GONSET

INSTRUCTION MANUAL

GONSET SIDEWINDER
MODEL 900A

POWER SUPPLY
MODEL 901A — AC
MODEL 902A — DC

GONSET,® INC.
A SUBSIDIARY OF ALTEC LANSING CORPORATION
1515 S. MANCHESTER AVE., ANAHEIM, CALIF.

520-765

WARRANTY POLICY

Gonset, Inc., warrants this equipment, when properly registered, against defects in workmanship, materials, and construction under normal use and service -- in accordance with the warranty card furnished. Under this warranty, our obligation is limited to repairing or replacing any defective parts.

This warranty is valid only when the enclosed card is properly filled in and returned within ten (10) days from purchase date. This warranty shall not apply to any equipment which has been tampered with in any way, or which has been misused or damaged by accident or negligence, or which has had the serial number removed, altered, or effaced.

Gonset, Inc., reserves the right to discontinue or change, at any time, specifications, design, or prices without notice and without incurring obligations.

DO NOT SEND EQUIPMENT TO THE FACTORY WITHOUT FIRST SECURING AUTHORIZATION TO DO SO; EQUIPMENT SHOULD BE SENT ONLY TO AUTHORIZED REPAIR STATIONS, UNLESS OTHERWISE DIRECTED. THIS WARRANTY DOES NOT INCLUDE TRANSPORTATION COSTS TO AND FROM THE FACTORY.

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INTRODUCTION

The Sidewinder transceiver provides SSB, AM, and CW operation in the 144 to 148 MC range. (2 meter band) It is designed with solid-state circuitry except for the transmit mixer, driver, and final amplifier tubes. A switch on the front panel controls the filaments of these tubes eliminating much of the power drain when the unit is operating in the receive mode.

The Sidewinder consists of a double conversion receiver and a double conversion exciter-transmitter with an input of 20 watts PEP. The receive and transmit circuits use common oscillators, crystal lattice filter, and IF circuits. The high frequency oscillator is crystal controlled by one of four crystals selected by the Frequency Sector knob on the front panel: each crystal spanning a 1 MC segment of the 2 meter band. With band-pass IF's and a crystal lattice filter, the Sidewinder achieves a -50 db image rejection figure and extremely narrow selectivity.

The receiver has a sensitivity of 0.5 microvolts for 10 db S+N/N, and spurious suppression of -50 db or better. The carrier injection oscillator is crystal controlled to insure the frequency stability needed for single-sideband operation. The receiver uses separate detectors for AM and SSB. The audio portion uses a Class B amplifier to deliver 3.0 watts to the speaker.

Two power supplies are available for the Sidewinder, the Model 901A for AC operation, and the Model 902A for DC operation. Both these models contain solid-state silicon rectifiers for lower voltage drop, reduced heat, and longer life. The supplies also contain the speaker and the high voltage control relay, which turns off the high voltage power supply except during transmit. Housed in all-steel containers, these supplies can be clamped to the back of the Sidewinder, providing a solid unit suitable for fixed or mobile operation, or installed in a remote location if space is a problem.

PERFORMANCE SPECIFICATIONS

TRANSMITTER:	
Frequency Range:	144 to 148 MC
Frequency Control:	HF Conversion - Crystal Controlled
Nominal Frequency Stability: (after 15 minute warm-up)	Ambient: -50 cycles per 15 minute period. (Ambient with transmit filaments on causing chassis heat rise.) Temperature Coefficient: -300 cycles for 10° change.
Type of Final:	Link Coupled
Emission:	AM, SSB, and CW
Power Input To Final Amp:	SSB - 20 Watts PEP AM - 6 Watts
Spurious Suppression:	-50 db
Unwanted Sideband Suppression:	40 db SSB
Carrier Suppression:	-50 db
Audio Response:	300 to 3000 cycles
Output Impedance:	50 ohms
Power Consumption:	12.6 volts @ 8.0 amps. max. 100 watts @ 117 VAC

RECEIVER:	
Frequency Range:	144 to 148 MC
Types of Reception:	AM, SSB, and CW
Nominal Frequency Stability: (after 15 minute warm-up)	Ambient: -50 cycles per 15 minute period. (Ambient with transmit filaments on causing chassis heat rise.) Temperature Coefficient: -300 cycles for 10° change.
Sensitivity:	0.5 microvolt for 10 db $\frac{S+N}{N}$
IF Frequencies:	First IF - 15 MC Sec. IF - 9 MC
Spurious Rejection:	-50 db
Image Rejection:	-50 db
Audio Output:	3 watts into a 4 ohm load
Antenna Input Impedance:	50 ohms unbalanced

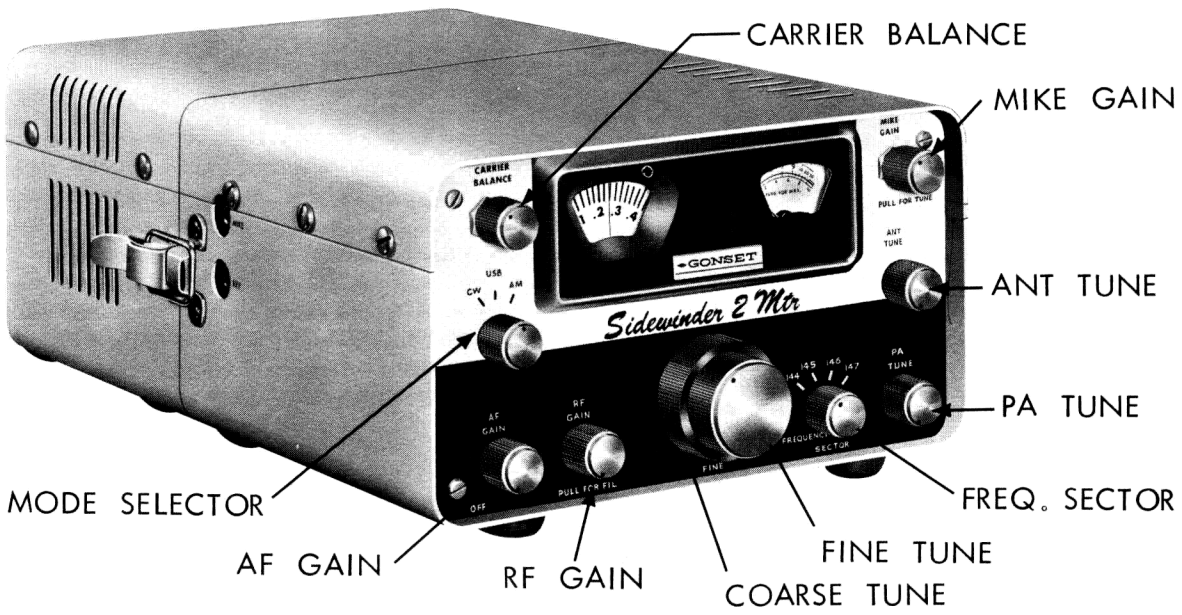


Fig. 1

CONTROLS & FUNCTIONS:

Control Name	Function
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: This switch will illuminate the frequency dial and the 'S' meter only if the RF Gain knob is pulled out.
CW-USB-AM	The CW-USB-AM knob controls a 3-position switch which selects the mode of operation for both transmit and receive.
144-145-146-147	The frequency selector switch divides the 2 meter band into four sectors, each of which is one megacycle wide.
RF GAIN	The RF Gain knob is a dual function control. Pulling out the knob turns on the dial light and filament power to the transmitter mixer, driver, and final amplifier. Pushing in this knob turns off the filaments and the dial light, thereby conserving power. Rotating the knob clock-wise increases the RF Gain; conversely, rotating the knob counter-clock-wise attenuates RF Gain.
Frequency	The large knob is the coarse tuning control; the smaller knob is the fine tuning control.
PA TUNE	The PA Tune knob is used only during transmit and tunes the transmitter final amplifier.
ANT TUNE	The Ant Tune knob is used only during transmit and tunes the antenna for the most effective impedance match between transmitter tank and antenna.
Carrier Balance	The Carrier Balance knob controls the null point in the balanced modulator for 'USB' operation during transmit.
Mike Gain	The Mike Gain knob is a dual function control. Rotating the knob clock-wise increases the microphone input to the speech amplifier; pulling out the knob disables 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.

INSTALLATION

GENERAL

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 unit is very low due to the transistor circuits used. The only requirement is that the ventilation holes on the side and top are not blocked.

The antenna connection, J4, is located at the rear of the unit. It is designed for use with a 50 or 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 use 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 press-to-talk 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 feed-back.

MOBILE INSTALLATION

Before installing, 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 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 lights for a few minutes, then speed up engine to full generator output. Voltage at battery terminals should remain between 14 and 14.5 volts. If not, have the regulator adjusted or replaced.

MOBILE NOISE SUPPRESSION

Equipment operating in the range of this unit is highly vulnerable to interference caused by such things as ignition sparks, generator noise, static discharge from wheels and 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 following chart has been compiled:

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 0.25 to 0.5 mfd capacitor at the generator in series with the armature lead. B. Install a hand wound choke in series with the generator field.
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.

Fig. 2, MOBILE NOISE SUPPRESSION CHART

POWER CONNECTIONS

In the event that a power supply other than the Gonset Model 901A or Model 902A is used, extreme caution is recommended, as any damage caused by incorrect connections to, or voltages from, power supplies other than Gonset units will not be covered by the warranty. The user should be familiar with the technicalities involved before using another supply.

Figure 3 illustrates the plug on the rear of the Sidewinder. (J2)

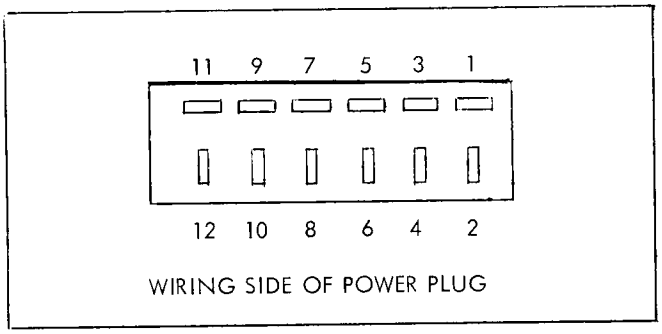


Fig. 3, POWER PLUG, J2

PIN CONNECTIONS ON J2

1. 12 V
2. 12 V, Filtered
3. Bias Voltage
4. Filament Voltage
5. Screen Voltage
6. B+ Voltage
7. Speaker
8. T/R Relay
9. Power On-Off
10. Power On-Off
11. Ground
12. Spare

ANTENNA

The most important consideration of good mobile operation is; Proper installation and tuning of the antenna. For maximum signal, the antenna should be as long as possible, with a low-loss high-Q loading coil, mounted fairly high on the car body, and carefully tuned to exact resonance. The addition of a matching network at the feedpoint is of some help, and at times is necessary 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 less than 2:1. The various antenna manufacturers include installation and tuning procedures with their antennas.

The two-meter quarter wave whip installed in the center of the roof or trunk of the automobile, proves most satisfactory for mobile use. The coaxial and the horizontal polarized halo antenna have also been used successfully.

For those who will use the Gonset Sidewinder for portable operation on field days and transmitter hunts, the Gonset 621-018 telescoping antenna is available at a modest cost.

For fixed station operation various antenna will perform satisfactorily; however, the beam antenna is perhaps the most desirable.

It is suggested that the antenna handbook published by the ARRL be consulted in determining the type of antenna which will afford the user the optimum efficiency for his particular application.

OPERATING INSTRUCTIONS

RECEIVE:

1: CAUTION: Make sure the Mike Gain knob is pushed in; this will prevent any accidental transmission.

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

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

3: Rotate the mode switch to desired operation: CW, USB, or AM.

4: Set the Frequency Range Selector to the desired sector of the band to be monitored:

144 to 145 megacycles
145 to 146 megacycles
146 to 147 megacycles
147 to 148 megacycles

5: Rotate the RF Gain control clock-wise 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 sector of the desired band. The frequency dial is divided into ten equal parts which span the sector selected. Each of these ten equal parts is divided into four parts, each 25 kc wide. When the desired station is found, use the fine tune knob for closer adjustment. In the USB mode, use fine tune for 'naturalness' of voice.

NOTE: During the first few minutes of operation, it may be necessary to retouch the fine tuning knob in order to 'track' the received station due to circuit warm-up.

7: If the station is strong, rotate the RF Gain control counter-clockwise for best listening level. If the station is weak, rotate the RF Gain control clock-wise to the point where the station is loudest with the least interference, then adjust the AF Gain control for the desired listening level.

OPERATING INSTRUCTIONS

TRANSMIT:

1: CAUTION: Do not pull out the Mike Gain knob or press the microphone press-to-talk switch until the proper operating frequency has been selected.

2: Rotate the AF Gain knob clock-wise to turn on the unit.

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

4: Select the proper operating frequency in the following manner: Determine the sector in which you wish to operate: 144 to 145 megacycles; 145 to 146 megacycles; 146 to 147 megacycles or 147 to 148 megacycles. Now set to the desired frequency with the coarse tune, using the frequency dial. The frequency dial is divided into ten equal parts which span the sector selected. Each of these ten equal parts is further divided into four parts, each 25 kc wide. If you selected 146.725 megacycles on which to transmit, you would first set the Frequency Range Selector switch to 146, then turn the coarse tune knob to .725. You are now on the selected frequency and ready to tune-up the transmitter.

5: To tune-up the transmitter for any mode of operation, use the following steps:

CAUTION: This final amplifier tune-up procedure should be done rapidly; prolonged off resonance operation could result in damage to the transmitter final amplifier.

A: Turn the mode selector knob to 'CW'.
B: Pull out Mike Gain knob which will automatically transmit the carrier.
C: Using the PA Tune knob, tune the RF meter for maximum deflection.
D: Use the Ant Tune knob to increase the RF meter deflection.

