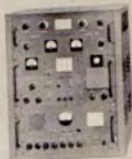


# ELDICO

## SINGLE SIDEBAND COMMUNICATION EQUIPMENT



## INSTRUCTION MANUAL

**INSTRUCTION MANUAL**  
**SSB-1000**  
**Linear Amplifier**

**HELECO CORPORATION**  
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Minneapolis, New York

## TABLE OF CONTENTS

### SECTION I DESCRIPTION

<u>PARAGRAPH</u>	<u>PAGE</u>
1. General . . . . .	1
2. Features . . . . .	1
a. Low Drive Requirements . . . . .	1
b. 1000 Watt Peak Power Input. . . . .	1
c. Radial Beam Power Tetrode . . . . .	1
d. Rugged Power Supply . . . . .	1
e. Built-In Oscilloscope . . . . .	2
f. High Harmonic Attenuation . . . . .	2
g. Compact Attractive Styling. . . . .	2
3. Specifications . . . . .	2

### SECTION II INSTALLATION

1. Unpacking . . . . .	3
2. External Connections . . . . .	3
a. Output . . . . .	3
b. Input . . . . .	4
c. External Connections. . . . .	4

### SECTION III OPERATION

1. Controls . . . . .	4
a. Power On-Off . . . . .	4
b. Plate On-Off . . . . .	5
c. Tune - Operate . . . . .	5
d. Overload Reset. . . . .	5
e. Band Change . . . . .	5
f. Grid Tuning . . . . .	5
g. Plate Tuning . . . . .	5
h. Plate Loading . . . . .	5
2. Tuning Procedure . . . . .	5
a. AM Transmission . . . . .	6
b. SSB Transmission . . . . .	6
c. CW Transmission . . . . .	7

## SECTION I DESCRIPTION

### 1. GENERAL

The Eldico Model SSB-1000 Linear Amplifier is a completely self-contained linear amplifier incorporating the better features of modern engineering design. Together with any type of exciter, it provides a full kilowatt of talk power on the 80, 40, 20, 15, 11, and 10 meter amateur bands. Great pains have been taken to provide the utmost in convenience of operation, modern attractive styling, compactness without crowding, plus rugged construction and dependable operation. It is completely self-contained, virtually free of television interference due to its advance design and type of operation (AB1), and with its exciter has talk power equal to transmitters of many times its size.

### 2. FEATURES

(a) LOW DRIVE REQUIREMENTS. Eldico's SSB-1000 Linear Amplifier needs only 3 watts peak envelope power to drive it to its full input power rating of 1000 watts peak envelope power without flattening. This allows the SSB-1000 to be used with any commercial or amateur built exciter.

(b) 1000 WATT PEAK POWER INPUT. The SSB-1000 Linear Amplifier loafs along at its full rated input with extremely low third order distortion. Operating in pure AB1, it assures linear amplification, minimum band width, and faithful reproduction of its input signal.

(c) RADIAL BEAM POWER TETRODES. The use of Eimac's new 4X250B radial beam power tetrodes allows compactness yet high efficiency and dependability. Ample plate dissipation - 500 watts - for rated power input, together with excellent high frequency characteristics makes this tube the ideal choice for this particular application. The high power sensitivity of this tube makes Class AB1 operation feasible with little or no sacrifice in efficiency, yet with remarkably improved linearity.

(d) RUGGED POWER SUPPLY. A heavy duty, compact, power supply is self-contained and supplies 2000 volts DC at far above the current requirements, the regulated screen voltage, bias voltage, and filament power. A 4 to 24 henry swinging choke and 10 mfd oil filled capacitor are used for good power regulation. A heavy duty rotary blower provides more than adequate cooling of the 4X250B's.

(e) **BUILT-IN OSCILLOSCOPE.** An internal oscilloscope continuously monitors the linearity of the amplifier by visual comparison of input and output wave forms and gives positive indication of percentage of modulation (up to 100% modulation) on AM as well. An oscilloscope is a necessity in properly tuning an SSB transmitter and assures top performance of the transmitter on the air.

(f) **HIGH HARMONIC ATTENUATION.** A high Q tank circuit plus a pi-network output and operation in AB1 assures high order of harmonic attenuation. The pi-network output circuit also allows matching to a wide range of antenna impedances.

(g) **COMPACT ATTRACTIVE STYLING.** Completely self-contained in an attractive black wrinkle receiver-type cabinet, it harmonizes with other modern type communication equipment. All controls have been located for convenience and simplicity of operation.

### 3. SPECIFICATIONS

<u>Frequency Range</u>	<u>Band</u>	<u>Range (mc)</u>
	80 meters	3.50 to 4.00
	40 meters	7.00 to 7.30
	20 meters	14.00 to 14.35
	15 meters	21.00 to 21.45
	10 meters	26.90 to 29.70
<u>Tube Line Up</u>	9 tubes: including 3 voltage regulators, 2 rectifiers, 1 oscilloscope deflection amplifier, 1 oscilloscope, and 2 power amplifiers.	
<u>Power Rating</u>	DC Average Input	CW 1000 watts AM 700 watts
	Peak Envelope Power Input SSB	1000 watts
	Peak Envelope Power Output SSB	825 watts
<u>Power Input</u>	115 Volts AC, 60 cycles, 1000 - 1500 watts	
<u>Types of Emission</u>	Continuous Wave, Amplitude Modulation, Single Sideband Suppressed Carrier, Frequency Shift Keying.	

Harmonics and  
Spurious Responses

Third order distortion products	30 db or more down
TV interference suppression	40 db or more down second harmonic, 60 db or more down, higher order harmonics

<u>Drive Requirements</u>	3 watts peak envelope power. Input impedance 52 ohms.
<u>Output Impedance</u>	52 ohms nominal. Can be loaded into 40-200 ohms approximately.
<u>Size</u>	10-3/4" high by 17" wide by 15" deep.
<u>Weight</u>	98 pounds.
<u>Finish</u>	Black wrinkle finish.
<u>Cabinet</u>	Table model receiver-type cabinet with hinged interlocked cover.

