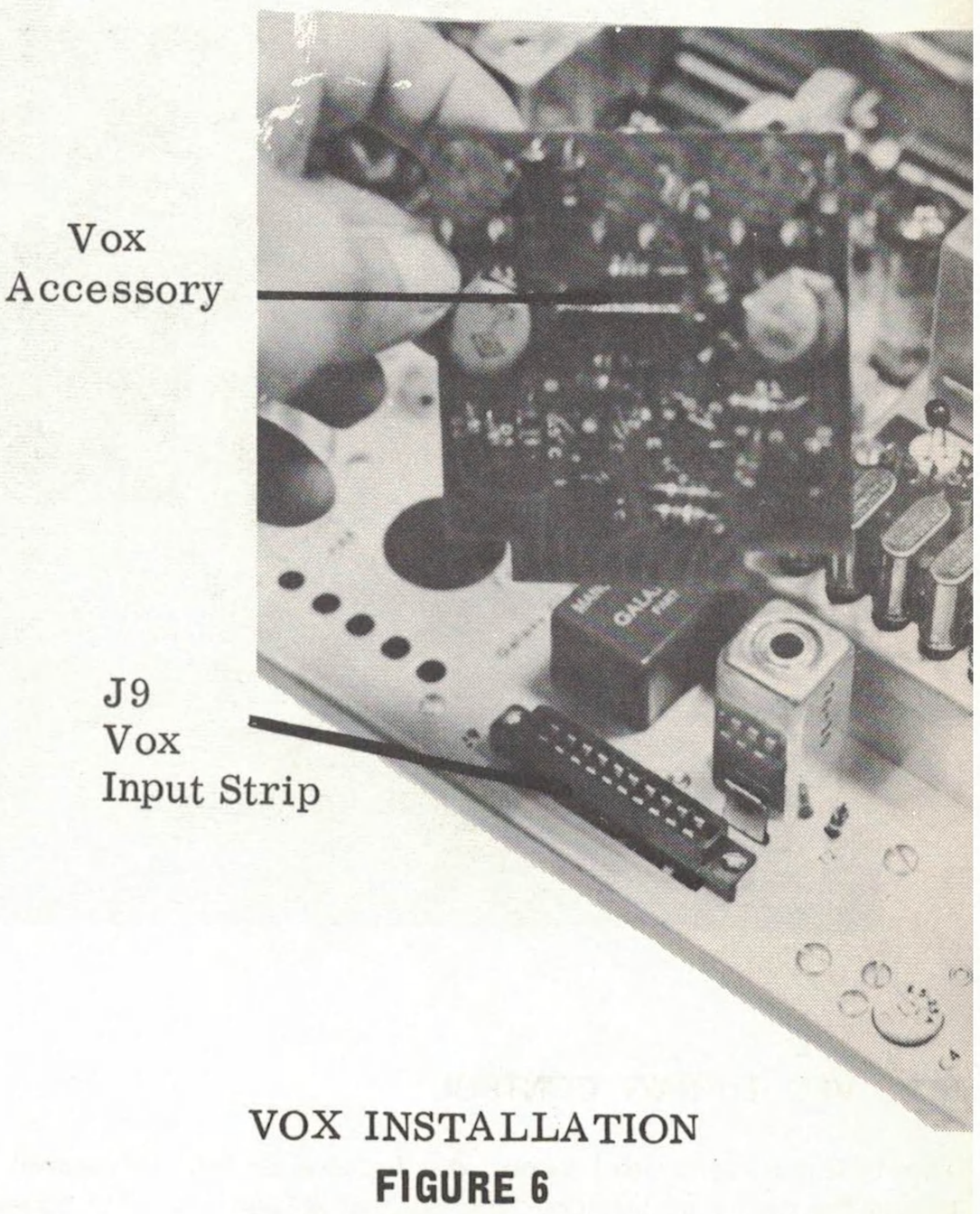


CALIBRATOR INSTALLATION

FIGURE 5

4.2 VOX –35C INSTALLATION

To install the VOX accessory make sure the AC power is OFF. Remove the top cover from the GT–550A and remove the JUMPER STRIP now installed in J9. With the VOX positioned so the control side of the board is to the outside of the chassis, insert the VOX into the contact strip J9. Make sure it is firmly seated for good contact along its full length. Replace the GT–550A top cover and adjust the VOX controls as called for in paragraph 7.6. Figure 6 illustrates proper installation of the VOX accessory.



VOX INSTALLATION

FIGURE 6

4.3 RV–550A VFO INSTALLATION

The RV–550A is installed by removing the JUMPER PLUG in the EXT VFO octal socket and plugging the REMOTE VFO control cable into the EXT VFO socket. Plug the small cable (VFO INPUT) into the EXT VFO input jack located just beneath the speaker output

4.4 F3 CW FILTER INSTALLATION

Remove the top cover of the GT–550A and clip (remove) the short jumper between the Filter IN and Filter OUT jacks. After this has been done, replace the top cover and plug the three leads into the rear panel of the GT–550A as marked––Filter IN, 12 VDC and Filter OUT.

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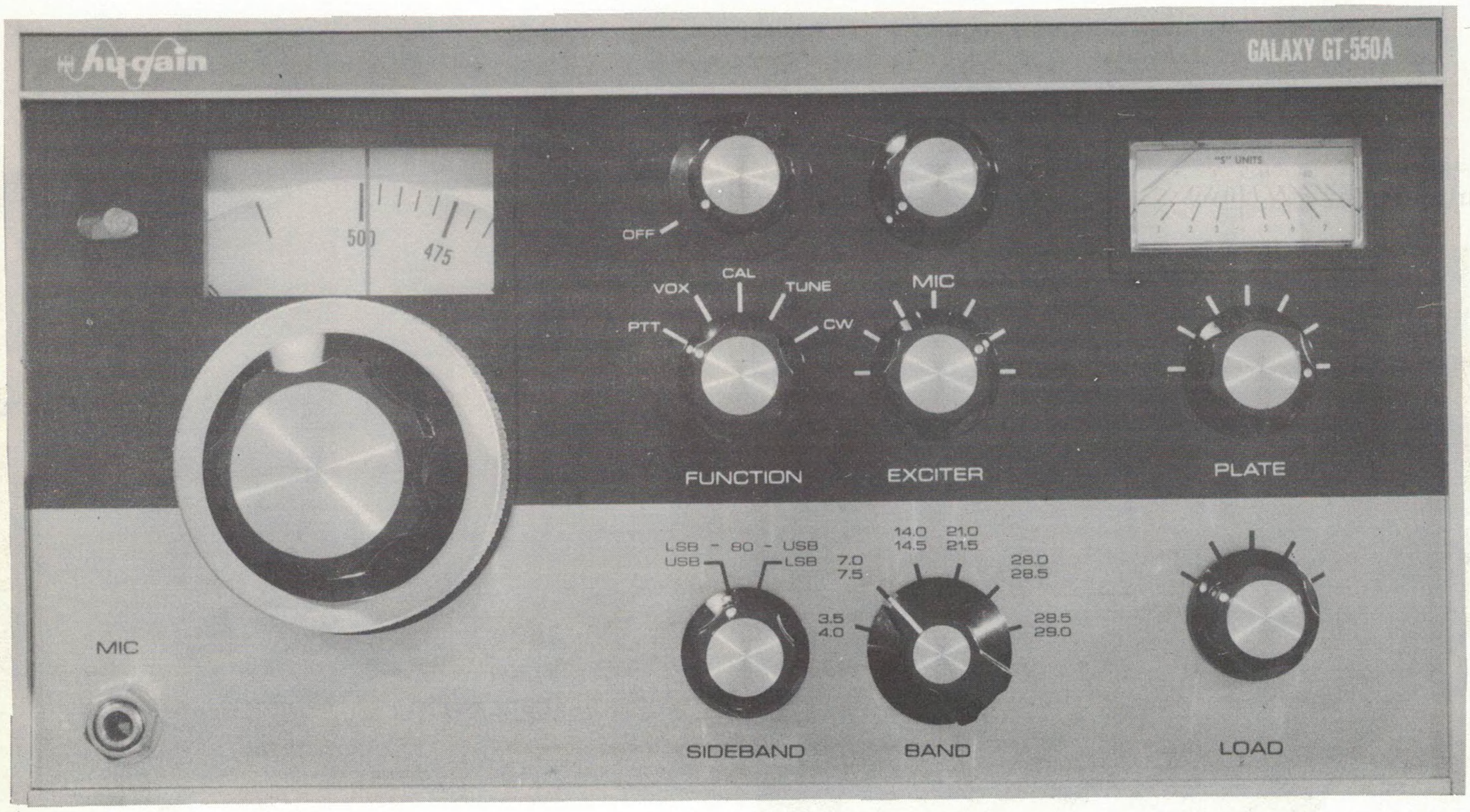
SECTION V

FUNCTIONS OF OPERATING CONTROLS

All controls utilized during normal operation of the Model GT–550A Transceiver are located on the front panel.



5.1 VFO TUNING CONTROL

The VFO tuning control knobs are located at mid left panel just below the dial escutcheon. The control drives the VFO capacitor which is the frequency determining element of the transceiver. The frequency to which the unit is tuned is displayed in the window above the concentric knobs.

The frequency dial in the window is calibrated from 0 to 500 KHz in 5 KHz increments. The MegaHertz range is selected by the Bandswitch. The following examples will aid in developing the read out technique:

Set the BAND switch at 3.5 – 4.0 and set the tuning knob so that 150 is under the red hairline in the window. The window display is added to the BAND switch to get the final frequency. The frequency then reads out as 3.650 MHz.

Now set the BAND switch at 14.0 – 14.5 and leave the Tuning Knob set as before. The frequency now reads out as 14.150 MHz.

The concentric knobs provide fast and slow tuning rates for rapid frequency change and easy fine tuning of CW and SSB signals.

5.2 VFO INDICATOR CORRECTION TAB

This tab is used to set the hairline of the VFO window for accurate calibration of the dial.

5.3 MIC (INPUT JACK)

The microphone jack requires a 3/16" diameter 3–circuit plug such as a Switchcraft S–260. The tip is PTT, the ring is AUDIO and the sleeve or barrel is GROUND.

5.4 SIDEBAND

This control serves two functions. It inserts carrier into the pass band of the filter for TUNE or CW positions of the FUNCTION switch when in the maximum clockwise position. When the FUNCTION switch is in positions other than TUNE or CW the SIDEBAND switch selects UPPER or LOWER sideband operation.

NOTE

80 meter USB and LSB positions are reversed from those of 40, 20, 15 and 10 meters.

5.5 BAND

This control selects the desired output frequency range. The panel markings indicate the upper and lower limits of the range.

5.6 LOAD

This control matches the Final Plate circuit to the Antenna Load within the range of the Pi–network. It can match resistive antenna loads from 30 to 100 ohms.

5.7 PLATE

The Plate control adjusts an air variable capacitor in the Pi–network circuitry of the final amplifier to tune it to resonance.

5.8 METER

In the receive mode the "S" meter provides information about received signal strength. At S–9 on the meter scale, the received signal level is about 100 microvolts on the 7 MHz band.

In the transmit mode, the meter measures cathode current of the final power amplifier tubes for proper setting of the bias control, tune up and SSB operation. Refer to the tuning procedure for further details.

5.9 EXCITER

The Exciter control drives a two section variable capacitor which tunes both receiver and transmitter circuits to frequency within a given band.

For general receiver tuning, the control is adjusted for maximum receiver sensitivity, however, for transceiver operation the control is adjusted for maximum transmitter output during transmitter tune–up and left at this setting for the receive mode.

5.10 MIC

The MIC gain control adjusts the audio level to the balanced modulator stage from the microphone amplifier stages. Clockwise rotation increases sensitivity.

When the FUNCTION switch is in the TUNE position it controls the carrier level inserted for tune up of the GT–550A. When the FUNCTION switch is in any other position, it serves as a microphone gain control.

5.11 FUNCTION

The FUNCTION control is a five position switch used to select the mode of transmission or reception. The five functions are:

PTT – Allows keying of the transmitter with the mike push–to–talk button. VOX will not operate when the switch is in this position.

VOX – When in this position and the VOX accessory is installed, the transmitter is keyed by normal voice as well as push–to–talk.

CAL -- In this position the crystal calibrator accessory is turned on allowing calibration of the main tuning dial.

NOTE

Do not leave FUNCTION switch in the CAL position for transmit or receive operation.

TUNE – In this position the transmitter is placed in a transmi condition at reduced power. (MIC Gain Control varies drive level.)

NOTE

The SIDEBAND switch must be in the maximum clockwise position

See Tuning Procedure for further details.

CW – This position places the transceiver in the full power for CW operation. See Tuning Procedure.

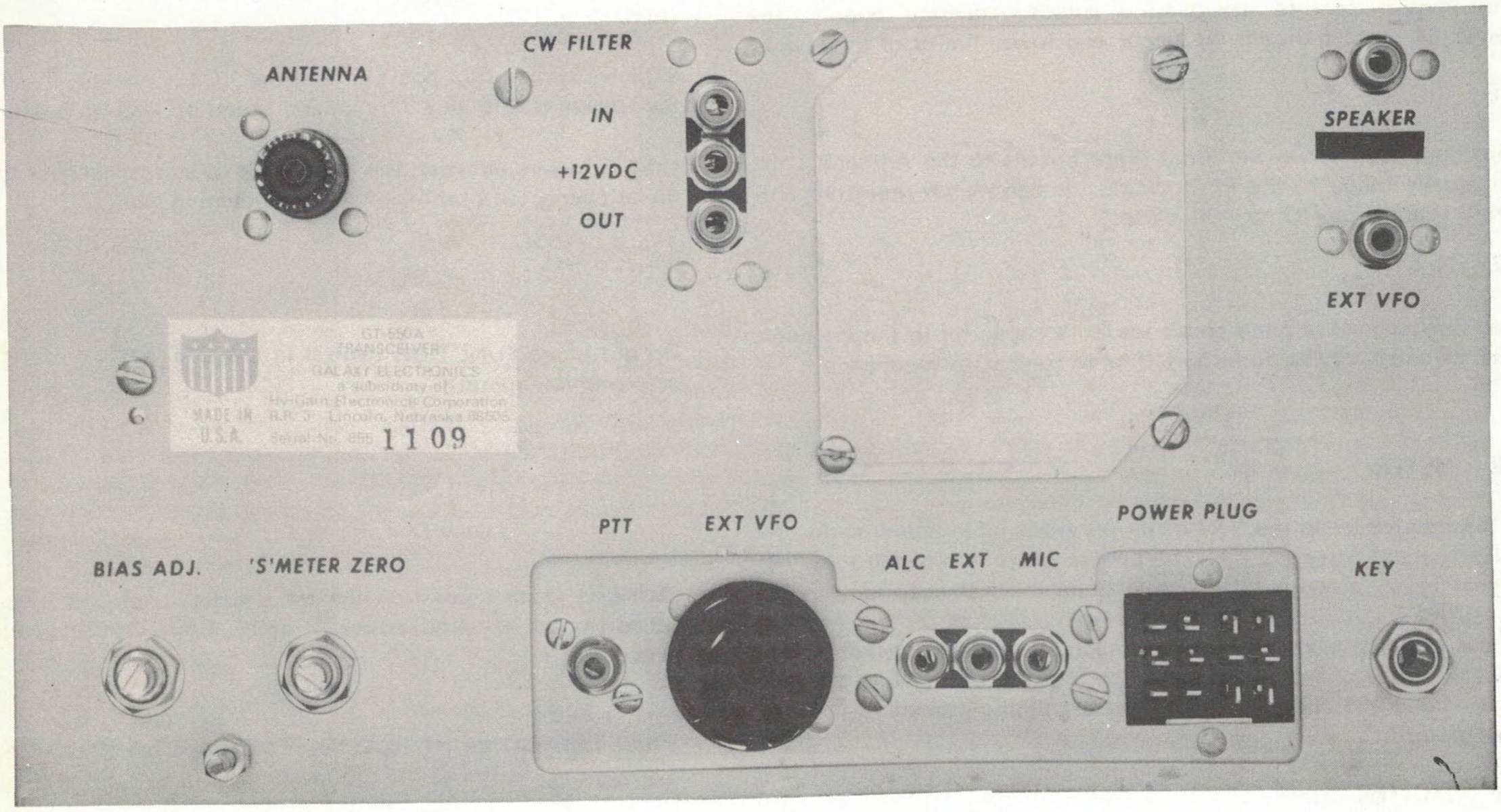
5.12 RF–AF GAIN, ON/OFF CONTROL

The RF gain and AF gain controls are two potentiometers mounted on concentric shafts. The RF gain control (rear knob) varies the gain of the receiver RF and IF amplifier stages. This is normally left in the clockwise position. For extremely strong signals it may be set in a counterclockwise direction to increase the AGC threshold level. As the RF gain is reduced, the "S" meter level will increase and only signals of this strength or greater will move the meter.

