

NAVSHIPS 93205

UNCLASSIFIED

TECHNICAL MANUAL
for
ANTENNA GROUP AN/SRA-17 (XN-1)

Polytronics Research Incorporated
Rockville, Maryland

DEPARTMENT OF THE NAVY
BUREAU OF SHIPS

18 AUGUST 1958

LIST OF EFFECTIVE PAGES

PAGE NUMBERS	CHANGE IN EFFECT	PAGE NUMBERS	CHANGE IN EFFECT
Title Page	Original	3-1 to 3-2	Original
A to C	Original	4-1 to 4-2	Original
i to iii	Original	5-1 to 5-4	Original
1-1 to 1-9	Original	6-1 to 6-6	Original
2-1 to 2-3	Original		

From: Polytronic Research, Inc.
7326 Westmore Road
Rockville, Maryland

Subject: Part Number References -
Alterations and Amendments

All Sheets Concerned	Delete (XN-1) From AN/SRA-17 (XN-1) Callout.
All Sheets Concerned	Change AT-252/SR to AT-924/SR Callout. The AT-924/SR Antenna, now furnished with Antenna Group AN/SRA-17 is the same as the AT-252/SR Antenna, Less the 10 x 10 Mounting Plate.
Sheet 6 - 3	Change K201 Part No. 5409-2HS to Part No. 5409-40 HS.
Sheet 6 - 3	Change K202 Part No. 5409-2HS to Part No. 5409-40 HS.
Sheet 6 - 3	Add K203 Part No. 5409-40 HS.
Sheet 6 - 3	Change L201 CGS Lab. Inc. Part No. 58DB1 to Polytronic Part No. 60-2.
Sheet 6 - 3	Change L202 CGS Lab. Inc. Part No. 48DB2 to Polytronic Part No. 60-1.

**AN/SRA-17(XN-1)
FRONT MATTER**

NAVSHIPS 93205

Promulgating Letter

1 January 1955

From: Chief, Bureau of Ships

To: All activities concerned with the installation, operation and maintenance of the subject equipment

Subj: Instruction Book for Antenna Group AN/SRA-17(XN-1) NAVSHIPS 93205

1. This publication is the instruction book for the subject equipment and is in effect upon receipt.
2. When superseded by a later edition, this publication shall be destroyed.
3. Extracts from this publication may be made to facilitate the preparation of other Department of Defense publications.
4. All Navy requests for NAVSHIPS publications should be directed to the nearest District Publications and Printing Office. When changes or revised books are distributed, notice will be included in the Bureau of Ships Journal and in the Index of Bureau of Ships General and Electronics Publications, NAVSHIPS 250-020.

**W.D. LEGGETT, JR.
Chief of Bureau**

Corrections

NAVSHIPS 93205

AN/SRA-17(XN-1)

RECORD OF CORRECTIONS MADE

Change No.	Date	Signature Of Officer Making Correction

TABLE OF CONTENTS

	Page
SECTION 1. GENERAL DESCRIPTION	
1. GENERAL	1-1
2. DESCRIPTION OF MAJOR UNITS	1-1
a. Antenna	1-1
b. Radio Frequency Tuner	1-1
c. Antenna Control Unit	1-2
SECTION 2. THEORY OF OPERATION	
1. GENERAL	2-1
a. Antenna Control Unit	2-1
b. Radio Frequency Tuner	2-1
c. Noise Generator Circuit	2-2
SECTION 3. INSTALLATION	
1. INSTALLATION OF THE RADIO FREQUENCY TUNER HOUSING AND CABLES	3-1
2. INSTALLATION OF ANTENNA AT-252/SR	3-2
SECTION 4. OPERATION	
SECTION 5. MAINTENANCE	
1. ANTENNA AT-252/SR	5-1
2. ANTENNA CONTROL AND RADIO FREQUENCY TUNER	5-1
3. TROUBLE SHOOTING IN THE NOISE GENERATOR CIRCUIT	5-4
SECTION 6. PARTS LIST	

LIST OF ILLUSTRATIONS

Figure 1-1. Antenna Group AN/SRA-17(XN-1)	1-4
Figure 1-2. Radio Frequency Tuner, Cover Open	1-5
Figure 1-3. Radio Frequency Tuner, removed from housing, top view	1-6
Figure 1-4. Radio Frequency Tuner, removed from housing, bottom view	1-7
Figure 1-5. Antenna Control Unit	1-8
Figure 1-6. Antenna Control Unit, top interior view	1-9
Figure 2-1. Antenna Group, Schematic Diagram	2-3

LIST OF TABLES

Table	Page
1-1 Equipment supplied	1-2
1-2 Equipment required but not supplied	1-3
1-3 Electron tube complement	1-3
5-1 Antenna Control Resistance measurements	5-1
5-2 Radio Frequency Tuner resistance measurements	5-2
5-3 Antenna Control Unit Voltage measurements	5-2
5-4 Antenna Control Unit Voltage measurements	5-3
5-5 Voltage measurements, Antenna Control Unit and Radio Frequency Tuner connected	5-4

DESTRUCTION OF MATERIAL IN COMBAT ZONE

To prevent the capture of this equipment, or when ordered to do so, DESTROY IT SO THAT NO PART CAN BE SALVAGED, RECOGNIZED OR USED BY THE ENEMY. BURN ALL PAPERS AND BOOKS.

REPORT OF FAILURE

A report of failure of any part of this equipment shall be made to the Bureau of Ships in accordance with current regulations using U.S. NAVY FAILURE REPORT FORM NAVSHIPS 383. The report shall cover all details of the failure and give the date of installation of the equipment. For procedure in reporting failures, see Chapter 67 of the Bureau of Ships Manual or superseding instructions.

ORDERING PARTS

All requests or requisitions for replacement material shall include the following when available:

1. Standard Navy stock numbers when available from the parts list.
2. Standard item name (capacitor, fixed, paper dielectric, etc.)
3. Quantity required

If the appropriate stock number is not available, the following shall be specified:

1. Equipment model or type designation, and the reference designation of the part.
2. Name of part and complete description.

SAFETY NOTICE

The attention of officers and operating personnel is directed to Chapter 67 of the Bureau of Ships Manual or superseding instructions on the subject of radio-safety precautions to be observed.

This equipment employs voltages which are dangerous and may be fatal if contacted by operating personnel. Extreme caution should be exercised when working at equipment maintenance.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must at all times observe all safety regulations. Do not change tubes or make adjustments inside the equipment with high voltage supply on. Under certain conditions dangerous potentials may exist in circuits with power controls in the off position due to charges retained by capacitors. Always remove power and discharge or ground circuits.

SECTION 1 GENERAL DESCRIPTION

1. GENERAL

Antenna Group AN/SRA-17(XN-1) was designed and developed by the U.S. Navy Electronics Laboratory. Four developmental models were constructed under Bureau of Ships assigned problem NE-091003-2 (NEL B1-5g) for shipboard installation and evaluation under Fleet operating conditions.

Development of Antenna Group AN/SRA-17(XN-1) was undertaken to provide a physically small, but efficient receiving antenna which would cover the VLF-LF frequency range. The need for such an antenna exists on ships where interaction between large, closely spaced antennas presents a problem, and on smaller craft where space for a long-wire antenna is not available.

