# INSTRUCTION BOOK

FOR

# RADIO RECEIVING EQUIPMENT
# MODEL SLR-H

FREQUENCY RANGE 0.53 TO 1.60 AND 5.55 TO 15.60 MCS.
SUPPLY 115 VOLTS 60 CYCLES, ONE PHASE

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# 1. INTRODUCTION

1.1 These instructions cover the installation, operation, and servicing of the MODEL SLR-H Radio Receiving Equipment. THEY SHOULD BE READ AND STUDIED WITH GREAT CARE BEFORE THE INSTALLATION OR OPERATION OF THE EQUIPMENT IS ATTEMPTED IN ORDER THAT OPTIMUM PERFORMANCE MAY BE OBTAINED.

# 2. GENERAL DESCRIPTION

2.1 The Model SLR-H Radio Receiving Equipment is suitable and is primarily intended for use aboard marine vessels of all types. It is equally suitable for use at radio shore stations.

2.2 The receiving equipment covers the frequency ranges of 0.53 to 1.60 and 5.55 to 15.6 megacycles in three frequency bands. It is specifically designed to provide optimum performance and high quality reception of voice or tone modulated and C.W. radio frequency signals, on all frequency bands, by head telephone or loudspeaker methods. For this reason, a beat frequency oscillator for the reception of radio telegraph signals is provided.

2.3 Special circuits and features are incorporated in the Model SLR-H Radio Receiver to preclude its oscillator feeding voltages into the antenna circuit and radiating interferences which could be detected by sensitive radio receiving or radio direction finding equipments in the same, or close vicinity.

2.4 The receiving equipment is designed for AC operation, being equipped with a self-contained rectifier type power supply for supplying all operating voltages required from an AC source of 110/125 volts, 58/62 cycles, single phase.

2.5 The audio frequency output circuits of the Radio Receiver are designed to permit the use of one pair of head telephones, separately, or in conjunction with one to five loud speakers of the permanent magnet type coupled to the receiver by means of the proper coupling transformers.

2.6 The Model SLR-H Radio Receiving Equipment consists of the Radio Receiver mounted in a metal cabinet.

2.7 The equipment is supplied with one set of vacuum tubes contained within the receiver. Two instruction books and one set of spare tubes are supplied with each equipment.

2.8 The net weights and overall dimensions of the major units of the complete equipment are listed in par. 8.16.

# 3. DESCRIPTION OF MAJOR UNITS

3.1 The Model SLR-H Radio Receiver is a 12 tube superheterodyne covering the frequency ranges of 0.53 to 1.60 and 5.55 to 15.6 megacycles in three frequency bands, as follows:

BROADCAST BAND
0.53 to 1.60 MEGACYCLES

SHORT WAVE BAND-1
5.55 to 9.55 MEGACYCLES

SHORT WAVE BAND-2
9.2 to 15.6 MEGACYCLES

3.2 This major unit employs the cabinet type of construction, with the cabinet suitably shock mounted and designed for top of table or bench mounting. The chassis design and construction are such that the chassis may be mounted in a standard, cabinet type, relay rack. However, this type of mounting is not recommended for installations where the equipment will be subjected to severe shock or vibration.

3.3 The Receiver unit contains, on a single chassis, all apparatus, (including power supply) necessary for taking energy from an antenna, amplifying and converting such energy into intermediate frequency energy, amplifying the intermediate frequency energy and then demodulating such energy into audio frequency energy for delivery, through an audio frequency amplifier to a phone jack on the front operating panel and/or one to five sets of loud speaker terminals at the rear of the chassis.

3.4 The electrical circuits of the Model SLR-H Radio Receiver employed for signal reception on all bands consist of one stage of radio frequency amplification, first detector (or mixer), a separate high frequency oscillator, two stages of intermediate frequency amplification at 455 kilocycles, a diode type second detector and noise limiter, one stage of resistance coupled audio amplification a combined phase inverter and push-pull driver stage and a push-pull output stage. The second detector utilizes one set of elements of a duo-diode, the other being used as a peak noise limiter. Likewise, the first audio amplifier tube is a twin-triode, the second set of elements being used as a beat-frequency oscillator, the output of which is coupled to the second detector.

3.5 The power supply section of the Receiver, which is employed for supplying the necessary voltages for the receiver circuits, is designed for operation from a 110/125 volt, 58/62 cycle, single phase source of AC power. The power supply includes a power transformer with RF input filter and a primary fuse, a vacuum tube rectifier, and a two section a-f filter.

3.6 Two audio output circuits are provided:

(1) A phone jack is mounted on the front panel and is supplied from one of the five output windings on the audio output transformer. This winding is directly connected to the O-600 ohm terminals at the rear of the chassis and to the phone jack through an attenuation network which limits the maximum available output at the phone jack to approximately 30 milliwatts. The phone jack is provided for monitoring purposes, by head telephone methods, since the receiver is primarily intended for loud speaker reproduction.

(2) The pair of speaker terminals referred to in (1) above are provided for the connection of the 600 ohm ouput of the Receiver to one permanent magnet type loudspeaker, through a 600 ohm matching transformer, which is supplied with each speaker equipment.

(3) Speaker terminals are also provided for connecting two, three, four or five speakers to the receiver, in which case each speaker is equipped with a 600 ohm matching transformer, and all speakers are connected in parallel and attached to the proper terminals on the rear of the Receiver.

(4) Each speaker is furnished with a "T" pad with which the volume on each individual speaker may be adjusted to any desired level.

(5) Where only one speaker is to be used on the installation NEVER turn the volume control on the receiver to maximum with the "T" pad in the minimum position as continued operation in this condition will burn out the windings on the "T" pad.

3.7 A balanced-line antenna jack is mounted on the rear of the Radio Receiver chassis for antenna connections. A hole in the rear of the cabinet provides access to the jack. A plug which mates with the jack is furnished as part of the complete equipment.

3.8 A power receptacle and mating plug are also provided at the rear of the chassis for AC power input connection. No power input cable is furnished.

3.9 The fuse in the primary circuit is mounted adjacent to the power input receptacle at the rear of the Receiver Chassis. The fuse mounting is of such design that the fuse, which is of the miniature cartridge type is replaceable without the use of tools, and without the necessity for the removal of the Receiver from the cabinet.

3.10 Facilities are also provided, in the rear of the chassis, for connecting a phonograph pickup to the input circuits of the audio frequency amplifier. With the necessary switching completed, the radio frequency circuits are rendered ineffective during operation of the audio frequency circuits in conjunction with a phonograph pickup.

3.11 A Receptacle E-124 located at the rear of the chassis is provided so that when the mating plug, which is attached to the Rotary Converter, is plugged in, both the Receiver and Rotary Converter can be turned ON and OFF by means of the POWER switch on the front operating panel of the Receiver.

## 4. TUBE COMPLEMENT

4.1 The vacuum tubes employed in the Model SLR-H Radio Receiver are as follows:

| *Symbol* | *Type* | *Function* |
|---|---|---|
| V-101 | 6K7 | R.F. Amplifier |
| V-102 | 6J5 | H.F. Oscillator |
| V-103 | 6SA7-GT | First detector and Mixer |
| V-104 | 6SK7-GT | First I.F. Amplifier |
| V-105 | 6SK7-GT | Second I.F. Amplifier |
| V-106 | 6H6-GT | Second Detector, A.V.C. |
| V-107 | 6SN7-GT | First A.F. Amplifier, B.F.O |
| V-108 | 6SN7-GT | Phase Inverter |
| V-109 | 6V6-GT | A.F. Power output |
| V-110 | 6V6-GT | A.F. Power output |
| V-111 | 6E5 | Tuning Indicator |
| V-112 | 5U4-G | Rectifier (Full Wave) |

## 5. POWER REQUIREMENTS

5.1 The Model SLR-H Radio Receiver is designed for operation from a 110/125 volt, 58/62 cycle single phase power source. The line current at 115 volts is 0.82 amps. The nominal power consumption at 115 volts is 95 watts.

## 6. ANTENNA REQUIREMENTS

6.1 The input circuit of the Model SLR-H Receiver is so arranged as to be suitable for use with either a balanced feed-line or a single wire antenna system.

6.2 **Caution**—a lightning arrestor of the neon tube type *must* be used on all antenna installations. When using a two-wire feed line, a dual type arrestor must be used.

6.3 Where it is desired to use a single wire antenna, a flexible lead must be connected to the "B" prong of the antenna plug and this lead connected to the ground terminal of the Receiver which is adjacent to the antenna jack. The antenna lead-in is then connected to the "A" terminal of the antenna plug. The dimensions of a single wire antenna are not critical. The recommended minimum overall length of antenna and lead-in is fifty feet. The recommended maximum overall length is two hundred feet.

6.4 In an installation having a balanced feed-line, connect the two wires of the lead-in directly to the two terminals of the antenna plug.

6.5 In an installation having a concentric feed-line, connect the outer conductor to the "B" prong of the antenna plug which is adjacent to the ground terminal of the receiver. Connect the inner conductor of the feed-line to the "A" prong of the antenna plug. The outer conductor of the feed-line must then be connected to the ground terminal of the chassis.

## 7. INSTALLATION

7.1 The Model SLR-H Equipment with one full complement of vacuum tubes, and one antenna connecting plug, is shipped in a single wooden packing box. Two instruction manuals, and one set of spare tubes are also contained in the same packing box.

7.2 After unpacking the equipment it should be inspected for any possible damage that might have resulted from careless handling in transit. Make certain that all vacuum tubes are firmly seated in their respective sockets. Inspection of the chassis and vacuum tubes may be readily effected upon the removal of the chassis from the cabinet. This is accomplished by loosening the four thumb screws and removing their respective retaining plates at either side of the front panel. Then remove the two retaining screws in the rear of the cabinet. The Receiver chassis may then be removed from the cabinet, using the two handles on either side of the front panel to accomplish this. The two retaining screws in the rear of the cabinet may be left out when the receiver is mounted permanently.

7.3 The mounting base to which the shock mounts for the Receiver are attached is drilled with four mounting holes. The location and size of the mounting holes are such as permit the use of sufficiently large screws or bolts to provide a secure mounting for the Receiver when the mounting base is fastened on the top of an operating table or bench.

7.4 In planning an installation, care should be taken to provide adequate clearance from the back of the Receiver to the bulkhead or nearest obstruction in order to provide access to the power input plug, speaker output, or phonograph input terminals, fuse, or the movement of feeder cables when withdrawing the chassis from the cabinet for servicing or tube replacement.

7.5 A monitor loudspeaker of the permanent magnet type with a 600 ohm matching transformer is used with each SLR-H Equipment. This speaker is furnished with suitable brackets for mounting the speaker to the wall of the radio room or to the bulkhead. Holes are also provided in the bottom of the speaker case so the speaker may be mounted securely to a table or other flat surface. A 12 foot two conductor cable is furnished with each speaker, which should be used to connect the speaker to terminals O-600 (0-1) on the rear of the Receiver chassis.

7.6 On installations where additional speakers are to be connected to the Receiver they should be connected in parallel and connected to the proper terminals on the rear of the Receiver as shown in the chart below. A shielded two conductor cable must be used where the speaker is located more than 25 feet from the Receiver.

| *Number of Speakers* | *Connect to Terminals* |
|---|---|
| 1 | 0-1 (600) |
| 2 | 0-2 (300) |
| 3 | 0-3 (200) |
| 4 | 0-4 (150) |
| 5 | 0-5 (120) |

7.7 Where a six inch monitor loudspeaker is furnished, it should be mounted adjacent to the Model SLR-H Receiver and used for monitoring the receiver when tuning in programs so that sufficient volume will be furnished all other speakers installed on the ship.

7.8 After the installation has been completed, the "T" Pads on all speakers should be advanced to maximum volume position, a program tuned in and the audio gain control of the Receiver adjusted to give the desired volume at the various speakers. The "T" Pad on the monitor speaker should then be turned back to give the desired volume required at the monitoring position and this point marked on the speaker case, opposite the pointer on the knob.

CAUTION: NEVER FORCE THE KNOB ON THE SPEAKER CONTROL PAST THE STOP. IF MORE VOLUME IS DESIRED THE VOLUME CONTROL ON THE RECEIVER MUST BE ADVANCED.

7.9 A phonograph pick-up may be attached to the Receiver at terminals E-102 at the rear of the chassis. These terminals are marked PHONO and GND for convenience in making the desired connections. If the pick-up is a high impedance type it may be connected directly to terminals E-102, if low impedance, a matching transformer must be used.

## 8. CONSTRUCTION

8.1 The Model SLR-H Radio Receiver is primarily designed for top of table or bench mounting. It is furnished with its chassis housed in a metal cabinet supported from its mounting base with rubber shock-mounts at the four bottom corners of the cabinet. The front panel, to which the chassis is secured forms the enclosure for one side of the cabinet. The general appearance and type of construction employed are shown in figures 1 and 2.

8.2 The cabinet is of fabricated construction with ventilating louvers in its two sides and clearance apertures in the rear for access to the antenna plug, power input receptacles, fuse and speaker and phonograph terminals.

8.3 The chassis assembly is rigidly secured to the front panel. All component items, exclusive of those mounted on the front panel entering into the construction of the Receiver, are mounted either on top or underneath the chassis structure. The chassis and front panel form a basic assembly capable of being inserted or withdrawn from the cabinet as a unit.

8.4 When the chassis assembly is housed in the cabinet, it is secured to the cabinet by the front panel, through the use of eight knurled, captivated type thumb screws which pass through four slots in opposite edges of the panel and engage with suitable inserts in the flanged sides of the front opening of the cabinet. The captivated type thumb screws are retained, when loosened in groups of four, in removable angles which also serve as trim for the front side corners of the cabinet by concealing the mounting screw slots in the front panel. Two handles are conveniently arranged on the front panel to permit the insertion or removal of the chassis assembly without subjecting any of the operating controls to strain.

8.5 The construction of the chassis assembly and the arrangement and mounting of the component parts are clearly depicted in figures 3 to 6 inclusive. All vacuum tubes are accessible from the top of the chassis upon removal of the chassis from the cabinet. The design and construction of the chassis assembly and the arrangement of the component items mounted thereon provides a high degree of accessibility to all items for inspection, servicing, or replacement. A bottom cover plate not shown in figures 5 and 6 completely encloses the bottom of the chassis proper. It is provided as an additional shield and for the protection of the under side chassis mounted components against damage due to careless handling. It is secured to the chassis with machine screws so that it is readily removable when necessary to make repairs.

8.6 The receiver panel layout is shown in figure 1, and the location and functions of the various controls are described in section 10, operating instructions.

8.7 The Model SLR-H Radio Receiver is especially designed to minimize radiation from the H.F. oscillator. This is accomplished by isolating the antenna input circuits from the first detector or mixer and the H.F. oscillator circuits, through the use of extensive shielding and filtering, and by the use of a type of construction which reduces to practical limits undesirable circuit coupling by virtue of circulating currents in common shields.

8.8 A separate shielded compartment, designed as a complete sub-assembly, contains all the circuit elements between the antenna input and the signal grid of the R.F. amplifier tube. This sub-assembly as pictured in figures 3 to 6 inclusive, is mounted at the rear center of the chassis, and is centrally disposed above and below the chassis. Details of the construction of the shielded compartment and the arrangement and mounting of the component parts, which it contains, are shown in figure 8. The figure depicts an oblique rear view of the shielded compartment with the sides removed or opened to display the internal components. The compartment as pictured, is inverted with respect to its normal position in the chassis.

8.9 A second shielded compartment constructed and mounted in the same manner as that containing the antenna circuit elements, but larger in overall dimensions, contains all of the circuit elements from the R.F. amplifier tube to the first I.F. amplifier input transformer, and includes also all circuit elements associated with the high frequency oscillator. This compartment, as pictured in figures 3 to 6 inclusive is mounted on the chassis between the front panel and the compartment containing the antenna input circuit elements. The arrangement and mounting of the circuit components are depicted in figure 7 which shows an oblique view of the sub-assembly with the bottom cover plate removed to show the disposition of the internal circuit components. This view depicts the sub-assembly in an inverted position with respect to its normal position in the Receiver. Circuit components, associated with the compartment sub-assembly and not visible in figure 7 are shown in figure 4 which shows the two compartment sub-assemblies, described above in their normal positions but with their top shield cover plates removed.

8.10 Insulated mechanical couplings are employed for joining together the shafts of the tuning capacitors and band selector switches in the two shielded compartments. These couplings are shown in figures 3 to 6 inclusive. The R.F. amplifier tube is mounted in a horizontal position in a socket which is provided with a clamp for securing the tube in place. The socket is mounted on the rear wall of the large compartment and all wiring thereto is contained within the shielded compartment. The vacuum tube then projects into the side of the compartment containing the antenna circuit components, and connection to the signal grid cap is made within this compartment. The internal shields of the vacuum tube isolates the signal grid circuit from the plate circuit, and in effect completes the shielding of the antenna circuit compartment so that these circuits are electrically isolated from the plate circuit of the R.F. amplifier tube insofar as stray coupling from the H.F. oscillator is concerned.

8.11 Removable cover plates, secured with thumb screws, are provided on the two shielded compartments for access to the vacuum tubes contained within. Similar cover plates on the bottoms of the shielded compartments are secured with conventional machine screws. Either the top or bottom cover plate, as described above must be removed for access to the circuit trimmers of the R.F. amplifier, 1st detector and H.F. oscillator, since it is not possible to provide access holes in the plates themselves, without compromising the shielding integrity of the Receiver.

8.12 The secondary windings of the antenna coupling transformers feeding the grid of the R.F. amplifier tube are provided with individual adjustable iron cores for inductance trimming and adjustable mica dielectric trimmer capacitors for capacity trimming during circuit alignment. Adjustment of the trimmer capacitors is afforded through access holes in the rear of the shielded compartment housing these transformers. Corresponding holes in the rear of the chassis and cabinet permits the adjustment of the trimmer capacitors as a final adjustment in the installation of the equipment for optimum performance with the specific antenna employed, without the necessity for the removal of the receiver chassis from its cabinet. Access to the adjustable iron cores is provided upon the removal of the top cover plate of the shielded compartment containing the antenna coupling transformers.

8.13 The R.F. transformers coupling the plate of the R.F. amplifier tube with the signal grid of the first detector, are each provided with both inductance trimmers, and capacity trimmers for purposes of alignment of these circuits with the H.F. oscillator circuits. Access to all trimmers, either capacitive or inductive is afforded upon the removal of the bottom cover plate from the shielded compartment containing these transformers.

8.14 The inductors employed in the high frequency oscillator circuits are similarly provided with adjustable powdered iron cores, and adjustable air dielectric trimmer capacitors for inductance and capacity trimming. These adjustable trimmers together with "padder" capacitors permit the tracking of the H.F. oscillator circuits with the R.F. amplifier circuits. The "padder" capacitors are, except for the BROADCAST BAND, of the fixed molded mica dielectric type. In the BROADCAST BAND an adjustable air dielectric capacitor is employed in parallel with the fixed capacitor. All adjustable trimmer and padder capacitors are accessible for adjustment upon the removal of the bottom plate of the compartment containing these circuit elements.

8.15 The cabinet, front panel and mounting base of the Receiver have a standard black wrinkle finish. All metallic parts which enter into the construction of the chassis are finished with a suitable plating or paint to provide: first, a high degree of protection to these parts against the deleterious effects of corrosion; and second, a chassis assembly presenting a pleasing appearance.

8.16 The dimensions and weights of the Major Units are as follows;

1. SLR-H Radio Receiver:

*Dimensions.*

| | *Chassis in Cabinet* | *Chassis Only* |
|---|---|---|
| Length | 20.5 inches | 19 inches |
| Depth | 18.5 inches | 18.5 inches |
| Height | 13.75 inches | 10.5 inches |

Weights:

Chassis in Cabinet—104 pounds
Chassis Only — 80 pounds

## 9. CIRCUIT DESCRIPTION

### 9.1 GENERAL

9.11 The actual schematic diagram of the Model SLR-H Radio Receiver is shown in figure 9. For purposes of illustration it will be assumed that the circuits are set up as for signal reception on SHORT-WAVE BAND 2, as depicted in the diagram. The following description will refer, therefore to the symbol numbers of the circuit elements of the band as or when pertinent to the description. It shall be assumed that unless otherwise specifically noted, the description will be equally applicable to SHORT-WAVE BAND 1 and BROADCAST BAND.

### 9.2 SIGNAL FREQUENCY CIRCUITS

9.21 Signal input to the receiver through antenna jack J-103 is connected to the primary winding of antenna input transformer T-103 by switch S-102E. An electrostatic shield, at ground potential, separates the secondary from the primary winding. The secondary winding together with variable air dielectric capacitor C-135 and series capacitor C-114 constitutes the first tuned circuit. Transfer of R.F. signal at the resonant frequency of this tuned circuit from the antenna to the control grid of R.F. amplifier tube V-101, is accomplished by inductive coupling through antenna input transformer T-103. Variable capacitor C-135 is ganged with variable capacitors C-134A and C-134B to provide uni-controlled tuning of the receiver. Capacitor C-114 is shorted out for the BROADCAST BAND and its selection and proper connection is controlled by switch S-102D. The secondary winding of transformer T-103 is provided with adjustable iron core E-105 for inductance trimming and a shunt connected, variable, mica dielectric capacitor C-127 for capacity trimming. These trimmer elements permit the accurate alignment of the tuned circuit, at both ends of the frequency band, and are accessible for adjustment as described under section 8. The high potential end of the tuned circuit is connected to the control grid of R.F. amplifier tube V-101 by switch S-102D and through coupling capacitor C-104. The low potential end of the tuned circuit is returned to ground. The DC bias return from the control grid of R.F. amplifier tube V-101 to the A.V.C. bus is closed through grid resistor R-137.