When the AF Gain Control knob is in the maximum counterclockwise position the power to the GT–550A is turned OFF. Advancing the control clockwise turns the power ON. When the power is ON the control governs the audio output (volume).

SECTION VI

REAR PANEL CONTROLS AND JACKS



REAR PANEL
FIGURE 8

.1 BIAS ADJ

he BIAS ADJ control sets the operating bias required by the inal amplifier tubes. The bias adjustment must be made when he transmitter is first placed in operation, and then only an oc— asional check and possible adjustment will be required there— fter.

NOTE

Refer to paragraph 7.4 or 10.3 for details.

6.2 "S" METER ZERO

This control is the electrical "S" meter zero adjustment potenti— ometer. It should be adjusted only when the antenna is not con— nected.

6.3 PTT

This jack is in parallel with the push-to-talk (PTT) circuit of the microphone input jack on the front panel. It is used for foot op— erated PTT or other accessories, such as the PR—550 that require a separate PTT input.

6.4 EXT VFO

This 8 pin socket provides power and control circuitry for the RV—550A Remote VFO or XO—550 Crystal Adapter. As shipped from the factory, it has a jumper plug installed to permit normal operation of the transceiver.

6.5 ALC

The ALC jack provides an input to the GT—550A ALC circuitry to control gain when used with an external linear amplifier.

6.6 EXT

During the transmit mode, the center pin of this jack is grounded for control of linear amplifier relays.

CAUTION

Do not apply more than 70 volts AC or DC or more than one amp to the EXT jack. NEVER key 115VAC with this jack.

6.7 MIC

The MIC jack is in parallel with the microphone connection on the front panel. It is normally used for phone patch connections.

6.8 POWER

The Main Power connection requires a Cinch—Jones S—312CCTL connector. This connector is supplied with the AC—400 and G— 1000DC Power Supplies.

6.9 KEY

A standard 1/4" phone plug is used in this jack for connection of a telegraph key or keyer.

6.10 EXT VFO

The EXT VFO input jack is located under the Speaker Jack. This jack is used to connect the RF cable from the RV–550A Remote VFO or XO–550 to the internal VFO of the GT–550A, when either are used.

6.11 SPEAKER

A 3.2–ohm speaker should be attached to this jack. The Model SC–550A is recommended. The SC–550A matches the GT–55(styling and will also house the AC–400 Power Supply.

6.12 CW FILTER

Filter IN, 12 VDC, Filter OUT––these three jacks are for cor nection of the F3 selective CW Filter. The IN and OUT jacks a ''shorted'' internally. To use the F3 Filter this internal jump must be removed.

SECTION VII

TUNING PROCEDURE

7.1 GENERAL

The operating procedure for the Model GT–550A Transceiver is not complicated, but normal care should be used when operating to realize maximum performance from the equipment. Before ap– plying power, it would be well to reche ck the installation. Make certain the antenna and speaker are properly connected. Check the power connection and make sure it is seated in the power in– put plug.

IMPORTANT

Before operating the transmitter portion of the transceiver, the bias adjustment control on the rear panel must be correctly set. Refer to paragraphs 7.4 or 10.3.

7.2 RECEIVER OPERATION

The transmitter controls not mentioned below have no direct bear– ing on receiver operation and may be disregarded for the moment.

Pre–set the front panel controls as follows:

RF Gain.....Full Clockwise

AF Gain.....''OFF''

FUNCTION Switch.....''PTT''

BAND Switch.....as desired

EXCITER Control.....Mid Range

SIDEBAND Switch.....USB or LSB as desired

Connect the line cord to the power outlet.

Turn on the GT–550A by rotating the AF gain control clockwise. The dial and meter faces on the transceiver will become illumin– ated. Allow a few minutes for the equipment to warm up.

After the unit has been on for several minutes, disconnect the antenna, peak the EXCITER control for maximum noise and then adjust R2, ''S'' meter zero control, on the rear panel so the ''S'' Meter needle rests on the extreme left mark of the meter face. This will align the ''S'' Meter for a true reading. By adjusting the ''S'' Meter in this manner, it will be possible to read atmospheric noise levels.

The antenna should now be re–connected.

As the receiver is tuned across the band, occasional adjustme of the EXCITER control will be necessary. Always adjust it f maximum ''S'' Meter reading on signal or for maximum backgrour noise without signals present. When the EXCITER control ha been set during transmitter tune–up, it must be left at this set ting for receive. The exact setting is more critical for transmit ter operation than for the receiver mode.

Normally, the RF gain control is set full clockwise to obtain fu AGC (Automatic Gain Control) action for uniform speaker out put. While AGC is customarily employed for SSB reception, i may also be used for CW reception. The RF gain control must b set full clockwise to obtain normal ''S'' meter operation. As th RF gain is reduced, the ''S'' meter level will increase and re ceiver sensitivity will be reduced. Manual control of receive sensitivity, at times, is desirable and the RF gain may be set a required for these occasions.

Correct tuning of an SSB signal is very important. Do not merel tune until the voice can be understood, set the slow tuning knc to the exact spot where the voice becomes natural.

Because the transceiver transmits exactly on the same frequenc that the receiver is tuned to, precise tuning is necessary to in- sure you will sound natural to the other station and be easil understood. Also, if both are using transceivers, it is possibl to ''walk'' right out of the band as each operator retunes th other. Most complaints of drift or frequency instability are du to constant retuning during reception periods of a contact.

7.3 DIAL CALIBRATION

With the CAL–250 accessory installed, exact dial calibration i improved. The CAL–250 produces strong marker signals ever 25 KHz on all bands.

To accurately calibrate the dial, set the FUNCTION switch t CAL. The nearest 25 KHz marker should be tuned in for exac zero beat. The hairline is set directly over the correspondin dial mark.

The CAL–250 accessory permits easy, accurate location of th sub–band frequency allocations to prevent out of-band viola- tions.

After calibration at the nearest 25 KHz marker, frequency ca easily be interpolated to 2 KHz or less.

NOTE

Never transmit or use the receiver in the ''CAL'' position of th FUNCTION Switch. It is to be used for dial calibration only

7.4 BASIC TRANSMITTER TUNE–UP

The Model GT–550A Transceiver can be tuned up on several frequency segments that are outside the amateur bands. Do not transmit on these frequencies.

The receiver controls not mentioned below have no direct bearing on transmitter operation and may be disregarded for the moment.

Preset the front panel control as follows:

FUNCTION switch.....''PTT''
BAND switch.....as desired
EXCITER control.....mid–range
SIDEBAND switch.....fully clockwise
LOAD control.....fully counterclockwise
PLATE control.....fully clockwise
MIC control.....fully counterclockwise
Tuning dial.....set to desired frequency

If the transceiver has just been turned on, allow a few minutes for the equipment to reach operating temperature before proceeding with the transmitter tune–up.

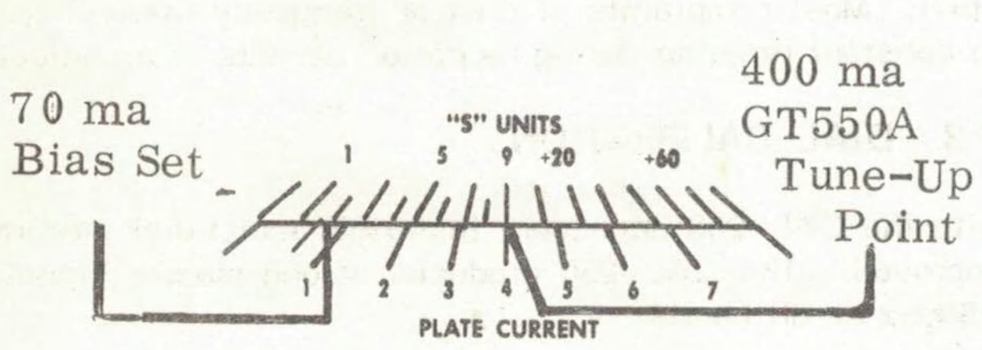
The use of a 50–ohm dummy load for transmitter tune–up is recommended. Its usage will prevent interference on the air and minimize the possibility of improper tune–up due to antenna mismatch.

If a step is forgotten during tune–up, place the FUNCTION switch in the ''PTT'' position and re–read the tune–up procedure. Do Not keep the transmitter on the air in an untuned condition or you will damage the power amplifier tubes.

NOTE

If a telegraph key or keyer is plugged into the GT–550A, be sure it is closed for normal transmitter operation.

After warm up, set the BIAS potentiometer, R35 on the rear panel, to MAXIMUM COUNTERCLOCKWISE. Close the PTT circuit on the microphone and adjust the BIAS control for a 70 ma reading on the panel meter.



BIAS SET POINT
FIGURE 9

Open the PTT switch. If the line voltage changes, or when you change the GT–550A from fixed–station to mobile operation be sure to reset the BIAS adjustment. If in doubt, CHECK IT!

NOTE

You will hear a tone in the speaker or headphones whenever you have the Transceiver in the TUNE or CW settings of the FUNCTION Switch and have the key closed. The volume of this SIDE TONE can be regulated with the AF control.

WARNING

DO NOT ALLOW THE PLATE CURRENT TO EXCEED 500MA FOR MORE THAN 5-10 SECONDS IF THE PLATE CONTROL IS NOT TUNED FOR A PLATE CURRENT DIP.

Failure to observe this important warning will cause excessive plate dissipation resulting in premature tube deterioration.

After setting the BIAS, proceed with tune up by setting the MIC control fully clockwise.

Place the FUNCTION switch in the TUNE position and adjust the EXCITER control for maximum meter reading and then quickly rotate the PLATE control for a dip on the meter, (minimum reading) and set the control on this dip.

NOTE

If the meter reading is ABOVE the 400 ma point on the meter STOP, turn the FUNCTION Switch to the PTT position and check your antenna. A dip which results in a meter reading ABOVE the 400 ma point indicates antenna problems. This indication points out that the antenna impedance is below that which the pi–network can match (BELOW 30 ohms), Corrective action must be taken, such as retuning the antenna or using an antenna matching device.

If the meter reading is BELOW the 400 ma point on the meter, proceed with tune–up of the transmitter.

Adjust the MIC gain control COUNTERCLOCKWISE until the meter drops about 25%, retune the EXCITER control for a precise peak on the meter. Return the MIC gain control to a MAXIMUM CLOCKWISE setting.

Now adjust the LOAD control CLOCKWISE until the meter rises to 400 ma on the meter. Quickly adjust the PLATE control for a dip on the meter once again. It should be a higher MINIMUM than before.

Continue to advance the LOAD control adjusting the PLATE control for a dip until the MINIMUM meter reading after retuning the PLATE control is at 400 ma on the meter. The object being to get the last dip of MINIMUM current at the 400 ma point on the meter.

When the last adjustment allows the dip to appear at the 400 ma point on the meter, then tuning is complete. Return the FUNCTION switch to the PTT position.

Rotate the MIC control fully counterclockwise after completion of tuning.

NOTE

If the LOAD control reaches the fully clockwise position and you are unable to dip the meter to 400 ma, STOP and place the FUNCTION switch in the PTT position. This condition indicates your antenna has an impedance ABOVE that which the pi–network can match (ABOVE 100 ohms). Corrective action must be taken such as retuning your antenna or using an antenna matching device.

As the operating frequency is changed within the band, retune the transmitter with the EXCITER, PLATE AND LOAD controls to maintain full power operation.

7.5 PUSH–TO–TALK SSB OPERATION

Assuming that the transmitter has been properly loaded and tuned to frequency as described in the basic transmitter tune–up procedure, set the SIDEBAND switch to either USB or LSB depending upon the sideband to be used for transmission and reception. Set the FUNCTION Switch to "PTT".

Press the microphone push–to–talk button. Speak into the microphone at a normal voice level and advance the MIC gain control until the meter pointer begins kick–up to about 200 ma to 250 ma on voice peaks. This is the correct working level.

The MIC gain control setting will not be critical because of the compression action of the ALC circuitry; however, the actual setting still depends upon the type of microphone, the operator's voice characteristics, and his operating habits.

Release the microphone button. The transceiver will return to the receive mode. The meter now will indicate the strength of incoming signals.

7.6 VOICE CONTROLLED SSB OPERATION (WITH VOX–35C ACCESSORY INSTALLED)

The operating procedure outlined for basic transmitter tune–up (6.4) and push–to–talk sideband operation (6.5) also apply for voice controlled single sideband operation. The following adjustments are intended only for adjustment of the VOX–35C control system.

Place the FUNCTION switch in the "VOX" position to activate the VOX–35C system.

To avoid unintentional transmission, set the MIC gain control to minimum (Full CCW) during VOX–35C adjustment.

Initially set the VOX gain, Delay and Anti–trip controls fully counterclockwise.

Turn the VOX gain control clockwise, while talking into the microphone, until the control relay closes on the first syllable of speech.

Adjust the DELAY control for the desired drop–out delay. The delay period increases as the control is turned clockwise. The delay period should be long enough to prevent change–over between words.

Set the receiver AF gain control for the desired listening level and advance the Anti–Trip control clockwise until the received signals do not actuate the control relay. Excessive Anti–Trip gain or a large increase in listening level may lock–out the voice control system or cause cycling of the control relay.

Generally, VOX operation will require close talking to the microphone and moderate speaker levels for satisfactory service.

When the FUNCTION switch is in the VOX position, normal PTT operation is also retained.

NOTE

Some microphones have shorting contacts in the switch to disable the microphone element when the push button is released. VOX operation is not possible unless this circuitry is disconnected within the microphone.

7.7 CW OPERATION

A. MANUAL, 400 WATT

After the transmitter has been properly loaded and tuned to frequency as described in the basic transmitter tune–up procedure, place the FUNCTION switch in the CW position. The unit will now be in a receiving condition. To transmit, close the PTT with the microphone and operate the key for CW. Open the PTT to return to the receiving condition. (A foot switch can be connected to the PTT jack on the rear panel if so desired.)

This is the HIGH POWER method normally used when the VOX is not used. The microphone should be plugged in as a convenient means of placing the transmitter in the transmit condition with the PTT switching. The setting of the MIC gain control DOES NOT control power in the CW mode. It should be set fully counter-clockwise.

B. SEMI–BREAK–IN, 400 WATT

This method of operation requires that a VOX–35C Accessory be installed and correctly adjusted. After loading and tuning the transmitter, place the FUNCTION switch in the CW position. When the key is closed the unit will automatically go into a transmit condition. It will remain in transmit a second or two after releasing the key, adjustable by the "delay" setting on the VOX unit. After the "delay" the unit will automatically return to the receive state. Adjust the VOX "delay" as desired. There is a slight "click" in the speaker during switching, to minimize switching a "hold –time" of one second is recommended.

C. MANUAL, LOW POWER

After loading and tuning the transmitter, place the FUNCTION switch in the TUNE position. CW can now be sent with the station key or keyer.

When done transmitting, return the FUNCTION switch to the PTT position. The input with the FUNCTION switch in the TUNE position for CW is approximately 300 watts. It is recommended that the microphone be unplugged from the panel if this method is used. To reduce power for this type of operation, set the MIC gain control in a COUNTERCLOCKWISE direction which will reduce the power input. This may be done to obtain any power input level desired down to a fraction of a watt.

SECTION VIII

THEORY OF OPERATION

8.1 GENERAL

The Model GT–550A Transceiver consists of a single conversion (utilizing pre–mixed crystal and VFO frequencies) receiver and transmitter. To achieve "on frequency operation", the VFO, converter oscillator, and carrier frequency oscillators all contribute to the transmit and receive functions. Circuitry that would be compromised to accomplish common usage between transmit and receive function has been avoided in the design of the GT–550A.