The AN/SRA-17(XN-1) Antenna (see fig. 1-1) is a ten-and-one-half foot vertical stainless-steel whip, Navy type AT252/SR. The antenna is connected to a Radio Frequency Tuner located directly under the antenna mounting. The r-f signals from the tuner unit are fed through a 72-ohm transmission line to the receiver. An Antenna Control Unit at the receiver location enables the operator to tune the antenna from the operating position.

The Antenna Group was designed to cover the frequency spectrum from 14-600 kc.

The small physical size of the AN/SRA-17(XN-1) for the frequency range covered, provides an advantage over untuned, long-wire antennas aboard ship, both in space requirements and mounting locations. These advantages are gained with comparable efficiency of operation.

The complete Antenna Group operates on 117-volt, 60 cps power. A cable connection from the Antenna Control Unit supplies power to the Radio Frequency Tuner.

2. DESCRIPTION OF MAJOR UNITS

The complete AN/SRA-17(XN-1) group (see fig. 1-1) consists of (1) the Antenna; (2) the Radio Frequency Tuner; and (3) the Antenna Control Unit.

a. Antenna.

The Antenna consists of the ten-and-one-half foot, stainless-steel, tubular, whip-type, one-piece radiator, and its mounting. The assembly is a complete unit, Navy type AT-252/SR. It mounts on a 12-inch-square steel plate which forms the top of the Radio Frequency Tuner housing. Six half-inch studs hold the antenna assembly in place.

b. Radio Frequency Tuner. (See figs. 1-2 and 1-3)

The Radio Frequency Tuner consists essentially of two variable inductors (Incredutors), and a silicon-diode noise source, plus associated relays for switching the proper inductors and the noise source into the circuit.

The noise source is used as an aid in tuning, since the Antenna Control has no calibrated dial.

The Tuner is mounted on a small V-shaped chassis which fits into the Radio Frequency Tuner housing on which the antenna is mounted. The chassis is held in the housing by means of four 10-32 screws.

c. Antenna Control. (See figs. 1-4 and 1-5)

The Antenna Control is a d.c. power supply which provides a regulated voltage for operation of the variable inductors on the R.F. Tuner, and, in addition, an unregulated voltage for the relays.

To facilitate maintenance of the Antenna Control, all the components are exposed when the cover is removed.

TABLE 1-1. EQUIPMENT SUPPLIED

Quan. Per. Equip.	Name of Unit	Navy Type Desig	Dimensions			Vol. (Cu. ft.)	Wt. (lbs.)
			Height	Width	Depth		
1	Antenna Control		4½"	12"	14"	0.437	16
1	Radio Frequency Tuner		4½"	6½"	5"	0.0845	2½
1	Radio Frequency Tuner Housing		10"	12"	12"	0.904	20
1	Antenna	AT 252/SR	131"	7"	- - -	- - -	20
1	Connector	AN 3106A-14S-9S					
1	Connector	AN 3106A-18-8P					
1	UHF Connector	PL-259,49190					
1	UHF Connector	SO-239,49194					
1	UHF type hood	UG-106/u,M-360, 49193					
2	Instruction Book	93205					

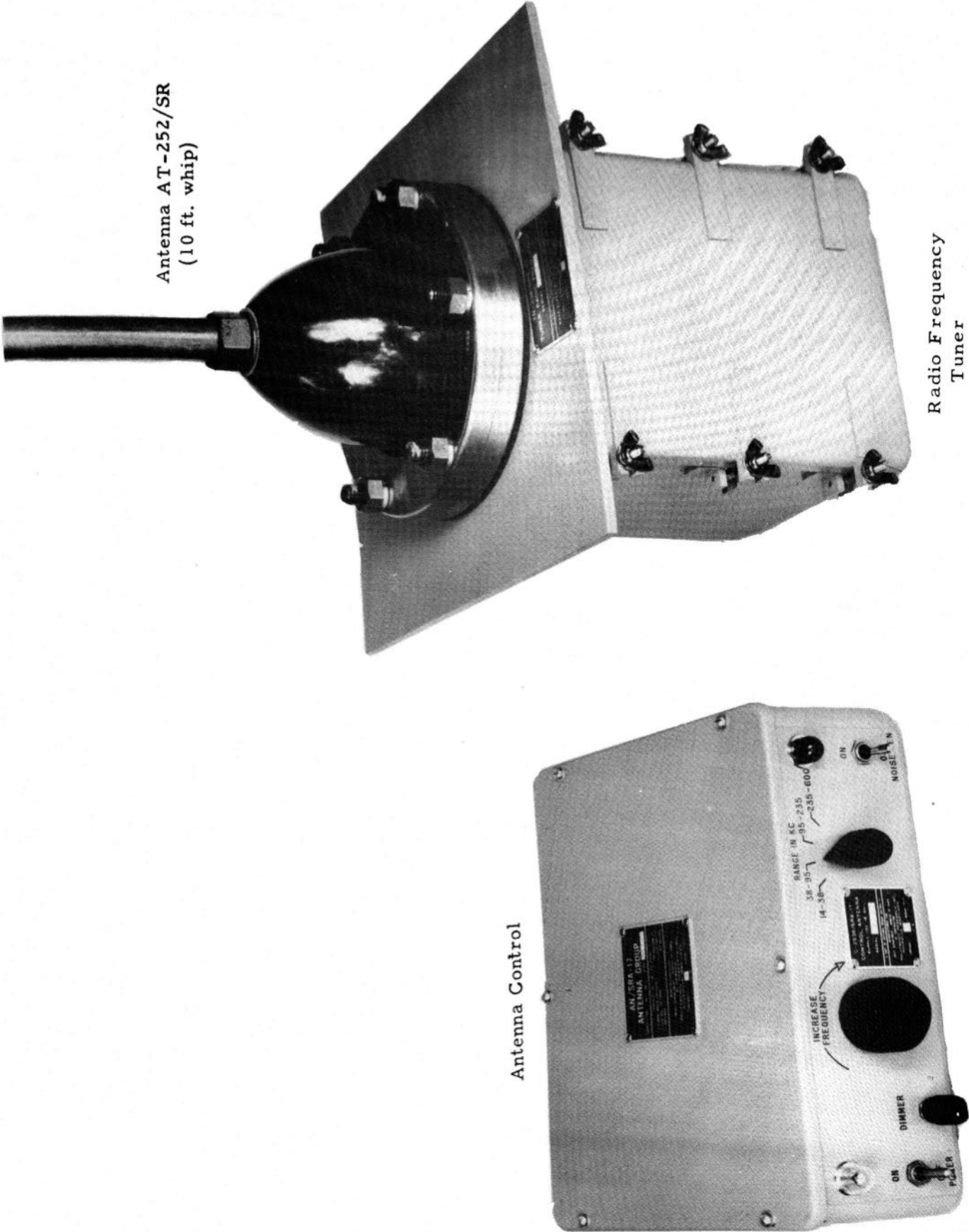
TABLE 1-2. EQUIPMENT REQUIRED BUT NOT SUPPLIED.

Quan. Per Equip.	Name of Unit	Navy Type	Function	Characteristics
1	Coax Cable	RG-12/u	Connect Radio Frequency Tuner to receiver	Length determined by specific installation
1	Power Cable	- - - - -	Connect Antenna Control to Power Supply	" " "
1	G.R. type* female conn.	NT49121-A	Fitting for RG-12/u cable	
1	Control Cable	TTRSA	Connect output of Antenna Cont. to Radio Freq. Tuner input	8 conductor shielded cable. Length determined by specific installation.

