RESTRICTED PRELIMINARY INSTRUCTIONS

for

Model RBG Radio Receiving Equipment

RANGE: .54 - 31.0 mc SUPPLY: 115 Volts 60 cycles

consisting of:

RADIO RECEIVER CHC 46140
LOUD SPEAKER CHC 49154

NAVY DEPARTMENT - BUREAU OF SHIPS

contractor

GENERAL ELECTRIC SUPPLY CORP.

Washington, D. C.

BY: Subcontractor

THE HAMMARLUND MANUFACTURING CO., INC.

New York, N. Y.

Contract Nos. 87147 Contract date, June 14, 1941

CONTRACTUAL GUARANTEE

Applicable only to Model RBG, Contract Nos. 87147 dated June 14th, 1941.

The equipment, including all parts and spare parts, except vacuum tubes, shall be guaranteed for a service period of one year with the understanding that, as a condition of this contract, all items found to be defective as to design, material, workmanship or manufacture shall be replaced without delay and at no expense to the Government, provided that such guarantee and agreement shall not obligate the contractor to make replacement of defective material unless the failure, exclusive of normal shelf life deterioration, occurs within a period of two years from the date of delivery of the equipment to and acceptance by the Government, and provided further, that if any part or parts (except vacuum tubes) fail in service or are found defective in ten per cent (10%) or more of the total number of equipments furnished under the contract, such part or parts, whether supplied in the equipment or as spares, shall be conclusively presumed to be of defective design, and as a condition of contract subject to one hundred per cent (100%) replacement of all similar units supplied on subject contract by suitable redesigned replacements. Failure due to poor workmanship while not necessarily indicating poor design, will be considered in the same catagory as failure due to poor design. Redesigned replacements which will assure proper operation of the equipment shall be supplied promptly, transportation paid, to the Naval activities using such equipment, upon receipt of proper notice and without cost to the Government. All defective parts originally furnished under contract shall be held subject to rejection and return to the contractor.

This period of two years and the service period of one year shall not include any portion of the time that the equipment fails to give satisfactory performance due to defective items and the necessity for replacement thereof, and provided further, that any replacement part shall be guaranteed to give one year of satisfactory service.

REPORT OF FAILURE

Report of failure of any part of this equipment, during its service life, shall be made to the Bureau of Ships in accordance with current instructions. The report shall cover all details of the failure and give the date of installation of the equipment. Refer to latest revision of Bureau of Engineering Circular Letter No. 40 for instructions concerning Report of Failures, etc.

PERTINENT DATES AFFECTING REPLACEMENTS UNDER THE GUARANTEE

Contract Nos. 87147 Date of Contract 14th, June, 1941
Serial number of Equipment_____
Date of acceptance by the Navy_____
Date of delivery to contract destination_____
Date of completion of installation_____
Date placed in service_____

Blank spaces in the book shall be filled in at time of installation. Operating personnel shall also mark the "date placed in service" on the acceptance date plate located on the rear skirt of receiver chassis.

GENERAL DESCRIPTION

The Type CHC 46140 Radio Receiver is an eleven tube superheterodyne covering a continuous frequency range of .54 to 31.0 megacycles in six bands. In addition, band spread is provided on four bands as follows:

4.00 - 4.60 mc
8.00 - 9.60 mc
12.00 - 13.60 mc
15.00 - 18.00 mc

The circuit employed comprises one stage of radio frequency amplification, first detector and high frequency oscillator, three stages of intermediate frequency amplification operating at 455 Kilocycles, second detector, first audio amplifier and a power output stage. A beat frequency oscillator is coupled to the second detector to provide for C. W. code reception. A full-wave, high vacuum rectifier furnishes plate voltage and a voltage regulator tube is used to stabilize the H. F. oscillator plate supply.

A crystal filter, the use of which is optional, is included and provides adjustable selectivity for the reception of signals where the normal non-crystal selectivity of the receiver is insufficient for rejection of closely adjacent interfering signals.

One section of the duplex diode operates as second detector and also provides automatic volume control for the radio frequency amplifier and the first and second

intermediate frequency amplifiers. The other diode section is utilized in a limiter circuit which is useful in the reduction of ignition and similar pulse types of interference. The use of the limiter is optional and is controlled by a switch on the front panel.

A tuning meter is provided which indicates relative signal strength, when the receiver is operated on AVC and the sensitivity control is set at maximum. This meter operates on either AVC or manual control as a tuning indicator, the meter reading maximum at correct tuning of signal.

The antenna compensator control on the front panel provides correct alignment of the radio frequency amplifier stage for maximum sensitivity, image rejection ratio and signal to noise ratio.

Two audio output circuits are provided; a phone jack mounted on the front panel is connected to a balanced winding which will deliver approximately 10 milliwatts of audio power to a 600 ohm load, when the audio output is adjusted to provide 2 watts of audio power to the 5000 ohm speaker terminals located on the rear of the receiver chassis.

The loud speaker CHC-49154 is an 8 inch permanent magnet dynamic type, mounted in a metal housing and provided with matching input transformer and phone tipped cable for connection to the pin jack terminals on the rear of the chassis.

A N T E N N A

The input circuit of the receiver is arranged to be suitable for use with either a balanced feed line or a simple antenna-ground combination. The antenna terminals are located on the rear of the receiver chassis and are marked A, A, and G. When a balanced feed line is used, connect the feed line to the two A terminals and connect the G terminal to a good ground. If the simple antenna is used, connect the G terminal and the adjacent A terminal together and to ground, and connect the antenna to the remaining A terminal. The antenna length is not critical. A good length is approximately 50 feet.

INSTALLATION AND OPERATION

Insert the eleven tubes in their proper sockets as shown by the tube diagram plate on the tuning condenser cover. Attach the speaker cable to the phone tip jacks at the rear of the chassis, or insert headphones in the phone jack on the front panel. Connect the antenna as described above, and insert the power cord plug into a 115 Volt, 50 - 60 cycle source of single-phase alternating current - DO NOT CONNECT TO D.C.

