



GENERAL DESCRIPTION

This model is a HI-FIDELITY two band ten tube (plus 2 rectifiers) AM and FM receiver with a three speed automatic record changer together with a pre-amp system. The I-F stages use high gain miniature type tubes. Built-in Air Wave Antennas are provided for the FM and broadcast bands. Features include compensator circuits to prevent oscillator drift, push-pull pentode power output stage, automatic volume control, a coaxial two-way 12" P.M. dynamic loud speaker and provisions for use of external AM and FM antennas if desired.

ELECTRICAL SPECIFICATIONS

Power Supply..... 105-125 volts AC 60 cycles, 95 watts, 120 watts with record changer.

Frequency Ranges and Band Width..... AM-535-1620 KC-8½ KC
FM-88-108 MC-200 KC

Intermediate Frequency. AM-455 KC
FM-10.7 MC

Selectivity..... AM--43 KC Broad at 1000 times signal, measured at 1000 KC
I.F. FM-200 KC broad at 2 times down
I.F. FM-800 KC broad at 200 times down

ELECTRICAL SPECIFICATIONS (Cont.)

Sensitivity.....AM-5 microvolts (average)
100 milliwatts output
FM-20 microvolts (average)
30 db quieting

Amplifier Frequency Response..... 20 to 20,000 CPS

Power Output..... 12.5 watts maximum
12 watts 10% distortion

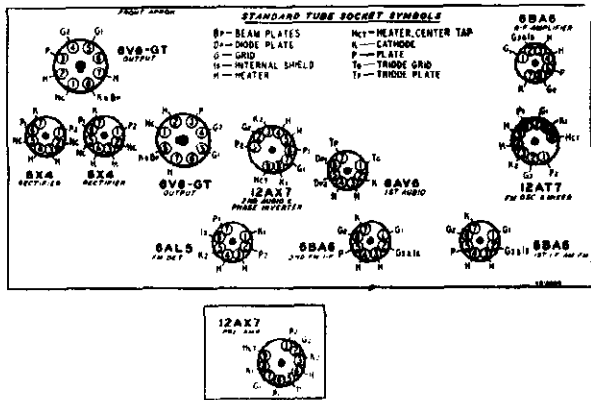
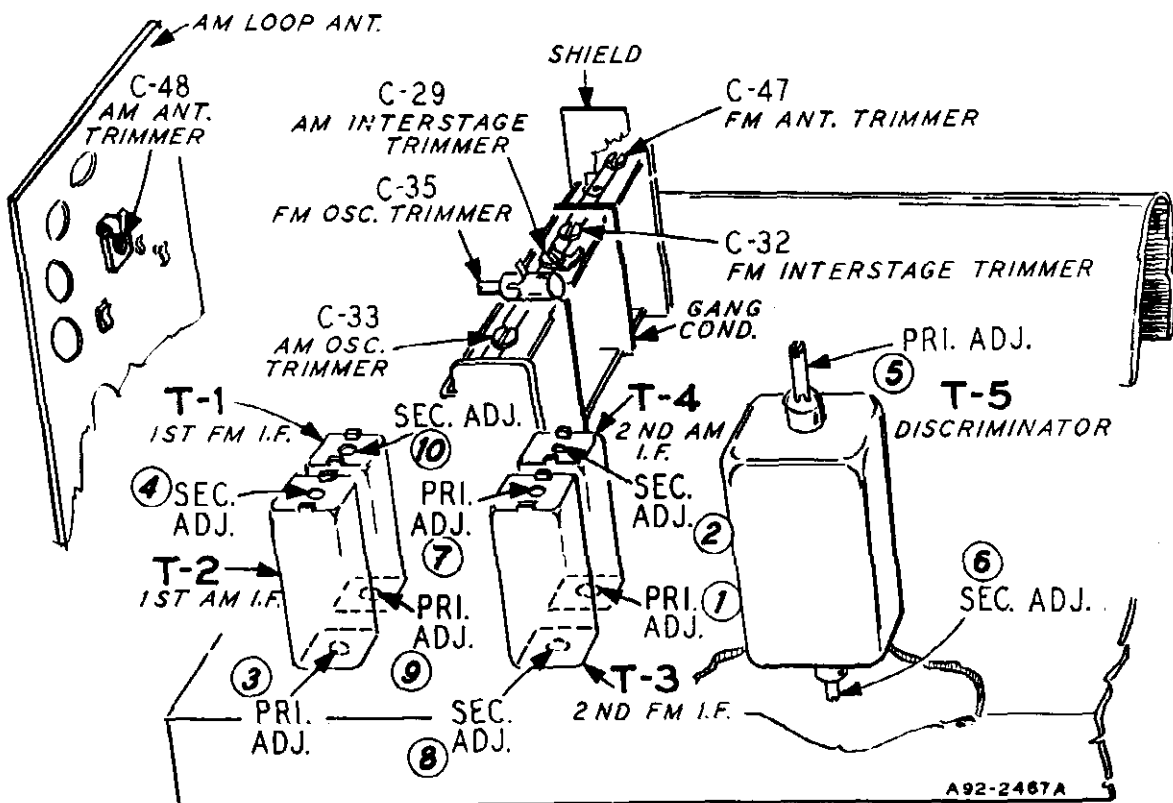
Loud Speaker..... The single unit coaxial, dual cc Electro-Voice SP-12-B 12-inch range speaker, with 16-oz. A co-V Magnet, gives smooth response (30 through 13,000 cycles). The 5 cu. ft. tone chamber is specially designed for optimum speaker performance. Other features are a 2-inch aluminum voice coil and a wide dispersion high frequency radiator cone. The voice coil impedance is 8-ohms 40 cycles.

Record Changer..... One of the newest and best high fidelity units available, the 935 High Fidelity record changer uses a resonance-free die cast aluminum tone arm. The cartridge is a GE RPX-050 (60H30) variable reluctance plug-in type with PRJ-010 (61H28) twin sappt needles. A 4-pole, 4-coil magnetic and weighted, balanced turntable eliminate hum and turntable rumble and insure constant speed. The muting switch will insure quiet operation during change cycles.

Tube and Dial Lamp Complement

- 1 6BA6 AM-FM R-F Amplifier
- 1 12AT7 FM Osc. & Mixer
- 1 6BA6 FM-AM 1st I-F Amplifier
- 1 6BA6 FM 2nd I-F Amplifier
- 1 6AL5 FM Detector
- 1 6AV6 Audio Amplifier, AM : Detector and AVC
- 2 6V6-GT Audio Output
- 2 6X4 Rectifiers
- 1 12AX7 2nd Audio & Phase Inverter
- 1 12AX7 Pre-Amplifier
- 2 No. 47 Dial Lamps
- 3 No. 51 Indicator Lamps

PAGE 23-2 WELLS-GARDNER
MODEL WG-30A8-A-496



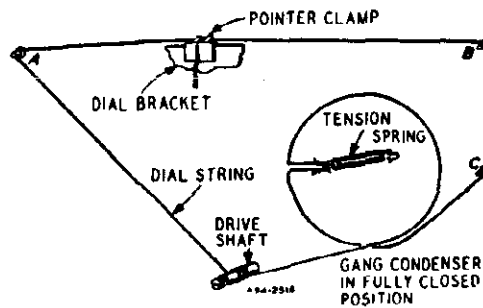
DRIVE CORD REPLACEMENT

Use a new 10X68 drive cord assembly or a new length of cord 46 inches long for the installation, winding three turns clockwise around the drive shaft with the turns progressing away from the chassis. After completing the installation, rotate the drive shaft a few turns to take up the slack in the cord.

TUBE SOCKET VOLTAGES

Socket voltages are shown on the Schematic diagram at the tube socket terminals. All voltages are between the socket terminal and chassis ground. Plate, screen and cathode voltages were taken with a 1000 ohm-per-volt meter with a 300 volt scale used for plate and screen voltages. Audio grid voltages were read with a vacuum tube volt-meter. Conditions of measurement are:

Line voltage 117 Volts AC
Signal Input None
A variation of ±10% is usually permissible.



ALIGNMENT PROCEDURE AM STAGES

MODEL WG-30A8-A-4

The following is required for aligning:
 An All Wave Signal Generator Which Will Provide an Accurately Calibrated Signal at the Test Frequencies as Listed.
 Output Indicating Meter, Non-Metallic Screwdriver, Dummy Antennas
 —.1 mf, 200 mmf.

Volume Control—Maximum all Adjustments
 Connect Radio Chassis to Ground Post of Signal Generator with Short Heavy Lead.
 Allow Chassis and Signal Generator to "Heat Up" for Seven Minutes.

SIGNAL GENERATOR		CONNECT GENERATOR OUTPUT TO	THROUGH DUMMY ANTENNA	BAND SWITCH SETTING	GANG CONDENSER SETTING	ADJUST	ADJUST FOI
	FREQUENCY SETTING						
I-F	455 kc	12A7 Pin 7 and Chassis	.1 mf	Broadcast	Rotor Fully Open	2nd I-F Pri. & Sec. ① & ② 1st I-F Pri. & Sec. ③ & ④	Maxim Outp
Broadcast	1620 kc	External ant. term.	200 mmf	Broadcast	Rotor Fully Open	Broadcast Oscillator C-33 Broadcast Interstage C-29	
	1400 kc	External ant. term.	200 mmf	Broadcast	Turn Rotor to Max. Output Set pointer to 1400 kc See Note A		
	1400 kc	External ant. term.	200 mmf	Broadcast		Loop Antenna C-48	

Note A—If the pointer is not at 1400 KC on dial, reset pointer at the 1400 KC mark on the dial scale.

FM STAGES

The following equipment is required for aligning:
 An accurately calibrated signal generator providing unmodulated signals at the test frequencies listed below.
 Non-metallic screwdriver.
 Dummy Antennas and I-F Loading Resistor—.01 mf, 300 ohms and 1000 ohms.

Zero center scale DC vacuum tube voltmeter having a range approximately 3 volts.
 (If a zero center scale meter is not available, a standard vacuum tube voltmeter may be used by reversing the meter connections for negative readings.)
 Allow chassis and signal generator to warm up for several minutes.