* If RBA receiver used. Type N male if AN/SRR-11 used.

TABLE 1-3. ELECTRON TUBE COMPLIMENT.

Name of Unit	Number of tubes of type indicated		
	5Y3 WGTA	VR105	IN21B
Antenna Control	1	1	
R.F. Tuner			1



Antenna AT-252/SR
(10 ft. whip)

Radio Frequency
Tuner

Antenna Control

Figure 1-1. Antenna Group AN/SRA-17(XN-1)



Figure 1-2. R.F. Tuner, Cover Open

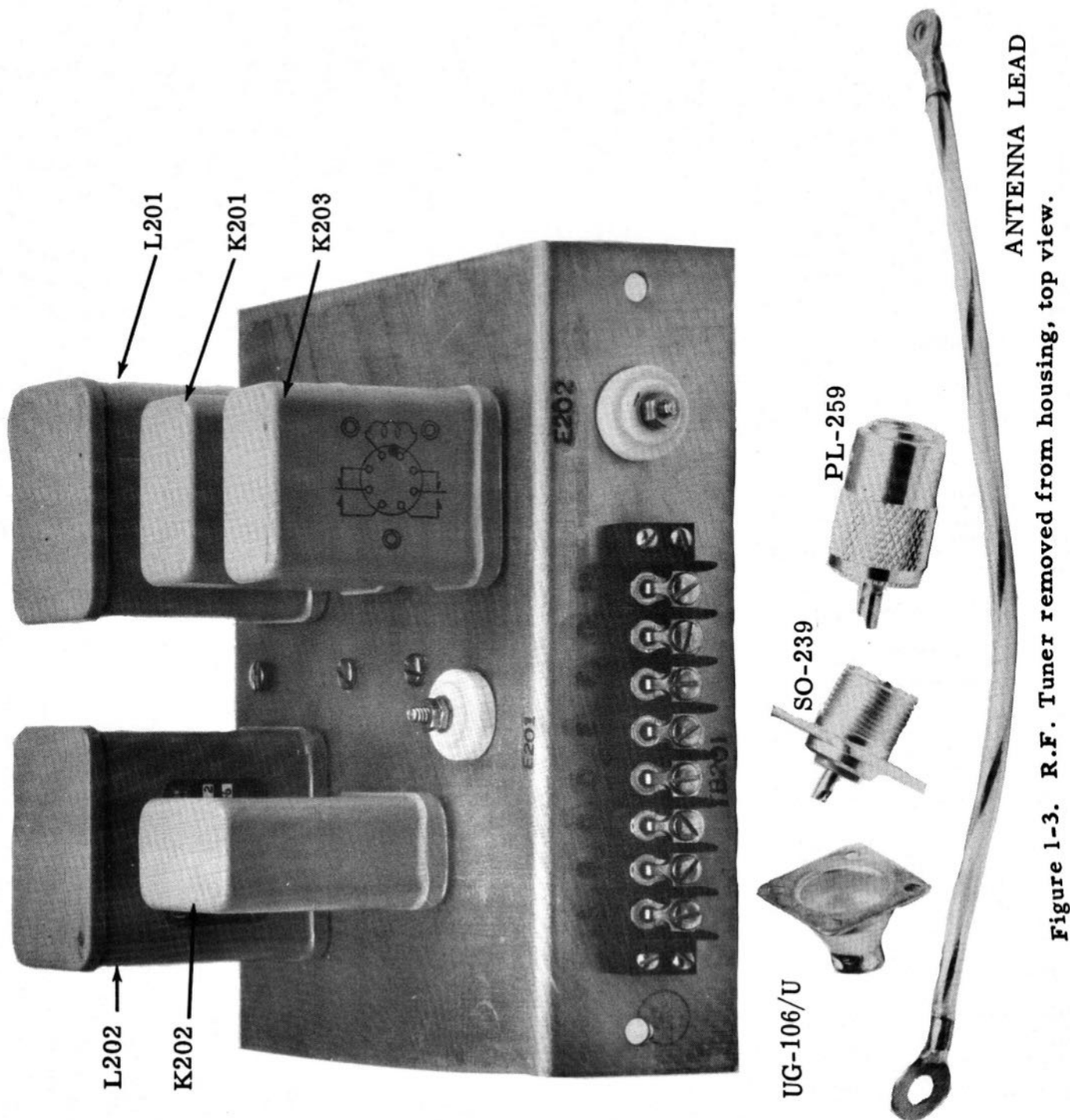
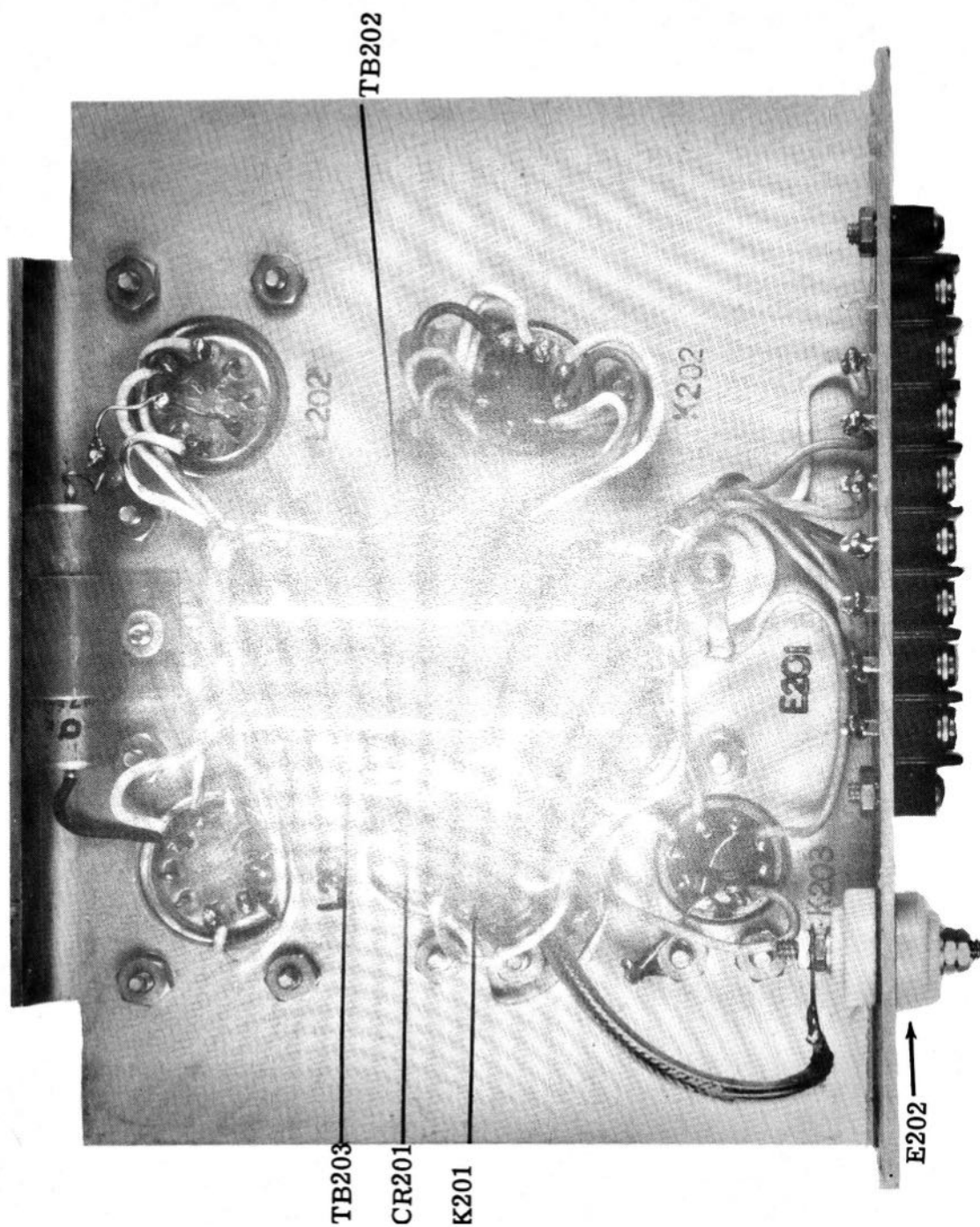


Figure 1-3. R.F. Tuner removed from housing, top view.