NOTE: The Ant Tune control is normally very broad, and when the Sidewinder is connected to a properly matched load the resonate point will be found when the dot on this control is somewhere between 11 and 3 o'clock. Critical tuning, great inter-action with the PA Tune control, or, failure of this control to tune-up properly, are all indications of a seriously mis-matched antenna system and should be corrected if the Sidewinder is to be operated 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 a convenient reading on the meter, and then tune-up as usual.

E: Repeat 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 adjustable.

G: You are now ready to select a specific mode of operation as per step 6, 7, or 8; for 'CW', 'USB', or 'AM', respectively.

6: To operate in the 'CW' mode, complete step 5, then:
A: Plug in key, (lower jack on left side, rear).
B: Pull out Mike Gain knob and use key.
C: Push in Mike Gain knob to receive.

7: To operate in the 'USB' mode, finish step 5, then adjust the Carrier Balance control using this procedure:

NOTE: For this adjustment, do not press the microphone press-to-talk switch. The correct setting for the Carrier Balance control must be obtained with no audio present. Pressing the microphone switch will allow the microphone to pick up any audio or background noise.

A: Turn mode selector knob to 'USB'.
B: Pull out 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 increases, allow it to go through the null and bring it up until it indicates the lowest division on the scale. Using the slot on the knob for reference, note it's postion 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 back to the same scale division used previously. Again using the slot on the knob for reference, note it's angular relation to the first position when the meter was on 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.

D: Now rotate the Mike Gain knob while speaking into the microphone until an RF meter reading of 1/3 to 1/2 scale is obtained.

8: To operate in the 'AM' mode, complete step 5 and then follow this procedure:
A: Turn mode selector knob to 'AM'.
B: Make sure the Mike Gain knob is pushed in.
C: Set the carrier by adjusting the Carrier Balance control until the output meter reads '3' on the 0 to 10 scale.
D: Press the microphone press-to-talk switch and speak into the microphone.
E: While speaking into the microphone, rotate the Mike Gain knob until the RF meter just 'kicks' positive.

NOTE: In multiple conversion receivers, "birdies", (internally generated signals), are likely to be encountered. The receive portion of the Sidewinder is free of "birdies", which can be demonstrated by operating the Sidewinder without an antenna. In the transmit mode, one "birdie" does exist, at exactly '0.5' on the dial. When you are transmitting at this dial position, a nearby receiver may notice a weak audio tone on your carrier. This tone is 20 to 25 db down, and if objectionable, may be eliminated by re-tuning 3 or 4 KC in either direction.

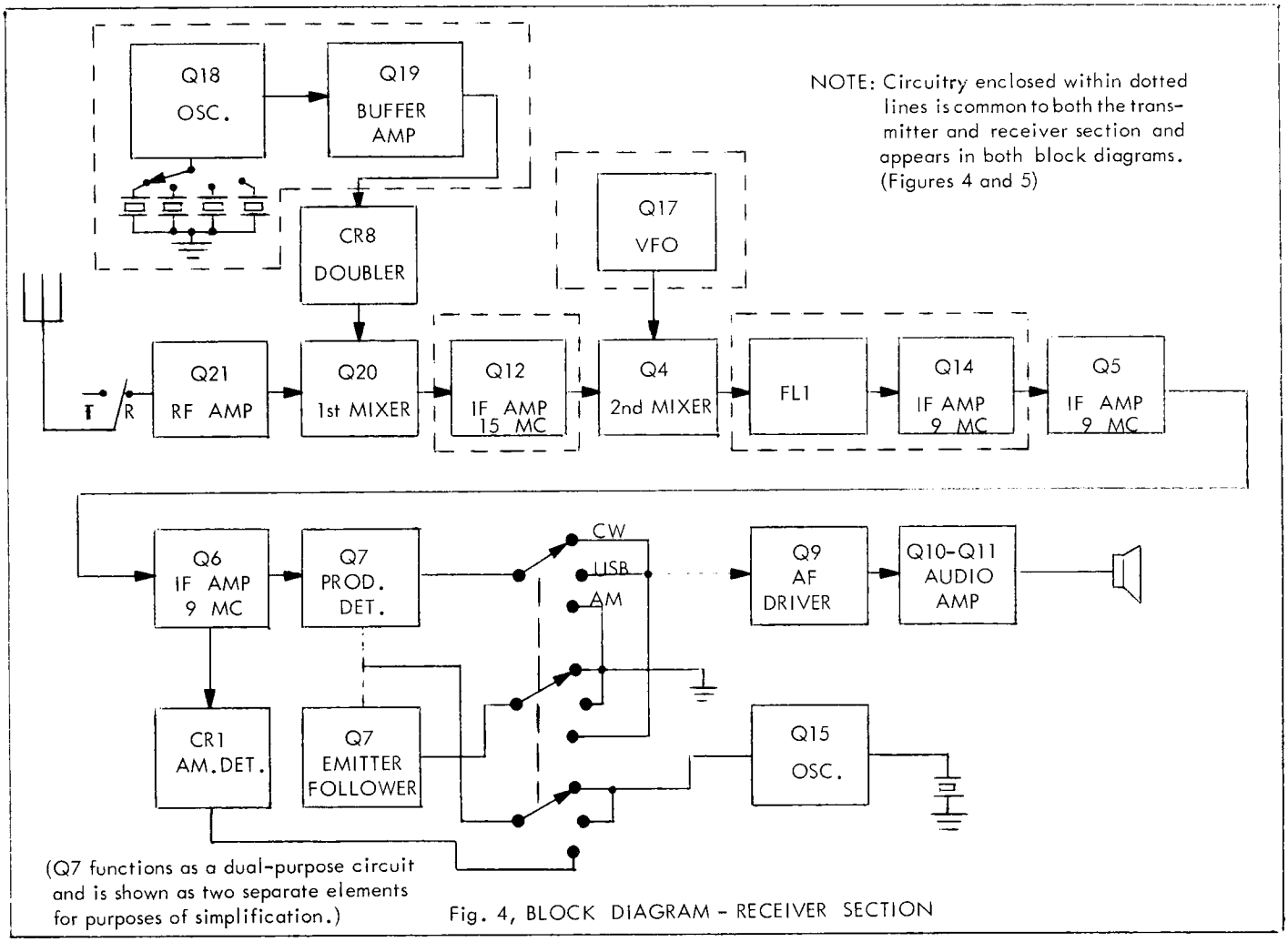


Fig. 4, BLOCK DIAGRAM - RECEIVER SECTION

THEORY OF OPERATION

RECEIVE:

The receive portion of the SIDEWINDER TRANSCEIVER is an all solid-state, dual conversion, superheterodyne unit, employing the latest development in transistors and utilizing special design emphasis on circuit reliability.

Referring to Figure 4, it will be noted that the signal from the antenna is fed into the RF amplifier by the operation of T/R relay K1. A tuned circuit ahead of the RF amplifier, Q21, provides an impedance match to the amplifier from the antenna, in addition to attenuating the noise and other signals outside the 2 meter band. The RF amplifier, Q21, couples a high frequency local oscillator signal to cause the first conversion. The high frequency injection signal to the first mixer, Q20, originates in the crystal oscillator, Q18. This oscillator provides a signal at half the frequency needed for injection. The signal is fed to the buffer amplifier, Q19, which provides isolation and amplification of the injection signal. The amplified local oscillator signal is then fed into a diode, CR8, which doubles the frequency and feeds this injection frequency into the first mixer, Q20. The first mixer, heterodyning the RF signal and the injection frequency, produces a nominal 15 megacycles for the input to the first IF amplifier, Q12. This amplifier is double-tuned at both the input and output, amplifying any frequency between 14.5 and 15.5 megacycles, and feeds it to the second mixer, Q4. The other input to this mixer is from the VFO, Q17, a manually tuned oscillator, controlled by the frequency tuning dial. The product of the second mixer, at approximately 9 megacycles, is coupled to the crystal lattice filter, FL1, which has just sufficient band-pass to accept one inherently narrow band signal. This signal is fed into the 9 megacycle amplifiers, Q14, Q5, and Q6, and then to the detectors, CR1 ('AM') and Q7 ('USB'and 'CW' mode).

In the 'USB' and 'CW' mode, the narrow band 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 is controlled by the AF Gain control and fed into the audio driver, Q9. This driver feeds a Class B audio amplifier, consisting of transistors Q10 and Q11, which drives the speaker.

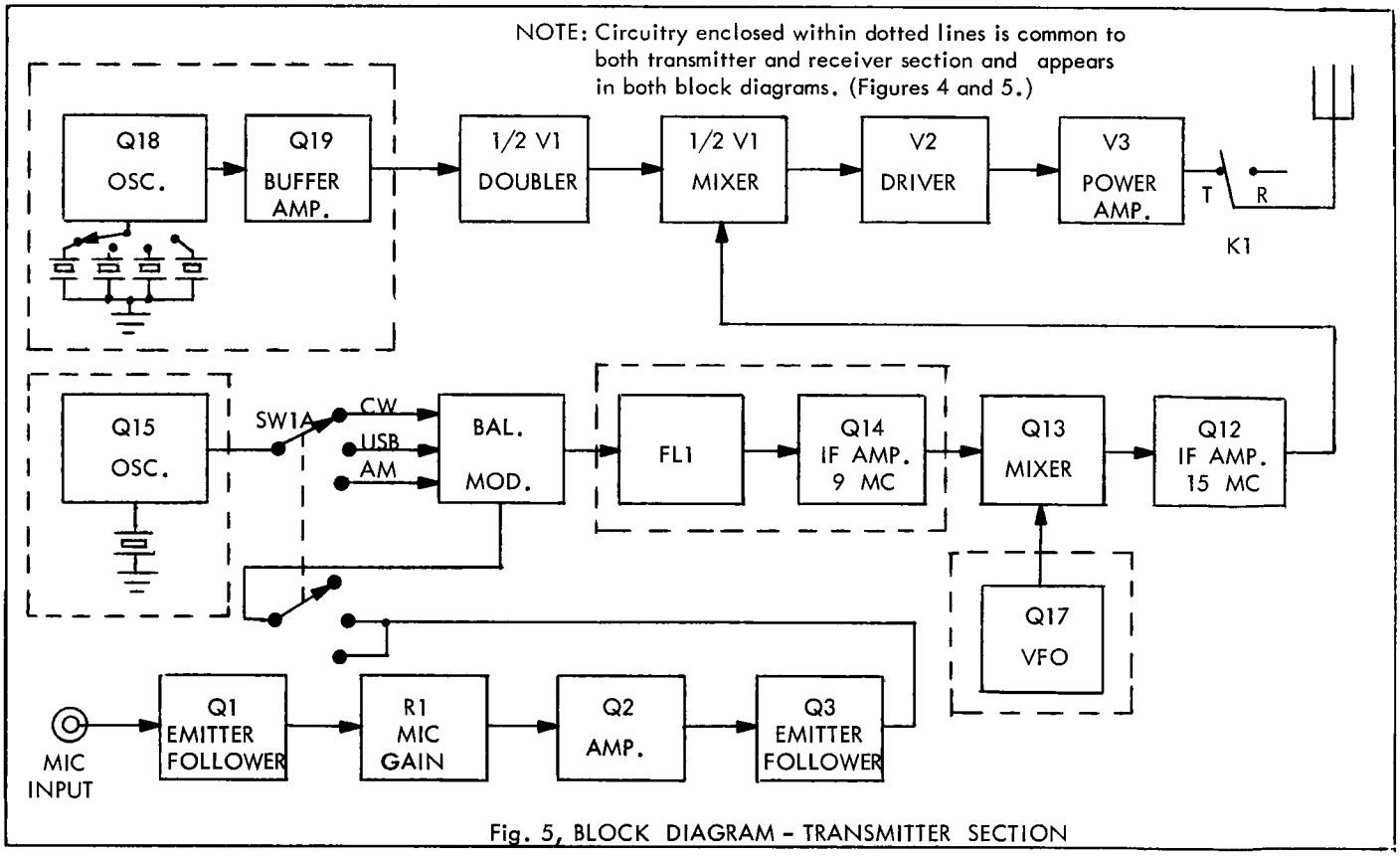


Fig. 5, BLOCK DIAGRAM - TRANSMITTER SECTION

THEORY OF OPERATION

TRANSMIT:

The transmitter portion of the SIDEWINDER TRANSCEIVER utilizes dual conversion, crystal lattice filter, and the latest solid-state circuitry where design permits. Only the mixer, driver, and the final amplifier are vacuum tube ---- allowing a great saving in power and space.

The block diagram of the SIDEWINDER transmit portion for the following circuit description may be found by referring to Figure 5.

The basic carrier signal originates in the crystal controlled oscillator, Q15, and is fed to the modulator by way of the mode selector switch. If 'CW' operation is selected, the modulator couples the basic carrier signal to the crystal lattice filter, FL1. If 'AM' or 'USB' operation is selected, audio is combined with the carrier in the modulator.

The audio input to the modulator for 'AM' and 'USB' operation comes from the speech amplifier, consisting of transistors Q1, Q2, and Q3. A high impedance microphone should be used with this amplifier, as the first transistor (Q1) is an emitter follower with a high input impedance. This emitter follower feeds the audio signal through the Mike Gain TR control to amplifier Q2, which drives emitter follower, Q3.

For 'USB' operation, the output to the speech amplifier is combined with the basic carrier signal in the modulator which will operate balanced so as to cancel out the carrier, leaving the audio as side-bands. The unwanted lower side-band is suppressed in the crystal lattice Filter, FL1, and the desired upper side-band is fed into the first IF, Q14.

When the 'AM' mode of operation has been selected, the audio from the speech amplifier and the basic carrier signal are combined in the modulator which will operate in an unbalanced condition and produce a conventional AM signal. This signal is then fed into the crystal lattice filter, FL1.

