GONSET

INSTRUCTION MANUAL

GONSET SIDEWINDER
MODEL 910A

POWER SUPPLY

MODEL 911A — AC

MODEL 912A — DC

GONSET, INC.

INTRODUCTION

The Gonset model 910A Sidewinder is designed for SSB, AM, and CW transceiver operation on the 6 meter band. In the transceive mode, the Sidewinder features "Offset Tuning" -- the receiver may be tuned one and one-half kilocycles in either direction without disturbing the frequency of the transmitted signal. The exciter/transmitter, with an input of 20 watts PEP, can be either VFO or crystal controlled and is designed as an ideal companion piece to the Gonset 913A RF power amplifier. The Sidewinder employs solid-state circuitry in all but the transmit mixer, driver and final amplifier, and utilizes common oscillators, IF circuits, crystal lattice filter, and balanced modulator to reduce size and increase reliability.

The receiver has a sensitivity of 1/2 microvolt for 10 db $\frac{S+N}{N}$, and image rejection of -50 db. A crystal controlled injection oscillator, double conversion in all modes and a crystal lattice filter ensure a highly selective receiver with excellent stability. Completely solid-state, the receiver is designed with separate detectors for AM service and SSB-CW service with the audio power derived from a class B amplifier delivering 2.5 watts to the speaker.

The transmitter may be either VFO or crystal controlled with sockets provided for four crystals -- one on the front panel for quick crystal changes and the other three inside of the Sidewinder. One of the four crystals may be trimmed closely to "net" or other critical frequencies. The basic carrier oscillator is crystal controlled and, in the SSB mode, feeds a balanced modulator to provide the carrier suppression required for SSB service. Filament power to the transmit tubes may be switched off by a front panel control -- thereby eliminating almost all of the power drain when the Sidewinder is operating in the receive mode. The high frequency oscillator, used in both transmit and receive, is crystal controlled by one of four crystals selected by the front panel Sector control; each crystal allowing coverage of a one-megacycle segment of the 6 meter band.

Two power supplies have been designed for the Sidewinder; the model 911A for operation from a 120 vac source and the model 912A for operation for a 12 vdc source. The 901A and 902A power supplies are electrically compatible, also. Both power supplies -- all solid state -- use silicon rectifiers for reduced heat dissipation and higher efficiency and contain the speakers and the high voltage relay. The model 911A, the ac power supply, has an ac receptacle on the rear which is controlled by the T/R relay to provide 120 vac to an external antenna relay when using an RF power amplifier.

TABLE OF CONTENTS

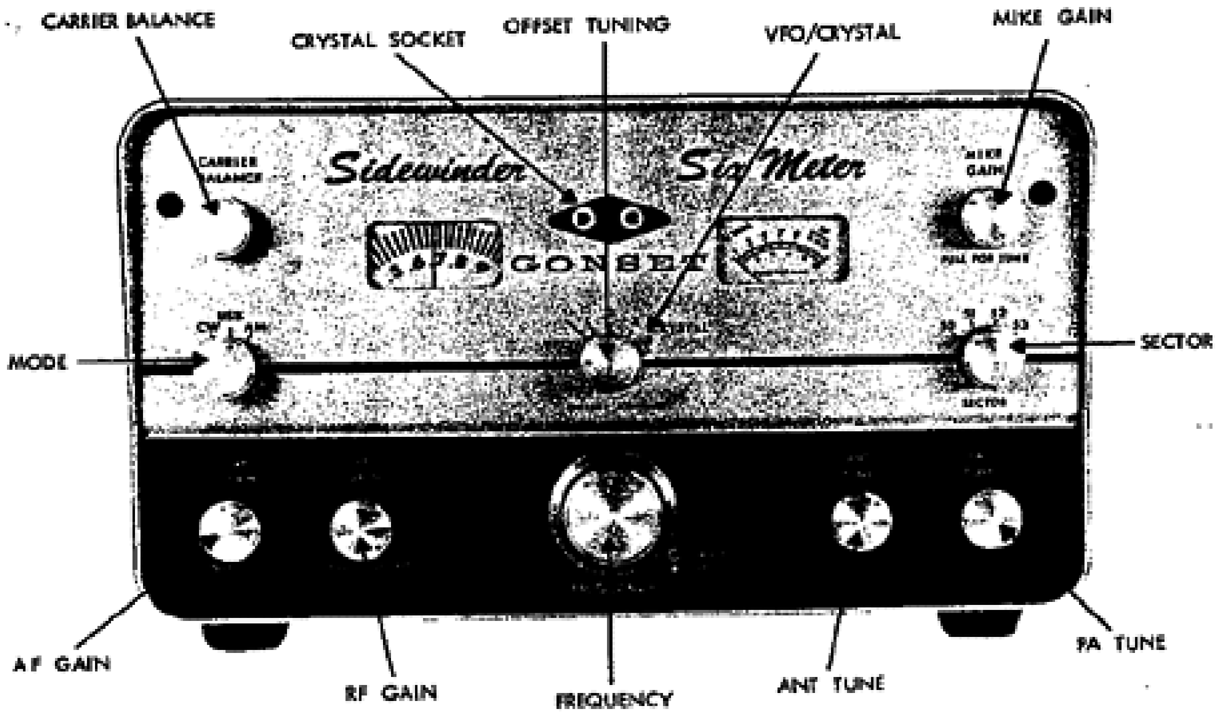


Figure 1

CONTROLS AND FUNCTIONS

Carrier Balance — The "Carrier Balance" knob controls the null of the balanced modulator during sideband transmission. Also, it controls the carrier level during AM transmission.

Mode — The "Mode" selector control is used to select the mode of operation for both transmit and receive.

Offset Tuning — The "Offset Tuning" control will tune the receiver ±1-1/2 kc from the transmit frequency.

VFO/Crystal — The "VFO/Crystal" switch (the lever behind the "Offset Tuning" control) determines if the transmitter will be VFO or crystal controlled: if crystal controlled, the numbers on the crystal side of the switch indicate which crystal has been selected.

Mike Gain — The "Mike Gain" knob is a dual function control. Rotating the knob clockwise increases the microphone input to the transmitter; pulling out the knob overrides the T/R relay control in the microphone switch and holds the T/R relays in transmit. This function is used principally during the transmitter 'tune-up' procedure.

Sector — The frequency "Sector" switch selects the one megacycle segment of the six meter band in which the unit will operate.

AF Gain — The "AF Gain" knob is a dual function control. Initial rotation turns the unit ON and further rotation increases the AF gain.

NOTE: The pilot lamp will turn on with the unit only if the filament switch is on. See RF Gain.

RF Gain — The "RF Gain" knob is a dual function control. Pulling the knob out switches power to the dial lamps and the filaments of the transmitter final stages. Pushing this knob in turns off the filaments and the dial lamps, thereby conserving power. Rotating the knob clockwise increases the RF gain.

Frequency — The "Frequency" tuning control determines the exact frequency of operation within the selected one megacycle sector. This control is not used for the transmitter when the Crystal-VFO switch is in one of the crystal positions.

Ant Tune — The "Ant Tune" control knob is used only during transmit and tunes the antenna link for the most effective impedance match between the transmitter tank and the antenna.

PA Tune — The "PA Tune" control knob is used only during transmit and tunes the transmitter final amplifier.

Crystal Socket — The crystal socket on the front panel is selected by position 1 on the "VFO/Crystal" switch.

PERFORMANCE SPECIFICATIONS

TRANSMITTER

Frequency Range:	49.975 to 54.025 mc
Emmission:	AM, SSB, and CW
Frequency Control:	Crystal HF oscillator, stabilized LF VFO
Nominal Frequency Stability: (after 15 minute warm-up.)	50 cycles per 15 minute period. (With transmit filaments on causing chassis heat rise.)
Final Amplifier:	6360 tube, class AB_1, link coupled
Power Input to Final Amplifier:	SSB: 20 watts PEP AM: 6 watts CW: 20 watts
Spurious Suppression:	-40 db
Unwanted Sideband Suppression:	-40 db
Carrier Suppression:	-50 db
Audio Response:	300 to 3450 cycles
Output Impedance:	50 ohms

RECEIVER

Frequency Range:	49.975 to 54.025 mc
Types of Reception:	AM, SSB, and CW
Nominal Frequency Stability: (after 15 minute warm-up.)	50 cycles per 15 minute period. (With transmit filaments on causing chassis heat rise.)
Sensitivity:	0.5 microvolt for 10 db $\frac{S+N}{N}$
Selectivity:	3 kcs
IF Frequencies:	First IF: 14.5 to 15.5 mc Sec. IF: 9 mc
Image Rejection:	-50 db
Audio Output:	2.5 watts into a 3.2 ohm load
Antenna Input Impedance:	50 ohms, unbalanced

TRANSCEIVER

Dimensions:	9 1/2" W x 5 1/2" H x 9" D
Weight:	11 pounds
Power Consumption:	DC: 12.6 volts @ 8.0 amperes AC: 100 watts @ 117 or 120 vac

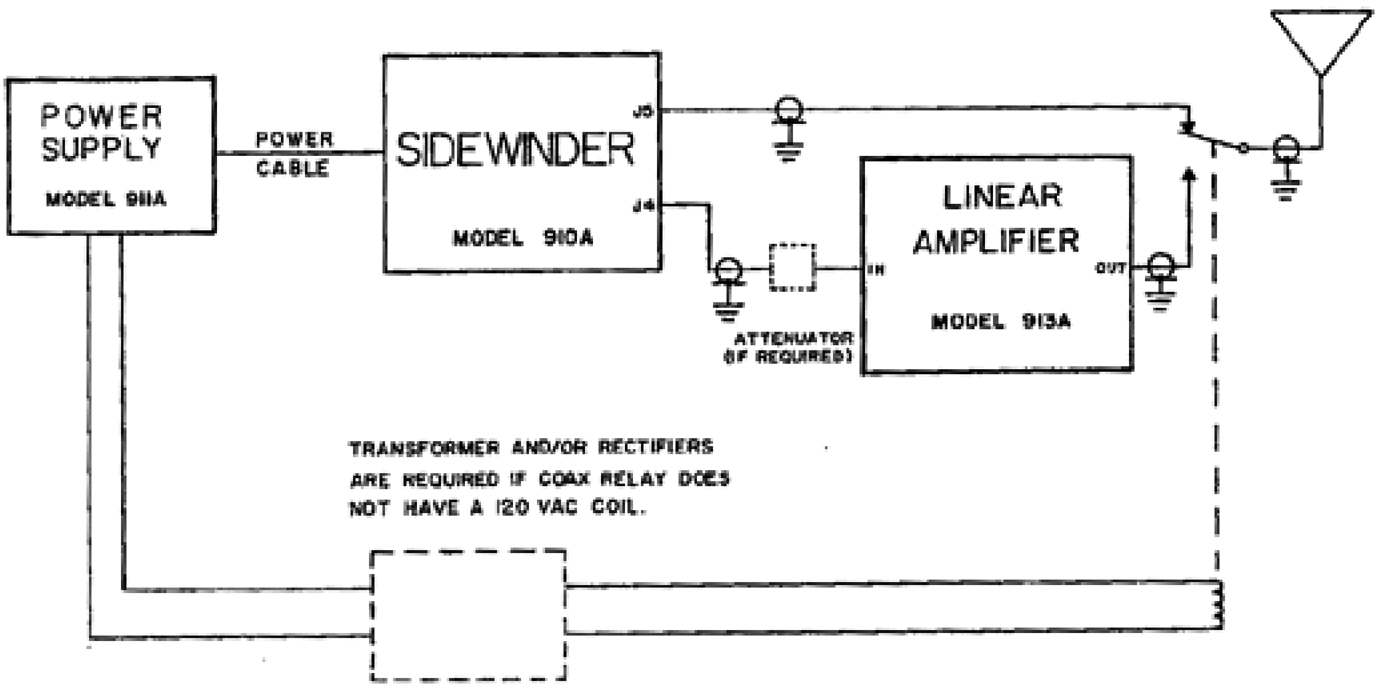


Figure 2

INSTALLATION

Fixed Station:

Installation of the Sidewinder in any location is extremely simple since only three things are necessary: power cable, microphone and antenna. Picking a location is not critical as the heat-rise of the Sidewinder is very low due to the transistor circuitry used. To allow proper air flow past the transmitter tubes, the Sidewinder should always be operated right side up, and the ventilation holes should not be blocked.

The antenna connection, J4, is located at the rear of the unit. The antenna circuit is designed for a 50/75 ohm coaxial cable. For fixed station operation where the antenna cable is over 25 feet long, it is recommended that a good quality RG-8/U be used instead of RG-58/U or RG-59/U since power losses are appreciably lower when larger diameter cables are used. In mobile installations the smaller diameter RG-58/U is satisfactory and more practical to install.

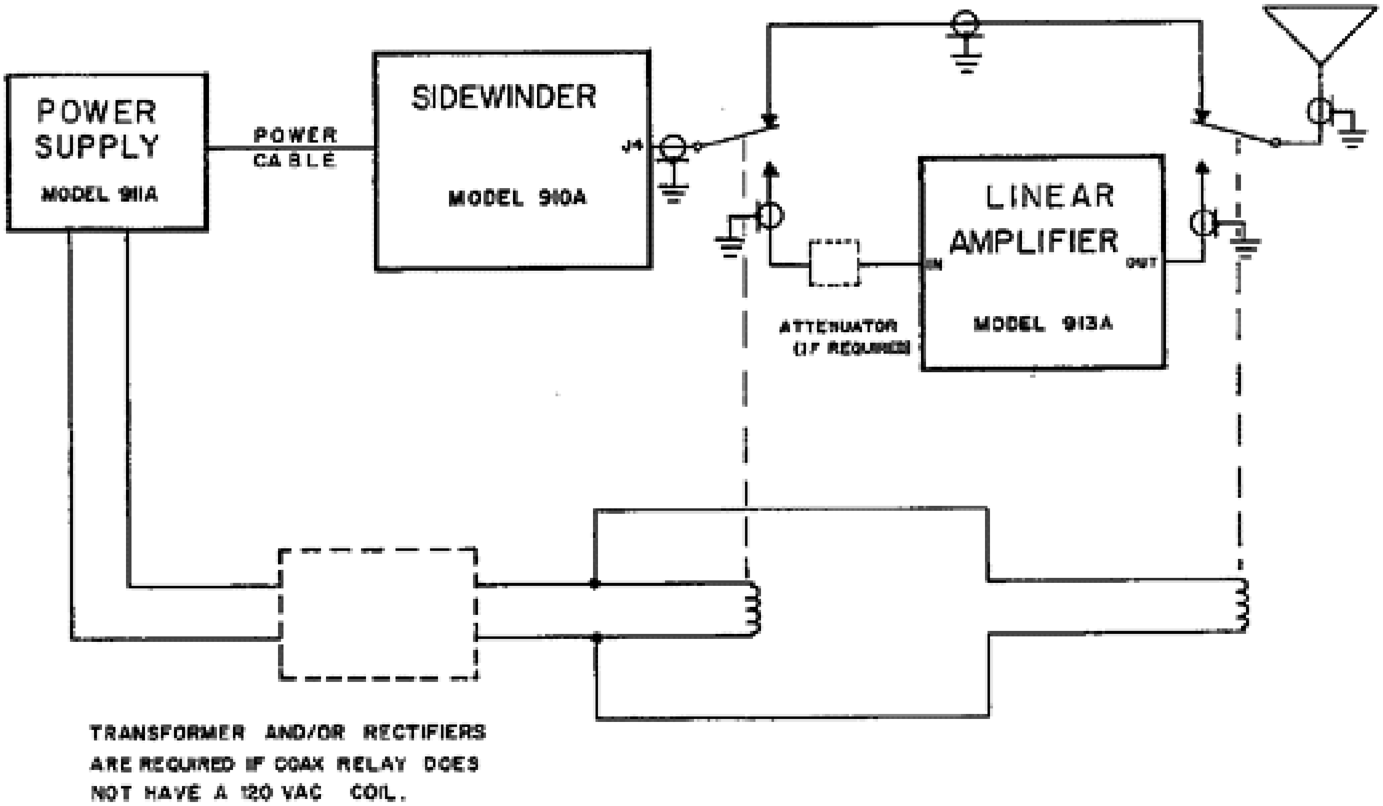
The Sidewinder is designed to operate with a press-to-talk microphone in which the press-to-talk switch 'mutes' the microphone in the released position, and actuates the relay circuit in the 'depressed' position. Most commonly used microphones have this feature, however, if a microphone without this feature is used, it may be necessary to turn down the Mike Gain control when receiving to prevent AF Feedback.