SECTION II  
INSTALLATION

1. UNPACKING

(a) Open packing carton carefully to prevent damage to the equipment. Check the packing material carefully for small packages. Inspect the transmitter for mechanical damage and try the various front panel controls to see that they operate properly. Any claim for damage must be filed immediately with the transportation company and the original packing material must also be preserved.

(b) The final 4X250B tubes are usually shipped in a separate package. The tubes should be carefully unpacked and placed in its proper socket and the plate connector firmly attached as shown in Figure 1.

2. EXTERNAL CONNECTIONS

(a) OUTPUT. The transmitter is equipped with two 83-1R coaxial receptacles on the rear of the chassis for use with 52/72 ohm coaxial cable. The 83-1R connector on the extreme right is the output connector for RG-8 or 11U feed systems to the antenna. Balanced antennas should be connected through an antenna tuner or Balun coil, which in turn is fed with coaxial cable from the transmitter for best results.

**CAUTION:** DO NOT OPERATE THE TRANSMITTER UNLESS YOU MAKE SURE THAT A PROPER EXTERNAL LOAD IS CONNECTED TO IT. OTHERWISE, EXCESSIVE RF VOLTAGES MAY DEVELOP IN THE FINAL WHICH MIGHT CAUSE THE BREAKDOWN OF COMPONENTS.

(b) INPUT. Any commercial or amateur built exciter can be used to drive the SSB-1000 Linear Amplifier. A peak output of as low as 3 watts is sufficient to drive the unit to its full 1000 watts peak envelope input. If exciters of a higher output (over a maximum of 20 watts output) are used, a fixed attenuator should be placed between the exciter and the SSB-1000 Linear Amplifier. If the SSB-1000 is to be used with an Eldico SSB-100A Exciter/Transmitter, a fixed attenuator, as per Figure 4, can easily be constructed and used in the coaxial line connecting the output of the SSB-100A to the input of the SSB-1000. If the advantage of switching from low to hi power is desired with the above combination, a low/hi unit can be constructed as per Figure 5.

(c) EXTERNAL CONNECTION. On the rear terminal strip of the SSB-1000 117 volts AC is brought out on terminals 1 and 2 when the plate power switch is in the "ON" position (red pilot light on). If low/hi power switching is used (Figure 5), the relay terminals 1 and 2 are connected to terminals 1 and 2 on the rear of the SSB-1000 (see Figure 1). By this means the SSB-100A is connected directly to the antenna and operation on low power (100 watts) is available. When the plate switch is placed in the "ON" position, the relay is energized through terminals 1 and 2 automatically changing over the output of the exciter to the input of the linear amplifier and the output of the linear amplifier directly to the antenna. This allows the operator to use low power for most of the contacts, but if DX comes in on the frequency, or if QRM gets rough, by merely throwing one switch, instantaneous hi power operation is available.

Terminals 3 and 4 are used for bias-switching the linear amplifier. The bias-switching relay requires a 117V AC under transmit which can be obtained from terminals 4 and 5 on the SSB-100A. This relay connects the final grids to the full available bias in the unenergized position, thus providing plate-current-cutoff in the final amplifier, thereby avoiding thermal noise being generated by this stage during receiving periods. On transmit, the relay connects normal operating bias to the final grids.

### SECTION III OPERATION

#### 1. CONTROLS

(a) POWER ON-OFF. This switch turns on the filament of all tubes, as well as the bias supply. The green pilot light indicates filament on.

**CAUTION:** Never work on the transmitter without making sure that all power switches are in the "OFF" position. SWITCH TO SAFETY TODAY.

(b) **PLATE ON-OFF.** This switch turns on the high voltage DC plate supply which supplies the necessary high voltage to the 4x250B's as well as the regulated screen voltage. The red pilot light indicates that plate voltage is on. This switch remains in the "ON" position at all times when the SSB-1000 Linear is in operation

(c) **TUNE-OPERATE.** This switch connects a resistor into the cathode return of the amplifier tubes, to limit the plate current to safe values for tune-up purposes.

(d) **OVERLOAD RESET.** Reconnects the H. V. after overload has been tripped.

**CAUTION:** Always put plate switch in the "OFF" position before pushing overload reset.

(e) **BAND CHANGE.** This switch is used to select the desired amateur band. The amateur bands of 80, 40, 20, 15, 11, and 10 meters can be selected by means of this control.

(f) **GRID TUNING.** This control tunes the grid of the final. The capacity of the tuning condensers increases clockwise. It should be tuned for maximum current as indicated by the plate meter.

(g) **PLATE TUNING.** This condenser resonates the final plate circuit. It should be tuned for minimum plate current (dip) as indicated by the meter.

(h) **PLATE LOADING.** The loading control should always be set at the maximum clockwise position (minimum loading) when first tuning up the transmitter. It should then be gradually turned counter-clockwise and the plate current redipped until the final is properly loaded as explained at the next chapter. Screen current as indicated by the screen meter is an indication of the degree of loading.

## 2. TUNING PROCEDURE

The Eldico SSB-1000 is easily tuned and operated on AM (Amplitude Modulation), SSSC (Single Sideband Suppressed Carrier) and CW (Continuous Wave). Once the unit is properly tuned and set up for operation, it is only necessary to switch the exciter for the type of operation desired.

Use the following procedure to tune the transmitter:



(a) AM TRANSMISSION.

1. Power switch on. Green pilot light should be lit. Allow thirty seconds for mercury vapor rectifiers to warm up before applying plate voltage.
2. Select the desired band and tune the exciter for the proper band and frequency.
3. Set the load condenser in the extreme clockwise position (maximum capacity).
4. Place power switch in "ON" position. Red pilot light should be lit. Apply 117V AC to bias-switching relay (put exciter on transmit) then adjust bias potentiometer R-2 located at the rear of the unit (see Figure 1) for zero signal plate current of approximately 200 ma.
5. Place tune-operate switch in tune position.
6. Apply steady input signal from the exciter and peak the grid for maximum indication as shown on the plate meter. Adjust the excitation until off resonance plate current is approximately 200 ma. then dip the plate and increase the loading into the antenna, until the plate dip is just barely perceptible.
7. Put tune-operate switch back in operate position and retouch the loading to a point where the screen current remains approximately stationary at resonance. The plate dip at this point will be quite small (in order of 10-20 ma). Proper operation of the transmitter can be visually checked by reference to the oscilloscope patterns as shown in this instruction manual, (Figure 6).

