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NEMS CLARKE
EQUIPMENT

RANGE EXTENSION UNIT REU-300C

• PRODUCED BY

Vitro ELECTRONICS
A DIVISION OF VITRO CORPORATION OF AMERICA

919 JESSUP BLAIR DRIVE • SILVER SPRING, MARYLAND
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Warranty for Equipment and Accessories

Vitro Electronics warrants each new equipment to be free of defects in material and workmanship, for a period of one (1) year after date of original shipment, except that tubes, fuses, transistors and diodes will be warranteed for a period of 90 days. Any instrument which is found within the one year period not to meet the foregoing standards, after examination by our factory, will be repaired or at the option of Vitro replaced without charge. This warranty does not apply to equipment which has been altered, improperly handled, or damaged in any way.

Changes in Specifications

The right is reserved to change the published specifications of equipment at any time, and to furnish merchandise in accordance with current specifications, without incurring any liability to modify equipment previously sold.

Returning Equipment to Factory

Factory service is available for repair and readjustment of this instrument; however, a description of the trouble, plus the model and serial numbers of the unit should be forwarded first, whereupon instructions for correcting the trouble or authorization for returning the equipment will be given. This applies to all units, whether under warranty or not.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT'D)

LIST OF ILLUSTRATIONS

LIST OF TABLES

SECTION 1. GENERAL DESCRIPTION

1.1 Purpose of Equipment

The REU-300 Range Extension Unit has been specifically designed to extend the operating frequency of VHF receivers capable of tuning 60 mc. The REU-300 tunes continuously from 250 to 475 mc, and from 475 to 900 mc in two bands and will extend the operating range of a receiver to 900 mc. Thus offering operation in three bands from 55 to 900 mc.

1.2 Description of Equipment

Figure 1-1 shows a front view of the REU-300 Range Extension Unit, Table 1-1 shows the Performance Specifications. The front panel controls of the REU-300 consist of two frequency selection knobs, two frequency indicating dials, a coaxial "RANGE" switch, two protective line fuses, a power switch, and a pilot lamp. An illuminating lamp is provided, behind each frequency indicating dial, that will light when that particular dial is in use. Neither lamp will light when the coaxial "RANGE" switch is in the "DIRECT" position and normal tuning is accomplished with the tuning dial on the associated receiver.

The REU-300 is designed in such a manner that simply tuning the associated receiver to 60 mc (the IF frequency of the REU-300) and energizing the appropriate section of the REU-300 will provide operation in any of the bands of the REU-300.

The RF sections of the REU-300 are completely shielded sub-assemblies, featuring great mechanical stability and a high degree of electrical stability. Stenciled terminal boards are used where practical in the main chassis to allow central location of components, and to facilitate identification. The REU-300 is designed to operate in a 50 ohm system, and consists of two separate RF sections, one for use in the 250 to 475 mc band and one for use in the 475 to 900 mc band. Application of B plus is discontinued to RF sections when the associated receiver is operated in the 55 to 260 mc band.

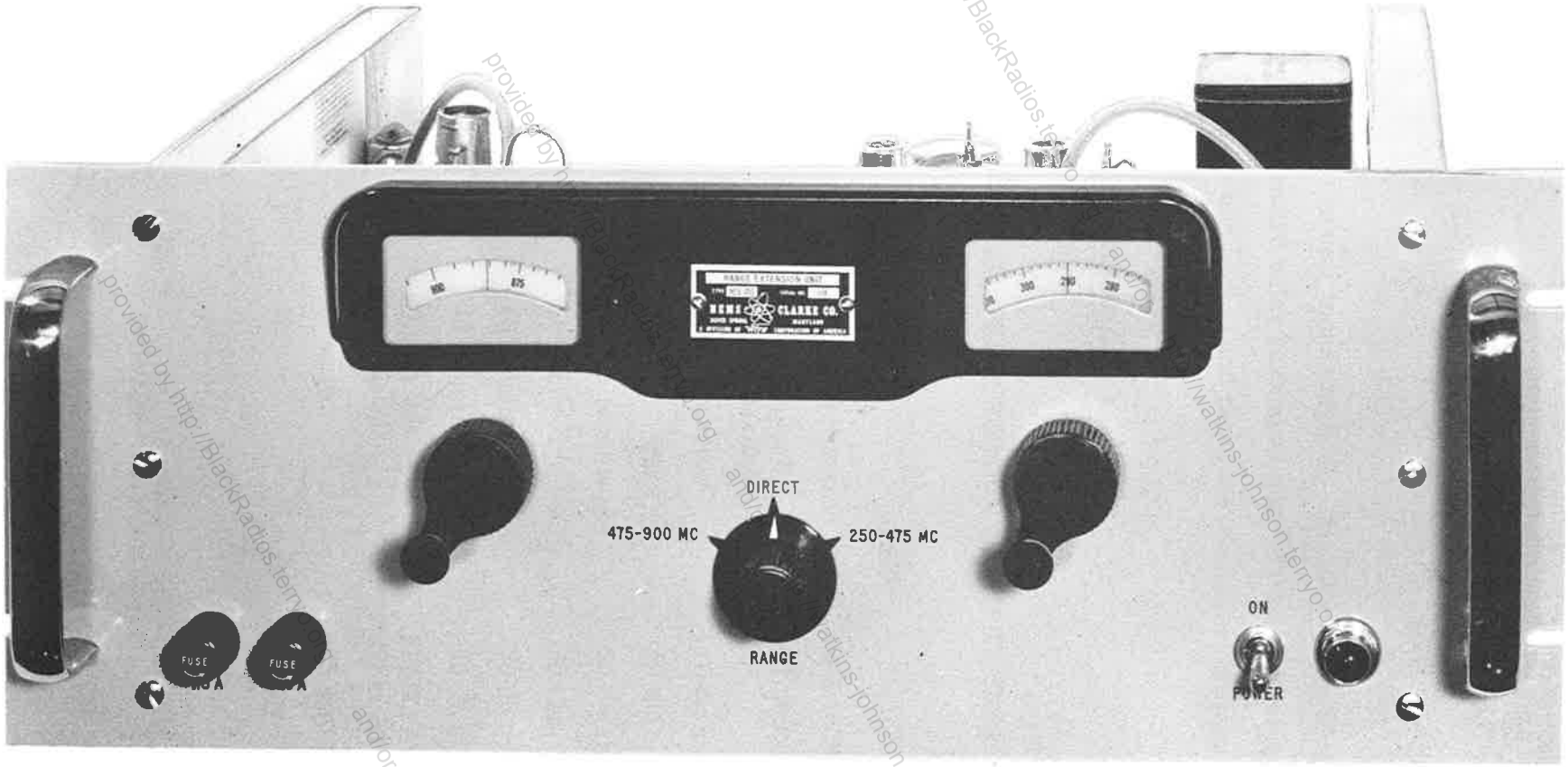


Figure 1-1. REU-300C Range Extension Unit, Front View

The unit measures 7 inches high, by 19 inches wide, by 15 inches deep, and is designed for standard relay rack mounting. The weight of the unit is approximately 20 lbs; when packed and ready for shipment, the unit weighs approximately 35 lbs.

1.3 Performance Specifications

Refer to Table 1-1

TABLE 1-1. PERFORMANCE SPECIFICATIONS FOR REU-300

Characteristic	Range	
Tuning Range	250 to 475 mc.	475 to 900 mc.
Noise Figure	11 db typical 14 db maximum	11 db typical
Gain	8db minimum	10 db minimum
I.F. Frequency	60 mc.	60 mc.
Input Impedance	50 ohm (nominal)	50 onm (nominal)
Output Impedance	50 ohm "	50 ohm "
I. F. Rejection	60 db minimum	50 db minimum
Image Rejection	40 db minimum	40 db minimum
Power Requirements	117/230 VAC 50 to 60 cps	117/230 VAC 50 to 60 cps
Power Consumption	27 watts	25 watts
Weight	20 lbs.	20 lbs.

SECTION 2. INSTALLATION

2.1 Unpacking and Inspection

Check the front panel of the unit for damage to knobs, windows, and indicator dials. Operate the control knob, examine it for looseness. Operate the tuning knobs through their entire range any noticeable binding indicates a damaged tuning system.

Remove the top and bottom covers and examine tubes, making certain they are properly seated.

2.2 Installation Data

The unit may be rack mounted in a standard 19-inch equipment rack by four screws inserted through slots on the front panel, and screwed into the rack frame.