The AC power supply designed for the Sidewinder has T/R controlled contacts on the rear of the power supply in the form of an AC receptacle. The AC receptacle supplies 117 vac for use with an external coaxial relay. Figure 3 illustrates the use of the Sidewinder and the Gonset 913A six-meter linear amplifier.

Mobile Installation:

Before making any installation, check the voltage regulator of the vehicle for correct operation. Use an accurate voltmeter and suitable scale to allow readings of 0.1 volt in the 12 to 15 volt region. Connect the meter to the battery terminals and start the engine. Note the voltage with the engine operating below generator pull-in speed. If voltage is less than 12 volts, check battery connections and, if necessary, recharge or replace the battery.

Speed up the engine until the generator is operating at full output -- battery terminal voltage should not exceed 14.5 volts. With the engine idling, turn on the lights for a few minutes, then speed up the engine to full generator output. Voltage at battery terminal should remain between 14 and 14.5 volts. If not, have the regulator adjusted or replaced.



NOTE.

If a two-pole coaxial relay is available, or if two single pole relays are used with their coils connected in parallel, the Sidewinder is connected to the linear as shown in Figure 3.

If only one single-pole relay is available, connection to the Sidewinder may be made as in Figure 2. For this application, the jumper between pins 5 and 14 of the relay K1 must be cut. This jumper is easily accessible when the cover to the Sidewinder is removed, and is readily located as being the only jumper between pins on the antenna relay. Clip the jumper in the middle and move the ends 1/4" or so apart. This provides separate inputs to the transmit and receive antenna circuits, as shown in Figure 2. When normal transceiver operation is again desired, simply push the severed ends back together and tack with a bit of solder. This method of changing the type of antenna connection eliminates from the receiver input the noticeable insertion loss of the antenna patch cables which would otherwise be required.

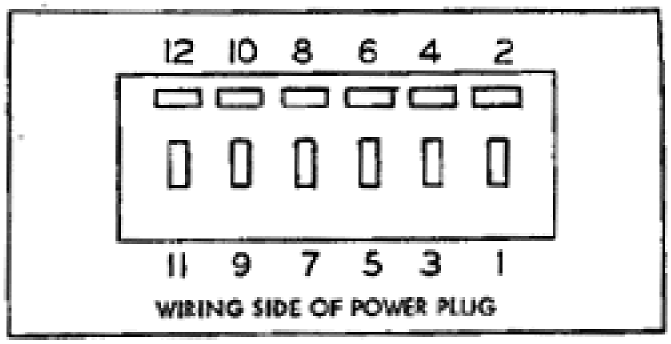
Figure 3

POWER CONNECTIONS

The model 910A Sidewinder will operate from the Gonset 901A, 902A, 911A, and the 912A power supplies. If difficulty is experienced when operating the Sidewinder from the early 901A power supplies due to marginal pull-in of the T/R relays, it may be corrected easily by connecting a 500 to 1000 mfd, 20 volt capacitor in parallel with C6B. See schematic number 510-129 supplied with the 901A power supply. It is recommended that the new models (911A or 912A) be used with the 910A Sidewinder.

In the event that a power supply other than the above Gonset models is used, extreme caution is required, as damage could result from incorrect connections or voltages from power supplies other than Gonset units. The user should be familiar with the technicalities involved before using another supply.

Figure 4 illustrates the power connector as seen from the inside of the Sidewinder.



1. 12 v, Audio
2. 12 v, P. C. Card
3. Bias Voltage, -22.0 vdc
4. Filament Voltage
5. Screen Voltage, +200 vdc
6. B+ Voltage, +300 vdc
7. Speaker
8. T/R Relay
9. Power ON/OFF
10. Power ON/OFF
11. Ground
12. Spare

Figure 4

MOBILE NOISE SUPPRESSION

Equipment operating in this frequency range is highly vulnerable to interference caused by such things as ignition sparks, generator noise, static discharge from wheels, static drain from a moving vehicle, regulator noise, etc. In all cases an attempt should be made to identify the source of the interference before attempting to correct it. To aid in the proper identification of such interference, the chart in Figure 5 has been provided.

AUDIBLE CHARACTERISTIC	SOURCE	CHECK	SUPPRESSION
Popping Sound	Ignition	Noise varies with engine speed. Stops when ignition is switched off.	A. Use heavy copper grounding braid to bond each corner of the engine block to chassis ground. B. Install radio resistance wiring.
High Pitched Whine	Generator	Noise varies with engine speed and will continue when ignition is switched off until engine stops.	A. Install a .25 to .5 mfd coaxial capacitor at the generator in series with the armature lead. B. Install a hand wound choke in series with the generator field. *See Note.
Rasping Sound	Voltage Regulator	Arcing voltage regulator contacts.	A. Install a 0.25 to 0.5 mfd coaxial capacitor at the battery terminal in series with the battery lead and at the generator terminal in series with the armature lead.
Hissing Sound	Gauges	Disconnect one at a time until guilty gauge is found.	A. By-pass gauges at terminals with a 0.1 to 0.5 mfd capacitor.
Low Pitched Clicking Sound	Oil Sender	Noise varies with oil pressure, stabilizes at maximum oil pressure.	A. Install a 0.25 to 0.5 mfd capacitor from gauge lead terminal to chassis ground.
Irregular Popping Sound	Wheel Static	Noise stops when brakes are applied.	A. Install grounding brushes or springs under hub caps.
Regular Popping Sound	Tire Static	Noise is worse at 30-50 mph.	A. Put anti-static powder in tires.
All Types	Antenna Cable Ground	Ground connection at base of antenna.	A. Make firm mechanical and electrical ground for coaxial cable from the antenna.

Figure 5, MOBILE NOISE SUPPRESSION CHART

*CAUTION: Do not install bypass capacitor at the Field terminal.

ANTENNA

The 6 meter band is borderline territory between the DX frequencies and those normally employed for local work. Thus, just about every form of wave propagation found throughout the radio spectrum appears, on occasion, in the 50 megacycle region. For this reason, the choice of an antenna will depend largely upon the type of operation the user intends.

For mobile operation, the standard mobile whip cut to 50 mc (54"), should prove satisfactory if loaded and tuned properly. For maximum signal, the antenna should be as long as possible, consistent with wave-length, with a low-loss, high-Q loading coil, mounted fairly high on the body of the car and carefully tuned to exact resonance. The addition of a matching network at the feed point is of some help, and at times may be a necessity, to get the SWR below 2:1. Top capacitive loading will decrease the amount of coil necessary and raise the efficiency of the antenna by reducing coil losses. Always use an SWR bridge in tuning the mobile antenna for a Standing Wave Ratio of 2:1 or better. The various antenna manufacturers include installation and tuning procedures with their products.

If portable use of the Sidewinder is desired in "transmitter hunts", 'field days', etc., the Gonset telescoping antenna, part number 621-018, is available at modest cost.

For fixed station operation, various antennas will perform satisfactorily, however, the multi-element beam is perhaps the best. The antenna handbook published by the ARRL should be consulted in determining the type of antenna which will afford the user the optimum efficiency for his particular application.

RECEIVE OPERATION

1. Before the unit is turned on, make sure that the Mike Gain knob is pushed in to prevent any accidental transmissions.

2. Rotate the AF Gain knob about half way; this will turn on the unit and allow audio output.

   NOTE: The tuning dial and the "S" meter will not be illuminated unless the RF Gain knob is pulled out. This switches on the dial lamps and the filaments in the transmitter final stages. For conserving battery power in mobile receive operation, the RF Gain knob may be left in.

3. Select the desired mode of operation with the mode switch: CW, USB, or AM.

4. Turn the Sector switch to the desired sector of the band to be monitored:

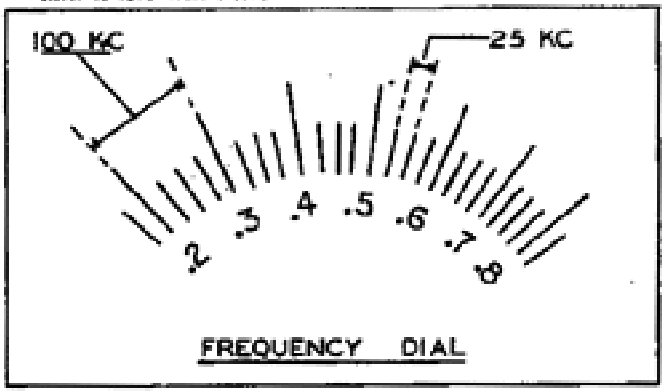
   50 = 50-51 megacycles,
   51 = 51-52 megacycles,
   52 = 52-53 megacycles,
   53 = 53-54 megacycles.

5. Rotate the RF Gain control fully clockwise until the "S" meter shows some deflection and receiver noise can be heard from the speaker.

6. Use the coarse tune frequency knob to tune across the selected sector of the band. See Step 4. The frequency dial is divided into ten equal parts which span the one-megacycle selected by the sector control. Each of these ten equal parts is divided into sections 25 kc wide. See Figure 6. When the desired frequency is found, use the fine tune knob for closer adjustment. When the transmitter is being used also, the final receive adjustment for "naturalness" of voice should always be made with the "Offset Tuning" control. This control tunes only the receiver. Since it does not disturb the transmit frequency, 'tracking' or re-tuning on the part of the other operator is avoided.

7. If the received station is extremely strong, the RF Gain control may be rotated counterclockwise for clearest reception and reduction of background noise. Note, however, that the "S" meter does not function if the RF Gain control is not fully advanced.

8. If the transmitter is switched from VFO to crystal control while listening to a station on the receiver, it may be necessary to re-tune the receiver slightly for continued reception. This is a normal consequence of switching Q19 from a receive VFO buffer to a transmit crystal oscillator, and has no practical affect on dial accuracy, as the frequency shift is less than 1 kc.



ALL SMALL DIVISIONS ARE 25 KC, INCLUDING THE ONES BELOW "0" AND ABOVE "1.0".

Figure 6

TRANSMIT OPERATION

NOTE: For proper transmitter performance, the Sidewinder dial lamp must be operating as it forms a part of the filament circuit. Should this lamp burn out, the recommended replacement is a GE long-life type #755, Gonset part number 471-024. If this lamp is not readily available, a #1847 medium life or an ordinary #47 lamp may be used as a substitute. All these lamps are electrically identical, but the life of the #47 lamp is considerably shorter than that of the recommended lamp.

1. Do not pull out the Mike Gain knob or press the microphone press-to-talk switch until you are ready to transmit.

2. Rotate the AF Gain knob clockwise to turn on the unit.

3. Pull out the RF Gain knob to turn on the filaments in the final transmitter stages.

4. Operating Frequency: The transmit section of the Sidewinder may be either crystal controlled or VFO tuned. The crystal socket on the front panel is one of four that may be used for crystal control. The other three are inside the Sidewinder and are readily accessible by removing the top cover of the Sidewinder. The VFO/Crystal switch on the front panel selects the operating crystal with the front panel socket being wired to position 1. If VFO operation is selected, the following procedure should be used to determine frequency:

   The main tuning dial covers a band segment one megacycle wide. The frequency at the low or 'zero' end of the dial is selected by the frequency sector switch and the dial tunes over the megacycle above. Thus, if the sector switch is on 51, and the dial is on .8, the operating frequency is 51.8 megacycles. The minor dial divisions are 25 kcs apart.

5. To tune-up the transmitter for any mode of operation, use this procedure:

   A. Turn the mode selector knob to "CW".

   B. Pull out the Mike Gain knob which will switch the unit to transmit.

   C. Use the PA Tune knob to obtain maximum meter deflection.

   D. Use the Ant Tune knob to increase the RF meter deflection.

   E. Repeat steps C and D until further tuning will not increase the RF meter reading.

   F. Push the Mike Gain knob back in.

   NOTE: The PA Tune and the Ant Tune controls have no stops and are continuously variable.

   NOTE: The Ant Tune control is normally very broad. Critical tuning, great interaction with the PA Tune control, or, failure of this control to tune-up properly, are all indications of a seriously mis-matched antenna system which should be corrected if the Sidewinder is to operate properly.

   In some parts of the band, particularly with a slightly reactive antenna, the output meter may go off scale when the Sidewinder is transmitting in the "CW" mode. In order to tune-up with this condition, switch to the "USB" mode and adjust the Carrier Balance control for convenient reading on the meter, and then tune-up as usual.

   G. Select the desired mode of operation as per step 6, 7, or 8; for "CW", "USB", or "AM" respectively.

6. CW Operation; (after completing step 5)

   A. Switch to "CW" mode and plug in your key (lower jack on the left side, rear).

   B. Pull out the Mike Gain knob to use the key.

   C. Push in the Mike Gain knob to receive.

7. USB Operation; (after completing step 5)

   A. Turn the mode selector knob to "USB".

   B. Pull out the Mike Gain knob.

   C. Turn the Carrier Balance knob slowly clockwise and watch the RF meter.

   NOTE: This control is a ten-turn device and must be adjusted carefully. If the meter reading increases, the null has been passed and the control must be rotated in the opposite direction. If the meter reading decreases, allow it to go through the null and bring it up until it indicates the lowest division on the meter scale. Using the dot on the knob for reference, note its position in relation to the printing on the panel behind it. Now slowly rotate the knob the opposite way; the meter reading should decrease to a null and then increase. Bring the meter reading back to the same scale division used previously. Again using the dot on the knob for reference, note its angular relation to the first position when the meter indicated the same scale division. The correct setting will be a point that is half-way between these two positions, and the meter should read below scale.

8. AM Operation; (after completing step 5)

   A. Turn the mode selector knob to "AM".

   B. Turn the Mike Gain control fully counterclockwise and pull it out.

   C. Set the carrier by adjusting the Carrier Balance control until the output meter reads 3 on the 0 to 10 scale. Push the Mike Gain control back in after this adjustment is completed.