CAUTION: Do not attempt to operate the amplifier in the tune position because this will cause excessive distortions.

(b) SSSC TRANSMISSION.

1. After the above tuning procedure for AM is accomplished, no special tuning is required for SSSC (Single Sideband Suppressed Carrier) operation.
2. Adjust or tune the exciter for SSSC operation and talk into the microphone. Correct operating levels can be determined by reference to the oscilloscope patterns and Figure 6 of this instruction manual. For voice control operation, the plate switch of the SSB-1000 is left on at all times. Without signal input from the exciter, there will be no output from the SSB-1000 Linear Amplifier. When the operator talks into the microphone, the voice operated relay in the exciter is switched,

the signal from the exciter is fed into the linear amplifier and the output of the linear amplifier is fed into the antenna.

3. NOTE: The swing of the plate meter will vary with the peak to average power of individual voices. An average voice, with 1000 watts peak envelope power input to the 4X250B's will have plate current swing of approximately 400 ma. Reference to the internal oscilloscope will clearly indicate where flattening occurs.

(c) C W TRANSMISSION.

1. The excitation from the transmitter is increased so that resonant plate current is approximately 500 ma. (2000 volts DC x 500 mills = 1000 watts approximately).
2. The transmitter is then tuned like any conventional transmitter for maximum output. Screen current, when the transmitter is properly loaded for CW (key down), will be approximately 25 ma.

## SECTION IV

### THEORY OF OPERATION

#### 1. GENERAL

Unlike a Class C amplifier stage where the output voltage stays almost constant over a wide range of changes in grid excitation, a linear amplifier has to give faithful reproduction of the input signal. In other words, the output voltage has to be exactly proportional to the input voltage. Three classes of operation can be used for linear amplifiers, e. g. Class A, Class AB1, and Class B. Each class of operation has its own particular advantages and disadvantages.

Class A operation gives the best linearity, but the efficiency is limited to 50% at maximum output, so that for high power linear amplifiers, Class A operation would be very uneconomical.

Class B amplifiers have very good efficiency at maximum output, approaching Class C amplifiers, namely 78.5%. However, distortion products are quite high with this class of operation, in addition to the fact that a Class B amplifier reflects a varying load to the driver stage, which requires excellent drive regulation.

Class AB1 operation avoids all the problems of Class B operation, giving only slightly increased distortion products over Class A operation, while the efficiency approaches Class B operation. The efficiency of Class AB1 amplifiers is in the order of 60 to 70%. Class B and AB1 amplifiers in RF services can be operated single-ended because the flywheel action of the tank circuit provided the missing half of the RF cycle.

Another fact worth mentioning at this point is the apparent difference in efficiency of linear amplifiers for different types of services. As most of you have probably heard at one time or another, linear amplifiers on AM are limited to an efficiency of 33-1/3%. There is nothing magic about this figure, and in most cases it is not correct either. It would be much more correct and less confusing if we simply state that the efficiency of a linear amplifier at AM carrier level is 50% of the peak efficiency, which in the case of AB1 operation is limited to about 70% and occurs at the peak of the modulation envelope. In other words, in a linear amplifier the efficiency is proportional to the amount of excitation, being zero for zero excitation and about 70% in the case of the SSB-1000 at the point where the tube is just about starting to draw grid current.

It is obvious from this discussion, that on CW the efficiency will be about 70% since the tube can be run at top level because the input is a steady signal. On AM, however, where the tube has to be capable of following the upwards swing of the modulation envelope, the drive level on carrier has to be reduced to the point where the efficiency at the carrier level is about 50% of the peak efficiency that the amplifier is capable of.

On Single Sideband Suppressed Carrier, efficiency considerations are of little importance since the average signal level is very low, and hence, the average plate dissipation is very low also.

For a more detailed discussion of these facts, reference should be made to the February 1956 issue of QST, "Linear Amplifiers for AM".

## 2. CIRCUIT DESCRIPTION

### (a) POWER SUPPLY

The power supply consists of two separate supplies, a bias supply and a high voltage supply. The bias supply uses selenium stacks in a full wave rectifier circuit, giving a bias voltage of about 150 volts at 65 ma. It is dropped to operating bias voltage in a 5 K ohm 25 watt potentiometer, R-2, which is available for adjustment at the rear of the unit. The high voltage supply uses a pair of 866 Mercury vapor rectifiers, a 4-24 henry swinging choke, and a 10mfd oil filled condenser. The supply voltage is rated at 2000 volts with 500 ma of output current. The screen voltage for

the 4X250B is obtained from the high voltage supply through a dropping resistor, and is regulated by a set of VR tubes. This arrangement has the advantage over other types of screen supplies in that it gives excellent screen voltage regulation plus added tube protection. This is due to the fact that if the tubes should draw excessive screen current, the VR tubes go out and the screen voltage drops to a low value, thus keeping screen dissipation to a safe value. At the same time, this provides additional bleeding of the high voltage supply together with the high zero signal plate current of the tubes thus providing both excellent static and dynamic plate voltage regulation. Both plate and screen voltage are fully interlocked with the hinge cover on the cabinet.