2.2.1 Dimensions

The REU-300C is 7 inches high, 19 inches wide and 15 inches deep.

2.2.2 Interconnections with Auxiliary Equipment.

All external connections to the REU-300C are located on the rear apron. Refer to Figure 6-2 for connector locations.

(a) Connect the 55 to 260 mc antenna through a 50 ohm transmission cable to J-108.

(b) Connect the 250 to 475 mc antenna through a 50 ohm transmission line to J-112.

(c) Connect the 475 to 900 mc antenna through a 50 ohm transmission line to J-101.

(d) Connect the "Output" Connector, J-110, through a 50 ohm transmission line to the input of the receiver to be used with the REU-300C.

(e) Place the 117/230 volt selector switch, S-102 in the appropriate position for the supply available.

(f) Connect the power cord to jack J-111 and apply 117/230 volt, 50 to 60 cps, single phase, alternating current.

SECTION 3. OPERATION

3.1 General

All normal operating controls are located on the front panel of the unit. Refer to Figure 1-1.

3.2 Operation

(a) Place "POWER" switch S-101 in the "ON" position

(b) Turn the "RANGE" switch to the position corresponding to the desired range of operation.

(c) Tune the associated receiver to 60 mc. (The output frequency of the REU-300C).

(d) Tune the REU to the desired frequency of operation using the appropriate frequency selector knob and indicator dial.

SECTION 4. THEORY OF OPERATION

4.1 Block Diagram Discussion

A block diagram of the REU-300 Range Extension Unit is shown in Figure 4-1. The circuit with the "RANGE" switch in the 250 to 475 mc position is such that power is applied to the low-frequency RF section consisting of V-201, V-202, and V-203. With the "RANGE" switch in the "DIRECT" position, the circuit is such that the associated receiver gets its signal directly from the 55 to 260 mc antenna and operation is permitted in this range. With the "RANGE" switch in the 475 to 900 mc position, the circuit is such that power is applied to the high-frequency RF section consisting of V-102, V-105, and CR-105 and the system operates in the latter range.

4.2 Detailed Theory

Refer to schematic diagram Figure 7-1

4.2.1 "RANGE" SWITCH IN 250 to 475 mc POSITION.

(a) Antenna.- The input impedance of the REU-300 with the "RANGE" switch in the 250 to 475 mc position is approximately 50 ohms over the tuning range. The input signal is fed through a type "N" coaxial receptacle, J-112, on the rear apron of the chassis.

(b) R.F. Amplifier, V-201, 5842/417A.- The input is applied to the cathode of the grounded-grid RF amplifier, V-201. The basic tuning element for the cathode of V-201 is one of four tuning sections of a Mallory UHF Inductuner, L-210A, which broadly resonates the cathode circuit to the frequency of the desired input signal. Cathode resistor method of obtaining self-bias is used in this circuit, resistor R-201 developing the bias, and capacitor C-214 providing cathode resistor by-passing. The plate circuit of the RF Amplifier, V-201, is capacitively coupled to the grid of the mixer, V-202, through a double tuned band-pass circuit, the basic tuning elements of which are two sections of the Mallory UHF Inductuner, L-210B, and L-210C.

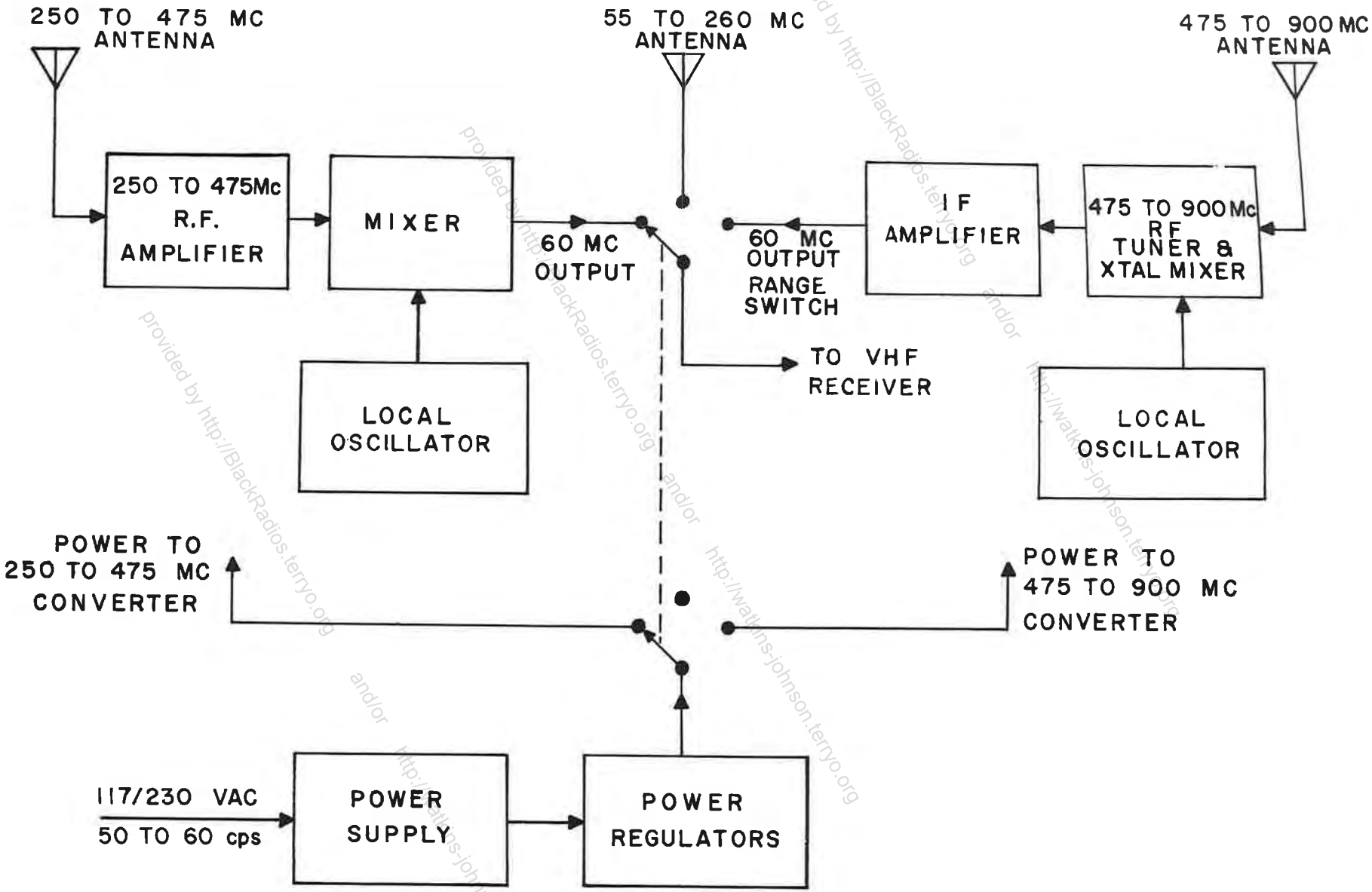


Figure 4-1. Block Diagram REU-300C Extension Unit

(c) Local Oscillator, V-203/6AF4A.- The local oscillator, V-203, which is a modified version of the Colpitts configuration, operates at a frequency of 60 mc above the signal input frequency to which the RF amplifier is tuned. Maximum oscillator stability is insured by the use of regulated B plus voltage for the oscillator plate circuit. The oscillator signal is injected into the mixer grid circuit through capacitor C-206, a 2.7 pf capacitor, thus developing an operational mixer grid bias proportional to the amplitude of the local oscillator signal.

(d) Mixer, V-202/6AK5.- The mixer, V-202, receives the local oscillator injection voltage through C-206, and develops an operational grid bias across the grid resistors, R-204 and R-205. The R.F. signal from the double tuned band-pass circuit is coupled through capacitor C-205 to the grid of the mixer. A decoupled test point, from a tap on the mixer grid resistors, R-204 and R-205, provides a means of observing the response of the R F. circuits and measuring the oscillator injection voltage. Trimmers are incorporated in the R.F. plate, mixer input, and oscillator tank circuits for proper alignment and adjustment. The plate of the mixer, V-202, is tuned to 60 megacycles by L-204, a tunable series coil, and is coupled to the output across a capacitor, C-207, connected to the low R.F. potential end of L-204.

A blocking capacitor, C-219, 470 pf is provided to prevent application of B+ to the output circuit. The output is taken from J-202 through Coaxial Range Switch S-103, at 60 mc and applied to the Output jack, J-110 on the rear apron of the unit.