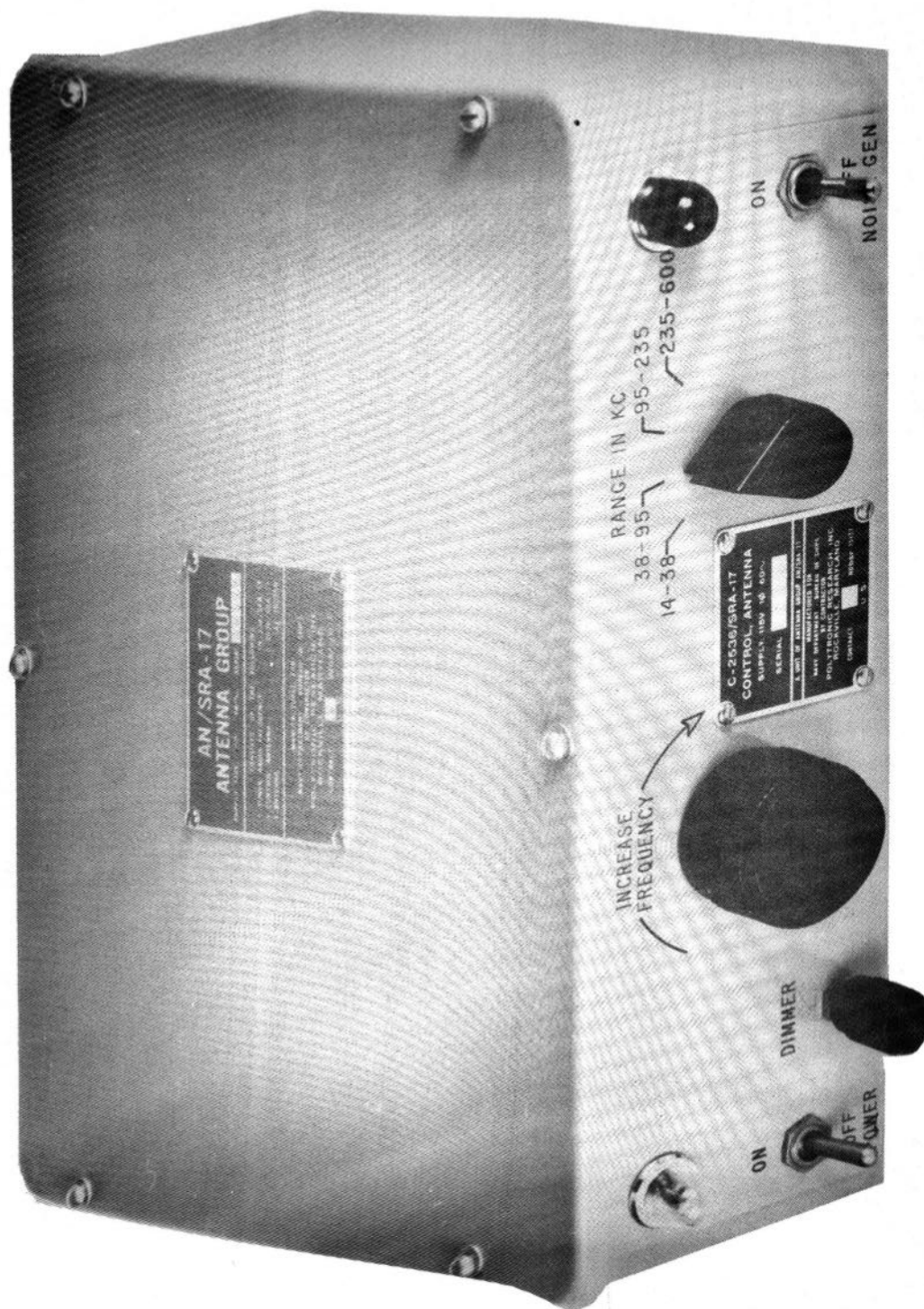


Figure 1-5. Antenna Control Unit

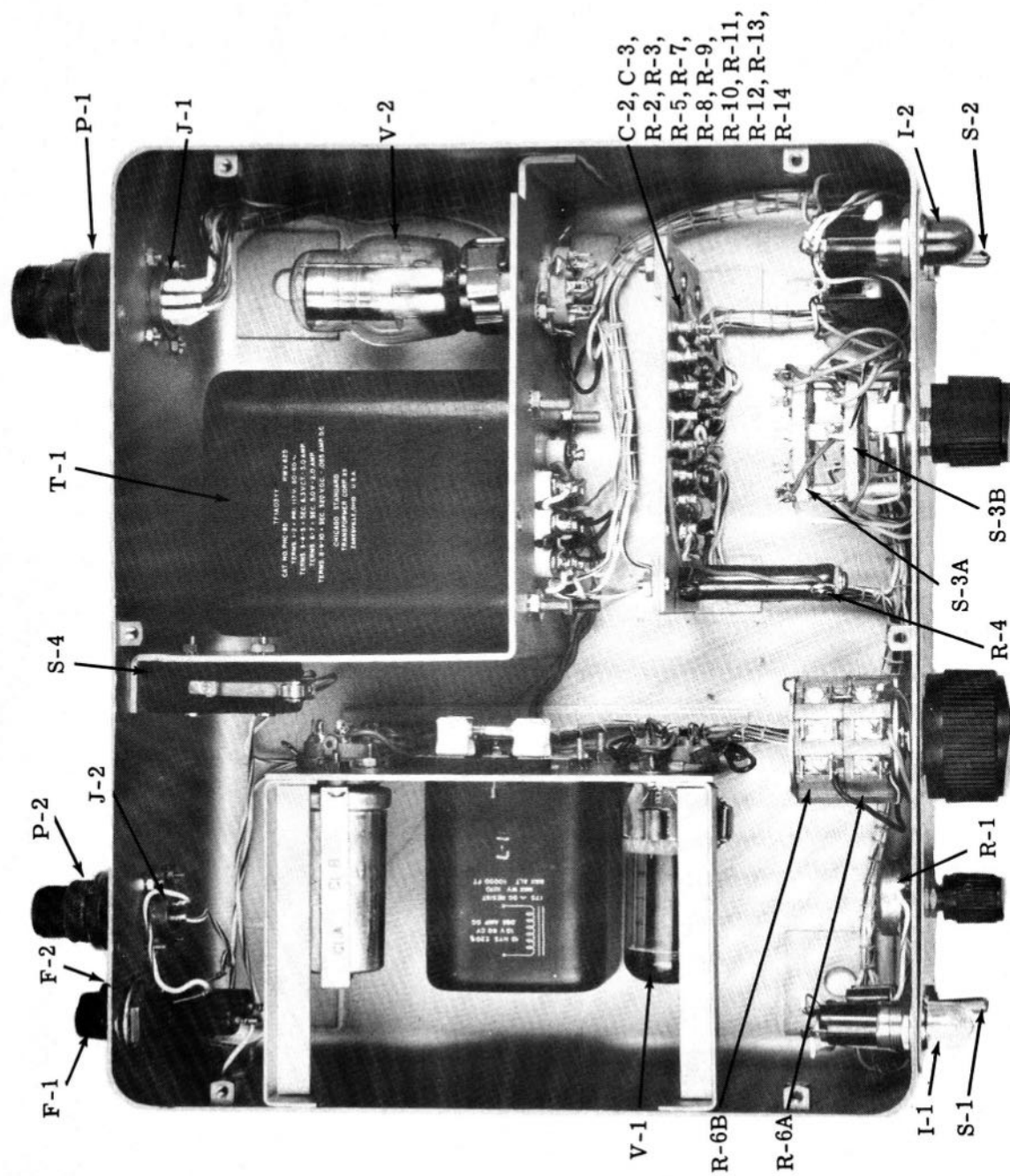


Figure 1-6. Antenna Control unit top interior view.

THEORY OF OPERATION

1. GENERAL

Antenna Group AN/SRA-17(XN-1) is divided for circuit discussion into (1) Antenna Control Unit, (2) Radio Frequency Tuner Unit, and (3) Noise Generator circuit.

a. Antenna Control Unit.

The Antenna Control Unit provides d.c. power to the Radio Frequency Tuner through an 8-conductor shielded cable. A steady drain of approximately 10 milliamps is taken from the unregulated portion of the Antenna Control circuit for operation of relays K201, K202, and K203 in the R.F. Tuner. The relays, which have their coils in series, are actuated through the range selector switch S3A-B. To keep a constant 10 ma drain, a resistor having equivalent coil resistance (10K) is switched into the circuit when a relay is switched out.

The regulated output (105 volts) of the Antenna Control Unit supplies current for the control windings of the variable inductors L201 and L202. The control winding current can be varied from 0 to 30 ma maximum by tuning potentiometer R6A-B. The tuning potentiometer is varied to resonate the inductor-antenna series circuit. Resistors R11; R12 R13 and R14 in the Increductor control winding circuit are used to give a bandsread effect for ease in tuning. A regulated voltage is also supplied for operation of the Noise Generator.

b. Radio Frequency Tuner.

The Radio Frequency Tuner series tunes the antenna at its base through variable inductor L201 or L202.

The Increductor consists of a signal and a control winding. These two windings are wound over a special ferro-magnetic core material. They are separated by an electrostatic shield to prevent capacitive coupling. Varying the d.c. current through the control winding changes the permeability of the core material and the inductance of the signal winding.

Increductor L201 has a starting inductance (with 0 control current) of 20 millihenries, L202 a starting inductance of 500 millihenries. Increasing the control current lowers this inductance. L202 is used in tuning the antenna from 14-95 kc in two ranges. L201 tunes from 95-600 kc, also in two ranges. Four shunt capacitors, C202 through C205, connected from the antenna side of the signal winding to ground, are used in conjunction with L201 and L202 to increase the starting control current. One is used for each frequency range. This increased current permits tuning at high ambient temperatures.

c. Noise Generator Circuit

CR201, a 1N21B silicon diode, generates the r.f. noise supplied by the Noise Generator. Silicon diodes have the property of generating considerable r.f. noise when current is passed through them in the reverse direction, but this reverse current must be kept low in order to prevent damage to the crystal.

The Noise Generator circuit is mounted on terminal board TB201 in the R.F. Tuner chassis (see fig. 1.3). It consists of four components in addition to the diode, C206, C207, R201, and R202. Resistor R201 is the output impedance of the Noise Generator. Resistor R202 limits the current through CR201 to 1.0 milliamperes. The generated noise is coupled to the Increductor signal winding through capacitor C206, the dummy antenna substituted for antenna AT 252/SR when the Noise Generator is in operation. Capacitor C207 acts as a by-pass to isolate the Noise Generator from the power supply.