The narrow band signal from FL1 is amplified at the first 9 megacycle IF amplifier, Q14, and is mixed with the VFO signal at the first mixer, Q13. The VFO signal originates in the manually tuned oscillator, Q17, and is variable over a range of 5.5 to 6.5 megacycles, controlled by the frequency tuning dial. The output of the first mixer, Q13, is fed through a double-tuned circuit adjusted to accept a frequency range of 14.5 to 15.5 megacycles, and is fed into the second IF amplifier, Q12. This double-tuned amplifier is coupled into the second mixer, which is one-half of V1, and is combined with the signal from the local oscillator. This oscillator, Q18, feeds into the buffer amplifier, Q19, and the frequency is doubled in the other half of V1. The output of V1 provides the high frequency signal to the second mixer. The product of the second mixer, now within the 2 meter band, is coupled into the band-pass driver stage, V2, which is tuned to accept signals only in the 144 to 148 megacycle range. Grid block keying is provided for in the cathode of this stage during 'CW' operation. The output of driver V2 is inductively coupled through tuned circuits to the final power amplifier, V3. This amplifier is push-pull, with 20 watts PEP (peak envelope power) input and is inductively coupled to the antenna with adjustable tuning and loading circuits.

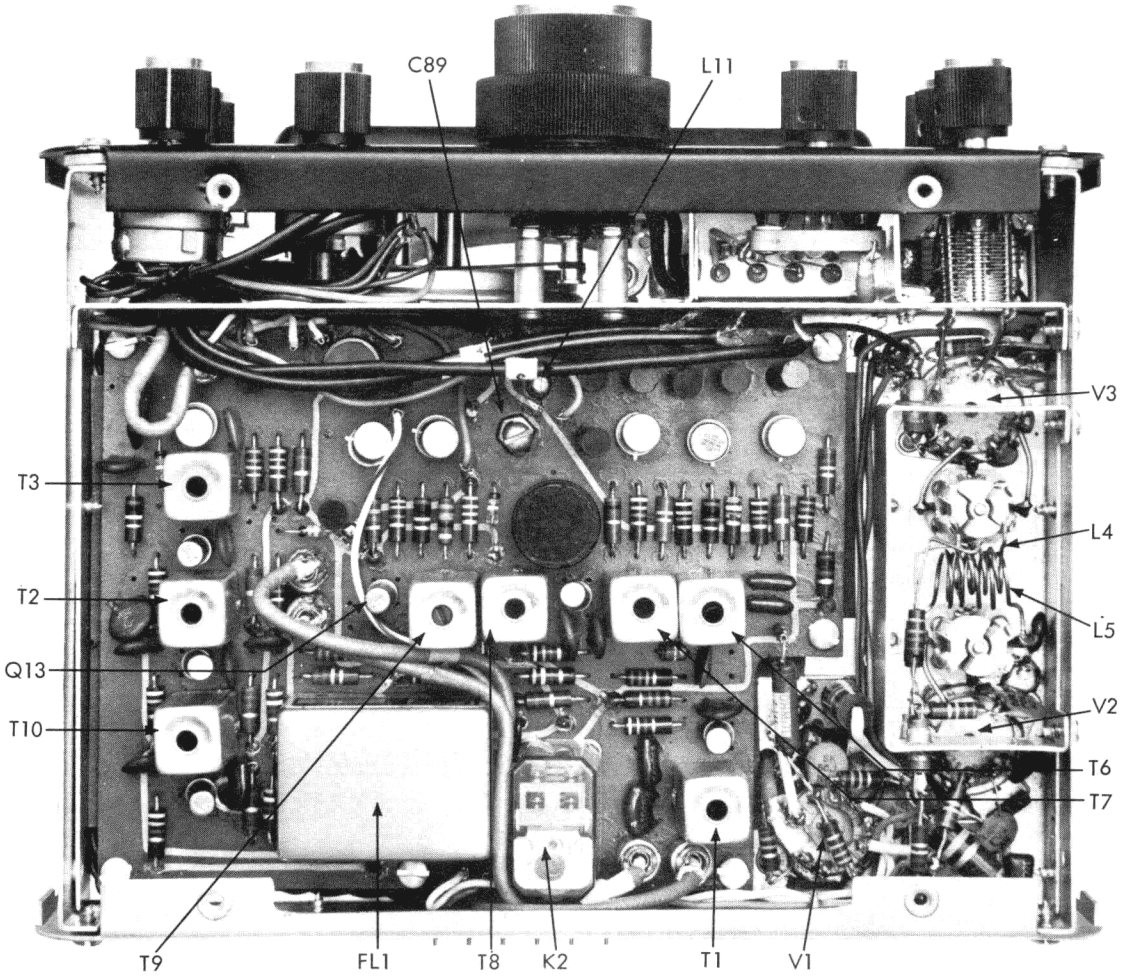


Fig. 6, BOTTOM VIEW

ALIGNMENT INSTRUCTIONS

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 that is necessary for a given situation, as only a major component failure, (IF transformers, RF coils, crystals, etc.), will cause serious misalignment of any circuit. Complete re-alignment 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 L11, and the high end with C89, see Fig. 6. 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', ±1/2 scale division each time.

NOTE: It may be necessary to repeat the L11 and C89 adjustments several times before the VFO will track properly.

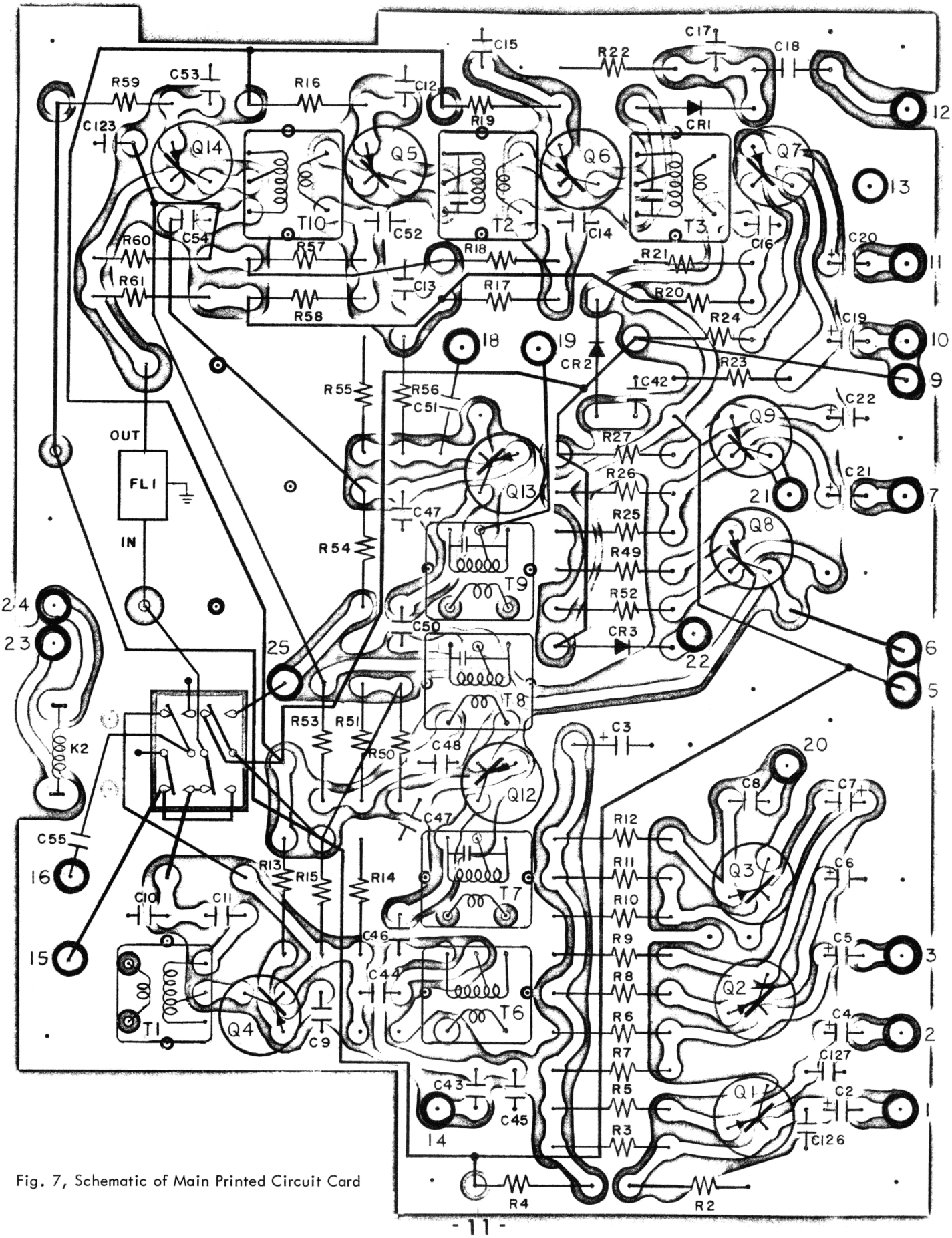


Fig. 7, Schematic of Main Printed Circuit Card

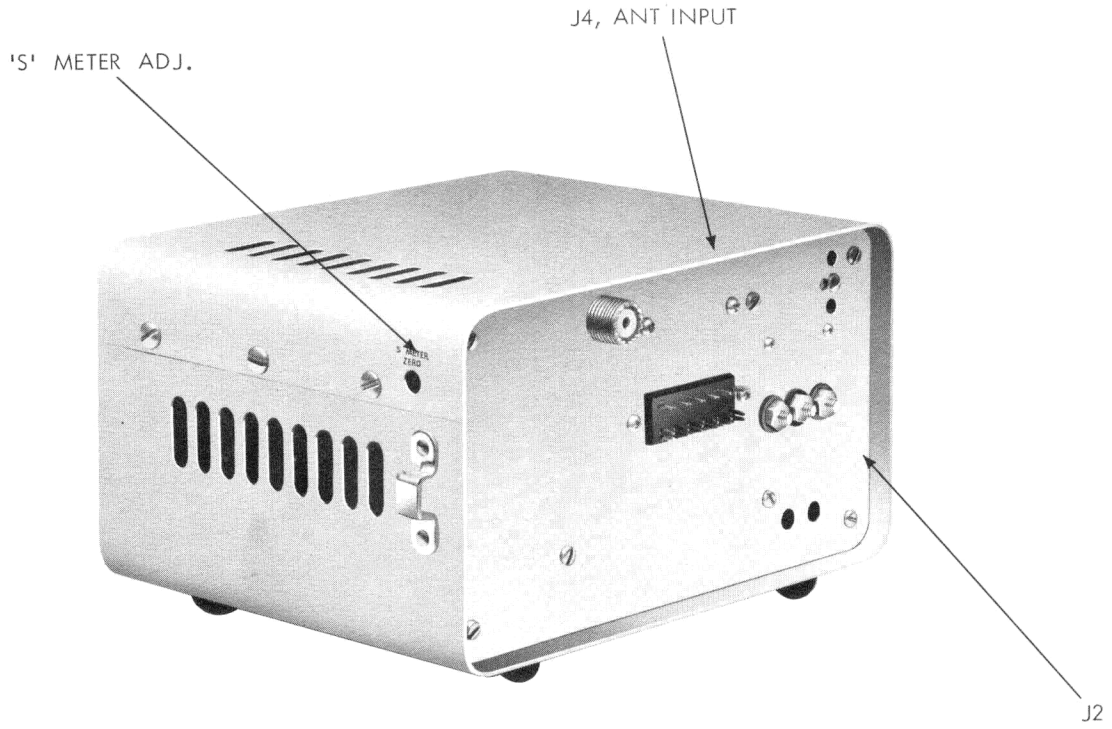


Fig. 8, REAR VIEW

C. 9 MC IF ALIGNMENT

Before starting this alignment procedure make sure that the 'S' meter is zeroed. See Fig. 8. To check the 'S' meter, disconnect the antenna, turn the RF GAIN knob fully clock-wise and adjust the 'S' meter with the adjustment located on the right side near the top of the case. Allow the unit to warm-up for about five minutes before making this adjustment.

Operate the Sidewinder in the "AM" receive mode, with the RF GAIN knob fully clock-wise. 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 pass-band. Align T1, T10, T2, and T3, see Fig. 6, 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 is properly aligned, 10 to 20 micro-volts of generator output should produce 5 volts peak-to-peak of audio across the speaker terminals, if the AF GAIN knob is fully clock-wise.

D. 15 MC IF ALIGNMENT

Connect a sweep generator, set to 15 MC, to J18 on the main printed circuit card, see Fig. 6. Couple an oscilloscope with a demodulator probe, such as the RCA WG-291, to pin 2 of V1, with a 2 or 3 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-up the Sidewinder as follows:

RF GAIN ..... pushed in (filaments off)
CW-USB-AM .... AM mode
MIKE GAIN TR .. pulled out
AF GAIN ..... turned on

Align 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.