9.22 Plate potential from the high voltage DC bus is applied to the plate of R.F. amplifier tube V-101 through decoupling filter resistor R-109, bypassed to ground by capacitor C-145B, and RF inductor L-101. Screen potential, also obtained from the high voltage DC bus, is applied to the screen through a decoupling filter consisting of filter resistor R-124 and bypass capacitor C-145C. The suppressor is connected to the side of the heater circuit which is operated at ground potential. Initial bias is obtained by means of cathode resistor R-106, bypassed by capacitor C-145A.

9.23 The amplified signal voltage from the plate of R.F. amplifier tube V-101 is applied to the primary winding of R.F. transformer T-106 through coupling capacitor C-105, by switch S-102C. The low potential end of the primary winding is returned to ground. The secondary winding of transformer T-106 together with variable air dielectric tuning capacitor C-134B and series connected capacitor C-115 (the latter employed for the same purpose and in the same manner as capacitor C-114), constitute the second and final tuned circuit operating at the signal frequency. Transfer of signal energy from the plate circuit of R.F. amplifier tube V-101 to the control grid of first detector tube V-103 is accomplished by inductive coupling through R.F. transformer T-106 and by the connection of the high potential end of the tuned circuit to the control grid of first detector tube V-103 by switch S-102C, through coupling capacitor C-106. The low potential end of the tuned circuit connects to ground. Adjustable iron core E-108 and parallel connected variable, mica dielectric trimmer capacitor C-129 are associated with the tuned circuit for purposes of circuit alignment and are accessible for adjustment as described in section 8. The DC bias return from the control grid of first detector tube V-103 to the A.V.C. bus is closed through grid resistor R-138.

9.24 Screen potential from the high voltage DC bus is applied to the screen of first detector tube V-103 through RF inductor L-102, bypassed to ground by capacitor C-107 and thence through decoupling filter resistor R-117, bypassed to ground by capacitor C-143B. The suppressor is internally connected to the shell of the tube. Initial bias is obtained by means of cathode resistor R-105, bypassed to ground by capacitor C-143A.

### 9.3 HIGH FREQUENCY OSCILLATOR CIRCUITS

9.31 The H.F. oscillator circuit is of the "electron coupled" type. The tuned circuit consists of tapped inductor element T-109, shunted with variable air dielectric trimmer capacitor C-132 and tuned with variable air dielectric tuning capacitor C-134A, series connected capacitor C-116 and padder capacitor C-123. Capacitor C-116 is shorted out by the switch S-102B for the BROADCAST BAND. The inductor element is also provided with adjustable iron core E-111 for inductance trimming. Padder capacitor C-123 is used to modify the tuning of the H.F. oscillator so that it will maintain a fixed frequency difference of 455 kilocycles with respect to the signal frequency when tuning capacitors C-134A, C-134B, and C-135 are varied simultaneously from minimum to maximum capacity. The high potential end of the oscillator tuned circuit is connected, by switch S-102B, through coupling capacitor C-112 to the control grid of the H.F. oscillator tube V-102. This grid is returned to ground through grid resistor R-122 for DC bias return. The low potential end of the tuned circuit is also returned to ground. The cathode of H.F. oscillator tube V-102 is connected, by switch S-102B, to the tap on inductor element T-109 and through coupling capacitor C-111 to the oscillator injector grid of first detector tube V-103. This grid has a DC return to ground through grid resistor R-118.

9.32 The plate of H.F. oscillator tube V-102 is connected to the high voltage DC bus through decoupling filter resistor R-116, bypassed to ground by capacitor C-144B, and RF filter inductor L-103, bypassed to ground by capacitor C-108. One side of the heater circuit operates at ground potential while the other side is filtered by capacitors C-144A and C-109 and RF filter inductor L-104.

### 9.4 I.F. AMPLIFIER CIRCUITS

9.41 The signal frequency arriving at the control grid of first detector tube V-103 and the H.F. oscillator frequency arriving at the injector grid of this tube are mixed (or heterodyned) and the resultant difference frequency (455 kilocycles) is fed to the input of the intermediate frequency amplifier.

9.42 Transfer of intermediate frequency energy, from the first detector tube V-103 to second detector tube V-106 is accomplished by inductive coupling through I.F. transformers T-110, T-111 and T-112 and amplified through I.F. amplifier tubes V-104 and V-105. First I.F. transformer T-110 consists of two tuned circuits, primary and secondary, with the secondary tuned circuit operating in conjunction with switch S-101B, resistors R-103 and R-104 and a tertiary winding to provide three degrees of selectivity by changing the electrical constants of the secondary tuned circuit and its coefficient of coupling with the primary tuned circuit. The primary and secondary windings are each tuned to the intermediate frequency by fixed, mica dielectric capacitors C-117 and C-118, augmented by adjustable iron cores E-112 and E-113, provided for inductance trimming, and accessible through the top and bottom of the transformer shield can. The high potential end of the primary tuned circuit connects to the plate of first detector tube V-103 through a shielded conductor, while the low potential end connects to the high voltage DC bus through decoupling filter resistor R-110, bypassed to ground by capacitor C-137A. The high potential end of the secondary tuned circuit is connected to the grid of first I.F. amplifier tube V-104 while the low potential end is connected to the A.V.C. bus through filter R-133 and C-137B.

9.43 Screen potential from the high voltage DC bus is applied to the screen of first I.F. amplifier tube V-104 through decoupling filter resistor R-125, bypassed to ground by capacitor C-138B. Initial cathode bias is applied through bias resistor R-107, bypassed by capacitor C-138A.

9.44 Second I.F. transformer T-111 is identical to first I.F. transformer T-110, with respect to its design, construction, and operating characteristics. Accordingly, except for differences in circuit symbol designations, which becomes obvious upon examination of Figure 9, the circuit description of paragraph 9.42 is applicable to this transformer in all details, except that the low potential end of the secondary tuned circuit is returned to ground instead of to the A.V.C. bus.

**9.45** The circuit arrangement of second I.F. amplifier tube V-105 is the same, except for symbol designations, as described for the first I.F. amplifier tube V-104, in paragraph 9.43 above. No automatic control of control grid bias is provided for this tube however.

**9.46** Third I.F. transformer T-112 contains a tuned primary circuit and an untuned secondary circuit. The primary tuned circuit consists of the primary winding shunted by fixed, mica dielectric capacitor C-113 and permeability tuned by adjustable iron core E-116 which is accessible, for adjustment through the bottom of the transformer shield can. Plate potential to the plate of third I.F. amplifier tube V-106 is applied from the high voltage DC bus through the primary winding and decoupling filter resistor R-112, bypassed to ground by capacitor C-139C. The high potential end of the secondary winding feeds the second detector diode while its low potential end connects to the A.V.C. bus.

### 9.5 SECOND DETECTOR CIRCUITS

**9.51** Tube V-106 is a twin diode tube, one section is used as a second detector, the plate of which is connected to the high potential end of the secondary winding of third I.F. transformer T-112. The cathode is grounded, thus the tube acts as a half-wave rectifier. The voltage appearing across diode load resistor R-135 is filtered by resistor R-139 and condenser C-140A and the resultant DC A.V.C. voltage is used to control the gain of amplifier tubes V-101, V-103, V-104, the degree of control being dependent on the strength of the incoming signal. The other half of the twin diode tube V-106 is used in a peak noise limiter circuit, which reduces peak noise levels to a degree where weak signals may be received through very heavy noise levels.

**9.52** The voltage across diode load resistor R-135 is also filtered by resistor R-142 and capacitor C-141A and the resultant DC voltage is applied to the control grid of electron-ray indicator tube V-111. This DC voltage regulates the shadow angle of the electron-ray tube to indicate when the receiver is properly tuned to resonance with the received signal.

### 9.6 A.F. AMPLIFIER CIRCUITS

**9.61** The AF voltage developed across the diode load resistor R-135 as the result of the demodulating action of the second detector tube V-106, is applied to the control grid of first A.F. amplifier tube V-107, through coupling capacitor C-136 by switch S-101A and VOLUME control potentiometer R-145.

**9.62** Switch S-101A is ganged with switch S-101B and S-101C. It operates to transfer the input to VOLUME control potentiometer R-145 and hence, the input circuits of first A.F. amplifier tube V-107 from the second detector circuit to PHONO terminals E-102 to permit the operation of the audio amplifier system of the Receiver with a high impedance phonograph pickup. Low impedance pick-ups may also be employed provided that their connection to E-102 are made through suitable matching transformers.

**9.63** Amplification of the A.F. signals from the second detector is accomplished by resistance-capacity coupling between the first and second A.F. amplifier tubes V-107 and V-108, respectively, and the output tubes V-109 and V-110. Transfer of audio frequency energy from the plates of output amplifier tubes V-109 and V-110 to headphone jack J-101 and loudspeaker terminals E-122, is accomplished through output transformer T-113 which matches the plate impedance of the tubes with the separate loads with which the set is designed to operate.

**9.64** Variable potentiometer R-146 and series connected capacitor C-149 constitutes the control for regulating the fidelity of the audio amplifier system of the Receiver. The series combination is connected between the plate of the first A.F. amplifier tube V-107 and ground.

### 9.7 RECTIFIER POWER CIRCUITS

**9.71** The proper AC heater potential for all vacuum tubes except the rectifier is obtained from the secondary winding of power transformer T-114. One side of this secondary is operated at ground potential. Another secondary winding supplies filament potential for rectifier tube V-112. High voltage AC plate potential from a third winding of the transformer is applied to the plates of rectifier tube V-112. The rectified pulsating potential is derived from the filament of V-112 and fed to a two section filter consisting of L-105, L-106, C-154, C-101, C-102 and C-103.

**9.72** The AC power input line to the primary winding of power transformer T-114 is filtered by capacitors C-142A and C-142B to prevent stray R.F. potentials from being applied across the primary winding. Power is applied through switch S-103.

### 9.8 C.W. OSCILLATOR CIRCUITS

9.81 The C.W. oscillator uses one of the triode sections of V-107, the other being used as the first A-F amplifier. The C.W. oscillator circuit normally operates at the I-F frequency, 455 kilocycles. It provides an R-F potential with which an unmodulated I-F signal at the second detector can heterodyne to produce an audible beat note and is intended for the reception of C.W. signals. The frequency of the C.W. signal is determined by inductor L-107, parallel connected capacitor C-157 and adjustable iron core E-131. The circuit of the C.W. oscillator is of the "Hartley" type. A variable air-dielectric capacitor C-160 is connected across L-107 and is controlled by the "C.W. OSC." knob from the front operating panel within narrow limits. Potential from the C.W. oscillator tube V-107 is coupled by means of fixed capacitor C-159, to the second detector diode plate of V-106. Plate potential is applied to the plate C.W. oscillator tube V-107 through resistor R-150 bypassed to ground by filter capacitor C-158. The grid circuit is closed to ground by R-151 and forms a grid-leak combination with capacitor C-156.

## 10. OPERATING INSTRUCTIONS

**10.1** All switches and controls (with the exception of the main tuning control) of the Receiver are identified by panel engraving.

**10.2** The main tuning control knob E-119 is centrally located near the bottom of the front panel and is secured to a shaft which drives the ganged, main tuning capacitors through a friction operated mechanical drive. The mechanical drive also controls the movement of dial pointer N-104, through a system of pulleys and a flexible bronze cable across the face of main tuning dial, N-105. Dial disc N-102 which carries a linear dial scale and operates in conjunction with fixed index plate N-103, is rotated by the tuning drive mechanism in such a manner that one rotation is completed with a complete traverse of dial pointer N-104 across the face of the dial. Main tuning dial N-105 is of lucite with white scale markings and characters on a black background. This dial carries a frequency scale for each band. The Lucite dial is framed with escutcheon plate H-106, fitted with a transparent shatter-proof lense, indirect dial illumination is afforded by edge lighting of the lucite dial plate, from suitable dial lamps mounted behind the panel and at the two sides of the dial plate.

**10.3** The VOLUME control R-145 is located at the left of the main tuning control and is operated by control knob E-118. The control is a dual potentiometer. The outside section R-145B controls the gain of the R-F amplifier tube V-101 and the first I-F and second I-F amplifier tubes V-104 and V-105 when the selectivity switch is in the C.W. position. The inside section of the gain control R-140A is used to control the input signal to the audio amplifier.

**10.4** The FIDELITY control, located at the left of the VOLUME control is operated by control knob E-117. It is a rheostat which operates in conjunction with a series connected fixed capacitor, in the plate circuit of the first A.F. amplifier tube to limit the high frequency response of the receiver. Full clockwise to full counter-clockwise rotation of this control affords a continuous reduction of the high frequency audio response. The control should be adjusted to an extreme clockwise setting for high fidelity reception. For such reception, the SELECTIVITY control, described in paragraph 10.8 should be set at BROAD.

**10.5** Immediately above the FIDELITY control is mounted PHONE jack J-101 which is provided to permit monitoring of the received signals by head telephone methods, as described in previous portions of these instructions.

**10.6** The power on-off switch located at the upper left hand corner of the front panel is connected in the AC power line of the Receiver, and is provided to apply or remove line power to or from the Receiver.

**10.7** A BAND SELECTOR switch, operated by control knob E-120, is located at the right of the main tuning control knob E-119. This control operates to select the R.F. and high frequency oscillator circuits for the three frequency ranges covered by the Receiver. The settings of this switch for the three frequency bands covered by the receiver are marked SW2, SW1, and BC, in left to right sequence.

**10.8** The SELECTIVITY control is located adjacent to the BAND SELECTOR switch. Its five positions are; C.W., SHARP, MEDIUM, BROAD and PHONO. When the SELECTIVITY switch is set to the C.W. position, the C.W. OSC. circuit is operating, the sensitivity section of the gain control is switched into the circuit so that the gain of the R-F. first and second I-F amplifier tubes may be controlled and the receiver is in the correct operating condition for the reception of C.W. signals. The next three positions, SHARP, MEDIUM and BROAD, provide a variable selectivity characteristic in the I-F transformers. The fifth position connects the PHONO input terminals at the rear of the chassis to the input of the audio amplifier. The panel is engraved for the five positions, from left to right with C.W., SHARP, MED., BRD., and PHONO.

**10.9** There is located at the upper right hand corner of the receiver panel an electron ray indicator which indicates when the receiver is tuned to resonance with the frequency of the received signals. Resonance is indicated by the shadow angle of the electron ray indicator, which should be adjusted by manipulation of the main tuning control, until the two halves of the shadow approximately meet. The shadow of the electron ray indicator can be adjusted on a strong signal, so that the two halves of the shadow just meet, by turning the eye adjusting control R-147 with a screwdriver. CAUTION: WHEN TUNING THE RECEIVER ALWAYS TURN THE SELECTIVITY CONTROL TO THE SHARP POSITION AND TUNE FOR MAXIMUM SIGNAL AS INDICATED BY THE ELECTRON RAY INDICATOR. Should the receiver be tuned while the SELECTIVITY control is at MEDIUM or BROAD, the electron ray indicator may indicate maximum signal on either side of resonance owing to the fact that the selectivity characteristic of the I.F. amplifier has somewhat of a flat top characteristic in each of these two positions of the selectivity control. After the receiver has been properly tuned to resonance, as described above, the SELECTIVITY control may then be adjusted to the BROAD and MEDIUM positions as desired.

**10.10** The C.W. oscillator control knob is located directly below the tuning indicator. This control is effective only when the selectivity control is in the C.W. position and is used to vary the frequency of the C.W. oscillator, which tunes to the intermediate frequency of 455 Kc. when the knob is set at zero. The best setting of the C.W. oscillator will depend upon operating conditions. When the received signal is free from interference and is sufficiently strong to override static and circuit noise, it is recommended that the C.W. oscillator control be set at the I-F frequency or zero. As the control is turned to either side of zero, the C.W. oscillator is detuned from the I-F frequency of the receiver. The operator can determine the extent of this deviation by listening to the pitch of the background and circuit noises. When the pitch of the beat note is 2000 or 3000 cycles it will be found that the receiver has definite "single signal" properties such that one side of the audio beat note of a received signal will be considerably louder than the other side. This characteristic is helpful in receiving weak signals through interference and utilizes the maximum available sensitivity and selectivity of the receiver.

## 11. PERFORMANCE DATA

**11.1** The SENSITIVITY vs. FREQUENCY curves are plotted in Plate 1 and are representative of the overall sensitivity of the Model SLR-H Radio Receiver over the three frequency bands covered by the Receiver. These curves, together with the OVERALL SELECTIVITY curves shown in plate 2, provide data for definitely checking the Receiver to determine if repairs or realignment are necessary since the majority of circuit element failures or any misalignment will reduce the sensitivity of the equipment. The data referred to above will, therefore, also serve to show the efficacy of repairs or realignment.

**11.2** The selectivity of a radio receiver is that characteristic which determines the extent to which it is capable of differentiating between the desired signal and disturbances of other frequencies. The OVERALL SELECTIVITY curves of Plate 2 are representative of the overall selectivity characteristics of the equipment for the three degrees of selectivity, that is made possible by suitable adjustment of the SELECTIVITY control of the Receiver. Over the frequency ranges covered by the Receiver the OVERALL SELECTIVITY, for any adjustment of the SELECTIVITY control, will be essentially the SELECTIVITY characteristics of the intermediate frequency amplifier. For signal frequencies below 1000 kilocycles, the OVERALL SELECTIVITY characteristics for the BROAD and MEDIUM adjustments of the SELECTIVITY control will be somewhat sharper than shown by the corresponding curves in plate 2, due to "side band cutting" by the tuned circuits of the R.F. amplifier preceding the first detector.

**11.3** The image attenuation is the degree to which a superheterodyne type of radio receiver is capable of rejecting signals off resonance which, in combination with the fundamental or any harmonic of the H.F. oscillator, produce intermediate frequencies which are amplified by the intermediate frequency amplifier and result in spurious responses. The IMAGE ATTENUATION vs.

DESIRED SIGNAL FREQUENCY curves of Plate 3, show the extent to which the Model SLR-H Radio Receiver is capable of rejecting image responses. The curves of plate 3, are representative of the extent to which primary image frequencies are attenuated by the preselector tuned circuits of the Receiver. The primary image frequency is equal to the desired signal frequency plus two, times the intermediate frequency. The attenuation of the primary image, corresponding to any desired signal frequency, as derived from the curves of Plate 3, is predicated on the ratio between the R.F. inputs at the desired signal and primary image frequencies, to produce a constant output as measured with the receiver tuned for resonance with the desired signal frequency.

**11.4** The intermediate frequency rejection offered by the Model SLR-H Radio Receiver is better than 75.0 decibels. This expression is the ability of the Model SLR-H Radio Receiver to reject signals at the frequency to which the intermediate frequency amplifier is resonated.

**11.5** The A.V.C., OVERALL FIDELITY and A.F. AMPLIFIER FIDELITY characteristics shown on Plates 4, 5, and 6 are necessary when particular performance checks are desired, but are of secondary importance in most cases in the determination of the necessity for repairs or realignment.

**11.6** The maximum undistorted output, as measured at 400 cycles, across a load impedance of 600 ohms connected to the 0 and 600 terminals of the speaker terminal board, is approximately 10 watts with 3% distortion. If other terminals are used on the board, care must be used to match the output impedance as indicated on the terminals.

**11.7** The high frequency oscillator radiation as measured at the R.F. input terminals of the Receiver, is less than 400 micro-microwatts at any frequency covered by the MODEL SLR-H Radio Receiver.