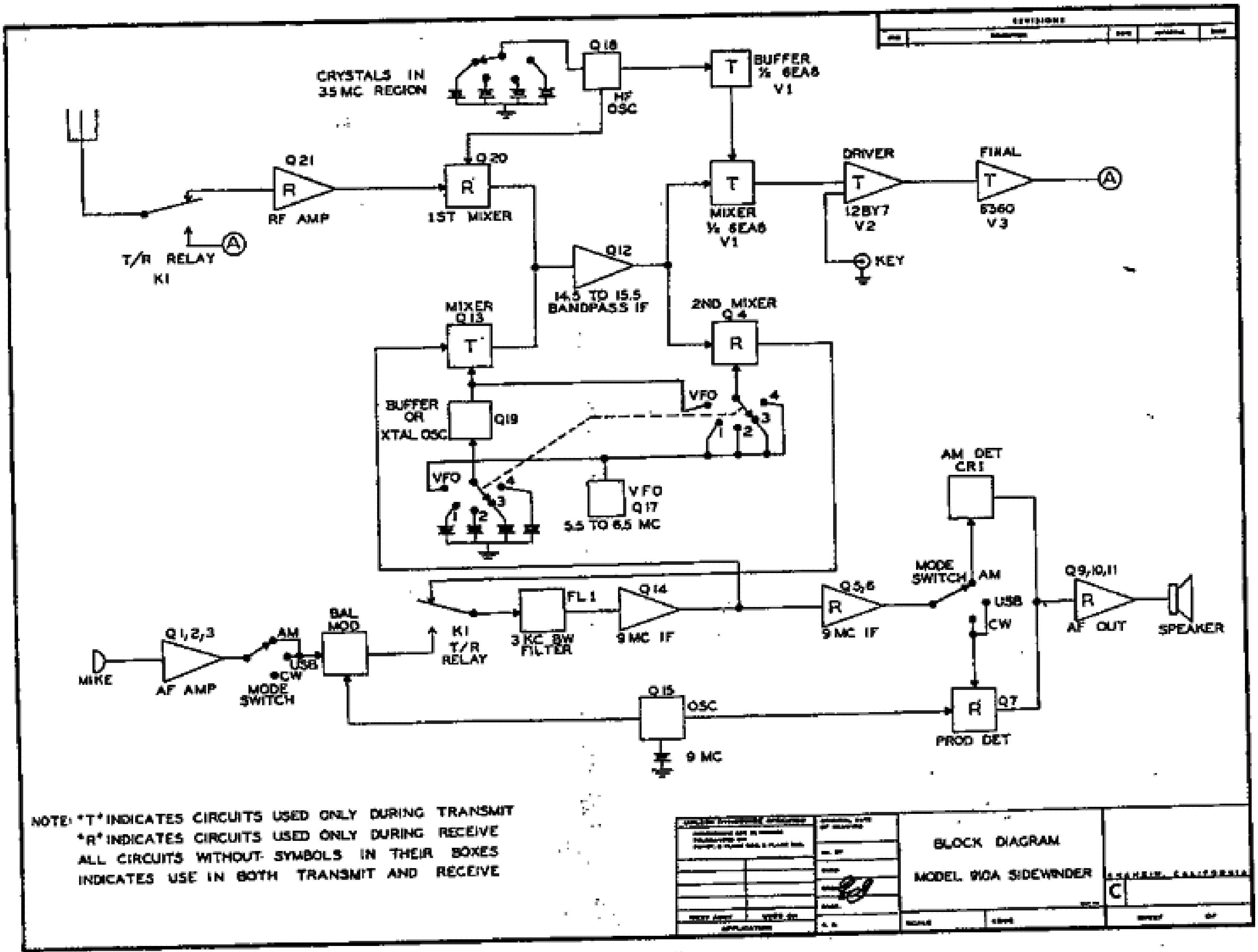
   D. Press the microphone press-to-talk switch and speak into the microphone.

   E. While speaking into the microphone, rotate the Mike Gain control until the RF meter just 'kicks' positive.

Crystal Controlled Operation for any Mode:

The 910A Sidewinder requires fundamental-mode crystals operating between 5.50 and 6.5 mc for transmitter spot frequency control. Use of crystals outside this range will result in spurious response and is not recommended. The crystal sockets are designed for HC-6 holders with .050" diameter pins. If the exact frequency of operation is not too critical, within 15 kc or so, either series or parallel mode crystals may be employed. The oscillator is purposely designed to be tolerant of low-activity crystals, so that 'junk-box' crystals may be ground to frequency with good probability of success. Crystals in older type holders may be fitted to the front panel socket by means of an adapter.

When an exact frequency is desired, within 1 or 2 kc, a series-mode crystal in the correct holder should be ground to your frequency. The transmitter output frequency will be the crystal frequency minus 5.5 mc, plus the frequency indicated by the "Sector" switch. For instance, a 5.650 mc crystal would provide output at 50.150 mc when the "Sector" switch is set at 50. The same crystal produces a signal 51.150 mc when the "Sector"



· Figure 7

switch is at 51, and so forth. Thus, each single crystal employed provides the capability of four crystal controlled points within the 6-meter band. The following chart will aid in determining your operating frequency:

Sector Control		*Crystal Frequency		Operating Frequency
50	+		-5.5 =	
51	+		-5.5 =	
52	+		-5.5 =	
53	+		-5.5 =	

*Insert the frequency of the crystal in mc to determine the operating frequency.

In addition to the crystal socket on the front panel, three sockets are provided internally which may be selected by the front panel crystal switch for more frequently used crystals. Access to these sockets is provided by removing the Sidewinder cover and the VFO (center) module cover. The socket nearest the rear of the Sidewinder is selected by switch position #2, the middle socket by switch position #3, and the socket nearest the front by switch position #4. The #2 crystal socket (rear) is provided with a trimmer so that the crystal installed in this socket may be pulled a few kilocycles to the exact frequency. This trimmer is the protruding screw located near the crystal sockets.

CAUTION: Do not turn this screw out (CCW) to more than 5/8" above the chassis, or the trimmer will be damaged. Also, take care not to turn the similar trimmer on the opposite end of the VFO as this trimmer is only used for VFO calibration.

NOTE: It is difficult if not impossible to damage the Sidewinder by improper tune-up. It is possible, however, to produce a poor quality signal by careless operating techniques. Therefore, it is recommended that the above instructions be understood and followed carefully.

THEORY OF OPERATION - Receive

The receive portion of the Sidewinder is an all transistor, dual conversion, superheterodyne unit, employing many specially designed circuits to provide high performance and reliability in a compact, rugged enclosure.

The block diagram (Figure 7) will aid in the following circuit description. The signal from the antenna is fed to the RF amplifier, Q21, by the operation of the T/R relay, K1. A tuned circuit ahead of the RF amplifier provides an impedance match to the amplifier from the antenna as well as attenuating the noise and unwanted signals outside the 6-meter band. The RF amplifier, Q21, is coupled to the first mixer, Q20, by way of bandpass circuitry designed to pass signals within the 6-meter band. The high frequency injection signal to the first mixer originates in the crystal controlled oscillator, Q18, and is heterodyned with the input signal to produce a nominal 15 megacycle signal which is amplified at the first IF amplifier, Q12. This IF amplifier, double-tuned at both the input and the output, amplifies all the converted frequencies between 14.5 and 15.5 megacycles, and feeds them to the second mixer, Q4. The other input to the second mixer is from the VFO, Q17, which is manually tuned by the main tuning dial. A switch allows the VFO to be tuned to any part of the dial without disturbing transmit frequency when the transmit section is crystal controlled, or, by using the Offset Tuning control, the received signal may be tuned 1-1/2 kc from the main tuning dial setting without changing the transmitted frequency. The products of the second mixer, now at approximately 9 megacycles, are coupled to the crystal lattice filter, FL1, and tuning of the VFO determines which of the mixer products will be at the correct frequency to be passed by the filter. The narrow band Output of the filter is fed into the 9 megacycle IF amplifiers, Q14, Q5, and Q6, and then coupled to the detectors.

In the "USB" and "CW" mode, the signal from Q6 and the carrier insertion signal from the crystal controlled oscillator, Q15, are heterodyned in Q7 which is used as a product detector. In the "AM" mode, Q7 becomes an emitter follower and the "AM" detection is done by CR1.

In all modes, the audio signal from the detectors is fed into the audio driver, Q9, by way of the AF Gain control, and then coupled to the class B audio amplifier, Q10 and Q11, which drives the speaker.

THEORY OF OPERATION - Transmit

The transmitter portion of the Sidewinder utilizes dual conversion, crystal lattice filter, and the latest solid-state circuitry where design permits. Only the mixer, driver, and final amplifier are vacuum tube.

The block diagram (Figure 7) illustrates the following circuit description:

The basic carrier signal originates in the crystal controlled oscillator, Q15, and is fed to the modulator by the mode selector switch. If "AM" or "USB" operation is selected, audio is combined with the carrier in the modulator. If "CW" operation is selected, the audio input is disconnected.

The audio input to the modulator for "AM" and "USB" operation comes from the speech amplifier transistors, Q1, Q2, and Q3. The input from the microphone is coupled to Q1, a high impedance emitter follower, which feeds the audio signal through the Mike Gain control to Q2 which drives emitter follower, Q3.

During "USB" operation the balanced modulator operates normally to cancel out the carrier, leaving the audio as sidebands. The unwanted lower sideband is then suppressed in the crystal lattice filter, FL1, and the desired upper sideband is fed into the first IF, Q14.

For "AM" operation, the balanced modulator operates slightly unbalanced so that a carrier and a normal pair of sidebands are fed into the filter, FL1. The filter eliminates the lower sideband and partly attenuates the carrier, leaving the reduced carrier and the upper sideband to be fed into Q14, the first IF amplifier. The original carrier level is so adjusted that this signal is equivalent to a normal, 100% modulated "AM" signal, but does not occupy so wide a band.

The first IF amplifier, Q14, amplifies the narrow band signal from the crystal lattice filter, FL1, and then feeds the signal to the first mixer, Q13, for the first conversion. The other signal for the first mixer is either VFO or crystal controlled, determined by the front panel VFO/Crystal switch. In the VFO position, the frequency, ranging from 5.5 to 6.5 megacycles, is manually adjusted by the main tuning dial. For crystal operation, frequencies within the same range are used, but they are derived from Q19 which now functions as a crystal-controlled oscillator for the transmitter. The output of the first mixer, Q13, is the sum of the two input frequencies, and is, therefore, between 14.5 and 15.5 megacycles. This signal is then fed to the IF amplifier, Q12, which has double-tuned circuitry at both the input and the output and is designed to amplify only those signal within the 14.5 to 15.5 megacycle range. The amplified signal is passed on to the second mixer, V1, which is the pentode section of 6EA8.

At the second mixer the signal is combined with the signal from the local oscillator, Q18. The oscillator is coupled to the buffer amplifier which is the other half of the 6EA8 and produces the amplified, high frequency signal required at the second mixer. The product of the second mixer now falls within a one megacycle segment of the 6-meter band, determined by the crystal selected for the high frequency local oscillator, Q18. This crystal is selected by the front panel Sector control. The product of the second mixer is coupled to the band-pass driver stage, V2, which is tuned to accept signals within the 50-54 megacycle range. Grid-block keying is provided in this stage for "CW" operation. The output of the driver, V2, is inductively coupled through tuned circuits to the final amplifier, V3. The final amplifier operates class AB_1 with 20 watts PEP (peak-envelope-power) input and is link coupled to the antenna with adjustable tuning and loading circuits.

ALIGNMENT INSTRUCTION

A. Introduction

The following test procedures, followed in sequence, are required for complete alignment of the Sidewinder. However, the technician may use only that portion which is necessary for a given situation because only a major component failure (IF transformer, RF coils, crystals, etc.) will cause serious misalignment of any circuit. Complete realignment of the entire Sidewinder should never be necessary.

The owner is cautioned that this alignment procedure requires well calibrated test equipment which may not be readily obtained, and that any attempt to align the Sidewinder without the proper equipment will invalidate the warranty. If there is any problem of this nature, see the closest Gonset Dealer.

B. VFO Tracking

Track the VFO so that the frequency is 5.5 mc, ±2 kc, at '0' on the dial, and 6.5 mc, ±2 kc, at '1.0' on the dial. The low end is adjusted with L1, and the high end with C29 (see Figure 8). Alternate between these two adjustments until the VFO will track as follows: (Use a Frequency Meter or Counter) Set the VFO to 5.6 mc, ±1 kc, and then check the VFO dial. It should indicate within 1/2 scale division of '0.1'. Make the same check at 5.8 mc, 6.0 mc, 6.2 mc, and 6.4 mc. The VFO dial should indicate '0.3', '0.5', '0.7', and '0.9' each time, within ±1/2 scale division.

NOTE: It may be necessary to repeat the L1 and C29 adjustments several times before the VFO will track properly.

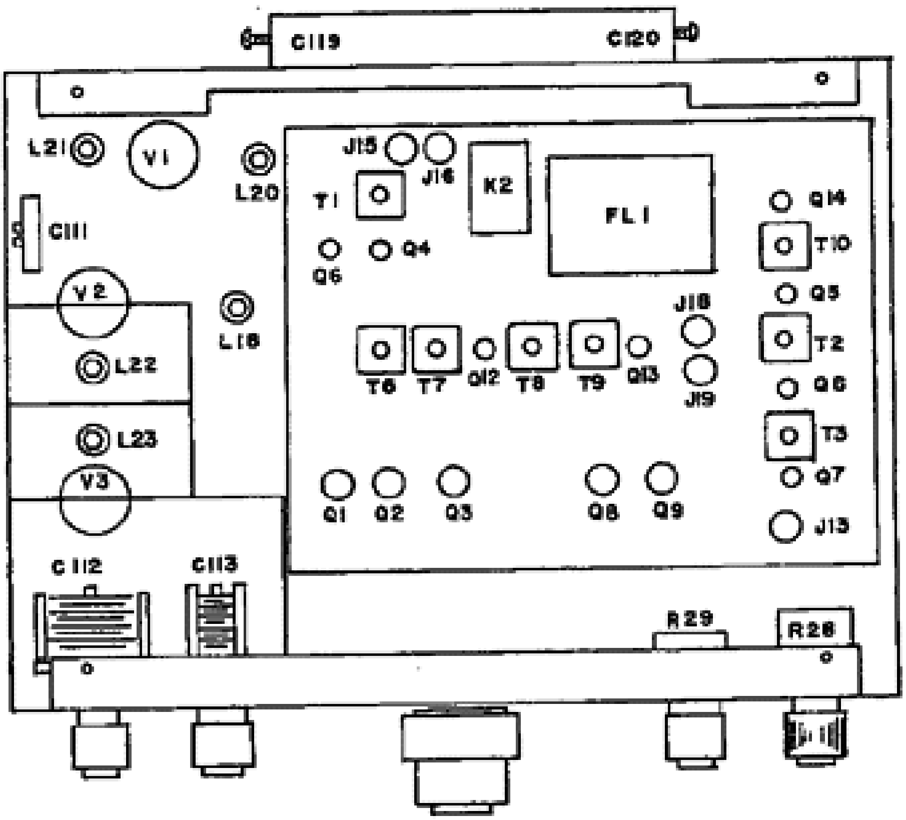


Figure 8, Bottom View

C. 9 MC IF Alignment

Before starting this alignment procedure make sure that the 'S' meter is zeroed. To check the 'S' meter, disconnect the antenna, turn the RF GAIN knob fully clockwise and adjust the 'S' meter with the adjustment located on the right side near the top of the case. See Figure 9. Allow the unit to warm up about five minutes before making this adjustment.