The equipment is now ready for operation and is turned on by means of the power switch which is thrown by turning the audio gain control in a clockwise direction. This control adjusts the amount of audio signal as desired. The send-receive switch should be in the "receive" position. This switch

de-sensitizes the receiver during transmitting periods for protection from the local transmitter, but does not disconnect the receiver from the power source, thus leaving the tubes heated and ready for instant use. In the absence of a local transmitter this switch should be left in the "receive" position.

Set the band change switch to the band in which reception is desired and set the MAN-AVC-BFO switch in accordance with type of signal desired. If the AVC is used the sensitivity control should be fully advanced and the audio gain control used for adjusting output. If either CW code reception or manual gain control of modulated signals is desired, the audio control should be set at or near maximum and the sensitivity control should be advanced only as far as is required by the signal, in order to prevent overloading.

When the MAN-AVC-BFO switch is in the BFO position the beat frequency oscillator is turned on for CW reception or for locating very weak signals. The automatic volume control is not in use in this position and the sensitivity of the receiver is varied by use of the sensitivity cortrol. The control marked "beat oscillator" normally is set at the zero position and is adjusted from this position to produce the desired audio beat note after tuning the desired signal to zero beat.

ANTENNA COMPENSATOR

In tuning weak signals it is very important to adjust

the antenna compensator for maximum signal. This control provides correct tuning of the radio frequency stage, which is essential in obtaining maximum signal to noise ratio and image frequency rejection.

L I M I T E R

The use of the limiter, on or off, is optional and determined by the conditions of reception. If ignition or other similar short pulse types of noise are present the limiter will be of great help.

CRYSTAL FILTER

The quartz crystal filter has six definite degrees of selectivity controlled by the CRYSTAL SELECTIVITY switch on the front panel. When this switch is set on position 1 the crystal holder is short-circuited, the crystal is consequently inactive, and the receiver exhibits least selectivity, or broadest response. Positions 2, 3 and 4 give selectivity varying from broad to fairly sharp and are usually suitable for phone or modulated signal reception. Positions 5 and 6 are sharp and very sharp respectively and are usually suitable only for CW code reception. Normally the phasing control should be set at the arrow in the center of its scale. Adjustment of this control when on any of the five positions from 2 to 6 greatly increases the selectivity on one side or the other of the signal frequency and reduces or eliminates

heterodyne interference.

TUNING DIALS AND CALIBRATION

The main tuning dial is calibrated in megacycles, in six bands. The band and scale used depends upon the setting of the band-change switch. When using the main dial calibration the band spread dial should be set at the 200 line on its arbitrary scale. The calibration of the main dial should then be accurate within one percent.

When the band spread dial is used it is to be noted that the 200 line on its arbitrary scale coincides with the high frequency end of all four of the navy spread bands. The main dial should be set at the diamond mark corresponding to the high frequency end of the band spread range in which operation is desired.

For example; if reception of a 12.70 megacycle signal is desired using the band spread dial; set the band-change switch at 10 - 18 megacycles and set the main dial at the diamond mark at 13.6 megacycles. The band spread dial is now used to tune the desired 12.70 megacycles signal (or any other signal in the band 12.00 - 13.60 megacycles). When set up in this manner the band spread calibration should agree approximately with known signal frequencies. If however, it is found to be slightly off, the band spread dial should be re-adjusted to correspond with the known frequency of the signal, and the signal should then be retuned by slightly altering the setting of the main dial. A very slight deviation from the

diamond mark on the main dial will make an appreciable change in the band spread tuning.

MAINTENANCE

The alighment of the circuits is precisely done at the factory and these adjustments should not be tampered with unless it is definitely determined that misalignment exists, and then only by a person who has familiarized himself with the receiver and who has available the required equipment. If the receiver fails to operate correctly it is recommended that substitution of new tubes be tried one at a time in order to determine if a tube is at fault. If this fails to remedy the trouble, resort to a voltage check using the voltage chart and the resistance chart which are provided for this purpose.

A high resistance voltmeter (1000 ohms per volt) and an ohmmeter should be available for these tests and, of course, the ohmmeter can be used for individual testing of resistors and condensers, being careful to consult the circuit diagram in order to avoid erroneous values due to parallel circuits. Replacement of defective resistors or condensers when found will not in most cases have any effect on the circuit alignment.

TUBE SOCKET VOLTAGES

TERMINAL NAME	PIN NO.	VARIABLE SYMBOL	VARIABLE SETTING	D.C. Volts R 127 At 0	D.C. Volts R 127 At 10
V101 Grid	4	none		0	0
V101 Cathode	5	none		B 23	A 3.8
V101 Screen	6	none		C 105	C 102
V101 Plate	8	none		D 256	D 234
V102 Sig. Grid	CAP	none		0	0
V102 Cathode	8	none		A 2	A 2
V102 Screen	4	none		C 95	C 95
V102 Sig. Plate	3	none		C 247	C 232
V102 Osc. Grid	5	none		*	*
V102 Osc. Plate	6	none		C 105	C 105
V103 Grid	4	none		0	0
V103 Cathode	5	none		B 23	A 3.8
V103 Screen	6	none		C 105	C 102
V103 Plate	8	none		C 250	C 220
V104 Grid	4	none		0	0
V104 Cathode	5	none		B 23	A 3.8
V104 Screen	6	none		C 105	C 102
V104 Plate	8	none		C 250	C 220
V105 Grid	4	none		0	0
V105 Cathode	5	none		A 3.6	A 3.3
V105 Screen	6	none		C 103	C 98
V105 Plate	8	none		C 233	C 217
V107 Grid	4	S109	BFO	B -6#	B -6#
V107 Cathode	5	S109	BFO	0	0
V107 Screen	6	S109	BFO	B 36	B 35
V107 Plate	8	S109	BFO	C 200	C 188
V108 Grid	5	none		0	0
V108 Cathode	8	none		A 2.7	A 2.7
V108 Plate	3	none		C 130	C 122
V109 Grid	5	none		0	0
V109 Cathode	8	none		B 13	B 12
V109 Screen	4	none		D 253	D 240
V109 Plate	3	none		D 250	D 240
V111 Cathode	2	none		0	0
V111 Anode	4, 5, 8	none		105	105

Values in this table are made with the equipment connected for normal operation. Power input 115 Volts 60 cycles. No input signal. MAN.-AVC-BFO Switch (S109) in MAN. position unless otherwise specified. Send-receive switch (S110) in receive position. Voltage measurements made with a D.C. voltmeter, 1000 ohms per volt. All voltages are measured between terminal and receiver chassis, the chassis being the minus or negative lead, except value marked #, for which the polarity is reversed.