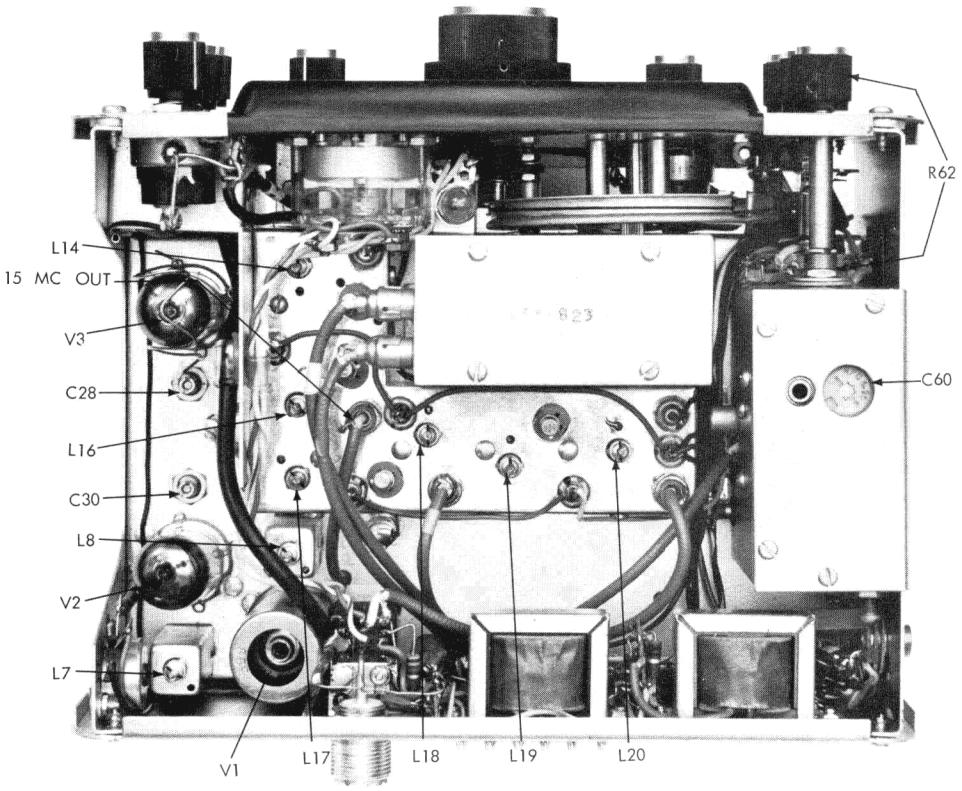


Fig. 9, TOP VIEW

E. 65 MC OSCILLATOR AND BUFFER ADJUSTMENT

NOTE: There are two methods of adjusting the 65 MC oscillator, the preferred method is outlined first.

Connect a Frequency Meter or Counter to pin 9 of V1, see Fig. 6, and operate the Sidewinder in the "AM" receive mode. Monitor the crystal frequency while adjusting L14, see Fig. 9. First turn the L14 slug clock-wise until it is nearly at the end of it's range, and then slowly bring it back. As the slug is returned counter-clock-wise the frequency will increase until point is reached where the frequency is stable, that is, the tuning slug can be rotated several turns with only a slight frequency change. This is the area of stable operation and is the proper setting for L14. If L14 is turned counter-clock-wise beyond the stable area, the crystal will cease to oscillate entirely.

Turn to each crystal in turn using the Frequency Sector knob and check the frequency of each crystal. The correct frequencies are given below:

Frequency Sector knob - 144 = 64.75 MC
Frequency Sector knob - 145 = 65.25 MC
Frequency Sector knob - 146 = 65.75 MC
Frequency Sector knob - 147 = 66.25 MC

NOTE: The tolerances on all frequencies is ± 10 KC.

It should be possible to find a setting of L14 which places all four crystals in the stable area with only a slight frequency change.

An alternate method is to connect a signal generator into the antenna with a one-turn gimmick, or tune the receiver to a received signal of known stability.

First turn L14 clock-wise until it is nearly to the end of it's range, and then slowly bring it back. As L14 is adjusted it will be necessary to reset the receiver main tuning dial to keep the signal tuned in. A stable area will be found where changing L14 will not require any resetting of the main tuning dial. It should be possible to find a setting of L14 which places all four crystals in the stable area. This can be checked by making the above adjustment in all four crystal positions, using four different test signals.

The buffer amplifier is adjusted by coupling an RF VTVM through a one-turn gimmick to pin 9 of V1, switching the Frequency Sector knob to either 145 or 146, and then adjusting L16 for a maximum output. All four crystal positions should now show equal outputs within ± 10%.

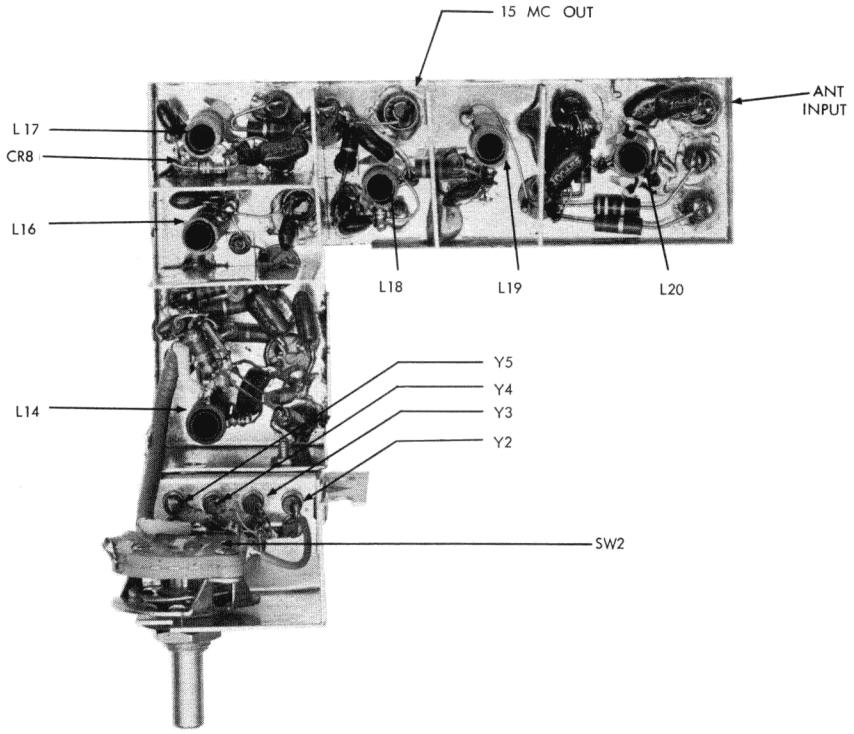


Fig. 10, RF MODULE

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 J4 to ground. See Fig. 6. Inject a low level signal, swept at 144 MC, into the antenna jack from a generator of known accuracy. Use an external signal generator to supply markers at 141, 146, and 148 MC. This generator may be adjusted to each frequency as required.

Adjust L18 and L19 to obtain a response from 144 to 148 MC that is flat within 3 to 4 db. L17 and L20 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 re-adjustment of L17 and L20 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 Fig. 4, and connect an RF VTVM across the plug, and then tune T11, see Fig. 9, for a maximum output.

Switch the Sidewinder to "USB" and adjust the CARRIER BALANCE control, R62, and the trimmer capacitor, C60, 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.

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 Fig. 6. Connect an RF VTVM to the emitter of Q13, and adjust C66, see Fig. 6, 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.

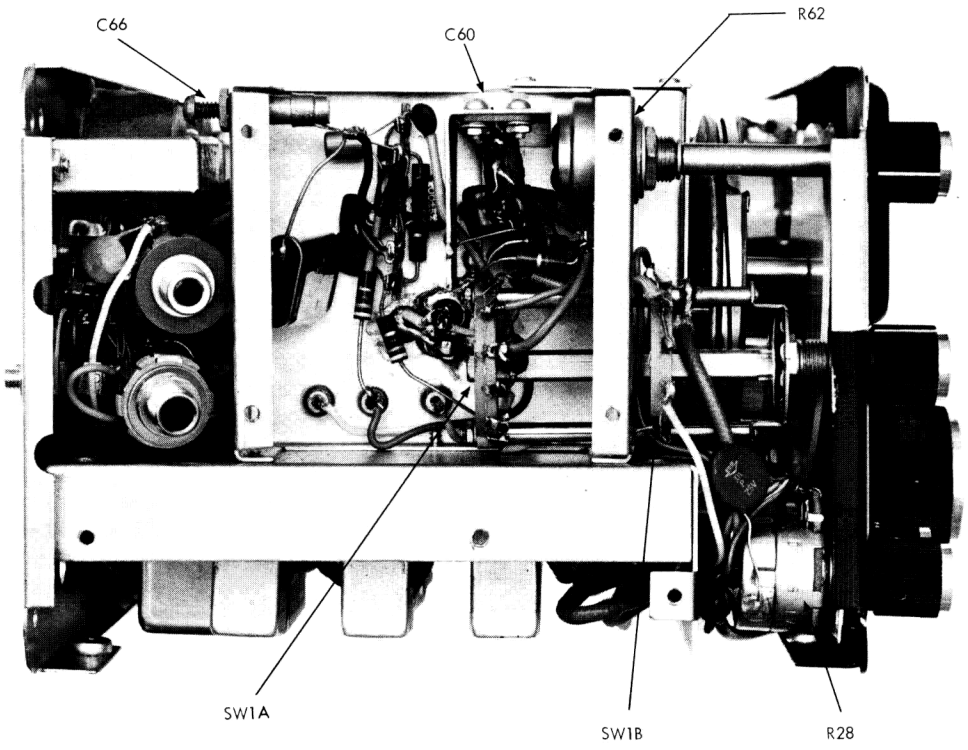


Fig. 11, SIDE VIEW

I. TRANSMIT DRIVER INTERSTAGE ALIGNMENT

Make sure the power is off. Disconnect C36 from pin 2 of V2, see Fig. 6, and couple a sweep generator to this pin with a properly terminated cable. Use a 0.1 mfd capacitor between the cable and the tube to avoid shorting out the bias in the Sidewinder. Set the sweep generator to a center frequency of 146 MC. Couple an oscilloscope with a demodulator probe, such as a RCA WG-291, to pin 3 of V3 with a one-turn gimmick. Set C28 and C30 to half-mesh, and set C25 fully open.

Set-up the Sidewinder as follows:

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

Adjust C30 and C28 for a maximum output, consistent with 4 db maximum peak-to-valley difference, in the range of 144 to 148 MC. Adjust the coupling between L4 and L5 to control bandwidth. Pushing L4 and L5 into closer mesh will make the bandwidth narrower, and reducing the mesh will increase the bandwidth. It will be noted that C30 has the effect of moving the entire pass-band without greatly changing it's shape, while C28 has more effect on the relative amplitude of the two ends of the pass-band.

Return the circuitry to normal when the alignment is completed.

J. TRANSMIT DOUBLER AND DRIVER GRID ALIGNMENT

Set-up the Sidewinder to transmit at 146 MC. Monitor the output with the Sidewinder's own output meter and adjust L7 and L8 for maximum meter deflection. See Fig. 9.

K. 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 two-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 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 C66 clock-wise 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 - MODEL 900A

SCHEMATIC SYMBOL	DESCRIPTION	GONSET PART NO.
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, 300 V	376-103Z
C10	Capacitor, 510 pf, 5%, DM15	433-511J
C11	Capacitor, 160 pf, 5%, DM15	433-161J
C12	Capacitor, .01 mfd, 300 V, disc	376-103Z
C13	Capacitor, .01 mfd, 300 V, disc	376-103Z
C14	Capacitor, .01 mfd, 300 V, disc	376-103Z
C15	Capacitor, .01 mfd, 300 V, disc	376-103Z
C16	Capacitor, 50 pf, disc ceramic	401-500J
C17	Capacitor, .01 mfd, 300 V	376-103Z
C18	Capacitor, .1 mfd disc ceramic	381-104
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, 50 pf, disc ceramic	401-500J
C24	Capacitor, 3.3 - 24.3 pf	074-117
C25	Capacitor, 2.4 - 10.8 pf	075-020
C26	Capacitor, Feed-thru, 1000 pf	077-021
C27	Capacitor, 50 pf, disc ceramic	401-500J
C28	Capacitor, 2.4 - 10.8 pf	075-020
C29	Capacitor, Feed-thru, 1000 pf	077-021
C30	Capacitor, 2.4 - 10.8 pf	075-020
C31	Capacitor, 50 pf, disc ceramic	401-500J
C32	Capacitor, 100 pf, DM15	433-101J
C34	Capacitor, Feed-thru, 1000 pf	077-021
C35	Capacitor, 5 pf, DM15	433-509K
C36	Capacitor, 50 pf, disc ceramic	401-500J
C37	Capacitor, 100 pf, DM15	433-101J
C38	Capacitor, 50 pf, disc ceramic	401-500J
C39	Capacitor, 100 pf, DM15	433-101J
C40	Capacitor, 50 pf, disc ceramic	401-500J
C41	Not Required	
C42	Capacitor, 15 mfd, 15 V	422-150Z
C43	Capacitor, 39 pf, Silver Mica	433-390G
C44	Capacitor, 50 pf, disc ceramic	401-500J
C45	Capacitor, 27 pf, DM15	433-270J
C46	Capacitor, 6.2 pf, comp.	361-629J
C47	Capacitor, .005 mfd	373-502Z
C48	Capacitor, .005 mfd	373-502Z
C49	Capacitor, .005 mfd	373-502Z
C50	Capacitor, 6.2 pf, comp.	361-629J
C51	Capacitor, 15 pf, DM15	433-150J
C52	Capacitor, .01 mfd, 300 V	376-103Z
C53	Capacitor, .01 mfd, 300 V	376-103Z
C54	Capacitor, 130 pf, DM15	433-131
C55	Capacitor, 15 pf, DM15	433-150J
C56	Capacitor, Feed-thru, 1000 pf	077-021
C57	Capacitor, 20 pf, disc ceramic	433-200J
C58	Capacitor, 100 pf, DM15	433-101J
C59	Capacitor, 20 pf, disc ceramic	433-200J
C60	Capacitor, 5-30 trimmer, NPO	089-009
C61	Capacitor, 50 pf, disc ceramic	401-500J
C62	Capacitor, .001 mfd, disc	374-102P
C63	Capacitor, Feed-thru, 1000 pf	077-021
C64	Capacitor, Feed-thru, 1000 pf	077-021
C65	Capacitor, 20 pf, disc ceramic	433-200J
C66	Capacitor, 3-12 pf, trimmer	089-041
C67	Capacitor, 15 pf, DM15	433-150J
C68	Capacitor, 200 pf, DM15	433-201J
C69	Capacitor, .01 mfd, 300 V	376-103Z
C70	Capacitor, 50 pf, disc ceramic	401-500J
C71	Capacitor, Feed-thru, 1000 pf	077-021
C72	Capacitor, 50 pf, disc ceramic	401-500J
C73	Capacitor, 50 pf, disc ceramic	401-500J
C74	Capacitor, 50 pf, disc ceramic	401-500J
C75	Capacitor, 50 pf, disc ceramic	401-500J
C76	Capacitor, 50 pf, disc ceramic	401-500J
C77	Capacitor, 50 pf, disc ceramic	401-500J
C78	Capacitor, 50 pf, disc ceramic	401-500J
C79	Capacitor, 50 pf, disc ceramic	401-500J
C80	Capacitor, 50 pf, disc ceramic	401-500J
C81	Capacitor, 50 pf, disc ceramic	401-500J
C82	Capacitor, 50 pf, disc ceramic	401-500J
C83	Capacitor, 50 pf, disc ceramic	401-500J
C84	Capacitor, 50 pf, disc ceramic	401-500J
C85	Capacitor, 50 pf, disc ceramic	401-500J
C86	Capacitor, 15 pf, N 330	084-605
C87	Capacitor, 6-33 pf, tuning	074-154
C88	Capacitor, 12 pf, DM15	433-120J
C89	Capacitor, 3-12 pf, NPO	089-041
C90	Capacitor, 1500 pf, DM19	432-152J
C91	Capacitor, 1000 pf, DM19	432-102J
C92	Capacitor, 1000 pf, feed-thru	077-019
C93	Capacitor, 200 pf, DM15	433-201J
C94	Capacitor, 50 pf, disc ceramic	401-500J
C95	Capacitor, 33 pf, DM15	433-330J
C96	Capacitor, 33 pf, DM15	433-330J
C97	Capacitor, 50 pf, disc ceramic	401-500J
C98	Capacitor, Feed-thru, 1000 pf	077-021
C99	Capacitor, 10 pf, DM15	433-100J
C100	Capacitor, 33 pf, DM15	433-330J
C101	Capacitor, 33 pf, DM15	433-330J
C102	Capacitor, 390 pf, DM15	433-391J
C103	Capacitor, Feed-thru, 1000 pf	077-021
C104	Capacitor, 390 pf, DM15	433-391J
C105	Capacitor, 20 pf, NPO	433-200J
C106	Capacitor, 5 pf, DM15	433-509K
C107	Capacitor, 1.5 pf, comp.	361-159J
C108	Capacitor, 12 pf, DM15	433-120J
C109	Capacitor, 100 pf, DM15	433-101J
C110	Capacitor, Feed-thru, 1000 pf	077-021
C111	Capacitor, 100 pf, DM15	433-101J
C112	Capacitor, 10 pf, DM15	433-100J
C113	Capacitor, .68 pf, comp.	361-688K
C114	Capacitor, 10 pf, DM15	433-100J
C115	Capacitor, Feed-thru, 1000 pf	077-021
C116	Capacitor, 100 pf, DM15	433-101J
C117	Capacitor, 1000 pf, Feed-thru	077-021
C118	Capacitor, 1000 pf, Feed-thru	077-021
C119	Capacitor, 100 pf, DM15	433-101J
C120	Capacitor, 10 pf, DM15	433-100J
C121	Capacitor, 33 pf, DM15	433-330J
C122	Capacitor, 15 pf, DM15	433-150J
C123	Capacitor, 510 pf, DM19	433-511J