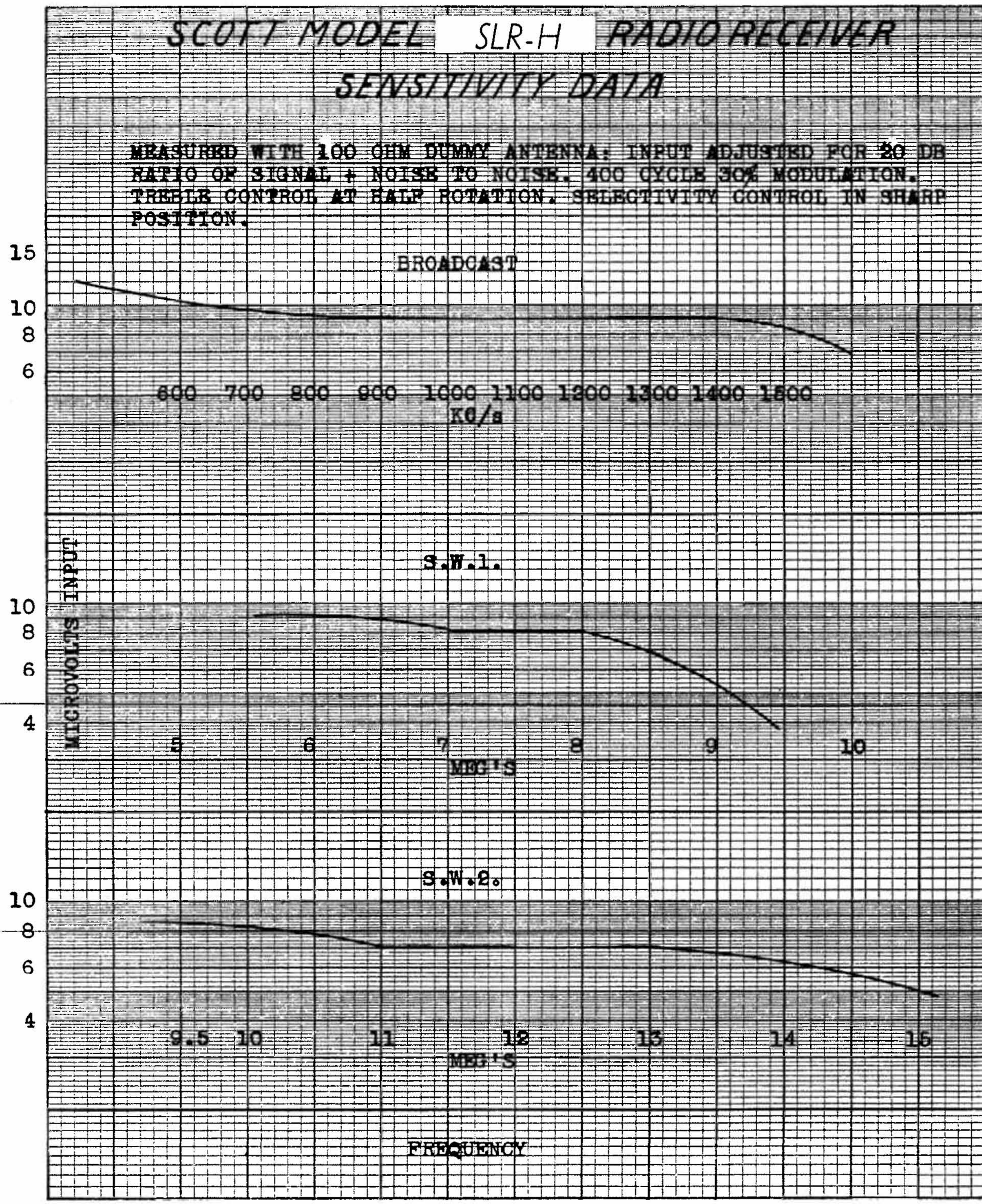

SCOTT MODEL SLR-H RADIO RECEIVER
SENSITIVITY DATA
MEASURED WITH 100 OHM DUMMY ANTENNA: INPUT ADJUSTED FOR 20 DB RATIO OF SIGNAL + NOISE TO NOISE. 400 CYCLE 30% MODULATION. TREBLE CONTROL AT HALF ROTATION. SELECTIVITY CONTROL IN SHARP POSITION.
BROADCAST
15
10
8
6
600 700 800 900 1000 1100 1200 1300 1400 1600
KC/s
MICROVOLTS INPUT
S.W.1.
10
8
6
4
5 6 7 8 9 10
MEG'S
S.W.2.
10
8
6
4
9.5 10 11 12 13 14 15
MEG'S
FREQUENCY

PLATE 1

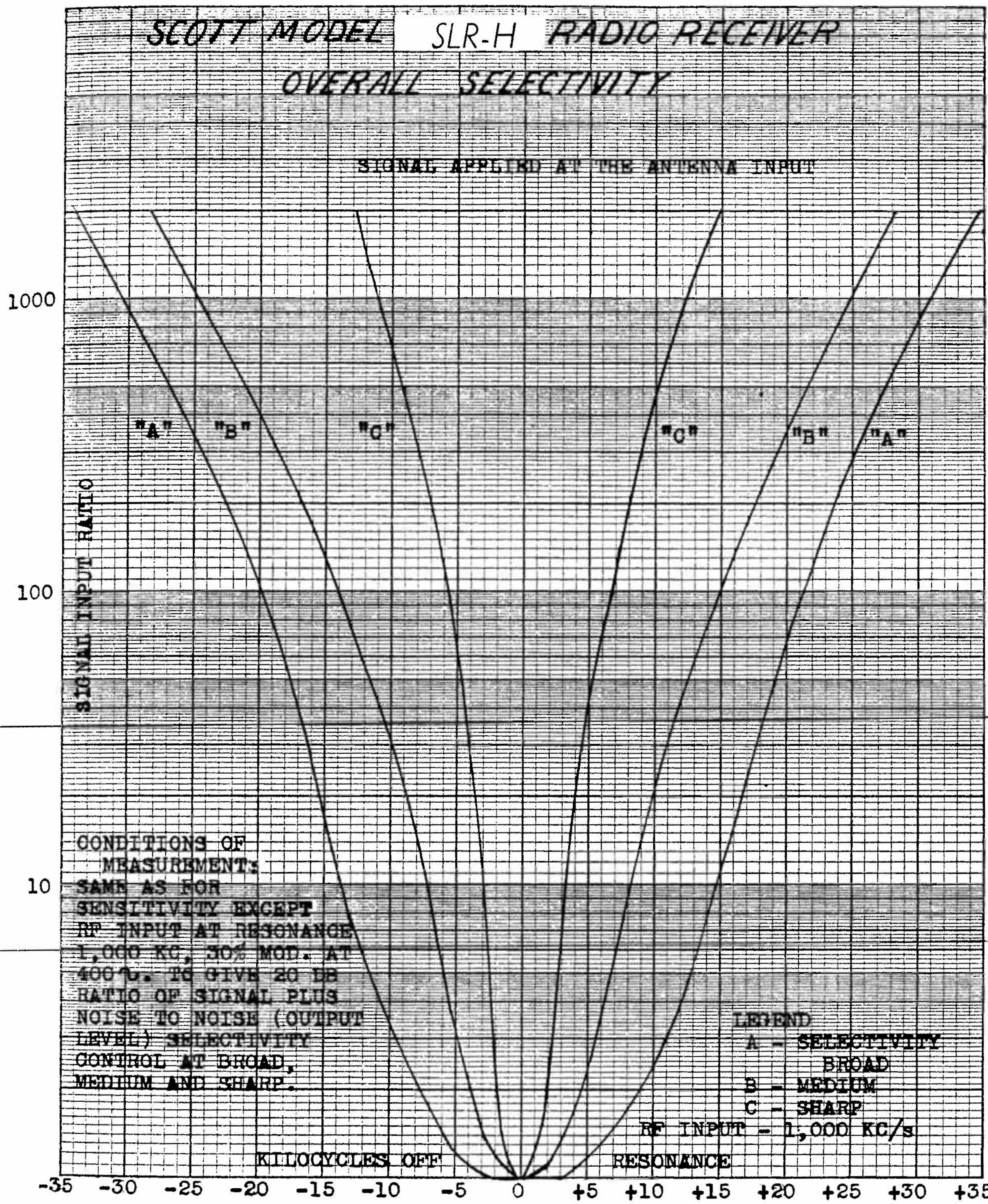

SCOTT MODEL SLR-H RADIO RECEIVER
OVERALL SELECTIVITY
SIGNAL APPLIED AT THE ANTENNA INPUT
SIGNAL INPUT RATIO
1000
100
10
"A"
"B"
"C"
"C"
"B"
"A"
CONDITIONS OF MEASUREMENT:
SAME AS FOR SENSITIVITY EXCEPT RF INPUT AT RESONANCE 1,000 KC, 30% MOD. AT 400 ~. TO GIVE 20 DB RATIO OF SIGNAL PLUS NOISE TO NOISE (OUTPUT LEVEL) SELECTIVITY CONTROL AT BROAD, MEDIUM AND SHARP.
LEGEND
A - SELECTIVITY BROAD
B - MEDIUM
C - SHARP
RF INPUT - 1,000 KC/s
KILOCYCLES OFF RESONANCE
-35
-30
-25
-20
-15
-10
-5
0
+5
+10
+15
+20
+25
+30
+35

PLATE 2

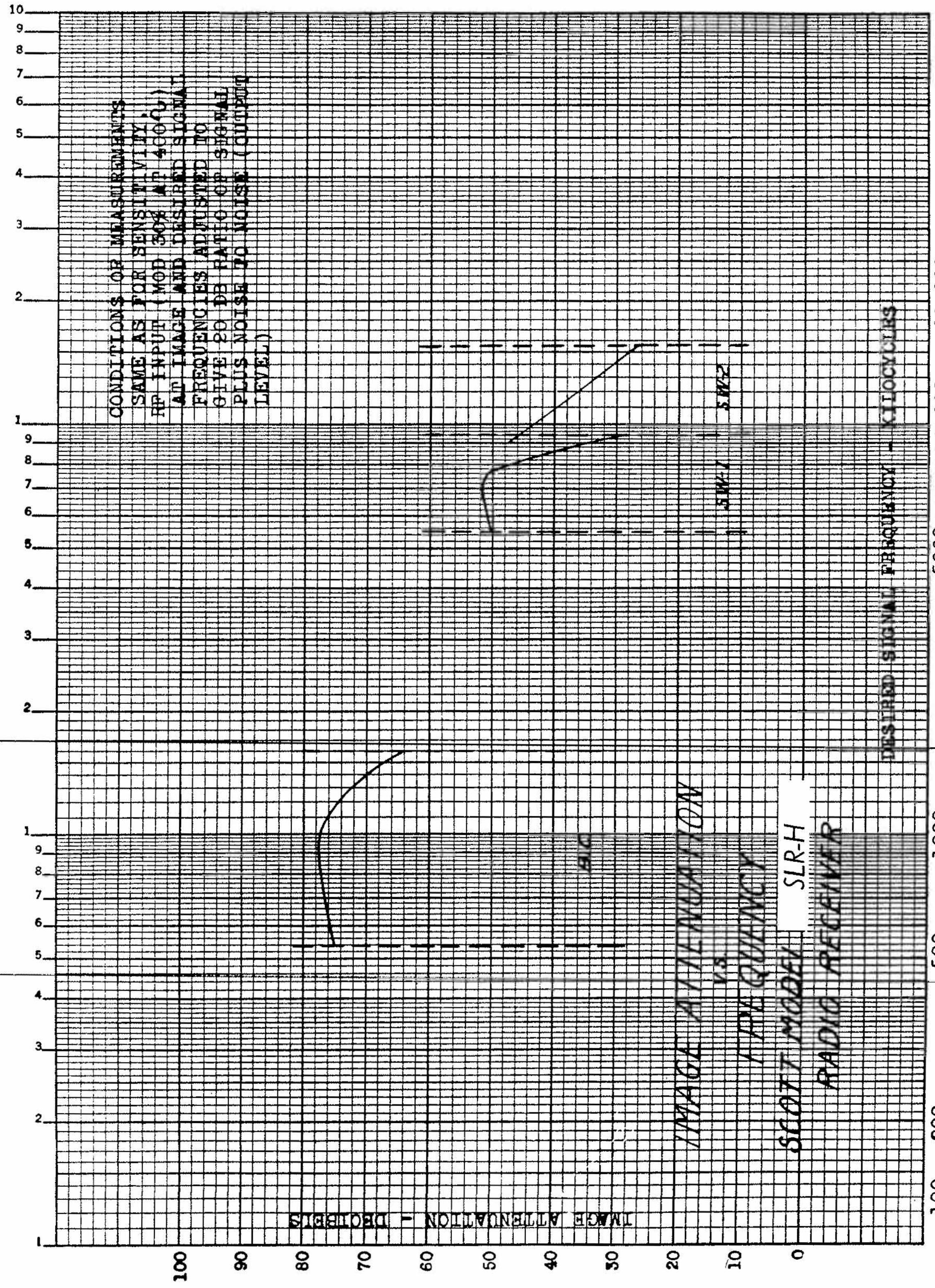

CONDITIONS OF MEASUREMENTS
SAME AS FOR SENSITIVITY,
RF INPUT (MOD 30% AT 400~)
AT IMAGE AND DESIRED SIGNAL
FREQUENCIES ADJUSTED TO
GIVE 20 DB RATIO OF SIGNAL
PLUS NOISE TO NOISE (OUTPUT
LEVEL)
SW2
SW1
BC
IMAGE ATTENUATION
V.S.
FREQUENCY
SCOTT MODEL SLR-H
RADIO RECEIVER
DESIRED SIGNAL FREQUENCY - KILOCYCLES
20,000
10,000
5000
1000
500
200
100
IMAGE ATTENUATION - DECIBELS
100
90
80
70
60
50
40
30
20
10
0

PLATE 3

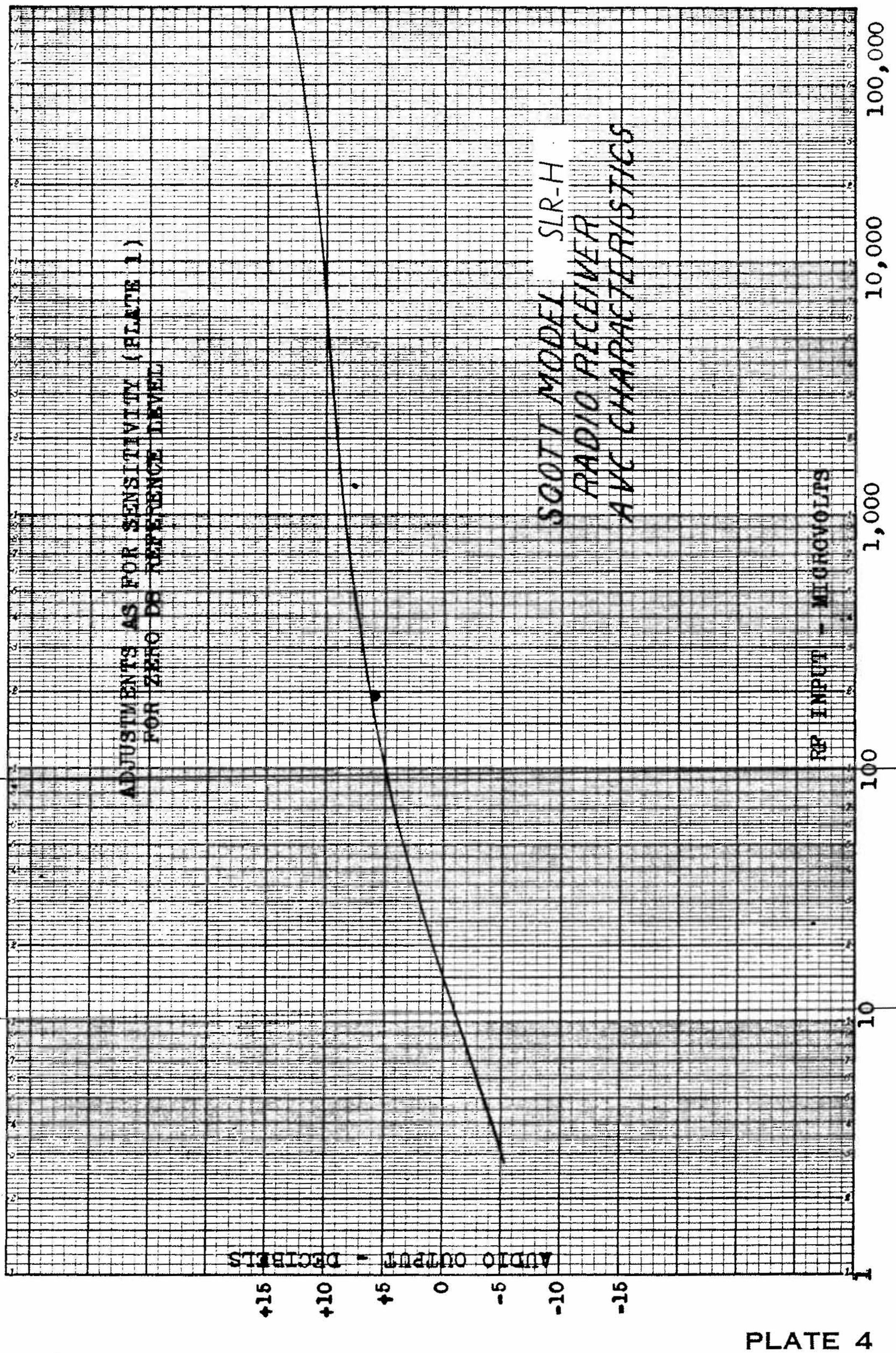

ADJUSTMENTS AS FOR SENSITIVITY (PLATE 1)
FOR ZERO DB REFERENCE LEVEL
SCOTT MODEL SLR-H
RADIO RECEIVER
AVC CHARACTERISTICS
RF INPUT - MICROVOLTS
1
10
100
1,000
10,000
100,000
AUDIO OUTPUT - DECIBELS
+15
+10
+5
0
-5
-10
-15

PLATE 4

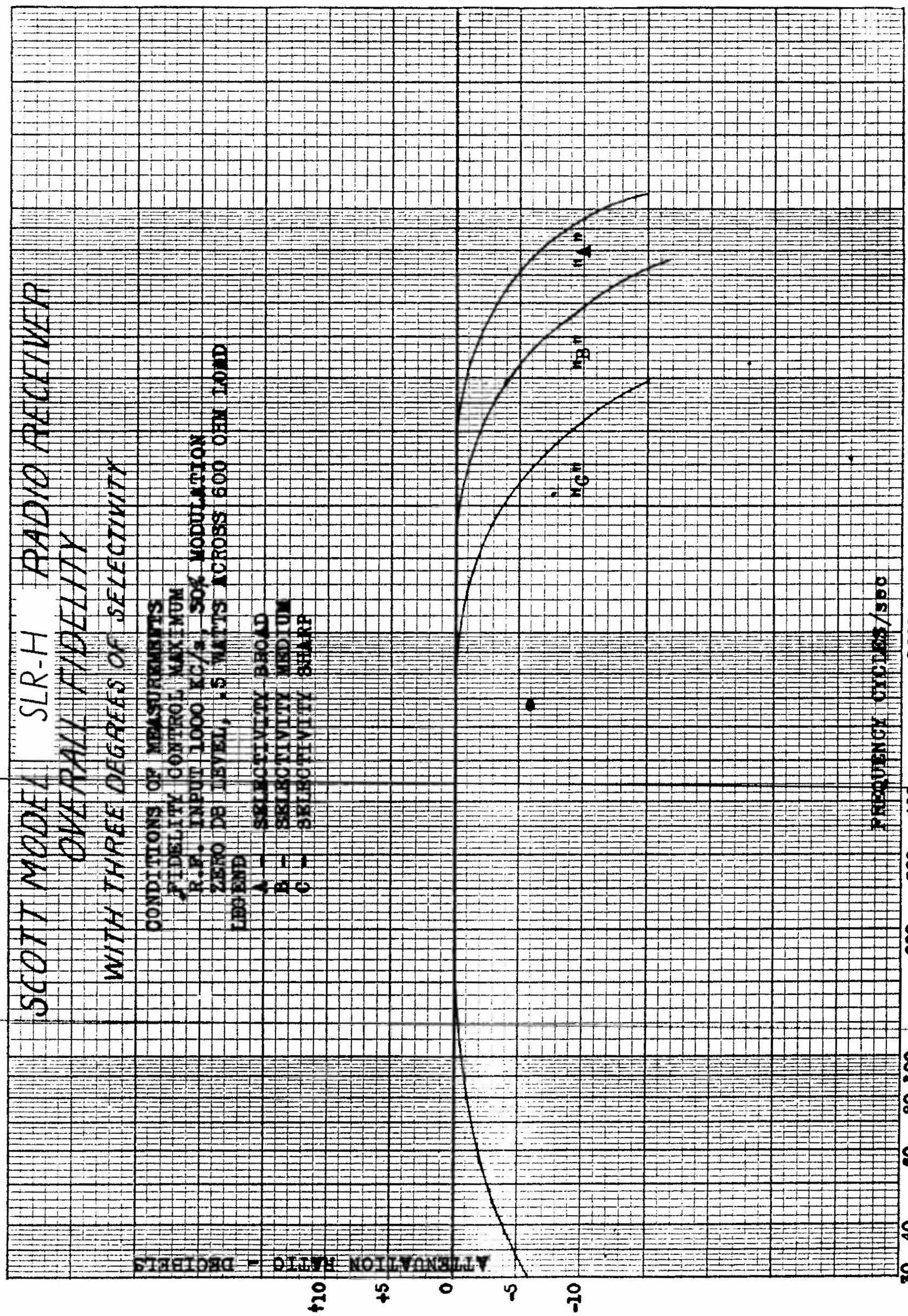

SCOTT MODEL SLR-H RADIO RECEIVER
OVERALL FIDELITY
WITH THREE DEGREES OF SELECTIVITY
CONDITIONS OF MEASUREMENTS
FIDELITY CONTROL MAXIMUM
R.F. INPUT 1000 KC/S, 30% MODULATION
ZERO DB LEVEL, .5 WATTS ACROSS 600 OHM LOAD
LEGEND
A - SELECTIVITY BROAD
B - SELECTIVITY MEDIUM
C - SELECTIVITY SHARP
"A"
"B"
"C"
ATTENUATION RATIO - DECIBELS
+10
+5
0
-5
-10
FREQUENCY CYCLES/SEC
30
40
60
80
100
200
300
400
1000
2000
3000
5000
10000