Operate the Sidewinder in the receive mode, "AM", with the RF GAIN knob fully clockwise. Connect a signal generator directly into J16 on the main printed circuit card. (disconnect the plug which is normally in this jack). Set the signal generator to 9 mc with 30% modulation at 1000 cycles.

Tune the generator frequency slightly and increase the output as required until the signal is audible from the speaker. "Rock" the generator frequency for maximum audio output, so that the signal is centered in the filter passband. Align T1, T10, T2, and T3, see Figure 8, for maximum recovered audio at the speaker. Note that on T2 and T3 two different peaks can be obtained, both of which are true peaks, but one of which positions the slug for tighter coupling to the secondary and thus provides higher gain. The higher gain peak should normally be used, unless this produces so much gain that oscillation occurs, in which case the alternate peak should be selected.

When the 9 mc IF is properly aligned, 10 to 20 microvolts of generator output should produce 5 volts peak-to-peak of audio across the speaker terminals, if the AF GAIN knob is fully clockwise.

D. 15 MC IF Alignment

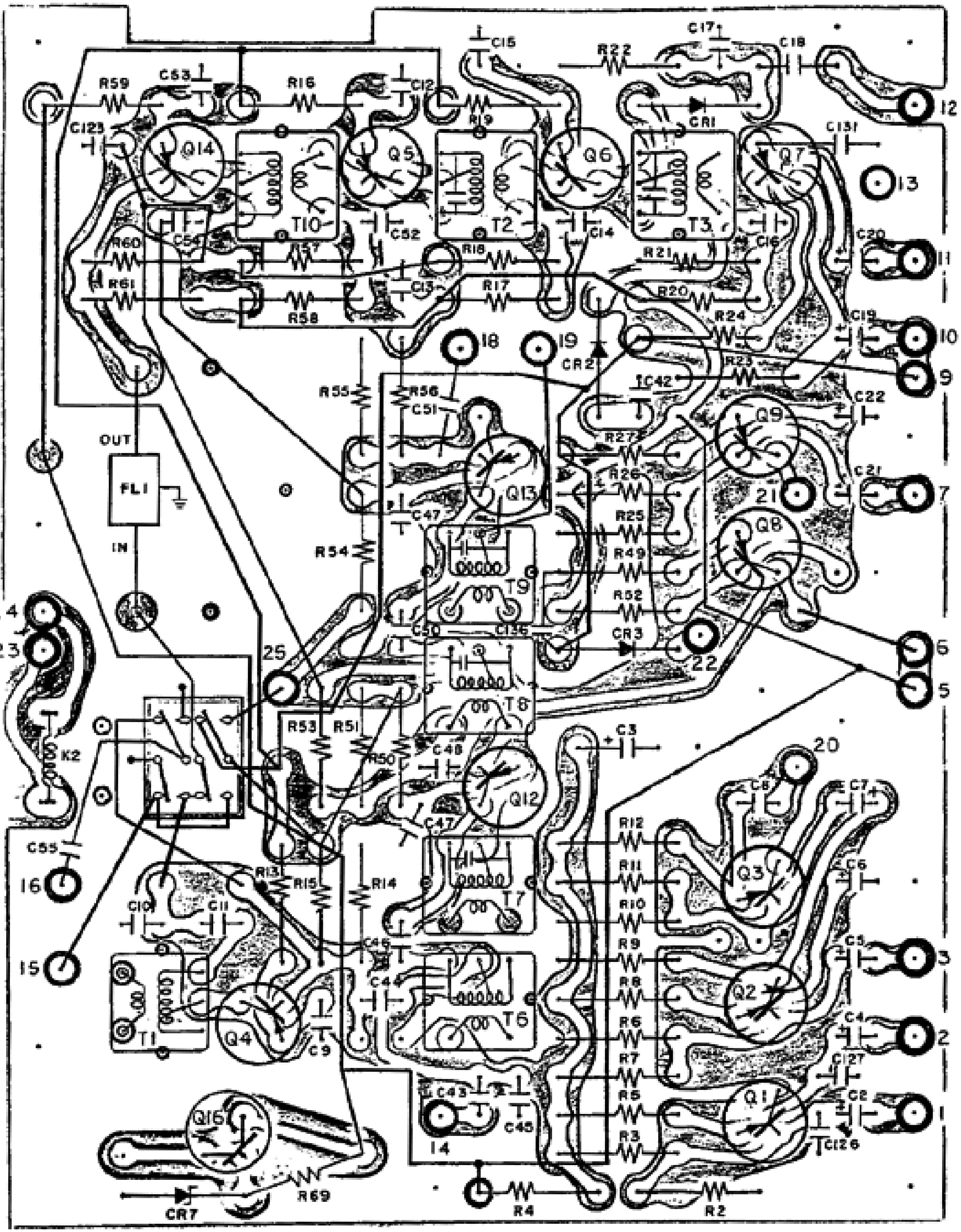
Connect a sweep generator, set to 15 mc, to J18 on the main printed circuit card. See Figure 8. Couple an oscilloscope with a demodulator probe, such as the RCA WG-291, to pin 2 of V1, with a two or three twist capacitance gimmick or a maximum 1 pf capacitor. Provide fixed markers at 14.5 and 15.5 mc. Remove the 9 mc injection from Q13 by disconnecting the plug from J15.

Set the controls on the Sidewinder as follows:

RF GAIN. . . . . . .PUSHED IN (filaments off)
MODE. . . . . .AM
MIKE GAIN TR . . .PULLED OUT
AF GAIN. . . . . . .TURNED ON

Align L18, T6, T7, T8, and T9 to obtain a flat response within 3 db over the 14.5 to 15.5 mc range.

NOTE: Some 'staggering' of the tuned circuits will be required, and can be easily seen on the oscilloscope.


R59
C53
R16
C12
C15
R22
C17
C18
12
R19
CR1
C125
Q14
Q5
Q6
Q7
C131
13
T10
C52
T2
C14
T3
C16
C54
R60
R57
R18
R21
C20
11
R61
R58
C13
R17
R20
R24
C19
10
18
19
CR2
R23
9
R55
R56
C51
C42
C22
OUT
R27
Q9
R26
C21
Q13
21
7
FL1
C47
R25
Q8
IN
R54
R49
T9
R52
24
CR3
6
23
C50
C136
22
25
5
T8
E
R53
R51
C3
K2
R50
C48
20
Q12
C8
C7
C47
R12
C55
R11
Q3
C6
16
R13
R15
R14
T7
R10
C10
C11
C46
R9
C5
3
15
C44
R8
Q2
T6
R6
C4
2
T1
Q4
C9
R7
C127
C43
R5
Q1
C2
1
Q16
C45
R3
C126
14
R69
R4
R2
CR7
Figure 12

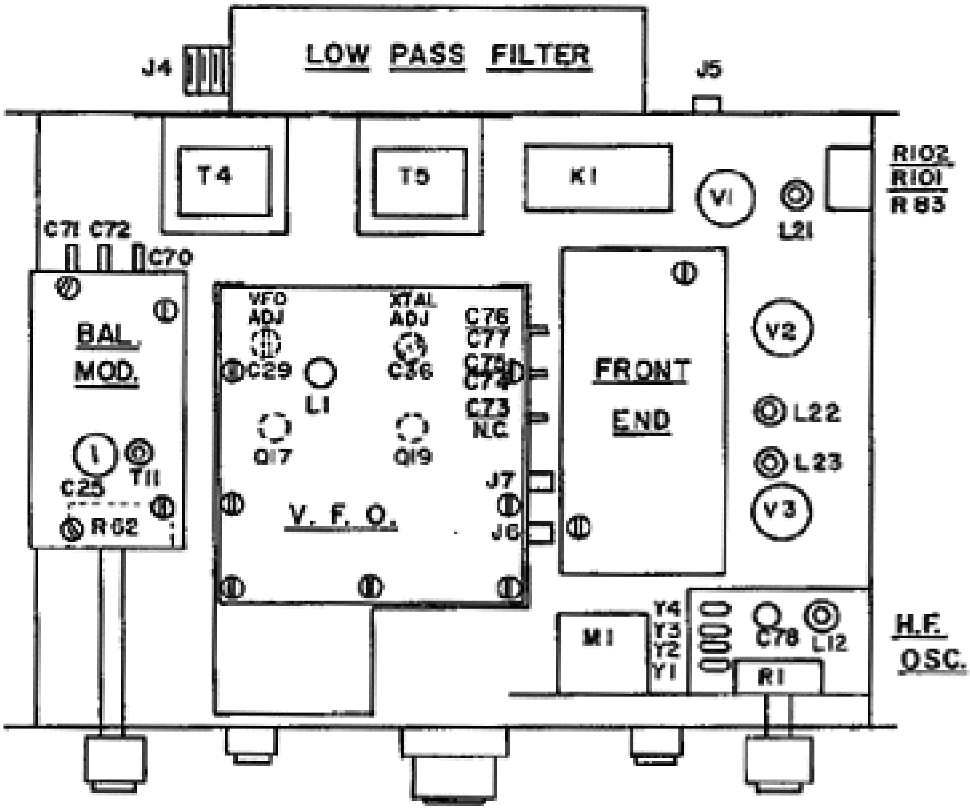


Figure 10

E. HF Crystal Oscillator Adjustment

Remove, from J8, the RCA plug coming from the HF oscillator, and connect this plug to the input of a Frequency Counter capable of operating to at least 40 megacycles. Turn on the Sidewinder and set the Sector switch to "50". Adjust L12 until the Frequency Counter reads 35.50 mc, ±3 kc. Then switch to 51, 52, and 53 with the Sector switch. The Frequency Counter should read 36.5 mc, 37.5 mc, and 38.5 mc, respectively, all ±3 kc. It should be possible to find a compromise adjustment of L12 where all four crystals are within tolerance.

If a Frequency Counter is unavailable, a heterodyne-type frequency meter may also be used. Connect an RCA jack, having a 3 or 4 turn loop approximately an inch in diameter, to the output plug of the oscillator, to radiate the signal into the frequency meter.

The open circuit voltage of this stage is approximately 1 volt rms.

F. Front End and First Receive Mixer Alignment

Connect an oscilloscope by means of a demodulator probe, such as a RCA WG-291, directly across a 0.2 mh RF choke which has been connected from J10 to ground. See Figure 8. Inject a low level signal, swept at 50 mc, into the antenna jack from a generator of known accuracy. Use an external signal generator to supply markers at 50, 52, and 54 mc. This generator may be adjusted to each frequency as required.

Adjust L15 and L16 to obtain a response from 50 to 54 mc that is flat within 3 to 4 db. L17 and L14 should also be adjusted at this time, but these slugs will primarily affect the amplitude of the response with only a secondary effect on the bandpass. A slight readjustment of L17 and L14 is sometimes necessary to 'smooth-out' a rough response.

G. Balanced Modulator Adjustment

Switch the Sidewinder to "CW", transmit mode. Disconnect the plug from J15 on the main printed circuit card. See Figure 9. Connect an RF VTVM across the plug and then tune T11 for a maximum output.

Switch the Sidewinder to "USB" and adjust the CARRIER BALANCE control, R62, and the trimmer capacitor, C25, for a minimum. Use a fiber screwdriver when adjusting the trimmer capacitor. It is best to adjust the trimmer in small steps, and then rotate the CARRIER BALANCE control through the null. A trimmer position should be found at which the CARRIER BALANCE control will tune through a null of less than 1 millivolt of RF.

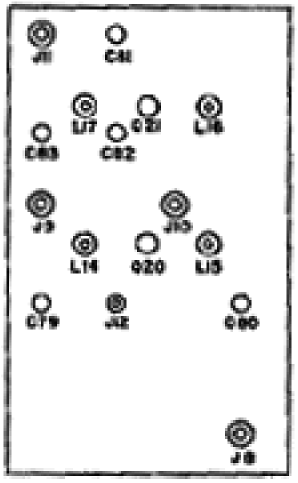


Figure 11, RF Module

H. 9 MC Oscillator Adjustment

Switch the Sidewinder to the transmit mode with the filaments off, (RF GAIN knob pushed in). Remove the plug from J18 on the main printed circuit card. See Figure 9. Connect an RF VTVM to the emitter of Q13, and adjust C23 to obtain 65 millivolts rms.

NOTE: When this voltage is correctly adjusted, the oscillator frequency is correctly positioned on the bandpass of the crystal lattice filter.

I. Transmit Driver Interstage Alignment

Disconnect L18 and C109 from pin 2 of the 6EA8, V1, and connect a 50 mc sweep generator. Make sure that the generator cable is properly terminated and use a coupling capacitor between the cable and the tube to prevent shorting out R44. Couple an oscilloscope with a demodulator probe, such as the RCA WG-291, to pin 3 of V3 with a one-turn gimmick. Set C112 fully open.

Set the controls of the Sidewinder as follows:

RF GAIN. . . . . PULLED OUT
CW-USB-AM . . . . . USB
MIKE GAIN TR. . . . PULLED OUT
AF GAIN . . . . TURNED ON

Adjust L21, L22, and L23 for maximum output and a flat response within 2 or 3 db between 50 and 54 mc. Adjust the neutralization capacitor, C111, to eliminate any instability noted on the output trace. Instability is evidenced by sharp changes in the effective bandpass, appearing as a "sawtooth" pattern over all or part of the bandpass when C111 is badly misadjusted.

J. Transmit Doubler and Driver Grid Alignment

Set the controls on the Sidewinder to transmit at 52 mc. Monitor the output with the Sidewinder's own output meter and adjust L20 for maximum meter deflection. See Figure 10.

K. Transmit Center Frequency Adjust

Set the "Offset Tuning" control to the center of its range. Set the VFO to 0.5. At this VFO dial setting the VFO is actually operating at 6.0 mc. Monitor this 6 mc signal on a communications-type receiver with the BFO turned on. Key the Sidewinder from the receive to transmit mode, but with the transmitter filaments turned off. Adjust R83 until no shift of the beat frequency is noted as the unit is switched back and forth from transmit to receive. This adjustment is not critical as any slight T/R offset is taken care of during actual operation by the "Offset Tuning" control.

L. "S" Meter Sensitivity Adjust

Operate the Sidewinder normally on 'receive' with the RF Gain control fully advanced. After normal warm-up, zero the "S" meter with no signal input. Then supply 100 microvolts of signal (unmodulated), to the antenna input, using a well calibrated signal generator set to around 52 mc. Tune in the signal and adjust R101 until the "S" meter reads "S9".

M. Performance Test

After alignment is completed, the performance of the Sidewinder may be tested by operating the unit in the "CW" mode, and 'tuning up' into a calibrated dummy load at a number of points within the six-meter band. Some variation in power output is normal because of the bandpass circuitry employed in the Sidewinder, but with proper alignment, the output power will show a maximum variation of from 8 to 15 watts.

If the average "CW" power output across the band is greater than 11 or 12 watts, the 9 mc drive should be reduced by turning C23 clockwise until this average is obtained. This will place the carrier frequency even further down the filter skirt than the original adjustment in step "H", and provide better carrier suppression. Do not attempt to obtain greater than the rated output by omitting this drive adjustment, as any added output produced will result in excess distortion in the "AM" and "USB" modes.