"A" readings on 0-10 scale: meter resistance 10,000 ohms.
"B" readings on 0-100 scale: meter resistance 100,000 ohms.
"C" readings on 0-250 scale: meter resistance 250,000 ohms.
"D" readings on 0-500 scale: meter resistance 500,000 ohms.

* Measurement cannot be made with voltmeter due to loading effects on circuit.

POINT TO POINT RESISTANCES

TERMINAL TO CHASSIS

TERMINAL NAME	PIN NO.	VARIABLE SYMBOL	VARIABLE SETTING	RESISTANCE IN OHMS
V101 Grid	4	S109	MAN.	1,000,000
V101 Grid	4	S109	AVC	3,000,000
V101 Grid	4	S109	BFO	1,000,000
V101 Cathode	5	R127	0	5,000
V101 Cathode	5	R127	10	140
V101 Screen	6	none		71,000
V101 Plate	8	S110	REC	66,000
V101 Plate	8	S110	SEND	INFINITE
V102 Sig. Grid	CAP	S105	*	.02 to 4 *
V102 Cathode	8	none		230
V102 Screen	4	none		71,000
V102 Sig. Plate	3	none		67,000
V102 Osc. Grid	5	none		50,000
V102 Osc. Plate	6	none		70,000
V103 Grid	4	S109	MAN.	10,000
V103 Grid	4	S109	AVC	2,000,000
V103 Grid	4	S109	BFO	10,000
V103 Cathode	5	R127	0	5,000
V103 Cathode	5	R127	10	140
V103 Screen	6	none		71,000
V103 Plate	8	S110	REC	66,000
V103 Plate	8	S110	SEND	INFINITE
V104 Grid	4	S109	MAN.	10,000
V104 Grid	4	S109	AVC	2,000,000
V104 Grid	4	S109	BFO	10,000
V104 Cathode	5	R127	0	5,000
V104 Cathode	5	R127	10	140
V104 Screen	6	none		71,000
V104 Plate	8	S110	REC	66,000
V104 Plate	8	S110	SEND	INFINITE
V105 Grid	4	none		1
V105 Cathode	5	none		300
V105 Screen	6	none		115,000
V105 Plate	8	none		67,000
V106 Cathode	8	none		0
V106 Cathode	4	S108	OFF	270,000
V106 Cathode	4	S108	ON	2,360,000
V106 Plate	5	S108	OFF	555,000
V106 Plate	5	S108	ON	590,000
V106 Plate	3	S108	OFF	270,000
V107 Grid	4	none		50,000
V107 Cathode	5	none		.8
V107 Screen	6	S109	BFO	275,000
V107 Plate	8	S109	BFO	78,000
V108 Grid	5	R132	10	250,000
V108 Cathode	8	none		600
V108 Plate	3	none		90,000
V109 Grid	5	none		200,000
V109 Cathode	8	none		280

TERMINAL NAME	PIN NO.	VARIABLE SYMBOL	VARIABLE SETTING	RESISTANCE IN OHMS
V109 Screen	4	none		65,000
V109 Plate	3	none		65,000
V110 Cathode	8	none		65,000
V110 Plate	4	none		105
V110 Plate	6	none		.115
V111 Cathode	2	none		0
V111 Anode	5	none		69,000

* Value depends on frequency band setting.

TABLE I

Parts List by Symbol Designation for Model RBG Radio Receiving Equipment
Section 1
CHC-46140 Radio Receiver Unit (101-199)

Symbol Desig. #	Function	Description	Mfr.	Mfr. Desig.	Hammarlund Mfg. Co. Dwg. or Part No.
		STRUCTURAL PARTS			
A101	Front Panel	Etched Aluminum 1/16" thick	17		6261
A102	Receiver Cabinet	Fabricated Steel Black finish	9		6256
A103	Shock Mtg. Frame	Fabricated Steel Black finish	9		6234
		CAPACITORS			
C101	Antenna Compensating Capacitor	Variable Air	9		SA-759
C102 A	RF Grid Tuning Cap. Large Sect.	Variable Air	9		
B	Det. Grid Tuning Cap. Large Sect.	Variable Air			
C	HF Osc. Tuning Cap. Large Sect.	Variable Air			
D	RF Grid Tuning Cap. Small Sect.	Variable Air			
E	Det. Grid. Tuning Cap. Small Sect.	Variable Air			
F	HF Osc. Tuning Cap. Small Sect.	Variable Air			
G	RF Grid Tuning Cap. Band Spread	Variable Air			

* Spare parts furnished refer to table 3 for quantities
\# Symbol part designation if any