By means of the noise source it is possible to tune the actual antenna to a specific frequency quickly and accurately without the aid of a frequency calibrated dial on the Antenna Control Unit. The noise source may also be used as a maintenance tool for rapidly checking the performance of the Antenna Group and associated receiver. See page 4-1.

SECTION 3 INSTALLATION

Antenna Group AN/SRA-17(XN-1) was designed for shipboard installation. For Optimum performance Antenna AT 252/SR and the R.F. Tuner should be mounted in the clear near the top of a mast, king post, stack or other vertical portion of the superstructure. Vertical mounting of the antenna is best because the bowl insulator may be strained if it must support the antenna in the horizontal position. The Antenna Control is installed in the radio room directly above the receiver with which it is to be used.

1. INSTALLATION OF THE RADIO FREQUENCY TUNER HOUSING AND CABLES.

The R.F. Tuner housing, which also supports the antenna, is secured by a 12 x 12-inch steel plate. If the housing is mounted against a vertical surface, the steel plate should be welded in position with the access door facing outward. Gussets welded on either side of the plate will not interfere with maintenance. Two holes must be made in the Tuner Housing, one to take the RG-12/U r.f. cable (not furnished), the other the 8-conductor, shielded control cable (not furnished). Both cables should enter the R.F. Tuner housing through stuffing tubes. The cables can be inserted in the housing wherever they will not prevent removal of the R.F. Tuner.

The end of the RG-12/U which enters the Tuner housing should be terminated with UHF-type male connector (supplied). The cable is connected to the R.F. Tuner by a UHF-type female connector equipped with a length of shielded lead (supplied). The r.f. lead is connected to insulator E202 on the R.F. Tuner. The shield is grounded to the tuner chassis. The shielded lead is not terminated with lugs, since its length will depend on where the cable enters the housing. It can be shortened if necessary.

The receiver end of the RG-12/U is terminated with a type G.R. female connector (not supplied). If it is desired to use the AN/SRA-17(XN-1) with VLF/LF receiver other than an RBA, it may be necessary to use a different fitting.

The AN/SRA-17(XN-1) was designed to use 100 feet of RG-12/U cable between Tuner and receiver. It is preferable to keep the cable less than 150 feet long. Satisfactory performance will be obtained with lengths up to 300 feet.

The end of the 8-conductor cable which enters the Tuner housing should be stripped of its outer sheath, and each conductor should be equipped with a lug for connecting to terminal strip TB201 on the R.F. Tuner chassis. The shield can be grounded to "A" on the terminal strip.

The end of the 8-conductor cable going to the Antenna Control Unit should be fitted with an 8-pin male connector (supplied).

2. INSTALLATION OF ANTENNA AT-252/SR

Antenna AT-252/SR is mounted on the Tuner housing by six half-inch bolts welded to the steel plate. The Tuner housing is shipped with the antenna insulator bolted on the plate. The insulator must be removed to attach the whip to it. There is also a five-inch flexible antenna lead supplied which must be attached to the base of the whip before the whip and insulator are bolted to the Tuner housing.

The other end of the antenna lead is fastened to insulator E201 on the R.F. Tuner chassis.