SIGNAL GENERATOR		CONNECT GENERATOR OUTPUT TO	THROUGH DUMMY ANTENNA	BAND SWITCH SETTING	GANG CONDENSER SETTING	ADJUST	ADJUST FOI
	FREQUENCY SETTING						
Discriminator	10.7 MC Note B	6BA6 2nd I-F Pin 1 and Chassis	.01 mf	FM	Rotor Fully Open	Disc. Pri. ⑤ Note A	Maxim Deflec
	10.7 MC Note B	6BA6 2nd I-F Pin 1 and Chassis	.01 mf	FM	Rotor Fully Open	Disc. Sec. ⑥ Note C	Zero Cent
I-F	10.7 MC Note F	6BA6 1st I-F Pin 1 and Chassis	.01 mf	FM	Rotor Fully Open	2nd I-F Pri. Note A and D ⑦ 2nd I-F Sec. Note A and E ⑧	Maxim Deflec
Discriminator	10.7 MC Note F	6BA6 1st I-F Pin 1 and Chassis	.01 mf	FM	Rotor Fully Open	Disc. Pri. ⑤ Note A	Maxim Deflec
	10.7 MC Note F	6BA6 1st I-F Pin 1 and Chassis	.01 mf	FM	Rotor Fully Open	Disc. Sec. ⑥ Note C	Zero Cent
	10.7 MC Note F	FM-RF Gang Condenser terminal	.01 mf	FM	Rotor Fully Open	1st I-F Pri. ⑨ 1st I-F Sec. ⑩ Notes A, D & E	Maxim Deflec

Recheck I-F Adjustments in order given

R-F & Osc.	108.4 Note H	Disconnect dipole and connect generator to dipole terminals with resistor in series	300 ohms	FM	Rotor Fully Open	Oscillator C-35 Note G	Maxim Deflec
	104.5	Disconnect dipole and connect generator to dipole terminals with resistor in series	300 ohms	FM	Tune Rotor for Max. AVC voltage	FM Interstage C-32	Maxim Deflec
	104.5	Disconnect dipole and connect generator to dipole terminals with resistor in series	300 ohms	FM	Tune Rotor for Max. AVC voltage	Ant. C-47	Maxim Deflec

Recheck R-F and Osc. Adjustments in order given

NOTE A—Test Equipment connections are as given in the table. The zero center scale DC vacuum tube voltmeter is to be connected between chassis ground and the AVC line at the junction of resistor R-22 and condenser C-18 for all adjustments except the discriminator secondary adjustment, for which See Note C.

NOTE B—A signal of .1 volt must be fed into the receiver for this adjustment.

NOTE C—Disconnect zero center DC vacuum tube voltmeter from AVC and connect to junction of R-18 and C-62. Adjust for zero voltage indication.

NOTE D—Before adjusting Pri. core connect 1000 ohm load resistor across the 2nd I-F. secondary terminals. Input may have to be increased to .1 volt if receiver is badly mis-aligned.

NOTE E—Disconnect 1000 ohm load resistor from secondary terminals and connect across the 2nd I-F. primary terminals. Input may have to be increased to .1 volt if receiver is badly mis-aligned.

NOTE F—Input can be reduced to 10,000 microvolts.

NOTE G—Oscillator frequency above signal frequency.

NOTE H—Remove the 1000 ohm load resistor before attempting check the R-F and oscillator adjustments.

PARTS LIST

Use only genuine factory tested parts (for the part numbers listed) to insure service jobs you can depend on and to original set performance.

Use universal parts where no part numbers or prices are listed.

IMPORTANT — All prices in this literature are subject to change without notice and are subject to an additional charge cover any applicable sales tax, use, occupation, or other tax affecting our purchase or sale of merchandise.

Ref. No.	Part No.	Description	List Price
CAPACITORS			
C-1A C-1B C-1C C-1D C-1E C-1F	14A207	Gang Condenser Assembly	\$7.00
C-2 C-3 C-7 C-9 C-13 C-16 C-18 C-19 C-27 C-42	47X507	5000 mmf Ceramic	.30
C-4	47X497	100 mmf Ceramic	.25
C-5	47X499	47 mmf Ceramic	.30
C-8	47X498	47 mmf Ceramic	.25
C-10 C-65	Part of T-1		
C-11 C-28	47X550	100 mmf Ceramic	.25
C-15	Part of T-3		
C-21	Part of T-5		
C-22 C-24 C-31 C-51	47X501	68 mmf Ceramic	.25
C-23	45X361	5 mf 100 V Dry Electrolytic	1.00
C-25 C-26 C-45	47X496	500 mmf Ceramic	.25
C-29 C-32 C-33 C-47	Part of Gang Condenser		
C-30	47X552	15 mmf Ceramic	.25
C-34	47X516	20 mmf Ceramic	.25
C-35	26A489	1-8 mmf Trimmer	.50
C-36 C-64	47X549	5 mmf Ceramic	.35
C-37 C-73	RCP10W6403M	.04 mf 600 V Tubular	.30
C-38 C-39	Part of T-2		
C-40 C-52 C-60	RCP10W2503M	.05 mf 200 V Tubular	.20
C-41 C-43	Part of T-4		
C-44A C-44B	47X112	50-50 mmf Dual Mica	.20
C-48	Part of T-7		
C-50A C-50B C-50C	45X403	40 mf 400 V Dry Electrolytic	4.75

Ref. No.	Part No.	Description	List Price
Capacitors—Cont.			
C-53	47X468	220 mmf Ceramic	
C-54 C-70	RCP10W6203M	.02 mf 600 V Tubular	
C-55 C-71	RCP10M10222M	.0022 mf 1000 V Tubular	
C-56 C-63 C-72	RCP10W2203M	.02 mf 200 V Tubular	
C-57	45X404	1000 mf 10 V Dry Electrolytic	
C-58	RCP10W4503M	.05 mf 400 V Tubular	
C-59	45X405	20 mf 250 V Dry Electrolytic	
C-62	47X575	2700 mmf Ceramic	
C-66 C-68	RCP10W6202M	.002 mf 600 V Tubular	
C-67	47X624	330 mmf Ceramic	
C-69	RCP10W2502M	.005 mf 200 V Tubular	
RESISTORS			
		Ohms	Watts
R-1 R-22 R-49	B85105	1.0 meg.	0.5 Carbon
R-2 R-12 R-15	B84680	68	0.5 Carbon
R-3 R-11 R-16	C84823	82 K	1.0 Carbon
R-4 R-42	B84103	10 K	0.5 Carbon
R-5	B85104	100 K	0.5 Carbon
R-6	B84102	1 K	0.5 Carbon
R-7 R-13 R-17	C84103	10 K	1.0 Carbon
R-8	B84682	6.8 K	0.5 Carbon
R-9	B85225	2.2 meg.	0.5 Carbon
R-10	B83335	3.3 meg.	0.5 Carbon
R-14	B85473	47 K	0.5 Carbon
R-18	B84273	27 K	0.5 Carbon
R-19	43X233	3.6	0.5 Wirewound
R-20 R-21	B83682	6.8 K	0.5 Carbon
R-24	C84333	33 K	1.0 Carbon
R-25	36X390	0.5 meg.	Volume Control
R-26	B85153	15 K	0.5 Carbon
R-27	B84123	12 K	0.5 Carbon
R-28	B85106	10.0 meg.	0.5 Carbon
R-29	B84681	680	0.5 Carbon
R-30	43X283	200	4.0 Wirewound

MODEL WG-30A8-A-496

PARTS LIST (continued)

Ref. No.	Part No.	Description	List Price
RESISTORS—Cont.			
		Ohms Watts	
R-31 } R-35 } R-47 } R-54 }	884224	220 K 0.5 Carbon	.15
R-32 } R-55 } R-57 }	884683	68 K 0.5 Carbon	.15
R-33	884473	47 K 0.5 Carbon	.15
R-34	885474	470 K 0.5 Carbon	.10
R-36	D84682	6.8 K 2.0 Carbon	.30
R-37	884562	5.6 K 0.5 Carbon	.15
R-38	884154	150 K 0.5 Carbon	.15
R-39	884221	220 0.5 Carbon	.15
R-40	884153	15 K 0.5 Carbon	.15
R-41 } R-43 }	884124	120 K 0.5 Carbon	.15
R-44 } R-50 }	884471	470 0.5 Carbon	.15
R-45	883752	7.5 K 0.5 Carbon	.20
R-46 } R-48 } R-58 }	884104	100 K 0.5 Carbon	.15
R-51	884274	270 K 0.5 Carbon	.15
R-52	884222	2.2 K 0.5 Carbon	.15
R-53A } R-53B }	78X16	0.25 meg. Treble 1.0 meg. Bass Dual Tone Control	1.90
R-59 } R-60 }	C84820	82 1.0 Carbon	.20
TRANSFORMERS AND COILS			
L-2	9A2025	Interstage Coil (AM)	2.20
L-3	9A2024	Interstage Coil (FM)	.10
L-4	9A2022	Oscillator Coil (AM)	.15
L-5	35A5	Osc. Cathode Choke	.25
L-6	9A1881	Filament Choke	.80
L-7	9A2023	Oscillator Coil (FM)	.15
L-8	35A7	Mixer Plate Choke	.30
L-9	9A2027	Antenna Coil (FM)	1.05
L-10	52X93	Filter Choke	2.25
T-1	9A2043	1st I-F Trans. (FM)	2.15
T-2	9A2029	1st I-F Trans. (AM)	2.00
T-3	9A2030	2nd I-F Trans. (FM)	1.85
T-4	9A2042	2nd I-F Trans. (AM)	1.45
T-5	9A2064	Discriminator Coil	2.95
T-6	9A2004	Di-Pole Antenna	.95
T-7	9A2312	"B" Range Loop Antenna	2.50
T-8	33X335	Power Transformer	10.80
T-9	51X163	Output Transformer	5.50