Symbol Desig. #	Function	Description	Mfr.	Mfr. Desig.	Hammarlund Mfg. Co. Dwg. or Part No.
		CAPACITORS (Continued)			
C102 H	Det. Grid Tuning Cap. Band Spread	Variable Air			
I	HF Osc. Tuning Cap. Band Spread	Variable Air			
*C103	V101 Grid Coupling	Molded Mica: 600 mmf. ±10% 500V DC W	6	5W	6073
*C104	V101 Plate Coupling	Same as C 103			
*C105	V101 Grid Filter	Molded Mica: .01 mfd. ±10% 300V DC W	6	3WLS	4886
*C106 A	V101 Cathode By-pass	Paper: 3 x .05 mfd. +20%-10% 600V DC W	6	DYR600555	4891
B	V101 Screen By-pass				
C	V101 Plate Filter				
*C107 A	V102 Cathode By-pass	Same as C106			
B	V102 Screen By-pass				
C	V102 Osc. Plate Filter				
C108	V102 Neutralizing	Mica Trimmer Adj. & sealed 1.5-2.0mmf.	9		6189
*C109	V102 Osc. Plate Blocking	Molded Silver Mica: 673. mmf. ± 1% 500 V DC W	6	2R	6061
C110	V102 Osc. Grid	Molded Silver Mica: 95. mmf. ± 2% 500 V DC W	6	5R	6195
C111	HF Osc. Compensating	Ceramic Temp. Comp, 5.5 mmf. ± 10% 500 V DC W	24	N680L	6277
*C112	V103 Grid Filter	Same as C105			
*C113	V102 Plate Filter	Same as C105			
*C114 A	V103 Cathode By-pass	Same as C106			
B	V103 Screen By-pass				
C	V103 Plate Filter				
C115	V103 Plate Tuning	Molded Silver Mica: 120 mmf. ± 2% 500 V DC W	6	5R	6179
*C116	Crystal Filter Center Tapping	Molded Mica: 100.mmf. ± 5% 500 V DC W	6	5W	6172
*C117	Crystal Filter Center Tapping	Same as C116			
*C118	Crystal Filter Phasing Trimmer	Mica Trimmer: 1.5-5.0 mmf.	9		6189

* Spare parts furnished refer to table 3 for quantities
\# Symbol part designation if any

Symbol Desig. #	Function	Description	Mfr.	Mfr. Desig.	Hammarlund Mfg. Co. Dwg. or Part No.
		CAPACITORS (Continued)			
C119	Crystal Filter Phasing	Variable Air Dual Stator	9		SA-760
C120	V104 Grid Tuning	Molded Silver Mica: 85.mmf. ± 2% 500 V DC W	6	5R	6180
*C121	V104 Grid Filter	Same as C105			
*C122 A	V104 Cathode By-pass	Same as C106			
B	V104 Screen By-pass				
C	V104 Plate Filter				
*C123 A	V105 Cathode By-pass	Same as C106			
B	V105 Screen By-pass				
C	V105 Plate Filter				
C124	V105 Plate Tuning	Same as C110			
C125	V106 Det. Plate Tuning	Same as C110			
C126	V106 R. F. Filter	Same as C110			
C127	V106 R. F. Filter	Same as C110			
*C128	V107 to V106 Coupling	Molded Silver Mica: 6.mmf. ±0 -2 mmf. 500V DC W	6	5R	6151
C129	V106 Limiter Plate By-pass	Same as C110			
*C130	M101 By-pass	Same As C105			
*C131	AVC. timing	Same as C105			
*C132 A	Limiter Timing	Same as C106			
B	V107 Plate Filter				
C	V107 Screen by-pass				
*C133	V108 Grid Coupling	Same as C105			
C134	V107 Grid	Silver Mica 240. mmf. (part of L131 assembly			
C135	V107 Tuning	Silver Mica 225 mmf. (part of L131 assembly			
C136	CW.Osc. Vernier	Variable Air	9		SA-758
*C137	V108 Plate By-pass	Same as C103			
*C138	V108 to V109 Coupling	Same as C105			

* Spare parts furnished refer to table 3 for quantities

\# Symbol part designation if any

Symbol Desig. #	Function	Description	Mfr.	Mfr. Desig.	Hammarlund Mfg. Co. Dwg. or Part No.
		CAPACITORS (Continued)			
*C139	V109 Plate By-pass	Same as C105			
*C140	L118 Trimmer	Mica Trimmer: 4.-30. mmf.	9		6055
*C141	L117 Trimmer	Same as C140			
*C142	L116 Trimmer	Same as C140			
C143	L116 Series Padder	Molded Silver Mica: 2500.mmf.± 5% 300 V DC W	6	1R	6236
*C144	L115 Series Padder	Molded Silver Mica: 1500.mmf.± 5% 500 V DC W	6	1R	6235
*C145	L115 Trimmer	Same as C140			
*C146	L114 Trimmer	Same as C140			
*C147	L114 Series Padder	Molded Silver Mica: 988.mmf.± 2% 500 V DC W	6	1R	6296
*C148	L113 Series Padder	Molded Silver Mica: 375.mmf.± 1% 500 V DC W	6	5R	6295
*C149	L113 Trimmer	Same as C140			
*C150	L107 Trimmer	Same as C140			
*C151	L108 Trimmer	Same as C140			
*C152	L109 Trimmer	Same as C140			
*C153	L110 Trimmer	Same as C140			
*C154	L111 Trimmer	Same as C140			
*C155	L112 Trimmer	Same as C140			
*C156 A	AC line By-pass	Paper: 2 x .1 mfd. + 20% - 10% 600 V DC W	6	DYR6011	6275
B	AC line By-pass				
*C157	Input Filter	Paper: 4. mfd. + 10% - 3% 600 V DC W Navy type 481080	6	TLAD-6040	6254
*C158	Input Filter	Same as C157			
*C159	Intermediate Filter	Same as C157			
*C160	Intermediate Filter	Same as C157			
*C161	Output Filter	Same as C157			

* Spare parts furnished refer to table 3 for quantities
# Symbol part designation if any