#### (b) LINEAR AMPLIFIER

The 4X250B's are used in a bridge neutralized pi-network output circuit which features both high grid circuit and output circuit tank-Q for good linearity and maximum harmonic attenuation. The tubes are tapped down on the grid circuit through the capacitive voltage divider C-12 and the tube input capacity, thus keeping the tube from loading down the grid circuit in case an occasional peak of grid current should be drawn. Resistors R-14 and R-9 further aid in providing a constant load to the drive stage. The grid circuit itself consists of high Q coils in a turret arrangement and the input is link-coupled to the grid coils. The links are designed to provide a 52 ohm non-reactive load with less than 2:1 voltage standing wave ratio on all bands. This aids in efficient power transfer from the exciter to the final amplifier, and a maximum of 3 watts peak envelope power across the input terminal will drive the SSB-1000 to full rated input on all bands. The output circuit is a pi-network using high efficiency components throughout. C-23 is switched in parallel with loading condenser on 80 meters, thus enabling a good match into 52 ohms even on that band. C-22b is switched in parallel with C-22a on 80m to give the proper tank-circuit Q. Both screen and plate currents are metered, the plate meter being located in the cathode circuit for added protection and safety. A protective overload relay is also placed in the cathode return of the tubes and is factory set-up to remove the plate-voltage if the total cathode current exceeds 600 ma. on peaks. R-8 is put into the cathode circuit in the tune position to limit the plate current to safe values. The grid circuit is completely shielded and enclosed in a pressurized box, thus reducing external feedback to the absolute minimum. Internal feedback is virtually eliminated by the bridge neutralizing circuit, thus providing extreme stability of the amplifier on all frequencies. A high efficiency blower is used to pressurize the grid box. It delivers more than the required amount of air to insure adequate cooling of the tube under all conditions.

## (c) THE OSCILLOSCOPE

A 1CP1 scope tube is used to constantly compare the input and output wave shape of the amplifier. Part of the input signal is fed to the crystal diode CR-1 where it is rectified. The resulting signal is the envelope of the input signal. This envelope is amplified in a 6AU6 deflection amplifier, then applied to the horizontal deflection plates through C-29. For the vertical deflection, some RF is picked up through C-31 and applied to the vertical deflection plate, thus giving a trapezoid display on the scope tube.

### SECTION V

### MAINTENANCE

#### 1. TROUBLE SHOOTING

If the SSB-1000 is used according to this manual, little maintenance should be required to keep the unit in top operating condition all the time. Besides keeping the unit dry and clean of dust, the blower bearings and VR tubes are the only things requiring periodical check-ups. In normal usage, the blower bearings should be oiled with one or two drops of oil about every six months. They are made out of porous bronze, so they can hold lubrication for a considerable length of time. Any good household utility oil will serve the purpose. The oilers are located behind the final plate circuit and can be reached from the top of the unit.

The VR tubes should be checked periodically for their ability to regulate voltages because aging causes them to increase their internal resistance. The nominal screen voltage is 405 volts and if the screen voltage is found more than 20 volts higher, they should be replaced. If component failure should occur, a list of voltages enclosed at different points in the amplifier should be of considerable help in locating the source of trouble.

#### 2. FACTORY SERVICE

If the trouble experienced is of complex nature, and cannot be cured with ordinary measures, it is suggested that a letter be sent to the factory giving the following information:

- (a) Item, type number and serial number of the equipment.
- (b) From whom the item was purchased, and the date of delivery.
- (c) The date on which the item was placed into service, and the number of hours of service.
- (d) Nature of trouble, and the cause if known.

(e) Remarks

If necessary, authorization will be given to return the unit to the factory for servicing. The unit should be properly packed for shipment and shipped prepaid by Railway Express, insured for its full value. If the unit is with Eldico's standard warranty, Eldico will repair or replace without charge, any equipment, parts, or accessories which are defective as to design, workmanship, or materials. If not within the guarantee, parts will be billed at amateur costs, and labor at \$3.50 per hour.

When ordering replacement parts, you should direct your order to the factory and furnish the following information:

- (a) Quantity required.
- (b) Part name and number (taken from parts list in instruction manual).
- (c) Eldico's type number, item, and serial number of the equipment.
- (d) Remarks.

3. VOLTAGE MEASUREMENT

Measurements are taken with a 20,000 ohm per volt meter such as Simpson Model 260. Variations of  $\pm 10\%$  can be expected. Voltages are measured between ground and point indicated with amplifier operating under idling conditions 200 ma P. A. plate current. Refer to chart on circuit diagram for values, Figure 4, Page 13.