Ref. No.	Part No.	Description	List Price
DIAL AND DRIVE ASSEMBLY			
	58X775	Dial Glass	1.40
	58X777	Glass Control Panel	4.90
	25X1650	Dial Bracket	1.40
	41X88	Dial Light Reflector	.15
	15X280	Painter	.25
	10X68	Drive Cord Assembly	.20
	28X113	Drive Cord Tension Spring	.05
	7A199	Pilot Light Socket Assembly	.45
	7A103	No. 47 Pilot Light Bulb	.25
	19X192	"C" Washer (Mtg. Drive Shaft)	.05
	26X531	Drive Shaft	.90
	6X67	Rubber Grommet	.05
MISCELLANEOUS			
	12A514	12" PM Speaker	56.00
	3A462	Tube Socket (Miniature)	.30
	3A436	Tube Socket (12AT7) (Miniature)	.80
	3A426	Tube Socket (Miniature)	.20
	3A430	Pre-Amp Socket	.15
	3A458	Tube Socket (Miniature)	.20
	3A460	Tube Socket	1.05
	3A474	Tube Socket	.15
	66X10	Selenium Rectifier	2.30
	3A305	Phono Socket (Single Pin Tip)	.10
	4A405	Antenna Terminal Strip	.10
	2A433	Band Switch	4.20
	7A252	Pilot Light Socket Assembly (Phono Ind.)	.20
	7A253	Pilot Light Socket Assembly (Radio Ind.)	.25
	7A233	Pilot Light Assembly } Cabinet	.65
	7A230	Jewel (Red) } Base	.25
	7A32	No. 51 Pilot Light Bulb (7A253—7A252—7A233)	1.15
	13X839-2	Line Cord & Plug Assembly	.65
	32X403	Tube Shield	.10
	32X404	Tube Shield	.25
	10A825-1	Knob (Volume Control)	1.60
	10A825-2	Knob (Tuning)	1.60
	10A825-3	Knob (Band Indicator)	1.60
	10A823-2	Knob (Tone) Outer	.50
	10A824	Knob (Tone) Inner	.50
	28X568	Spring (10A824 Knob)	.05
	7A243	Phono Light Socket Assembly (Phono Comp.)	.40
	7A244	Phono Light Bulb 10 W.	.50
TYPE V-28A193 RECORD CHANGER PARTS			
	V-6208	Motor Assembly 60 cycles 105-125 Volts A. C.	
	V-6497-BG	Tone Arm (Shell only)	
	V-6320-BG	Cartridge Head	
	GE-RPX-050	Variable Reluctance Cartridge complete with dual stylus assembly	15.60
	GE-RPJ-010	Dual Stylus Assembly	5.50

Instructions for Using Your RADIO-ALARM CLOCK Combination Receiver

Equipped with Appliance Receptacle

This skillfully designed and carefully constructed Wakemaster will give you long and enjoyable service. This Receiver can perform the following services for the user:

1. Provide accurate sweep second time.
2. Receive broadcast programs being transmitted and within range—at any time.
3. Turn off radio or appliance at will of user up to 60-minute interval or less.
5. Turn on radio program for awakening.
6. Turn on either or both radio program for awakening and electrical appliance connected to appliance receptacle.
7. Turn on appliance at present time with radio off.
8. Turn buzzer alarm on 10 minutes after radio starts playing.
9. Turn on buzzer alarm for awakening with radio and appliance turned off.

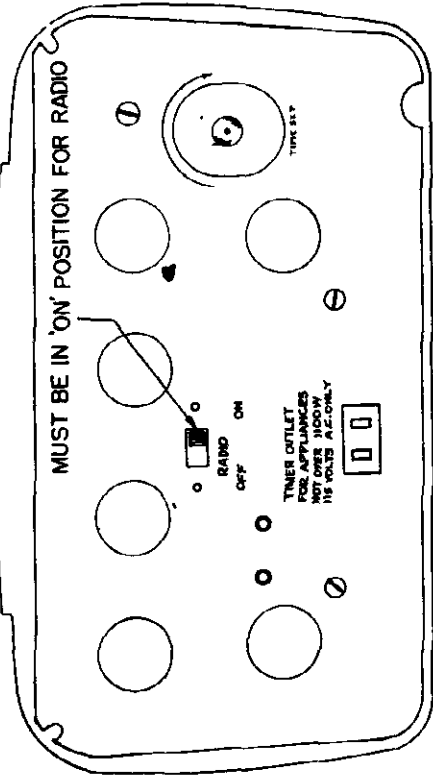
INSTALLATION—Check the voltage and cycles of the electric power supplied to your home. This combination will operate **ONLY** on 60 cycle alternating current (a-c), from 105 to 125 volts. **THIS SET WILL NOT OPERATE ON ANY OTHER TYPE OF CURRENT OR CYCLES.** Your electric company will help you make certain that you have the correct kind of power.

This combination includes a sensitive five multi-purpose tube super-heterodyne radio including a rectifier tube. Your radio has a self contained duro-loop antenna capable of supplying sufficient volume in areas of normal reception. If you live in an area where radio reception is poor, you can improve the performance by connecting an outside antenna to the screw marked EXT. ANT. which you will find on the right hand side of the rear of the cabinet.

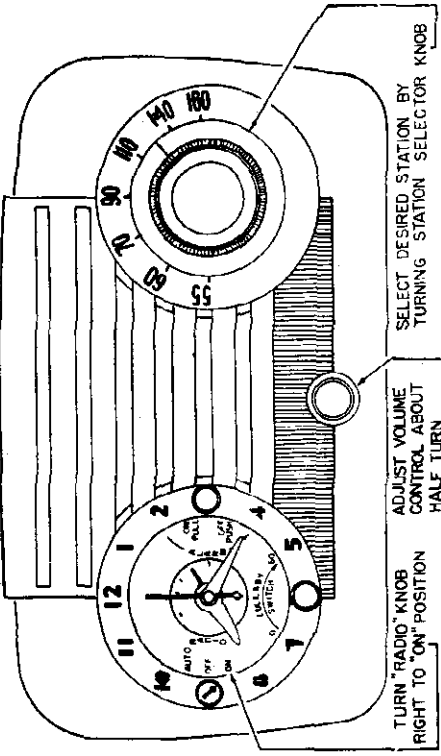
1. TO SET THE CLOCK

Your self-starting TELECHRON movement will begin operating when the set is plugged into the proper outlet and your sweep second hand begins to rotate. Set the correct time by means of the small knob at the right REAR of the cabinet. Turn **ONLY** in the direction shown on the back cover.

2. TO TURN ON RADIO MANUALLY



(Figure 2A)



(Figure 2B)

The appliance timer outlet receptacle, as shown in figure 2A, will operate such appliances as coffee maker, toaster, lamp, attic fan, etc. Their power rating must not exceed 1100 watts. The receptacle is arranged to deliver power controlled by the alarm and sleep control of the clock movement. In an appliance can be operated in a similar manner with controls set as described in Illustrations 2, 3, 4, 6, 7, and paragraphs 8, 9, and 10.

REAR RADIO ON-OFF SWITCH

The radio and appliance can be connected separately. If it is desired...

MODEL D-2015

3.

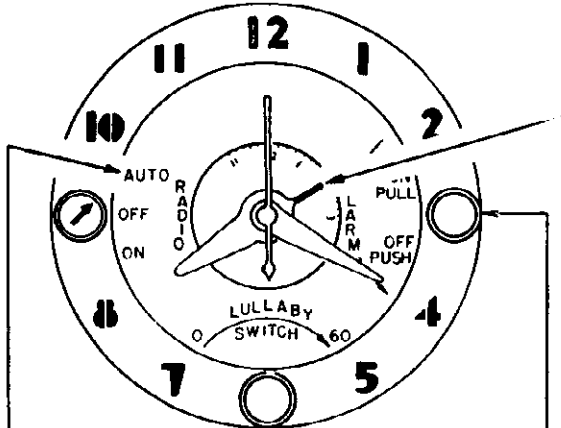
TO TURN OFF RADIO MANUALLY

Turn Lullaby Knob counter-clockwise (to left) to "O" position.

4.

TO AWAKE TO MUSIC

Select station and adjust volume to level sufficient to awaken (as indicated in Illustration 2B)



TURN "RADIO" KNOB LEFT TO "AUTO" POSITION

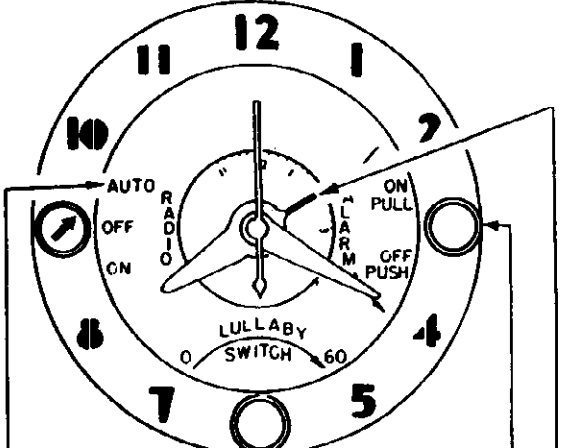
PULL OUT "ALARM" KNOB AND TURN IN COUNTER CLOCKWISE (ARROW) DIRECTION UNTIL POINTER IS OVER HOUR FIGURE AND MINUTE MARKS DESIRED FOR AWAKENING

THIS TIME SETTING MAY BE 11 HOURS IN ADVANCE OR LESS. AFTER HAVING SET AWAKENING HOUR PUSH IN "ALARM" KNOB.

6.

TO AWAKE TO MUSIC AND BUZZER ALARM

Select station and adjust volume to level sufficient to awaken you (as indicated in Illustration 2B)



TURN "RADIO" KNOB LEFT TO "AUTO" POSITION

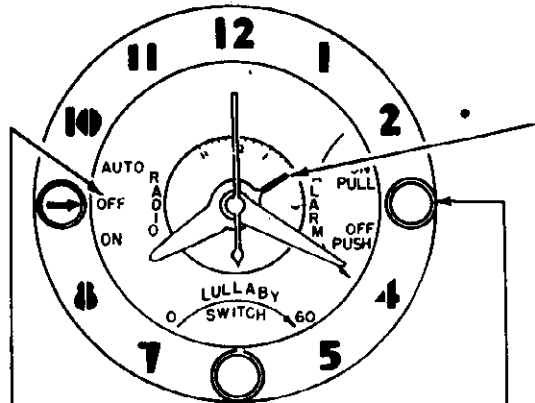
PULL OUT "ALARM" KNOB AND TURN IN COUNTER CLOCKWISE (ARROW) DIRECTION UNTIL POINTER IS OVER HOUR FIGURE AND MINUTE MARKS DESIRED FOR AWAKENING.

THIS TIME SETTING MAY BE 11 HOURS IN ADVANCE OR LESS.

Buzzer sounds as a reminder approximately 10 minutes after radio comes on. To shut off buzzer push in "Alarm" Knob.

5.