PARTS LIST

SCHEMATIC SYMBOL	DESCRIPTION	GONSET PART NUMBER
C119	Capacitor, 3-12 pf, trimmer	089-041
C120	Capacitor, 3-12 pf, trimmer	089-041
C121	Capacitor, 120 pf, DM15, 5%	433-121J
C122	Capacitor, 27 pf, DM15	433-270J
C123	Capacitor, 510 pf, DM15	432-511J
C124	Capacitor, 100 pf, DM15, 5%	433-101J
C125	Capacitor, 10 pf, DM15, 5%	433-100J
C126	Capacitor, 100 pf, DM15, 5%	433-101J
C127	Capacitor, 100 pf, DM15, 5%	433-101J
C128	Capacitor, .01 mfd, ceramic	376-103Z
C129	Capacitor, 27 pf, DM15	433-270J
C130		
C131	Capacitor, .01 mfd, disc ceramic	376-103Z
C132		
C133		
C134		
C135		
C136	Capacitor, .01 mfd, disc ceramic	376-103Z
C137	Capacitor, .01 mfd, disc ceramic	376-103Z
C138	Capacitor, .01 mfd, disc ceramic	376-103Z
R1	Potentiometer, Mike Gain	052-148
R2	Resistor, 270K, 1/2W, 10%	042-274
R3	Resistor, 82K, 1/2W, 10%	042-823
R4	Resistor, 100Ω, 1/2W, 10%	042-101
R5	Resistor, 2.7K, 1/2W, 10%	042-272
R6	Resistor, 39K, 1/2W, 10%	042-393
R7	Resistor, 4.7K, 1/2W, 10%	042-472
R8	Resistor, 1K, 1/2W, 10%	042-102
R9	Resistor, 4.7K, 1/2W, 10%	042-472
R10	Resistor, 22K, 1/2W, 10%	042-223
R11	Resistor, 4.7K, 1/2W, 10%	042-472
R12	Resistor, 1K, 1/2W, 10%	042-102
R13	Resistor, 470Ω, 1/2W, 10%	042-471
R14	Resistor, 22K, 1/2W, 10%	042-223
R15	Resistor, 2.2K, 1/2W, 10%	042-222
R16	Resistor, 470Ω, 1/2W, 10%	042-471
R17	Resistor, 3.9K, 1/2W, 10%	042-392
R18	Resistor, 2.7K, 1/2W, 10%	042-272
R19	Resistor, 470Ω, 1/2W, 10%	042-471
R20	Resistor, 33K, 1/2W, 10%	042-333
R21	Resistor, 82K, 1/2W, 10%	042-823
R22	Resistor, 100K, 1/2W, 10%	042-104
R23	Resistor, 2.7K, 1/2W, 10%	042-272
R24	Resistor, 2.7K, 1/2W, 10%	042-272
R25	Resistor, 10K, 1/2W, 10%	042-103
R26	Resistor, 3.3K, 1/2W, 10%	042-332
R27	Resistor, 270Ω, 1/2W, 10%	042-271
R28	Potentiometer, AF Gain	052-145
R29	Potentiometer, RF Gain	052-147
R30	Resistor, 4.7Ω, 1/2W, 10%	042-479
R31	Resistor, 470Ω, 1/2W, 10%	042-471
R32	Resistor, 1.8 Ω, 2W, 5%	061-189
R33	Resistor, 1.5K, 1/2W, 10%	042-152
R34	Resistor, 33K, 1/2W, 10%	042-333
R35	Resistor, 1.5K, 1/2W, 10%	042-152
R36	Resistor, 150Ω, 1/2W, 10%	042-151
R37	Resistor, 1.5K, 1/2W, 10%	042-152
R38	Resistor, 2.2K, 1/2W, 10%	042-222

SCHEMATIC SYMBOL	DESCRIPTION	GONSET PART NUMBER
R39	Resistor, 100Ω, 1/2W, 10%	042-101
R40	Resistor, 22K, 1/2W, 10%	042-223
R41	Resistor, 22K, 1/2W, 10%	042-223
R42	Resistor, 10K, 2W, 10%	044-103
R43	Resistor, 68K, 1/2W, 10%	042-683
R44	Resistor, 33K, 1/2W, 10%	042-333
R45	Resistor, 10K, 1/2W, 10%	042-103
R46	Resistor, 680Ω, 1/2W, 10%	042-681
R47	Resistor, 1.5K, 1/2W, 10%	042-152
R48	Resistor, 68K, 1/2W, 10%	042-683
R49	Resistor, 22Ω, 1/2W, 10%	042-220
R50	Resistor, 470Ω, 1/2W, 10%	042-471
R51	Resistor, 3.9K, 1/2W, 10%	042-392
R52	Resistor, 33K, 1/2W, 10%	042-333
R53	Resistor, 2.7K, 1/2W, 10%	042-272
R54	Resistor, 470Ω, 1/2W, 10%	042-471
R55	Resistor, 22K, 1/2W, 10%	042-223
R56	Resistor, 2.2K, 1/2W, 10%	042-222
R57	Resistor, 2.7K, 1/2W, 10%	042-272
R58	Resistor, 3.9K, 1/2W, 10%	042-392
R59	Resistor, 470Ω, 1/2W, 10%	042-471
R60	Resistor, 2.7K, 1/2W, 10%	042-272
R61	Resistor, 3.9K, 1/2W, 10%	042-392
R62	Potentiometer, Bal. Mod.	052-146
R63	Resistor, 470Ω, 1/2W, 10%	042-471
R64	Resistor, 1K, 1/2W, 10%	042-102
R65	Resistor, 470Ω, 1/2W, 10%	042-471
R66	Resistor, 6.8K, 1/2W, 10%	042-682
R67	Resistor, 4.7K, 1/2W, 10%	042-472
R68	Resistor, 22K, 1/2W, 10%	042-223
R69	Resistor, 470Ω, 1/2W, 10%	042-471
R70	Resistor, 2.7K, 1/2W, 10%	042-272
R71	Resistor, 3.3K, 1/2W, 10%	042-332
R72	Resistor, 3.9K, 1/2W, 10%	042-392
R73	Resistor, 1K, 1/2W, 10%	042-102
R74	Resistor, 39K, 1/2W, 10%	042-393
R75	Resistor, 1.5K, 1/2W, 10%	042-152
R76	Resistor, 18K, 1/2W, 10%	042-183
R77	Resistor, 1.5K, 1/2W, 10%	042-152
R78	Resistor, 3.9K, 1/2W, 10%	042-392
R79	Resistor, 1K, 1/2W, 10%	042-102
R80	Resistor, 15K, 1/2W, 10%	042-153
R81	Resistor, 1K, 1/2W, 10%	042-102
R82	Resistor, 22K, 1/2W, 10%	042-223
R83	Potentiometer, 5K, Linear	051-009
R84	Resistor, 1.5K, 1/2W, 10%	042-152
R85	Resistor, 330Ω, 1/2W, 10%	042-331
R86	Resistor, 10K, 1/2W, 10%	042-103
R87	Resistor, 2.2K, 1/2W, 10%	042-222
R88	Resistor, 200Ω, 1/2W, 10%	042-201
R89	Resistor, 270Ω, 1/2W, 10%	042-271
R90	Resistor, 1.5K, 1/2W, 10%	042-152
R91	Resistor, 4.7K, 1/2W, 10%	042-472
R92	Resistor, 15K, 1/2W, 10%	042-153
R93	Resistor, 1K, 1/2W, 10%	042-102
R94	Resistor, 2.7K, 1/2W, 10%	042-272
R95	Resistor, 2K, 1/2W, 5%	046-202
R96	Resistor, 1.5K, 1/2W, 10%	042-152
R97	Resistor, 3.9K, 1/2W, 10%	042-392

SCH SYM
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C23
C24
C25
C26
C27
C28
C29
C30
C31
C32
C33
C34
C35
C36
C37
C38
C39
C40
C41
C42
C43
C44
C45
C46
C47
C48
C49
C50
C51
C52
C53
C54
C55
C56
C57
C58
C59

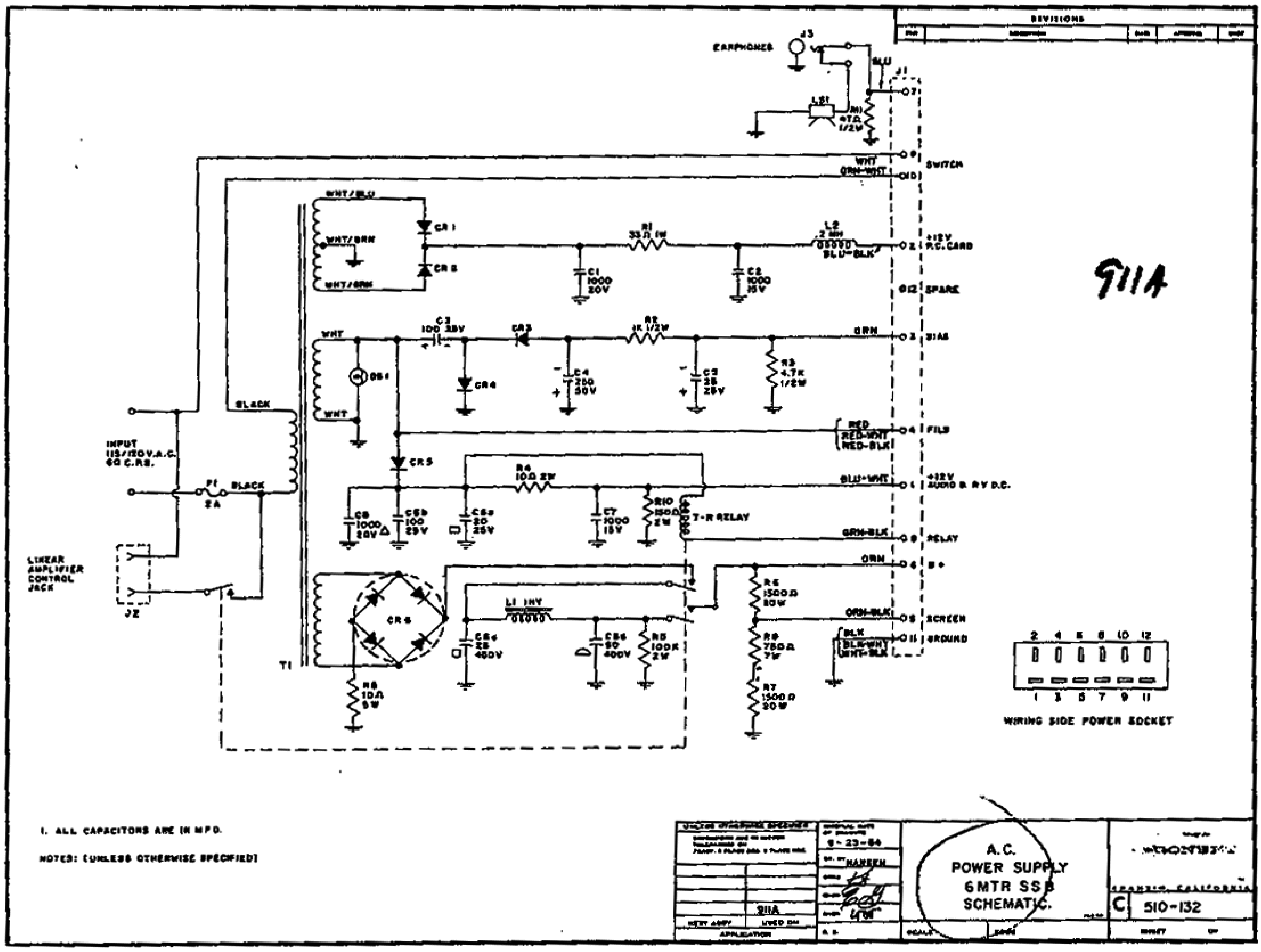
PARTS LIST

SCHEMATIC SYMBOL	DESCRIPTION	GONSET PART NUMBER
R98	Resistor, 2.7K, 1/2W, 10%	042-272
R99	Resistor, 22K, 1/2W, 10%	042-223
R100	Resistor, 10K, 1/2W, 10%	042-103
R101	Potentiometer, 5K Linear	051-009
R102	Potentiometer, 1K, "S" Meter	051-008
L1	Coil, VFO	012-605
L2	RF Choke, 600 uh	027-019
L3	RF Choke, 12 uh	027-116
L4	RF Choke, 33 uh	027-117
L5	RF Choke, 33 uh	027-117
L6	RF Choke, 33 uh	027-117
L7	RF Choke, 33 uh	027-117
L8	RF Choke, 12 uh	027-116
L9	RF Choke, 12 uh	027-116
L10	RF Choke, 12 uh	027-116
L11	RF Choke, 12 uh	027-116
L12	Coil, Oscillator, HF	012-638
L13	RF Choke, 1.8 uh	027-078
L14	Coil, mixer input	012-637
L15	Coil, DT Sec	012-636
L16	Coil, DT Pri	012-635
L17	Coil, Antenna Input	012-634
L18	Coil, 15 mc matching	012-441
L19	RF Choke, 1.8 uh	027-078
L20	Coil, HF Buffer	012-639
L21	Coil, Driver input	012-640
L22	Coil, Driver, output	012-467
L23	Coil, Final input	012-468
L24	Coil, Final tank	011-126
L25	Coil, Antenna link	011-127
L26	RF Choke, 8.2 uh	027-079
L27	RF Filter coil	012-641
L28	RF Filter coil	012-641
L29	RF Filter coil	012-641
L30	RF Filter coil	012-641
L31	RF Choke, 35 uh	027-115
Q1	Transistor, GC 815	476-012
Q2	Transistor, GC 815	476-012
Q3	Transistor, GC 815	476-012
Q4	Transistor, GC 814A	476-031
Q5	Transistor, GC 814A	476-031
Q6	Transistor, GC 814A	476-031
Q7	Transistor, GC 814A	476-031
Q8	Transistor, GA 2319	476-032
Q9	Transistor, GC 815	476-012
Q10	Transistor, GC 4001	476-029
Q11	Transistor, GC 4001	476-029
Q12	Transistor, GC 813	476-027
Q13	Transistor, GC 814A	476-031
Q14	Transistor, GC 814A	476-031
Q15	Transistor, GC 814A	476-031
Q16	Transistor, GA 2319	476-032
Q17	Transistor, GC 814A	476-031
Q18	Transistor, TI 391	476-028
Q19	Transistor, GC 814A	476-031
Q20	Transistor, TI 391	476-028
Q21	Transistor, TI 391	476-028