PLATE 5

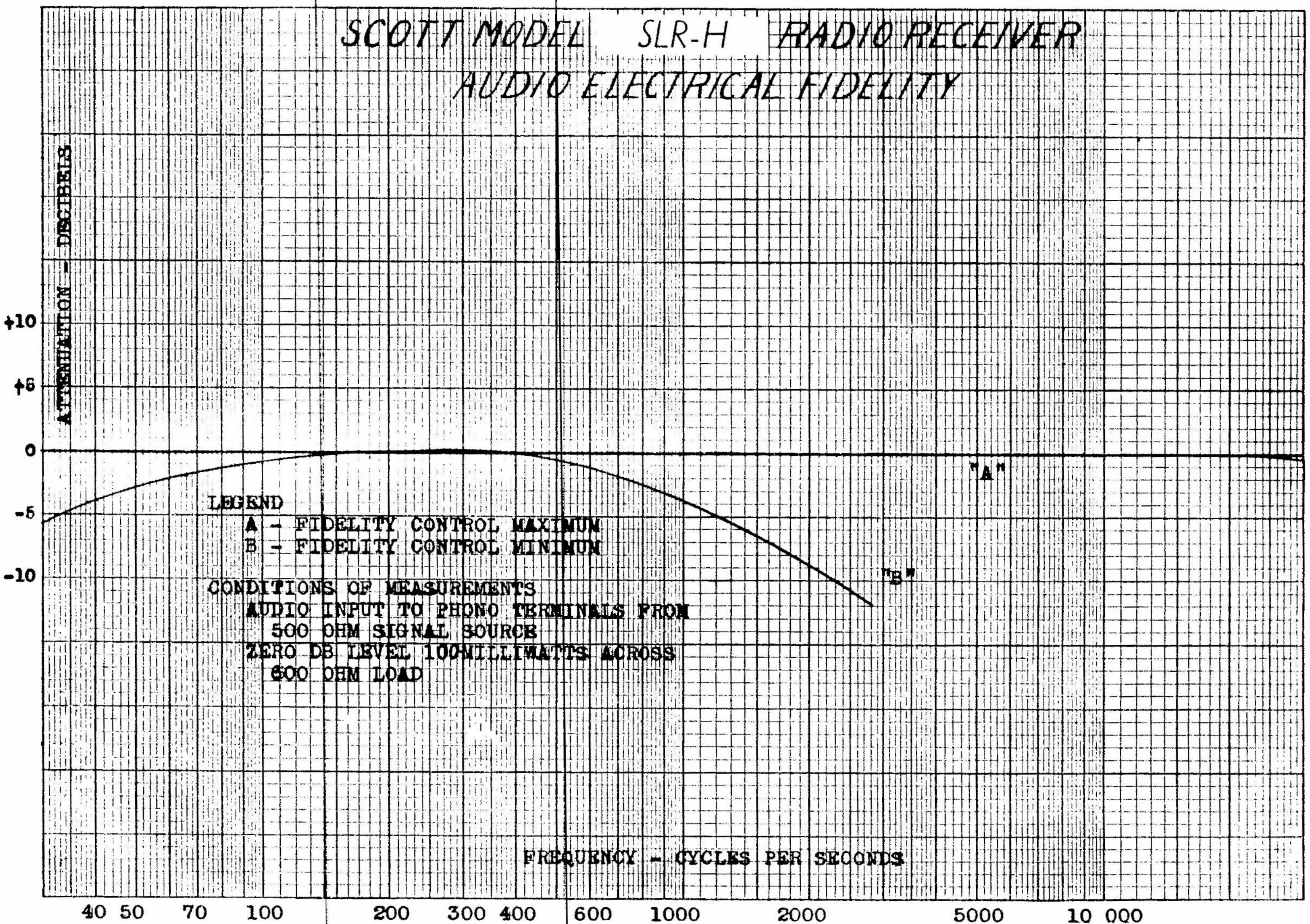

SCOTT MODEL SLR-H RADIO RECEIVER
AUDIO ELECTRICAL FIDELITY
ATTENUATION - DECIBELS
+10
+5
0
-5
-10
"A"
"B"
LEGEND
A - FIDELITY CONTROL MAXIMUM
B - FIDELITY CONTROL MINIMUM
CONDITIONS OF MEASUREMENTS
AUDIO INPUT TO PHONO TERMINALS FROM
500 OHM SIGNAL SOURCE
ZERO DB LEVEL 100MILLIWATTS ACROSS
600 OHM LOAD
FREQUENCY - CYCLES PER SECONDS
40 50 70 100 200 300 400 600 1000 2000 5000 10 000

PLATE 6

# 12. MAINTENANCE-FAILURES AND REMEDIES

## 12.1 GENERAL

12.11 Adequate test equipment for maintenance of the Model SLR-H Radio Receiver should include the following:

(1) A radio frequency standard signal generator.

(2) An audio output meter, General Radio company type 583A or equivalent.

(3) An analyzer for resistance measurements, testing vacuum tubes and measuring AC and DC potentials and currents in the circuits with which the tube under test is associated. The performance and test data of sections 11 and 13 may be determined with equipment as listed above.

12.12 In making any tests or adjustments, it is essential that the operator consider the influence that any one circuit element may have upon other associated circuits. The test data of section 13 will be particularly helpful in determining extent of such influences and the necessity for making further replacement after a fault in one particular circuit element has been located and repaired.

12.13 Any repairs in the Receiver which necessitate resoldering of joints should be made with care. The new joint should be such that the pieces to be soldered are firmly connected mechanically before solder is applied.

## 12.2 TUBE REPLACEMENT

12.21 ALL TUBES SUPPLIED WITH THE EQUIPMENT OR AS SPARES SHOULD BE USED IN THE RECEIVER PRIOR TO EMPLOYMENT OF TUBES FROM GENERAL STOCK.

12.22 Failure of a vacuum tube in the Receiver may reduce the sensitivity of the Receiver to radio signals, produce intermittent operation or cause the Receiver to be completely inoperative. In such cases all tubes should be checked either in an analyzer, or similar tube testing equipment, or by replacement with tubes of proven quality. When any tube is tested it should be tapped or jarred to make sure it has no internal loose connections or intermittent short circuits.

12.23 When tube replacements become necessary, substitution of new tubes may alter alignment of R.F. or I.F. amplifier circuits slightly inasmuch as the replacement tubes may not be identical with those originally employed. The necessity for realignment as well as alignment procedure are discussed in section 14.

## 12.3 FAILURE OF THE RADIO RECEIVER

12.31 In case of breakdown or failure of the Radio Receiver, the fault must first be localized in one portion of the circuit. This can be accomplished by observation of some peculiar action of one of the controls or by checking the Receiver against Test Data tabulated in section 13. Reference to figures 1 to 10, inclusive, will show the location of any component part of the Receiver. Functions and ratings of component parts are given in parts list, Section 15.

12.32 It must be remembered that the test data of section 13 will not positively locate certain faults. For instance, an open-circuited by-pass capacitor will not appear in point to point resistance tests and may introduce regeneration or oscillation in certain circuits which effect the stage gain of other circuits. Similarly, a short circuit occuring in a low resistance inductor will not appear in point to point resistance tests and if the short appears in an R.F. coil a false indication of the necessity for realignment may result.

12.33 By-pass or filter capacitors, which develop poor internal connections or which become open-circuited, will cause decreased sensitivity and/or poor stability. The defective unit can generally be located by temporarily connecting a good capacitor in parallel with each capacitor that is under suspicion.

12.34 Failure of any by-pass or filter capacitor may seriously overload resistors of associated circuits. Overloads of sufficient magnitude to permanently damage a resistor will cause the painted surface of the resistor to be scorched making the defective unit easy to locate by visual inspection.

12.35 Open or short-circuited resistors can be definitely located by testing the resistance of each individual resistor. The schematic diagram, Figure 9, should be consulted to make sure that any particular resistor under test is not connected in parallel with some other circuit element which might produce misleading measurements.

12.36 Loose connections, causing intermittent or noisy operation and which cannot be found by point to point resistance tests, can usually be located by individually testing each circuit element, or by tapping or shaking the component, under suspicion, when the Receiver is adjusted for normal operation.

## 13. TEST DATA

13.1 The TUBE SOCKET VOLTAGES AND CATHODE CURRENTS, table 1 must not be considered as a list of the actual operational voltages and currents in the circuits of the Receiver. The resistance of the measuring instruments, together with capacitive and resistive loading effects, will disturb many of the circuits to such an extent that they become inoperative, thus altering normal voltage and current distribution.

13.2 The only currents listed in Table 1 are those in the various cathode circuits. This listing is a desirable simplification, inasmuch as measurements of cathode current constitutes a definite check on all circuits directly associated with the vacuum tube in question.

13.3 The POINT TO POINT RESISTANCE Table 2 shows average resistance values in the Receiver with speakers disconnected from terminal panel E-122 and headphone removed from phone jack J-101. The vacuum tubes need not be removed from their sockets. In using Table 2, the statements of paragraph 12.32 must be given consideration.

13.4 All measurements in Table 1 are made with the Receiver connected for normal operation on a 115 volt, 60 cycle single phase AC source. The VOLUME control should be adjusted for full clockwise rotation and the FIDELITY control for approximately mid rotation.

## Table 1: TUBE SOCKET VOLTAGES AND CATHODE CURRENTS

| *Terminal* | | *Voltages* DC Volts | *Currents* DC MA |
|---|---|---|---|
| V-101 | Grid | 0 | |
| | Cathode | 4 | 6.5 |
| | Screen | 95 | |
| | Suppressor | 0 | |
| | Plate | 240 | |
| V-102 | Grid | 0 | |
| | Cathode | 0 | 8.0 |
| | Plate | 140 | |
| V-103 | Grid ♯1 | 0 | |
| | Cathode | 3 | 11.5 |
| | Grid ♯3 | 0 | |
| | Grid ♯5 | 0 | |
| | Grids ♯2 & 4 | 100 | |
| | Plate | 240 | |
| V-104 | Grid | 0 | |
| | Cathode | 4 | 6.4 |
| | Screen | 85 | |
| | Suppressor | 0 | |
| | Plate | 240 | |
| V-105 | Grid | 0 | |
| | Cathode | 3.5 | 6.2 |
| | Screen | 85 | |
| | Suppressor | 0 | |
| | Plate | 240 | |
| V-106 | Cathode ♯1 | 0 | |
| | Plate ♯1 | 0 | |
| | Cathode ♯2 | 0 | |
| | Plate ♯2 | 0 | |
| V-107A | Grid | 0 | |
| | Cathode | 3.5 | 1.6 |
| | Plate | 100 | |
| V-107B | Grid | 0 | |
| | Cathode | 0 | |
| | Plate | | |
| V-108 | Grid T1 | 0 | |
| | Cathode T1 | 4.5 | 2.0 |
| | Plate T1 | 105 | |
| | Grid T2 | 0 | |
| | Cathode T2 | 4.5 | 2.0 |
| | Plate T2 | 105 | |
| V-109 | Grid | 0 | |
| | Cathode | 18 | 37 |
| | Screen | 285 | |
| | Plate | 285 | |
| V-110 | Grid | 0 | |
| | Cathode | 18 | 37 |
| | Screen | 285 | |
| | Plate | 285 | |
| V-111 | Grid | 0 | |
| | Cathode | 0 | 1.4 |
| | Target | 245 | |
| | Plate | 90 | |
| V-112 | Fil. | 300 | |
| | Plate ♯1 | 290 AC | |
| | Plate ♯2 | 290 AC | |

♯ Measured on 500 volt scale

Voltage measurements made with a DC voltmeter, 20,000 ohms per volt. All measurements made between socket terminals and Receiver chassis.

## Table 2: POINT TO POINT RESISTANCES
*(Terminal to Chassis)*

| Terminal | | *Variable* | | *Resistance (Ohms) Plus or Minus 10%* |
|---|---|---|---|---|
| | | *Symbol* | *Setting* | |
| V-101 | Grid | NONE | | 1.91 Meg. |
| | Cathode | NONE | | 680 |
| | Screen | NONE | | Infinite |
| | Suppressor | NONE | | 0 |
| | Plate | NONE | | Infinite |
| V-102 | Grid | NONE | | .047 Meg. |
| | Cathode | S-102 | BC | .72 |
| | Cathode | S-102 | SW1 | .17 |
| | Cathode | S-102 | SW2 | .167 |
| | Plate | NONE | | Infinite |
| V-103 | Grid #1 | NONE | | 20,000 |
| | Cathode | NONE | | 270 |
| | Grid #3 | NONE | | 1.91 Meg. |
| | Grid #5 | NONE | | 0 |
| | Grids #2 & 4 | NONE | | Infinite |
| | Plate | NONE | | Infinite |
| V-104 | Grid | S-101 | SHARP | 1.1 Meg. |
| | Grid | S-101 | MED | 1.1 Meg. |
| | Grid | S-101 | BRD | 1.1 Meg. |
| | Grid | S-101 | PHONO | 1.1 Meg. |
| | Cathode | NONE | | 680 |
| | Screen | NONE | | Infinite |
| | Suppressor | NONE | | 0 |
| | Plate | NONE | | Infinite |
| V-105 | Grid | S-101 | SHARP | 5 |
| | Grid | S-101 | MED | 15 |
| | Grid | S-101 | BRD | 52 |
| | Grid | S-101 | PHONO | 52 |
| | Cathode | NONE | | 680 |
| | Screen | NONE | | Infinite |
| | Suppressor | NONE | | 0 |
| | Plate | NONE | | Infinite |
| V-106 | Cathode #1 | NONE | | 0 |
| | Cathode #2 | NONE | | 1.3 Meg. |
| | Plate #1 | NONE | | 0.3 Meg. |
| | Plate #2 | NONE | | 0.3 Meg. |
| V-107A | Grid | R-145 | MIN | 0 |
| | Grid | R-145 | MAX | 0.5 Meg. |
| | | S-101 | SHARP | |
| | Grid | R-145 | MAX | 0.5 Meg. |
| | | S-101 | MED | |
| | Grid | R-145 | MAX | 0.5 Meg. |
| | | S-101 | BRD | |
| | Grid | R-145 | MAX | 0.5 Meg. |
| | Grid | S-101 | PHONO | 0.5 Meg. |
| V-107A | Cathode | NONE | | 2400 |
| | Plate | NONE | | Infinite |
| V-107B | Grid | NONE | | 0.47 Meg. |
| | Cathode | NONE | | |
| | Plate | NONE | | Infinite |
| V-108 | Grid T1 | NONE | | 0.1 Meg. |
| | Cathode T1 & 2 | NONE | | 1200 |
| | Plate T1 | NONE | | Infinite |
| | Grid T2 | NONE | | 0.1 Meg. |
| | Plate T2 | NONE | | Infinite |

Table 2: POINT TO POINT RESISTANCES (*Continued*)
(*Terminal to Chassis*)

| *Terminal* | | *Variable* | | *Resistance (Ohms) Plus or Minus 10%* |
|---|---|---|---|---|
| | | *Symbol* | *Setting* | |
| V-109 | Grid | NONE | | 0.1 Meg. |
| | Cathode | NONE | | 250 |
| | Screen | NONE | | Infinite |
| | Plate | NONE | | Infinite |
| V-110 | Grid | NONE | | 0.11 Meg. |
| | Cathode | NONE | | 250 |
| | Screen | NONE | | Infinite |
| | Plate | NONE | | Infinite |
| V-111 | Grid | R-147 | MAX | 0.84 Meg. |
| | Grid | R-147 | MIN | 0.2 Meg. |
| | Cathode | NONE | | 0 |
| | Target | NONE | | Infinite |
| | Plate | NONE | | Infinite |
| V-112 | Fil. | NONE | | Infinite |
| | Plate #1 | NONE | | 60 |
| | Plate #2 | NONE | | 60 |

### 13.5 STAGE GAIN MEASUREMENTS

13.51 The sensitivity measurements, listed below are made under the following conditions:

(1) The Model SLR-H Radio Receiver is set up in accordance with paragraph 14.13. The standard signal generator is connected in accordance with paragraph 14.23, except that the high potential lead is connected to the control grid of the tubes specified in table 3.

(2) Adjust the standard signal generator for a test signal frequency of 455 kilocycles, modulated 30% at 400 cycles.

(3) The VOLUME control of the Receiver is fully advanced, the FIDELITY control set approximately mid position and the SELECTIVITY control on SHARP position.

(4) Table 3 as a tabulation of the minimum allowable I.F. sensitivity (maximum signal input) for 0.5 watts as measured at the 600 ohm terminal strip with the output meter.

Table 3

| *Terminal* | | *I. F. Sensitivity Microvolts* |
|---|---|---|
| V-103 | Grid | 10 uv ± 5 uv |
| V-104 | Grid | 150 uv ± 50 uv |
| V-105 | Grid | 6000 uv ± 500 uv |

## 14. ALIGNMENT DATA

### 14.1 GENERAL

14.11 Should realignment of the Receiver become necessary the following alignment data should be carefully studied before making any circuit adjustments. It is important that the operator understand the functions of each circuit element so that correct alignment may be obtained quickly and accurately. The alignment data of this section is therefore, supplemented by section 8, Construction, and section 9, circuit description.

14.12 Performance data and test data presented in sections 11 and 13 will be particularly helpful in determining the necessity for making any specific adjustments. The operator is cautioned against making any adjustments indiscriminately and he should not realign any circuit unless tests definitely indicate realignment is necessary.

14.13 All alignment and calibration tests, measurements, etc., may be made with the standard signal generator, and an output meter. All tests are made with the standard signal generator adjusted to provide a test signal having 400 cycle 30% modulation, unless otherwise specified.

14.14 Before proceeding with the alignment of any circuit of the Receiver, other than the adjustment of trimmer capacitors associated with the secondary windings of the antenna coupling transformers, then the Receiver chassis must be taken out of its cabinet; the bottom cover plate of the chassis; top cover plate of the shielded compartment (fig. 8) containing the antenna coupling transformers; and the bottom cover plate of the shielded compartment containing the H.F. oscillator and R.F. transformers, (Fig. 7) must be removed. Removal of the latter cover plates provide access to the capacitive and inductive trimmers.

14.15 The Receiver must be connected to a 115 volt, 60 cycle source of AC supply; The power switch S-103 to ON; SELECTIVITY control knob E-121, to SHARP; FIDELITY control knob E-117 to approximate mid position, and, VOLUME control knob E-118 to full clockwise rotation. An output meter should be connected to speaker terminals E-122 and adjusted for 600 ohm impedance.

14.16 The complete alignment of the Receiver may be divided into four steps:

(1) Intermediate frequency amplifier alignment.

(2) High frequency oscillator alignment.

(3) Radio frequency amplifier alignment.

(4) Trimming of antenna input circuit.

NOTE: THE CIRCUITS MUST BE CHECKED IN THE ABOVE ORDER WHEN COMPLETE ALIGNMENT IS NECESSARY.

### 14.2 I.F. AMPLIFIER ALIGNMENT

14.21 The intermediate frequency of the Model SLR-H Radio Receiver is 455 kilocycles, plus or minus one kilocycle.

14.22 Tuning adjustments are provided in each I.F. transformer. These adjustments consist of adjustable iron cores and are designated by symbol numbers E-112 to E-116 inclusive, as indicated on Schematic diagram, Figure 9.

14.23 The high potential lead of the standard signal generator should be connected to the control grid (terminal No. 8) of the first detector tube V-103 and the ground lead to any metal part making direct contact with the chassis.

14.24 The frequency of the signal generator should be carefully adjusted to 455 kilocycles and the signal input to first detector tube V-103 adjusted to provide a reading on the output meter. The I.F. tuning adjustments, listed in paragraph 14.22 should be carefully adjusted to give a maximum reading on the output meter. The order in which the adjustments are made is unimportant.

NOTE: IT IS ESSENTIAL THAT THE INPUT SIGNAL, FROM THE SIGNAL GENERATOR BE KEPT BELOW THE THRESHOLD OF OPERATION OF THE AUTOMATIC VOLUME CONTROL. EXCESSIVE SIGNAL INPUTS WHICH WILL CAUSE OVERLOAD OF EITHER THE SECOND DETECTOR OR AUDIO CIRCUITS SHOULD ALSO BE AVOIDED.

14.25 The performance of the Receiver, from the control grid of the first detector to the output load, can be checked against the stage gain data in table 3, section 13, after alignment has been completed. Similarly, the selectivity may be checked against the curves of plate 2, section 11.