8.2 RECEIVER SECTION

Referring to Figure 10, the incoming signal is switched through the antenna relay, then coupled into the 12BZ6 amplifier stage. The output of this stage is coupled to the 6HG8 receiving mixer tube. Signal from the VFO in the range of 5.0 – 5.5 MHz for 80 meter operation is coupled to the 6HG8 mixer tube; or in the range of 16.0 – 16.5 MHz for 40; 23.0 – 23.5 MHz for 20; 30.0 – 30.5 MHz for 15; and 37.0 – 38.0 MHz for 10 meter operation from the 6KE8 premixer.

The output of the 6HG8 is coupled to the 9 MHz crystal filter, with the bandpass of this filter determining selectivity. The output of the filter is coupled to the 6EW6 IF amplifier; its output fed to the 12BA6 second IF amplifier and then to the 6GX6 product detector carrier oscillator tube.

The 6GX6 output is low–level audio. This low level audio is coupled to the AGC amplifier and detector and audio amplifier. The AGC detector's negative DC output voltage is fed to the first and second IF amplifier stages, controlling the gain of these stages.

The audio from the 6GX6 is amplified by two transistor amplifier stages.

The output from the last audio transistor operates a complimentary pair of transistors which deliver audio to the speaker.

NOTE

This transceiver was designed for optimum performance using an 3.2 ohm PM speaker such as the Model SC–550A.

8.3 TRANSMITTER SECTION

The voice signal from the microphone is amplified by two transistors, Q9 and Q10, and then applied to the 12AT7 balanced modulator tube. A signal from the 6GX6 product detector carrier oscillator tube is also injected into the balanced modulator tube. This signal will be on 9001.250 KHz (SIDEBAND Switch Max. CW) or 8998.750 KHz (SIDEBAND Switch Max. CCW) depending on the band in use. The audio and RF signals are combined in the 12AT7 balanced modulator tube and the resultant output is a double sideband, suppressed carrier signal at 9 MHz.

The unwanted sideband of the double sideband signal is attenuated by more than 55 DB as the signal passes through the crystal lattice filter. The single sideband suppressed carrier signal from the filter output is amplified by the 6EW6 IF amplifier stage and then injected into the 6EJ7 transmit mixer tube.

A signal from the VFO, in the range of 5.0 – 5.5 MHz, is fed to the transmit mixer tube 6EJ7 for operation on the 80 meter band, or from the 6KE8 premixer tube for operation on the other bands. Output from the 6KE8 mixer tube is in the range of 16.0 – 16.5 MHz for 40 meters, 23.0 – 23.5 MHz for 20 meters, 30.0 – 30.5 MHz for 15 meters and 37.0 – 38.0 MHz for 10 meter operation. The sum or difference frequency, as required for the band of operation, is selected by the tuned circuits. This signal, along with the 9 MHz signal, is combined in the 6EJ7 transmit mixer to produce a signal on the desired operating frequency. The signal is amplified by the 6GK6 tube which drives the parallel 6LB6 tube in the output stage.

The plates of the 6LB6 tubes are connected in parallel and matched to the antenna output through an adjustable pi–network.

In CW operation the carrier oscillator is shifted to 8999.45 KHz for carrier insertion into the filter bandpass and the 6EJ7 is grid–block keyed.

8.4 METERING

During the receive mode the meter gives information regarding the strength of received signals. This information is derived by monitoring the changes in screen voltage of the AGC controlled stages. A balanced bridge comparitor circuit avoids loading of the AGC stages.

During the transmit mode the meter displays the cathode current of the 6LB6 power output amplifiers.

8.5 ALC SYSTEM

The Automatic Level Control circuits are in effect only in the transmit mode. ALC action goes into effect when transmitting single sideband signals at peak levels where grid current begins to flow in the power output amplifier tubes. The grid current pulses generate a small signal voltage across the resistance of R5 and the BIAS ADJ control R33. This signal voltage is rectified by D7 and D8 to become a varying DC bias voltage. The bias voltage is fed to the 9 MHz IF amplifier stage (V3) grid to reduce the stage gain as the ALC bias voltage increases. The ALC action on the IF amplifier stage makes the transition from desired drive level to over–driven less critical and a smoother more powerful signal is produced. Up to 10–15 DB of compression by the ALC system is possible before overdrive and resultant distortion occurs.

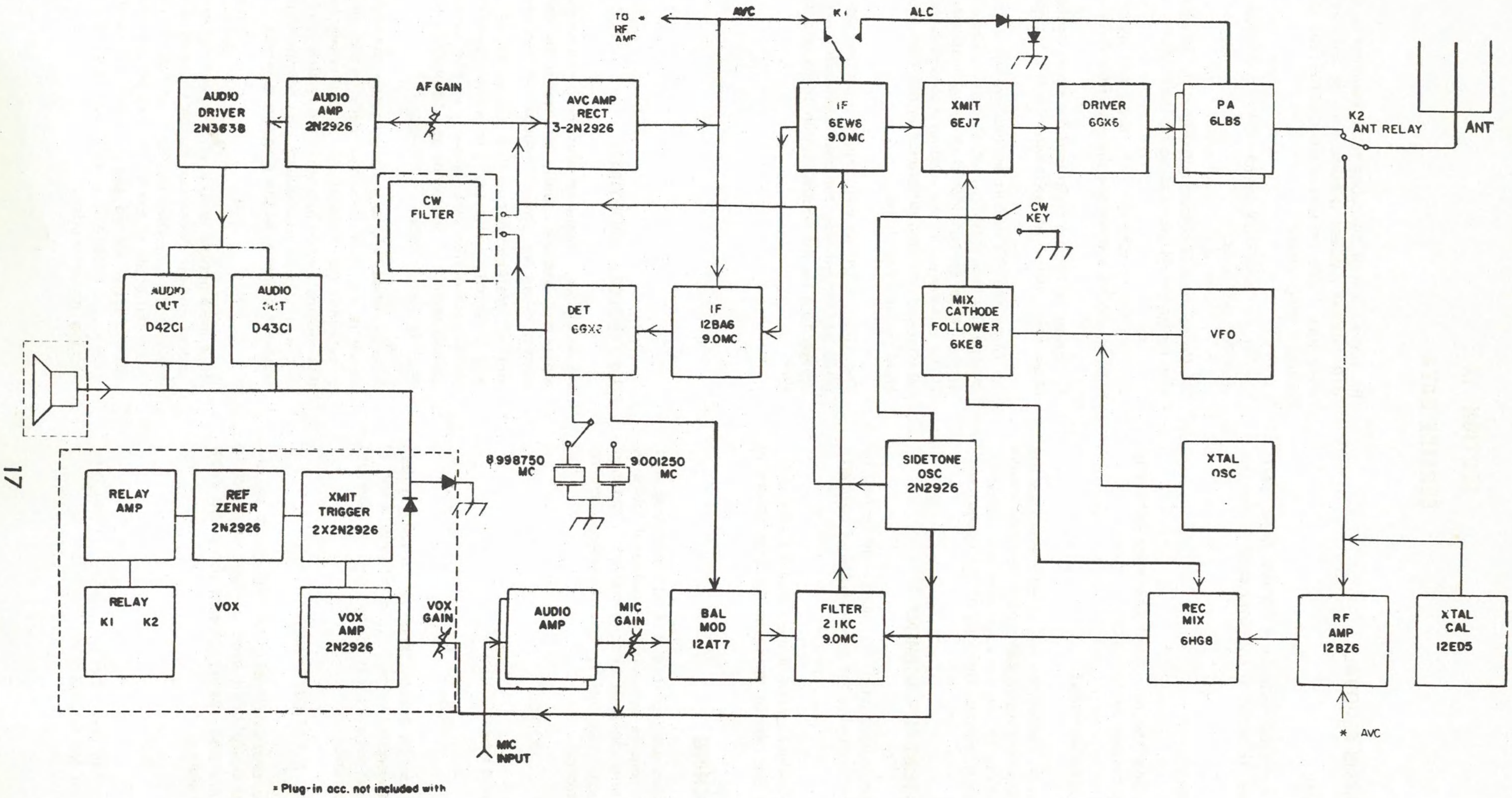
8.6 VOX CONTROL

VOX (Voice Operated Control) is an optional plug–in unit.

A portion of the audio is taken from the second microphone amplifier and coupled to the first VOX amplifier stage which drives the second VOX amplifier. When the input reaches the zener diode reference level, this pre–set level through a pair of transistors "triggers" the relay amplifier. This "trigger" circuit is much more positive in action than the usual VOX circuitry and will minimize any "chattering".

When operating CW, the keying circuit operates the sidetone oscillator and it injects a strong audio signal to operate the VOX for "break–in" action. When using the VOX for CW you will find operation better if the VOX gain is set HIGHER and the ANTI–VOX gain set lower than when using it for voice operation.

The ANTI–VOX circuitry can reject unwanted signals only to a degree, and excess audio from the speaker may cause the VOX unit to cycle on and off.



= Plug-in acc. not included with

FIGURE 10 BLOCK DIAGRAM

SECTION IX

SERVICE DATA

9.1 COVER AND CHASSIS REMOVAL

A. TOP COVER REMOVAL

Remove the four screws along the sides and lift the cover clear. When replacing the cover, be sure to carefully seat it into the front panel.

B. BOTTOM COVER REMOVAL

Remove the four screws near the equipment feet after removing the top cover and lift the bottom cover clear.

C. POWER AMPLIFIER COMPARTMENT

After removing the top cover, remove the two screws along the top of the vertical P.A. Compartment wall. The copper covered shield must be removed by carefully lifting the edge over the compartment wall. Take care not to damage the tops of the power output tubes.

9.2 FINAL AMPLIFIER TUBE REPLACEMENT

Access to the final power output amplifier tubes may be had by removing the top cover and removing the power amplifier compartment cover.

The tubes mav be lifted straight up out of their sockets after disengaging the plate clips and moving the parasitic suppressors to one side.

9.3 FINAL TUBE MATCHING

If either or both 6LB6 tubes are replaced, the tube matching will be required. This will require access to a number of tubes in order to select a pair with identical characteristics. Matched pairs of tubes are available from the Hy-Gain Customer Service Department for convenience.

NOTE

Use only matched GE brand tubes.

Field matching of tubes can be accomplished by utilizing a discarded 6LB6 tube with a working heater. Clip off pins 3 and 11 close to the tube base and substitute it temporarily for tube V11 during the matching operation.

CAUTION

During the matching operation it will be necessary to expose circuits that normally have high voltage applied to them. Use extreme care and always ground the plate caps before handling the tubes.

A) Disconnect the plate cap from tube V11. Tube V11 now only serves as a heater circuit for the matching operation.

B) Install one of the tubes to be matched in the socket for tube V10 (socket nearest outside edge of chassis) and connect the plate cap. The unused plate cap for tube V11 must not touch nearby components.

C) Set the FUNCTION switch at PTT and allow at least two minutes for warm-up.

D) Close the PTT circuit and adjust the BIAS ADJ control on the rear panel for 40 ma reading on the meter.

E) Turn the transceiver OFF, short circuit the plate cap of the 6LB6 to ground and remove the tube from its socket.

F) Insert a second 6LB6 into the same socket and connect the plate cap. Allow at least two minutes for warm-up.

G) Close the PTT circuit and observe the meter reading. (Do not change the bias setting.) If this tube reads between 35 ma and 45 ma, it can be considered as being matched to the original tube. If the difference in the reading exceeds 5 ma, other tubes must be checked until the difference in readings of the pair to be matched is less than 5 ma.

The final amplifier will require a neutralization check and possible adjustment after the new tubes are installed. Refer to paragraph 10.6 for the neutralization check and adjustment procedure.

9.4 TROUBLE SHOOTING

As in all well designed electronic equipment, maintenance and repair problems are usually confined to the checking and replacement of tubes and semi-conductor devices which may become defective. Malfunctions of this nature are usually easily isolated and corrected. However, it is entirely possible that a more obscure malfunction may arise. In this event, only thoroughly trained technical personnel should attempt to service equipment of this complexity.

A recommended aid to troubleshooting the Model GT-550A Transceiver is a general coverage check on the various oscillator circuits within the transceiver. A lead connected to the antenna of this receiver, when placed in the proximity of the oscillator tube in the circuit to be checked, can determine the presence or absence of signal from the stage in question.

If a malfunction occurs when operating on one particular band and/or mode of operation, the unit should be checked on all other bands and in all other modes of operation to isolate the difficulty. A careful study of the block diagram will give a quick clue as to which tubes should be checked. The voltage and resistance charts and schematic diagram will also aid in isolating and correcting a malfunction.

9.5 SERVICE AND OPERATING QUESTIONS

For further information regarding operation or servicing of the Model GT–550A Transceiver, contact the dealer from whom the unit was purchased. Hy–Gain Electronics Corporation has a system of Authorized Service Stations where any required service will be performed promptly and efficiently at no charge if this equipment is delivered to the service station within 90 days from date of purchase by the original buyer and the defect falls within the terms of the warranty. It is necessary to present the bill of sale in order to establish warranty status. After the expiration of the warranty, repairs will be made for a nominal charge.

Make no service shipments to the factory unless instructed to do do by letter, as Hy–Gain Electronics Corporation will not accept responsibility for unauthorized shipments.

Hy–Gain Electronics Corporation reserves the privilege of making revisions in current production of equipment, and assumes no obligation to incorporate such revisions in earlier models.

SECTION X
ALIGNMENT PROCEDURE

CAUTION

NEVER OPERATE THE MODEL GT–550A TRANSCEIVER AS A TRANSMITTER WITHOUT A MATCHED ANTENNA OR ADEQUATE DUMMY LOAD TERMINATION. ILLUMINATING LAMPS WILL NOT PRESENT A CONSTANT LOAD IMPEDANCE. THE POWER AMPLIFIER TUBES AND PI–NETWORK COMPONENTS CAN BE DAMAGED IF THE EQUIPMENT IS OPERATED AS A TRANSMITTER UNLOADED.

WARNING

The voltages used in the Model GT–550A and Power Supply are lethal. Avoid unnecessary exposure to high voltage circuits when making circuit adjustments or voltage checks. Serious radio frequency burns will result if the plate or antenna output ends of the final amplifier PI network are contacted while transmitting.

10.1 GENERAL

The Model GT–550A Transceiver has been carefully aligned and tested at the factory and, with normal usage, should not require other than the usual attention given to electronic equipment. Service or replacement of a major component or circuit may require subsequent realignment, but under no circumstances should realignment be attempted unless the malfunction has been analyzed and definitely traced to mis–alignment. Service work should be performed by persons experienced in this work, using the proper test equipment.

NOTE

Do not make any adjustments unless the operation of the transceiver is fully understood and adequate test equipment is available.

10.2 EQUIPMENT REQUIRED

10.2.1 RF signal Generator; Hewlett–Packard Model 606A or an equivalent signal generator having up to one volt output at an impedance of 50 to 70 ohms and a frequency coverage to 30 MC.

10.2.2 A Vacuum Tube Voltmeter (VTVM); Hewlett–Packard Model 410B or equivalent VTVM having an RF probe good to 50 MC.

10.2.3 A dummy load; 50 ohms non–reactive; rated at 500 watts average power, Bird Wattmeter or equivalent.

10.2.4 AF Signal Generator; Hewlett–Packard Model 200 AB, or equiva lent.

10.2.5 A general coverage receiver covering the frequency range from 3 to 30 MC with a 100 KC calibrator or a calibrator accessory for the GT–550A.

10.3 BIAS ADJUSTMENT

The final amplifier bias must be checked and if necessary set before any extensive checks are made on the transmitter portion of the Model GT–550A. Correctly setting the bias will insure normal operating plate dissipation for the final amplifier tubes. Adjust the BIAS ADJ control located on the rear panel of the transceiver unit as follows:

A) Set the FUNCTION control PTT. Turn the transceiver ON. Allow the transceiver time to reach operating temperature. Pre–set the following controls as indicated.

MIC GAIN.....At Zero (Full CCW)
SIDEBAND.....As desired
BAND.....As desired

B. Check the setting of the BIAS ADJ control. It must be set for maximum bias voltage (full CCW position).

C. Close the PTT circuit of the microphone and set the BIAS ADJ control for 70 ma indicated plate current on the panel meter.