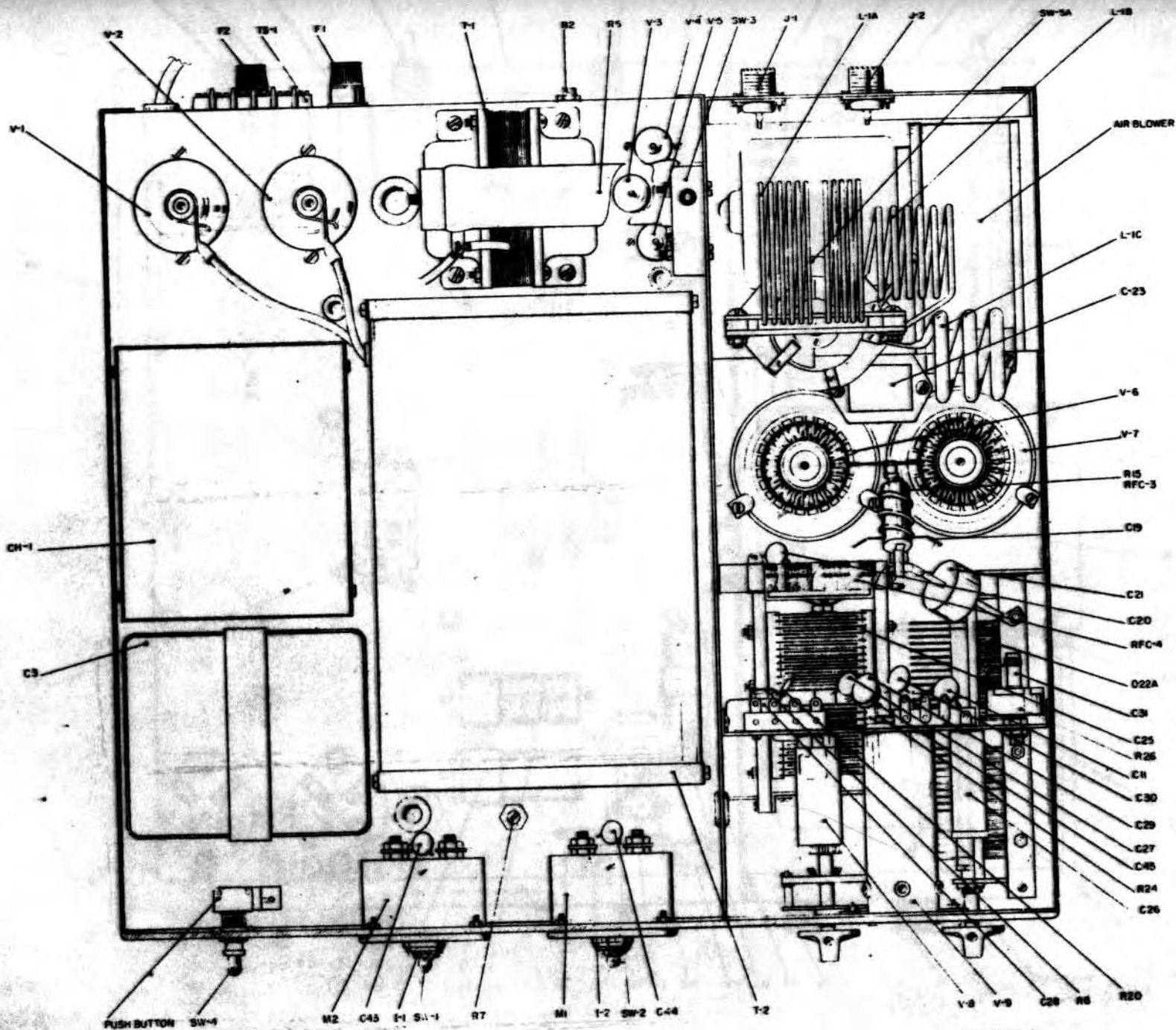


FIGURE NO. 2  
SSB-1000 TOP VIEW

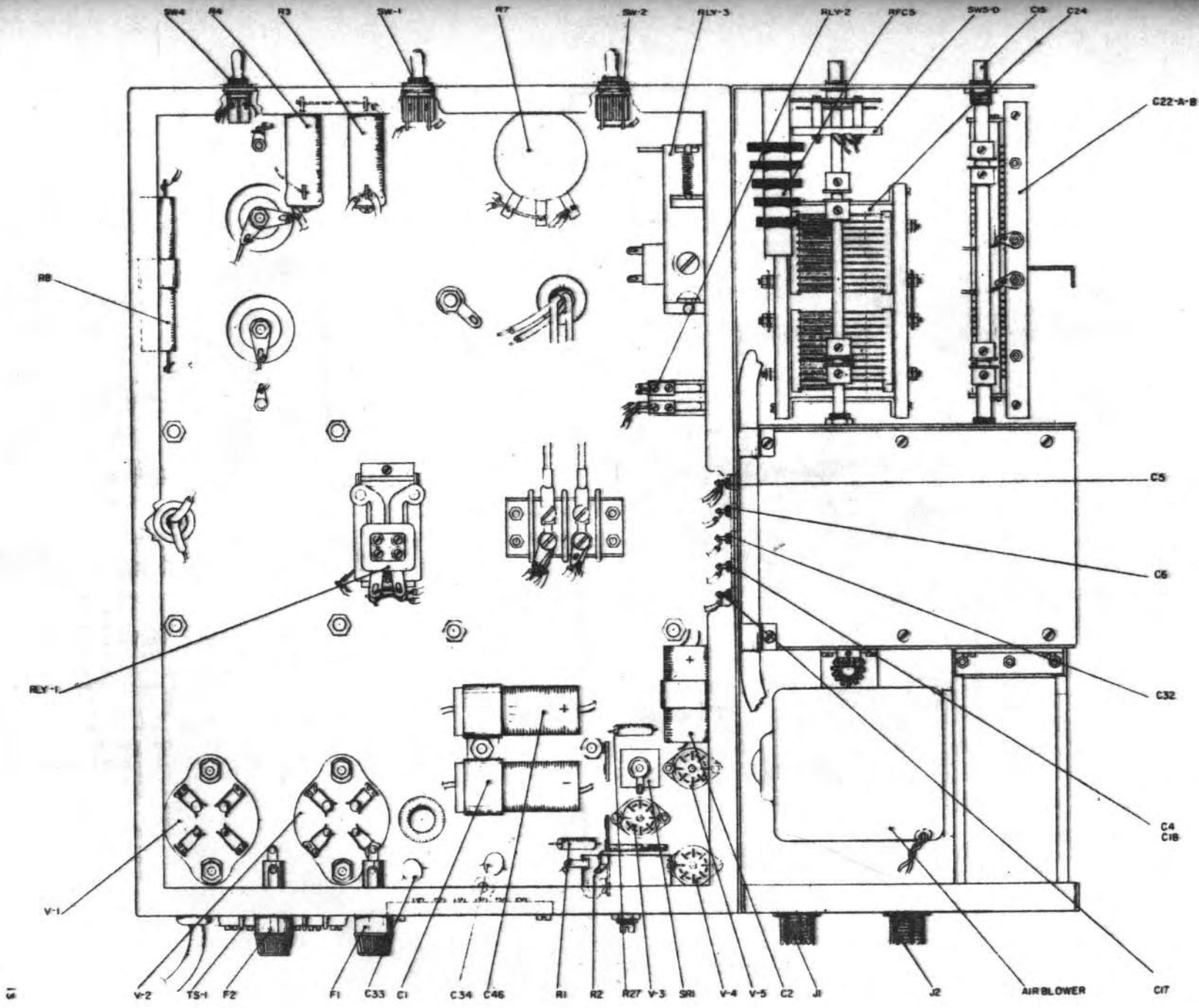
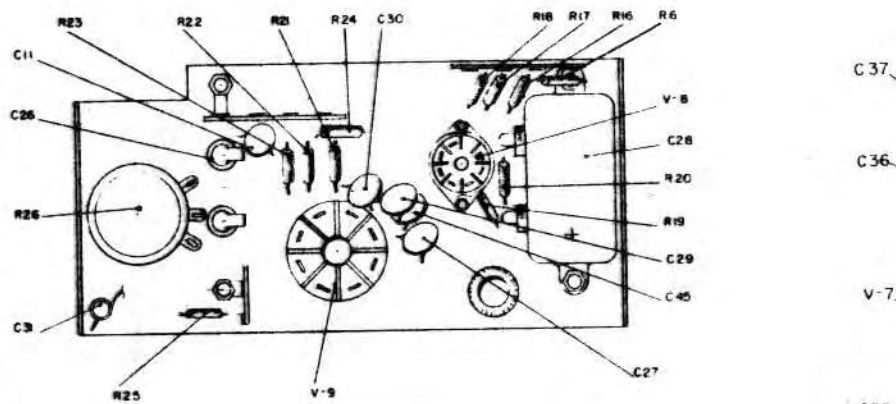