### 14.3 HIGH FREQUENCY OSCILLATOR ALIGNMENT

14.31 Realignment of the H.F. oscillator circuits for any frequency band is usually necessary if the resonant frequency of the Receiver as indicated by the tuning dial reading is in error with respect to the actual resonant frequency by more than plus or minus 1.0 percent.

WARNING: READJUSTMENT OF THE H.F. OSCILLATOR CIRCUIT SHOULD NOT BE ATTEMPTED UNTIL AFTER THE NEED FOR SUCH READJUSTMENTS HAS BEEN POSITIVELY ESTABLISHED BY TESTS COVERED IN SECTION 13.

14.32 To check the operation of the R.F. amplifier and H.F. oscillator circuits, the signal generator should be connected to the antenna input jack J-103, using a 100 ohm non-inductive resistor as a dummy antenna. The VOLUME control may be retarded somewhat if desired as background noise may be excessive when the control is fully advanced.

14.33 If error in calibration is found, check the dial pointer to make certain that it has not been pushed out of position. This may be checked by tuning the main tuning control knob E-119 until pointer N-104 is at the extreme left position of its travel. At this point the pointer should line up with the vertical lines on the end of the dial scale.

14.34 The following general procedure should be employed in the alignment of H.F. oscillator circuits of any frequency band.

(1) General.
If, when the Receiver is resonated, at the high frequency end of the band, with a test signal frequency, the dial pointer appears above the dial scale marking for this frequency, then adjustment is made by tuning the oscillator trimmer capacitor, associated with that band, in a clockwise direction to increase its capacity; conversely, if the Receiver resonates at a lower frequency, as indicated by the markings on the dial, correction is made by turning the trimmer counterclockwise.

(2) Broadcast BC position of BAND SELECTOR switch.

- (A) Set signal generator to 1500 kilocycles.
- (B) Set Receiver dial pointer to 1500.
- (C) Adjust trimmer C-130 until maximum output is obtained.
- (D) Set signal generator to 600 kilocycles.
- (E) Set receiver dial pointer to 600.
- (F) Adjust padder C-133 for maximum output.
- (G) Set signal generator to 900 kilocycles.
- (H) Set receiver dial pointer to 900.
- (I) Adjust iron core E-109 for maximum output.
- (J) Repeat operations A to I inclusive, until the pointer lines up with the dial markings at all three points on this band.

(3) Shortwave Band 1, SW1 position of BAND SELECTOR switch.

- (A) Set signal generator to 9.0 megacycles.
- (B) Set receiver dial pointer to 9.0.
- (C) Adjust trimmer capacitor C-131 for maximum output.
- (D) Set signal generator to 5.8 megacycles.
- (E) Set receiver dial pointer to 5.8.
- (F) Adjust iron core E-110 for maximum output.
- (G) Repeat A to F inclusive, until the dial markings correspond to these two frequencies without further adjustment.

(4) Shortwave Band II, SW2 position on BAND SELECTOR switch.

- (A) Set signal generator to 15 megacycles.
- (B) Set receiver dial pointer to 15.
- (C) Adjust C-132 until maximum output is obtained.
- (D) Set signal generator to 9.5 megacycles.
- (E) Set receiver dial pointer to 9.5.
- (F) Adjust E-111 for maximum output.
- (G) Repeat A to F inclusive, until these two frequencies are resonated at the dial markings for these two frequencies.

## 14.4 R.F. AMPLIFIER ALIGNMENT

14.41 The following general procedure should be employed in the alignment of R.F. and antenna stages.

(1) General.
Standard signal generator is adjusted to provide a 30%, 400 cycle modulated carrier, specified in (2), (3), and (4); connection is made to the receiver through J-103 using a 100 ohm non-inductive resistor as a dummy antenna.

(2) Broadcast Band BC.

- (A) Set signal generator to 1500 kilocycles.
- (B) Set Receiver dial pointer to 1500.
- (C) Adjust C-124 and C-125 for maximum output.
- (D) Set signal generator to 600 kilocycles.
- (E) Set receiver dial pointer to 600.
- (F) Adjust E-103 and E-106 for maximum output.
- (G) Repeat A to C inclusive, for final adjustment.

(3) Shortwave Band 1, SW1.

- (A) Set signal generator to 9.0 megacycles.
- (B) Set receiver dial pointer to 9.0.

(C) Adjust C-126 and C-128 for maximum output.

(D) Set signal generator to 5.8 megacycles.

(E) Set receiver dial pointer to 5.8.

(F) Adjust E-104 and E-107 for maximum output.

(G) Repeat A to C inclusive, for final adjustment.

(4) Shortwave Band II SW2.

(A) Set signal generator to 15 megacycles.

(B) Set receiver dial pointer to 15.

(C) Adjust C-127 and C-129 for maximum output.

(D) Set signal generator to 9.3 megacycles.

(E) Set receiver dial pointer to 9.3.

(F) Adjust E-105 and E-108 for maximum output.

(G) Repeat A to C inclusive, for final adjustment.

### 14.51 ANTENNA ALIGNMENT

Final antenna alignment should be made after installation, by adjusting trimmers C-124, C-126, and C-127, for the BC, SW1 and SW2 bands respectively, for optimum performance with the specific antenna employed.

## 15. PARTS LISTS

### 15.1 TABLE I
### LIST OF MAJOR UNITS
### FOR MODEL SLR-H RADIO RECEIVING EQUIPMENT

| *Symbol Group* | *Type Designation* | *Name of Major Unit* |
|---|---|---|
| 101 - 199 | MODEL SLR-H | RADIO RECEIVER |

## 15.2 TABLE II
## PARTS LIST BY SYMBOL DESIGNATIONS
## FOR MODEL SLR-H RADIO RECEIVING EQUIPMENT

| Symbol Desig. | Function | Description | Drawing and Part Number |
|---|---|---|---|
| | | CAPACITORS | |
| C-101 | Center filter | Capacitor, Electrolytic, 20 mfd. 450 volts DC working | 7131 |
| C-102 | Output filter | Same as C-101 | |
| C-103 | Output filter | Same as C-101 | |
| C-104 | Antenna to V-101 coupling | Capacitor, mica, 250 mmf. ± 10%, 500 volts DC working | 5077 |
| C-105 | V-101 plate coupling | Same as C-104 | |
| C-106 | V-103 grid coupling | Same as C-104 | |
| C-107 | V-103 screen supply filter | Capacitor, mica, 5100 mmf. ± 10%, 300 volts DC working | 8421 |
| C-108 | V-102 plate supply filter | Same as C-107 | |
| C-109 | V-102 heater bypass | Same as C-107 | |
| C-110 | V-101 plate filter bypass | Same as C-107 | |
| C-111 | Oscillator coupling | Capacitor, silver mica, 51 mmf. ± 5%, 500 volts DC working | 8418 |
| C-112 | V-102 grid coupling | Same as C-111 | |
| C-113 | T-112 primary tuning | Capacitor, silvermica, 100 mmf. ± 5%, 500 volts DC working | 7133 |
| C-114 | Antenna tuning padder | Capacitor, silvermica, 180 mmf. ± 5%, 500 volts DC working | 7285 |
| C-115 | RF tuning padder | Same as C-114 | |
| C-116 | Oscillator tuning padder | Same as C-114 | |
| C-117 | T-110 primary tuning | Capacitor, silvermica, 225 mmf. ± 5%, 500 volts DC working | 7134 |
| C-118 | T-110 secondary tuning | Capacitor, silvermica, 250 mmf. ± 5%, 500 volts DC working | 7135 |
| C-119 | T-111 primary tuning | Same as C-118 | |
| C-120 | T-111 secondary tuning | Same as C-118 | |
| C-121 | T-107 fixed padder | Capacitor, silvermica, 350 mmf. ± 5%, 500 volts DC working | 7136 |
| C-122 | T-108 padder | Capacitor, silvermica, 3,000 mmf. ± 5%, 500 volts DC working | 7137 |
| C-123 | T-109 padder | Capacitor, silvermica, 4,000 mmf. ± 5%, 300 volts DC working | 7138 |
| C-124 | T-101 trimmer | Capacitor, variable mica, Min. capacity 1.0 mmf. Max. capacity 12 mmf. compression type | 6093 |
| ~~C-125~~ | ~~T-104 trimmer~~ | ~~Same as C-124~~ | |
| C-126 | T-102 trimmer | Capacitor, variable mica, Min. capacity 4 mmf. Max. capacity 60 mmf., compression type | 5071 |
| C-127 | T-103 trimmer | Same as C-126 | |
| C-128 | T-105 trimmer | Same as C-126 | |
| C-129 | T-106 trimmer | Same as C-126 | |
| C-130 | T-107 trimmer | Capacitor, variable air, Min. capacity 3 mmf. Max. capacity 25 mmf. | 5072 |
| C-131 | T-108 trimmer | Capacitor, variable air, Min. capacity 4 mmf. Max. capacity 50 mmf. | 5073 |
| C-132 | T-109 trimmer | Same as C-131 | |
| C-133 | T-107 variable padder | Capacitor, variable air, Min. capacity 6 mmf. Max. capacity 75 mmf. | 5074 |
| C-134 | | Capacitor, variable air. Min. capacity 14 mmf. Max. capacity 390 mmf. 25 plates, curve "C" 0.015 min. spacing, 2 gang | 5101 |
| C-134A | Oscillator tuning | | |
| C-134B | R.F. tuning | | |

## 15.2 TABLE II (*Continued*)

## PARTS LIST BY SYMBOL DESIGNATIONS FOR MODEL SLR-H RADIO RECEIVING EQUIPMENT

| Symbol Desig. | Function | Description | Drawing and Part Number |
|---|---|---|---|
| | | CAPACITORS (*Continued*) | |
| C-135 | Antenna tuning | Capacitor, variable air. Min. capacity 14 mmf. Max. capacity 390 mmf. 25 plates, Curve "C" 0.015 min. spacing, 1 gang | 5100 |
| C-136 | V-106 to V-107 coupling | Capacitor, paper 0.02 mfd. 600 volts DC working. Hermetically sealed | 5066 |
| C-137 | | Capacitor, paper, 0.05/0.05 mfd. each section, 600 volts DC working. Hermetically sealed | 5067 |
| C-137A | V-103 plate filter | | |
| C-137B | V-104 grid filter | | |
| C-138 | | Same as C-137 | |
| C-138A | V-104 cathode bypass | | |
| C-138B | V-104 screen bypass | | |
| C-139 | | Capacitor, paper 0.1/0.1/0.1 mfd. each section, 600 volts DC working, hermetically sealed | 5065 |
| C-139A | V-105 screen bypass | | |
| C-139B | V-105 cathode bypass | | |
| C-139C | V-105 plate filter | | |
| C-140 | | Same as C-137 | |
| C-140A | AVC filter | | |
| C-140B | V-104 plate filter | | |
| C-141 | | Same as C-137 | |
| C-141A | V-111 grid filter | | |
| C-141B | Noise limiter bypass | | |
| C-142 | | Same as C-137 | |
| C-142A | AC line filter | | |
| C-142B | AC line filter | | |
| C-143 | | Capacitor, paper, 0.1/0.1 mfd. each section, 600 volts DC working, hermetically sealed | 5069 |
| C-143A | V-103 cathode bypass | | |
| ~~C-143B~~ | ~~V-103 screen bypass~~ | | |
| C-144 | | Same as C-143 | |
| C-144A | V-102 heater bypass | | |
| C-144B | V-102 plate bypass | | |
| C-145 | | Same as C-139 | |
| C-145A | V-101 cathode bypass | | |
| C-145B | V-101 plate filter | | |
| C-145C | V-101 screen bypass | | |
| C-146 | V-107 to V-108 coupling | Capacitor, paper, 0.05 mfd. 600 volts DC working, hermetically sealed. | 7002 |
| C-147 | V-108 to V-109 coupling | Same as C-146 | |
| ~~C-148~~ | ~~V-108 to V-110 coupling~~ | ~~Same as C-146~~ | |
| C-149 | Fidelity control condenser | Same as C-136 | |
| C-150 | V-107 plate filter | Capacitor, paper, 0.25 mfd. 600 volts DC working, hermetically sealed. | 7130 |
| C-151 | V-107A cathode bypass | Capacitor, electrolytic, 25 mfd. 25 volts DC working | 5088 |
| C-152 | V-108 cathode bypass | Same as C-151 | |
| C-153 | V-109 cathode bypass | Same as C-151 | |
| C-154 | + B input filter | Capacitor, paper, 4.0 mfd. 600 volts DC working | 5070 |
| C-155 | V-106 diode filter | Capacitor, mica, 50 mmf. ± 10%, 500 volts DC working | 5076 |
| C-156 | V-107B grid coupling | Same as C-111 | |
| C-157 | L-107 tuning, B.F.O. | Capacitor, silver mica, 200 mmf. ± 5%, 500 volts DC working | 7328 |
| C-158 | V-107B plate filter | Capacitor, mica, 0.01 mfd. ± 20%, 300 volts DC working | 8108 |

## 15.2 TABLE II (*Continued*)
## PARTS LIST BY SYMBOL DESIGNATIONS FOR MODEL SLR-H RADIO RECEIVING EQUIPMENT

| Symbol Desig. | FUNCTION | DESCRIPTION | Drawing and Part Number |
|---|---|---|---|
| | | **CAPACITORS** (*Continued*) | |
| C-159 | V-107B cathode to V-106 plate coupling | Capacitor, silver mica, 5 mmf. ± 5%, 500 volts DC working | 7568 |
| C-160 | L-107 variable trimmer | Capacitor, variable air trimmer, 2.8—17 mmf. shaft ¼" dia. x ⅞" long | 7314 |
| C-161 | V-101 Cathode bypass | Same as C-107 | |
| C-162 | T-108 compensating | Capacitor, silver ceramic, 15 mmf. ± 5%, neg. temp., coeff. N-750, 500 volts DC working | 7323 |
| C-163 | T-109 compensating | Same as C-162 | |
| | | **MISCELLANEOUS ELECTRICAL PARTS** (*Continued*) | |
| E-101 | V-101 grid cap | ¼" grid cap for octal tubes | 5045 |
| E-102 | Phono input terminals | Phono input two terminal strip marked PHONO and GND. terminals have captive screws | 6001 |
| E-103 | T-101 Sec. inductance trimmer | Compressed, powdered iron core coil inductance trimmer | 5103 |
| E-104 | T-102 Sec. inductance trimmer | Compressed, powdered iron core coil inductance trimmer | 5102 |
| E-105 | T-103 Sec. inductance trimmer | Same as E-104 | |
| E-106 | T-104 Sec. inductance trimmer | Same as E-103 | |
| E-107 | T-105 Sec. inductance trimmer | Same as E-104 | |
| E-108 | T-106 Sec. inductance trimmer | Same as E-104 | |
| E-109 | T-107 Sec. inductance trimmer | Same as E-103 | |
| E-110 | T-108 Sec. inductance trimmer | Same as E-104 | |
| E-111 | T-109 Sec. inductance trimmer | Same as E-104 | |
| E-112 | T-110 Pri. inductance trimmer | Same as E-103 | |
| E-113 | T-110 Sec. inductance trimmer | Same as E-103 | |
| E-114 | T-111 Pri. inductance trimmer | Same as E-103 | |
| E-115 | T-111 Sec. inductance trimmer | Same as E-103 | |
| E-116 | T-112 Pri. inductance trimmer | Same as E-103 | |
| E-117 | Treble control knob | 1½" black bakelite knob | 5119 |
| E-118 | Volume control knob | Same as E-117 | |
| E-119 | Main tuning knob | 2⅛" black bakelite knob | 5120 |
| E-120 | Band change knob | Same as E-117 | |
| E-121 | Selectivity control knob | Same as E-117 | |
| E-122 | Speaker output terminals | Speaker output terminal strip marked 600 (1), 300 (2), 200 (3), 150 (4), 120 (5), ± (0) six terminals, captive screws | 7074 |
| E-123 | AC power receptacle | Two pole plug set in drawn steel shell for below surface mounting | 7000 |
| E-124 | DC power receptacle | Two pole polarized plug set in drawn steel shell for below surface mounting | 7228 |
| E-125 | SW2 indicator lamp socket | Bayonet type socket | 5174 |
| E-126 | SW1 indicator lamp socket | Bayonet type socket | 5173 |
| E-127 | BC indicator lamp socket | Bayonet type socket | 5172 |
| E-128 | Phono indicator lamp socket | Bayonet type socket | 5171 |
| E-129 | Dial lighting lamp socket | Bayonet type socket | 5041 |
| E-130 | Dial lighting lamp socket | Same as E-129 | |
| E-131 | L-107 inductance trimmer | Same as E-103 | |
| | | **FUSES** | |
| F-101 | AC line fuse | Fuse, 2 amps. up to 250 V, cartridge type, 1¼" long ferrules ¼" diameter | 5111 |

## 15.2 TABLE II (*Continued*)
## PARTS LIST BY SYMBOL DESIGNATIONS FOR MODEL SLR-H RADIO RECEIVING EQUIPMENT

| Symbol Desig. | FUNCTION | DESCRIPTION | Drawing and Part Number |
|---|---|---|---|
| | | **HARDWARE** | |
| H-101 | Plug button for T-110 shield | ½″ plug button | 5037 |
| H-102 | Plug button for T-111 shield | Same as H-101 | |
| H-103 | N-106 to C-134 coupling | Insulated coupling for ⅜″ shaft | 7157 |
| H-104 | C-134 to C-135 coupling | Insulated coupling for ⅜″ shaft | 6081A |
| H-105 | O-101 to O-102 coupling | Insulated coupling for ¼″ shaft | 5106 |
| H-106 | Dial escutcheon | Transparent escutcheon | 5109 |
| H-107 | Pull handle | ⅜″ round pull handle | 5115 |
| H-108 | Captive thumb screw | 8/32 captive thumb screw | 5166 |
| H-109 | Panel trim thumb screw | 10/32 captive thumb screw | 5167 |
| H-110 | Shock mounting | Rubber shock mounting | 5170 |
| | | **INDICATING DEVICES** | |
| I-101 | SW2 indicator lamp | Type 44, 6.3 v, 0.25 A, lamp | 5110 |
| I-102 | SW1 indicator lamp | Same as I-101 | |
| I-103 | BC indicator lamp | Same as I-101 | |
| I-104 | Phono indicator lamp | Same as I-101 | |
| I-105 | Dial lighting lamp | Same as I-101 | |
| | | **JACKS AND RECEPTACLES** | |
| J-101 | Phone jack | Jack, single, open circuit, short for 2 conductor plugs with tip and sleeve only | 5118 |
| J-102 | Fuse holder | Extractor type fuse holder | 5112 |
| J-103 | Antenna jack | Two contact female antenna receptacle | 7140 |
| | | **INDUCTORS R.F. AND A.F.** | |
| L-101 | V-101 plate choke | R.F. choke, 2.5 MH 125 MA DC, distributed capacity 1 mmf. 50 ohms DC resistance, pigtail terminals | 5047 |
| L-102 | V-103 + B filter choke | Same as L-101 | |
| L-103 | V-102 plate supply choke | Same as L-101 | |
| L-104 | V-102 heater choke | R.F. choke, 50T #24E | 5046 |
| L-105 | + B input filter choke | 4.5 H, 150 MA DC ± 20% DC resistance 53 ohms ± 10% | 7079 |
| L-106 | + B output filter choke | 12 H, 80 MA DC ± 20% DC resistance 250 ohms ± 10% | 7085 |
| L-107 | B.F.O. inductor | R.F. inductor 455 KC | 7313 |
| | | **NAMEPLATES — DIALS** | |
| N-101 | Model nameplate | Etched zinc nameplate | 7141 |
| N-102 | Linear dial scale | Etched scale 0-100 | 5107A |
| N-103 | Dial log index plate | Etched index plate | 5107B |
| N-104 | Dial indicator pointer | Dial pointer | 7109 |
| N-105 | Dial calibration scale | Screened calibration on lucite plate | 5108 |
| N-106 | Dial assembly | Complete dial assembly | 7100 |
| | | **MECHANICAL PARTS, SHAFTS** | |
| O-101 | Band change shaft- | Switch shaft and detent plate | 5195A |
| O-102 | Band change shaft extension | Fibre extension shaft | 7018 |
| O-103 | Selectivity switch shaft | Switch shaft and index plate | 5196A |