10.4 "S" METER ZERO ADJUSTMENT

The "S" meter will require a zero adjustment if it does not indicate between zero and S–1 in the receive mode with the RF Gain control full CW and no antenna connected.

To adjust, allow the transceiver to each operating temperature, disconnect the antenna, set the RF Gain full CW and adjust the "S" METER ZERO control on the rear panel until the meter needle rests on the extreme left hand mark of the meter face.

10.5 CARRIER BALANCE

The transceiver should be allowed to reach operating tem–perature before making the carrier balance adjustments. Remove the top cabinet cover to gain access to the carrier balance adjustments C7 and R1.

A) Tune–up the transceiver for SSB operation using an antenna load or dummy load for the transmitter. An output indicator must be installed in the coax to the load or antenna.

B) Turn the MIC GAIN control fully counterclockwise to remove all audio from the modulator stage.

C) Close the microphone PTT circuit.

D) Adjust the output indicator for good indication.

E) Adjust C7 and R1 for minimum output. (Located in center rear of top chassis) These two controls interact and adjustment should be repeated several times until no further improvement results.

F) Set the SIDEBAND Switch to the opposite sideband and ob–serve any carrier remaining. C7 and R1 may have to be reset for a compromise to obtain best suppression on both sidebands.

10.6 FINAL AMPLIFIER NEUTRALIZATION

A) Set the BANDSWITCH to the 28.0 – 28.5 MHz range.

B) Set the VFO dial to .500 (28.5 MHz).

C) Tune–up the transceiver for high power CW operation, then set the FUNCTION switch to CW and close the PTT switch.

D) Rock the PLATE tuning control slightly to either side of re–sonance and see if the MAXIMUM power output on the indicator occurs exactly at the "DIP" or MINIMUM plate current on the meter. If this does not occur, turn OFF the transceiver and ad–just C13 slightly. Turn the transceiver back ON and repeat the test. Continue to test and adjust C13 until the "DIP", and MAX–IMUM power output occur together. Do this quickly to prevent damaging the tubes.

Open the PTT circuit and set the FUNCTION switch to PTT position.

CAUTION

Do not adjust C13 while transmitting. Remove all power during adjustment of C13 to prevent damage to the trans–ceiver or power supply. Avoid all contact with the high voltages present.

10.7 VFO CALIBRATION ALIGNMENT

TRIMMER ADJUSTMENT ONLY

Trimmer capacity correction is indicated if the dial cali–bration at the 100 KHz check points consistently falls to one side of the hairline and cannot be corrected by the VFO corrector tab.

A) Remove the top cover to gain access to trimmer C5 next to the main VFO Capacitor.

B) Set the BAND switch at 3.5 MHz, FUNCTION Switch at PTT, SIDEBAND at LSB, and EXCITER Control for maximum received signal.

C) Center the VFO corrector tab.

D) Set the dial for exactly 3500 KHz. Carefully adjust trimmer C5 for zero beat using a non–metallic screwdriver. Only a slight adjustment will be required. Take care to in–sure dial calibration is not shifted by a complete 100 KHz.

E) Check calibration across the dial at the 100 KHz check points. If the frequency error is less then approximately 3000 Hz, the calibration is within acceptable limits. If the error increases and exceeds 3000 Hz, the VFO will require a coil adjustment in addition to the trimmer adjustment.

TRIMMER AND COIL ADJUSTMENT

If the dial error progressively increases in the same dir–ection with the high frequency end of the dial running out more than 3000 Hz, both coil L19 and trimmer C5 will re–quire adjustment. Re–calibrate the VFO as follows:

A) Set the controls as follows:

( ) RF gain control fully clockwise.

( ) FUNCTION switch to the CAL position (if you do not have a calibrator, use an external source but the accuracy of alignment depends on the accuracy of the referency sig–nal).

( ) Set the BANDSWITCH to the 80 meters 3.5 – 4.0 MHz.

( ) Set the EXCITER control to 10 o'clock.

( ) Set the SIDEBAND selector to full CCW.

( ) Set the VFO indicator to center full using VFO indi–cator correction tab.

B) Adjust the Main Tuning Dial slightly to find the 4.0 MHz signal.

C) Adjust L19 through the side of the VFO shield and Main Tuning Dial until the ZERO BEAT note and calibrator signal occur at 4.0 MHz on the dial.

D) Set the Main Tuning Dial to 3.5 MHz.

E) Adjust C5 and Main Tuning Dial until the ZERO BEAT note and calibrator signal occur at 3.5 MHz.

F) Repeat steps B thru E until tuning dial ZERO BEAT is at ex–actly 3.5 and 4.0 MHz. respectively. Take care not to shift the entire tuning range of the VFO by selecting the wrong 100 KHz marker during alignment.

G) Plug the VTVM RF probe into test point 1 on the chassis (Fig–ure 11) and place VTVM on the 3 volt RMS scale.

H) Set the Main Tuning Dial to 3.750 MHz (.250 on dial).

I) Ground test point 1 on T2 (Figure 11).

J) Adjust bottom slug on T2 for maximum output on VTVM.

K) Remove ground on test point 1 and ground test point 2 (Figure 11) on T2.

L) Adjust top slug on T2 for maximum output on VTVM.

M) Remove ground from test point 2.

N) Vary VFO dial from 0 to .500. The output should be 1.4 volts RMS or higher across the entire tuning range.

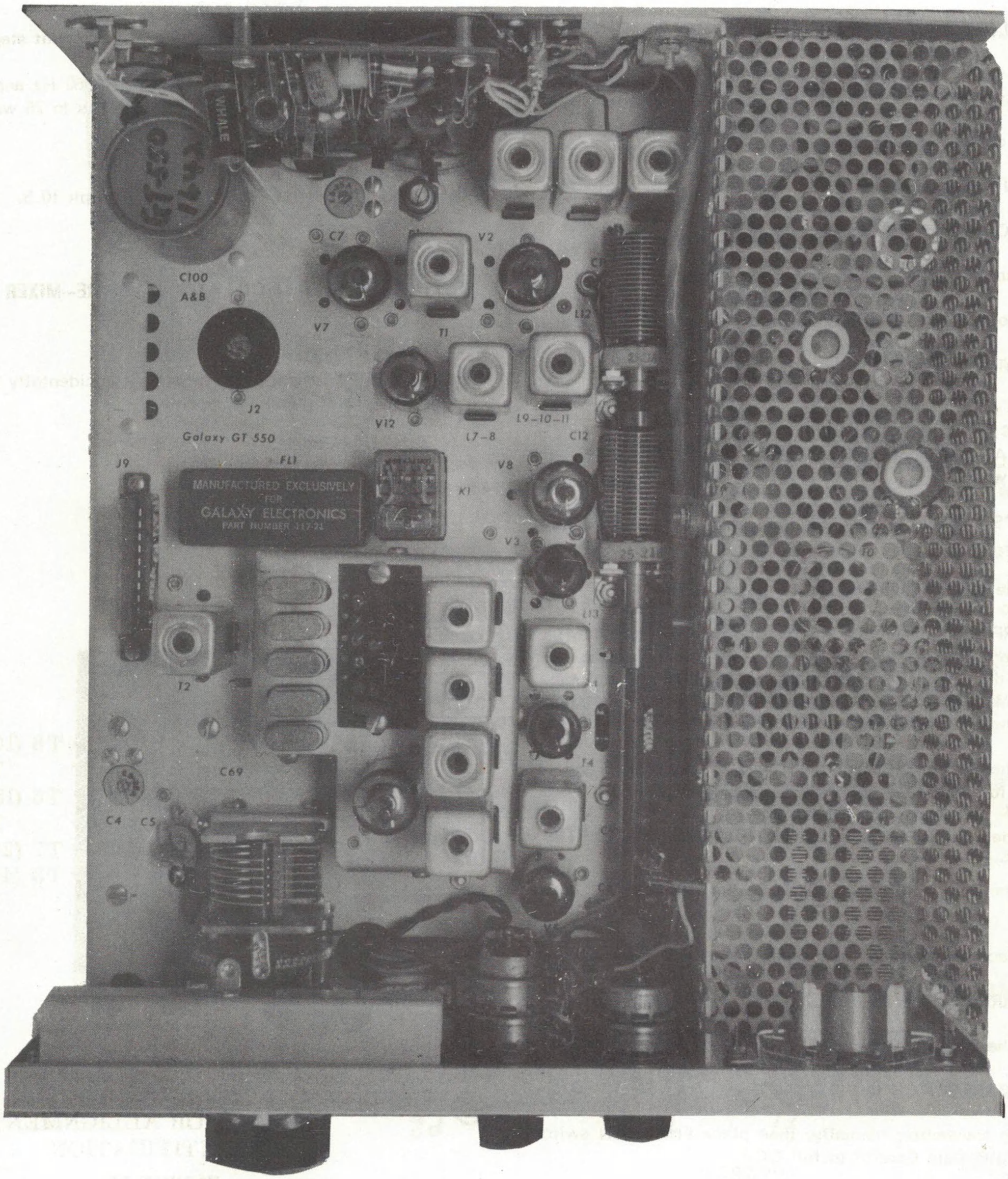


Figure 11 Top View of Chassis

10.8 VFO SIDEBAND SHIFT ADJUSTMENT

The VFO sideband shift trimmer, C4, shifts the VFO frequency approximately 2700 Hz to correct for the difference in frequency between the upper and lower sideband carrier cuptal frequencies. To check the trimmer setting, tune the transceiver in the LSB mode to zero beat with the 3800 KHz marker frequency. Switch to USB mode. There should be less than a 25 Hz change in frequency. If the change is more than 25 Hz, adjust trimmer C4 until the difference between LSB and USB is less than 25 Hz.

10.9 IF ALIGNMENT (9 MHz)

A) Remove the VOX or Jumper Board from J9 to prevent the unit from being placed in the transmit condition accidentally.

B) Set the controls as follows:

( ) RF GAIN fully clockwise.

( ) FUNCTION switch in the PTT position.

( ) LOAD control at 10 o'clock position.

( ) PLATE control at 12 o'clock position.

( ) BANDSWITCH to the 40 meter band 7.0 – 7.5 MHz.

C) Connect the RF Signal Generator to the antenna jack.

D) Set the AF gain control 1/2 open and allow 5 minutes for the receiver to warm up.

E) Adjust "S" METER ADJ on the back panel for a zero reading on the "S" meter.

F) Adjust the slug in L1 to the top of the can.

G) Set the RF Signal Generator for 10,000 microvolt output at 9.0 MHz, then vary the generator frequency slightly until a beat note is heard in the speaker. Adjust the EXCITER tuning for maximum "S" Meter reading. Adjust the Signal Generator output level until the "S" Meter reads approximately S6.

H) Adjust the slug in L13 (Figure 11) and the slugs in T1 and T4 (Figure 11) for maximum "S" Meter reading.

I) Adjust the Signal Generator output for a reading of 10 – 20 DB over "S–9".

J) Adjust the slug in L1, the 9 MHz trap, for minimum "S" Meter reading.

K) Disconnect the generator and replace the VOX Jumper board.

10.10 CARRIER CRYSTAL ALIGNMENT

A) Attach the RF output indicator (watt meter) and Dummy Load.

B) Set the BANDSWITCH to 7.0 – 7.5 MHz. Set VFO to 500. .

C) Tune–up transmitter normally, then place FUNCTION switch to PTT and MIC Gain Control to full CCW.

D) Set the SIDEBAND switch full CCW or USB on 40 meters.

E) Connect an accurately calibrated audio signal generator to the MIC jack. Also, connect the SPST toggle switch to the PTT circuit front or rear jacks.

F) Set the audio generator to 1000 Hz with .05 volts output.

G) Close the PTT circuit with the toggle switch and adjust the MIC gain control for a wattmeter reading of 100 watts.

H) Change the audio generator to exactly 350 Hz and, if necessary, adjust C9 until the output power drops to 25 watts.

I) Set the audio generator to exactly 1400 Hz and adjust T1 for a maximum output.

J) Set the SIDEBAND switch fully CW and repeat steps F and G.

K) Change the audio generator to exactly 350 Hz and, if necessary, adjust C8 until the output power drops to 25 watts.

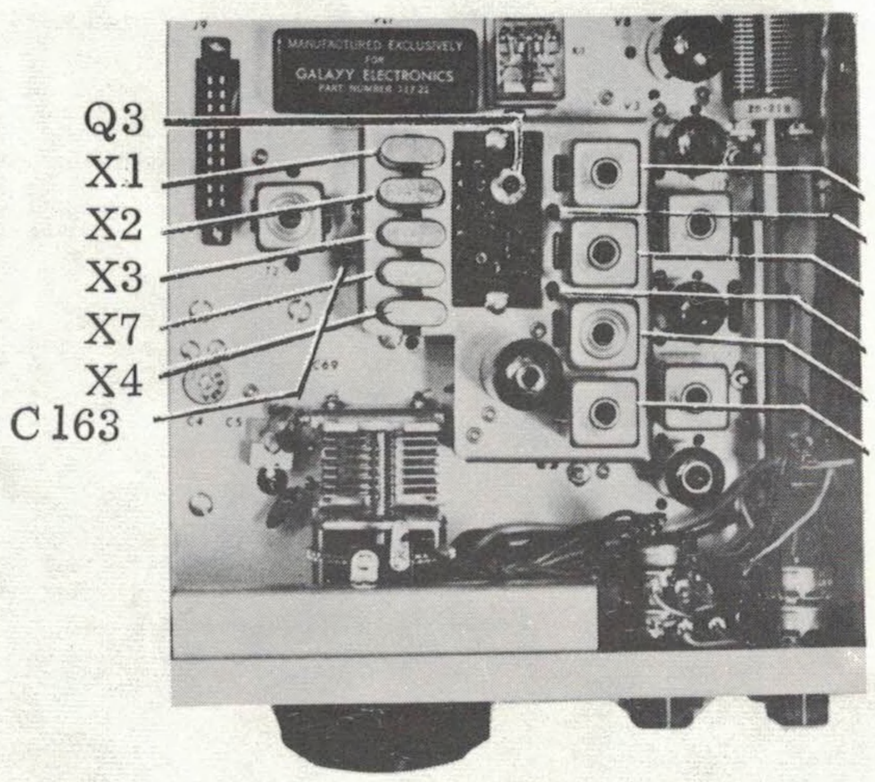
L) Repeat steps E to K.

M) Repeat the Carrier Adjustment, paragraph 10.5.

10.11 CONVERTER OSCILLATOR AND PRE–MIXER ALIGNMENT

NOTE

Remove the VOX jumper board to prevent accidentally transmitting a signal while aligning the module.



CONVERTOR ALLIGNMENT IDENTIFICATION

FIGURE 12

This operation consists of setting the crystal controlled oscillator and 6KE8 premixer to insure operation on 40, 20, 15 and 10 meters.

CRYSTAL OSCILLATOR ADJUSTMENT

Capacitor C163, a piston trimmer located on the side of the converter module is tuned to insure the crystal oscillator, Q3, starts reliably on each frequency it is required to oscillate on. This capacitor will not normally require field adjustment.

To set C163, as would be required after crystal replacement or component change, set the BAND switch to 28.5 – 29.0 MHz, VFO dial to 250, EXCITER for maximum received signal, and connect the RF probe of the VTVM to test point 5. (Figure 11)

Set the meter to the 3 volt RMS range.

Capacitor C163 is set for highest VTVM reading. It will be noted that as the trimmer is peaked, the oscillator will "drop out" quickly on one side of the peak and slowly on the other side of the peak reading. After setting C163 for peak reading, check 40, 20, 15, and 10 meters for proper oscillator operation. Minimum reading should be 1.5 VRMS on 40, 20, 15 and 10 meters.

If the oscillator is "dead" on any band, reset C163 until the oscillator starts working again. The setting of C163 will have to be compromised to insure the oscillator starts oscillating on each band.

PRE–MIXER ADJUSTMENT

The module has built in test points for the alignment of T3, T5, T6 and T7. During alignment the correct test point should be grounded with a screwdriver.

Align the pre–mixer output as follows:

A) Plug the VTVM RF probe into TEST POINT 5 (Figure 11) and set the VTVM to 3 volts RMS scale.