SECTION 4

OPERATION

Operation of Antenna Group AN/SRA-17(XN-1) is accomplished from the Antenna Control Unit in conjunction with a receiver of appropriate frequency range (14-600 kc).

Tuning in a signal on the receiver for maximum response consists of the following steps:

1. Set the receiver to the desired frequency, with the gain control full on.
2. Turn the Range Selector switch on the Antenna Control Unit to the proper frequency range.
3. Turn on the Noise Generator, and tune for the maximum noise using the tuning potentiometer on the Antenna Control Unit. If the noise is greater than 20 db, back down the receiver gain. The tuning potentiometer should be used in conjunction with the receiver's antenna compensator. Peak one, then the other. If the antenna control is used with an RBA, each coupling position should be tried with the tuning potentiometer and antenna compensator.
4. After the optimum point has been determined, turn off the Noise Generator.

NOTE

If the Noise Generator is left in the ON position, the whip antenna is grounded. ALWAYS MAKE SURE THE NOISE GENERATOR IS OFF.

The desired signal on the receiver should now be peaked to within a db of maximum. It may be necessary, however, to produce the final peak signal by slightly rotating the tuning control to either side of its setting.

In addition to its use as a tuning indicator, the Noise Generator can be used as a rough measurement of receiver sensitivity as follows:

1. Repeat steps 1, 2, and 3 described above.
2. Turn the tuning potentiometer fully to the left to measure receiver noise output
3. Set the receiver gain to produce 0 db receiver noise (0 reading on the DIRECT scale).
4. Repeat the tuning potentiometer to produce maximum noise and record the value. This value can be used to check the overall system performance from time to time. If this output falls off, there is indication of reduced performance. Typical values for both receiver and Antenna Group in good operating condition are as follows:

Frequency, KC.	Output meter reading, ADD 20.DB scale
25	-3 db
62	-1 db
155	-0 db
385	-0 db

If the output falls more than 4 db below the values listed above, a check of receiver sensitivity is indicated. If the receiver is found to have a sensitivity in accordance with its maintenance manual, try replacing CR201 with one of the spares supplied.

SECTION 5

MAINTENANCE

1. ANTENNA AT-252/SR

No maintenance is required by the antenna except for periodic checks of the insulator. The insulator should be cleaned regularly to remove deposits of soot or salt film that might eventually form a path to ground.

2. ANTENNA CONTROL AND RADIO FREQUENCY TUNER.

Maintenance of the Antenna Control and Radio Frequency Tuner is largely a matter of routine checking and component replacement. The following tables of resistance and voltage measurements will be helpful in determining which unit and component is malfunctioning. Any deviation of approximately 20 per cent or more from the values indicated will disclose a possible source of trouble.

TABLE 5-1 ANTENNA CONTROL RESISTANCE MEASUREMENTS.

Conditions: Tuning potentiometer turned fully clockwise. Equipment off. Readings taken from pins of power output receptacle, J2, to chassis ground.

PIN	POSITION OF RANGE SELECTOR SWITCH			
	14-38 kc	38-95 kc	95-235 kc	235-600 kc
Noise Generator switch in OFF position				
A	0	00	00	00
B	8800	6000	5600	4000
C	Open	10,000	10,000	Open
D	Open	Open	Open	Open
E	Open	Open	24,000	13,500
F	Open	24,000	Open	10,000
G	Open	Open	Open	Open
H	Open	Open	Open	Open
Noise Generator switch in ON position				
C	Open	Open	Open	Open
D	4500	4500	4500	4500
F	Open	24,000	Open	Open
G	35,000	Open	Open	Open

Readings to remaining pins are the same as with Noise Gen. OFF

TABLE 5-2. RADIO FREQUENCY TUNER RESISTANCE MEASUREMENTS

These readings can be taken at the Antenna Control end of the control cable, from pin A1 (ground pin) of plug P2 to each successive pin.

Pin A to	Resistance in Ohms
B	2,200
C	Open
D	116,000
E	Open
F	Open
G	10,500
H	Open

TABLE 5-3. ANTENNA CONTROL UNIT VOLTAGE MEASUREMENTS, 5Y3 and C1B.

All voltage readings were taken with a vacuum tube voltmeter.

Voltages to ground	
Pin 8 of 5Y3	340 volts
Plus side of C1B	330 volts

TABLE 5-4. ANTENNA CONTROL UNIT, VOLTAGE MEASUREMENTS

The following conditions should be observed: All measurements should be taken with a VTVM. Tuning potentiometer should be tuned fully clockwise. Readings should be taken from pins of power output receptacle, J2, to chassis ground.

PIN	POSITION OF RANGE SELECTOR SWITCH			
	14-38 kc	38-95 kc	95-235 kc	235-600 kc

Noise Generator switch in OFF position.

A	0	0	0	0
B	92	92	92	92
C	0	0	0	0
D	0	0	0	0
E	0	0	330	330
F	0	330	0	0
G	0	0	0	0
H	0	0	0	0

Noise Generator Switch in ON position.

D	105	105	105	105
G	330	0	0	0

Readings to other pins are the same as with the Noise Gen. OFF

TABLE 5-5. VOLTAGE MEASUREMENTS, ANTENNA CONTROL UNIT AND RADIO FREQUENCY TUNER CONNECTED.

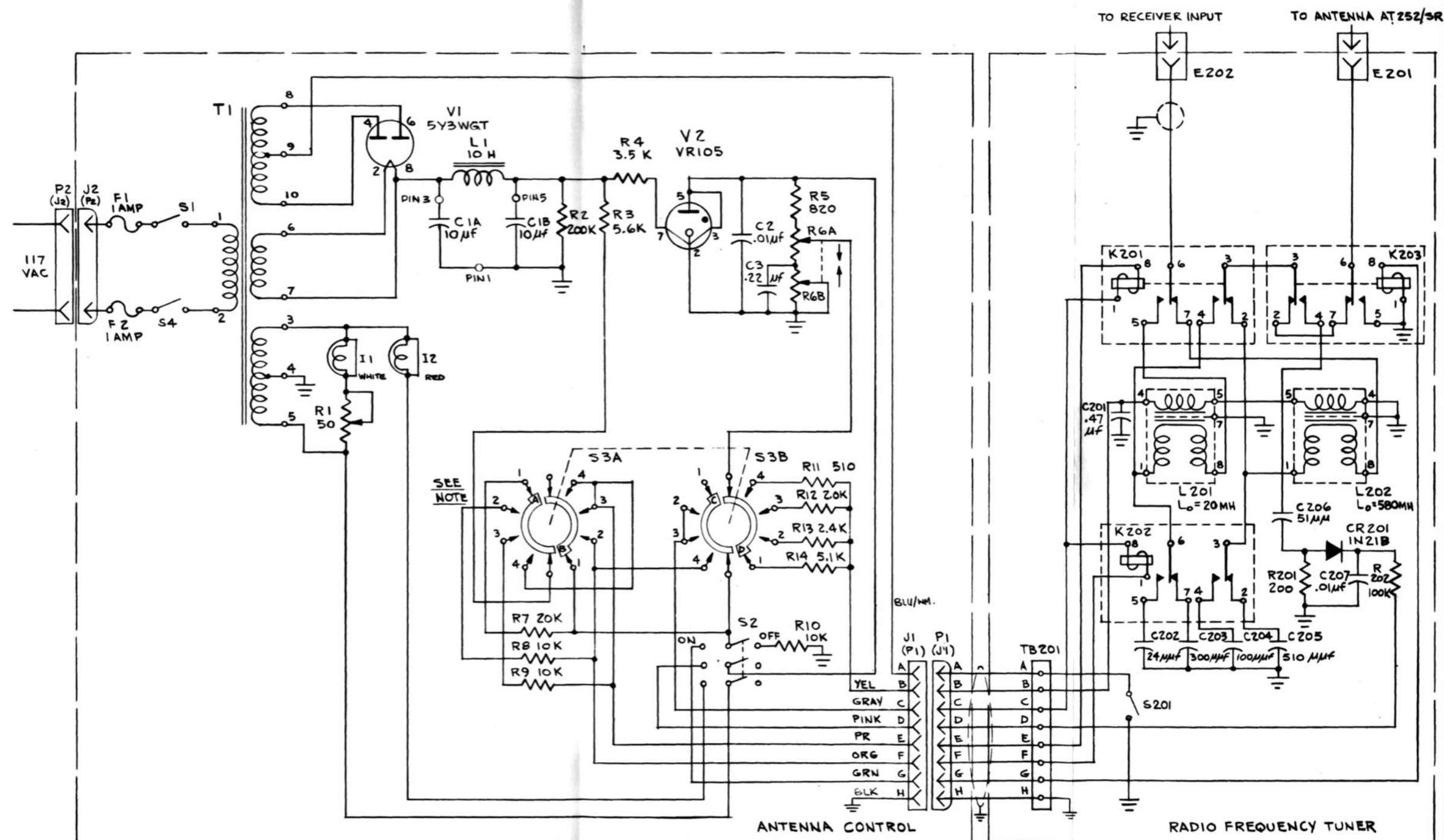
Readings were taken with the tuning control potentiometer turned fully clockwise. For these measurements, remove the cover of the Antenna Control Unit. Readings should be taken from the back of receptacle J2 to ground.