## 15.2 TABLE II (*Continued*)
## PARTS LIST BY SYMBOL DESIGNATIONS
## FOR MODEL SLR-H RADIO RECEIVING EQUIPMENT

| Symbol Desig. | FUNCTION | DESCRIPTION | Drawing and Part Number |
|---|---|---|---|
| | | **PLUGS** | |
| P-101 | Antenna plug | Two prong male plug | 7143 |
| P-102 | AC power input plug | Two pole receptacle | 7006 |
| | | **RESISTORS** | |
| R-101 | T-111 secondary series | Resistor, wire wound, 10 ohms ± 10% ½ watt phenolic insulated pigtail type terminals | 5131 |
| R-102 | T-111 secondary series | Resistor, wire wound, 47 ohms ± 10% ½ watt, phenolic insulated pigtail type terminals | 5132 |
| R-103 | T-110 secondary series | Same as R-102 | |
| R-104 | T-110 secondary series | Same as R-102 | |
| R-105 | V-103 cathode bias | Resistor, composition, 270 ohms ± 10% ½ watt pigtail terminals | 7145 |
| R-106 | V-101 cathode bias | Resistor, composition, 680 ohms ± 10% ½ watt pigtail terminals | 7146 |
| R-107 | V-104 cathode bias | Same as R-106 | |
| R-108 | V-105 cathode bias | Same as R-106 | |
| R-109 | V-101 plate filter | Resistor, composition, 1,000 ohms ± 20%, ½ watt pigtail terminals | 7229 |
| R-110 | V-103 plate filter | Same as R-109 | |
| R-111 | V-104 plate filter | Same as R-109 | |
| R-112 | V-105 plate filter | Same as R-109 | |
| R-113 | V-108 cathode bias | Resistor, composition, 1,200 ohms ± 10% ½ watt pigtail terminals | 7147 |
| R-114 | V-107 cathode bias | Resistor, composition, 2,400 ohms ± 10% ½ watt pigtail terminals | 7148 |
| R-115 | V-109 grid leak | Resistor, composition, 8,200 ohms ± 10% ½ watt pigtail terminals | 7149 |
| ~~R-116~~ | ~~V-102 plate filter~~ | ~~Resistor, composition, 15,000 ohms ± 10% 2~~ watt pigtail terminals | ~~7230~~ |
| R-117 | V-103 screen filter | Resistor, composition, 18,000 ohms ± 10% 2 watt pigtail terminals | 7231 |
| R-118 | V-103 #1 grid, leak | Resistor, composition, 20,000 ohms ± 10% ½ watt pigtail terminals | 7150 |
| R-119 | V-106 cathode bias | Resistor, composition, 0.82 meg ± 20% ½ watt pigtail terminals | 7090 |
| R-120 | V-107 plate series | Resistor, composition, 27,000 ohms ± 10% ½ watt pigtail terminals | 5140 |
| R-121 | V-107 plate load | Same as R-120 | |
| ~~R-122~~ | ~~V-102 grid leak~~ | Resistor, composition, 47,000 ohms ± 10% ½ watt, pigtail terminals | 5141 |
| R-123 | V-107 plate filter | Same as R-122 | |
| R-124 | V-101 screen filter | Resistor, composition, 0.1 meg. ± 10%, ½ watt, pigtail terminals | 5142 |
| R-125 | V-104 screen filter | Same as R-124 | |
| R-126 | V-105 screen filter | Same as R-124 | |
| R-127 | V-108 grid leak | Same as R-124 | |
| R-128 | V-108 plate load | Same as R-124 | |
| R-129 | V-108 plate load | Same as R-124 | |
| R-130 | V-109 grid series | Same as R-124 | |
| R-131 | V-110 grid leak | Same as R-124 | |
| R-132 | Noise limiter series | Resistor, composition, 1.0 meg. ± 10%, ½ watt, pigtail terminals | 5146 |
| R-133 | V-104 grid filter | Resistor, composition, 0.22 meg. ± 10%, ½ watt, pigtail terminals | 5144 |

## 15.2 TABLE II (*Continued*)

## PARTS LIST BY SYMBOL DESIGNATIONS FOR MODEL SLR-H RADIO RECEIVING EQUIPMENT

| Symbol Desig. | FUNCTION | DESCRIPTION | Drawing and Part Number |
|---|---|---|---|
| | | **RESISTORS** (*Continued*) | |
| R-134 | V-106 diode filter | Same as R-133 | |
| R-135 | V-106 diode load | Same as R-133 | |
| R-136 | V-111 eye control limiting | Same as R-133 | |
| R-137 | V-101 grid filter | Resistor, composition, 0.47 meg. ± 10%, ½ watt, pigtail terminals | 5145 |
| R-138 | V-103 grid filter | Same as R-137 | |
| R-139 | AVC filter | Same as R-132 | |
| R-140 | V-109 to V-108 feedback | Same as R-132 | |
| R-141 | V-110 to V-108 feedback | Same as R-132 | |
| R-142 | V-111 grid filter | Resistor, composition, 2.2 meg. ± 10%, ½ watt, pigtail terminals | 5147 |
| R-143 | V-109 cathode bias | Resistor, wire wound, 250 ohms, ± 10%, 10 watts, pigtail terminals | 7151 |
| R-144 | + B filter | Resistor, wire wound, 1,000 ohms ± 10%, 10 watts, pigtail terminals | 7152 |
| R-145 | | Potentiometer, composition, dual | 7319 |
| R-145A | Volume control | Section "A" 0.5 meg. 20%, 0.4 watt | |
| R-145B | R.F. gain control | Section "B" 7500 ohms, 20%, 0.4 watt<br>Shaft ¼" dia. x 2.187" long | |
| R-146 | Treble control | Potentiometer, 0.25 meg. ± 20%, composition, semi-log clockwise taper, shaft .250 x 2.187 | 5130 |
| R-147 | V-111 eye control | Potentiometer, 1.0 meg. ± 20%, composition, linear taper, shaft .250 x .500, screwdriver slot | 5128 |
| R-148 | Phone jack attenuator | Resistor, composition, 33,000 ohms ± 10%, ½ watt, pigtail terminals | 7237 |
| R-149 | V-111 target series | Resistor, composition, 1.0 meg. ± 20%, ½ watt, pigtail terminals | 7255 |
| R-150 | V-107B plate filter | Same as R-122 | |
| R-151 | V-107B grid leak | Same as R-122 | |
| | | **SWITCHES** | |
| S-101 | | Switch, rotary type, 4 sections, 5 positions, Phenolic wafers, silver contacts | 7317 |
| A | Phono radio switch | | |
| B | B.F.O. plate supply | | |
| C | Selectivity switch #2 I-F | | |
| D | Selectivity switch #1 I-F | | |
| S-102 | | | |
| A | Dial indicator lamp section | Bandchange switch, 5 wafer type sections, rotary type | 5195 |
| B | H.F. oscillator section | | |
| C | RF section | | |
| D | Antenna secondary section | | |
| E | Antenna primary section | | |
| S-103 | AC power switch | Toggle switch S.P.S.T., silver plated contacts, rated 3A, 250 volts DC | 5197 |
| S-104 | Noise limiter switch | Toggle switch S.P.D.T., silver plated contacts, rated 3A, 250 volts DC | 7091 |
| | | **TRANSFORMERS R.F., A.F., AND POWER** | |
| T-101 | J-103 to V-101 coupling BC Band | R.F. transformer assembly antenna section<br>Pri. DC resistance 0.58 ohms ±10%<br>Sec. DC resistance 4.73 ohms ±10% | Pri.5050<br>Sec.5051 |

## 15.2 TABLE II (*Continued*)
## PARTS LIST BY SYMBOL DESIGNATIONS FOR MODEL SLR-H RADIO RECEIVING EQUIPMENT

| Symbol Desig. | FUNCTION | DESCRIPTION | Drawing and Part Number |
|---|---|---|---|
| | | **TRANSFORMERS R.F., A.F., AND POWER** (*Continued*) | |
| T-102 | J-103 to V-101 coupling<br>SWI Band | R.F. transformer assembly antenna section<br>Pri. DC resistance 0.2 ohms ±10%<br>Sec. DC resistance 0.11 ohms ±10% | Pri.5054<br>Sec.5055 |
| T-103 | J-103 to V-101 coupling<br>SWII Band | R.F. transformer assembly antenna section<br>Pri. DC resistance 0.16 ohms ±10%<br>Sec. DC resistance 0.06 ohms ±10% | Pri.5058<br>Sec.5059 |
| T-104 | V-101 to V-103 coupling<br>BC Band | R.F. transformer assembly R.F. section<br>Pri. DC resistance 0.3 ohms ±10%<br>Sec. DC resistance 4.82 ohms ±10% | 5052 |
| T-105 | V-101 to V-103 coupling<br>SWI Band | R.F. transformer assembly R.F. section<br>Pri. DC resistance 0.14 ohms ±10%<br>Sec. DC resistance 0.11 ohms ±10% | 5056 |
| T-106 | V-101 to V-103 coupling<br>SWII Band | R.F. transformer assembly R.F. section<br>Pri. DC resistance 0.094 ohms ±10%<br>Sec. DC resistance 0.062 ohms ±10% | 5060 |
| T-107 | BC Band oscillator | R.F. transformer assembly oscillator section<br>Tap DC resistance 0.564 ohms ±10%<br>Total Coil DC resistance 3.1 ohms ±10% | 5053 |
| T-108 | SWI Band oscillator | R.F. transformer assembly oscillator section<br>Tap DC resistance 0.03 ohms ±10%<br>Total coil DC resistance 0.1 ohms ±10% | 5057 |
| T-109 | SWII Band oscillator | R.F. transformer assembly oscillator section<br>Tap DC resistance 0.023 ohms ±10%<br>Total coil DC resistance 0.06 ohms ±10% | 5061 |
| T-110 | V-103 to V-104 coupling | 1st IF transformer 455 Kc.<br>Pri. DC resistance 4.65 ohms ±10%<br>Sec. DC resistance 4.78 ohms ±10% | 5062 |
| T-111 | V-104 to V-105 coupling | 2nd IF transformer 455 Kc.<br>Pri. DC resistance 4.89 ohms ±10%<br>Sec. DC resistance 4.78 ohms ±10% | 5063 |
| T-112 | V-105 to V-106 coupling | 3rd IF transformer 455 Kc.<br>Pri. DC resistance 13 ohms ±10%<br>Sec. DC resistance 17.4 ohms ±10% | 5064 |
| T-113 | V-109 and V-110 to speaker terminals | Output transformer<br>Pri. impedance 8,000 ohms at 90 MA DC<br>DC resistance 447 ohms ±10%<br>Sec. impedance 600 ohms tapped at 300, 200, 150, 120 ohms<br>600 ohm sec. DC resistance 38.9 ohms ±10%<br>300 ohm sec. DC resistance 26.6 ohms ±10%<br>200 ohm sec. DC resistance 21.4 ohms ±10%<br>150 ohm sec. DC resistance 18.3 ohms ±10%<br>120 ohm sec. DC resistance 16.3 ohms ±10% | 7080 |
| T-114 | Power transformer | Primary 79 VA, 115 V, .69A ±10%<br>DC resistance 2.8 ohms ±10%<br>Sec. #1, 285-285 volts 150 MA AC ±10%, DC resistance each half 72 ohms ±10%<br>Sec. #2, 6.3 volts, 4.7 A AC. DC resistance 0.08 ohms ±10%<br>Sec. #3, 5.0 volts, 3 A AC. DC resistance 0.17 ohms ±10% | 7078 |

## 15.2 TABLE II (*Continued*)
## PARTS LIST BY SYMBOL DESIGNATIONS
## FOR MODEL SLR-H RADIO RECEIVING EQUIPMENT

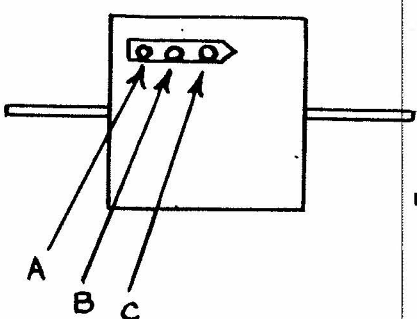
| Symbol Desig. | Function | Description | Drawing and Part Number |
|---|---|---|---|
| | | **VACUUM TUBES** | |
| V-101 | RF amplifier 6K7 | Vacuum tube (Receiving Metal). Triple grid super-control amplifier. Base: small wafer octal 7 pin. Miniature cap. Heater: current 0.3 amp at 6.3 volts AC or DC | 6017 |
| V-102 | H.F. oscillator 6J5 | Vacuum tube (Receiving Metal). Detector amplifier triode. Base: octal 6 pin, phenolic. Heater: current 0.3 amp. at 6.3 volts AC or DC | 6015 |
| V-103 | 1st Detector and mixer 6SA7 or 6SA7-GT | Vacuum tube (Receiving Metal or glass). Pentagrid converter. Base: small wafer octal 8 pin, phenolic. Heater: current 0.3 amp, at 6.3 volts AC or DC | 7166 |
| V-104 | 1st IF amplifier 6SK7 or 6SK7-GT | Vacuum tube (Receiving Metal or glass). Triple grid super-control amplifier. Base: small wafer octal 8 pin, phenolic. Heater: current 0.3 amp. at 6.3 volts AC or DC | 7165 |
| V-105 | 2nd IF amplifier 6SK7 or 6SK7-GT | Same as V-104 | |
| V-106 | 2nd Detector, AVC and Noise limiter, 6H6 or 6H6-GT | Vacuum tube (Receiving metal or glass). Twin diode. Base: Intermediate shell octal 7 pin phenolic. Heater: Current 0.3 amps at 6.3 volts AC or DC | 7167 |
| V-107 | 1st AF amplifier C.W. oscillator 6SN7-GT | Vacuum tube, Receiving glass). Twin triode amplifier. Base: Intermediate shell octal 8 pin. Heater: Current 0.6 amp at 6.3 volts AC or DC | 7155 |
| V-108 | Phase Inverter, push pull driver 6SN7-GT | Vacuum tube (Receiving glass). Twin triode amplifier. Base: Intermediate shell octal 8 pin. Heater: Current 0.6 amp at 6.3 volts AC or DC | 7155 |
| V-109 | Output power amplifier 6V6-GT | Vacuum tube (Receiving Glass). Beam power amplifier. Base: Intermediate shell octal 7 pin. Heater: current 0.45 amp at 6.3 volts AC or DC | 7153 |
| V-110 | Output power amplifier 6V6-GT | Same as V-109 | |
| V-111 | Tuning indicator 6E5 | Vacuum tube (Receiving glass). Electron ray tube. Base: Small wafer octal 6 pin. Heater: Current 0.3 amp at 6.3 volts AC or DC | 6012 |
| V-112 | Rectifier 5U4-G | Vacuum tube (Receiving glass). Full wave high vacuum rectifier. Base: Medium shell octal 5 pin. Heater: current 3.0 amp at 5.0 volts AC | 7154 |
| | | **SOCKETS** | |
| X-101 | Socket for V-101 | Vacuum tube socket eight contact (octal) plug-in type, with retaining ring and spacer washer. Mica filled molded bakelite base. Circular | 7035 |
| X-102 | Socket for V-102 | Same as X-101 | |
| X-103 | Socket for V-103 | Same as X-101 | |
| X-104 | Socket for V-104 | Same as X-101 | |
| X-105 | Socket for V-105 | Same as X-101 | |
| X-106 | Socket for V-106 | Same as X-101 | |
| X-107 | Socket for V-107 | Same as X-101 | |
| X-108 | Socket for V-108 | Same as X-101 | |
| X-109 | Socket for V-109 | Same as X-101 | |
| X-110 | Socket for V-110 | Same as X-101 | |
| X-111 | Socket for V-111 | Vacuum tube socket, 6 prong phenolic | 5040 |
| X-112 | Socket for V-112 | Same as X-101 | |

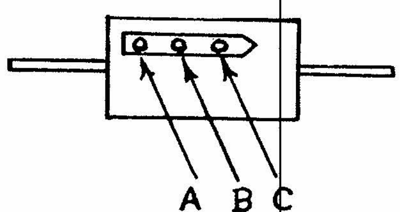
# TABLE III

## APPLICABLE COLOR CODES AND MISCELLANEOUS DATA FOR MODEL SLR-H RADIO RECEIVING EQUIPMENT

### Color Code in MMFD for Capacitors

| *Color* | *A* *1st Digit* | *B* *2nd Digit* | *C* *Ciphers* |
|---|---|---|---|
| Black | — | 0 | .0 |
| Brown | 1 | 1 | 0 |
| Red | 2 | 2 | 00 |
| Orange | 3 | 3 | 000 |
| Yellow | 4 | 4 | 0000 |
| Green | 5 | 5 | 00000 |
| Blue | 6 | 6 | 000000 |
| Purple | 7 | 7 | 0000000 |
| Gray | 8 | 8 | 00000000 |
| White | 9 | 9 | — |




Silver mica capacitors have values stamped into body of condenser.

### RMA Color Code for Resistors

| *Color* | *A* *1st Digit* | *B* *2nd Digit* | *C* *Ciphers* |
|---|---|---|---|
| Black | — | 0 | .0 |
| Brown | 1 | 1 | 0 |
| Red | 2 | 2 | 00 |
| Orange | 3 | 3 | 000 |
| Yellow | 4 | 4 | 0000 |
| Green | 5 | 5 | 00000 |
| Blue | 6 | 6 | 000000 |
| Purple | 7 | 7 | 0000000 |
| Gray | 8 | 8 | 00000000 |
| White | 9 | 9 | — |

D—Tolerance Code:

Gold—5% Silver—10%

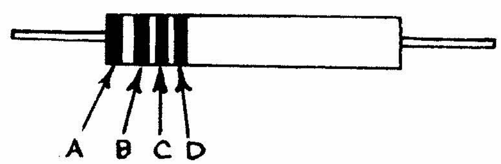


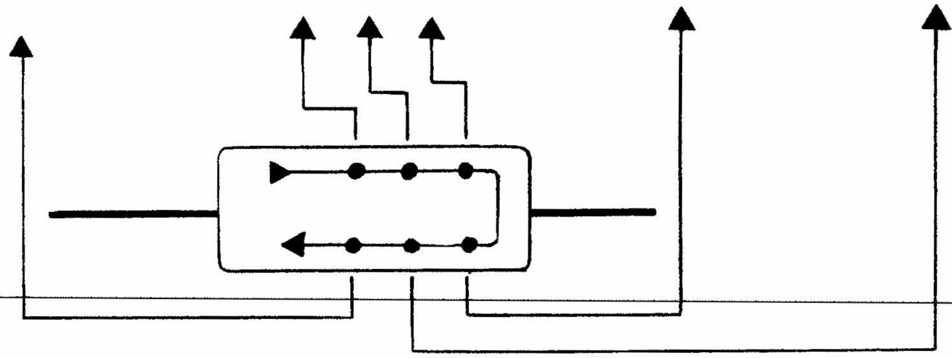
Table III

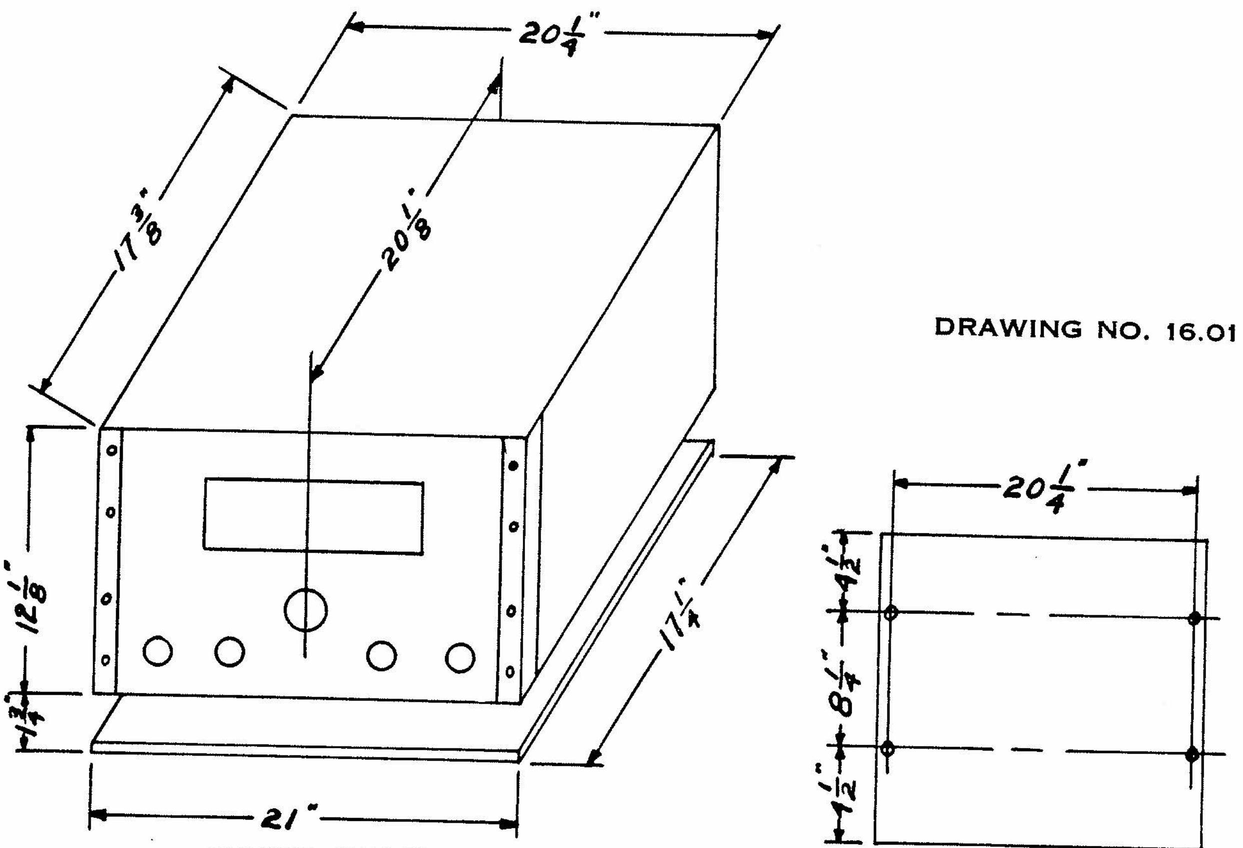
Applicable Color Codes and Miscellaneous Data for Model SLR-H Receiver