B) Adjust as follows:

BANDSWITCH	VFO DIAL	GROUND TEST POINT 4 Tune slug for MAXIMUM reading on VTVM
40 meters 7.0–7.5 MHz	.250	Bottom Slug T3
20 meters 14.0–14.5	.250	Bottom Slug T7
15 meters 21.0–21.5	.250	Bottom Slug T5
10 meters 28.0–28.5	.500	Bottom Slug T6

C) Remove ground from test point 4 and place the ground on test point 3, then proceed as follows:

BANDSWITCH	VFO DIAL	GROUND TEST POINT 3 reading on VTVM
40 meters 7.0–7.5	.250	Top Slug T3
20 meters 14.0–14.5	.250	Top Slug T7
15 meters 21.0–21.5	.250	Top slug T5
10 meters 28.0–28.5	.500	Top slug T6

E) Remove ground from test point 3. This completes the alignment of the module.

10.12 ALIGNMENT OF TRANSMIT MIXER/DRIVER AND RECEIVER ANTENNA STAGES.

NOTE

The final amplifier bias adjustment must be properly set before attempting alignment of the following stages.

It is assumed that the signal generating stages of the Model GT–550A are functioning properly. The internally generated signal of the transceiver will be used for alignment of the transmit mixer/driver and receiver antenna stages.

A) Attach a suitable dummy load with RF indicator to the ANTENNA jack. Replace the VOX jumper board, if not already in place.

B) 80 meter alignment – pre–set the controls as follows:

( ) BANDSWITCH to 3.5 – 4.0 MHz.

( ) SIDEBAND switch to USB.

( ) PLATE tuning to 2 o'clock position.

( ) LOAD control to 10 o'clock position.

( ) MIC gain maximum COUNTERCLOCKWISE.

( ) VFO dial to .500 (4.9 MHz).

( ) EXCITER control to 9 o'clock position (capacitor fully open).

( ) FUNCTION switch to TUNE.

Advance the MIC gain control until the meter rises to 200 ma or the meter. Adjust L2 and L7 (bottom slugs in cans) for maximum meter reading. Use the MIC gain control to keep the meter reading under 200 ma.

Return the FUNCTION switch to PTT.

C) 40 Meter Alignment –– pre–set the controls as follows:

( ) BANDSWITCH to 7.0 – 7.5 MHz.

( ) PLATE tuning to 12 o'clock.

( ) LOAD control to 10 o'clock.

( ) MIC Gain Control Full CCW.

( ) VFO dial to .500 (7.5 MHz).

( ) EXCITER tuning to 9 o'clock (capacitor fully open).

( ) FUNCTION switch to TUNE.

Then advance the MIC Gain Control until the meter rises to 200 ma. Adjust L3 and L8 (top slugs in cans) for maximum meter reading, using the MIC Gain Control to keep the meter reading below 200 ma.

Return the FUNCTION Switch to PTT.

D) 20 Meter Alignment––pre–set the controls as follows:

( ) BANDSWITCH to 14.0 – 14.5 MHz.

( ) PLATE tuning to 11 o'clock.

( ) LOAD control to 11 o'clock.

( ) MIC Gain Control full CCW.

( ) VFO dial to 000 (14.0 MHz).

( ) EXCITER tuning to 3 o'clock (capacitor fully meshed).

( ) FUNCTION switch to TUNE.

( ) Then advance the MIC Gain Control until the meter rises to 200 ma.

( ) Adjust L4 and L9 (top slugs in cans) for maximum meter reading, keeping meter below 200 ma with Mic Gain Control.

( ) Return FUNCTION switch to PTT.

E) 15 Meter Alignment--pre-set the controls as follows:

( ) BANDSWITCH to 21.021.5 MHz.

( ) PLATE tuning to 10 o'clock.

( ) LOAD control to 11 o'clock.

( ) MIC Gain Control full CCW.

( ) VFO dial to 000 (21.0 MHz).

( ) EXCITER tuning to 3 o'clock (capacitor fully meshed).

( ) FUNCTION switch to TUNE.

( ) Then advance the MIC Gain Control until the S-Meter reads 200 ma. Adjust L5 and L10 (Middle slugs in cans) for maximum meter reading using the MIC Gain Control to keep meter reading under 200 ma.

( ) Return FUNCTION switch to PTT.

F) 10 Meter Alignment--pre-set the controls as follows:

( ) BANDSWITCH to 28.0 – 28.5 MHz.

( ) PLATE control to 10 o'clock.

( ) LOAD control to 11 o'clock.

( ) MIC Gain Control full CCW.

( ) VFO dial to 000 (28.0 MHz).

( ) EXCITER tuning to 3 o'clock (capacitor fully meshed).

( ) FUNCTION switch to TUNE.

( ) Then advance the MIC Gain Control until the meter reads 200 ma. Adjust L6 and L11 (bottom slugs in cans) for maximum meter reading, keeping meter below 200 ma using the MIC Gain Control.

( ) Return the FUNCTION switch to PTT.

10.13 "S" METER SENSITIVITY ADJUSTMENT

To adjust the "S" meter sensitivity, set up the transceiver to receive on the 7 – 7.5 MHz range. Connect a calibrated signal generator to the ANTENNA input jack, set it to 7.5 MHz, 100 micro-volt output and tune the generator until heard in the receiver. Retune the transceiver for maximum "S" meter reading.

With the generator output at 100 microvolts, adjust R67, a screw driver adjust potentiometer located inside center rear bottom panel next to "S" Meter ZERO control, for a reading of "S-9" on the meter.

Disconnect the generator from the ANTENNA jack.

10.14 12 VOLT DC REGULATOR ADJUSTMENT

To adjust the regulated 12 volt supply voltage in the transceiver, remove the top and bottom covers and place the unit upside down. The regulator board, #200-48, is located close to the VOX socket, J9.

Attach the DC probe of the VTVM to the 12 VDC jack on the rear panel. This jack is between the FILTER IN and FILTER OUT jacks. Exercise caution and do not accidentally ground the 12 VDC jack or transistor Q1 will be damaged. Attach the VTVM ground lead to the chassis. Set the VTVM to the 15 volt scale.

Turn ON the transceiver and adjust R15, blue potentiometer on regulator board, for a VTVM reading of 11.5 VDC ± 0.1V.

This adjustment should also be carried out if the unit is operated mobile. When adjusting for mobile usage, be sure the motor is running, the headlights are on and the heater or air conditioner is running.

After adjustment, turn OFF the transceiver and disconnect the VTVM.

10.15 PRE-MIXER PEAKING COIL ADJUSTMENT

When operating on 40 meters, a peaking coil, L12, is switched into the pre-mixer buffer output to insure adequate drive to the transmit mixer, V8.

To align L12, set the BAND Switch to 7.0 – 7.5 MHz, VFO dial to 250 and tune up the transceiver for SSB operation. Remove the top cover of the transceiver and attach the RF probe of the VTVM to test point 5 (Figure 11) and set the VTVM on the 3 volt RMS range.

Adjust L12 for maximum meter reading on the VTVM.

If desired, the VFO can be set to the frequency most often operated and L12 peaked. However, this will compromise operation on other frequencies from 7.0 – 7.5 MHz.

If usage of the transceiver outside of Region 2 is contemplated, it will be desirable to align L12 at 7.050 MHz since the amateur frequency allocation is only from 7.0 – 7.1 MHz.

After alignment, disconnect the VTVM and replace the top cover.

10.16 AUDIO OUTPUT TRANSISTOR BALANCING

This adjustment insures the audio output transistors, Q6 and Q7, are biased for equal collector currents. This adjustment must be carried out using the AC–400 fixed station power supply.

If Q6 or Q7 have been replaced, preset R131, (1 Meg.) balance potentiometer upper left corner of the audio–AVC board, to mid–range before applying any power.

Disconnect the antenna and set the RF GAIN and AUDIO GAIN controls to full CCW. Turn on the transceiver and measure the DC supply voltage to the Audio–AVC Board on the rear panel with the DC probe of the VTVM. It is the yellow wire attached to the edge of the board next to the output transistors. Normally, it will read from 15 to 18 volts. Record the reading for refer–ence.

Attach the DC probe of the VTVM to the top of R137, (1 ohm 1 watt) next to Q7, (D43C1) and adjust R132 (1 Meg.) in the upper left corner until the indicated voltage is exactly one–half of the previously measured supply voltage. Wait for C142 to charge fully after each adjustment.

After adjustment, turn OFF the transceiver and disconnect the VTVM.

10.17 TROUBLE SHOOTING CHART:

SYMPTOM	PROBABLE CAUSE
GT–550A will not energize (no dial lights or filaments)	(1) Power Supply NOT PLUGGED INTO 110 VAC. (2) POWER CABLE between power supply and GT–550A not se–curely in place. (3) Fuse blown in Power Supply
NO BACKGROUND NOISE (receiver audio)	(1) Speaker not plugged in. (2) CW Filter Jumper cut and jacks not jumped. (3) Unit in transmit mode. (4) Audio Gain fully CCW.
BACKGROUND NOISE but no signals being heard	(1) Antenna not attached to GT–550A rear panel. Check to make sure it is connected. (2) Antenna is presenting a mismatch. (3) Antenna or antenna connector grounded out. (4) Q1 open and no 12 VDC to oscillator circuits, check V1, V4, V2, V5 and V6. (5) Remote VFO plug not plugged into J1 or the jumper has been removed from the plug.
GT–550A performs normally on 80 meters, but dead on 40, 20, 15 and 10	Check V6 and Q3 Check setting of C163
GT–550A performs normally on all bands but.....	40, check X1 20, check X7 15, check X2 28.0 – 28.5, check X3 28.5 – 29.0, check X4 Check setting of C163
Receive is normal, but will not TRANSMIT	(1) Keying line open at J3, check all cathodes in the transmit string to be sure they are being grounded. Check tubes V3, V5, V6, V7, V8, V9, V10, V11.

SYMPTON	PROBABLE CAUSE
No Modulation, But GT–550A TUNES normally	(1) CW key plugged into rear of unit (J3) and is not being shorted for SSB operation. (2) Check Q9, Q10, or C120, C123, C126, C127
Carrier on SSB Signal	(1) V7 is bad, replace and use AMPEREX ONLY (2) R1 and C7 need adjustment.
No Sidetone	Check Q11 and D9
Receive Sensitivity LOW	Check V1 and V4
Transmit Drive LOW	Check V3, V6, V8 and V9 Check 12 volt regulator setting.
Drive is ample, but unable to load to 400 ma	(1) V10 and V11 soft and require replacement (USE GE SELECTED TUBES ONLY) These tubes available from Hy–Gain Galaxy Customer Service. (2) Possible antenna impedance problems see paragraph 2.2
FM–ing while MOBILE and drifts when engine speeded up.	(1) Voltage regulator in car not set high enough––set to 13.5 VDC. (2) Check setting of 12 volt regulator.

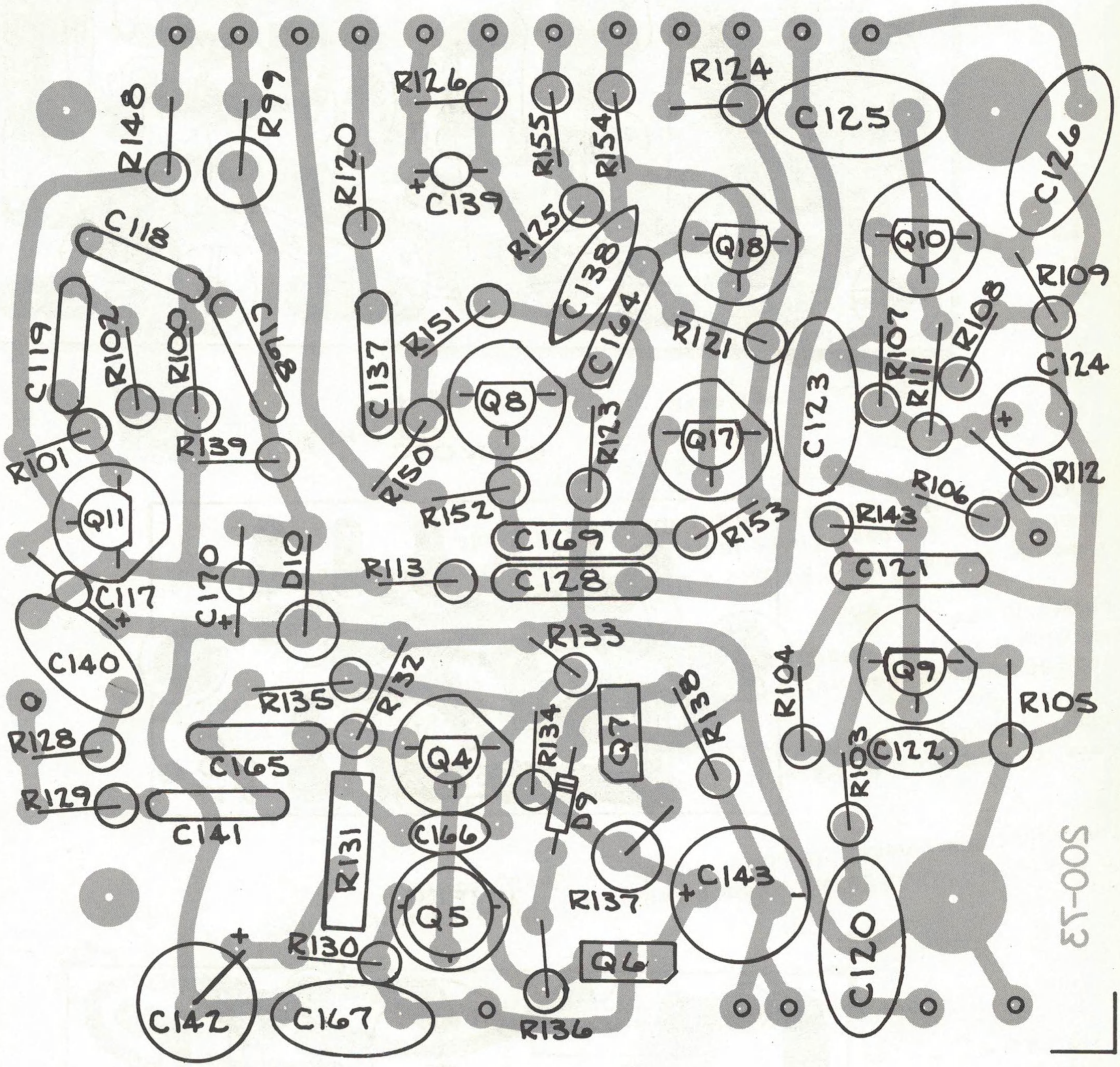
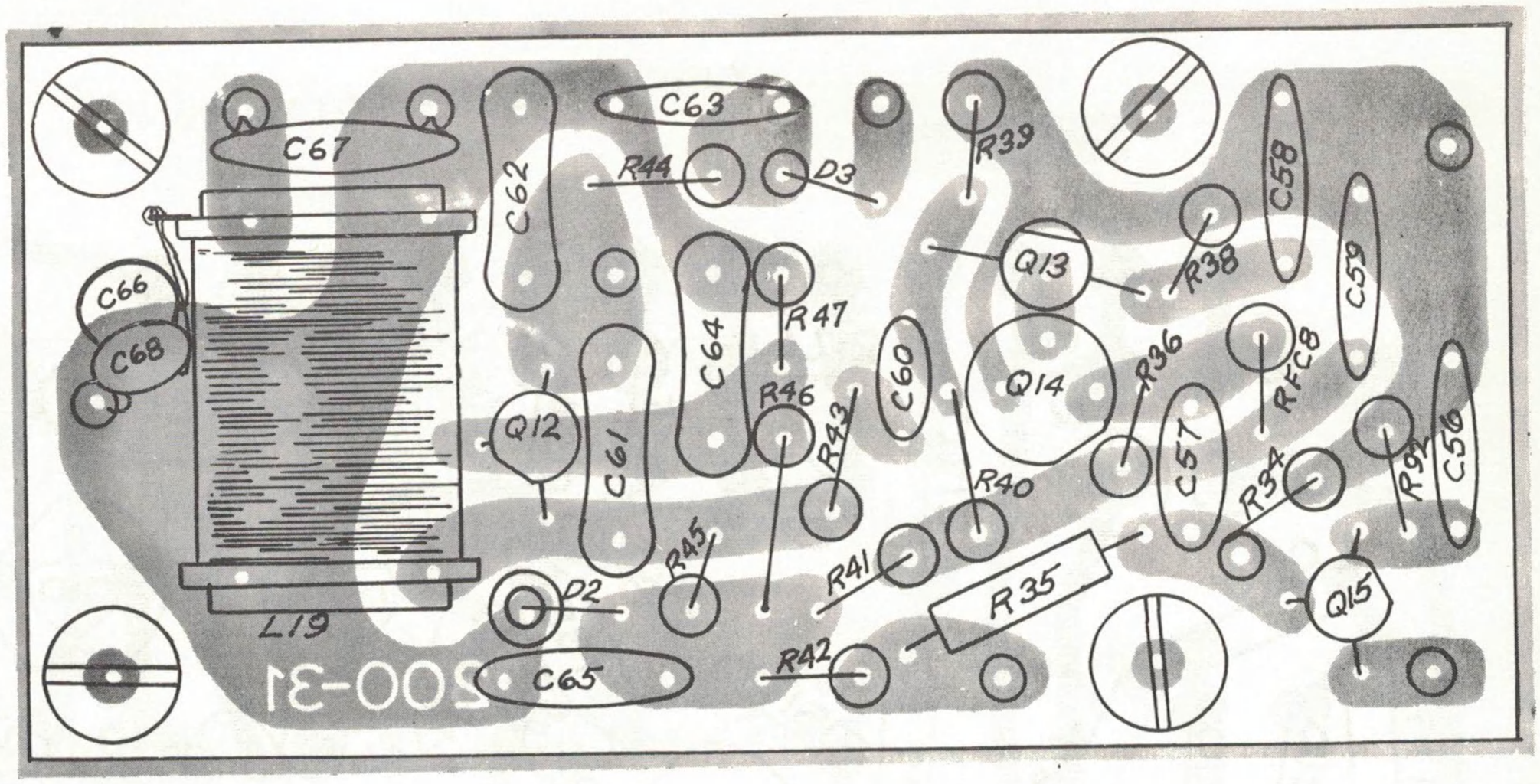
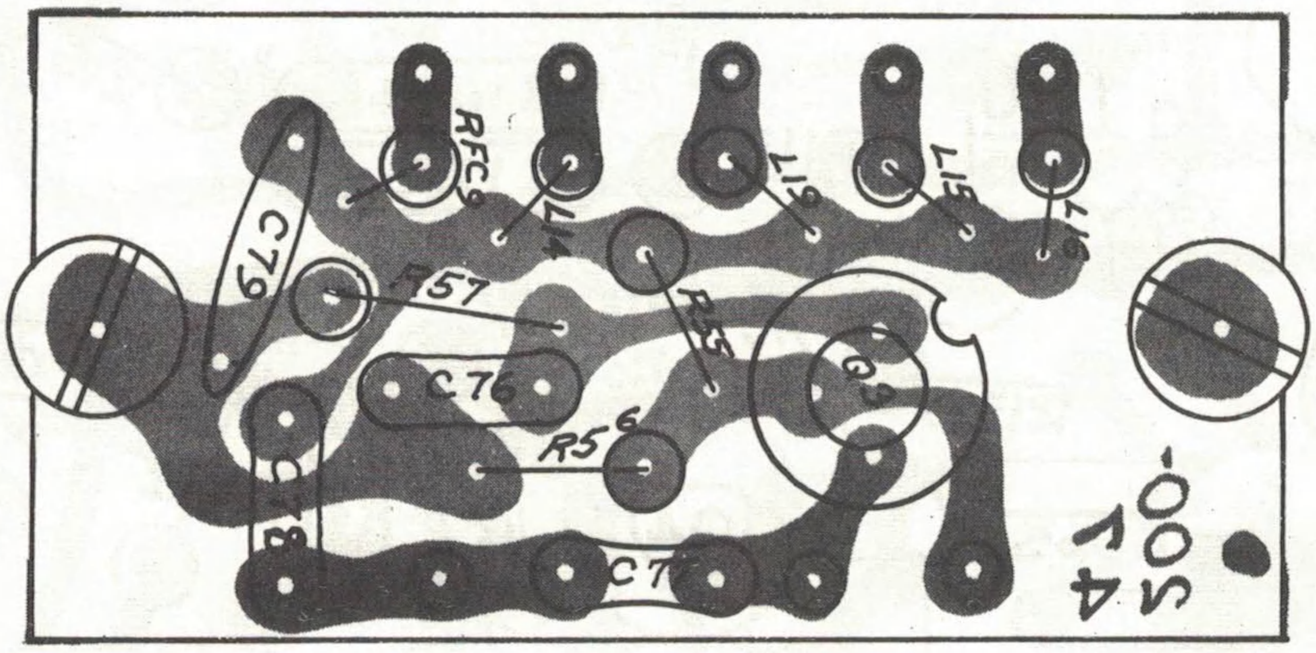