Symbol Desig. #	Function	Description	Mfr.	Mfr. Desig.	Hammarlund Mfg. Co. Dwg. or Part No.
		MISCELLANEOUS ELECTRICAL PARTS			
E101	Antenna Terminals	Screw Terminal Assembly	12		6088
E102	Speaker Terminals	Dual Pin Jack Assembly	12		6302
E103	Fuse Holder	Fuse Clip Holder Assembly	12		3859
E104	RF. Lead Thru. Insulator	Polystyrene Lead Thru. Insulator	18	TPB	6284
E105	Det. Lead Thru. Insulator	Same as E104			
E106	Osc. Lead Thru. Insulator	Same as E104			
E107	RF. Wiring Stand-off Insulator	Isolantite Stand-off 7/16" dia 3/4" long 6-32th.	9		2915
E108	RF. Wiring Stand-off Insulator	Same as E107			
E109	RF. Wiring Stand-off Insulator	Same as E107			
E110	Insulating Terminals	2 Terminal connection strip	12	2002	6281
E111	Insulating Terminals	Same as E110			
E112	Insulating Terminals	4 Terminal connection strip	12	2004	6152
E113	Insulating Terminals	5 Terminal connection strip	12	2005	6282
E114	Insulating Terminals	6 Terminal connection strip	12	2006	6153
E115	Insulating Terminals	Same as E114			
E116	Insulating Terminals	Same as E114			
E117	Insulating Terminals	Same as E114			
E118	Insulating Terminals	8 Terminal connection strip	12	2008	4931
E119	Main Tuning (C102A-C102F inc.)	Molded Bakelite Knob	14		3856
E120	Band Spread Tuning (C102G, H, I)	Same as E119			
E121	Antenna Compensator (C101)	Molded Bakelite Knob	7	2150	6105
E122	RF. Band Switch (S101-S106 Inc.)	Same as E121			
E123	Man-AVC-BFO Switch (S109)	Same as E121			
E124	Sensitivity Control(R127)	Same as E121			
E125	A F Gain Control (R132)	Same as E121			
E126	Send-Receive Switch (S110)	Same as E121			
E127	Limiter Switch (S108)	Same as E121			
E128	Beat Osc. Vernier(C136)	Same as E121			
E129	Crystal Switch (S107)	Same as E121			
E130	Crystal Phasing (C119)	Same as E121			

* Spare parts furnished refer to table 3 for quantities

\# Symbol part designation if any

Symbol Desig. #	Function	Description	Mfr.	Mfr. Desig.	Hammarlund Mfg. Co. Dwg. or Part No.
		FUSES			
*F101	A. C. Line Fuse	1.6 Amp. Glass Enclosed	4		6065
		HARDWARE			
H101	Shock Mounting Thumb Screw	Stainless Steel 10-32 Thread (4 used)	9		6272
H102	Cabinet Handle	Fabricated Metal Handle (2 used)	19	X-2818	6032
H103	Shock Absorber	Lord Shock Absorber (4 used)	15	200PH45	6262
H104	Receiver Feet	Rubber Bumper Feet 10-32 Screw (4 used)	2	422-A	6266
H105	Shock Mtg. Bolts	Cap Screw 3/8 x 24 (4 used)	9		6273
H106	Shock Mtg. Nuts	Steel Hex 3/8 x 24 (4 used)	9		6274
H107	Shock Mtg. Lockwasher	Bronze Split 3/8"x1/8"x3/32"(4used)	9		
H107	Meter Clamp Mtg.	Tuning Meter Clamp Ring Brass N.P.	26	D-54108	3926
H108	Transformer Mtg. Nut	Special Mtg. Post 8-32 x 3/4" Brass N. P.	9		6304
		INDICATORS			
*I101	Band Spread Dial Lamp	Bayonet Type .15 amp. 6.3 volt Pilot Lamp	8	47	6036
*I102	Main Dial Lamp	Same as I101			
*I103	Meter Dial Lamp	Same as I101			
I104	Main Dial Indicator	Transparent Celluloid Indicator Assembly	9		SA-650
I105	Band Spread Dial	Same as I104			

* Spare parts furnished refer to table 3 for quantities
\# Symbol part designation if any

Symbol Desig. #	Function	Description	Mfr.	Mfr. Desig.	Hammarlund Mfg. Co. Dwg. or Part No.
		JACKS			
*J101	Phone Jack	Long Frame 2 Circ. Fil. Light'g. Type Jack	16	5	6255
		INDUCTORS			
L101	Antenna Coil .54 - 1.32 Mc.	Bank Wound Litz. Adj. Iron Dust Core	9		SA-752D
L102	Antenna Coil 1.32 - 3.2 Mc.	Bank Wound Litz. Adj. Iron Dust Core	9		SA-752E
L103	Antenna Coil 3.2 - 5.7 Mc.	Spaced Wound	23		6013
L104	Antenna Coil 5.7 - 10.0 Mc.	Spaced Wound	23		6016
L105	Antenna Coil 10.0 - 18.0 Mc.	Spaced Wound	23		6019
L106	Antenna Coil 18.0 - 31.0 Mc.	Spaced Wound	23		6022
L107	R. F. Coil .54 - 1.32 Mc.	Bank Wound Litz Adj. Iron Dust Core	9		SA-753-C
L108	R. F. Coil 1.32 - 3.2 Mc.	Bank Wound Litz Adj. Iron Dust Core	9		SA-753-D
L109	R. F. Coil 3.2 - 5.7 Mc.	Spaced Wound Adj. Iron Dust Core	9		SA-753-E
L110	R. F. Coil 5.7 - 10.0 Mc.	Spaced Wound Adj. Iron Dust Core	9		SA-753-F
L111	R. F. Coil 10.0 - 18.0 Mc.	Spaced Wound Adj. Iron Dust Core	9		SA-753-G
L112	R. F. Coil 18.0 - 31.0 Mc.	Spaced Wound Adj. Iron Dust Core	9		SA-753-H
L113	HF. Osc. Coil .54 -1.32 Mc. Range	Bank Wound Litz Adj. Iron Dust Core	9		SA-754-C
L114	HF. Osc. Coil 1.32 - 3.2 Mc. Range	Bank Wound Litz Adj. Iron Dust Core	9		SA-754-D
L115	HF. Osc. Coil 3.2 - 5.7 Mc. Range	Spaced Wound Adj. Iron Dust Core	9		SA-754-E

* Spare parts furnished refer to table 3 for quantities
\# Symbol part designation if any