RMA 6 Dot Color Code

Read In Direction of Molded Arrow

| *Color of Dot* | *Working Voltage* | *Significant Figure of Dot* | *Decimal Multiplier* | *Tolerance* |
|---|---|---|---|---|
| Black | ........ | 0 | 1 | ...... |
| Brown | 100 | 1 | 10 | 1% |
| Red | 200 | 2 | 100 | 2% |
| Orange | 300 | 3 | 1000 | 3% |
| Yellow | 400 | 4 | ...... | 4% |
| Green | 500 | 5 | ...... | 5% |
| Blue | 600 | 6 | ...... | 6% |
| Violet | 700 | 7 | ...... | 7% |
| Gray | 800 | 8 | ...... | 8% |
| White | 900 | 9 | ...... | 9% |
| Gold | 1000 | .... | ...... | ...... |
| Silver | 2000 | .... | ...... | 10% |



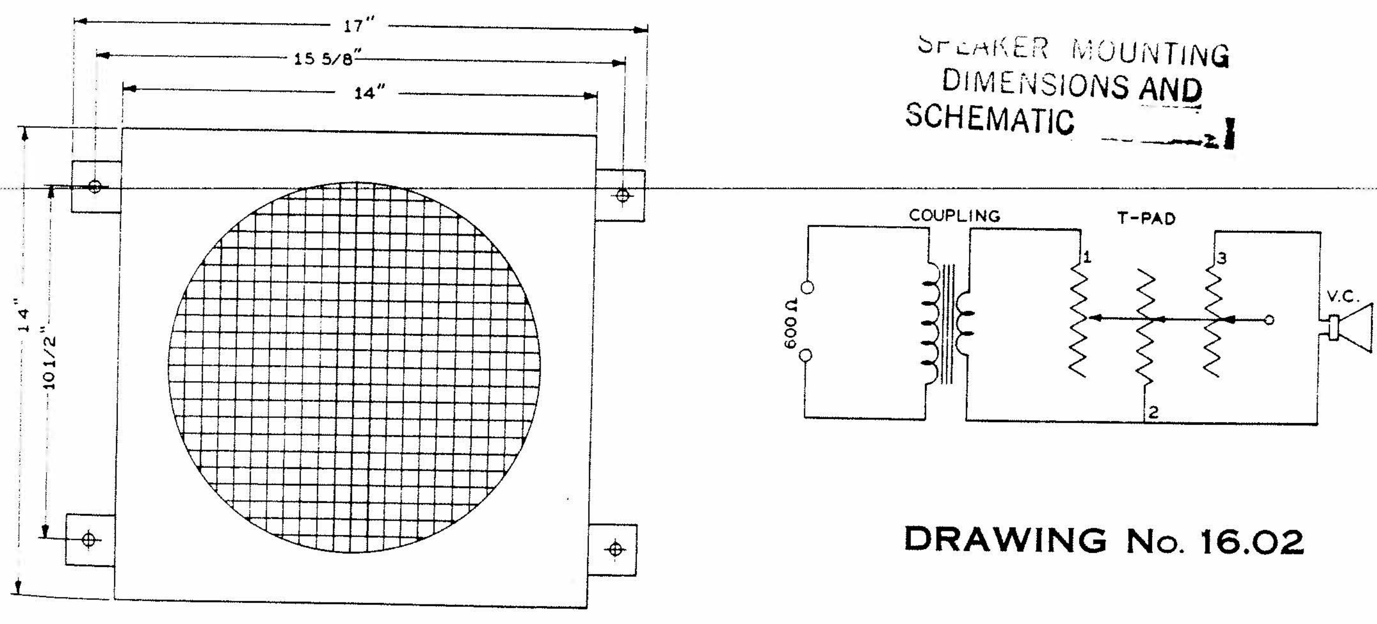



DRAWING NO. 16.01

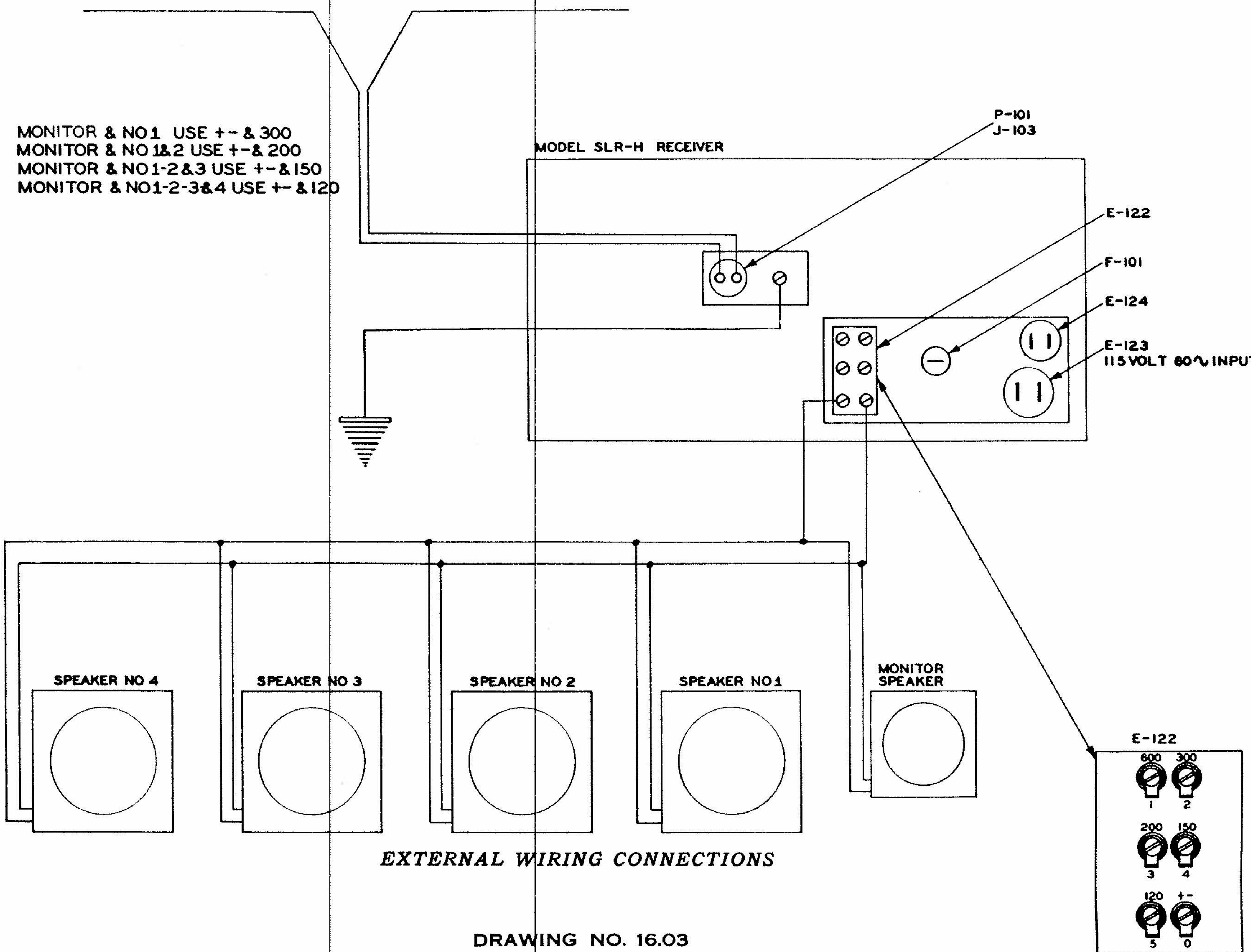
*MODEL SLR-H*
*RADIO RECEIVER*

*MOUNTING BASE*

SPEAKER MOUNTING DIMENSIONS AND SCHEMATIC




DRAWING No. 16.02




*EXTERNAL WIRING CONNECTIONS*

DRAWING NO. 16.03


FIG. 1. Left Front Oblique View, Radio Receiver.

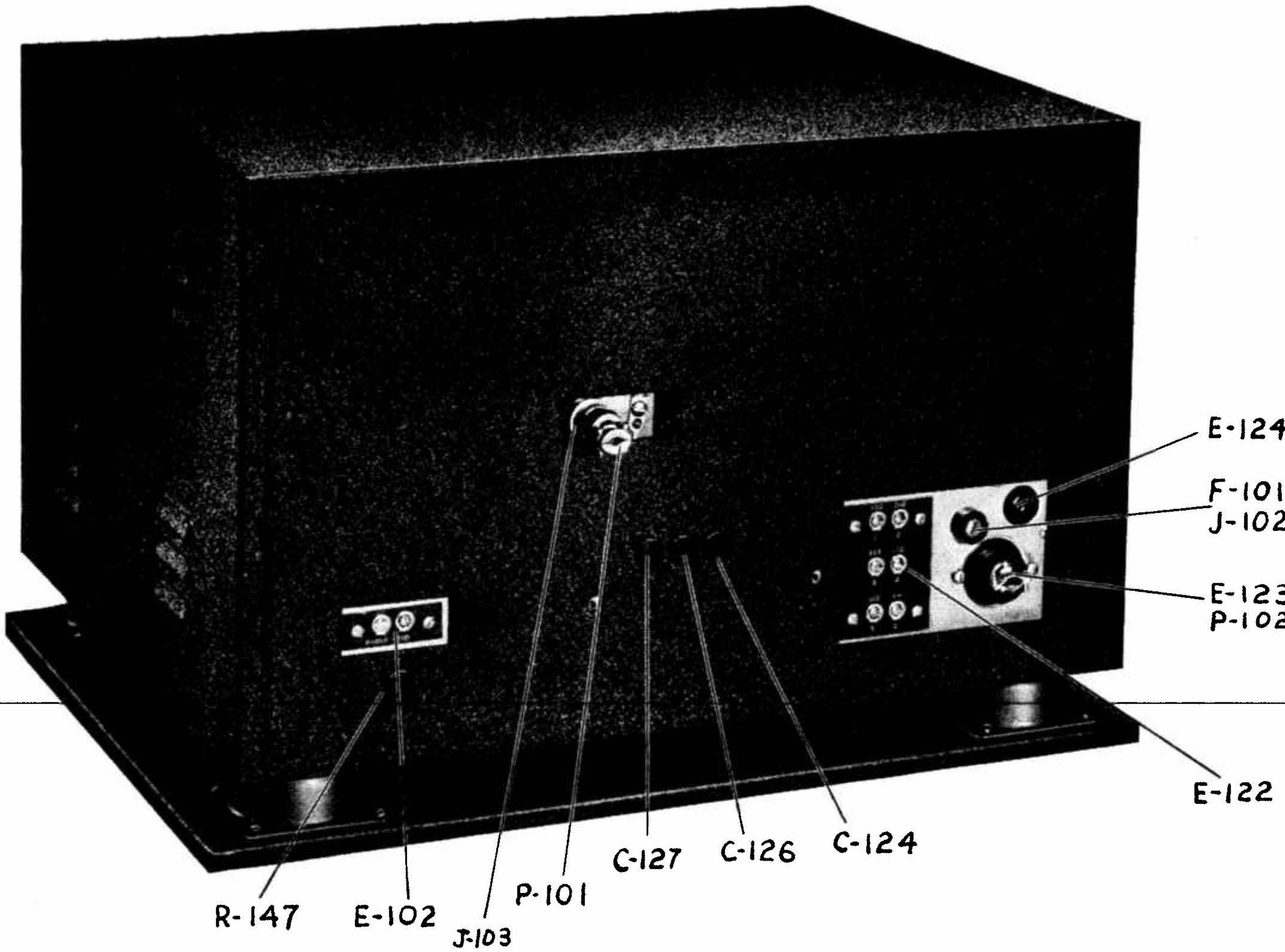



FIG. 2. Left Rear Oblique View, Radio Receiver.

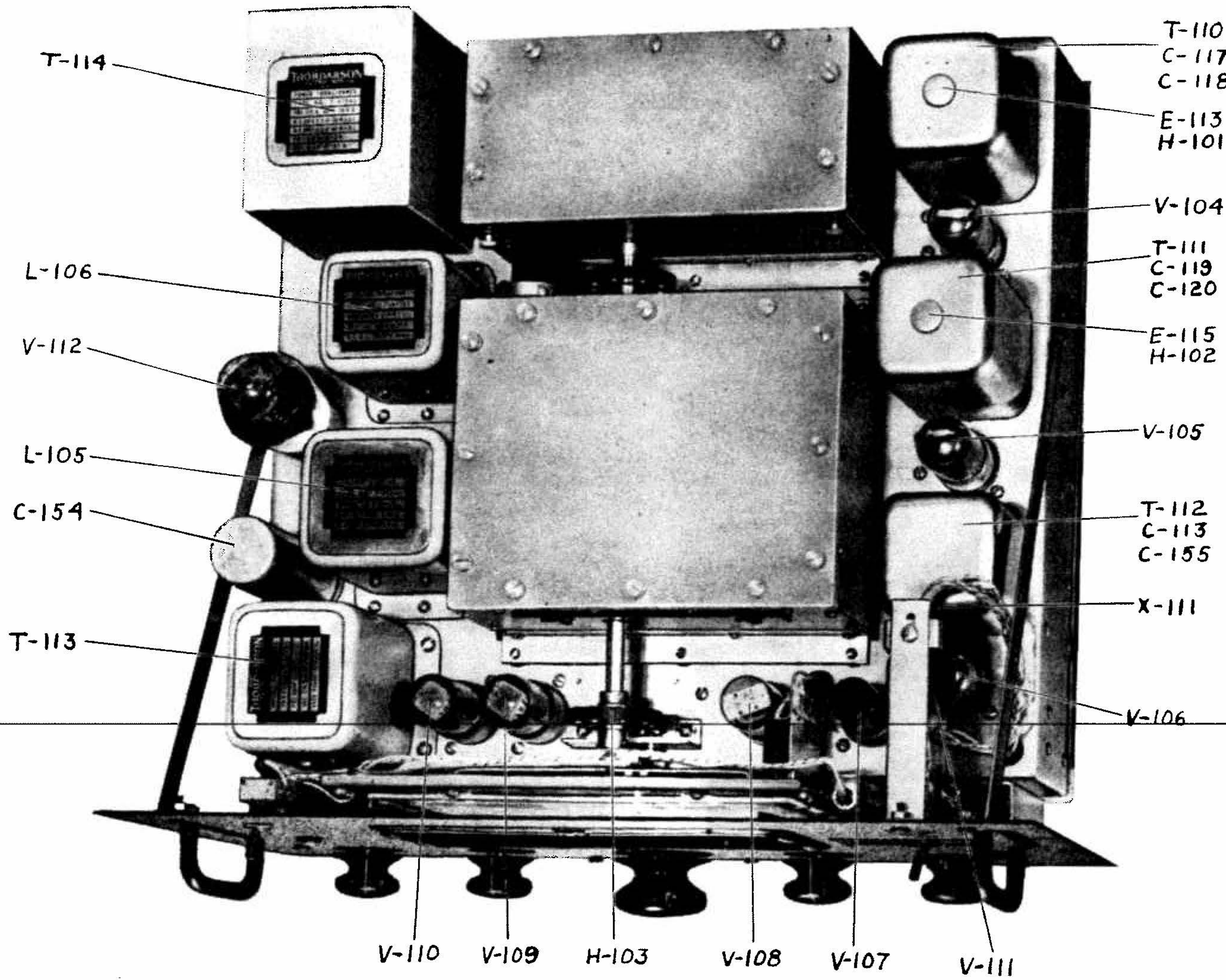



FIG. 3. TOP VIEW, RADIO RECEIVER CHASSIS.

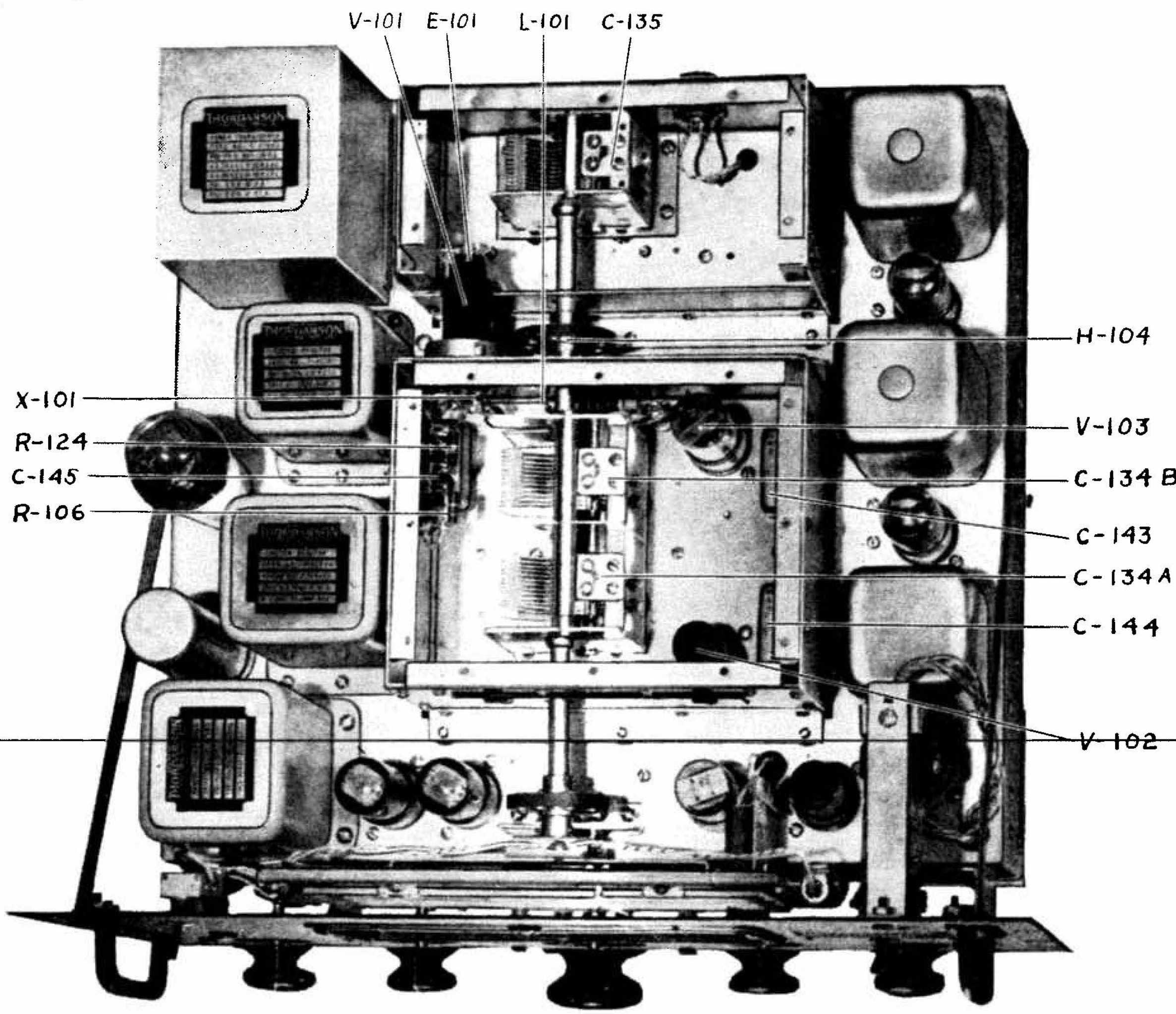



FIG. 4. TOP VIEW, RECEIVER CHASSIS, COMPARTMENT SHIELD COVERS REMOVED.