4.2.2 "RANGE SWITCH IN THE'DIRECT'POSITION

(a) With the coaxial range switch, S-103, in the "DIRECT" ' position the signal from the 55 to 260 mc antenna is applied to the input jack. J-108, and goes through the range switch, S-103, to the jack, J-110, on the

rear apron of the unit, thus allowing the associated receiver to operate in the 55 to 260 mc range. Switches S-104, S-105, S-106 and S-107 are open, thereby removing B+ from the two R.F. tuners.

4.2.3 "RANGE" SWITCH IN THE 475 to 900 mc POSITION

(a) Antenna.- The input impedance of the REU-300C with the "RANGE" switch in the 475 to 900 mc position is approximately 50 ohms over the tuning range. The input signal is fed through a type "N" coaxial receptacle, J-101, located on the rear apron of the unit.

(b) R.F. Section.- The REU-300C with the "RANGE" switch in the 475 to 900 mc position employs a tuned two-cavity radio-frequency stage. The coaxial input jack, J-102, is coupled to the radio-frequency section, which is resonated to the input frequency by changing the capacitance between the inner conductor and the wall. This effectively produces quarterwave tuning in the cavities, and is analagous to the coaxial line cavity in which the resonant frequency is determined by the position of the plunger. The signal is then coupled through the inductor L-109 to the IN82-A crystal mixer stage.

(c) Local Oscillator V-105/6AF4A.- The local oscillator employs a type 6AF4A triode, V-105, and is tuned 60 mc higher than the input signal. Its tank circuit consists of a pair of transmission lines whose load is a variable capacitance ganged with the radio-frequency tuning capacitor. Minimum oscillator drift is achieved by employing three temperature-sensitive capacitors connected across the line at different points.

(d) Mixer, CR-105/IN82-A.- The radio-frequency signal and the local oscillator signal are coupled to the IN82-A mixer, CR-105, an RF crystal diode, the output circuit of which is tuned to 60 mc and is inductively coupled to the I.F. amplifier, V-102.

(e) I.F. Amplifier, V-102/6BN4.- The 6BN4 I.F. amplifier, V-102, receives its signal from the IN82-A mixer, CR-105, through an inductive coupling network, consisting of L-101, a coaxial cable, a coupling coil (L-102) and a tunable input coil (L-103). The I.F. amplifier is a single stage 6BN4 triode, V-102, utilizing a shunt coil, L-105, for neutralization of grid-to-plate capacitance. The plate of the I.F. amplifier, V-102, is tuned to 60 mc by L-104, a tunable series coil, and is coupled to the output across C-103 which is connected to the low R.F. potential side of L-104. A blocking capacitor, C-104, is provided to prevent the application of B plus to the output circuit. The signal at 60 mc is then applied to the coaxial range switch and the output connector, J-110.

4.2.4 Power Supply

The REU-300 has a conventional power supply featuring operation at both 117 and 230 volts input; this is facilitated by the use of a center-tapped primary on the power transformer, T-101. A full-wave bridge rectifier consisting of CR-101 through CR-104 is connected across terminals No. 4 and No. 5 of the power transformer, T-101. The pulsating dc from the rectifiers is fed to a conventional capacitor input filter for dc supply. The B plus supplied to the local oscillators is regulated by either V-101 or V-103, depending upon which range the unit is operating upon. The filament voltage of 6.3 volts a.c. is applied to all filaments upon operation of the power switch S-101, the B plus, however, is applied only to the unit in operation, thus preventing any possibility of interaction between the two circuits. The coaxial range switch, S-103, and switches S-104, S-105, S-106, and S-107 are ganged together in such a manner that the non-operative section is disabled; consequently, power is applied only to the illuminating lamp and associated circuitry of the section in use. In the event that neither section is used, as in the case when the "RANGE" switch is

in the direct position, and the associated receiver is connected directly to its own antenna, power is applied to neither section, and the illuminating lamps behind both tuning dials are not lighted.

SECTION 5. MAINTENANCE

5.1 Introduction

The Model REU-300 has been fully aligned and factory tested before shipment and should give relatively trouble-free performance. In the event the unit appears to be unusually noisy, erratic, or to have unusually low sensitivity, check all R.F. coaxial connectors on the rear apron of the chassis. Should this fail to improve the operation of the unit, it is possible that a tube or crystal has become defective. Tube checking, or comparison of the voltages present in the unit with those indicated in the Tube Socket Voltage Chart will aid in locating defective tubes. Only a limited number of components may be replaced in the R.F. and I.F. sections of the REU-300 without disturbing critically tuned circuits. When replacing such components, it is imperative that the new components have leads of identical length with those of the old components and that the physical location and arrangement of all other components and leads not be disturbed. In the event that it becomes absolutely essential to realign the REU-300, refer to the Alignment Procedure:

5.1.1 Test Equipment Required

1. Oscilloscope, Hewlett-Packard 120-A.
2. Sweep Generator, Jerrold 900-A.
3. Adj. RF Attenuator Pad, Jerrold AV-50.
4. Marker Generator, RCA WR-99A.
5. Soldering Iron, Ungar, 47 W.
6. VTVM, RCA WV-98A.
7. Cement, General Cement GC #30.
8. Receiver, Nems-Clarke 1502-A.
9. 21.4 Mc Post Amplifier, Nems-Clarke Type 1-A.
10. 50 ohms Noise Generator, Polytechnic PRD Type 904.
11. Signal Generator, Hewlett-Packard, 608-D.

12. Signal Generator, Hewlett-Packard 612-A.

13. BNC to clip lead.

14. BNC to BNC 50 ohms coax.

5-2. Alignment of 475 to 900 mc section

5.2.1 General

The 60 mc I.F. signal from the IN.2-A crystal mixer, CR-105, in the R.F. tuning unit is coupled to the grid of a neutralized 6BN4 grounded-cathode triode, V-102, for amplification. The neutralization of grid-to-plate capacitance is accomplished by a tunable coil (L-105), in shunt with this capacitance. Both grid input coil L-103, and plate coil L-104, are shielded to prevent stray coupling from other components.

The following steps are to be followed in sequence for I.F. alignment:

5.2.3 I.F. Alignment.-

(1) Using a 50 ohm cable, connect the output of the REU-300 to any receiver which can be tuned to 60 megacycles and is equipped with an input signal level indicating device.

(2) Place the "RANGE" switch in the 475 to 900 mc position.

(3) Unsolder the 68 K ohm resistor, R-102, from feed-thru capacitor, C-108, on top of the chassis, and connect a bias voltage to C-108, which can be varied from 0 to minus 15 volts.

(4) Ground the feed-thru capacitor, C-109, from the top of the chassis.

(5) Disconnect P-104 from J-104 and feed 60 mc CW into J-104 from an accurately calibrated signal generator.

(6) Steadily increase the output from the 60 mc signal generator and the bias voltage simultaneously so as to maintain the output at a constant reference level until the 6BN4 is biased beyond cut-off, as the

output will not drop any further with any increase of bias voltage.

(7) Adjust the neutralization coil, L-105, for minimum output.

(8) Steadily decrease the signal generator output and the bias voltage simultaneously to maintain the output at the original reference level until the bias voltage is brought back to the minus 1.0 volt level.

(9) Adjust the plate coil, L-104, for maximum output.

(10) Disconnect the input from the signal generator and reconnect P-104 to J-104.

(11) Remove the bias supply, and remove the ground from the feed-thru capacitor, C-109.

(12) Resolder the 68 K ohm resistor, R-102, to capacitor C-108.

(13) Connect the output of a UHF signal generator to the antenna input jack, J-101. Set both the signal generator and high frequency tuning dial to approximately 800 mc. Adjust L-103 for maximum output. Keep the signal generator at a low output level to avoid possible damage to the mixer crystal.

5.2.4 R.F. Alignment

Under no circumstances should any adjustments be made in the R.F. section of the R.F. unit. These circuits have been carefully aligned at the factory and should require no further adjustments.

5.2.5 Local Oscillator Adjustment

Replacement of the 6AF4 oscillator tube affects tracking and sensitivity. The variation in performance with different tubes installed is

due to small variations in tube characteristics. If unable to restore satisfactory performance by substituting tubes, install a new tube and align the oscillator circuit in the following manner:

(1) Connect the test equipment as shown in Figure 5-1.