FIGURE NO 3  
SSB-1000 BOTTOM VIEW





C-17	0 VOLT
C-18	0 VOLT
C-4	0 VOLT
C-32	-60 VOLT
C-6	+405 VOLT
C-5	6.3 VOLT A.C.
4X250B PLATE	2000 VOLT

TUBE	PIN 1	2	3	4	5	6	7	8
V-8	0	0	0	6.3 AC	60	70	2	-
V-9	6.3 AC	1000	900	900	0	900	15	0

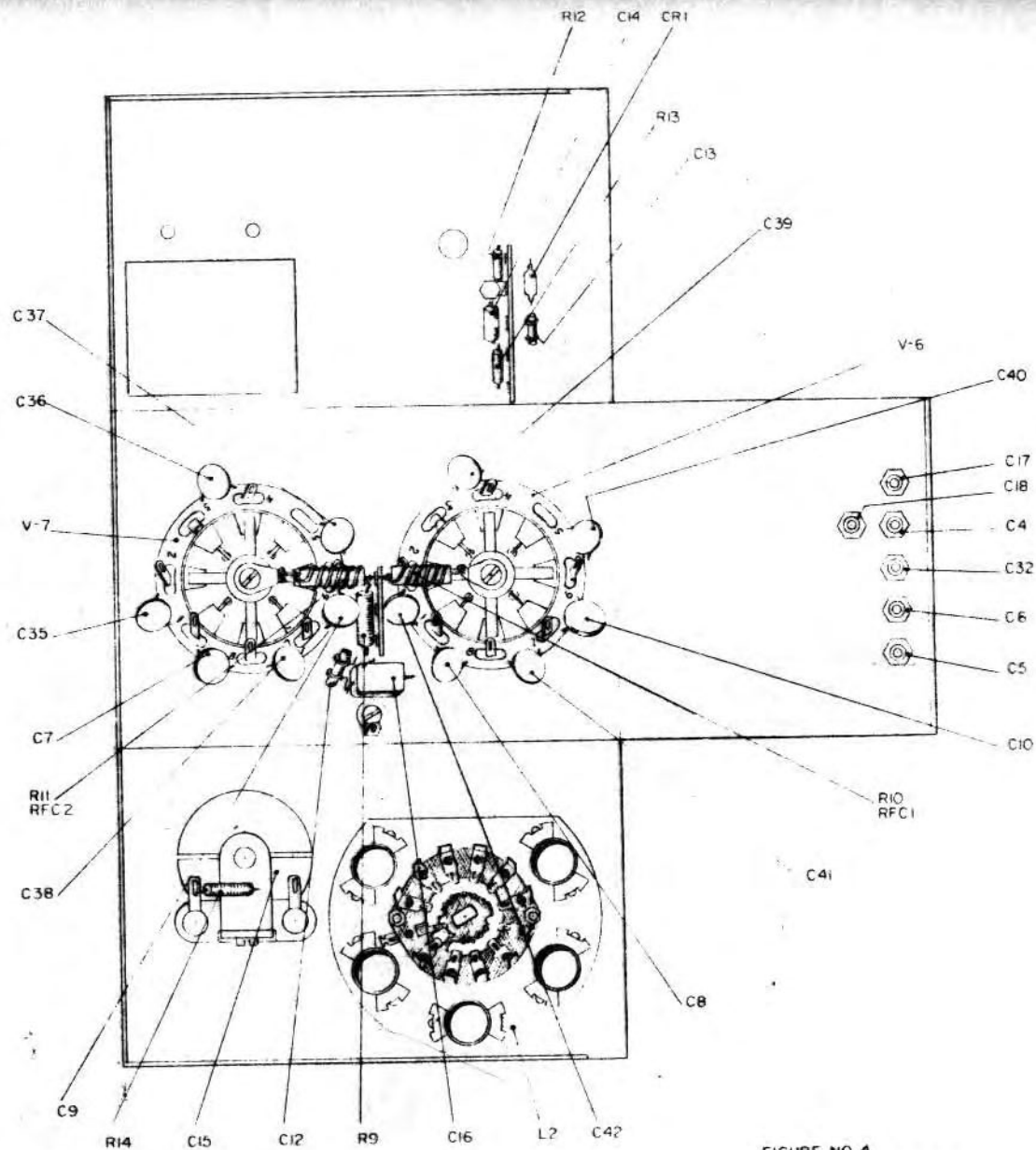
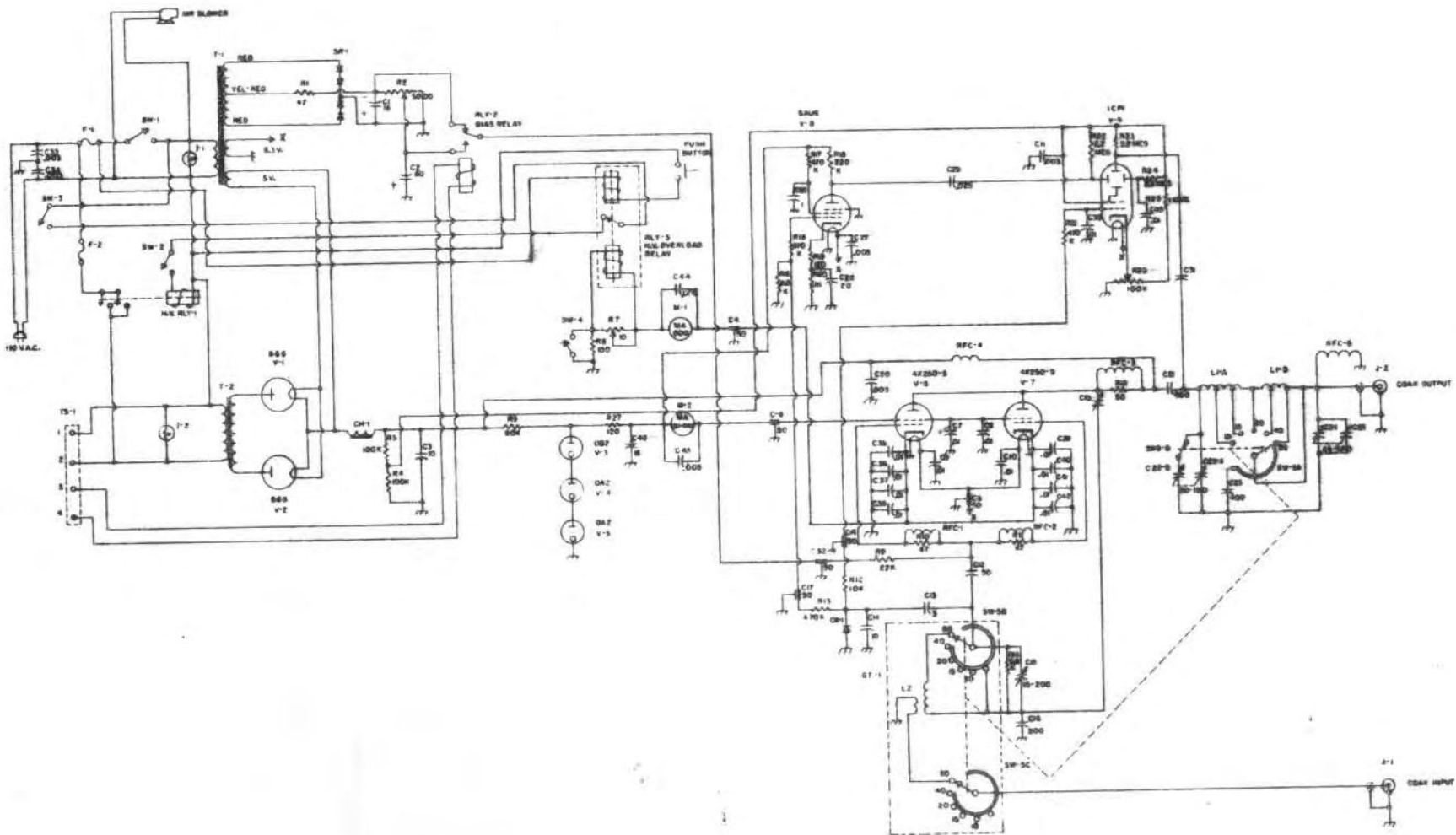
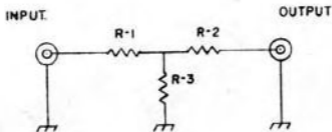