FIGURE 13X-ray View of Audio-AVCBand

VFO



CONV. OSC



12V. REG.

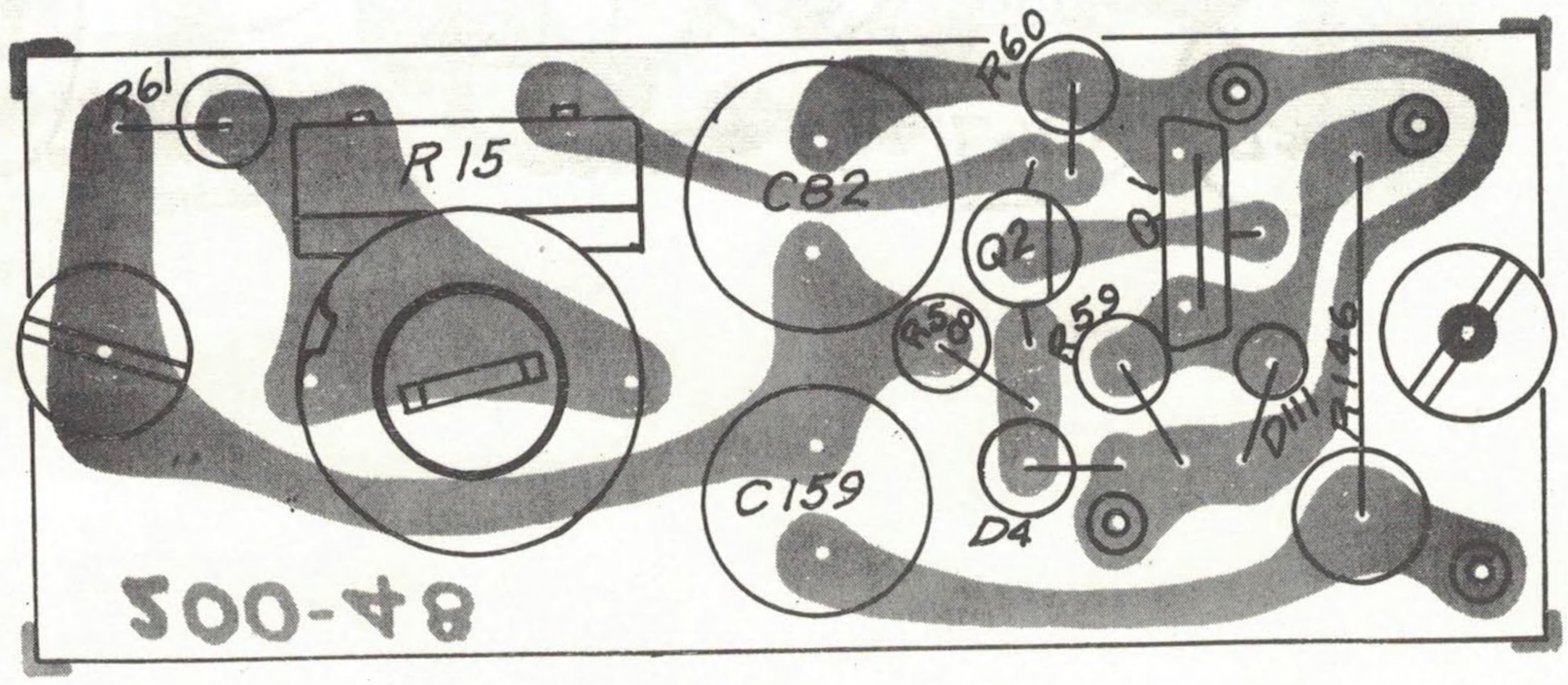


Figure14 X-ray View of VFO, Converter Oscillator, 12 Reg. Boards

	1	2	3	4	5	6	7	8	9	10	11	12
V1 - 12BZ6	-.5	.6	-	-	242	90	0					
	0	55*	-	-	280	180	0					
V2 - 6HG8	.9	-.1	.9	-	-	.8	44	285	44			
	50*	-95	50	-	-	0	0	0	0			
V3 - 6EW6	-.5	.38	-	-	190	105	0					
	-.5	.30	-	-	190	105	0					
V4 - 12BA6	-.5	0	-	-	160	66	1.2					
	0	0	-	-	250	180	54					
V5 - 6GX6	3.4*	4.6	-	-	120	158	0					
	2.8*	4.0	-	-	112	150	0					
V6 - 6KE8	180	-1	92	0	0	150	.8	5	0			
	150	-1.3	82	0	0	130	.72	4.5	0			
V7 - 12AT7	-.05	0	18	-	-	.05	0	18				
	150	0	2			150	0	2				
V8 - 6EJ7	15	0	15	-	-	0	300	300	0			
	3	-.3	3	-	-	0	280	158	0			
V9 - 6GK6	15	-7.5	0	-	-	0	360	360	0			
	.4	-7.5	0	-	-	0	360	360	0			
V10 - 6LB6	-	0	0	0	-62*	0	0	0	-62*	0	0	-
		.2	150	0	-62*	0	0	0	-62*	0	150	-
V11 - 6LB6	-	0	0	0	-62*	0	0	0	-62	0	0	-
		.2	150	0	-62*	0	0	0	-62*	0	150	-
V12 - OA2	0	0	0	0	0	0	0					
	150	0	0	0	150	0	0					

*Indicates reading varies with the bias setting potentiometer and must be properly set by the operator to be correct.
All readings taken with a VTVM, the GT550 is set in the following manner:
40 meters, 7.2 MHz, PTT FUNCTION, RF gain control MAXIMUM CLOCKWISE, the AF gain control MID-RANGE.
Top line readings are taken in the RECEIVE MODE.
Bottom line readings are taken in the TRANSMIT MODE (PTT circuit closed)
MIC CCW SIDEBAND CCW

GT550A TUBE VOLTAGE CHART
FIGURE 15

Q1	18	18	11.5
Q2	3.3	3.9	18
Q3	.28	.8	12
Q4	.5	1.0	16.1
Q5	16.6	16	9
Q6	8.6	9	16.6
Q7	8.6	8	0
Q8	3.9	4.5	-7.8
Q9	.6	1.1	10
Q10	10.2	10.7	23
Q11	-8.7	7.5	3.6
Q12	1.6	2.1	6.4
Q13	.16	.66	3.1
Q14	3.8	3.1	0
Q15	1.2	1.9	12
Q16	16	16	16
Q17	15	15	.4
Q18	15	15	.4

Reading taken in the TRANSIT MODE same as voltage reading. Al other readings taken in RECEIVE MODE on 40 meters, 7.2 MHz with RF gain control MAXIMUM CLOCKWISE, AG gain control MID-RANGE and MIC gain fully COUNTER-CLOCKWISE. Use a good VTVM with at least 11 megaohms input resistance.

FIGURE 15A
TRANSISTOR VOLTAGE CHART

	1	2	3	4	5	6	7	8	9	10	11	12
V1 - 12BZ6	2.2 meg	47	0	.6	60k	40	0	-	-	-	-	-
V2 - 6HG8	150	100k	150	.6	.4	100k	110k	60k	110k	-	-	-
V3 - 6EW6	3.3 meg	52	.6	.4	55k	120k	0	-	-	-	-	-
V4 - 12BA6	2.4 meg	0	.4	0	70k	55k	100	-	-	-	-	-
V5 - 6GX6	2.2 meg	1k	.4	0	280k	110k	47k	-	-	-	-	-
V6 - 6KE8	93k	10k	60k	.6	0	100k	100	470	100	-	-	-
V7 - 12AT7	30k	120k	inf.	.4	0	30k	0	inf.	4	-	-	-
V8 - 6EJ7	inf.	330k	inf.	0	.6	0	60k	100k	0	-	-	-
V9 - 6GK6	inf.	22k	0	.6	0	inf.	60k	50k	0	-	-	-
V10 - 6LB6	0	5	30k	0	6.8k	inf.	inf.	inf.	6.8k	0	30k	.5
V11 - 6LB6	0	5	30k	0	6.8k	inf.	inf.	inf.	6.8k	0	30k	.6
V12 - OA2	26k	0	inf	0	26k	inf.	0	-	-	-	-	-

All resistance readings taken with power dis-connected.
Readings taken with VTVM with at least 11 megaohms input resistance. GT550's controls as follows: RF gain control MAXIMUM CLOCKWISE. AF gain control MID-RANGE, 40 meters, 7.2 MHz and FUNCTION switch in PTT position. VOX and CALIBRATOR accessories are removed and the VOX jumper strip installed.
All measurements made from chassis ground to the pin designated.

FIGURE 16
GT550A RESISTANCE READINGS

SECTION XI

SERVICE

3.1 RETURNING EQUIPMENT FOR SERVICE:

DO NOT ship equipment to the Manufacturer without prior authorization. We prefer to send special shipping labels which will avoid the delay of unexpected shipment.

If time is extremely important, wire or call for approval and we will rush labels to you. When a shipment is expected, even the time of sending the labels is less than that lost when an unexpected shipment is received.

It is VERY IMPORTANT that the shipment be well packed and fully insured. Damage claims must be settled between you and the carrier and will greatly delay any returns. Proper packing normally avoids this trouble.

ALL SHIPMENTS MUST BE SENT TO US PREPAID. We do not accept collect shipments. All returns should be made in our standard cartons only — so save your carton when unpacking the unit. When a shipment is returned it will be handled in one of three ways . . . .

1—Where all service is in warranty the shipment will be returned prepaid by a carrier of our choice.

2—If there are any charges not covered by warranty we will hold the shipment and advise you of costs, which you can then send.

3—Or, upon your written authorization, we will ship C. O. D. for any charges not covered by warranty, then the carrier will collect these charges and the transportation costs on arrival. Unclaimed or refused C. O. D. shipments will not be reshipped until payment of service and transportation charges is received. Shipment will then be made collect for reshipment transportation charges. Unclaimed equipment automatically becomes the property of the Manufacturer 60 days after date of refusal or return and will be disposed of for payment of charges due.

NOTE

We WILL NOT ship by means of a carrier that will not fully insure the shipment. Some carriers have a $200.00 limit. The exception to this is when there is no other means (APO-FPO-etc.) of shipment than parcel post, and then we will ship by this means with your written agreement that you assume any loss over that which the carrier will insure. C. O. D. shipments cannot be made to APO-FPO addresses.

3.2 REPLACEMENT PARTS ORDERING:

All replacement parts orders must be prepaid or C. O. D. only.

Replacement part price quotes will be furnished on request for those who desire prepaid shipment or cannot accept C. O. D. shipments.

3.3 SHIPPING ADDRESS:

All requests, inquiries, warranty claims or equipment returns should be made to:

Hy-Gain Electronics Corporation
Rural Route 3
Lincoln, Nebraska 68505

Attn: Customer Service Manager

SECTION XII

WARRANTY

Hy-Gain Electronics Corporation warrants each new product manufactured to be free from defects in material and workmanship and agrees to remedy any such defect, or to furnish a new part, in exchange for any part of any unit which under normal installation, use, and service discloses such defect within ninety days from the date of purchase by original owner. The unit serial number must be registered by the original owner at the time of purchase to validate the warranty.

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

Hy-Gain Electronics Corporation reserves the right to make any changes deemed necessary or desirable without advance notice or incurring any obligation to make like changes in units prevously manufactured or sold.