(2) Set the UHF signal generator to 960 mc (if a VHF signal generator is used, set it at 480 mc for 2nd harmonic use, or 320 mc if the third harmonic is to be used). The signal generator should be calibrated for high accuracy.

(3) Turn the tuning knob until the tuner rotor blades are in full mesh with the stator blades. Set the dial exactly on the 900 megacycle mark.

(4) Turn the knob a small amount in the counterclockwise direction, (any rotation in the clockwise direction would invalidate step 3.)

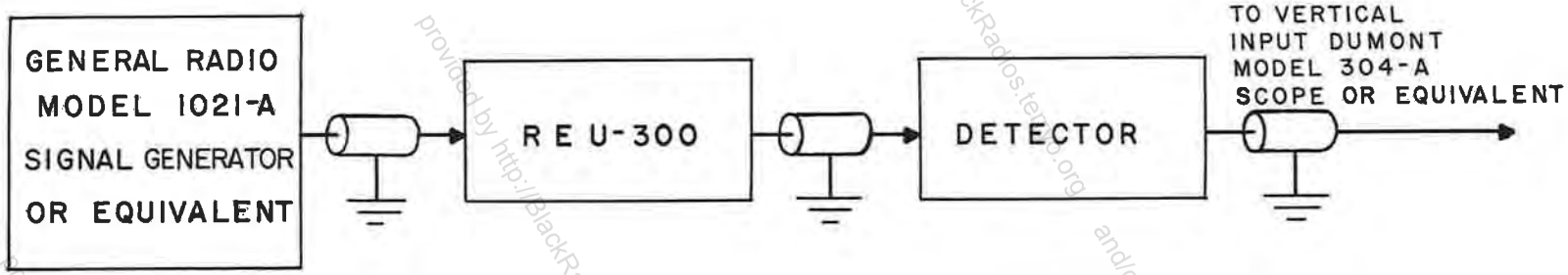
(5) Turn the knob in the counter-clockwise direction until it reaches the 900 megacycle mark. Set the high-end mechanical stop about 5 degrees above the 900 megacycle mark.

(6) Using a nonmetallic insulated screwdriver, adjust the trimmer capacitor, C-126, to produce zero beat as indicated on the oscilloscope. Limit signal generator output to just enough to produce zero beat. A large signal generator output may cause the local oscillator to "pull" and may damage the mixer crystal. As a starting point, vary the frequency of the signal generator to determine ititial oscillator frequency.

(7) Set the UHF signal generator to 535 mc (if a VHF signal generator is used, set to 267.5 mc for second harmonic use). Again calibrate the signal generator for high frequency accuracy.

(8) Set the dial of REU-300 at 475 mc. Use a nonmetallic

BLOCK DIAGRAM FOR LOCAL OSCILLATOR ADJUSTMENT.



DETECTOR SCHEMATIC DIAGRAM

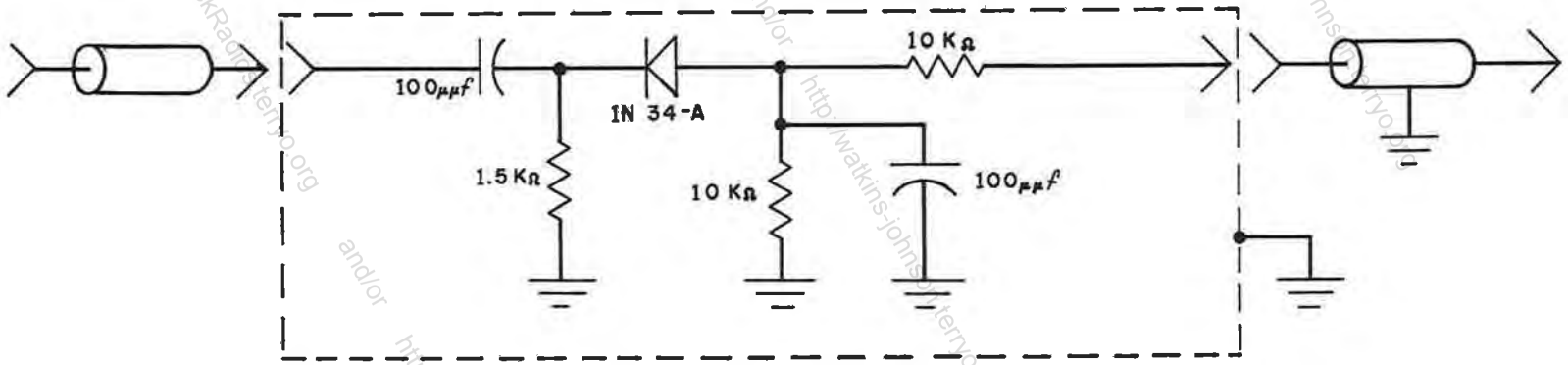


Figure 5-1. Block Diagram and Detector Schematic for Local Oscillator Adjustment

insulated screw-driver to adjust the trimmer, C-123, for zero beat.

(9) This completes the adjustment of the local oscillator for the high-frequency section.

5.3 Alignment of 250 to 475 mc section

5.3.1 Mixer

(1) Connect the output of the REU-300 to a VHF receiver which is equipped with an input signal strength meter.

(2) Feed a 60 mc. C.W. signal from a signal generator to the grid of the 6AK5 mixer, V-202, through the tie-point, TP-101, located on the top of the R.F. sub-chassis.

(3) Tune the output coil, L-204, for maximum output as indicated on the VHF receiver signal strength meter.

5.3.2 Local Oscillator Adjustment

(1) Local oscillator adjustment is limited to correcting the reading of the tuning dial, if it is found to be in error. The replacement of a tube may produce an error, and this may be corrected for by adjusting C-213. The adjustment should be made with a signal generator with a high degree of accuracy at 475 mc.

(2) The low-frequency end of the dial is controlled by the inductance of L-206. The correct adjustment has been made at the factory, and should not require readjustment in the field.

5.3.4 R.F. Alignment

The R.F. circuits are wide band and are designed around a modified Mallory four-section UHF inductuner. If realignment becomes necessary, proceed as follows:

(1) Connect a sweep generator with a 50 ohm source impedance to the 250-475 mc. antenna input coaxial connector, J-101.

(2) Connect a high gain oscilloscope to test point TP-101.

(3) Set the tuning dial for 300 mc.

(4) Adjust C-211 and C-212 for a double tuned symmetrical response centered around 300 mc. NOTE: The R.F. response at the high-frequency end is controlled by fixed inductances and adjustments should not be attempted in the field.

Table 5-1. Tube Socket Voltage Chart

Tube	Type	1	2	3	4	5	6	7	8	9
V-101	OA2	150V	Gnd	NC	NC	150V	NC	NC		
V-102	6BN4	+1.0V*	or	Gnd	6.3VAC	111V	+1.0V*			
V-103	OA2	150V	Gnd	NC	NC	150V	NC	NC		
V-104	Amp. (3-4)	NC	13.4 VAC	NC	NC	NC	NC	6.8VAC		
V-105	6AF4A	+60V*	-3.5V*	6.3VAC	Gnd	Gnd	-3.5V*	+60V*		
V-201	5842	148V	Gnd	Gnd	Gnd	Gnd	+1,6V	Gnd	Gnd	6.3VAC
V-202	6AK5	-1.4V	Gnd	6.3VAC	Gnd	145V	43V	Gnd		
V-203	6AF4A	78V	-5.7V	6.3VAC	0	0	-5.7V*	80V		

NOTES:

* 1. DC voltages measured on V 105 and all DC voltages marked with (*) were measured with a 1 meg resistor in series with VTVM probe.

2. Voltage taken with respect to chassis ground.

3. Input line voltage was 117V, 60 cps.

SECTION 6. PARTS LIST

6.1 General.

When ordering replacement parts, give the equipment name and model number and the reference designation number and description of each item ordered.