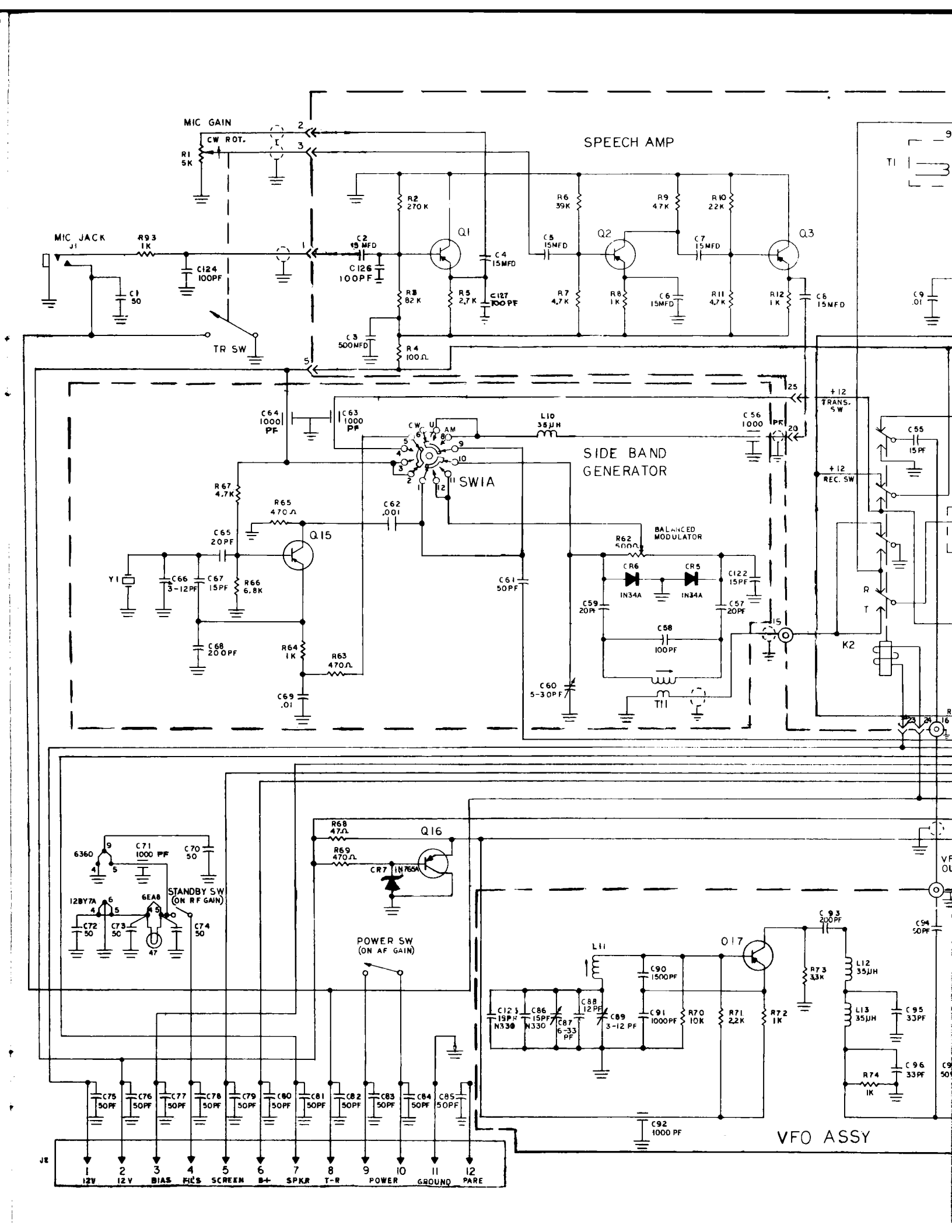
PARTS LIST - MODEL 900A

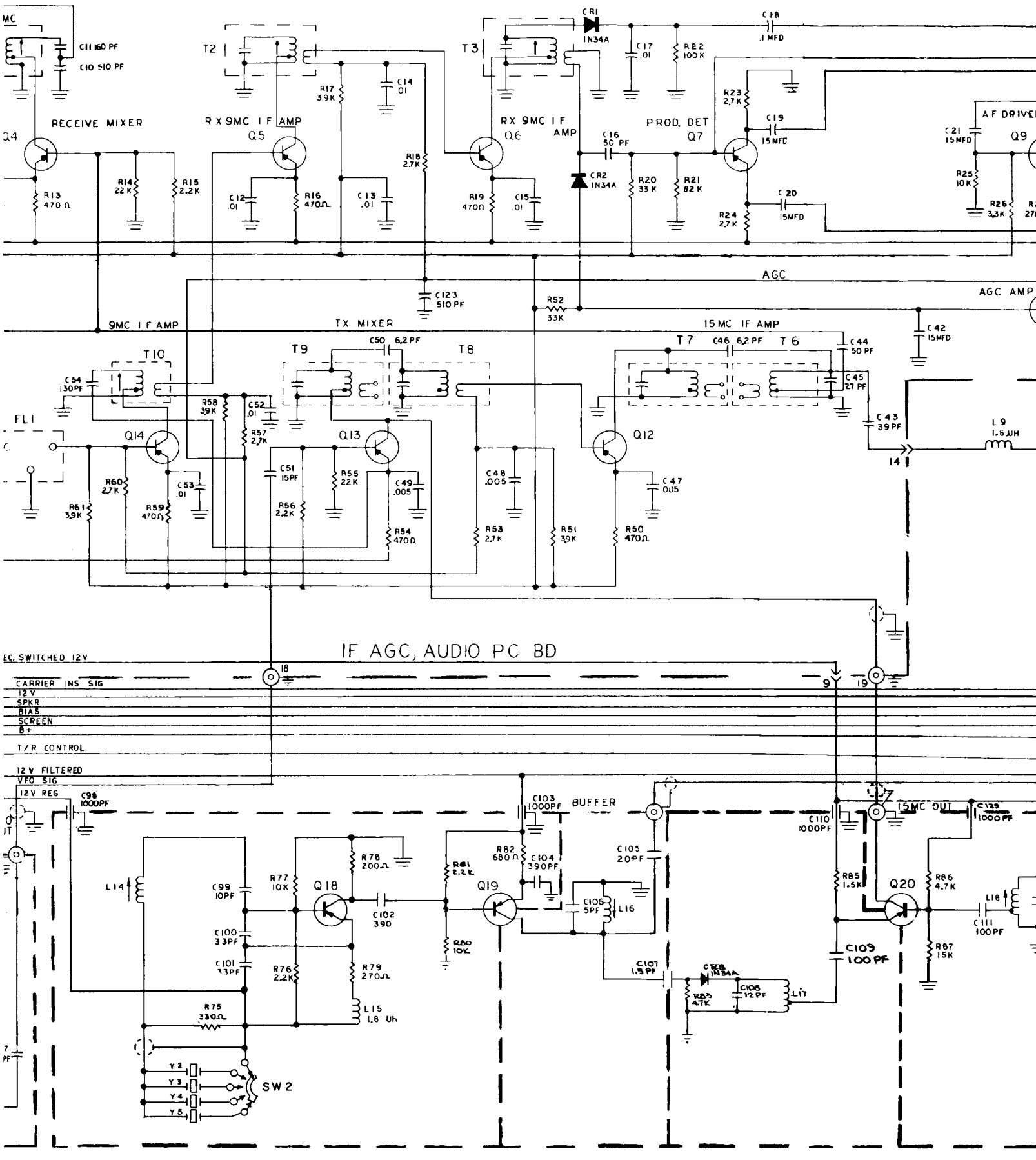
SCHEMATIC SYMBOL	DESCRIPTION	GONSET PART NO.
C124	Capacitor, 100 pf, DM15	433-101J
C125	Capacitor, 15 pf, N330	084-605
C126	Capacitor, 100 pf, DM15	433-101J
C127	Capacitor, 100 pf, DM15	433-101J
C128	Capacitor, .01 mfd, 300 V	376-103Z
C129	Capacitor, Feed-thru, 1000 pf	077-021
R1	Potentiometer, 5 K	052-139
R2	Resistor, 270K, 1/2 W.	042-274
R3	Resistor, 82K, 1/2 W.	042-823
R4	Resistor, 100Ω, 1/2 W.	042-101
R5	Resistor, 2.7K, 1/2 W.	042-272
R6	Resistor, 39K, 1/2 W.	042-393
R7	Resistor, 4.7K, 1/2 W.	042-472
R8	Resistor, 1K, 1/2 W.	042-102
R9	Resistor, 4.7K, 1/2 W.	042-472
R10	Resistor, 22K, 1/2 W.	042-223
R11	Resistor, 4.7K, 1/2 W.	042-472
R12	Resistor, 1K, 1/2 W.	042-102
R13	Resistor, 470Ω, 1/2 W.	042-471
R14	Resistor, 22K, 1/2 W.	042-223
R15	Resistor, 2.2K, 1/2 W.	042-222
R16	Resistor, 470K, 1/2 W.	042-471
R17	Resistor, 3.9K, 1/2 W.	042-392
R18	Resistor, 2.7K, 1/2 W.	042-272
R19	Resistor, 470Ω, 1/2 W.	042-471
R20	Resistor, 33K, 1/2 W.	042-333
R21	Resistor, 82K, 1/2 W.	042-823
R22	Resistor, 100K, 1/2 W.	042-104
R23	Resistor, 2.7K, 1/2 W.	042-272
R24	Resistor, 2.7K, 1/2 W.	042-272
R25	Resistor, 10K, 1/2 W.	042-103
R26	Resistor, 3.3K, 1/2 W.	042-332
R27	Resistor, 270Ω, 1/2 W.	042-271
R28	Potentiometer, 5 K	052-135
R29	Potentiometer, 1 K	052-138
R30	Resistor, 10Ω, 1/2 W.	042-100
R31	Resistor, 470Ω, 1/2 W.	042-471
R32	Resistor, 1.8Ω, 2 W., W.W.	061-189
R33	Resistor, 330Ω, 1/2 W.	042-331
R34	Potentiometer, 1 K	051-008
R35	Resistor, 1.5K, 1/2 W.	042-152
R36	Resistor, 150Ω, 1/2 W.	042-151
R37	Resistor, 1.5K, 1/2 W.	042-152
R38	Resistor, 22K, 1/2 W.	042-101
R39	Resistor, 100Ω, 1/2 W.	042-101
R40	Resistor, 22K, 1/2 W.	042-223
R41	Resistor, 22K, 1/2 W.	042-223
R42	Resistor, 10K, 2 W.	044-103
R43	Resistor, 68K, 1/2 W.	042-683
R44	Resistor, 33K, 1/2 W.	042-333
R45	Resistor, 10K, 2 W.	044-103
R46	Not Required	
R47	Not Required	
R48	Resistor, 68K, 1/2 W.	042-683
R49	Resistor, 22Ω, 1/2 W.	042-220
R50	Resistor, 470Ω, 1/2 W.	042-471
R51	Resistor, 3.9K, 1/2 W.	042-393
R52	Resistor, 33K, 1/2 W.	042-333
R53	Resistor, 2.7K, 1/2 W.	042-272
R54	Resistor, 470Ω, 1/2 W.	042-471
R55	Resistor, 22K, 1/2 W.	042-223
R56	Resistor, 2.2K, 1/2 W.	042-222
R57	Resistor, 2.7K, 1/2 W.	042-272
R58	Resistor, 3.9K, 1/2 W.	042-393
R59	Resistor, 470Ω, 1/2 W.	042-471
R60	Resistor, 2.7K, 1/2 W.	042-272
R61	Resistor, 3.9K, 1/2 W.	042-392
R62	Potentiometer, 500Ω	052-137
R63	Resistor, 470Ω, 1/2 W.	042-471
R64	Resistor, 1K, 1/2 W.	042-102
R65	Resistor, 470Ω, 1/2 W.	042-471
R66	Resistor, 6.8K, 1/2 W.	042-682
R67	Resistor, 4.7K, 1/2 W.	042-472
R68	Resistor, 47Ω, 1/2 W.	042-470
R69	Resistor, 470Ω, 1/2 W.	042-471
R70	Resistor, 10K, 1/2 W.	042-103
R71	Resistor, 2.2K, 1/2 W.	042-222
R72	Resistor, 1K, 1/2 W.	042-102
R73	Resistor, 3.3K, 1/2 W.	042-332
R74	Resistor, 1K, 1/2 W.	042-102
R75	Resistor, 330Ω, 1/2 W.	042-331
R76	Resistor, 2.2K, 1/2 W.	042-222
R77	Resistor, 10K, 1/2 W.	042-103
R78	Resistor, 200Ω, 1/2 W.	042-201
R79	Resistor, 270Ω, 1/2 W.	042-271
R80	Resistor, 10K, 1/2 W.	042-103
R81	Resistor, 2.2K, 1/2 W.	042-222
R82	Resistor, 680Ω, 1/2 W.	042-681
R83	Resistor, 4.7K, 1/2 W.	042-472
R84	Not Required	
R85	Resistor, 1.5K, 1/2 W.	042-152
R86	Resistor, 4.7K, 1/2 W.	042-472
R87	Resistor, 15K, 1/2 W.	042-153
R88	Resistor, 1.5K, 1/2 W.	042-152
R89	Resistor, 3.9K, 1/2 W.	042-392
R90	Resistor, 2.7K, 1/2 W.	042-272
R91	Not Required	
R92	Not Required	
R93	Resistor, 1K, 1/2 W.	042-102
L1	Coil, PA Plate, 144 MC	012-599
L2	Coil, link, 144 MC	012-600
L3	RF Choke, 1.8 uh	027-078
L4	Coil, PA Grid, 144 MC	012-598
L5	Coil, Driver Plate, 144 MC	012-597
L6	RF Choke, 1.8 uh	027-078
L7	Coil, Xmtr Mixer	012-613
L8	Coil, Xmtr Doubler	012-614
L9	RF Choke, 1.8 uh	027-078
L10	RF Choke, 35 uh	027-115
L11	VFO Coil	012-605
L12	RF Choke, 35 uh	027-115
L13	RF Choke, 35 uh	027-115
L14	Coil, HF Osc.	012-612
L15	RF Choke, 1.8 uh	027-078
L16	Coil, Buffer	012-611
L17	Coil, 144 MC	012-608
L18	Coil, 144 MC	012-608
L19	Coil, RF Amp.	012-609
L20	Coil, Antenna	012-610