TO AWAKE TO BUZZER ALARM



TURN "RADIO" KNOB LEFT TO MID "OFF" POSITION

PULL OUT "ALARM" KNOB AND TURN IN COUNTER CLOCKWISE (ARROW) DIRECTION UNTIL POINTER

IS SET TEN MINUTES AHEAD OF HOUR FIGURE AND MINUTE MARKS DESIRED FOR AWAKENING

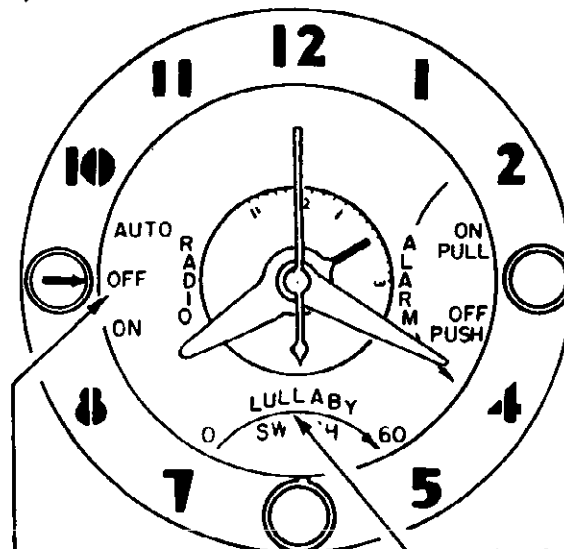
THIS TIME SETTING MAY BE 11 HOURS IN ADVANCE OR LESS.

FOR EXAMPLE -- SHOULD YOU DESIRE TO AWAKEN AT 7, SET ALARM POINTER TO 6:50 TO SHUT OFF BUZZER PUSH IN "ALARM" KNOB

7.

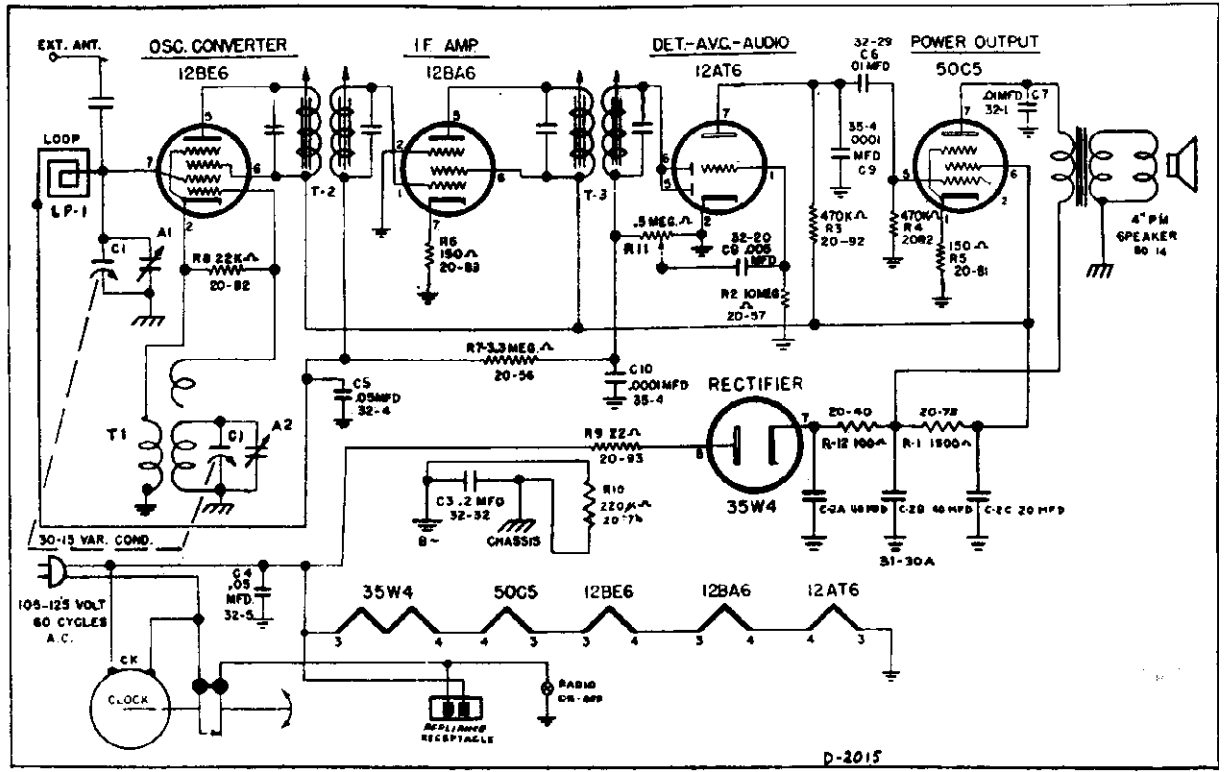
TO TURN RADIO OFF AUTOMATICALLY WHEN RETIRING

This receiver can be adjusted to play for a period of 60 or fewer minutes before retirement if desired by the listener.



TURN "RADIO" KNOB TO MID "OFF" POSITION

TURN LULLABY KNOB CLOCKWISE (TO RIGHT) FOR PLAYING TIME DESIRED. ESTIMATE TIME BETWEEN 0 AND 60 MARKS ALONG ARROW



ALIGNMENT PROCEDURE

- Output meter across voice coil (3.2 ohm)
- Volume control at maximum for all adjustments.
- Align for maximum output. Reduce input as needed to keep output near 1.28 volts (0.5 watt).

SIGNAL GENERATOR				TUNER SETTING	ADJUST TRIMMERS TO MAXIMUM OUTPUT (in order shown)
Frequency	Coupling Capacitor	Connections to Receiver	Ground Connection		
455 kc	0.1 mfd.	12BE6 grid	B—	Rotor full open (Plates out of mesh)	Input and output slugs of IF cans
1650 kc	0.1 mfd.	12BE6 grid	B—	Rotor full open (Plates out of mesh)	Oscillator trimmer A2
1500 kc		Radiating Loop		1500 kc	Antenna trimmer A1

MODEL D-2015

PARTS LIST

When ordering parts, specify part number and model number.

Ref. No.	Part No.	DESCRIPTION	List Price*
CAPACITATORS			
C1	30-15	Variable Condenser, 2 gang	\$2.16
C2	31-30A	40 mfd.—40 mfd.—20 mfd., 150 volt triple electrolytic condenser	1.75
C3	32-32	.2 mfd., 200 volt, paper	.20
C4	32-5	.05 mfd., 400 volt, paper	.20
C5	32-4	.05 mfd., 200 volt, paper	.18
C6	32-1	.01 mfd., 400 volt, paper	.20
C7	32-1	.01 mfd., 400 volt, paper	.20
C8	32-20	.005 mfd., 600 volt, paper	.20
C9	35-4	.0001 mfd., 500 volt, mica	.16
C10	35-4	.0001 mfd., 500 volt, mica	.16

RESISTORS

R1	20-73	1500 ohm, 1 watt 20%	.10
R2	20-57	10 megohm, 1/4 watt 20%	.06
R3	20-92	470,000 ohm, 1/4 watt 20%	.06
R4	20-92	470,000 ohm, 1/4 watt 20%	.06
R5	20-81	150 ohm, 1/2 watt 20%	.06
R6	20-89	150 ohm, 1/4 watt 20%	.06
R7	20-56	3.3 megohm, 1/4 watt 20%	.06
R8	20-82	22,000 ohm, 1/4 watt 20%	.06
R9	20-93	22 ohm, 1/2 watt 20%	.06
R10	20-74	220,000 ohm, 1/4 watt 20%	.06
R11	50-15B	1/2 meg. volume control with switch	.86
R12	20-40	100 ohms, 1/2 watt 20%	.06

COILS AND TRANSFORMERS

O-1	60-9	Oscillator coil	.70
T-2	61-11	Input IF transformer	1.36
T-3	61-11	Output IF transformer	1.36
LP-1	A125-36	Loop antenna	1.36

MISCELLANEOUS

80-14	80-14	4 inch P.M. speaker with output transformer	4.34
	122-19	Selector knob	.26
	122-15	Volume knob	.10
	120-33	Cabinet—walnut	3.34
CK	140-9	Clock	10.96

* Prices subject to change.

8.—To Turn Radio Off Automatically When Retiring and Awaken to Music

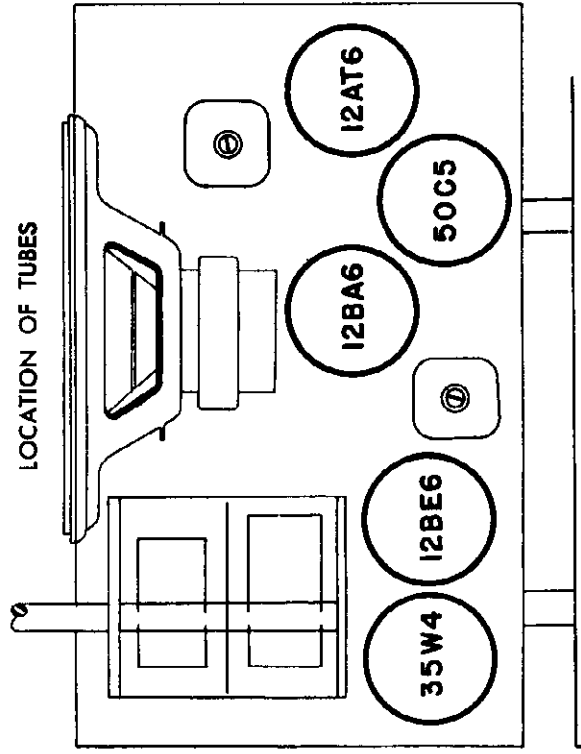
Set "Radio" Control as in Illustration 4.
Set "Lullaby" Knob as in Illustration 7.