Table 1-1. Main Chassis, Replaceable Parts

Reference Designation	Name and Description	Part Number Vitro	Part Number Vendor
C-102	CAPACITOR, Ceramic, Insulated: 470 uuf, ±10%, 500 WVDC	90901460	Erie GP2-301
C-103	CAPACITOR, Ceramic, Uninsulated: 33 uuf, ±5%, 500 WVDC	90900795	Erie NPO-A
C-104	Same as C-102		
C-105	CAPACITOR, Ceramic Disc: .001 uf, ±20%, 500 WVDC	90901641	EIA-RS-198 R2CC60Z5U102M
C-106	Same as C-105		
C-107	CAPACITOR, Ceramic, Feedthru: .001 uf, GMV, 500 WVDC	90901560	Sprague 514C1
C-108 C-109	Same as C-107		
C-110	CAPACITOR, Ceramic, Standoff: .001 uf, GMV, 500 WVDC	90901550	Sprague 507C2
C-111	Same as C-110		
C-112	CAPACITOR, Ceramic, Feedthru: .47 uuf, 500 WVDC	90901280	Sprague 514C11A
C-113 A&B	CAPACITOR, Paper, 2 Section: 20-20 ufd, ±20%, 450 WVDC	90910290	Aerovox AEP44J
C-115	CAPACITOR, Ceramic, Disc: .005 uf, GMV, 1400 WVDC	90901740	Radido Materials Type U
C-116	Same as C-115.		
CR-101	RECTIFIER, Diode, Silicon:		G.E. IN539

Table 1-1. Main Chassis, Replaceable Parts (Cont.)

Reference Designation	Name and Description	Part Number Vitro	Part Number Vendor
CR-102	Same as CR-101		
CR-103	Same as CR-101		
CR-104	Same as CR-101		
F-101	FUSE, Slo-Blo: 0.3 amp, 250 v	91800160	Bussman MDL
F-102	FUSE, Slo-Blo: .15 amp, 250 v	91800120	Bussman MDL
I-101	LAMP, Incandescent: 6-8 v, minimum bayonet base		G.E. 47
I-102	Same as I-101		
I-103	Same as I-101		
J-101	CONNECTOR, Receptacle:		UG-1052/U
J-104	CONNECTOR, Receptacle:	91371071	MS35179 UG-1094A/U
J-105	CONNECTOR, Receptacle:		IPC 1025 MX-1684/U
J-106	Part of S-103		
J-107	Part of S-103		
J-108	Same as J-101		
J-109	Part of S-103		
J-110	Same as J-101		
J-111	CONNECTOR, Receptacle: A.C. Power Connection	91371250	Hubbell 7486
J-112	Same as J-101		
J-113	Part of S-103		
L-101	INDUCTOR: Coil		A-18, 455
L-102	INDUCTOR: Coil		A-18, 455
L-103	Part of T-102, not separately replaceable.		
L-104	Part of T-103, not separately replaceable.		

Table 1-1. Main Chassis, Replaceable Parts (Cont.)

Reference Designation	Name and Description	Part Number Vitro	Part Number Vendor
L-105	INDUCTOR: Coil		A-18, 454
R-101	RESISTOR, Fixed, Composition: 10 K, ±5%, 1/2 w,	93551020	Allen Bradley EB1035
R-102	RESISTOR, Fixed Composition: 69 K, ±5%, 1/2 w	93551360	Allen Bradley EB6835
R-103	RESISTOR, Fixed Composition: 100 ohms, ±5%, 1/2 w,	93550290	Allen Bradley EB1015
R-104	RESISTOR, Fixed Composition: 2.2 K, ±5%, 1/2 w	93550750	Allen Bradley EB2225
R-105	RESISTOR, Fixed Composition: 1 K, ±5%, 2 w	93570160	Allen Bradley HB1025
R-106	RESISTOR, Fixed Composition: 2.2 K, ±5%, 2 w	93570220	Allen Bradley HB2225
R-107	RESISTOR, Fixed Composition: 6.8 K, ±5%, 1 w	93560360	Allen Bradley GB6825
R-108	RESISTOR, Fixed Composition: 82 ohms, ±5%, 2 W	93560090	Allen Bradley GB8205
R-109	RESISTOR, Fixed Composition: 8.2 ohms, ±10%, 1 w	93560070	Allen Bradley GB82G1
R-110	RESISTOR, Fixed Composition: 8.2 K, ±5%, 2 w	93570320	Allen Bradley HB8225
R-111	Same as R-106		
R-112	RESISTOR, Fixed Composition: 1.8 K, ±5%, 2 w	93570190	Allen Bradley HB1825
R-113	RESISTOR, Fixed Composition: 1.5 Meg, ±5%, 1/2 w	93551840	Allen Bradley
R-114	Same as R-113		
R-115	Same as R-109		
S-101	SWITCH: TOGGLE: SPST	94850314	MS25098 MIL-S-3950

Table 1-1. Main Chassis, Replaceable Parts (Cont.)

Reference Designation	Name and Description	Part Number Vitro	Part Number Vendor
S-102	SWITCH: Toggle, SPDT	94850350	MS-35058-23 MIL-S-3950
S-103	SWITCH, Coaxial:	94850040	Danbury-Knudsen 300-11421
T-101	TRANSFORMER, Power:	AB-19162	
T-102	INDUCTOR, Variable:	AB-18, 386	
T-103	INDUCTOR, Variable:	AB-18, 387	
V-101	TUBE, Electron:	95400009	OA2
V-102	TUBE, Electron:	95400300	6BN4
V-103	Same as V-101		
V-104	TUBE, Ballast:	95400710	Amperite (3-4)
XF-101	FUSEHOLDER:	92120110	Bussman HKP
XF-102	Same as XF-101		
XI-103	LAMP, Assembly: minature bayonet base, red lens	92500170	Dialco 81-410-112
XV-101	SOCKET, Tube 7 pin miniature	94450010	AL Con 550LL-2
XV-102	Same as XV-101		
XV-103	Same as XV-101		

Table 6-2. 250 to 475 mc R.F. Tuner, Replaceable Parts

Reference Designation	Name and Description	Part Number Vitro	Part Number Vendor
C201	CAPACITOR, Fixed: ±2.2 uuf, 25 v, 500 v	90900200	Erie NPO-301
C202	CAPACITOR, Fixed: 3.3 uuf, ±25 uuf, 500v	90900310	Erie NPO-301
C203	CAPACITOR, Fixed: .5 uuf, ±.25 uuf, 500 v	90900020	Erie NPO-301
C204	CAPACITOR, Fixed: 1 uuf, ±.25 uuf, 500 v	90900100	Erie NPO-301
C205	CAPACITOR, Fixed:	90900350	Erie NPO-301
C206	CAPACITOR, Fixed: 2.7 uuf ±.25 uuf, 500 v	90900260	Erie NPO-301
C207	CAPACITOR, Fixed: 15 uuf, ±5%, 500 v	90900795	Erie NPO-301
C208	CAPACITOR, Fixed: 6.8 uuf, ±.25 uuf, 500 v	90900555	Erie NPO-301
C209	CAPACITOR, Fixed: 5.6 uuf, ±.25 uuf, 500 v	90900480	Erie N1400-301
C210	CAPACITOR, Fixed: 27 uuf, ±10%, 500 v	90901010	Erie NPO-308
C211, 212	CAPACITOR, Variable .5-4.5 uuf, 500 v	90950040	C T C CST-6
C213	CAPACITOR, Variable: 1.5-12.5, uuf, 500 v	90950130	C T C CST-50
C214	CAPACITOR, Fixed .01 uf, 500 v	90901760	Sprague 29C9B8

Table 6-2. 250 to 475 mc R.F. Tuner, Replaceable Parts

Reference Designation	Name and Description	Part Number Vitro	Part Number Vendor
C215, 216, 217, 218	CAPACITOR, Fixed: .01 uf, 500 v	90901641	Eia-Spec Rs-198 (R2CC60Z5U102M)
C219	CAPACITOR, Fixed: 470 uuf, ±10%, 500 v	90901460	Erie GP2-301
C221, 222, 223, 224	CAPACITOR, Fixed Feedthru: .001 uf, 500 v	90901560	Sprague 514c1
J201, 202	CONNECTOR, Recp	91371070	Bnc UG-1094/u
L201	COIL, Strap	A18969-01	Vitro Elec.
L202	COIL, Strap	A18, 970-01	Vitro Elec.
L203	COIL	AA-18, 974-01	Vitro Elec.
L204	PART OF TIOI		
L205	COIL, Strap	A-18, 971-01	Vitro Elec.
L206	COIL	A-18, 973-01	Vitro Elec.
L207	COIL	A-18, 972-01	Vitro Elec.
L208	COIL	A-18, 972-02	Vitro Elec.
L209	COIL	A-18, 972-03	Vitro Elec.
L210 A, B, C, D,	INDUCTUNER, Modified	300198-01	Vitro Elec.
L211	COIL	102470-01	Vitro Elec.
R201	RESISTOR, FC: 68 ohm, ±5%, 1/2w	93550220	Mil-R11 (RC20GF680J)
R202	RESISTOR, FC: 150 ohm, ±10%, 1/2 w	93550350	Mil-R-11 (RC20GFlk5lk)