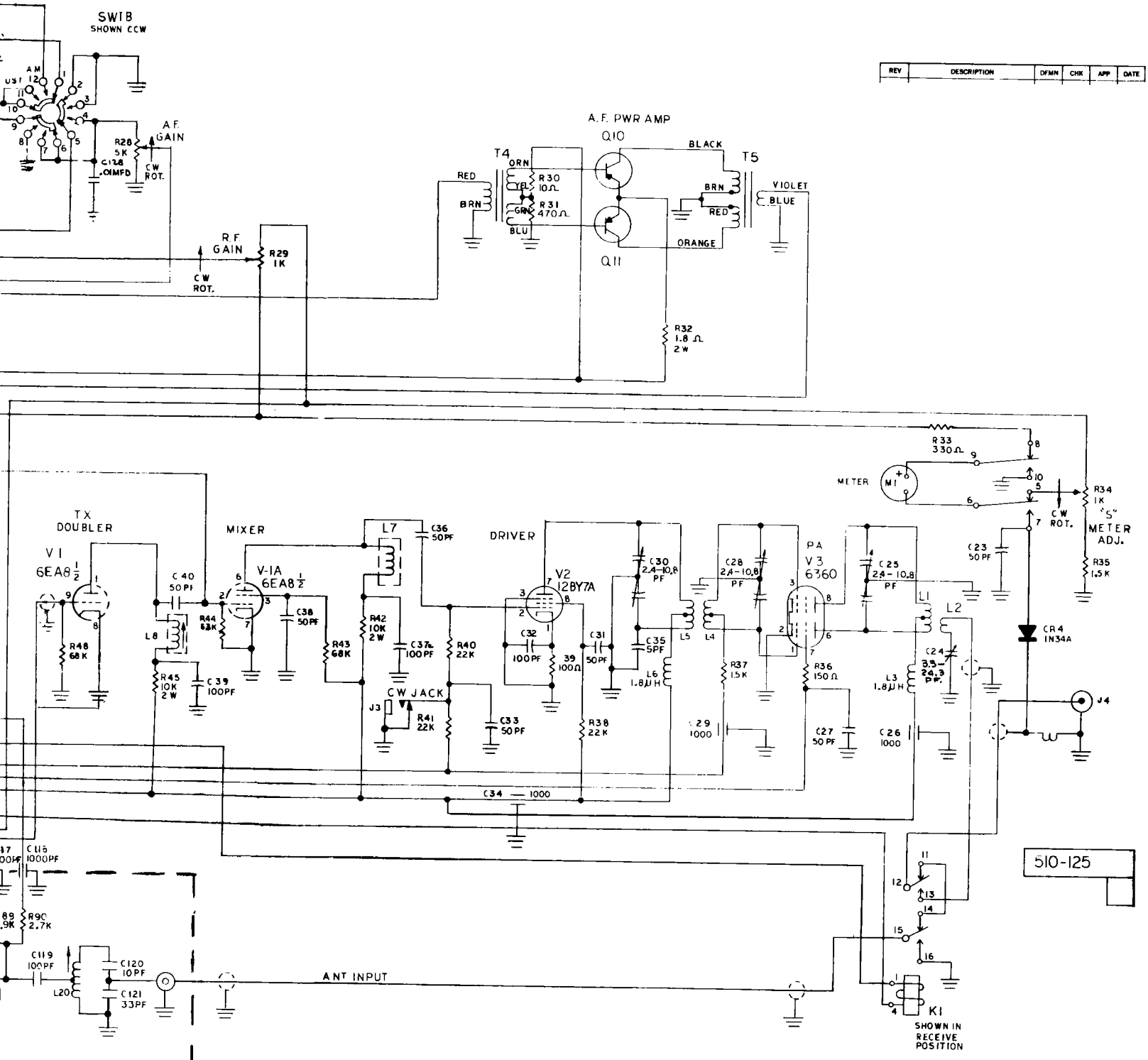
PARTS LIST - MODEL 900A

SCHEMATIC SYMBOL	DESCRIPTION	GONSET PART NO.
Q1	Transistor, Audio	476-012
Q2	Transistor, Audio	476-012
Q3	Transistor, Audio	476-012
Q4	Transistor, RF	476-031
Q5	Transistor, RF	476-031
Q6	Transistor, RF	476-031
Q7	Transistor, Audio	476-012
Q8	Transistor, DC	476-024
Q9	Transistor, Audio	476-012
Q10	Transistor, Audio Output	476-029
Q11	Transistor, Audio Output	476-029
Q12	Transistor, RF	476-027
Q13	Transistor, RF	476-027
Q14	Transistor, RF	476-031
Q15	Transistor,Rf	476-031
Q16	Transistor, Audio Output	476-029
Q17	Transistor, RF	476-031
Q18	Transistor, RF	476-028
Q19	Transistor, RF	476-028
Q20	Transistor, RF	476-028
Q21	Transistor, RF	476-022
CR1	Diode	475-001
CR2	Diode	475-001
CR3	Diode	475-001
CR4	Diode	475-001
CR5	Diode	475-001
CR6	Diode	475-001
CR7	Diode, Zenner	475-021
CR8	Diode	476-001
T1	Transformer, 9MC IF	014-112
T2	Transformer, 9MC IF	014-111
T3	Transformer, 9MC IF	014-111
T4	Transformer, Audio Driver	272-054
T5	Transformer, Audio Mod.	272-055
T6	Transformer, 9MC IF	014-112
T7	Transformer, 15 MC IF	014-110
T8	Transformer, 15 MC IF	014-115
T9	Transformer, 15 MC IF	014-110
T10	Transformer, 9 MC IF	014-112
T11	Transformer, 9 MC Bal. Mod.	014-113
V1	Electron Tube, 6EA8	472-110
V2	Electron Tube, 12BY7	472-029
V3	Electron Tube, 6360	472-503

SCHEMATIC SYMBOL	DESCRIPTION	GONSET PART NO.
Y1	Crystal, 8998 KC	486-439
Y2	Crystal, 144 MC	486-440
Y3	Crystal, 145 MC	486-441
Y4	Crystal, 146 MC	486-442
Y5	Crystal, 147 MC	486-443
M1	Meter	112-049
K1	Relay, Transmit - Receive	111-116
K2	Relay, Transmit - Receive	111-116
FL1	Crystal Filter, 9 MC	487-005
SW1A	Switch Index Assembly	171-147
SW1B	Switch Index Assembly	171-147
SW2	Switch, Crystal	171-148
	Front Panel	453-802
	Calibrated Dial	455-112
PL1	Panel Lamp #47	471-001
	Knob, Small	211-071B
	Knob, Main Tuning	211-073A
	Knob, Main Tuning	211-075
CW JACK		342-001
MIC JACK		342-002


SPEECH AMP
MIC GAIN
CW ROT.
R1 5K
MIC JACK J1
R93 1K
C124 100PF
C1 50
TR SW
R2 270K
C2 15 MFD
C126 100PF
Q1
C4 15MFD
R3 82K
R5 2.7K
C127 100PF
C3 500MFD
R4 100Ω
R6 39K
C5 15MFD
Q2
R9 4.7K
R10 22K
C7 15MFD
Q3
R7 4.7K
R8 1K
C6 15MFD
R11 4.7K
R12 1K
C8 15MFD
C9 .01
T1
+12 TRANS. SW
+12 REC. SW
C55 15PF
R
T
K2
SIDE BAND GENERATOR
C64 1000 PF
C63 1000 PF
L10 38μH
C56 1000 PF
CW
AM
SWIA
R67 4.7K
R65 470Ω
C62 .001
C65 20PF
Q15
Y1
C66 3-12PF
C67 15PF
R66 6.8K
C68 200PF
R64 1K
R63 470Ω
C69 .01
C61 50PF
BALANCED MODULATOR
R62 5000
CR6 IN34A
CR5 IN34A
C122 15PF
C59 20PF
C57 20PF
C58 100PF
C60 5-30PF
T11
R68 47Ω
R69 470Ω
Q16
CR7 1N765A
6360
C71 1000 PF
C70 50
12BY7A
6EA8
STANDBY SW (ON RF GAIN)
C72 50
C73 50
47
C74 50
POWER SW (ON AF GAIN)
L11
Q17
C93 200PF
C94 50PF
C90 1500PF
R73 33K
L12 35μH
C123 15PF N330
C86 15PF N330
C87 6-33 PF
C88 12PF
C89 3-12 PF
C91 1000PF
R70 10K
R71 2.2K
R72 1K
L13 35μH
C95 33PF
C96 33PF
R74 1K
C92 1000 PF
VFO ASSY
C75 50PF
C76 50PF
C77 50PF
C78 50PF
C79 50PF
C80 50PF
C81 50PF
C82 50PF
C83 50PF
C84 50PF
C85 50PF
J2
1 12V
2 12V
3 BIAS
4 FILS
5 SCREEN
6 B+
7 SPKR
8 T-R
9 POWER
10
11 GROUND
12 PARE


MC
C11 160 PF
C10 510 PF
RECEIVE MIXER
Q4
R13 470 Ω
R14 22 K
R15 2,2K
T2
R17 3.9K
C14 .01
RX 9MC I F AMP
Q5
C12 .01
R16 470Ω
C13 .01
T3
CR1 IN34A
C17 .01
R22 100 K
C18 .1 MFD
R18 2.7K
RX 9MC I F AMP
Q6
R19 470Ω
C15 .01
PROD. DET
Q7
C16 50 PF
CR2 IN34A
R20 33 K
R21 82 K
R23 2,7K
C19 15MFD
R24 2,7 K
C 20 15MFD
AF DRIVE
Q9
C21 15MFD
R25 10K
R26 3,3K
AGC
AGC AMP
C123 510 PF
R52 33K
9MC I F AMP
TX MIXER
15MC IF AMP
T10
T9
T8
T7
T6
C50 6,2 PF
C46 6,2 PF
C44 50 PF
C42 15MFD
C54 130PF
C45 27 PF
C43 39PF
L9 1.6 μH
14
FL1
Q14
Q13
Q12
R58 3,9K
C52 .01
R57 2,7K
C51 15PF
R55 22 K
C49 .005
C48 .005
C47 005
R60 2,7K
C53 .01
R56 2,2K
R54 470Ω
R53 2,7K
R51 3,9K
R50 470Ω
R61 3,9K
R59 470Ω
IF AGC, AUDIO PC BD
EC, SWITCHED 12V
CARRIER INS SIG
12 V
SPKR
BIAS
SCREEN
B+
T/R CONTROL
12 V FILTERED
VFO SIG
12 V REG
18
9
19
C98 1000PF
C103 1000PF
BUFFER
C110 1000PF
15MC OUT
C129 1000 PF
L14
C99 10PF
R77 10K
Q18
R78 200Ω
C102 390
R81 2.2K
Q19
R82 680Ω
C104 390PF
C105 20PF
C106 5PF
L16
R80 10K
R85 1.5K
Q20
R86 4.7K
L18
C111 100PF
C100 33PF
C101 33PF
R76 2.2K
R79 270Ω
L15 1.8 Uh
C107 1.5 PF
CR3 IN34A
R83 47K
C108 12 PF
L17
C109 100 PF
R87 15K
R75 330Ω
SW2
Y2
Y3
Y4
Y5