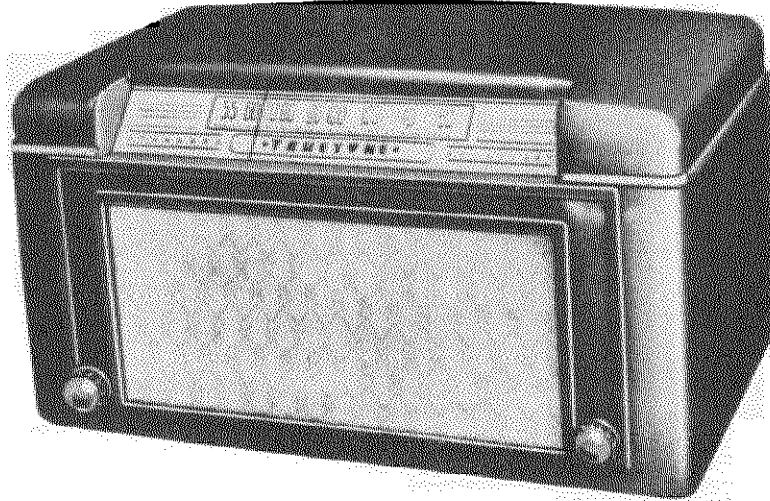
9.—To Turn Radio Off Automatically When Retiring and Awaken to Buzzer Alarm

Set Controls as in Illustration 5.
Set "Lullaby" Knob as in Illustration 7.

10.—To Turn Radio Off Automatically When Retiring, Awaken to Music and Buzzer Alarm

Set "Radio" Control as in Illustration 6.
Set "Lullaby" Knob as in Illustration 7.





SPECIFICATIONS

4 Tube Superheterodyne
 Tuning Frequency Range 540 to 1620 kc.
 Intermediate Frequency 455 kc.

Power Output 0.25 watt maximum,
 milliwatts (10% distort)
 Speaker 5-inch PM Dyna
 Speaker Voice Coil Impedance 3.2 Ω

ALIGNMENT PROCEDURE

IMPORTANT - Check to see that dial pointer indexes on dial scale. See illustration.

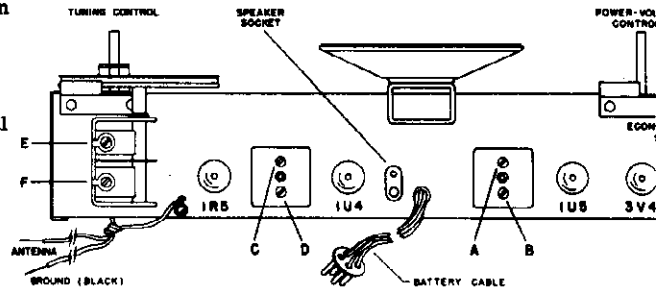
Volume control - Maximum for all adjustments.

Connect dummy antenna in series with high side of signal generator.

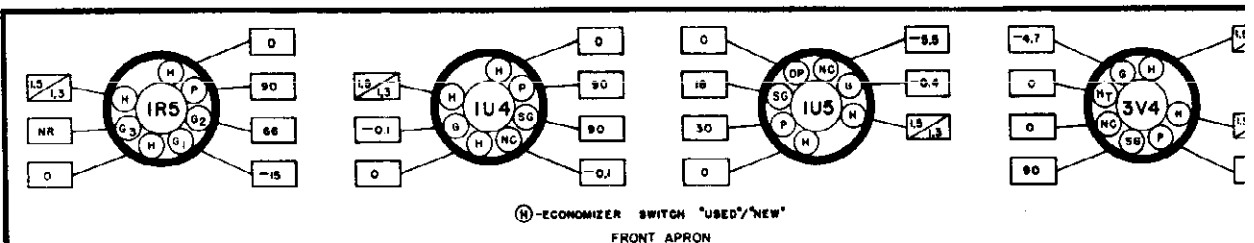
Connect generator ground to chassis.

Connect output meter across voice coil of speaker.

Use lowest output setting of signal generator capable of producing an audio output of approx. 50 milliwatts.



Band	Signal Generator Frequency	Dummy Antenna	Connection To Radio	Receiver Dial Setting	Trimmer Adjustment (In Order Shown)	Trimmer Function	Type of Adjustm
I.F.	455 KC.	.1 MFD.	Stator of rear section of tuning gang.	1000 KC.	A, B - 2nd. I.F.	Output I.F.	Adjust for maximum output
	455 KC.	.1 MFD.	Stator of rear section of tuning gang.	1000 KC.	C, D - 1st. I.F.	Input I.F.	Adjust for maximum output
BROAD-CAST	1500 KC.	.0002 MFD.	Antenna lead (Green)	1500 KC.	E F	Oscillator Mixer	Adjust for maximum output



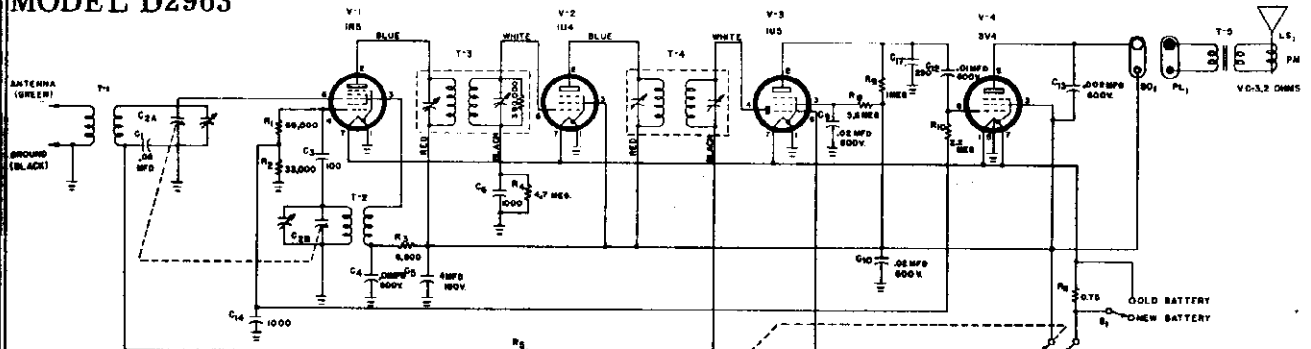
Ⓟ-ECONOMIZER SWITCH "USED"/"NEW"

FRONT APRON

BOTTOM VIEW OF CHASSIS

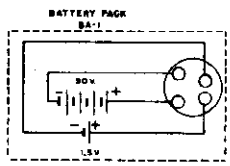
NOTES - VOLTAGE READINGS TAKEN WITH AN ELECTRONIC VOLTMETER.
 *NC - NO CONNECTION (TERMINAL USED AS A TIE LUG)
 *NR - NOT READABLE.

MODEL D2963



POINTER SETTINGS AND DIAL CORD REPLACEMENT

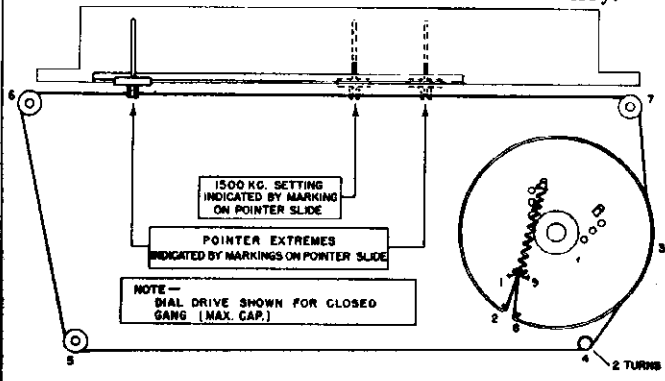
Turn the large drive pulley to close the gang. Use a 60-inch length of 30 lb. test dial cord and follow the stringing procedure outlined. Note that the cord is wound twice around the drive shaft for proper traction. With the tuning condenser at maximum capacity, attach the pointer and index it with the extreme left hand dial marker.



BATTERY SUPPLY

This receiver is designed to operate on a single unit Wizard B6430, Wizard B6432, Ray-O-Vac No. AB-82, Burgess 17G-D60, Eveready 748, Bond 0528 or General 60DL-ILL battery.

IF-455 KC RANGE-540 TO 1620 KC RESISTOR VALUES ARE IN OHMS. CAPACITOR VALUES ARE IN MMF UNLESS OTHERWISE SPECIFIED. LAST CAPACITOR SYMBOL - C₁₄ LAST RESISTOR SYMBOL - R₁₁



ECONOMIZER SWITCH

The battery Economizer Switch is located on the top of the chassis, left side. (See illustration) ALWAYS HAVE THIS ECONOMIZER SWITCH IN THE "NEW" BATTERY POSITION WHEN THE RADIO IS NEW OR AFTER A NEW BATTERY HAS BEEN INSTALLED. When the volume of stations decreases noticeably (After 200 or 300 hours of actual use), this switch should be pushed to the "USED" battery position.

C-8	46AZ602J	.006 mfd. 600 V., tubular	.15
C-9,10	46AY203	.02 mfd. 600 V., tubular	.20
C-13	46AZ202J	.002 mfd. 600 V., tubular	.15

TRANSFORMERS

T-1	51B1084	Transformer, mixer	.85
T-2	51B1085	Transformer, oscillator	1.03
T-3	50B412	Transformer, 1st IF	1.60
T-4	50B413	Transformer, 2nd IF	1.56
T-5		Transformer, output (Part of speaker ass'y.)	