Table 6-2. 250 to 475 mc R.F. Tuner, Replaceable Parts

Reference Designation	Name and Description	Part Number Vitro	Part Number Vendor
R204, 205, 206	RESISTOR, FC: 470 K 10%, 1/2 w	93551690	RC20GF474K MIL-R-11
R207	RESISTOR, FC: 10K, 10%, 1/2 w	93551030	RC20GF103K MIL-R-11
R208	RESISTOR, FC: 6.8K 590 1 w	93560360	RC32GF682J MIL-R-11
R209	RESISTOR, FC: 100 K, 10%, 1/2 w	93551440	RC20GF104K MIL-R-11
R210	RESISTOR, FC: 680 K, 5%, 1/2 w	93551730	RC20GF684J MIL-R-11
T201	TRANSFORMER, IF	AB18, 975-01	Vitro Elec.
V201	TUBE, 5842	95400615	
V202	TUBE, 6AK5	95400200	
V203	TUBE, 6AF4A	95400170	

Table 6-3. 475 to 900 mc R.F. Tuner, Replaceable Parts

Reference Designation	Name and Description	Part Number Vitro	Part Number Vendor
Z101	TUNER ASSEMBLY	AC-40764-90	

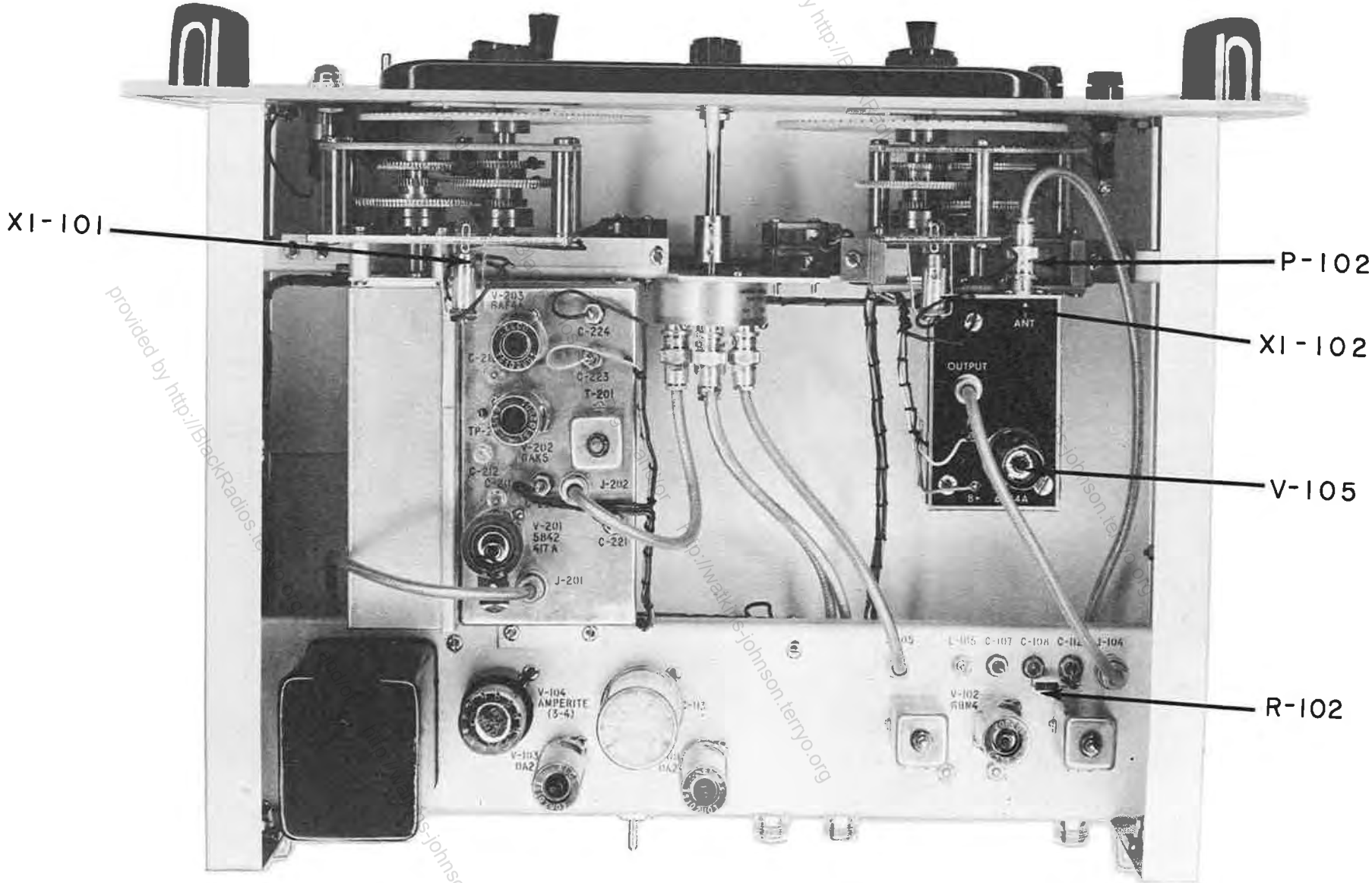


Figure 6-1. REU-300C Main Chassis, Top View, Component Location

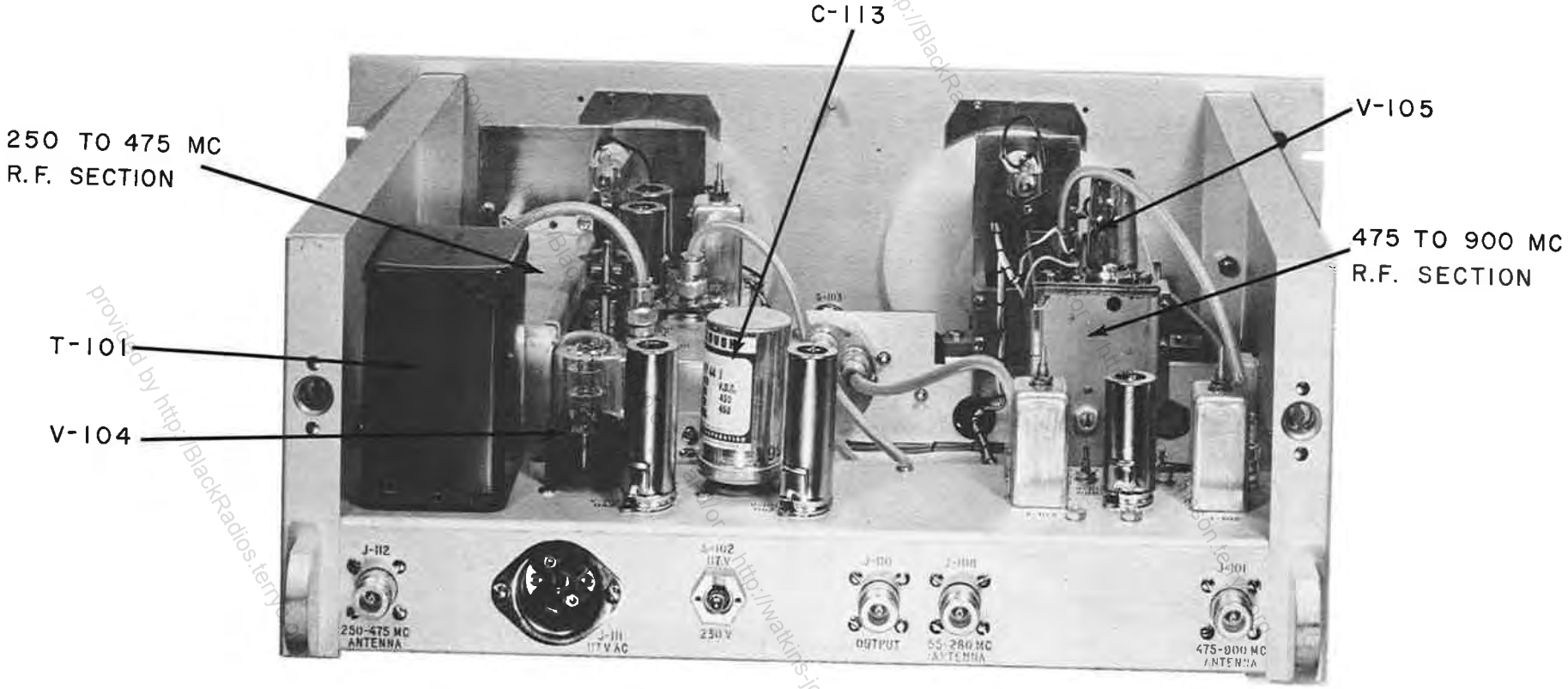


Figure 6-2. REU-300C Main Chassis, Rear View, Component Location

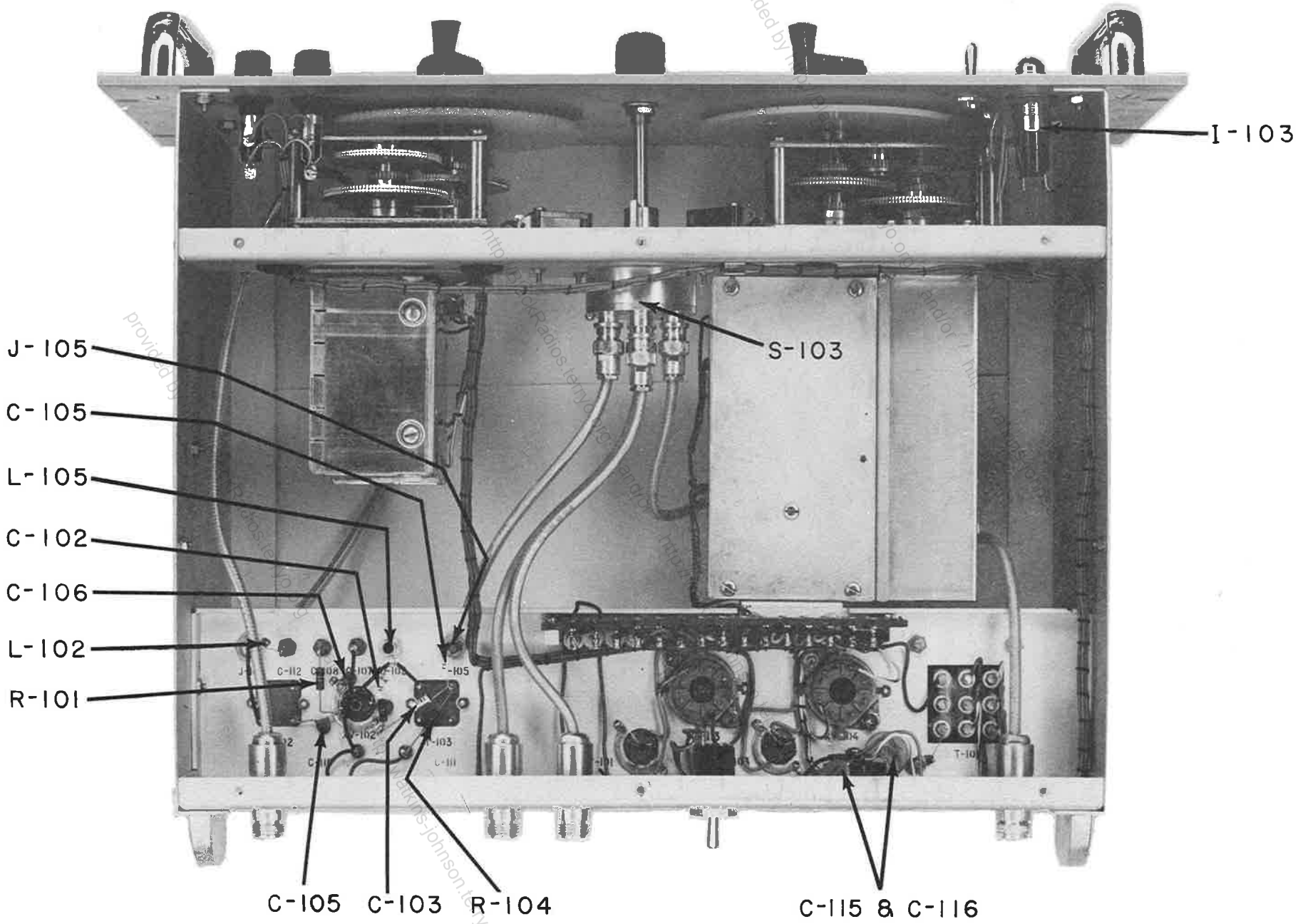


Figure 6-3. REU-300C Main Chassis, Bottom View, Component Location

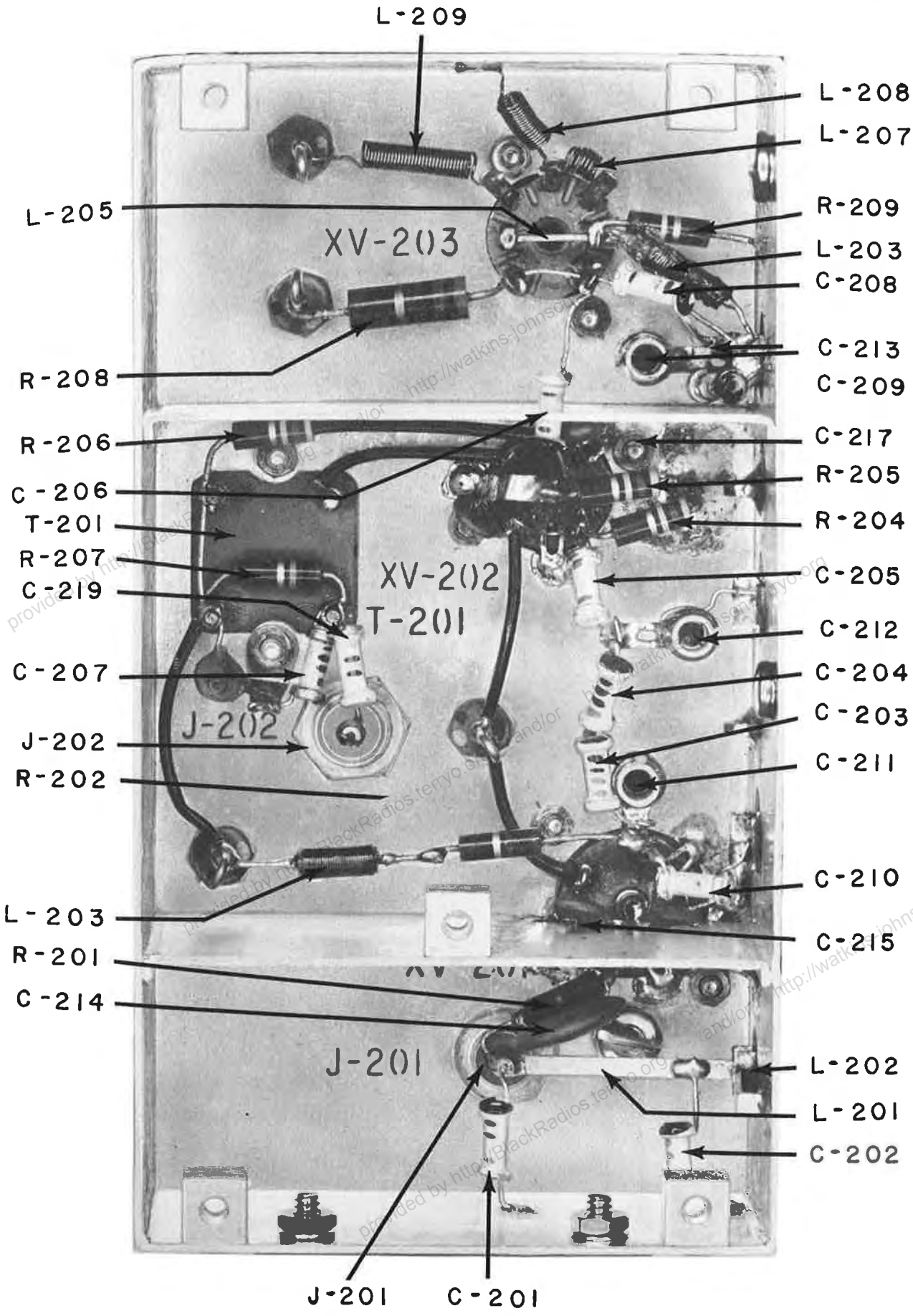


Figure 6-4. 250 to 475 mc R.F. Section, Bottom View, Component Location

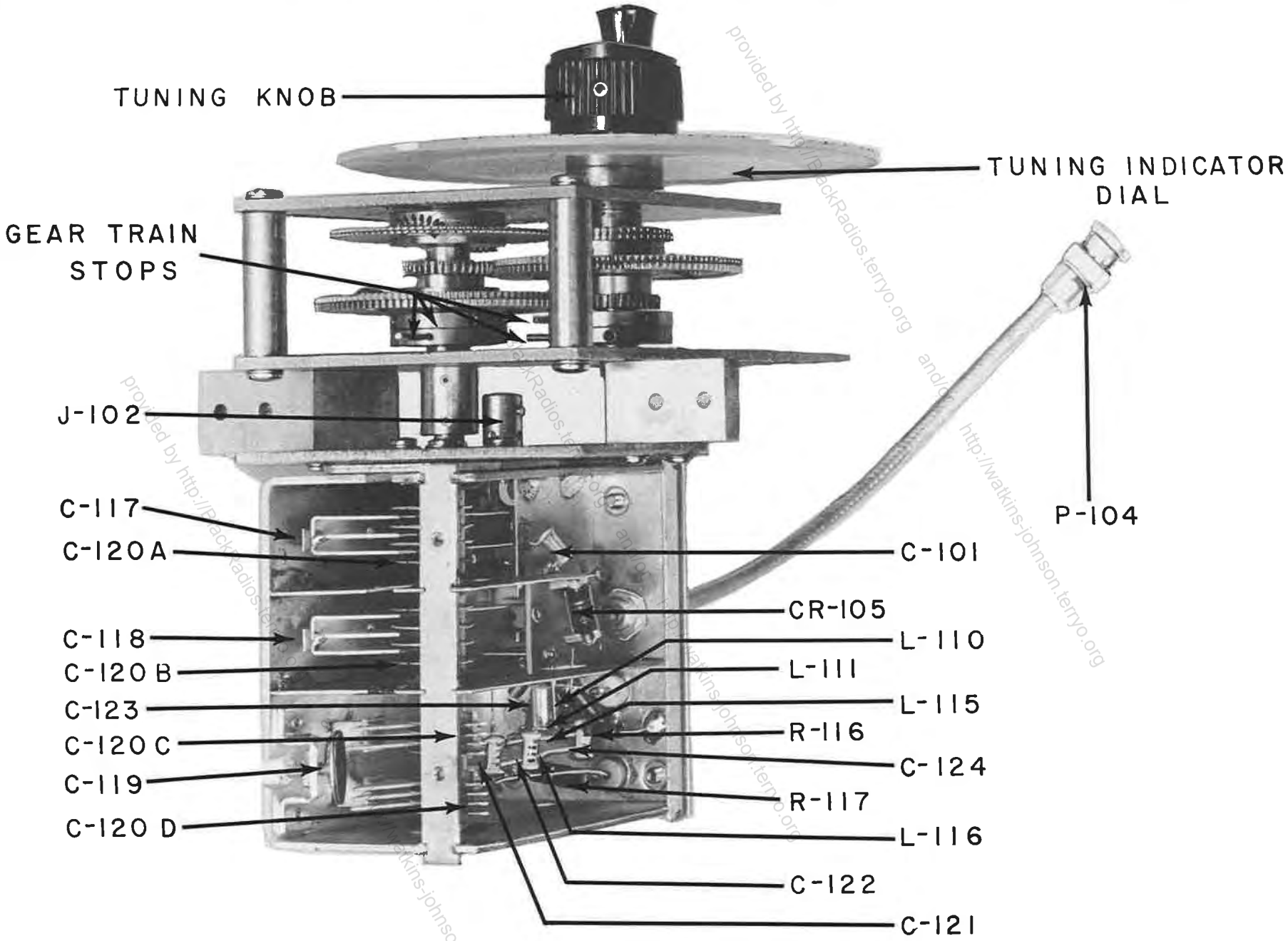
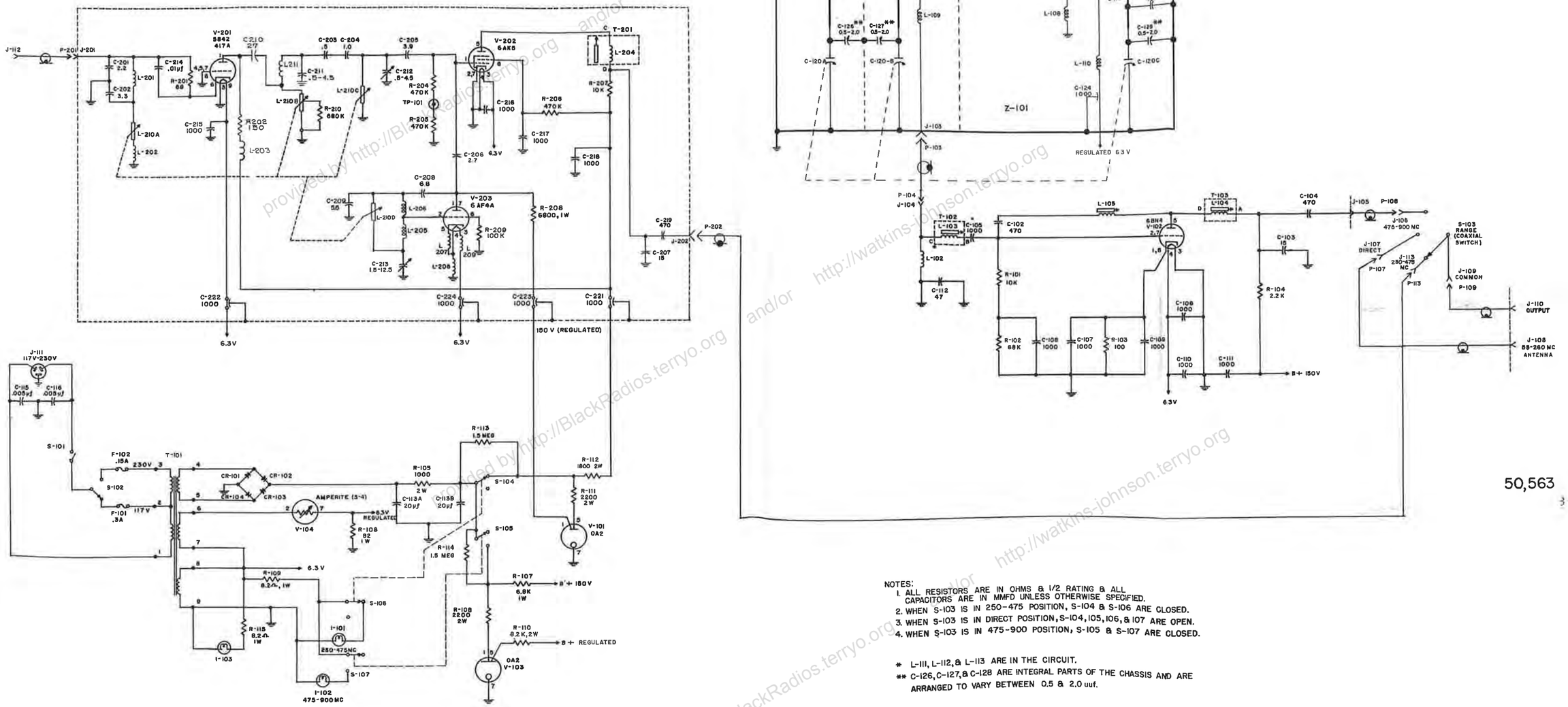


Figure 6-5. 475 to 900 mc R.F. Section, Bottom View, Component Location

SECTION 7. SCHEMATIC DIAGRAM

7.1 General

This section contains an overall schematic diagram for the REU-300C. It is referred to as Figure 7-1 throughout the manual.



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NOTES:
1. ALL RESISTORS ARE IN OHMS & 1/2 RATING & ALL CAPACITORS ARE IN MMFD UNLESS OTHERWISE SPECIFIED.
2. WHEN S-103 IS IN 250-475 POSITION, S-104 & S-106 ARE CLOSED.
3. WHEN S-103 IS IN DIRECT POSITION, S-104, 105, 106, & 107 ARE OPEN.
4. WHEN S-103 IS IN 475-900 POSITION, S-105 & S-107 ARE CLOSED.

* L-111, L-112, & L-113 ARE IN THE CIRCUIT.
** C-126, C-127, & C-128 ARE INTEGRAL PARTS OF THE CHASSIS AND ARE ARRANGED TO VARY BETWEEN 0.5 & 2.0 uuf.

Figure 7-1. REU-300C, Schematic Diagram, 50,563E