This warranty does not cover transportation or installation costs that may be incurred. Hy-Gain Electronics Corporation's sole liability is the remedy of any defect for ninety days. Hy-Gain Electronics Corporation is not responsible for personal injury or property damage resulting from improper or careless installation not intended by the manufacturer.

No person is authorized to assume for us any other liability in connection with the sale of our products.

All warranties are void and terminated one year after the last unit of its type and design has been manufactured by us.

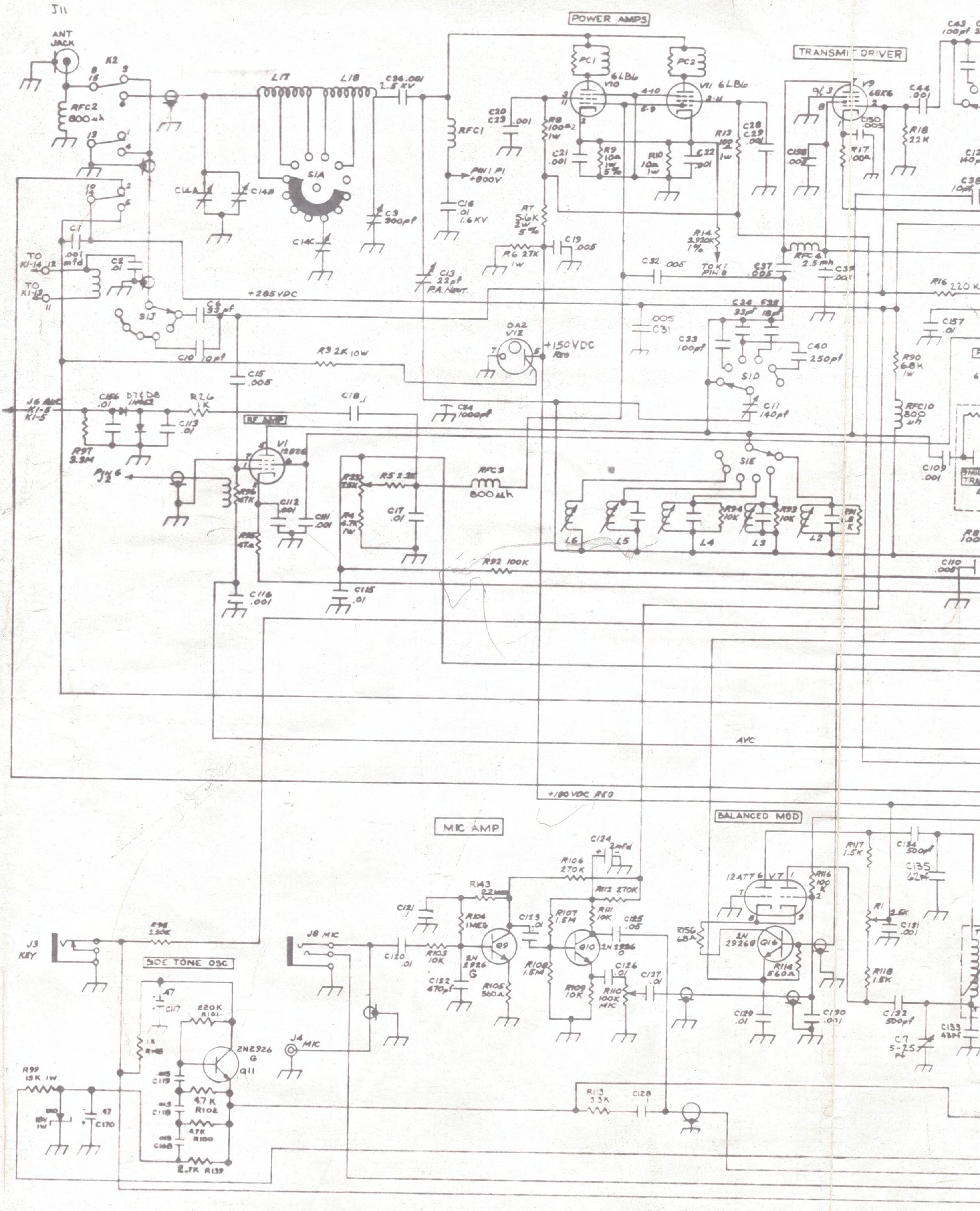
SECTION XIII

PARTS LIST

SYMBOL	DESCRIPTION	PART NO.	SYMBOL	DESCRIPTION	PART NO.
C1	.001 Disc Cap	721560	C61	1000 Pf DSM	721661
C2	.01 Disc	721550	C62	1000 Pf DSM	721661
C3	P.A. Tuning Cap	721830	C63	.01 Disc	721550
C4	5-25 Pf NPO Trimmer	721860	C64	1000 Pf DSM	721661
C5	3-15 Pf Trimmer	721842	C65	.1 Film	721574
C6	33 Pf NPO	721628	C66	6.8 Pf 5%	721596
C7	5-25 Pf Npo Trimmer	721860	C67	68 Pf NPO	721601
C8	5-25 Pf NPO Trimmer	721860	C68	15 Pf 5%	721599
C9	5-25 Pf NPO Trimmer	721860	C69	VFO Tune Cap	721833
C10	10 Pf NPO	721624	C70	330 Pf	721600
C11	140 Pf Exc Varible	721838	C71	6.8 Pf	721598
C12	140 Pf Exc Varible	721839	C72	100 Pf Disc	721559
C13	5-22 Pf Neut Cap	721828	C73	.001 Disc	721560
C14	Three Gang Load Cap	721827	C74	.001 Disc	721560
C15	.005 Disc	721548	C75	.001 Disc	721560
C16	.01 mfd 1.6 KV Cap	721565	C76	82 Pf DSM	721690
C17	.01 Disc	721550	C77	33 Pf NPO	721628
C18	.1 Mylar	721758	C78	150 Pf DSM	721668
C19	.005 Disc	721548	C79	.01 Disc	721550
C20	.001 Disc	721560	C80	.01 mfd Disc	721550
C21	.001 Disc	721560	C81	.01 mfd Disc	721550
C22	.001 Disc	721560	C82	100 mfd 15v Ele	721893
C23	.001 Disc	721560	C83	100 Pf	721663
C24	.001 Disc	721560	C84	.001 Disc	721560
C25	82 Pf DSM	721690	C85	.01 Disc	721550
C26	50 Pf NPO	721617	C86	.001 Disc	721560
C27	47 Pf NPO	721630	C87		
C28	.001 mfd Disc	721560	C88	50 Pf NPO	721617
C29	.001 mfd Disc	721560	C89	470 Pf Disc	721575
C30	.01 mfd Disc	721550	C90	.001 Disc	721560
C31	.005 mfd Disc	721548	C91	50 Pf NPO	721617
C32	.005 mfd Disc	721548	C92	50 Pf NPO	721617
C33	100 Pf DSM	721663	C93	.01 Disc	721550
C34	33 Pf DSM	721628	C94	.01 Disc	721550
C35	18 Pf DSM	721633	C95	.005 Disc	721548
C36	.001 2.5 KV	721660	C96	.001 Disc	721560
C37	.005 Disc	721548	C97	100 Pf DSM	721663
C38	10 Pf NPO	721624	C98	.001 mfd Disc	721560
C39	.005 Disc	721548	C99	.01 mfd Disc	721550
C40	250 Pf DSM	721687	C100	40-40 mfd 450v	721795
			C101	.005 Disc	721548
C42	33 Pf NPO	721628	C102	4.7 Pf Disc	721587
C43	100 Pf DSM	721663	C103	39 Pf. NPO	721629
C44	.001 Disc	721560	C104	.01 Disc	721550
C45	100 mfd 150v	721816	C105	100 Pf Disc	721559
C46	2000 Pf DSM	721669	C106	.01 Disc	721550
C47	.01 Disc	721550	C107	220 Pf DSM	721665
C48	25 Pf Disc	721632	C108	50 Pf NPO	721617
C49	.005 Disc	721548	C109	.001 Disc	721560
C50	.005 Disc	721548	C110	.005 Disc	721548
C51	.01 Disc	721550	C111	.001 Disc	721560
C52	100 Pf Disc	721559	C112	.001 Disc	721560
C53	560 Pf DSM	721677	C113	.01 Disc	721550
C54	150 Pf DSM	721668	C114	1000 Pf Feed-Thru	721670
C55	.01 Disc	721550	C115	.01 Disc	721550
C56	.01 Disc	721550	C116	.001 Disc	721560
C57	.001 Disc	721560	C117	.47 Tant	722169
C58	.01 Disc	721550	C118	.015 Film	722171
C59	.01 Disc	721550	C119	.015 Film	722171
C60	.001 Disc	721560	C120	.01 Disc	721550

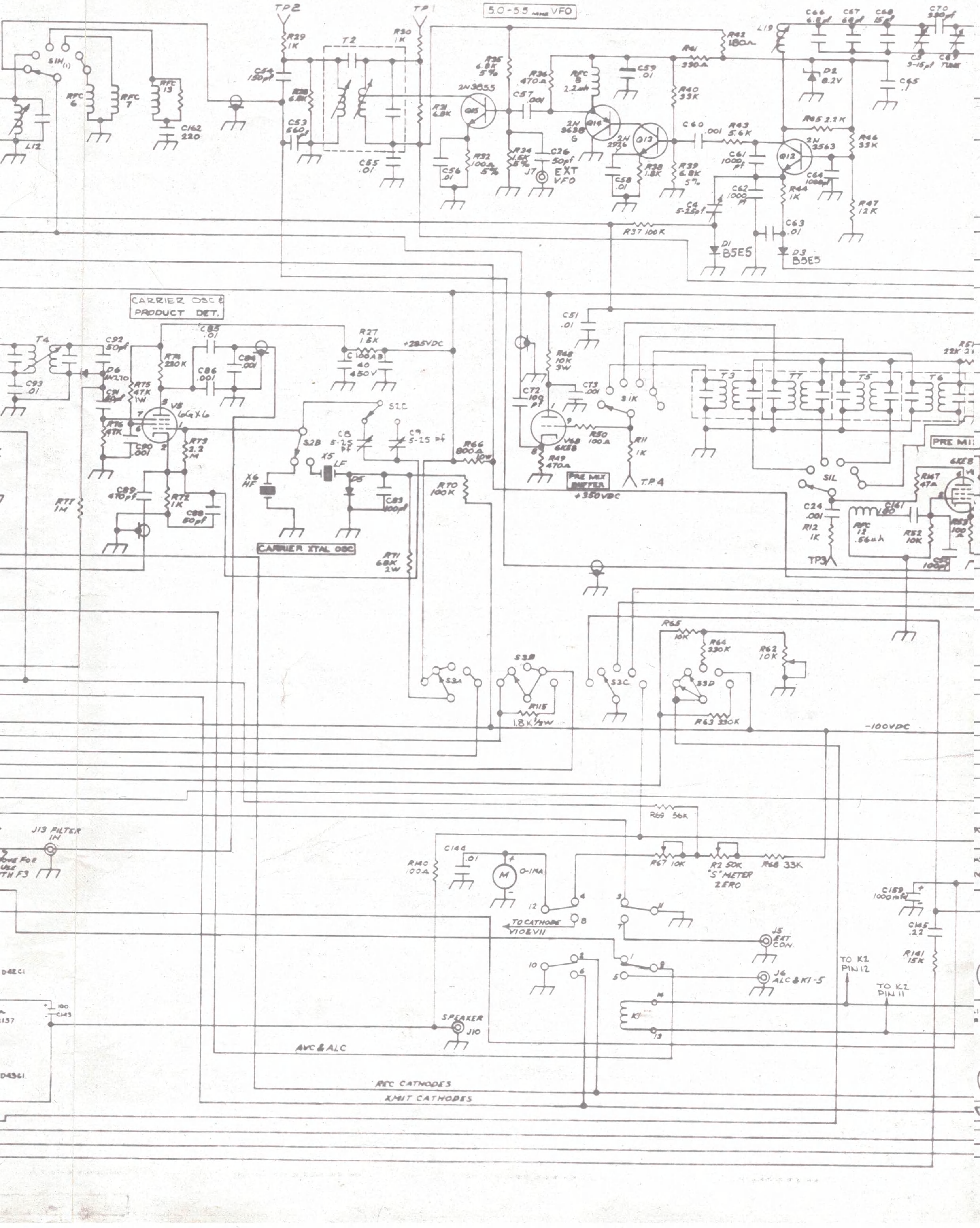
SYMBOL	DESCRIPTION	PART NO.
C121	.1 Film	721574
C122	470 Pf Disc	721575
C123	.01 Disc	721550
C124	2 mfd Ele	721892
C125	.05 Disc	721590
C126	.01 Disc	721550
C127	.01 Disc	721550
C128	.1 Film	721574
C129	.01 Disc	721550
C130	.001 Disc	721560
C131	.001 Disc	721560
C132	500 Pf Disc	721573
C133	43 Pf DSM	721671
C134	500 Pf Disc	721573
C135	62 Pf DSM	721651
C136	.005 Disc	721548
C137	.1 Film	721574
C138	.01 Disc	721550
C139	.47 Tant	722169
C140	.01 Disc	721550
C141	.022 Film	722170
C142	50 mfd Ele 25v	721890
C143	100 mfd Ele 15v	721893
C144	.01 Disc	721550
C145	.22 Disc	721766
C146	.01 Disc	721550
C147	.01 Disc	721550
C148	.01 Disc	721550
C149	.01 Disc	721550
C150	.005 Disc	721548
C151	.01 Disc	721550
C152	.01 Disc	721550
C153	.01 Disc	721550
C154	.01 Disc	721550
C155	.01 Disc	721550
C156	.01 Disc	721550
C157	.01 Disc	721550
C158	.005 Disc	721548
C159	1000 mfd Ele	721820
C160	.01 Disc	721550
C161	180 Pf DSM	721694
C162	220 Pf	721665
C163	3-12 Pf Trimmer	721867
C164	.1 Film	721574
C165	.02 Film	722170
C166	.001 Disc	721560
C167	.01 Disc	721550
C168	.015 Film	722171
C169	.1 Film	721574
C170	.47 Tant	722169
R1	2.5 K Pot	721447
R2	50 K Pot	721448
R3	2 K 10w	721527
R4	4.7 K 1w	721367
R5	2.2 K 1/2w	721308
R6	27 K 1w 10%	721375
R7	5.6 K 2w 5%	722222
R8	100Ω 1w 10%	721379
R9	10Ω 1w 5%	721385
R10	10Ω 1w 5%	721385
R11	1 K 1/2w	721313
R12	1 K 1/2w	721313
R13	100Ω 1w 10%	721379
R14	3920Ω 1%	721541
R15	2.5 K Trimmer Pot	721465
R16	220 K 1/2w	721282
R17	100Ω 1/2w	721285
R18	22 K 1/2 w	721284
R19	10K 1/2w	721318
R20	10K 1/2w	721318
R21	10K 1/2w	721318
R22	100 K 1/2w 10%	721309
R23	6.8 K 1/2w	721293
R24	270Ω 1/2w	721327
R25	39 K 2w	721422
R26	1 K 1/2w 10%	721313
R27	1.5 K 1w	721366
R28	6.8 K 1/2w 10%	721293
R29	1 K 1/2w	721313
R30	1 K 1/2w	721313
R31	6.8 K 1/2w 10%	721293
R32	100Ω 5%	721297
R33	7.5 K Pot	721451
R34	1.5 K 5%	721298
R35	6.8 K 5%	721299
R36	470Ω 1/2w 10%	721316
R37	100 K 1/2w	721309
R38	1.8 K 1/2w 10%	721295
R39	6.8 K 1/2w 5%	721299
R40	33 K 1/2w 10%	721324
R41	330Ω 1/2w 10%	721305
R42	120Ω 1/2w 10%	721336
R43	5.6 K 1/2w 10%	721342
R44	1 K 1/2w 10%	721313
R45	2.2 K 1/2w 10%	721308
R46	33 K 1/2w 10%	721324
R47	12 K 1/2w 10%	721343
R48	10 K 4.5w 3%	721536
R49	470Ω 1/2w 10%	721316
R50	100Ω 1/2w 10%	721285
R51	22 K 2w 10%	721410
R52	10 K 1/2w 10%	721318
R53	100Ω 1/2w 10%	721285
R54	100 K 1/2w 10%	721309
R55	4.7 K 1/2w 10%	721311
R56	470Ω 1/2w 10%	721316
R57	47Ω 1/2w 10%	721306
R58	330Ω 1/2w 10%	721305
R59	1 K 1/2w 10%	721313
R60	2.2 K 1/2w 10%	721308
R61	330Ω 1/2w 10%	721305
R62	10 K Pot	721470
R63	330 K 1/2w	721328
R64	330 K 1/2w	721328
R65	10 K 1/2w	721318
R66	800Ω 10w	721514
R67	10 K Pot	721462