SCHEMATIC SYMBOL	DESCRIPTION	GONSET PART NUMBER
T1	IF Transformer	014-112
T2	9 mc IF Transformer	014-111
T3	9 mc IF Transformer	014-111
T4	Driver Transformer	272-054
T5	Output transformer, audio	272-055
T6	IF Transformer	014-112
T7	15 mc IF transformer	014-110
T8	IF Transformer	014-115
T9	15 mc IF transformer	014-11
T10	IF Transformer	014-11
T11	9 mc BM Transformer	014-11
Y1	Crystal, 50 mc	486-44
Y2	Crystal, 51 mc	486-44
Y3	Crystal, 52 mc	486-44
Y4	Crystal, 53 mc	486-44
Y5	Crystal, 8.998 mc	486-43
FL1	Filter	487-00
V1	Electron tube, 6EA8	472-11
V2	Electron tube, 12BY7A	472-0
V3	Electron tube, 6360	472-5
CR1	Diode, 1N34	475-0
CR2	Diode, 1N34	475-0
CR3	Diode, 1N34	475-0
CR4	Diode, 1N34	475-0
CR5	Diode, 1N34	475-0
CR6	Diode, 1N34	475-C
CR7	Diode, zener, 1N765A	475-C
S1	Switch, bal. mod.	171-1
S2	Switch, VFO	171-
S3	Switch, HF crystal	171-
M1	Meter	112-
PL1	Lamp, #755	471-
K1	Relay, TF-154-6C or equal	111-
K2	Relay, PC	111-
J1	Mike Jack	342-
J2	Key Jack	342-
J3	Connector, 12 pin	344-
J4	Ant. Jack	344-
	Front Panel	441
	Feet, Rubber	222
	Top Cabinet Assembly	465
	Bottom Cabinet Assembly	465
	Dial Window	455
	Knob, 5/8" diameter	211
	Knob, 1" diameter	211
	Knob, 1-5/16" diameter	211
	Special Lever Knob	21
	Cabinet Lid Screws	25

PARTS LIST

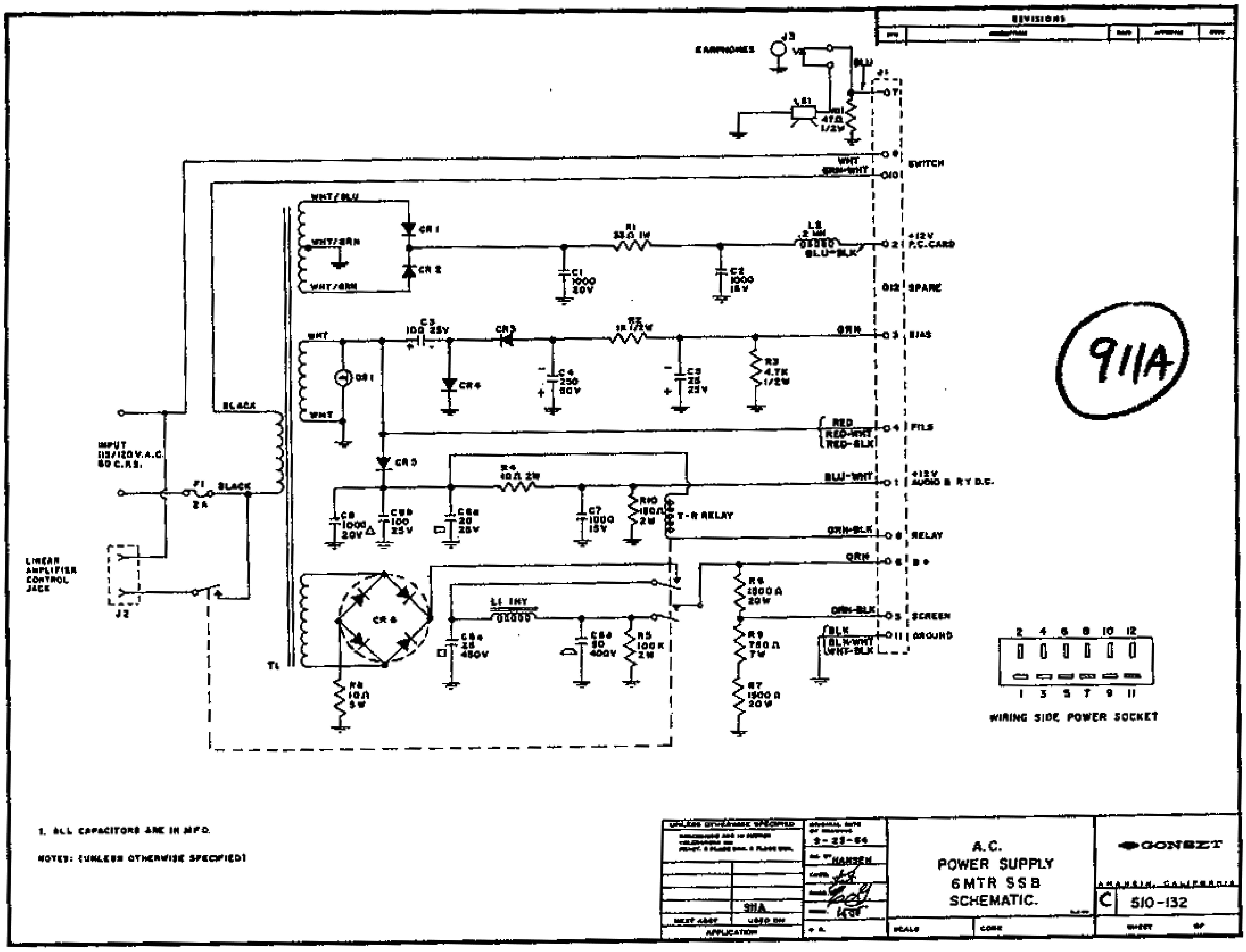
SCHEMATIC SYMBOL	DESCRIPTION	GONSET PART NUMBER
C1	Capacitor, 50 pf, disc ceramic	401-500J
C2	Capacitor, 15 mfd, 15 v	422-150Z
C3	Capacitor, 500 mfd, 15 v	422-501Z
C4	Capacitor, 15 mfd, 15 v	422-150Z
C5	Capacitor, 15 mfd, 15 v	422-150Z
C6	Capacitor, 15 mfd, 15 v	422-150Z
C7	Capacitor, 15 mfd, 15 v	422-150Z
C8	Capacitor, 15 mfd, 15 v	422-150Z
C9	Capacitor, .01 mfd, disc ceramic	376-103Z
C10	Capacitor, 510 pf, DM15 mica	432-511J
C11	Capacitor, 160 pf, DM15 5%	433-161J
C12	Capacitor, .01 mfd, disc ceramic	376-103Z
C13	Capacitor, .01 mfd, disc ceramic	376-103Z
C14	Capacitor, .01 mfd, disc ceramic	376-103Z
C15	Capacitor, .01 mfd, disc ceramic	376-103Z
C16	Capacitor, 50 pf, disc ceramic	401-500J
C17	Capacitor, .01 mfd, disc ceramic	376-103Z
C18	Capacitor, .1 mfd, disc ceramic	381-104Z
C19	Capacitor, 15 mfd, 15 v	422-150Z
C20	Capacitor, 15 mfd, 15 v	422-150Z
C21	Capacitor, 15 mfd, 15 v	422-150Z
C22	Capacitor, 100 mfd, 15 v	422-101Z
C23	Capacitor, 3-12 pf, trimmer	089-041
C24	Capacitor, 250 mfd, 25 v	366-251Z
C25	Capacitor, 5-25 pf, trimmer	089-009
C26	Capacitor, 15 pf, N330	084-605
C27	Capacitor, 15 pf, N330	084-605
C28	Capacitor, 10 pf, DM15, 5%	433-100J
C29	Capacitor, 3-12 pf, trimmer	089-041
C30	Capacitor, VFO	074-160
C31	Capacitor, 2 pf, DM15 mica	433-209
C32	Capacitor, 1500 pf, DM19	432-152J
C33	Capacitor, 1000 pf, DM19	432-102J
C34	Capacitor, 1000 pf, DM19	432-102J
C35	Capacitor, 1500 pf, DM19	432-152J
C36	Capacitor, 3-12 pf, trimmer	089-041
C37	Capacitor, 1500 pf, DM19	432-152J
C38	Capacitor, 1500 pf, DM19	432-152J
C39	Capacitor, 10 pf, DM15, 5%	433-100J
C40	Capacitor, 10 pf, DM15, 5%	433-100J
C41	Capacitor, 10 pf, DM15, 5%	433-100J
C42	Capacitor, 15 mfd, 15 v	422-150Z
C43	Capacitor, 39 pf, DM15	433-390J
C44	Capacitor, 50 pf, NPO, disc	401-500J
C45	Capacitor, 27 pf, DM15	433-270J
C46	Capacitor, 6.2 pf, comp	361-629J
C47	Capacitor, .005 mfd, ceramic	373-502Z
C48	Capacitor, .005 mfd, ceramic	373-502Z
C49	Capacitor, .005 mfd, ceramic	373-502Z
C50	Capacitor, 6.2 pf, comp	361-629J
C51	Capacitor, 47 pf, DM15, 5%	433-470J
C52	Capacitor, .01 mfd, disc ceramic	376-103Z
C53	Capacitor, .01 mfd, disc ceramic	376-103Z
C54	Capacitor, 130 pf, DM15, 5%	433-131J
C55	Capacitor, 15 pf, DM15, 5%	433-150J
C56	Capacitor, 47 pf, DM15, 5%	433-470J
C57	Capacitor, 20 pf, DM15, 5%	433-200J
C58	Capacitor, 100 pf, DM15, 5%	433-101J
C59	Capacitor, 20 pf, DM15, 5%	433-200J
C60	Capacitor, 10 pf, DM15, 5%	433-100J
C61	Capacitor, 50 pf, NPO	401-500J
C62	Capacitor, .001 mfd, ceramic	374-102P
C63	Capacitor, 47 pf, DM15, 5%	433-470J
C64	Capacitor, 47 pf, DM15, 5%	433-470J
C65	Capacitor, 20 pf, DM15, 5%	433-200J
C66	Capacitor, 10 pf, DM15, 5%	433-100J
C67	Capacitor, 15 pf, DM15, 5%	433-150J
C68	Capacitor, 200 pf, DM15, 5%	433-201J
C69	Capacitor, .01 mfd, ceramic	376-103Z
C70	Capacitor, 1000 pf, feed-thru	077-021
C71	Capacitor, 1000 pf, feed-thru	077-021
C72	Capacitor, 1000 pf, feed-thru	077-021
C73	Capacitor, 1000 pf, feed-thru	077-021
C74	Capacitor, 1000 pf, feed-thru	077-021
C75	Capacitor, 1000 pf, feed-thru	077-021
C76	Capacitor, 1000 pf, feed-thru	077-021
C77	Capacitor, 1000 pf, feed-thru	077-021
C78	Capacitor, 1000 pf, feed-thru	077-021
C79	Capacitor, 1000 pf, feed-thru	077-021
C80	Capacitor, 1000 pf, feed-thru	077-021
C81	Capacitor, 1000 pf, feed-thru	077-021
C82	Capacitor, 1000 pf, feed-thru	077-021
C83	Capacitor, 1000 pf, feed-thru	077-021
C84	Capacitor, 1000 pf, feed-thru	077-021
C85	Capacitor, 1000 pf, feed-thru	077-021
C86	Capacitor, 1000 pf, feed-thru	077-021
C87	Capacitor, 1000 pf, feed-thru	077-021
C88	Capacitor, 1000 pf, feed-thru	077-021
C89	Capacitor, 1000 pf, feed-thru	077-021
C90	Capacitor, 1000 pf, feed-thru	077-021
C91	Capacitor, 1000 pf, feed-thru	077-021
C92	Capacitor, 1000 pf, feed-thru	077-021
C93	Capacitor, 1000 pf, feed-thru	077-021
C94	Capacitor, 1000 pf, feed-thru	077-021
C95	Capacitor, 1000 pf, feed-thru	077-021
C96	Capacitor, 1000 pf, feed-thru	077-021
C97	Capacitor, 1000 pf, feed-thru	077-021
C98	Capacitor, 1000 pf, feed-thru	077-021
C99	Capacitor, 1000 pf, feed-thru	077-021
C100	Capacitor, 390 pf, DM15	433-391J
C101	Capacitor, 390 pf, DM15	433-391J
C102	Capacitor, 390 pf, DM15	433-391J
C103	Capacitor, 27 pf, DM15	433-270J
C104	Capacitor, 2.7 pf, QC type	361-279
C105	Capacitor, 20 pf, DM15, 5%	433-200J
C106	Capacitor, 390 pf, DM15	433-391J
C107	Capacitor, 390 pf, DM15	433-391J
C108	Capacitor, 68 pf, DM15, 5%	433-680J
C109	Capacitor, 390 pf, DM15	433-391J
C110	Capacitor, 390 pf, DM15	433-391J
C111	Capacitor, 4-40 pf, trimmer	089-005
C112	Capacitor, tank	074-158
C113	Capacitor, antenna	074-159
C114	Capacitor, 390 pf, DM15	433-391J
C115	Capacitor, 390 pf, DM15	433-391J
C116	Capacitor, 50 pf, disc ceramic	401-500J
C117	Capacitor, 20 pf, DM15, 5%	433-200J
C118	Capacitor, 20 pf, DM15, 5%	433-200J



PARTS LIST

SCHEMATIC SYMBOL	DESCRIPTION	GONSET PART NUMBER
R1	Resistor, 33Ω, 10%, 1 W	043-330
R2	Resistor, 1000Ω, 10%, 1/2 W	042-102
R3	Resistor, 4700Ω, 10%, 1/2 W	042-472
R4	Resistor, 10Ω, 10%, 2W	044-100
R5	Resistor, 100 K Ω, 10%, 2 W	044-104
R6	Resistor, 1500Ω, 20 W	049-095
R7	Resistor, 1500Ω, 20 W	049-095
R8	Resistor, 10Ω, 10%, 5 W	049-092
R9	Resistor, 750Ω, 7 W	049-107
R10	Resistor, 150Ω, 2 W	044-151
R11	Resistor, 47Ω, 1/2 W	042-470
C1	Capacitor, 1000 mfd, 20 v	073-169
C2	Capacitor, 1000 mfd, 15 v	365-102Z
C3	Capacitor, 100 mfd, 25 v	366-101P
C4	Capacitor, 250 mfd, 50 v	367-251Z
C5	Capacitor, 25 mfd, 25 v	366-250
C6	Capacitor, 50 mfd, 400 v 25 mfd, 450 v 100 mfd, 25 v 20 mfd, 25 v	073-154
C7	Capacitor, 1000 mfd, 15 v	365-102Z
C8	Capacitor, 1000 mfd, 20 v	073-169