PIN	POSITION OF RANGE SELECTOR SWITCH			
	14-38 kc	38-95 kc	95-235 kc	235-600 kc
Noise Generator switch OFF				
A	0	0	0	0
B	26	40	44	68
C	0	92	92	180
D	0	0	0	0
E	0	92	190	275
F	0	180	93	92
G	0	0	0	0
H	0	0	0	0
Noise Generator ON				
D	105	105	105	105
G	94	94	94	94
Readings to other pins are the same as with Noise Generator OFF				

3. TROUBLE SHOOTING IN THE NOISE GENERATOR CIRCUIT.

If the Noise Generator fails to introduce noise into the receiver the probable cause of the trouble will be:

- 1N21B crystal diode is defective. Replace from spare parts.
- Relay K203 is inoperative
- The signal winding of the inductor covering the frequency to which the unit is set is open.



NOTE:
 POSITION 1 14-38 KC RANGE
 " " 2 38-95 KC "
 " " 3 95-235 KC "
 " " 4 235-600 KC "

FIG. 2-1 ANTENNA GROUP AN/SRA-17, SCHEMATIC DIAGRAM

POLYTRONIC RESEARCH, INC.
 ROCKVILLE, MD.

SCALE: NTS
 DATE: 26 OCT 57
 APPROVED BY:
 DRAWN BY: JMA
 REVISED:

SCHEMATIC DIAGRAM, ANTENNA GROUP AN/SRA-17

DRAWING NUMBER
 C697-52

SECTION 6

PARTS LIST

NOTE: This parts list is supplied to identify parts for maintenance use only.

Ref. Desig.	Name and Description	Function
A 100	Antenna Group, AN/SRA-17, consisting of A 101, A 101A, A 102, A 102A	
A 101	Tuner, Radio Frequency, TN-334/SRA-17, height 15-3/16", width 12", depth 12", with 6 dog fasteners. Polytronic Part No. D-697-48	Protective case for the R.F. Tuner
A 101A	Cover, Radio Frequency Tuner, part of A 101. Polytronic Part No. C-697-39	
A 102	Control, Antenna, C-2536/SRA-17, height 4-1/4", width 12-9/16", depth 10-7/16". Polytronic Part No. D-697-47	Protective case for the Power Supply
A 102A	Cover, Control, Antenna, part of A 102. Polytronic Part No. D-697-46	
C 1A,B	Capacitor, electrolytic, dry, 2X10MF, 450 vdcw each section, plug in type, length 2-1/2", dia. 1-1/4". Sprague Part No. CE52F100R	Power Supply Filter
C 2	Capacitor, fixed, paper-foil type, oil impreg., tubular metal, .01MF, 600 vdcw, axial leads, 1/4" dia., 7/8" long. Sprague Part No. CPO4A1EF103M	R.F. By-pass in Control Unit
C 3	Capacitor, fixed, paper-foil type, oil impreg., tubular metal, .22MF, 200 vdcw, 5/16" dia., 1-3/8" long, 2 radial wire leads. Sprague Type CPO4A1EF224M	R.F. By-pass in Control Unit
C 201	Capacitor, fixed, paper-foil type, oil impreg., tubular metal, .47MF, 200 vdcw, 9/16" dia., 1-5/8" long, 2 radial wire leads. Sprague Type CPO8A1KC47M	R.F. By-pass in Tuner Unit
C 202	Capacitor, fixed, silver mica, 24 mmf, 500 vdcw, 5%, 33/64" long, 19/64" wide, 7/32" thick, 2 radial wire leads. Sangamo CM15E240J	Shunt for increasing starting control current for 235-600KC Range
C 203	Capacitor, fixed, silver mica, 300 mmf, 500 vdcw, 5%, 33/64" long, 19/64" wide, 7/32" thick, 2 radial wire leads. Sangamo CM15E301J	Shunt for increasing starting control current for 95-235KC Range
C 204	Capacitor, fixed, silver mica, 100 mmf, 500 vdcw, 5%, 33/64" long, 19/64" wide, 7/32" thick, 2 radial wire leads. Sangamo CM15E101J	Shunt for increasing starting control current for 38-95KC Range

PARTS LIST

Ref. Desig.	Name and Description	Function
C205	Capacitor, Fixed, silver mica, 510mmf, 300vdcw, 5%, 33/64" long, 19/64" wide, 7/32" thick, 2 radial wire leads. Sangamo CM15E511J	Shunt for increasing starting control current for 14-38KC Range
C206	Capacitor, fixed, silver mica, 51mmf, 500 vdcw, 5%, 33/64" long, 19/64" wide, 7/32" thick, 2 radial wire leads. Sangamo CM15E510J	Dummy Antenna for use with Noise Generator
C207	Capacitor, fixed, paper-foil type, oil impreg., tubular metal, .01MF, 100 vdcw, 1/4" dia., 3/4" long, 2 radial wire leads. Sprague type CP09A1EB103M	Noise Generator by-pass capacitor
CR201	Crystal unit, silicon diode, 13/16" long, 1/4" dia., Sylvania Type 1N21B.	Noise Generator Tuner Unit
E 1	Clamp, tube, non-corrosive nickle-steel for small shield octal tube, Cambridge Tehrmionic Corp. Part No. X1817A.	Clamp for securing VR tube in its socket
E 2	Clamp, tube, non-corrosive nickle-steel for intermediate small shield octal tube, Cambridge Thermionic Corp. Part No. X1817B.	Clamp for securing 5Y3WGTA tube in its socket
E 3	Assembly, Lamp, for No. 47 lamp bayonet base, Dialight Corp., No. 91410-937.	Holder for Power on-off lamp
E 4	Assemble, Lamp, for No. 47 lamp bayonet base, Dialight Corp., No. 91410-931.	Holder for Noise Generator indicator light
E 201	Insulator, lead-in bushing, steatite, 3/4" O.D., 31/64" I.D., 1-1/4" length, KEF Johnson No. 135-55.	Tuner Input
E 202	Same as E-201	Tuner Input
E 203	Holder, silicon diode. Polytronic Part No. A697-11 and A697-12	Holder for 1N21B Silicon Diode
E 203A	Spring part of E 203. Polytronic Part No. A697-13	Contract Spring for E 203
E 204	Antenna, Whip Type, stainless steel, Tubler Navy Type AT-252/SR	Receiving Antenna
F 1	Fuse, lamp, 250v, time delay operating, ferrule type glass body, Bussman Type MDM	Protect Control Unit input
F 2	Same as F 1	
I 1	Lamp, indicating, min-base, 6-8U, General Electric No. 47	Power On-Off indicator