RESISTORS

R-1	RC20AE683K	68,000 ohms 1/2 watt, carbon	.16
R-2	RC20AE333K	33,000 ohms 1/2 watt, carbon	.16
R-3	RC20AE682M	6800 ohms 1/2 watt, carbon	.16
R-4,7	RC20AE475K	4.7 megohms 1/2 watt, carbon	.16
R-5,10	RC20AE225K	2.2 megohms 1/2 watt, carbon	.16
R-6	25B806	1 megohm, volume control	.85
R-8	RC10AE565M	5.6 megohm 1/4 watt, carbon	.16
R-9	RC20AE105K	1 megohm 1/2 watt, carbon	.16
R-11	23A062	.75 ohms 1/2 watt carbon	.16

MISCELLANEOUS

			List Price
LS-1	85C085	Speaker ass'y. (Includes PL-1, T-5)	\$ 5.40
SO-1	6A275-0	Socket, speaker	.10
	6A314	Socket, miniature (tube)	.14
PL-2	87B1555-1	Battery cable ass'y.	.94
	66D500	Cabinet, plastic	10.60
	14B175	Grill cloth	.65

CAPACITORS

C-1	46AU503J	.05 mfd. 200 V., tubular	.19
C-2	48B208	Tuning condenser, 2 section	2.30
C-3	CM20A101M	100 mmf. 500 V., mica	.16
C-4,12	46AY103J	.01 mfd. 600 V., tubular	.15
C-5	45A143	4 mfd. 150 V., electrolytic	.75
C-6,14	47B20A102M3	1000 mmf. 350 V., ceramic	.20
C-7,11	CM20A271M	270 mmf. 500 V., mica	.18

DIAL AND DRIVE ASSEMBLY

		List Price
82B155	Pointer	.16
74A256	Shaft, tuning	.12
4A192	"C" washer	.05
4A195	Washer, spring	.05
75A012	Tension spring, drive cord	.05
38A001	Cord, dial drive	.05/yard
22B225	Dial glass (clear)	.96
67C883	Dial backing	1.08
76A412	Clip, dial glass	.05

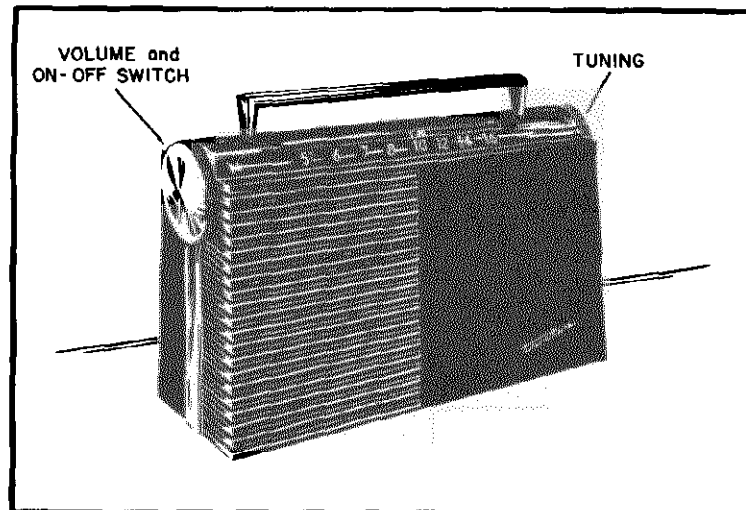
Prices subject to change without notice.

NOTICE: There is a model number label on the chassis. This label identifies the radio. When ordering parts or writing, give ALL information appearing on this label

GENERAL DESCRIPTION

This model is a 3-way portable radio with 4 tubes plus a selenium rectifier and uses a built-in antenna. The receiver will operate on 115 volts, 50 to 60 cycles AC, or 115 volts DC, or on the self-contained batteries. When using the radio on AC, reversing the plug may reduce hum. If the radio does not operate in one minute on direct current (DC), reverse the plug. When bat-

tery operation is desired, the line cord plug is inserted into a socket switch on the chassis (see bottom view), the insertion automatically moves the switch contacts for battery operation. When the line cord plug is removed from the chassis switch, the batteries are automatically disconnected.



OPERATION

OFF-ON SWITCH AND VOLUME CONTROL

The knob on the left is both the on-off switch and the volume control. When the control is turned all the way counter-clockwise, the set is off. A slight clockwise rotation will click the switch and turn the set on. The knob may then be used to regulate the volume. Be sure your set is turned completely off when not in use; otherwise the tubes will wear out and/or the batteries will be discharged unnecessarily.

TUNING KNOB

The knob on the right is the tuning knob; rotation of this knob moves the indicator along the dial scale. When selecting a station turn the knob back and forth until the tone is clearest and loudest. Do not use the tuning knob to regulate volume; the volume control should be used for that purpose after the station selector has been tuned in properly.

SPECIFICATIONS

Power Supply..... 115 volts, DC or 50-60 cycles AC, 25 watts.

A Battery—7.5 volts, 50 milliamperes.

B Battery—90 volts, 14 milliamperes

Frequency Range... 540 to 1600 kc.

Intermediate Freq... 455 kc.

Selectivity..... At 1000 kc., 60 kc. at 1000 x signal

Sensitivity..... 500 microvolts per meter

Power Output..... 150 milliwatts, undistorted
250 milliwatts, maximum

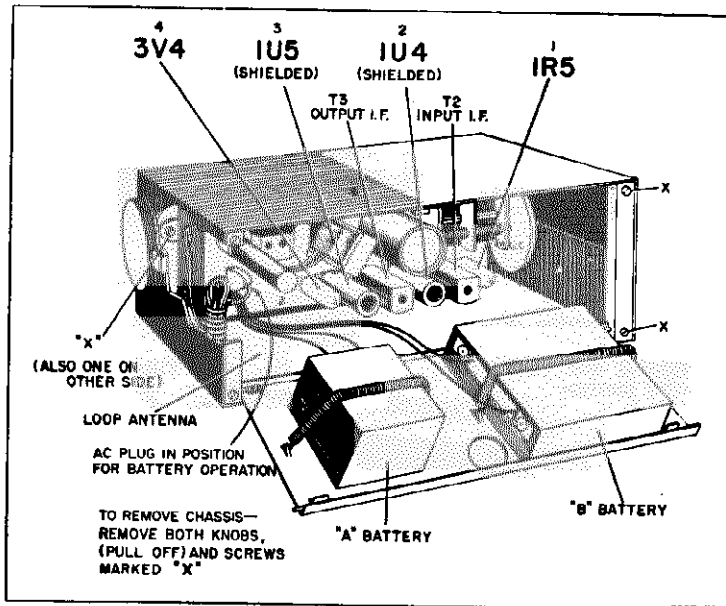
Loud Speaker..... 5" PM, v.c. impedance 3.2 ohms

Tube Complement....

1R5, Converter, 1U5, detector, AVC, audio

1U4, I.F. amplifier, 3V4, output amplifier,

Rectifier..... Selenium type.

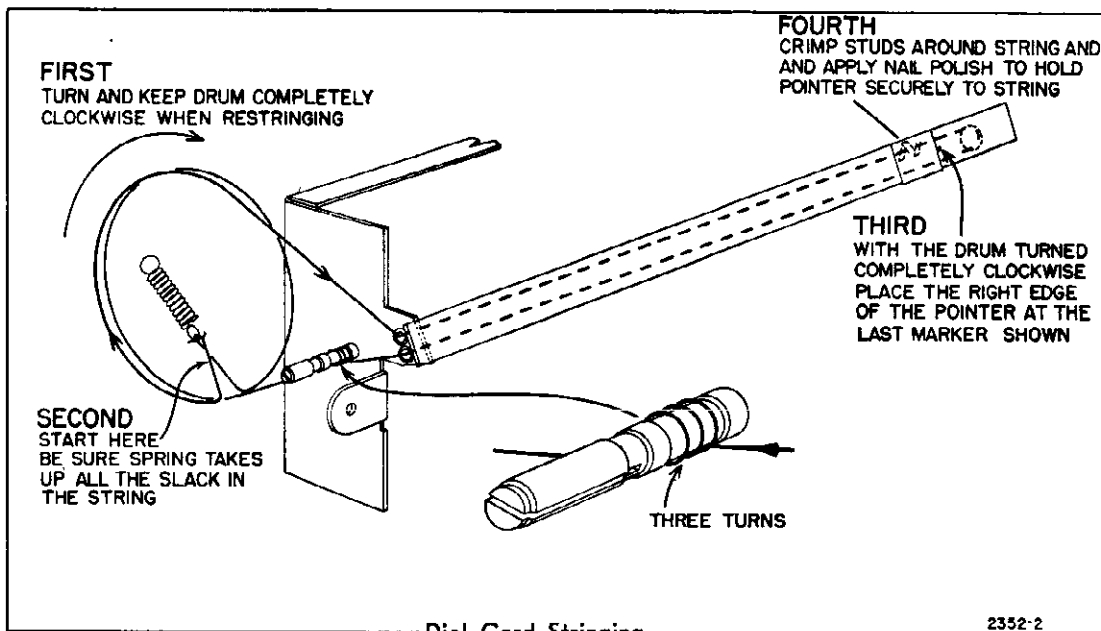


Bottom Chassis View

Manufacturer	A	B
RCA	VS-065	VS-090
General	31	132
Ray-O-Vac	P-751	4390
Eveready	717	490
Burgess	C5	N60

BATTERY REPLACEMENT

Since the receiver is small and compact, not every A or B Battery will fit in the space provided. Listed to the left are the five most common manufactured types to be used for replacement.