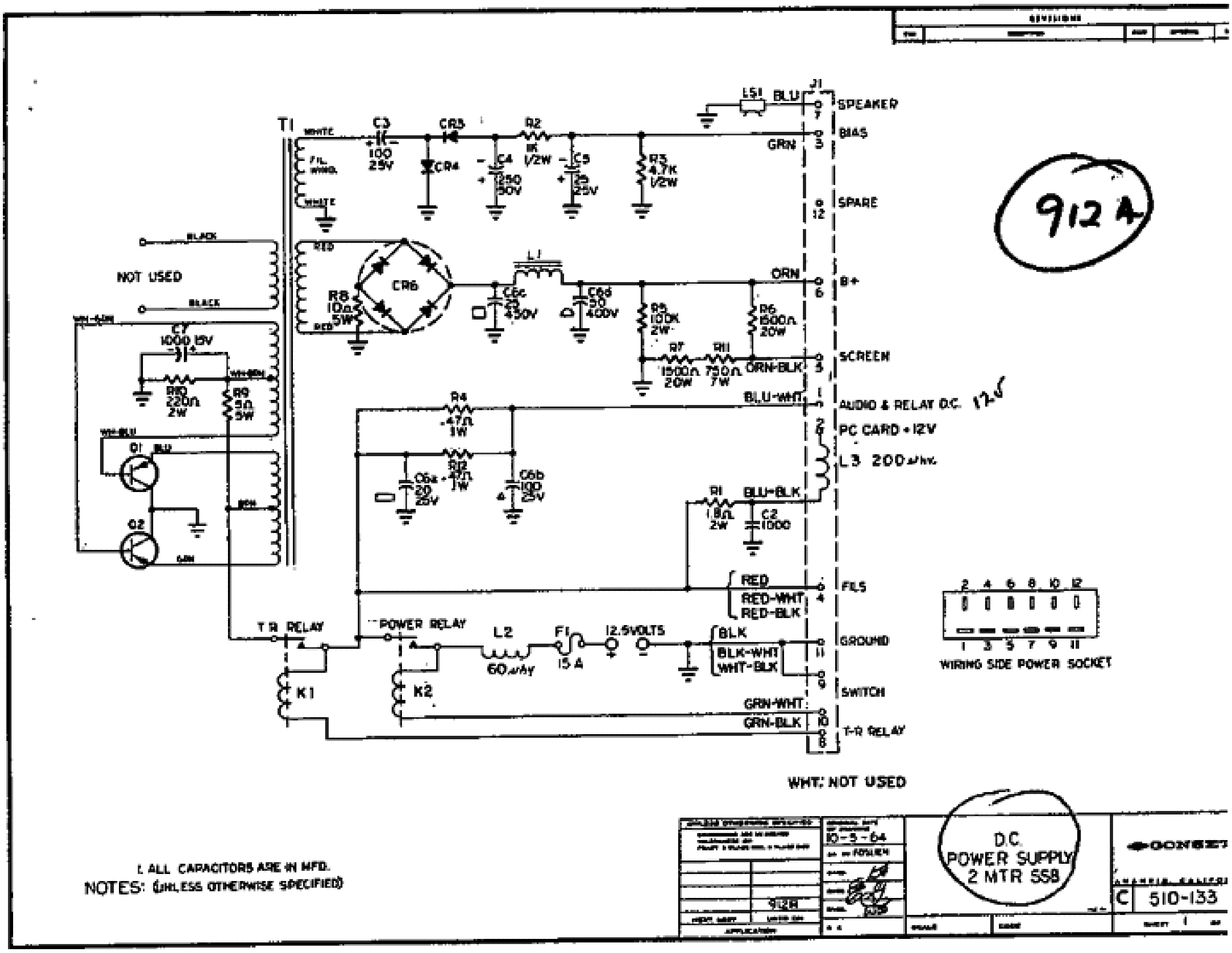
SCHEMATIC SYMBOL	DESCRIPTION	GONSET PART NUMBER
T1	Transformer, power	271-089
L1	Choke, filter	274-025
L2	RF Choke, 200 uh	027-017
LS1	Loudspeaker	152-023
K1	Relay	111-091
CR1	Diode, 50 piv	474-004-1
CR2	Diode, 50 piv	474-004-1
CR3	Diode, 50 piv	474-004-1
CR4	Diode, 50 piv	474-004-1
CR5	Diode, 50 piv	474-004-1
CR6	Diode bridge	474-026
J1	Connector, 12 contact	344-172
J2	AC Receptacle	344-023
J3	Phone jack	342-001
F1	Fuse, 2 ampere, 250 v	482-049
DS1	Dial lamp, #1815	471-004
	Power Cord	696-016



PARTS LIST

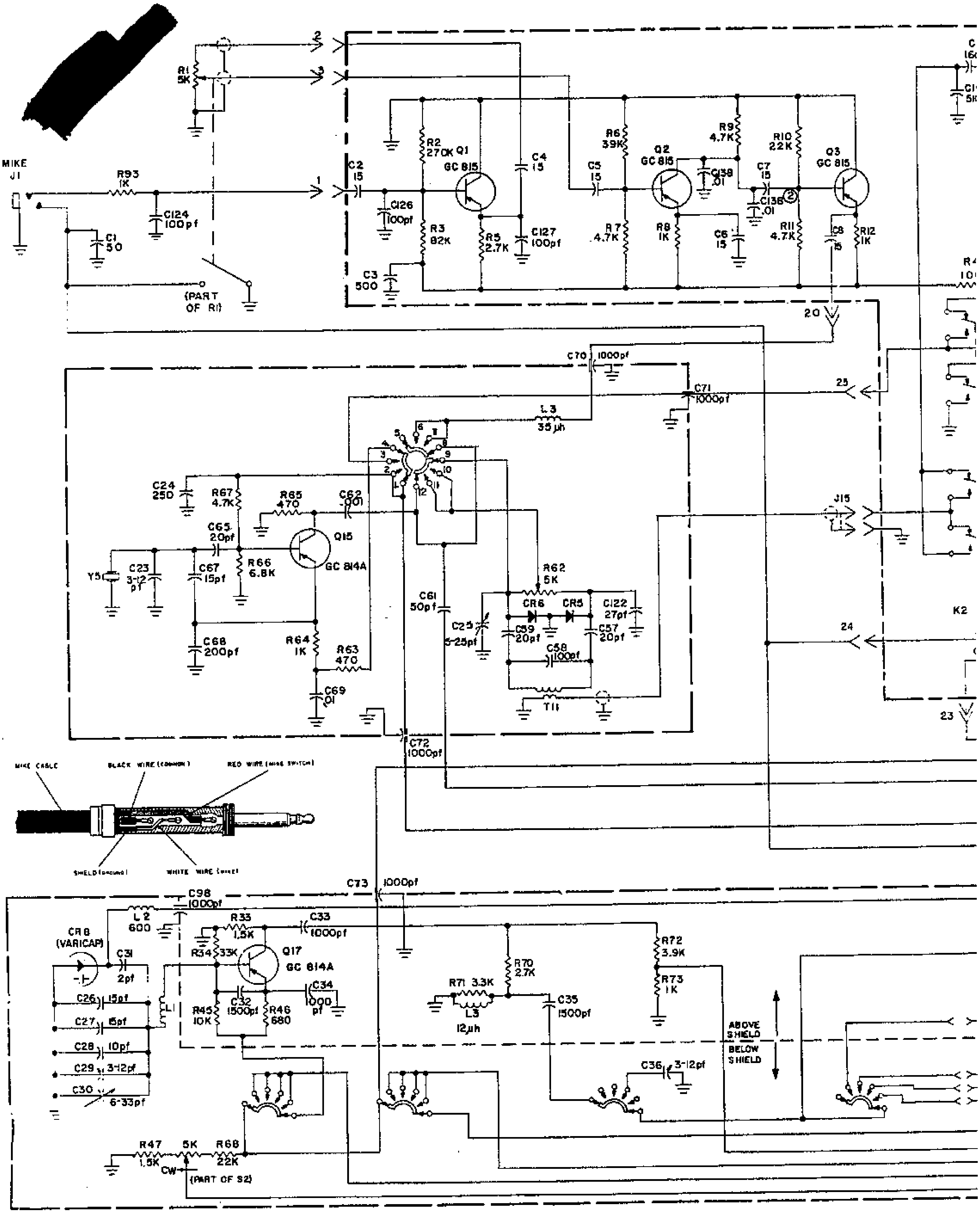
SCHEMATIC SYMBOL	DESCRIPTION	GONSET PART NUMBER
R1	Resistor, 33Ω, 10%, 1 W	043-330
R2	Resistor, 1000Ω, 10%, 1/2 W	042-102
R3	Resistor, 4700Ω, 10%, 1/2 W	042-472
R4	Resistor, 10Ω, 10%, 2W	044-100
R5	Resistor, 100 K Ω, 10%, 2 W	044-104
R6	Resistor, 1500Ω, 20 W	049-095
R7	Resistor, 1500Ω, 20 W	049-095
R8	Resistor, 10Ω, 10%,5 W	049-092
R9	Resistor, 750Ω, 7 W	049-107
R10	Resistor, 150Ω, 2 W	044-151
R11	Resistor, 47Ω, 1/2 W	042-470
C1	Capacitor, 1000 mfd, 20 v	073-169
C2	Capacitor, 1000 mfd, 15 v	365-102Z
C3	Capacitor, 100 mfd, 25 v	366-101P
C4	Capacitor, 250 mfd, 50 v	367-251Z
C5	Capacitor, 25 mfd, 25 v	366-250
C6	Capacitor, 50 mfd, 400 v	073-154
	25 mfd, 450 v	
	100 mfd, 25 v	
	20 mfd, 25 v	
C7	Capacitor, 1000 mf,d, 15 v	365-102Z
C8	Capacitor, 1000 mfd, 20 v	073-169

SCHEMATIC SYMBOL	DESCRIPTION	GONSET PART NUMBER
T1	Transformer, power	271-089
L1	Choke, filter	274-025
L2	RF Choke, 200 uh	027-017
LS1	Loudspeaker	152-023
K1	Relay	111-091
CR1	Diode, 50 piv	474-004-1
CR2	Diode, 50 piv	474-004-1
CR3	Diode, 50 piv	474-004-1
CR4	Diode, 50 piv	474-004-1
CR5	Diode, 50 piv	474-004-1
CR6	Diode bridge	474-026
J1	Connector, 12 contact	344-172
J2	AC Receptacle	344-023
J3	Phone jack	342-001
F1	Fuse, 2 ampere, 250 v	482-049
DS1	Dial lamp, #1815	471-004
	Power Cord	696-016