Symbol Desig. #	Function	Description	Mfr.	Mfr. Desig.	Hammarlund Mfg. Co. Dwg. or Part No.
		INDUCTORS (Continued)			
L116	HF. Osc. Coil 5.7 - 10.0 Mc. Range	Spaced Wound Adj. Iron Dust Core	9		SA-754-F
L117	HF. Osc. Coil 10.0 - 18.0 Mc. Range	Spaced Wound Adj. Iron Dust Core	9		SA-754-G
L118	HF. Osc. Coil 18.0 - 31.0 Mc. Range	Spaced Wound Adj. Iron Dust Core	9		SA-754-H
*L119	V101 Plate Inductor	R. F. Choke 2 mh 32 ohms DC	9		6181
*L120	V101 Cathode Filter	Same as L119			
*L121	V103 Cathode Filter	Same as L119			
*L122	V104 Cathode Filter	Same as L119			
*L123	V102 Osc. Plate Inductor	R. F. Choke 10. mh 90 ohms DC	9		6244
*L124	Plate Supply Filter	Iron Core Reactor 7.5 h at 110. MA DC 200 ohm	5	7381	6253
*L125	Plate Supply Filter	Same as L124			
L126	V103 Plate Coil	Crystal Filter Plate Coil	23		6291
L127	V104 Grid Coil	Crystal Filter Grid Coil	23		6245
L128	V105 Plate Coil	IF Output Plate Coupling Coil	23		6247
L129	Link Circuit Series Inductor	Series Coupling Coil (part of Z104)	23		6202
L130	V106 Input Coil	Diode Detector Input Coil	23		6248
L131	V107 Beat Osc. Coil	Part of Z106	23		6290
		METERS			
*M101	Tuning and "S" Meter	2" Flush Mtg. Special	3		4903
		NAMEPLATES AND DIALS			
N101	Equipment Nameplate	Integral part of Etched Panel (A101)			

* Spare parts furnished refer to table 3 for quantities
\# Symbol part designation if any

Symbol Desig. #	Function	Description	Mfr.	Mfr. Desig.	Hammarlund Mfg. Co. Dwg. or Part No.
		NAMEPLATES AND DIALS (Continued)			
N102	Receiver Nameplate	Integral part of Etched Panel (A101)			
N103	Acceptance Date Plate	Etched Aluminum	17		6300
N104	Main Tuning Dial	Frequency Imprinted Translucent Celluloid	9		SA-755
N105	Band Spread Tuning Dial	Frequency Imprinted Translucent Celluloid	9		SA-756
N106	Tube Location Diagram Plate	Etched Aluminum	17		6288
N107	License Notice Plate	Etched Aluminum	17		6203
		RESISTORS			
*R101	V101 Grid	1. Megohm ± 20% ½ watt	10	BT½	6167
*R102	V101 Grid Filter	10,000. ohm ± 20% ½ watt	10	BT½	6165
*R103	V101 Screen Filter	2,000. ohm ± 20% ½ watt	10	BT½	6160
*R104	V101 Plate Filter	1,000. ohm ± 10% ½ watt	10	BT½	6279
*R105	V102 Cathode	230. ohm ± 5% ½ watt	10	BW½	6156
*R106	V102 Screen Filter	Same as R 103			
*R107	V102 Osc. Plate Filter	Same as R104			
*R108	V102 Osc. Grid Leak	50,000. ohm ± 10% ½ watt	10	BT½	6075
*R109	V103 Grid Filter	Same as R102			
*R110	V102 Plate Filter	Same as R103			
*R111	V103 Screen Filter	Same as R103			
*R112	V103 Plate Filter	Same as R103			
*R113	V104 Grid Filter	Same as R102			
R114	Crystal Select. Determining	25. ohm ± 10% ½ watt	10	BW½	6155
R115	Crystal Select. Determining	50. ohm ± 10% ½ watt	10	BW½	6170
*R116	Crystal Select. Determining	300. ohm ± 10% ½ watt	10	BT½	6169
*R117	Crystal Select. Determining	Same as R103			

* Spare parts furnished refer to table 3 for quantities
\# Symbol part designation if any

Symbol Desig. #	Function	Description	Mfr.	Mfr. Desig.	Hammarlund Mfg. Co. Dwg. or Part No.
		RESISTORS (Continued)			
*R118	V104 Screen Filter	Same as R103			
*R119	V104 Plate Filter	Same as R103			
*R120	V105 Cathode	Same as R116			
*R121	V105 Screen Filter	50,000. ohm ± 20% 1 watt	10	BT-1	3803
*R122	V105 Plate Filter	Same as R103			
*R123	V106 Det. Filter	Same as R108			
*R124	V106 Det. Diode Load	270,000. ohm ± 10% ½ watt	10	BT½	6280
*R125	Limiter Timing	Same as R101			
*R126	Sensitivity Bleeder	60,000. ohm ± 10% 1 watt	10	BT-1	3804
*R127	Sensitivity Control	5,000. ohm Linear Pot.	10	VC-9688	6250
*R128	V101, V103, V104 Bias Limiting	100. ohm ± 10% ½ watt	10	BW½	4812
*R129	AVC Timing	2 Megohm ± 10% ½ watt	10	BT½	4920
*R130	V106 Det. Diode Load	Same as R124			
*R131	V106 Cathode	820,000. ohm ± 10% ½ watt	10	BT½	6293
*R132	A. F. Gain Control, V108 Grid	250,000. ohm Comp. Pot. (with S111)	10	VC-9257	6249
R133	V107 Grid Leak	50,000. ohm (Part of L131 Assbly.)			
*R134	V107 Plate	3,300. ohm ± 10% ½ watt	10	BT½	6292
*R135	V107 Screen Filter	200,000. ohm ± 10% ½ watt	10	BT½	3812
*R136	V107 + B Filter	Same as R102			
*R137	V108 Cathode	600. ohm ± 10% ½ watt	10	BT½	3807
*R138	V108 Plate	25,000. ohm ± 10% 1 watt	10	BT-1	6209
*R139	V109 Grid	Same as R135			
*R140	V109 Cathode	280. ohm ± 5% 1 watt	10	BW-1	6278
*R141	Non Speaker T102 Load	5,000. ohm ± 5% 5 watt wire wound	25	5K	6270
*R142	V111 Anode	4,000. ohm ± 5% 5 watt wire wound	25	5K	6276
		SWITCHES			
*S101	Antenna	Ceramic Rotary Wafer	20	21912-HC	6217
*S102	R F Ampl. Grid	Ceramic Rotary Wafer	20	22900-HC	6220