REV	DESCRIPTION	DFMN	CHK	APP	DATE

ITEM	QTY	PART NO.	DESCRIPTION	REMARKS

DFMN MARTINI
CHK
DES APP
PROJ ENG
FINAL APP

UNLESS OTHERWISE SPECIFIED: REMOVE ALL BURRS & SHARP EDGES
ALL DIMENSIONS IN INCHES
TOLERANCES: DECIMALS ± .010
FRACTIONS ± 1/32
ANGLES ± 1/2°
DO NOT SCALE DRAWING

MATERIAL
FINISH

APPROX SCALE

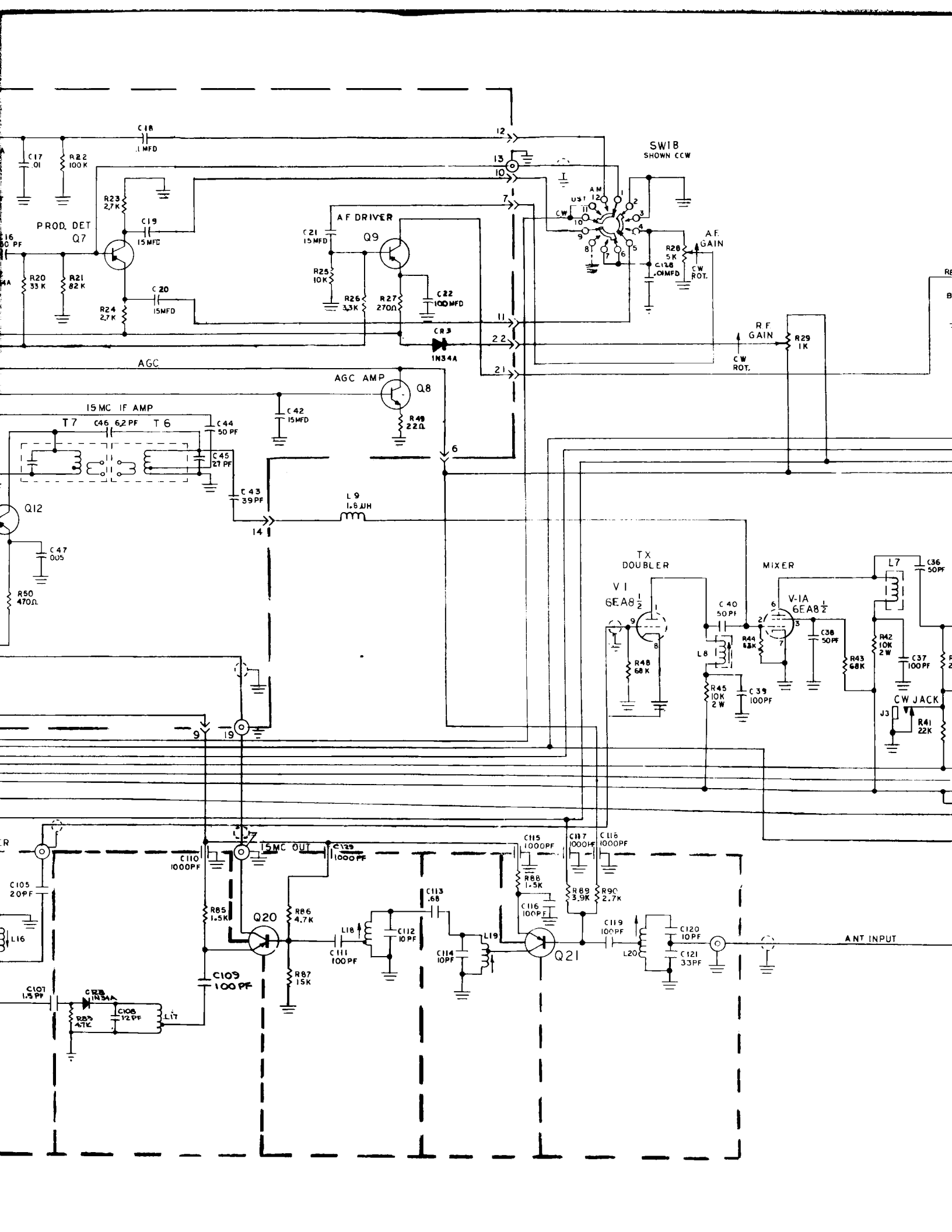
800-104 900A
ISSUE ASSY | FINAL ASSY | MODIFI