FIGURE NO. 4  
SSB-1000 GRID BOX AND  
SCOPE VIEW



558-000 CIRCUIT DIAGRAM  
FIGURE NO. 5



R-1, R-2, R-3 - 50 OHMS

ATTENUATOR

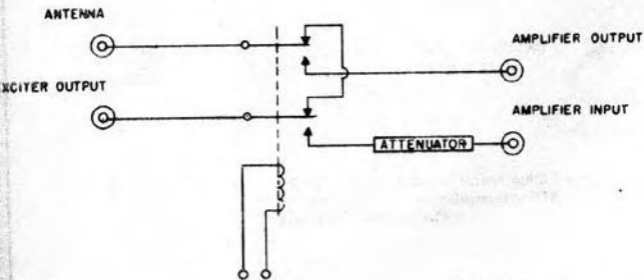


FIGURE NO. 6  
LOW POWER-HIGH POWER  
SWITCHING SYSTEM

# OSCILLOSCOPE PATTERNS



Unmodulated carrier or single test tone



AM pattern, about 60% modulation



AM pattern, 100% or more modulation  
SSB pattern, amplifier properly adjusted



Misadjusted amplifier, insufficient  
loading or excessive grid drive



Excessive grid bias on linear amplifier  
or nonlinearity in envelope-detector  
and deflection amplifier

FIGURE 110.7

## PARTS LIST

<u>ITEM</u>	<u>DESCRIPTION</u>
C-1	Condenser - Electrolytic 16 mfd, 450 volt
C-2	Condenser - Electrolytic 80 mfd, 150 volt
C-3	Condenser - Oil 10 mfd, 2000 volt
C-4	Condenser - Feed-through 50 mmfd, 600 volt
C-5	Condenser - Feed-through, 50 mmfd, 600 volt
C-6	Condenser - Feed-through, 50 mmfd, 600 volt
C-7	Condenser - Disc, .01 mfd, 600 volt
C-8	Condenser - Disc, .01 mfd, 600 volt
C-9	Condenser - Disc, .01 mfd, 600 volt
C-10	Condenser - Disc, .01 mfd, 600 volt
C-11	Condenser - Disc, .003 mfd, 2000 volt
C-12	Condenser - Ceramic, 50 mmfd, 600 volt
C-13	Condenser - Ceramic, 3 mmfd, 600 volt
C-14	Condenser - Ceramic, 10 mmfd, 600 volt
C-15	Condenser - Variable, 15-200 mmfd, 1000 volt
C-16	Condenser - Mica, 200 mmfd, 600 volt
C-17	Condenser - Feed-through, 50 mmfd, 600 volt
C-18	Condenser - Feed-through, 50 mmfd, 600 volt
C-19	Condenser - Neutralizing, Special
C-20	Condenser - Disc, .003, 2000 volt
C-21	Condenser - Ceramic, 500 mmfd, 10,000 volt
C-22 a, b	Condenser - Variable, 2-section, 15-180 mmfd, 2000 volt
C-23	Condenser - Mica, 400 mmfd, 2500 volt
C-24	Condenser - Variable, 2-section, 25-520, 1200 volt
C-25	Condenser - Variable, 25-520 mmfd, 1200 volt
C-26	Condenser - Bathtub, 1 mfd, 600 volt
C-27	Condenser - Disc, .005 mfd, 600 volt
C-28	Condenser - Electrolytic, .20 mfd, 50 volt
C-29	Condenser - Disc, .025 mfd, 600 volt
C-30	Condenser - Disc, .01 mfd, 600 volt
C-31	Condenser - Special
C-32	Condenser - Feed-through, 50 mmfd, 600 volt
C-33	Condenser - Disc, .003 mfd, 2000 volt
C-34	Condenser - Disc, .003 mfd, 2000 volt
C-35	Condenser - Disc, .01 mfd, 600 volt
C-36	Condenser - Disc, .01 mfd, 600 volt
C-37	Condenser - Disc, .01 mfd, 600 volt
C-38	Condenser - Disc, .01 mfd, 600 volt
C-39	Condenser - Disc, .01 mfd, 600 volt
C-40	Condenser - Disc, .01 mfd, 600 volt
C-41	Condenser - Disc, .01 mfd, 600 volt
C-42	Condenser - Disc, .01 mfd, 600 volt