* Spare parts furnished refer to table 3 for quantities
\# Symbol part designation if any

Symbol Desig. #	Function	Description	Mfr.	Mfr. Desig.	Hammarlund Mfg. Co. Dwg. or Part No.
		SWITCHES (Continued)			
*S103	R F Ampl. Plate	Ceramic Rotary Wafer	20	21913-HC	6218
*S104	HF Osc. Grid	Same As S103			
*S105	1st. Det. Grid	Ceramic Rotary Wafer	20	21914-HC	6219
*S106	HF Osc. Plate	Same as S105			
S107	Crystal Selectivity	Bakelite Rotary Wafer	20	22481-QH	6119
*S108	Limiter	Bakelite Rotary Wafer	20	22480-23	6241
*S109	MAN-AVC-CW	Bakelite Rotary Wafer	20	22482-53	6216
*S110	Send-Receive	Bakelite Rotary Wafer	20	22765-23	6098
S111	On-Off Power	Combined with R132			
		TRANSFORMERS			
*T101	Power Transformer	50-60 Cycle 1 Phase 90 VA PR1-1-2 380. ohms 117V Sec. 3-5, 580 V 4 Ct. .110 A DC 210 ohms total Sec. 8-9 5 V 4 Amp - 1 ohm Sec. 6-7 6.3V 3. Amp. 1 ohm	5	7382	6252
*T102	A. F. Output Transformer	PR1. 1-2 .380.ohms 2 5000 ohms PR1 Sec turn Ratio 1-1.07 Sec. 3-4, 2 5000. ohm PR1 - Sec. turn Ratio 1-1.0246 Sec. 5-6 Ct. Ground Z 3. ohm 3-4, 600Ω ohms DC 5-6 15.ohms DC	5	7383	6251
		VACUUM TUBES			
*V101	R. F. Amplifier	R. F. Pentode	21	6SK7	
*V102	H. F. Osc. 1st. Det.	Triode-Hexode Converter	21	6K8	
*V103	1st. IF Amplifier	Same as V101			

* Spare parts furnished refer to table 3 for quantities
\# Symbol part designation if any

Symbol Desig. #	Function	Description	Mfr.	Mfr. Desig.	Hammarlund Mfg. Co. Dwg. or Part No.
		VACUUM (Continued)			
*V104	2nd. IF. Amplifier	Same As V101			
*V105	3rd. IF. Amplifier	Same as V101			
*V106	2nd. Det. AVC Limiter	Twin Diode	21	6H6	
*V107	CW Beat OSC.	RF Pentode	21	6SJ7	
*V108	1st. A. F. Amplifier	Amplifier Triode	21	6C5	
*V109	A. F. Power Amplifier	Beam Power Amplifier	21	6V6	
*V110	Rectifier	Full Wave Rect.	21	5U4G	
*V111	Voltage Regulator	Voltage Regulator	21	VR-105	
		WIRE			
W101	Power Cord (with plug)	7½ ft. Twin Rubber (with plug)	27		6143
W102	Dial and Meter Lamp Wiring	Dial and Meter Lamp Wiring Assembly	9		SA-771
		TUBE SOCKETS			
*X101	Socket for V101	8 Prong Ceramic	1	RSS8M	6265
*X102	Socket for V102	Same as X101			
*X103	Socket for V103	Same as X101			
*X104	Socket for V104	Same as X101			
*X105	Socket for V105	Same as X101			
*X106	Socket for V106	Same as X101			
*X107	Socket for V107	Same as X101			
*X108	Socket for V108	Same as X101			
*X109	Socket for V109	Same as X101			
*X110	Socket for V110	Same as X101			
*X111	Socket for V111	Same as X101			

* Spare parts furnished refer to table 3 for quantities
\# Symbol part designation if any

Symbol Desig. #	Function	Description	Mfr.	Mfr. Desig.	Hammarlund Mfg. Co. Dwg. or Part No.
		CRYSTAL			
Y101	Resonator	Quartz Crystal 455. KC.	22		6182
		I F TRANSFORMERS-FILTERS ETC.			
*Z101	V102 to V103 Coupling	IF Transformer Assembly	23		6289
*Z102	V103 to V104 Coupling Crystal Filter	Crystal Filter Assembly	9		SA-768
*Z103	V104 to V105 Coupling	Same as Z101			
*Z104	V105 Plate to Link Coupling	IF Transformer Assembly	9		SA-766
*Z105	V106 Link to Diode Coupling	IF Transformer Assembly	9		SA-767
Z106	C. W. Osc. Tuning	CW Osc. Tuning Assembly (with S109)	9		SA-757

* Spare parts furnished refer to table 3 for quantities
\# Symbol part designation if any