Dial Cord Stringing

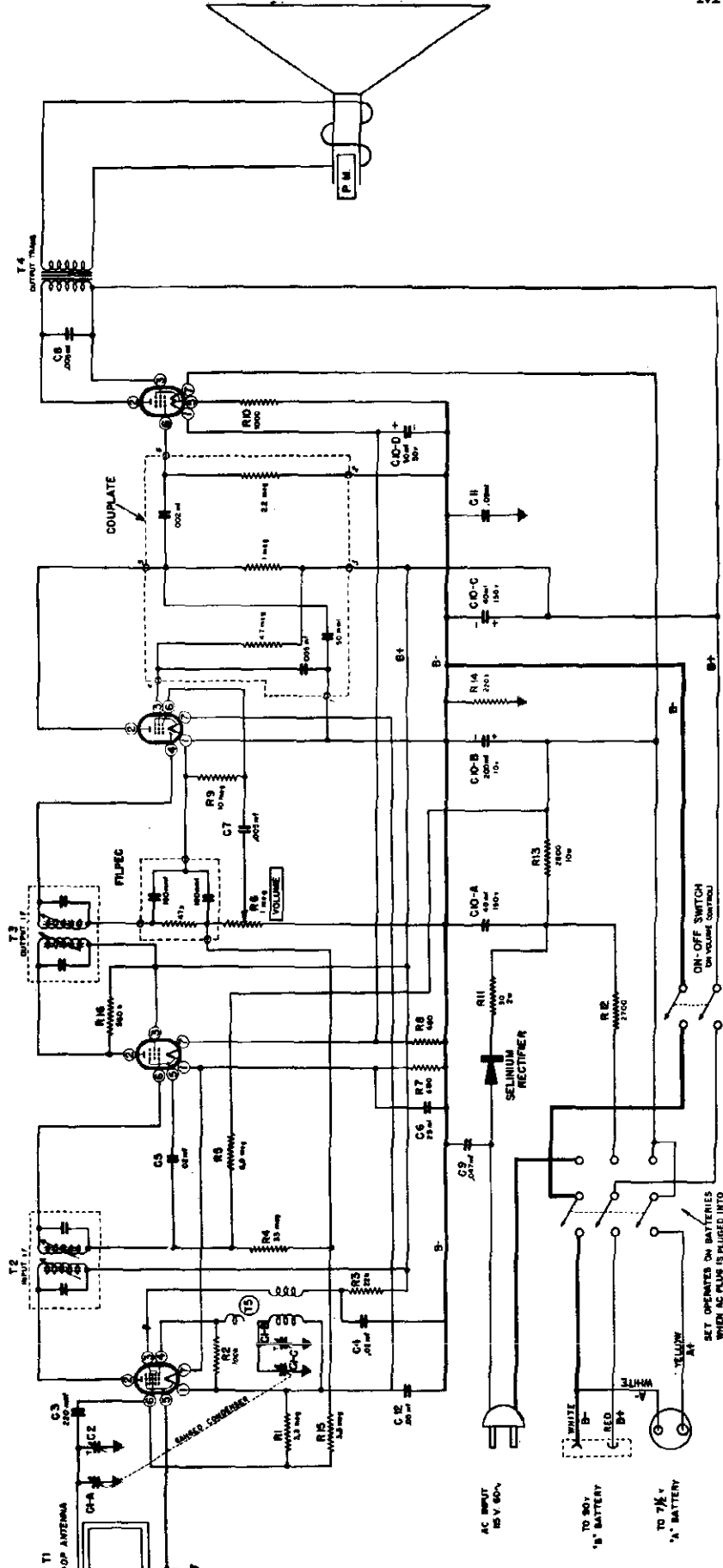
2352-2

⁴
3V4
AUDIO OUTPUT

³
IU5
DET. A.V.C.-AF

²
IU4
I.F. AMP

¹
IR5
CONVERTER



SCHEMATIC DIAGRAM

TO 50V AC INPUT
"B" BATTERY
"A" BATTERY

WHITE
B-
C-LED
B+

TO 50V AC INPUT
"B" BATTERY
"A" BATTERY

KEY OPERATES ON BATTERIES WHEN AC PLUG IS PLUGGED INTO CIGARETTE LIGHTER (SEE CIGARETTE LIGHTER VIEW)

MODEL D-3120A

ALIGNMENT PROCEDURE

The Alignment Procedure below includes the sensitivities at the input of various stage. All measurements are based on an output of 50 milliwatts. This may be measured by disconnecting the speaker voice coil and substituting a 3.2 ohm, 5 watt resistor across the secondary winding of the output transformer. A reading of .4 volts AC across this resistor will be equivalent to a

50 milliwatt output with speaker connected. The volume control must be set to maximum.

The signal source must be an accurately calibrated signal generator capable of supplying the frequencies designated, modulated 30% with a 400-cycle audio signal. A 400-cycle audio signal is required for the audio measurement. Variations in sensitivities of plus or minus 25% are usually permissible.

FREQUENCY	COUPLING CAPACITOR	DIAL SETTING	CONNECTION TO RADIO	GROUND CONNECTION	ADJUST	INPUT FOR 50 MILLIWATTS OUTPUT
455 kc.	.1 mfd.	1000 kc.	Pin No. 6 of 1R5	B— (shell of lytic)	I.F. slugs	100 microvolts
1620 kc.	.1 mfd.	1600 kc.	Pin No. 6 of 1R5	B— (shell of lytic)	C1-B Osc. Trim. on gang	_____
1400 kc.	Radiation Loop	1400 kc.	Radiation loop	None	C-2 Antenna Trim. on gang	250 microvolts
400 cycles	.05 mfd.	_____	Pin No. 6 of 1U5	B— (shell of lytic)	_____	.040 volts
400 cycles	.05 mfd.	_____	Pin No. 6 of 3V4	B— (shell of lytic)	_____	3 volts

PARTS LIST

When ordering parts, specify part number and complete model number

Ref. No.	Part No.	Description	Price	Ref. No.	Part No.	Description	Price
Capacitors							
CA-C	13D-19595	Gang tuning condenser	.80	18A-19586	5", PM speaker	5.70	
C1-B		Trimmer on gang	—	21J-19615	Selenium rectifier	2.25	
C2		Trimmer on gang	—	201-14083	Audio couplate	.85	
C3	8G-14459	220 mmf, ceramic	.25	201-15005	Filpec	.40	
C4, 5	8D-17268	.02 mfd x 200 volts	.25	15C-16007	7 prong, miniature socket	.15	
C6	8D-18042	.25 mfd x 100 volts	.35	2H-17008	Tube shield base	.10	
C7	8D-17785	.005 mfd x 200 volts	.25	2H-19188	Tube shield	.10	
C8	8G-13962	.005 mfd x 450 volts	.25	14M-15724	A.C. line cord	.85	
C9	8J-16081	.047 mfd x 400 volts	.30	5M-19963	Line cord lock	.10	
C10A, B, C, D	8C-16068	40-200-40-50 mfd, lytic	2.95	14A-16919	"B" Battery cable	.35	
C11	8D-11251	.09 mfd x 400 volts	.25	14A-19846	"A" battery cable	.35	
C12	8D-14460	.05 mfd x 200 volts	.35	Cabinet Parts			
				5C-19576-84	Bakelite cabinet	4.25	
R1, 4, 15	9B1-104	3.3 megohms, 1/2 watt, 10%	.25	4M-19581	Handle	2.50	
R2	9B1-86	100K ohms, 1/2 watt, 10%	.25	4B-19574	Escutcheon and dial scale	3.30	
R3	9B1-78	22K ohms, 1/2 watt, 10%	.25	2M-19647	Tie strap	.10	
R5	9B1-108	6.8 megohms, 1/2 watt, 10%	.25	2M-19585	Clip, cabinet side channel	.40	
R6	10A-19596-1 or 10A-19596	Volume control and switch, 1 megohm	1.20	2M-19609	Button cover	.85	
R7, 8	9B1-155	680 ohms, 1/2 watt, 5%	.30	49A-19612	Spring, battery	.20	
R9	9B1-37	10 megohms, 1/2 watt, 20%	.25	4B-19582	Knob	.90	
R10	9B1-159	1K ohms, 1/2 watt, 5%	.30	2M-19614	Stud	.10	
R11	9C-19770	30 ohms, 2 watts, 10%	.20	27C-6030	Rivet	.01	
R12	9B2-169	2700 ohms, 1 watt, 5%	.35	3M-19613	Shoulder stud	.05	
R13	9M-19833	2800 ohms, 10 watts, cerostat	.95	2D-19610	Bracket	.20	
Coils, Transformers and Chokes				2M-17580	I.F. clip	.05	
T1	13E-19844	Loop antenna assembly	1.30	62D-19893	Antenna clip	.15	
T2	13B-17397	Input I.F. transformer	1.45	6M-14372	Clamp, battery cable	.10	
T3	13B-17397	Output I.F. transformer	1.45	Dial Parts			
T4	12C-19591	Audio output transformer	1.85	2G-19590	Pointer	.40	
T5	13D-19595	Oscillator coil	.80	49A-11324	Tension spring	.05	
Miscellaneous				2M-19584	Pointer guide	.25	
	20A-19588	A.C. - D.C. battery switch	.90	3H-10879	Pulley	.10	
				27A-10102	Shoulder rivet	.05	
				3A-19583	Tuning shaft	.40	
				29C-10630	"C" washer	.05	

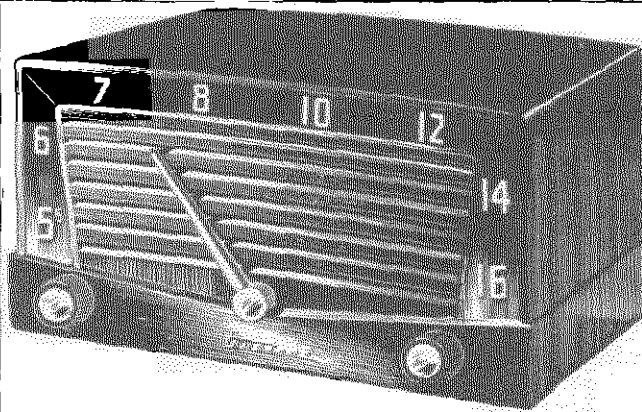
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODELS D-2102A
D-2103A, B

SERVICE DATA

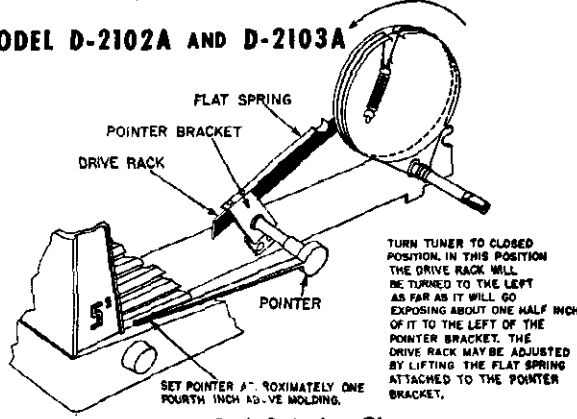
Power Supply.....115 volts, DC or 50-60 cycle, 24 watts.
Frequency Range.....540 to 1600 Kc.
Intermediate Freq....455 Kc.
Selectivity.....At 1000 Kc., 60 Kc., at 1000 signal
Sensitivity.....150 u. v. per meter
Power Output.....0.8 watts undistorted, 1.0 w. maximum
Loud Speaker.....4" PM., v.c. impedance, 3.2-
Tube Complement.....