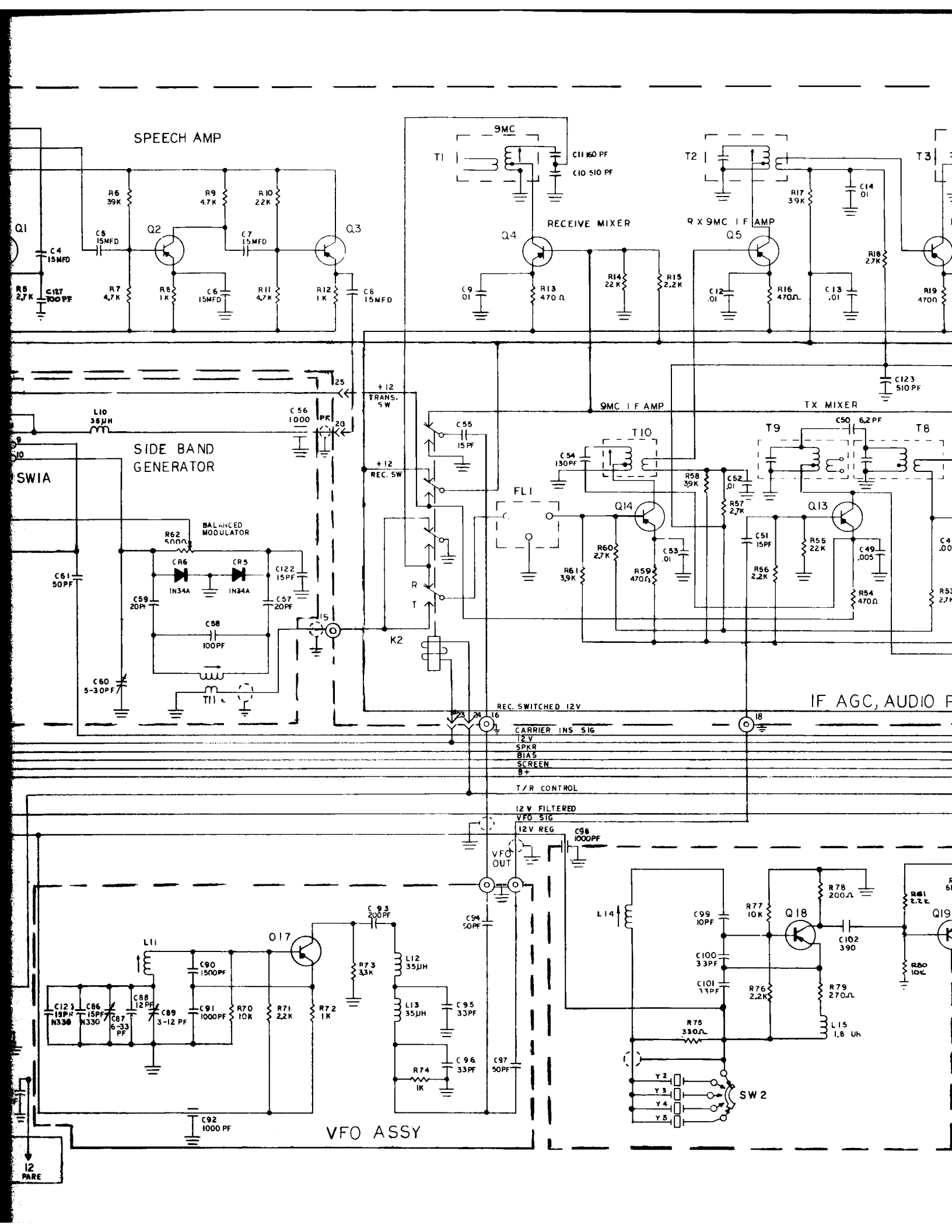
SCHEMATIC
2 METER SSB

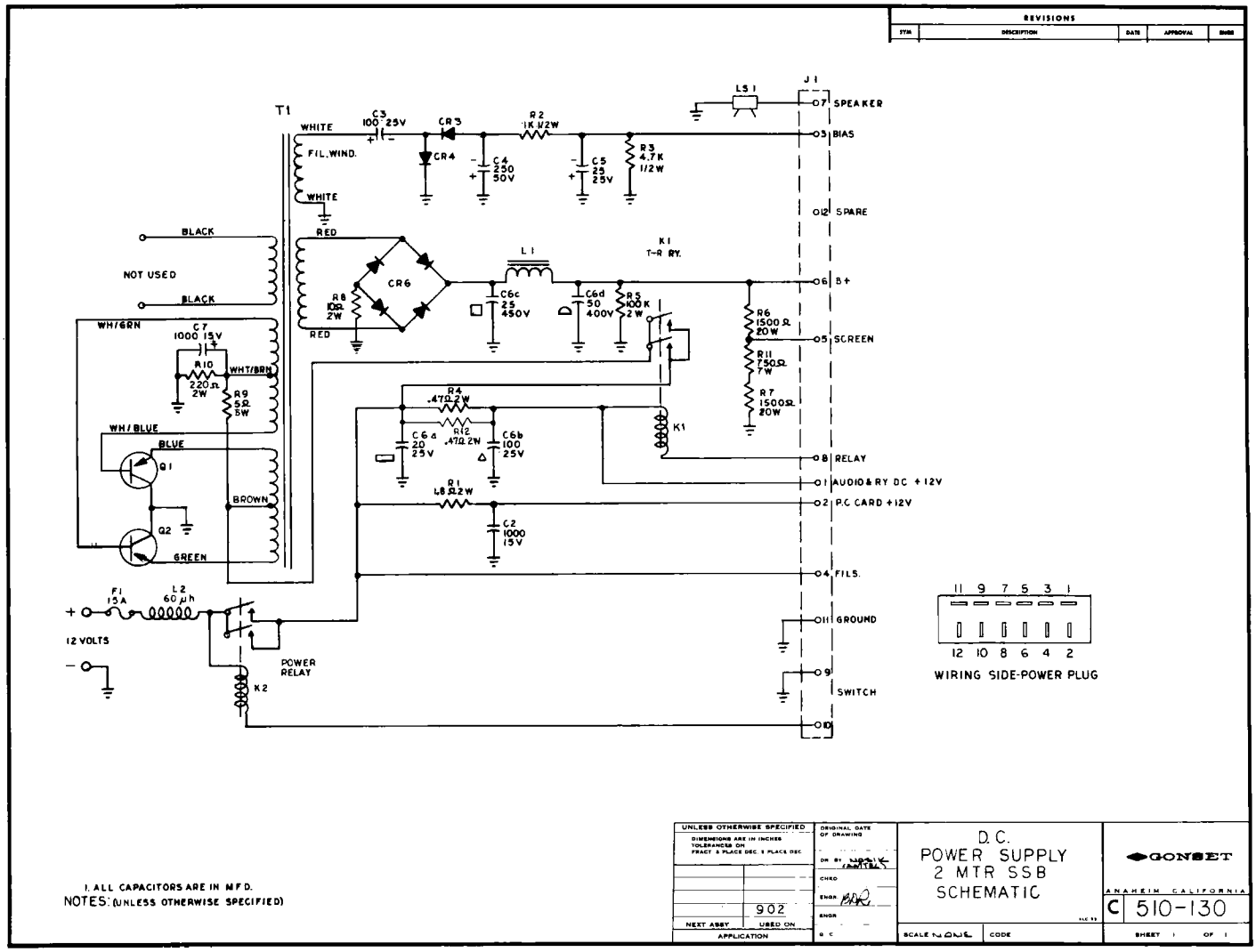
GONSET

R 510-125

SIZE | SHEET 1 OF 1

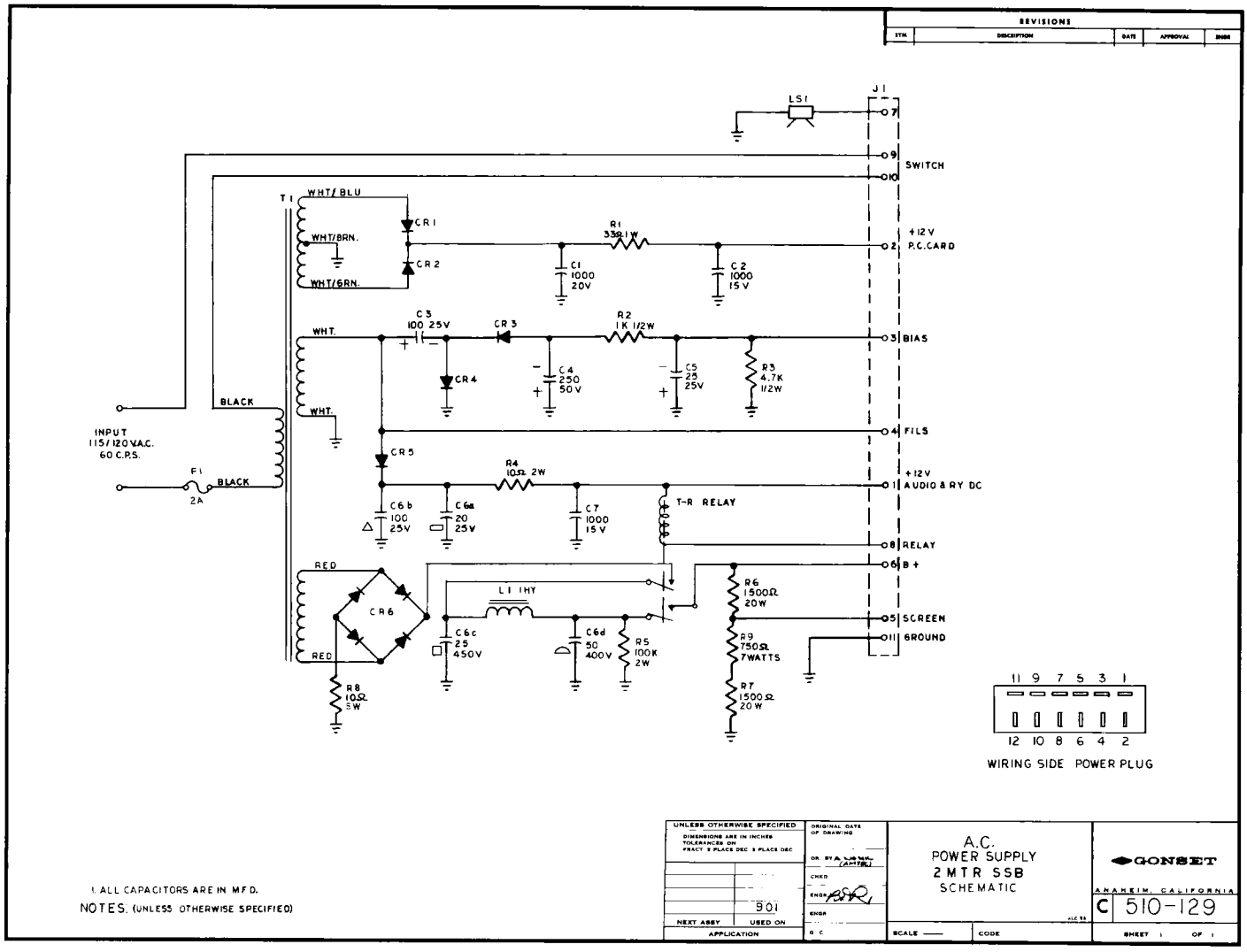

SWIB
SHOWN CCW
AF DRIVER
Q9
PROD. DET
Q7
AF GAIN
RF GAIN
CW ROT.
AGC
AGC AMP
Q8
15MC IF AMP
T7
T6
Q12
TX DOUBLER
V1
6EA8½
MIXER
V-1A
6EA8½
L7
CW JACK
J3
15MC OUT
Q20
Q21
ANT INPUT
C18 .1MFD
C17 .01
R22 100K
R23 2.7K
C19 15MFD
R20 33K
R21 82K
R24 2.7K
C20 15MFD
C21 15MFD
R25 10K
R26 3.3K
R27 270Ω
C22 100MFD
CR3 1N34A
R28 5K
C128 .01MFD
R29 1K
C42 15MFD
R49 220Ω
C46 6.2PF
C44 50PF
C45 27PF
C43 39PF
L9 1.6 μH
C47 .005
R50 470Ω
R48 68K
C40 50PF
R44 82K
L8
R45 10K 2W
C39 100PF
C38 50PF
R43 68K
R42 10K 2W
C37 100PF
R41 22K
C36 50PF
C110 1000PF
C129 1000PF
C115 1000PF
C117 1000PF
C116 1000PF
C105 20PF
L16
R85 1.5K
R86 4.7K
R87 15K
R88 1.5K
R89 3.9K
R90 2.7K
C113 .68
C116 100PF
C112 10PF
C111 100PF
C114 10PF
L18
L19
C119 100PF
C120 10PF
C121 33PF
L20
C109 100PF
C107 1.5PF
C108 12PF
L17
R83 4.7K
C128 1N34A


SPEECH AMP
9MC
T1
T2
T3
C11 160 PF
C10 510 PF
RECEIVE MIXER
RX 9MC I F AMP
Q1
Q2
Q3
Q4
Q5
R6 39K
R9 4.7K
R10 2.2K
C5 15MFD
C7 15MFD
C4 15MFD
R5 2.7K
C127 100 PF
R7 4.7K
R8 1K
C6 15MFD
R11 4.7K
R12 1K
C8 15MFD
C9 .01
R13 470 Ω
R14 22K
R15 2.2K
C12 .01
R16 470Ω
C13 .01
C14 .01
R17 3.9K
R18 2.7K
R19 470Ω
C123 510 PF
9MC I F AMP
TX MIXER
+12 TRANS. SW
+12 REC. SW
L10 38μH
C56 1000 PF
SIDE BAND GENERATOR
SWIA
C55 15 PF
T10
T9
T8
C50 6.2 PF
C54 130PF
FL1
Q14
Q13
R58 3.9K
C52 .01
R57 2.7K
R60 2.7K
R61 3.9K
R59 470Ω
C53 .01
C51 15PF
R55 22K
R56 2.2K
C49 .005
R54 470Ω
BALANCED MODULATOR
R62 5000Ω
CR6
CR5
1N34A
1N34A
C61 50PF
C122 15PF
C59 20PF
C57 20PF
C58 100PF
C60 5-30PF
T11
K2
R
T
REC. SWITCHED 12V
CARRIER INS SIG
12 V
SPKR
BIAS
SCREEN
B+
T/R CONTROL
12 V FILTERED
VFO SIG
12 V REG
C98 1000PF
VFO OUT
IF AGC, AUDIO
L11
Q17
C93 200PF
C94 50PF
C90 1500PF
R73 3.3K
L12 35μH
C123 18PF N330
C86 15PF N330
C87 6-33 PF
C88 12PF
C89 3-12 PF
C91 1000PF
R70 10K
R71 2.2K
R72 1K
L13 35μH
C95 33PF
C96 33PF
R74 1K
C97 50PF
C92 1000 PF
VFO ASSY
L14
C99 10PF
R77 10K
Q18
R78 200Ω
C102 390
C100 33PF
C101 33PF
R76 2.2K
R79 270Ω
L15 1.8 Uh
R75 330Ω
Y2
Y3
Y4
Y5
SW2
12 PARE



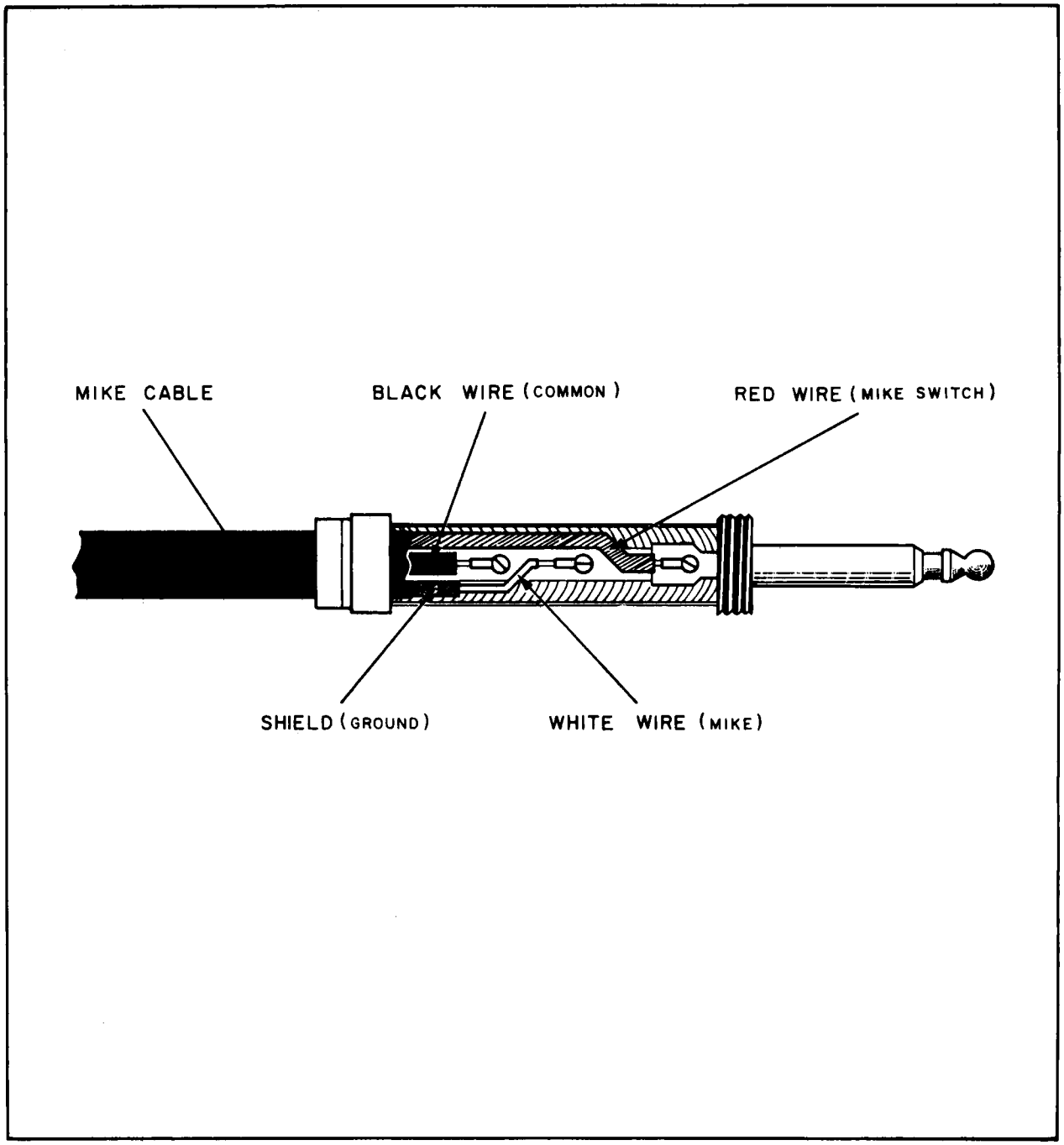
PARTS LIST

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, Electrolytic	073-154
	Section A, 20 mfd, 25 V	
	Section B, 100 mfd, 25 V	
	Section C, 25 mfd, 450 V	
	Section D, 50 mfd, 400 V	
C7	Capacitor, 1000 mfd, 15 V	365-102Z
R1	Resistor, 1.8 Ω, 10%, 1/2 W.	061-189
R2	Resistor, 1 K, 10 %, 1/2 W.	042-102
R3	Resistor, 4.7 K, 10%, 1/2 W.	042-472
R4	Resistor, 0.47Ω, 10%, 1 W.	056-478
R5	Resistor, 100K, 10%, 2 W.	044-104
R6	Resistor, 1.5K, 20 W.	049-095
R7	Resistor, 1.5K, 20 W.	049-095
R8	Resistor, 10Ω, 10%, 5 W.	049-092
R9	Resistor, 5Ω, 5 W.	049-100
R10	Resistor, 220Ω, 10%, 2 W.	044-221
R11	Resistor, 750Ω, 7 W.	049-107
R12	Resistor, 0.47Ω, 10% 1 W.	056-478
CR3	Diode, 50 PIV	474-004
CR4	Diode, 50 PIV	474-004
CR6	Diode Bridge	474-026
K1	Relay	111-107
K2	Relay	111-107
L1	Choke, Filter	274-025
L2	Hash Filter	027-027
T1	Transformer, Power	271-089
Q1	Transistor	476-006
Q2	Transistor	476-006
F1	Fuse, 2 Amp, 250 V	482-049
LS1	Loudspeaker	152-023



PARTS LIST

C1	Capacitor, 1000 mfd, 20 V	073-169	R8	Resistor, 10Ω, 10%, 5W.	049-092
C2	Capacitor, 1000 mfd, 15 V	365-102Z	R9	Resistor, 750Ω, 7 W.	049-107
C3	Capacitor, 100 mfd, 25 V	366-101P			
C4	Capacitor, 250 mfd, 50 V	367-251Z	CR1	Diode, 50 PIV	474-004
C5	Capacitor, 25 mfd, 25 V	366-250	CR2	Diode, 50 PIV	474-004
C6	Capacitor, Electrolytic	073-154	CR3	Diode, 50 PIV	474-004
	Section A, 20 mfd, 25 V		CR4	Diode, 50 PIV	474-004
	Section B, 100 mfd, 25 V		CR5	Diode, 50 PIV	474-004
	Section C, 25 mfd, 450 V		CR6	Diode Bridge	474-026
	Section D, 50 mfd, 400 V				
C7	Capacitor, 1000 mfd, 15 V	365-102Z	T1	Transformer, Power	271-089
R1	Resistor, 33Ω, 10%, 1W.	043-330	L1	Choke, Filter, 1 hy	274-025
R2	Resistor, 1K, 10%, 1/2 W.	042-102			
R3	Resistor, 4.7K, 10%, 1/2W.	042-472	K1	Relay	111-107
R4	Resistor, 10Ω, 10%, 2W.	044-100			
R5	Resistor, 100K, 10%, 2W.	044-104	F1	Fuse, 2 Amp. 250 V	482-049
R6	Resistor, 1.5K, 20 W.	049-095			
R7	Resistor, 1.5K, 20 W.	049-095	LS1	Loudspeaker	152-023



PL-68 TYPE MIKE PLUG