TABLE II

LIST OF MANUFACTURERS

Code No.	Name	Address
1	American Phenolic Corp.	Chicago, Ill.
2	Atlantic India Rubber Co.	Chicago, Ill.
3	Beede Elect. Inst. Co.	Penacook, N. H.
4	Bussmann Mfg. Co.	New York, N. Y.
5	Chicago Transformer Corp.	Chicago, Ill.
6	Cornell-Dubilier Elect. Corp.	South Plainfield, N. J.
7	Harry Davies Co.	Chicago, Ill.
8	General Elect. Co. (Mazda)	Cleveland, Ohio
9	Hammarlund Mfg. Co., Inc.	New York, N. Y.
10	International Resistance Co.	Philadelphia, Pa.
11	Jensen Radio Mfg. Co.	Chicago, Ill.
12	Howard B. Jones	Chicago, Ill.
13	Karp Metal Products Co.	Brooklyn, N. Y.
14	Kurz Kasch Co.	Dayton, Ohio
15	Lord Mfg. Co.	Erie, Pa.
16	P. R. Mallory & Co., Inc.	Indianapolis, Ind.
17	Metal Etching Corp.	Brooklyn, N. Y.
18	National Co., Inc.	Malden, Mass.
19	National Lock Co.	Rockford, Ill.
20	Oak Mfg. Co.	Chicago, Ill.
21	R. C. A. Mfg. Co.	Harrison, N. J.
22	R. C. A. Mfg. Co.	Camden, N. J.
23	F. W. Sickles	Springfield, Mass.
24	Erie Resistor Corp.	Erie, Pa.
25	Sprague Specialties Co.	North Adams, Mass.
26	Weston Elect. Inst. Corp.	Newark, N. J.
27	Belden Mfg. Co.	Chicago, Ill.

TABLE III
SPARE PARTS
(per each receiver)

Quantity	Hammarlund Part No.	All Symbol Designations Involved	Description
1	SA-768	Z102	Crystal Filter Assembly (including quartz crystal)
1	3803	R121	50,000 ohm 1 watt resistor
1	3804	R126	60,000 ohm 1 watt resistor
1	3807	R137	600 ohm ½ watt resistor
1	3812	R135, 139	200,000 ½ ½ watt resistor
1	4812	R128	100 ½ ½ watt resistor
5	4886	C105, 112, 113, 121, 130, 131, 133, 138, 139	.01 mfd. molded mica fixed capacitor
3	4891	C106, 107, 114, 122, 123, 132	3 x .05 paper fixed capacitor
1	4903	M101	Tuning meter
1	4920	R129	2,000,000 ohm ½ watt resistor
3	6036	I101, 102, 103	Dial lamps
6	6055	C140, 141, 142, 145, 146, 149, 150, 151, 152, 153, 154, 155, 156	4 - 30 mmf. mica trimmer
1	6061	C109	673 mmf. molded mica fixed capacitor
2	6065	F101	1½ Amp. fuse
2	6073	C103, 104, 137	600 mmf. molded mica fixed capacitor

Quantity	Hammarlund Part No.	All Symbol Designations Involved	Description
1	6075	R108, 123	50,000 ohm ½ watt resistor
1	6098	S110	"Send-Receive" switch
1	6151	C128	5½ mmf. molded mica fixed capacitor
1	6156	R105	230 ohm ½ watt resistor
5	6160	R103, 106, 110, 111, 112, 117, 118, 119, 122	2,000 ohm ½ watt resistor
2	6165	R102, 109, 113, 136	10,000 ohm ½ watt resistor
1	6167	R101, 125	1,000,000 ohm ½ watt resistor
1	6169	R116, 120	300 ohm ½ watt resistor
2	6172	C116, 117	100 mmf. molded mica fixed capacitor
1	6181	L119, 120, 121, 122	R. F. chokes
1	6189	C118	1.5 - 5 mmf. mica trimmer
1	6209	R138	25,000 ohm 1 watt resistor
1	6216	S109	MAN-AVC-BFO Switch
1	6217	S101	Switch wafer
1	6218	S103, 104	Switch wafer
1	6219	S105, 106	Switch wafer
1	6220	S102	Switch wafer
1	6235	C144	1,500 mmf. molded mica fixed capacitor

Quantity	Hammarlund Part No.	All Symbol Designations Involved	Description
1	6241	S108	Limiter switch
1	6244	L123	RF choke (10 mh)
1	6249	R132	A.F. gain control 250,000 ohms
1	6250	R127	Sensitivity control 5,000 ohms
2	6254	C157, 158, 159, 160, 161	4 mfd. paper fixed capacitor
1	6255	J101	phone jack
2	6265	X101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111	Ceramic tube sockets
1	6270	R141	5,000 ohm 5 watt resistor
1	6275	C156	2 x .1 paper fixed capacitor
1	6276	R142	4,000 ohm 5 watt resistor
1	6278	R140	280 ohm 1 watt resistor
1	6279	R104, 107	1,000 ohm ½ watt resistor
1	6280	R124, 130	270,000 ohm ½ watt resistor
1	6292	R134	3,300 ohm ½ watt resistor
1	6293	R131	820,000 ohm ½ watt resistor
1	6295	C148	375 mmf. molded mica fixed capacitor
1	6296	C147	988 mmf. molded mica fixed capacitor

Quantity	Hammarlund Part No.	All Symbol Designations Involved	Description
1		V110	5U4G
1		V109	6V6
1		V106	6H6
1		V107	6SJ7
1		V108	6C5
4		V101, 103, 104, 105	6SK7
1		V102	6K8
1		V111	VR-105-30
	(per each ten receivers)		
1	SA-766	Z104	I.F. Transformer assembly
1	SA-767	Z105	I.F. Transformer assembly
1	6251	T102	A.F. Output transformer
1	6252	T101	Power transformer
1	6253	L124, 125	Filter reactor
2	6289	Z101, 103	I.F. Transformer assembly
1	6303	T201	Speaker coupling transformer

TABLE I CONTINUED

Parts List by Symbol Designation for Model RBG Radio Receiving Equipment
Section 2
CHC-49154 Loud Speaker Unit (201-299)

Symbol Desig. #	Function	Description	Mfr.	Mfr. Desig.	Hammarlund Mfg. Co. Dwg. or Part No.
		STRUCTURAL PARTS			
A201	Speaker Cabinet	Fabricated Steel Black finish	9		6259
N201	Speaker Nameplate	Etched Aluminum	17		6294
*T201	Speaker Coupling Transformer	5,000. ohms to Voice Coil matching Trans. (with Shielded Cable)	11		6303
LS201	Loud Speaker	Perm. Mag. Dynamic	11		6260

* Spare parts furnished refer to table 3 for quantities
\# Symbol part designation if any