SYMBOL	DESCRIPTION	PART NO.
R67	10 K Pot	721462
R68	33 K 1/2w 10%	721324
R69	56 K 1/2w	721322
R70	100 K 1/2w	721309
R71	68 K 2w	721417
R72	1 K 1/2w	721313
R73	2.2 M 1/2w	721280
R74	220 K 1/2w	721282
R75	47 K 1w	721372
R76	47 K 1/2w	721291
R77	1 Meg 1/2w	721288
R78	22 K 1w	721373
R79	100 Ω 1/2w	721285
R80	100 K 1/2w	721309
R81	15 K 1w	721365
R82	47 K 1/2w	721291
R83	47 Ω 1/2w	721306
R84	220 Ω	721320
R85	100 K 1/2w	721309
R86	47 K 2w	721412
R87	27 K 2w	721415
R88	150 Ω 1/2w	721314
R89	100 K 1/2w	721309
R90	6.8 K 1w	721398
R91	6.8 K 1/2w	721293
R92	100 K 1/2w	721309
R93	10 K 1/2w	721318
R94	10 K 1/2w	721318
R95	47 Ω 1/2w	721306
R96	47 K 1/2w	721291
R97	3.3 M 1/2w	721319
R98	220 K 1/2w	721282
R99	15 K 1w 10%	721365
R100	4.7 K 1/2w	721311
R101	220 K 1/2w	721282
R102	4.7 K 1/2w	721311
R103	10 K 1/2w	721318
R104	1 Meg 1/2w	721288
R105	560 Ω 1/2w	721326
R106	270 K 1/2w	721290
R107	1.5 Meg 1/2w	721348
R108	1.5 Meg 1/2w	721348
R109	10 K 1/2w	721318
R110	100 K Pot	721470
R111	10 K 1/2w	721318
R112	270 K 1/2w	721290
R113	3.3 K 1/2w	721321
R114	560 Ω 1/2w	721326
R115	1.8 K 1/2w	721295
R116	100 K 1/2w 10%	721309
R117	1.5 K 1/2w 10%	721281
R118	1.5 K 1/2w 10%	721281
R119	1 K 1/2w 10%	721313
R120	15 K 1/2w	721340
R121	10 K 1/2w	721318
R122	10 K RF Pot	721457
R123	1 K 1/2w	721313
R124	47 K 1/2w	721291
R125	33 K 1/2w	721324
R126	2.2 Meg 1/2w	721280
R127	50 K AF Pot	721457
R128	560 K 1/2w	721350
R129	33 K 1/2w	721324
R130	220 K 1/2w	721282
R131	1 Meg Varible Pot	721492
R132	39 K 1/2w	721351
R133	150 Ω 1/2w	721314
R134	2.2 K 1/2w	721308
R135	10 K 1/2w	721318
R136	12 Ω 1/2w	721304
R137	1 Ω 1w	721386
R138	270 Ω 1/2w	721327
R139	2.7 K 1/2w 10%	721325
R140	100 Ω 1/2w	721285
R141	15 K 1/2w	721340
R142	10 K 1/2w 10%	721318
R143	2.2 Meg 1/2w	721280
R144	10 K 1/2w 10%	721318
R145	47 Ω 1/2w	721306
R146	1.8 Ω 2w	722172
R147	47 Ω 1/2w 10%	721306
R148	1 K 1/2w	721313
R149	10 K 1w	721364
R150	33 K 1/2w	721324
R151	22 K 1/2w	721284
R152	1 K 1/2w	721313
R153	10 K 1/2w	721318
R154	100 K 1/2w	721309
R155	100 K 1/2w	721309
R156	68 Ω 1/2w 10%	721296
D1	IN270	760293
D2	IN4738 8.2v Zener	760292
D3	B5E5	760285
D4	IN4738 8.2v Zener	760292
D5	B5E5	760285
D6	IN270	760293
D7	IN462	760288
D8	IN462	760288
D9	B5E5	760285
D10	18v 1w Zener	760307
D111	B5E5	760285
L1	9 MHz Trap	722012
L2, L3	80-40 Meter Coils	722010
L4, L5	10-20 Meter Coils	722076
L6, L7, L8	80-40 Meter Coils	722007
L9, L10	10-15-20 Meter Coils	722075
L11	40 Meter Trap-VFO	722013
L12	IF Coil, 9 MHz	722003
L13	40 Meter Choke	721931
L14	15 Meter Choke	721933
L15		


J11
ANT JACK
K2
RFC2 800 uh
L17
L18
C36 .001 2.5 KV
RFC1
PIN 1 P1 +800V
C16 .01 1.6 KV
S1A
C14A
C14B
C14C
C3 300pf
C13 22pf P.A. NEUT
C1 .001 mfd
C2 .01
TO K1-14
TO K1-13
+285 VDC
S1J
C6 33pf
C10 10pf
R3 2K 10W
C15 .005
J6 ALC K1-5 K1-5
C156 .01
D7 & D8 1N462
R26 1K
C113 .01
R97 3.3M
C18 .1
C34 1000pf
RF AMP
V1 12BZ6
PIN 6 J2
R36 47K
R35 47Ω
C112 .001
C111 .001
C116 .001
C115 .01
R33 7.5K
R5 2.2K
R4 4.7K 1W
C17 .01
RFC3 800 uh
R92 100K
POWER AMPS
PC1
PC2
6LB6 V10
V11 6LB6
C20 C23 .001
R8 100Ω 2 1W
C21 .001
R9 10Ω 1W 5%
R10 10Ω 1W
C22 .001
R13 100Ω 1W
C28 C29 .001
R7 5.6K 2W 5%
R6 27K 1W
C19 .005
R14 3.920K 1%
TO K1 PIN 8
C32 .005
C37 .005
RFC4 2.5 mh
C39 .005
OA2 V12
+150VDC REG
C31 .005
C33 100pf
C34 33pf
C38 18pf
C40 250pf
S1D
C11 140pf
S1E
L6
L5
L4
R94 10K
L3
R93 10K
L2
R91 6.8K
TRANSMIT DRIVER
V9 6GK6
C44 .001
C150 .005
C158 .005
R17 100Ω
R18 22K
C43 100pf
C38 10pf
R16 220K
C157 .01
R90 6.8K 1W
RFC10 800 uh
C109 .001
C110 .005
AVC
+180 VDC REG
MIC AMP
C124 2mfd
R106 270K
R143 2.2MEG
R112 270K
C121 .1
R104 1MEG
C123 .01
R107 1.5M
R111 10K
C125 .05
Q9
Q10 2N2926 O
2N 2926 G
R108 1.5M
C126 .01
C127 .01
R109 10K
R110 100K MIC
R105 560Ω
C120 .01
R103 10K
C122 470pf
J8 MIC
J3 KEY
R98 120K
SIDE TONE OSC
C117 .47
220K R101
1K R148
2N2926 G Q11
C119
C118
4.7K R102
4.7K R100
C168
2.7K R139
R99 15K 1W
D10 18V 1W
.47 C170
J4 MIC
R113 3.3K
C128 .1
BALANCED MOD
12AT7 V7
R116 100K
R156 68Ω
2N 2926 O Q16
R114 560Ω
C129 .01
C130 .001
R117 1.5K
C134 500pf
C135 62pf
R1 2.5K
C131 .001
R118 1.5K
C132 500pf
C133 43pf
C7 5-25 pf

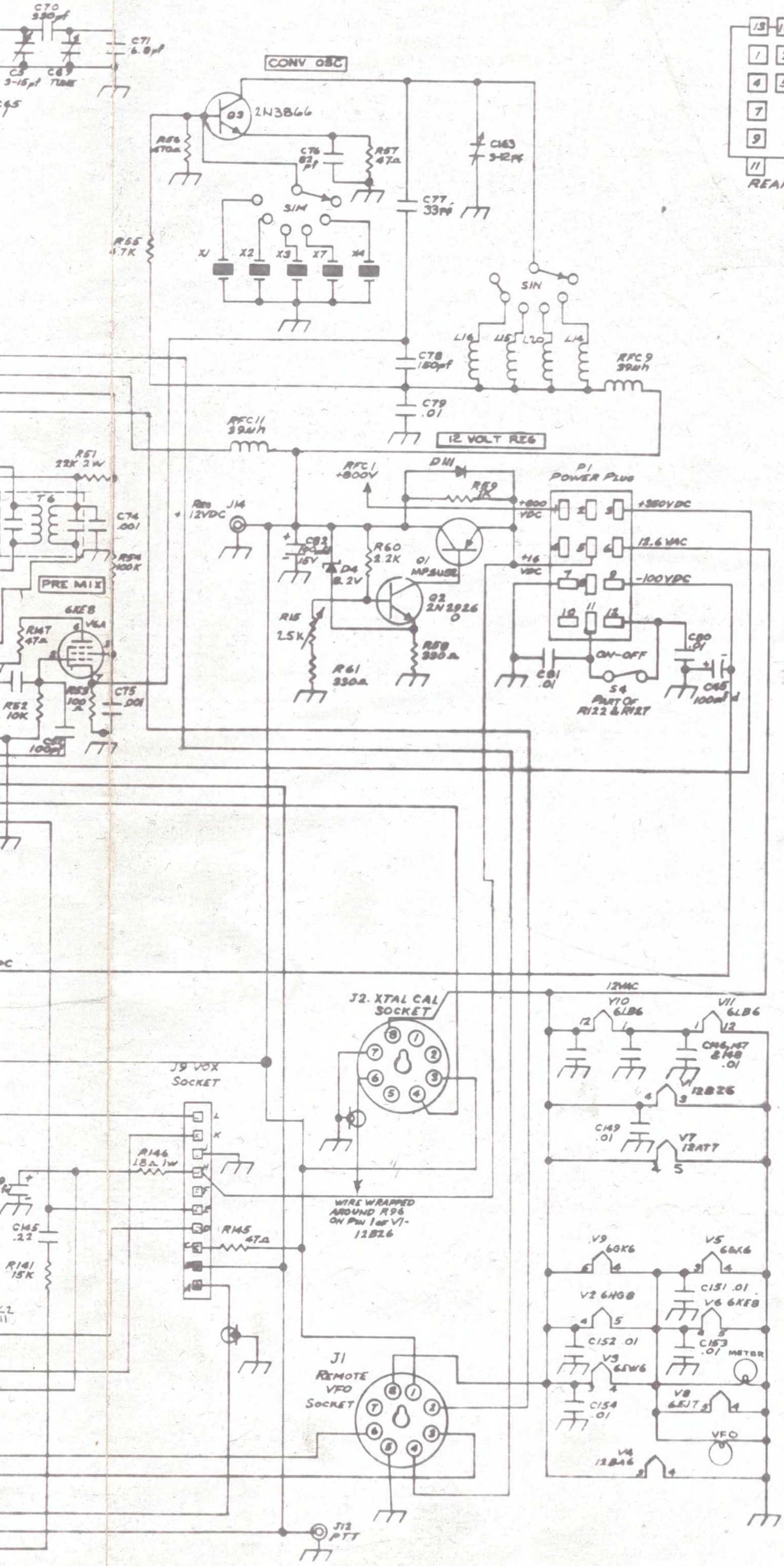
GT-550 A

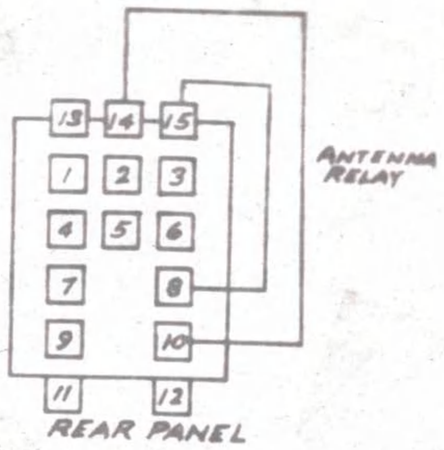
MATIC

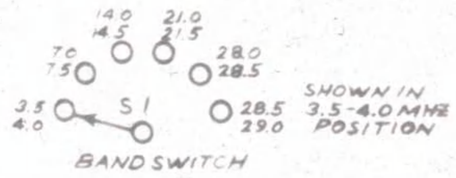


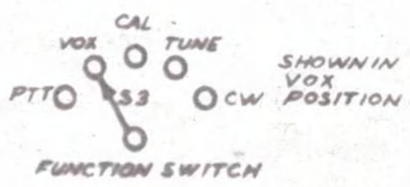
GALAXY 61550A
SCHEMATIC

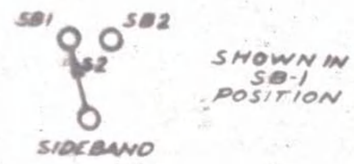
TRANS. MIXER
V8 6EJ7
C43 100pf
C42 33pf
C41 18pf
C44 .001
R18 22K
C12 140pf
C38 10pf
L11
L10
L9
L8
S1B
S1C
S1D
C25 82pf
R23 6.8K
C37 47pf
R20 10K
R19 10K
RFC5 800 uh
R21 10K
C46 2000pf
+285VDC
+350VDC
R24 270Ω
C49 .005
C50 .005
R25 39K 2W
C48 25pf
R22 100K
RFC14 Switch
C47 .01
S1F
S1G
S1H
10K R142
S2A
C160 .01
R143 10K
RFC 6
RFC 7
L12
R16 220K
-100VDC
+350VDC
C157 .01
R87 27K 2W
R86 47K 2W
TP5
R90 6.8K 1W
RFC10 800 uh
REC. MIX
V2 6HG8
C108 50pf
C107 220 pf
C106 .01
C105 100pf
R85 100K
9Mhz X-TAL FILT.
C109 .001
9MHZ TRAP L1
R88 150Ω
C155 .01
R89 100K
C110 .005
REC CATHODES
XMIT CATHODES
-100 VDC
C102 4.7pf
L13
R81 12K 1W
R78 22K 1W
C96 .001
C30 .01
1ST. IF
R82 47K
C97 100pf
V3 6EW6
C90 .01
R83 47Ω
C101 .005
C103 39pf
R84 220Ω
C104 .01
2ND IF
V4 12BA6
R149 10K 1W
C24 .01
C95 .005
R80 100K
R79 100Ω
C98 .001
T4
C93 .01
C92 50pf
D6 1N270
C91 50pf
R75 47K 1W
R76 47K
C90 .001
C89 470pf
R77 1M
C134 500pf
C135 62pf
R1 2.5K
C131 .001
R118 1.5K
C132 500pf
C7 5-25 pf
T1
C133 43pf
C136 .005
R150 33K
R152 1K
.1 C169
2N2926G
Q7
Q8
Q8
2N2926G
10K R163
10K R162
.1 C164
R151 22K
R153 1K
47K R124
.47 C139
R126 2.2M
R122 10K RF
C138 .01
R127 50K AF
R129 33K
R128 560K
C140 .01
AVC AMP & DET
C137
R120 15K
R125 33K
R154 100K
R155 100K
AVC
J15 FILTER OUT
J13 FILTER IN
REMOVE FOR USE WITH F3
R130 220K
AUDIO AMP
1 MEG R131
C162 50
C167 .01
2N2926Y
C141 .02
C165 .02
10K R135
R132 39K
C166 .001
R133 150Ω
2N 3638
Q4
Q5
Q6
D42C1
2.2K R134
12Ω R136
1Ω R137
100 C143
D1N34A
Q7
D43G1
R138











ALL RESISTORS ARE ½ W UNLESS OTHERWISE NOTED

ALL CAPACITORS ARE SHOWN IN MFD UNLESS OTHERWISE NOTED