C-43	Condenser - Disc .005 mfd, 600 volt
C-44	Condenser - Disc, .005 mfd, 600 volt
C-45	Condenser - Disc, .01 mfd, 600 volt
C-46	Condenser - Electrolytic, 16 mfd, 600 volt
CH-1	Choke - Swinging, 4-24 hy, 50-500 ma
CR-1	Crystal - Rectifier, 1N34A
F-1	Fuse and - Holder, 5 Ampere
F-2	Fuse-and - Holder, 15Ampere
I-1	Indicator Lamp and Assembly - 115 volt, 6 watt
I-2	Indicator Lamp and Assembly - 115 volt, 6 watt
J-1	Coax Receptacle - 83-1R
J-2	Coax Receptacie - 83-1R
L-a, b	Final Plate - Coil Assembly
L-2	Final Grid - Coil Assembly
M-1	Meter - 20-0-30 ma DC
M-2	Meter - 0-600 ma DC
R-1	Resistor - 47 $\Omega$ , 2 watt
R-2	Potentiometer - 5000 $\Omega$ , 25 watt
R-3	Resistor - 100 K, 25 watt
R-4	Resistor - 100 K, 25 watt
R-5	Resistor - 60 K, 100 watt
R-6	Resistor - 6.8 K, 1/2 watt
R-7	Potentiometer - 10 $\Omega$ , 10 watt
R-8	Resistor - 100 $\Omega$ , 25 watt
R-9	Resistor - 22K, 1 watt, carbon
R-10	Resistor - 47 $\Omega$ , 1 watt, carbon
R-11	Resistor - 47 $\Omega$ , 1 watt, carbon
R-12	Resistor - 10 K, 1/2 watt
R-13	Resistor - 470 K, 1/2 watt
R-14	Resistor - 5.6 K, 1 watt, carbon
R-15	Resistor - 50 $\Omega$ , 5 watt, Non-inductive
R-16	Resistor - 470 K, 1/2 watt
R-17	Resistor - 470 K, 1/2 watt
R-18	Resistor - 220 K, 1/2 watt
R-19	Resistor - 120 $\Omega$ , 1/2 watt
R-20	Resistor - 1 K, 1/2 watt
R-21	Resistor - 470 K, 1/2 watt
R-22	Resistor - 2.2 Meg, 1/2 watt
R-23	Resistor - 2.2 Meg, 1/2 watt
R-24	Resistor - 2.2 Meg, 1/2 watt
R-25	Resistor - 1 Meg, 1/2 watt
R-26	Potentiometer - 100 K, 3 watt

R-27	Resistor - 120Ω, 1/2 watt
RFC-1	Parasitic Choke, special
RFC-2	Parasitic Choke, special
RFC-3	Parasitic Choke, special
RFC-4	Radio-frequency Choke - .5 mh, 500 ma
RFC-5	Radio-frequency Choke - 1 mh, 500 ma
RLY-1	Relay - HV, 117 Vac, DPST contact, 30A
RLY-2	Relay - Bias switching, 117 Vac. DPDT contact
RLY-3	Relay - Overload 250-750 ma
SR-1	Selenium-Rectifier - 230 volt, 65 ma
SW-1	Switch - Toggle, SPST, 6A
SW-2	Switch - Toggle, SPST, 6A
SW-3	Switch - Interlock, SPST
SW-4	Switch - Toggle, SPST, tune-operate
SW-5 A-D	Bandswitch Assembly
T-1	Transformer - filament and bias
T-2	Transformer - High-voltage
TS-1	Terminal Strip - 4 Terminals
V-1	Rectifier - Type 866
V-2	Rectifier - Type 866
V-3	Voltage Regulator - Type OB-2
V-4	Voltage Regulator - Type OA-2
V-5	Voltage Regulator - Type OA-2
V-6	Final Amplifier - Type 4X250-B
V-7	Final Amplifier - Type 4X250-B
V-8	Deflection Amplifier - Type 6AU6
V-9	Oscilloscope - Type 1CP1

## WARRANTY

### Eldico Amateur Equipment

Eldico Corporation warrants this amateur product, manufactured by Eldico, to be free from defective material and workmanship, and agrees to remedy any defect or to furnish a new part in exchange for any part of any unit of its manufacture, which under normal installation, use and service, discloses such defect, provided:

1. Buyer has completed and returned to Eldico promptly following his purchase, the registration card included in the instruction manual furnished with the equipment.
2. Notice of the claimed defect is submitted in writing, to Eldico, within 90 days from the date of the original purchase.
3. Upon receipt of shipping instructions from Eldico, the unit is delivered by the owner to Eldico intact, for examination, with all transportation charges prepaid to our factory.
4. The examination discloses, in our judgment, that the product is thus defective.

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

Any part of a unit approved for remedy or exchange hereunder will be remedied or exchanged by Eldico Corporation without charge to the owner. This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our radio products. In no event shall Eldico have any liability for consequential damages, or for loss, damage or expense directly or indirectly arising from the use of the products, or any inability to use them either separately or in combination with other equipment or materials or from any other cause.

**IMPORTANT!** It is necessary that the business reply card included herewith be filled out and mailed to the Company promptly in order for this guarantee to be effective.





**ELDICO** ELECTRONICS

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