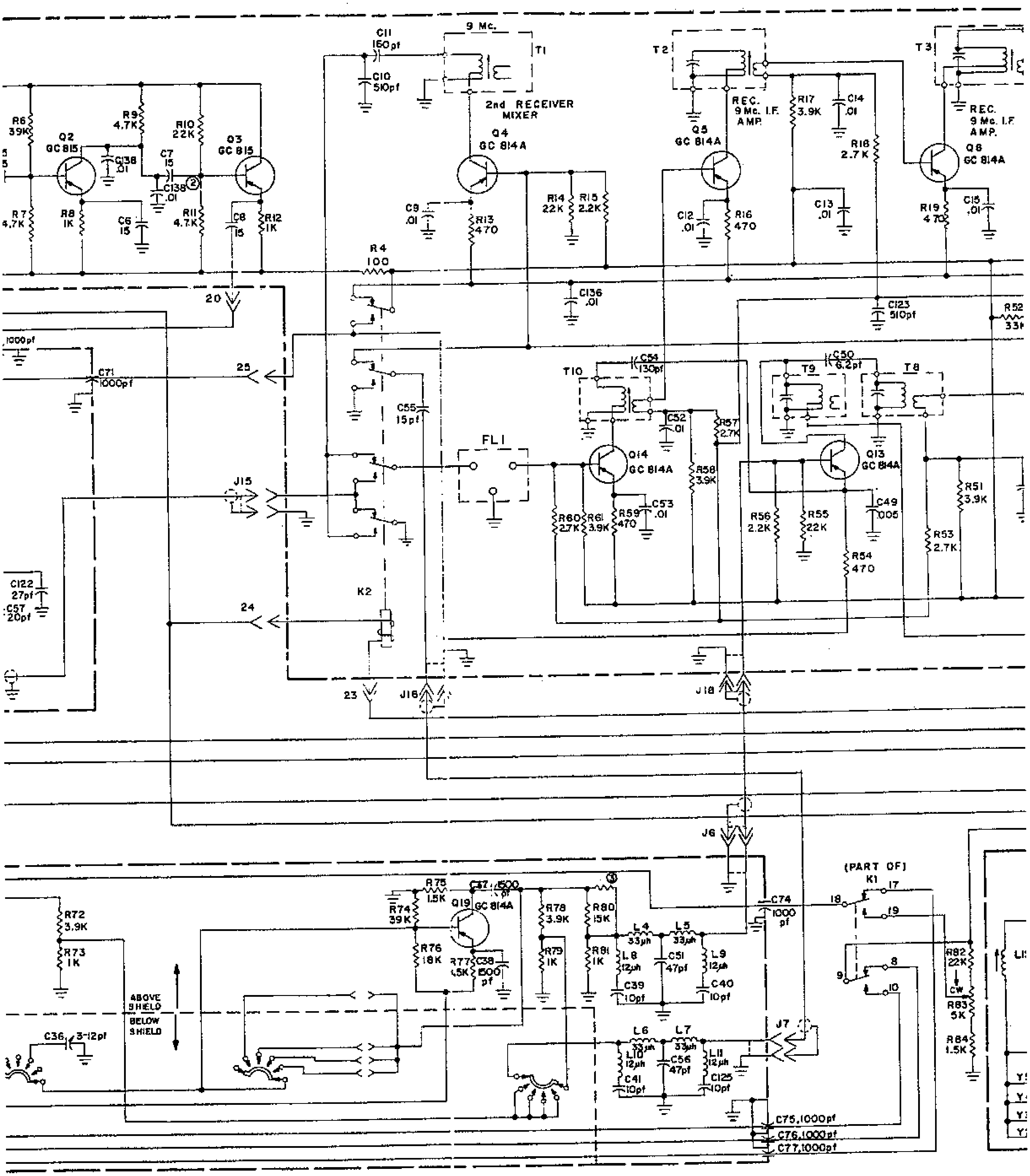


PARTS LIST

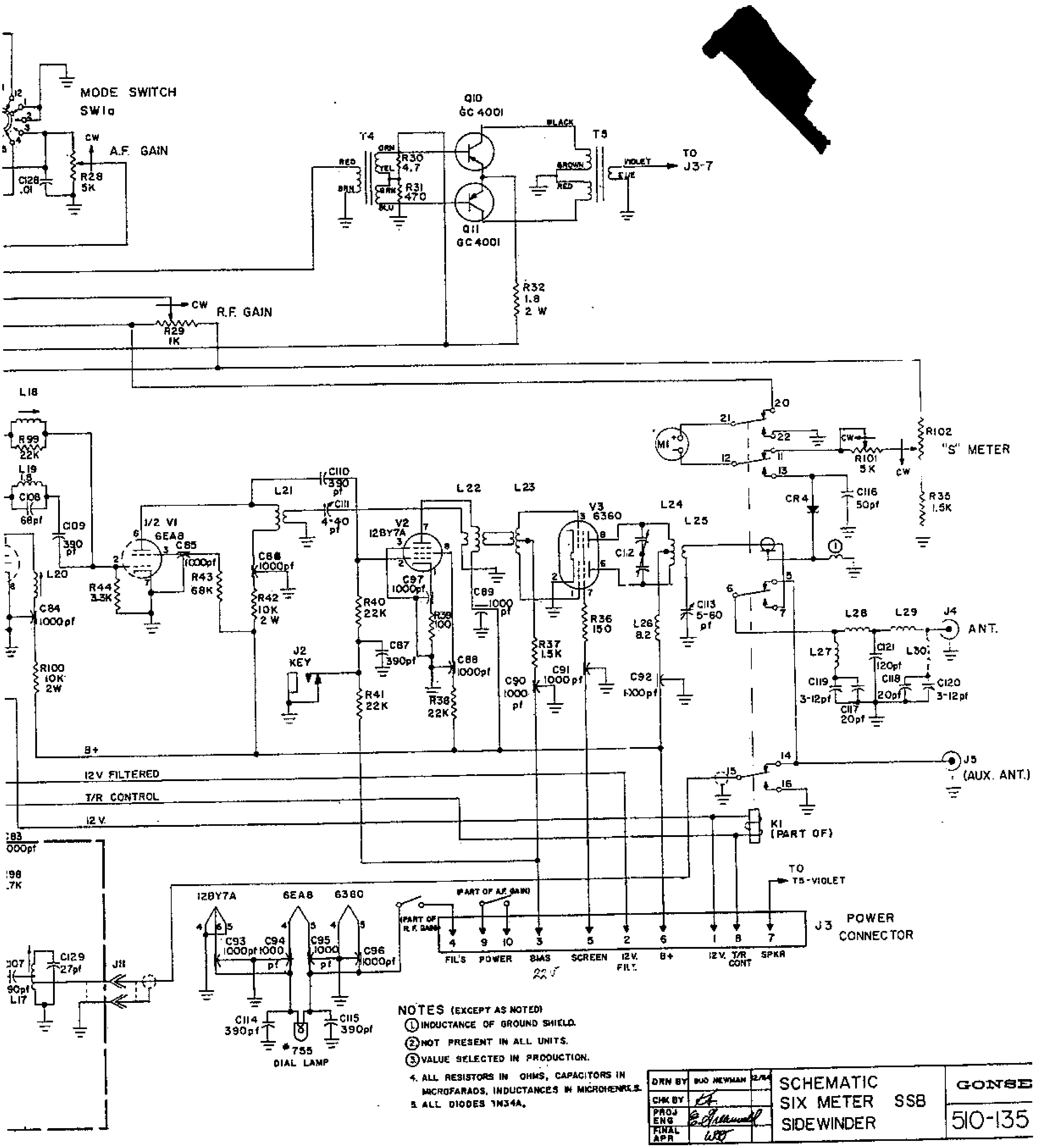
SCHEMATIC SYMBOL	DESCRIPTION	GONSET PART NUMBER	SCHEMATIC SYMBOL	DESCRIPTION	GONSET PART NUMBE
R1	Resistor, 1.8Ω, 10%, 2 W	061-189	T1	Transformer, power	271-C
R2	Resistor, 1000Ω, 10%, 1/2 W	042-102	L1	Choke, filter	274-C
R3	Resistor, 4700Ω, 10%, 1/2 W	042-472	L2	Hash filter, 60 uh	027-C
R4	Resistor, .47Ω, 10%, 1 W	056-478	L3	RF choke, 200 uh	027-C
R5	Resistor, 100KΩ, 10%	044-104			
R6	Resistor, 1500Ω, 20 W	049-095	Q1	Transistor,	476-C
R7	Resistor, 1500Ω, 20 W	049-095	Q2	Transistor	476-C
R8	Resistor, 10Ω, 10%, 5 W	049-092			
R9	Resistor, 5Ω, 5 W	049-100	CR3	Diode, 50 piv	474-C
R10	Resistor, 220Ω, 10%, 2 W	044-221	CR4	Diode, 50 piv	474-C
R11	Resistor, 750Ω, 7 W	049-107	CR6	Diode bridge	474-C
R12	Resistor, .47Ω, 10%, 1 W	056-478			
			LS1	Loudspeaker	152-C
C2	Capacitor, 1000 mfd, 15 v	365-102Z	K1	Relay	111-1
C3	Capacitor, 100 mfd, 25 v	366-101P	K2	Relay	111-1
C4	Capacitor, 250 mfd, 50 v	367-251Z			
C5	Capacitor, 25 mfd, 25 v	366-250	F1	Fuse, 15 Ampere, 32 v	484-C
C6	Capacitor, 50 mfd, 400 v	073-154			
	25 mfd, 450 v		J1	Receptacle	344-1
	100 mfd, 25 v				
	20 mfd, 25 v				
C7	Capacitor, 1000 mfd, 15 v	365-102Z			

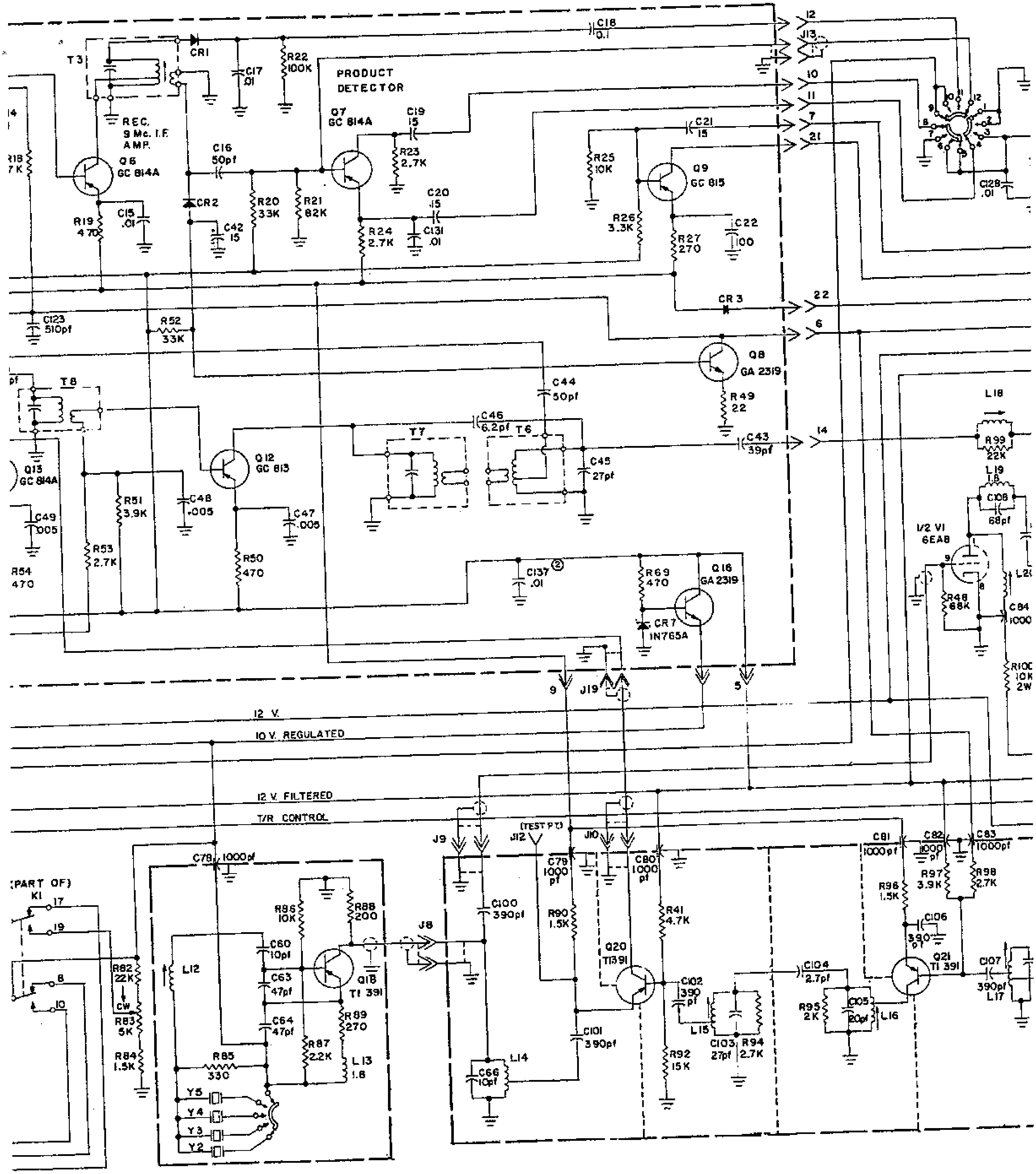


MIKE
J1
R93
1K
C124
100pf
C1
50
R1
5K
(PART
OF R1)
C2
15
C126
100pf
C3
500
R2
270K
R3
82K
Q1
GC 815
C4
15
R5
2.7K
C127
100pf
C5
15
R6
39K
R7
4.7K
Q2
GC 815
R8
1K
C139
.01
C6
15
R9
4.7K
C7
15
C136
.01
R10
22K
R11
4.7K
Q3
GC 815
C8
15
R12
1K
20
C70
1000pf
C71
1000pf
25
L3
35 µh
C24
250
R67
4.7K
R65
470
C62
.001
Q15
GC 814A
C65
20pf
R66
6.8K
Y5
C23
3-12
pf
C67
15pf
C68
200pf
R64
1K
R63
470
C69
.01
C61
50pf
C25
5-25pf
R62
5K
CR6
CR5
C122
27pf
C39
20pf
C57
20pf
C58
100pf
T11
J15
K2
24
23
C72
1000pf
MIKE CABLE
BLACK WIRE (COMMON)
RED WIRE (MIKE SWITCH)
SHIELD (GROUND)
WHITE WIRE (MIKE)
C73
1000pf
C98
1000pf
L2
600
CR8
(VARICAP)
C31
2pf
R33
1.5K
R34
33K
Q17
GC 814A
C33
1000pf
C32
1500pf
C34
1000
pf
R45
10K
R46
680
L1
C26
15pf
C27
15pf
C28
10pf
C29
3-12pf
C30
6-33pf
R70
2.7K
R71 3.3K
L3
12µh
C35
1500pf
R72
3.9K
R73
1K
C36
3-12pf
ABOVE
SHIELD
BELOW
SHIELD
R47
1.5K
5K
R68
22K
CW
(PART OF S2)


9 Mc.
T1
C11 160pf
C10 510pf
2nd RECEIVER MIXER
Q4 GC 814A
T2
REC. 9 Mc. I.F. AMP.
Q5 GC 814A
T3
REC. 9 Mc. I.F. AMP.
Q6 GC 814A
Q2 GC 815
Q3 GC 815
R6 39K
R7 4.7K
R8 1K
R9 4.7K
R10 22K
R11 4.7K
R12 1K
C6 15
C7 15
C8 15
C138 .01
C9 .01
R13 470
R14 22K
R15 2.2K
R16 470
R17 3.9K
R18 2.7K
R19 470
C12 .01
C13 .01
C14 .01
C15 .01
R4 100
C136 .01
C123 510pf
R52 33K
C71 1000pf
1000pf
20
25
24
23
C55 15pf
FL1
T10
C54 130pf
C52 .01
R57 2.7K
R58 3.9K
Q14 GC 814A
R60 2.7K
R61 3.9K
R59 470
C53 .01
T9
C50 6.2pf
T8
Q13 GC 814A
R56 2.2K
R55 22K
C49 .005
R54 470
R51 3.9K
R53 2.7K
J15
K2
C122 27pf
C57 20pf
J16
J18
J6
R75 1.5K
C37 1500 pf
R74 39K
Q19 GC 814A
R76 18K
R77 1.5K
C38 1500 pf
R78 3.9K
R79 1K
R80 15K
R81 1K
L4 33µh
L5 33µh
L8 12µh
C51 47pf
L9 12µh
C39 10pf
C40 10pf
C74 1000 pf
(PART OF) K1
17
18
19
8
9
10
R72 3.9K
R73 1K
ABOVE SHIELD
BELOW SHIELD
C36 3-12pf
L6 33µh
L7 33µh
L10 12µh
C56 47pf
L11 12µh
C41 10pf
C125 10pf
J7
C75,1000pf
C76,1000pf
C77,1000pf
R82 22K
CW
R83 5K
R84 1.5K

[redacted]


MODE SWITCH
SW1a
A.F. GAIN
CW
R28
5K
C128
.01
Q10
GC 4001
Q11
GC 4001
T4
T5
RED
BRN
GRN
YEL
BLU
R30
4.7
R31
470
BLACK
BROWN
RED
VIOLET
BLUE
TO
J3-7
R32
1.8
2 W
R.F. GAIN
R29
1K
L18
R99
22K
L19
1.8
C108
68pf
C109
390
pf
C110
390
pf
C111
4-40
pf
L21
L22
L23
L24
L25
1/2 V1
6EA8
C85
1000pf
R44
3.3K
R43
68K
C86
1000pf
R42
10K
2 W
L20
C84
1000pf
R100
10K
2W
V2
12BY7A
C97
1000pf
R40
22K
C87
390pf
R39
100
C88
1000pf
R38
22K
R41
22K
J2
KEY
C89
1000
pf
C90
1000
pf
R37
1.5K
C91
1000pf
V3
6360
C112
R36
150
L26
8.2
C92
1000pf
C113
5-60
pf
M1
R101
5K
R102
"S" METER
R35
1.5K
C116
50pf
CR4
L28
L29
J4
ANT.
L27
C121
120pf
L30
C119
3-12pf
C117
20pf
C118
20pf
C120
3-12pf
J5
(AUX. ANT.)
B+
12V FILTERED
T/R CONTROL
12 V.
K1
(PART OF)
C83
1000pf
C98
4.7K
C107
C129
27pf
J11
L17
12BY7A
6EA8
6360
C93
1000pf
C94
1000
pf
C95
1000
pf
C96
1000pf
C114
390pf
C115
390pf
#755
DIAL LAMP
(PART OF A.F. GAIN)
(PART OF R.F. GAIN)
FIL'S
POWER
BIAS
SCREEN
12V. FILT.
B+
12V.
T/R CONT
SPKR
22 V
TO
T5-VIOLET
J3
POWER
CONNECTOR
NOTES (EXCEPT AS NOTED)
(1) INDUCTANCE OF GROUND SHIELD.
(2) NOT PRESENT IN ALL UNITS.
(3) VALUE SELECTED IN PRODUCTION.
4. ALL RESISTORS IN OHMS, CAPACITORS IN MICROFARADS, INDUCTANCES IN MICROHENRIES.
5. ALL DIODES 1N34A.
DRN BY
BUD NEWMAN
CHK BY
PROJ ENG
FINAL APR
SCHEMATIC
SIX METER SSB
SIDEWINDER
GONSET
510-135


PRODUCT DETECTOR
REC. 9 Mc. I.F. AMP.
T3
CR1
C18 0.1
C17 .01
R22 100K
Q6 GC 814A
Q7 GC 814A
C19 15
R23 2.7K
C21 15
R25 10K
Q9 GC 815
C16 50pf
R20 33K
R21 82K
CR2
C42 15
R19 470
C15 .01
R24 2.7K
C20 15
C131 .01
R26 3.3K
R27 270
C22 100
C128 .01
CR 3
C123 510pf
R52 33K
Q8 GA 2319
R49 22
T8
C44 50pf
C46 6.2pf
T6
T7
C43 39pf
C45 27pf
Q12 GC 813
Q13 GC 814A
R51 3.9K
C48 .005
C47 .005
C49 .005
R53 2.7K
R54 470
R50 470
C137 .01
R69 470
Q16 GA 2319
CR7 1N765A
L18
R99 22K
L19 1.8
C108 68pf
1/2 V1 6EA8
R48 68K
C84 1000
R100 10K 2W
J19
12 V.
10 V. REGULATED
12 V. FILTERED
T/R CONTROL
J9
J12 (TEST PT.)
J10
J8
C78 1000pf
C79 1000 pf
C80 1000 pf
C81 1000pf
C82 1000 pf
C83 1000pf
(PART OF) K1
R82 22K
CW
R83 5K
R84 1.5K
L12
C60 10pf
C63 47pf
C64 47pf
R86 10K
R88 200
Q18 TI 391
R89 270
R87 2.2K
L13 1.8
R85 330
Y5
Y4
Y3
Y2
C100 390pf
L14
C66 10pf
R90 1.5K
C101 390pf
Q20 TI391
R41 4.7K
C102 390 pf
L15
C103 27pf
R94 2.7K
R92 15K
C104 2.7pf
R95 2K
C105 20pf
L16
R96 1.5K
R97 3.9K
R98 2.7K
C106 390 pf
Q21 TI 391
C107 390pf
L17