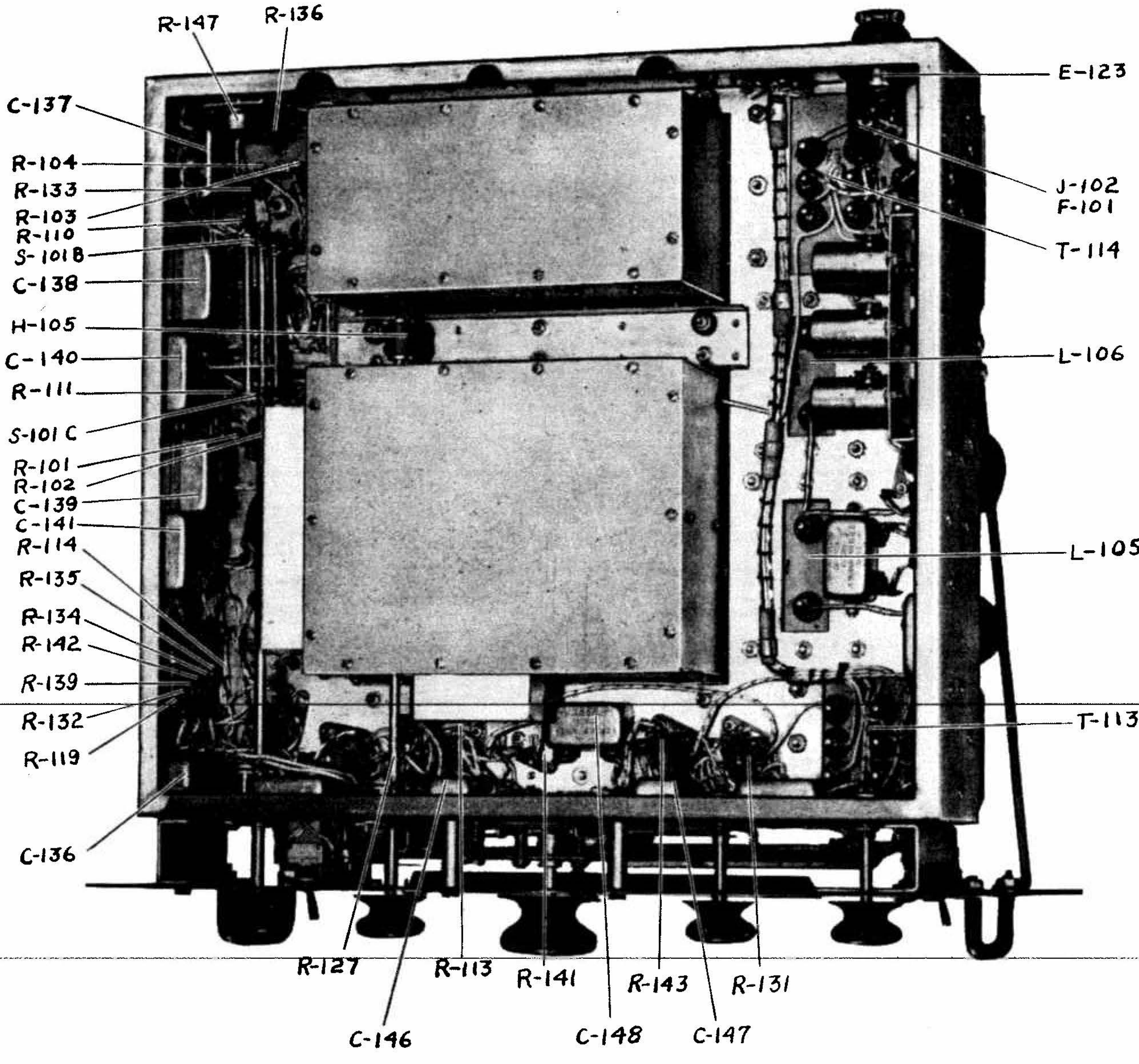



FIG. 5. LEFT BOTTOM OBLIQUE VIEW, RECEIVER CHASSIS, BOTTOM COVER PLATE REMOVED.

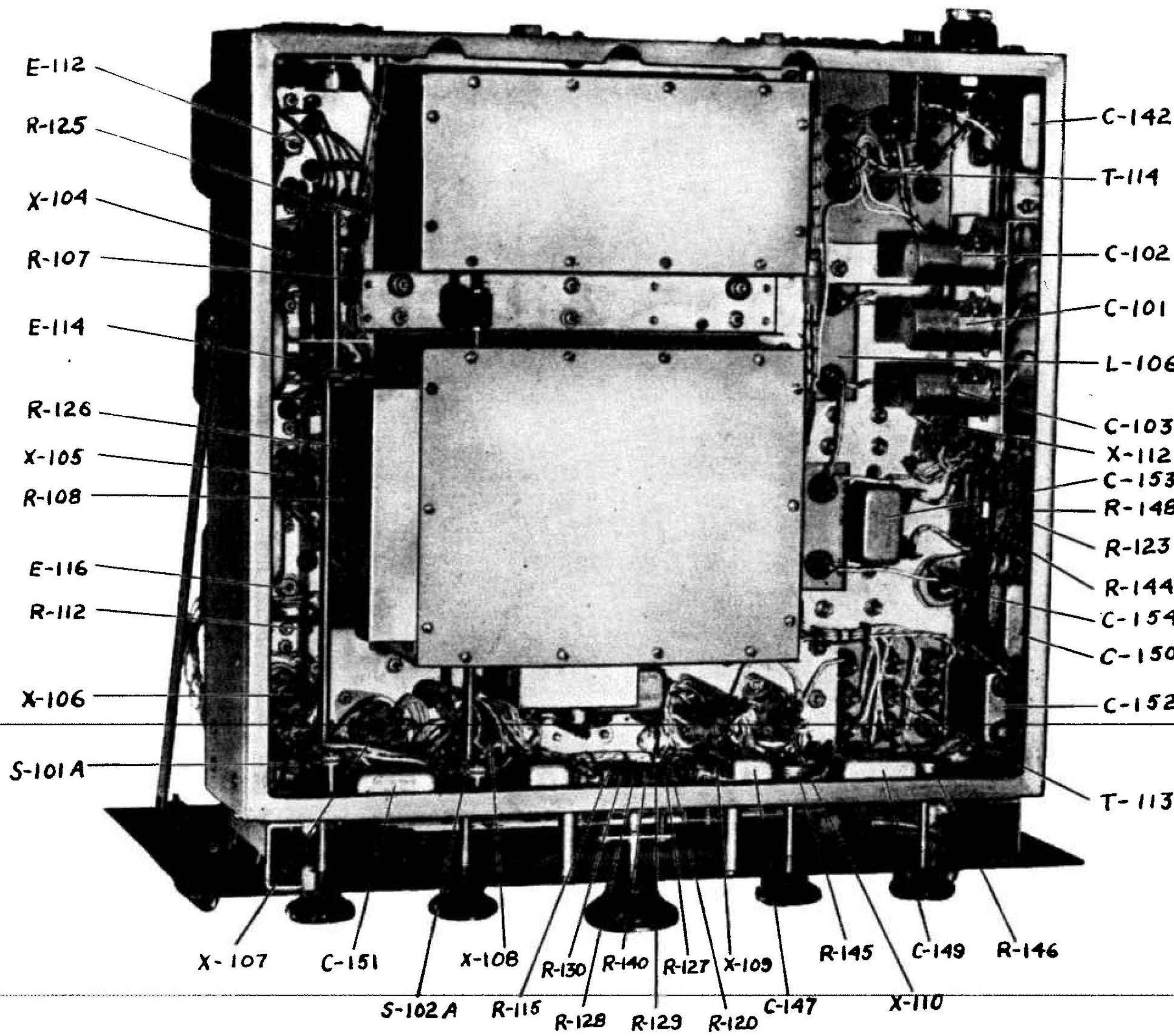



FIG. 6. Right Bottom Oblique View, Receiver Chassis, Bottom Cover Plate Removed.

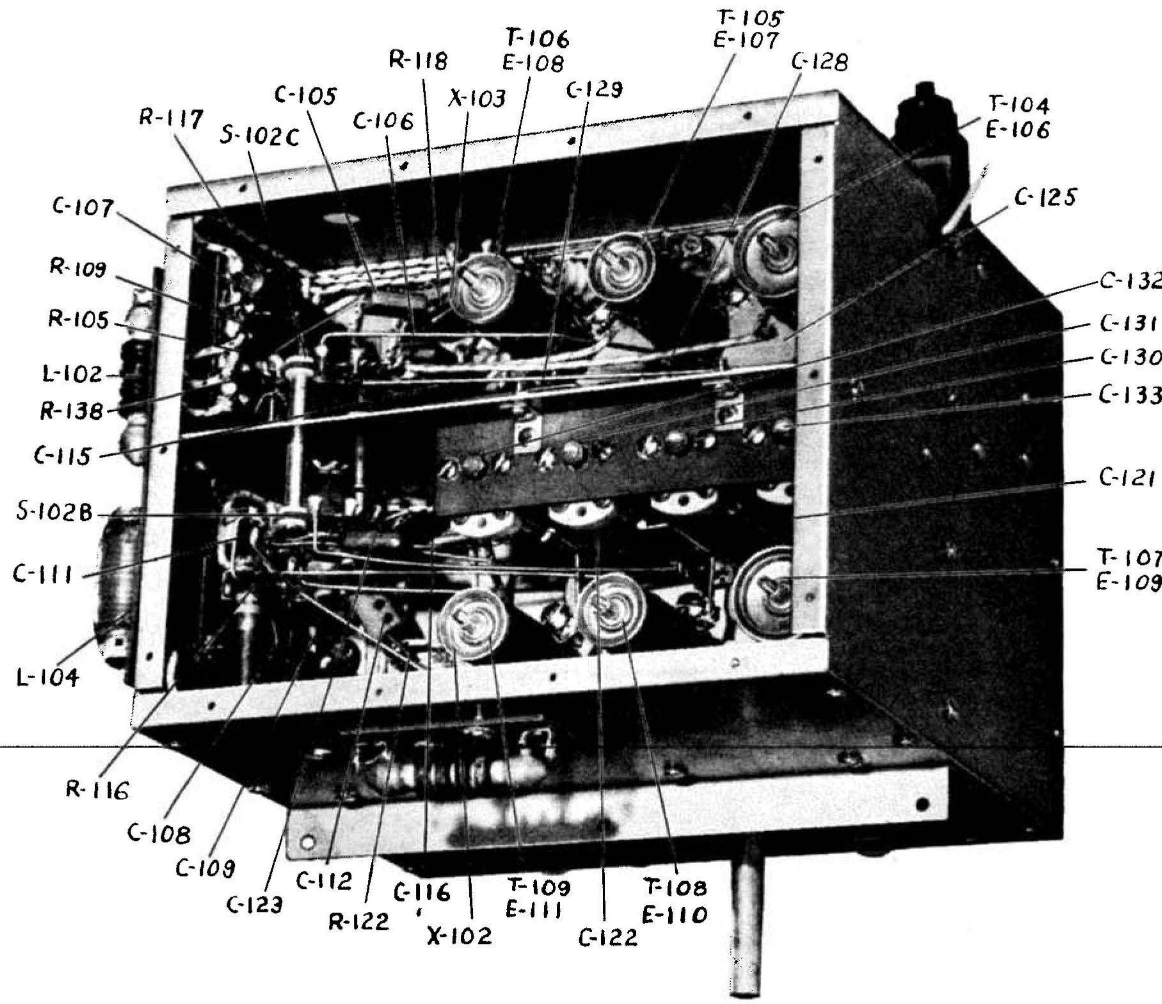



FIG. 7. Top Oblique View, R.F. and H.F. Osc. Compartment, Shields Partially Removed.

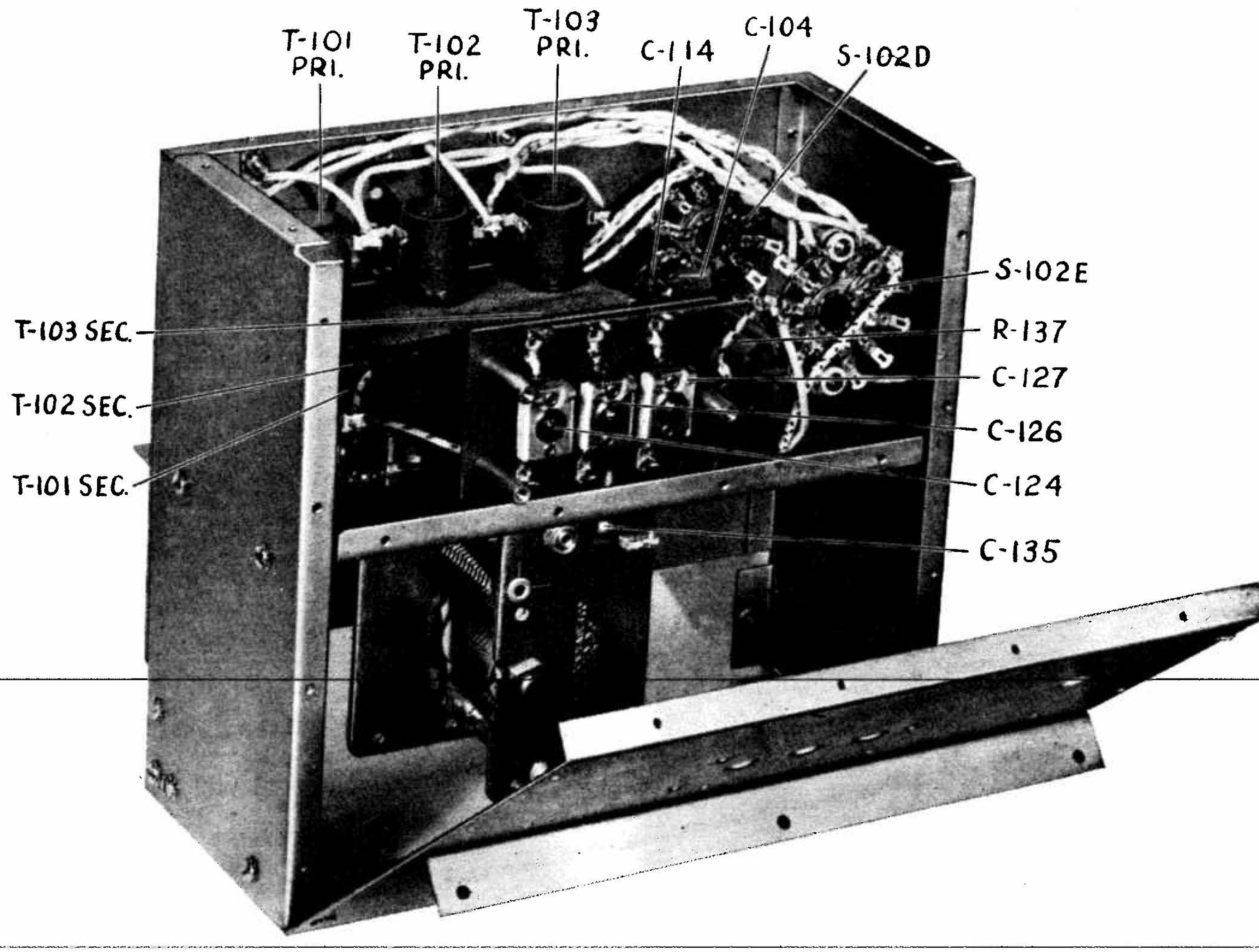



FIG. 8. LEFT OBLIQUE, INVERTED VIEW, ANTENNA COMPARTMENT, SHIELDS PARTIALLY REMOVED.

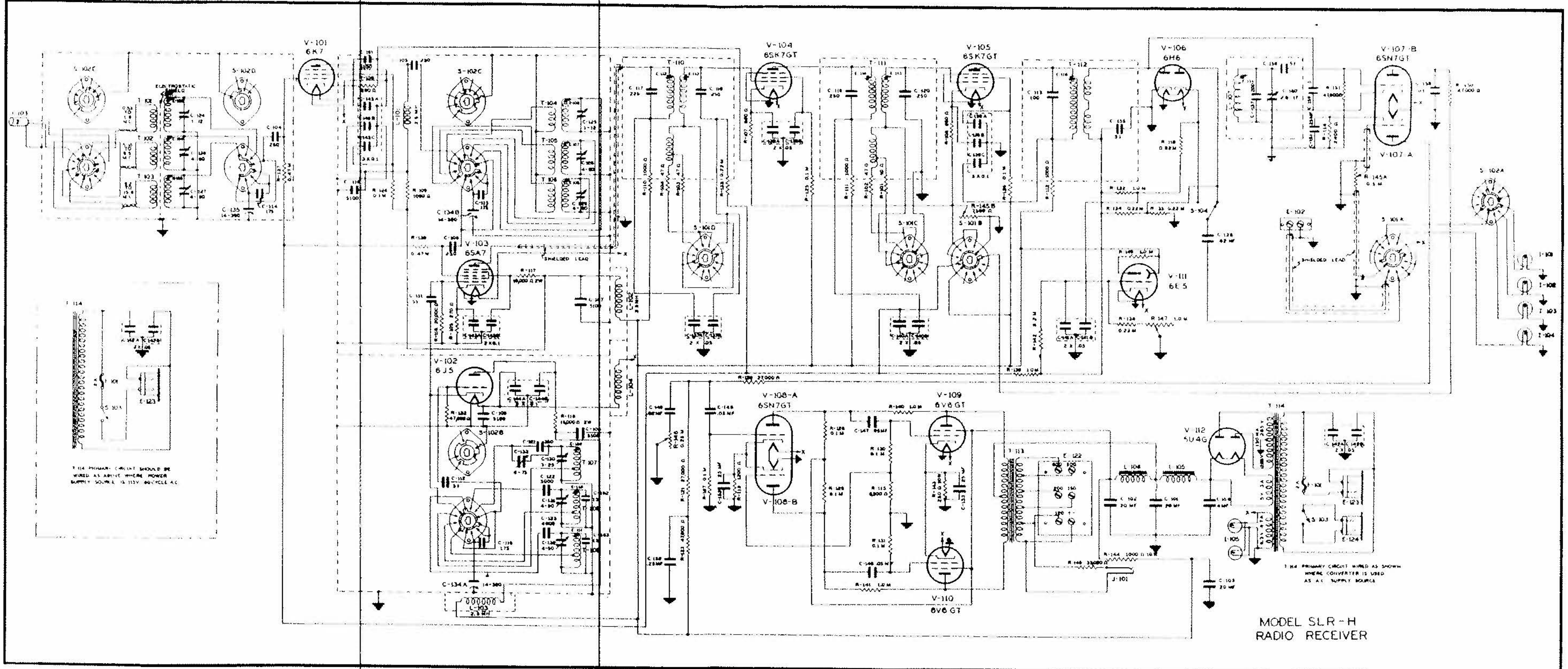



FIG. 9. ACTUAL SCHEMATIC DIAGRAM MODEL SLR-H RECEIVER

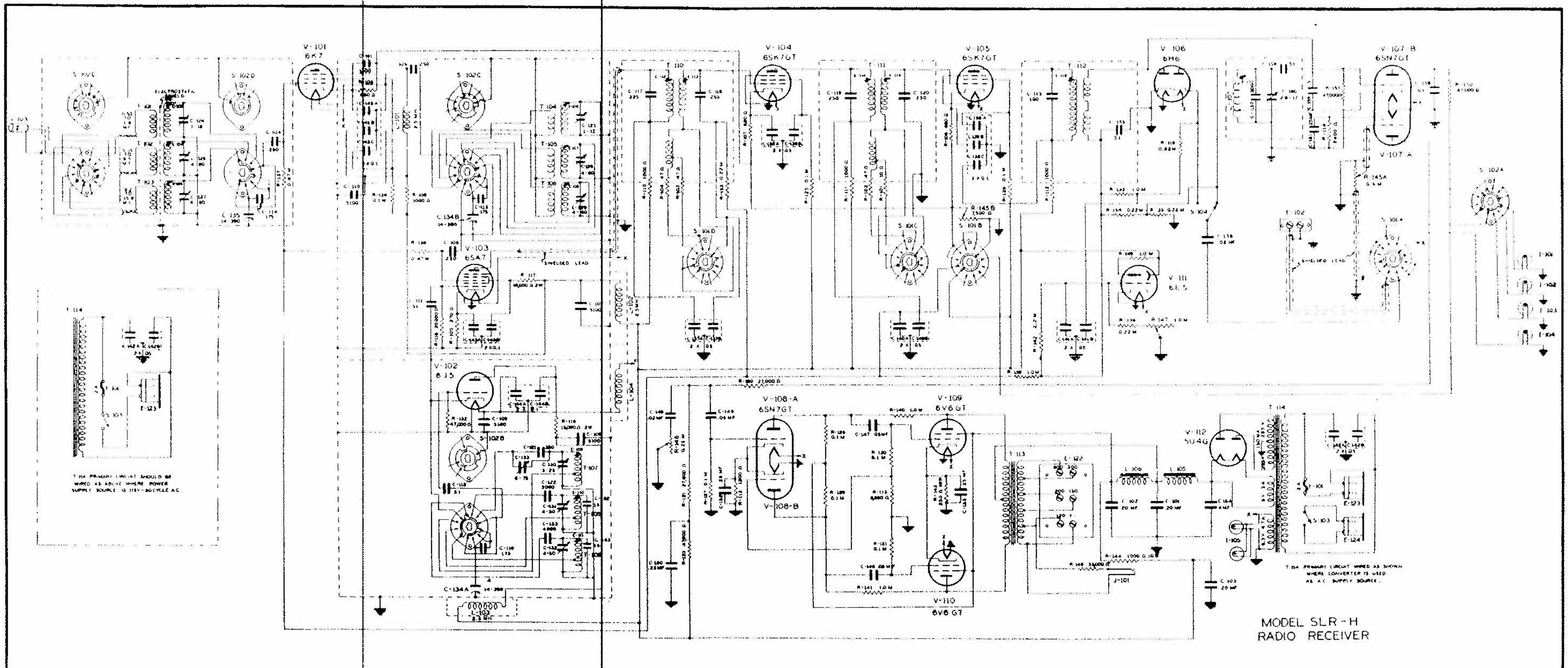



FIG. 9. ACTUAL SCHEMATIC DIAGRAM MODEL SLR-H RECEIVER