PARTS LIST

Ref. Desig.	Name and Description	Function
I 2	Same as I 1	Noise Generator On-Off Indicator
J 1	Connector, receptacle, 8-pin Amphenol Part No. AN3102A-18-8S	Power Out-put connector
J 2	Connector, receptacle, 2-pin, Amphenol Part No. AN3102A-14S-9P	Power In-put connector
K 201	Relay, DPDT, 80 vdcw, coil resistance 10,000 ohms, hermetically sealed, Price Electric Corp. No. 5409-2HS	Switch R.F. Output inductors L201 and L202
K 202	Relay, Same as K 201 Switches Antenna to ground and the Noise Generator to the current	Switch shunt capacitors C202, C203, C204, C205
L 1	Reactor, filter choke, 10H, 85 ma. dc, dc resistance 175 ohms, 250v rms test, herm. sealed, Chicago Trans. Co. No. RH-1085	Power Supply filter choke
L 201	Inductor, controllable inductor inductance with zero control current, 20 mh, CGS Lab. Inc., Part No. 58DB1	Base tune antenna, 95-600KC Range
L 202	Inductor, controllable inductor inductance with zero control current, 500 mh, CGS Lab. Inc., Part No. 48DB2	Base tune antenna, 14-95KC Range
P 1	Connector, Plug, 8-pin polarized straight Rating: 1 @ 35 amp. 7 @ 20 amp. 200 vdc 150 ac, Spec. MIL-C-5015, Amphenol Part No. AN-3106A-18-8P	Power Output control Connector
P 2	Connector, Plug, 2-pin, Spec. MIL-C-5105, Amphenol Part No. AN-3106A-14S-9S	Power Input
R-1	Potentiometer, linear, 50 ohm, 2 w, comp., 10%, RD flatted shaft 7/8", Allen Bradley Part No. 5001	Pilot Light Dimmer
R 2	Resistor, fixed, comp., 200K ohm, 1 w, 5%, Allen Bradley Part No. RC20BF204J	Bleeder for Power Supply
R 3	Resistor, fixed, comp., 5.6K, 2 w, 5%, Allen Bradley Part No. RC42BF562J	Voltage drop for relay circuit
R 4	Resistor, 3600 ohm, WW, Vitreous enamel, ohmite brown devil	Drop voltage
R 5	Resistor, fixed, comp., 820 ohm, 2 w, 5%	Drop voltage

PARTS LIST

Ref. Desig.	Name and Description	Function
R 6A,B	Potentiometer, two section, 2000 ohm lin., 3 w, per section, WW, 3/8-32 bushing, low-loss phenolic case, (Clarostat series 42A) Polytronic Part No. 697-53	Control current through control winding of increductor
R 7	Resistor, fixed, comp., 20K, 5%, 2 w, Allen Bradley Part No. RC42BF203J	Dummy load for relays
R 8	Resistor, fixed, comp., 10K, 5%, 2 w, Allen Bradley Part No. RC42BF103J	Dummy load for relays
R 9	Resistor, Same as R 8	Same as R 8
R 10	Resistor, Same as R 8	Same as R 8
R 11	Resistor, fixed, comp., 510 ohm, 5%, 1 w, Allen Bradley Part No. RC30BF511J	Current limit for bandsread
R 12	Resistor, fixed, comp., 2000 ohm, 5%, 1 w, Allen Bradley Part No. RC30BF202J	Same as R 11
R 13	Resistor, fixed, comp., 2400 ohm, 5%, 1 w, Allen Bradley Part No. RC30BF242J	Same as R 11
R 14	Resistor, fixed, comp., 5100 ohm, 5%, 1 w, Allen Bradley Part No. RC30BF512J	Same as R 11
R 201	Resistor, fixed, comp., 200 ohm, 5%, 1/2 w, Allen Bradley Part No. RC20BF201J	Limit current to CR 201
R 202	Resistor, fixed, comp., 100K, 1/2 w, Allen Bradley, Part No. RC20BF104K	Current limiting
S 1	Switch, SPST toggle, 250v, 6a, Bat handle, Cutler Hammer ST42A	Power on-off control switch
S 2	Switch, 3PDT toggle, Bat handle Cutler Hammer 7615K2	On-off switch for generator and actuate K203
S 3A,B	Switch, rotary selector, 2 pole per section, 2 sections, shorting, make before break, seatite insulation, Centralab Part No. 2514	Frequency range selector
S 4	Switch, interlock, SPST, 15a, 125 vac, Micro Part No. BZ-7RL204	Disables Control Unit when lid is removed
S 201	Same as S 4	Disables B+ when R. F. Tuner housing is opened
T 1	Transformer, power, 320-0-320 vac - 85ma, 5v - 2a, 6.3 v CT - 3a, Spec. MIL-T-27A, Chicago Transformer Co. PHC-85	Power Supply

PARTS LIST

Ref. Desig.	Name and Description	Function
TB 1	Board, terminal, silicon bonded fibre glass, 3-3/4" x 4-3/4" x 1/16" thick Polytronic Part No. B-697-1	Mounts R2, R3, R4, R7, R8, R9, R10, R11, R12, R13, R14, C2, C3
TB 201	Board, terminal, phenolic, 8 terminals, barrier type, Cinch 8-140Y	Control cable connections
TB 202	Board, terminal, silicon bonded fibreglass, 1-9/16" x 2-1/4" x 1/16" thick Polytronic Part No. B-697-2	Mounts C202, C203, C204, C205
TB 203	Board, terminal, silicon bonded fibreglass, Polytronic Part No. B-697-2	Mounts CR201, R201, C206, C207
V 1	Electron Tube, Glass envelope, full-wave rectifier. Sylvania 5Y3WGT	Power Rectifier
V 2	Electron Tube, Glass envelope, voltage regulator. Sylvania VR 105	Regulate Incredutor
XV 1	Socket, electron tube, octal, 8 beryllium copper alloy silver plated contacts, four ground lugs. Eby Part No. TS101P01	Hold 5Y3WGT
XV 2	Socket, Same as XV 1	Hold VR tube
XC 1	Socket, Same as XV 1	Hold C 1
XF 1	Fuseholder, extractor post type, phenolic holder, 250v, 18a max, Bussman Part No. HCM	Holds line fuse
XF 2	Fuseholder, Same as XF 1	Same as XF 1
XF 3	Fuseholder, block type, single open, rating 250v, 50a, Bussman Part No. 4413	Holds spare fuse