12BE6, Converter 50C5, Audio output
 12BA6, IF Amplifier 25Z6, Rectifier
 12AV6, or 12AT6,
 Detector, AVC, Audio



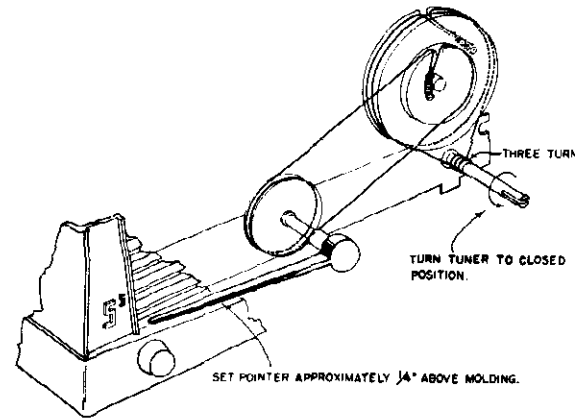
Front Cabinet View

MODEL D-2102A AND D-2103A

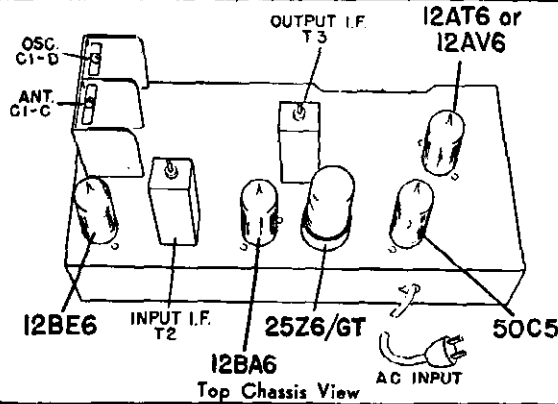


Dial Stringing Diagram

MODEL D-2102B AND D-2103B



Dial Stringing Diagram



Top Chassis View

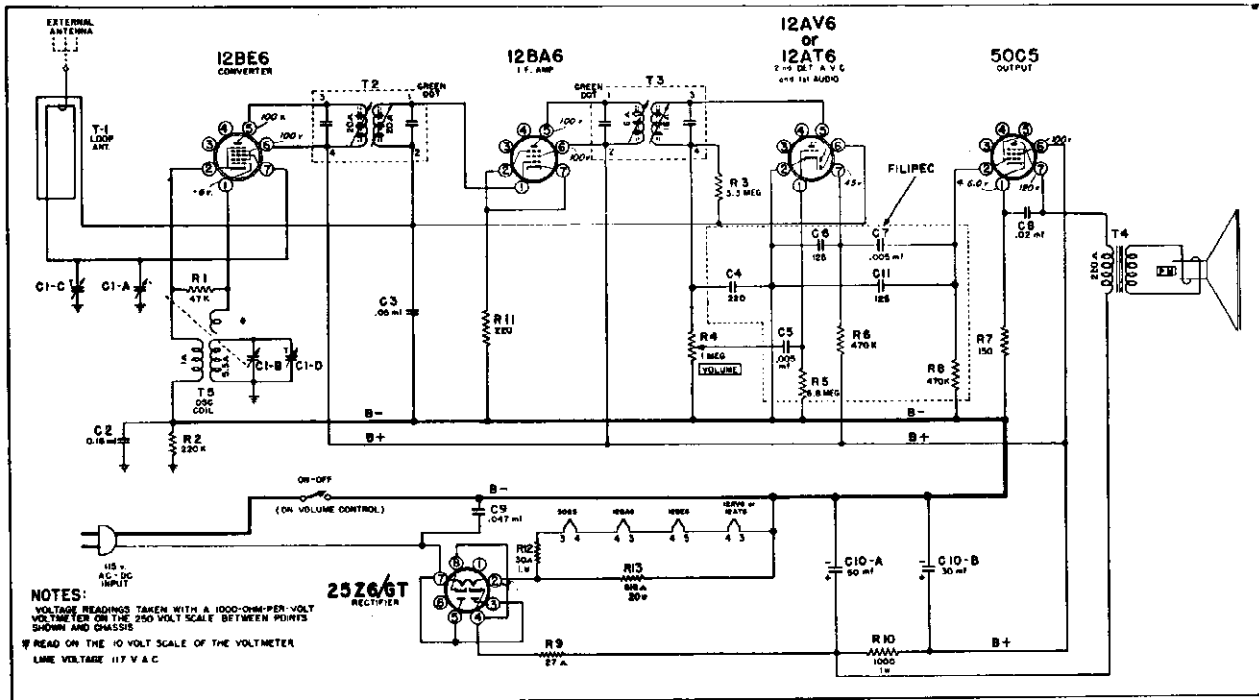
ALIGNMENT PROCEDURE

Loop must be connected and set volume to maximum.

SIGNAL GENERATOR				TUNER SETTING	ADJUST FOR MAXIMUM OUTPUT	INPUT 50-MILLI OUTPUT
Frequency	Coupling Capacitor	Connection to Radio	Ground Connection			
455 kc.	.1 mf	12BE6, Pin 7	HEAVY BUSS LEAD ACROSS CENTER OF CHASSIS	Capacitor fully open (plates out of mesh)	Top and bottom Cores in output and input I.F. cans	65 micrc
1620 kc.	.1 mf	12BE6, Pin 7		Capacitor fully open (plates out of mesh)	Oscillator trimmer C1-D on gang	70 micrc
535 kc.	.1 mf.	12BE6, Pin 7		Capacitor fully closed	Check for adequate range	70 micrc
1400 kc.	—	Lay generator lead near back of cabinet		Tune in 1400 kc. signal	Antenna trimmer C-1C on gang	200 to microv
400 cycles	.1 mf	12AT6, Pin 1		—	—	.06 va

Serial No. 367000 up

MODELS D-2102A,
B, D-2103A, B



NOTES:
VOLTAGE READINGS TAKEN WITH A 1000-OHM-PER-VOLT
VOLT METER ON THE 250 VOLT SCALE BETWEEN POINTS
SHOWN AND CHASSIS
V READ ON THE 10 VOLT SCALE OF THE VOLTMETER
LINE VOLTAGE 117 V A.C.

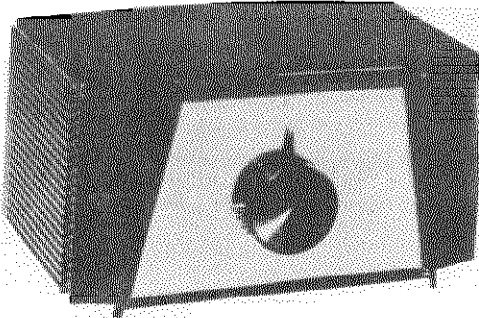
NOTE: Capacitor C2 should be .09 mmf.

SCHEMATIC DIAGRAM

Please specify part number and chassis model number when ordering replacements.

Ref. No.	Part No.	Description	Price	Part No.	Description	Price
Capacitors						
C1A-B	8A-19553	2-gang condenser	2.85	29E-17592	Spring washer	.05
C1C-D	8A-20219	Trimmers on gang		43D-17609	Tinnerman clip	.05
C2	8D-11251	.09 mfd x 400 volts	.25	29C-10630	"C" washer	.05
C3	8D-10770	.05 mfd x 200 volts	.25	53A-18547	Dial string (approx 20")	.05
C4-5-6-7-11- and R5-6-8	201-19303	Filipec	.90	49A-15616	Take up spring	.05
C8	8D-10774	.02 mfd x 400 volts	.25	2D-19555	Pointer bracket	.05
C9	8J-16081	.047 mfd x 400 volts	.30	2D-20217	Flat spring	.03
C10-A-B	8C-17391	Electrolytic condenser	1.25	2M-19545	Pointer shaft	.05
Resistors						
R1	9B1-82	47K ohms, 1/2 watt, 10%	.25	3A-19556	Pointer gear	.50
R2	9B1-27	220K ohms, 1/2 watt, 20%	.25	3J-19557	Drive rack	.05
R3	9B1-34	3.3 megohms, 1/2 watt, 20%	.25	2G-19559	Pointer	.40
R4	10A-19788	Volume control and switch	1.10	200-20227	Shaft and pulley assembly	.20
R5-6-8		See Filipec		49A-11324	Coil spring	.05
R7	9B1-52	150 ohms, 1/2 watt, 10%	.25	Miscellaneous		
R9	9B1-43	27 ohms, 1/2 watt, 10%	.25	5C-19530-65	Cabinet (walnut)	3.80
R10	9B2-62	1000 ohms, 1 watt, 10%	.25	5C-19530-9	Cabinet (ivory)	5.15
R11	9B1-54	220 ohms, 1/2 watt, 10%	.25	5B-16164-37	Knob (walnut)	.30
R12	9C-19769	30 ohms, 1 watt, 10%	.15	5B-18164-37	Knob (ivory)	.30
R13	9M-19602	618 ohms, 20 watts, 10%	1.10	18A-19554	Speaker, 4" PM	4.75
Transformers and Coils						
T1	13E-19560	Loop antenna assembly	1.25	43D-17609	Tinnerman clip	.05
T2-3	13B-17731	I.F. transformer	1.45	2H-17588 or	Tube shield	.10
T4	12C-17595	Output transformer	1.00	2H-19188	Tube shield	.10
T5	13D-17583	Oscillator coil	.70	2M-17589 or	Tube shield base	.05
Dial Parts						
	3A-17590	Tuning shaft	.20	2M-19187	Tube shield base	.05
	40A-17591	Bushing	.05	2M-17580	I.F. locking clip	.05
				15C-16007	7-prong, socket	.15
				15B-10440	Octal socket	.15
				14M-10088-4	AC line cord and plug	1.00
				2D-15432-1	Loop mounting bracket	.35
				23A-10344	Line cord lock	.05

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



INSTALLATION

Place the receiver upright on a table or other level surface convenient to a power outlet. Do not place it on or near a radiator or heater.

This receiver is designed to operate from a 117 Volt A C or D C source of supply. On A C, improved reception sometimes be obtained by turning the plug halfway around and reinserting it into the power outlet. Try it both ways leave it in the position which gives the best reception. On D C, the receiver will operate with the plug inserted in only position.

ANTENNA

A 15 foot hank antenna is attached to the receiver which should be uncoiled and stretched out to its full length best reception. Run the wire around the room floor and around window frames for good signal pickup.

In locations of low signal areas an Outdoor Antenna will greatly improve reception and our Western Auto Aerial Numbers 3D5111 and 3D5110 will prove highly satisfactory by increasing the reception volume level.

This receiver is designed to operate without a ground connection and no attempt should be made to use one.

OPERATION

Insert the power cord plug into the power receptacle. To turn the receiver on, turn the Volume Control knob located on the right side of the receiver until a click is heard. In about 30 seconds the set will be in operating condition. Turn the Volume to the right or clockwise increases the volume.

Tune in stations by turning the large center tuning knob. The numbers the tuning knob passes over, show Kilocycles with the last two ciphers left off. For example number 9 is the location of 900 Kilocycles. As you have tuned in the station desired move the tuning knob to the position which produces the deepest rounded tones with a minimum background noise and clearest reception.

To turn the receiver off, turn the volume knob to the left or counter clockwise position until a click is heard.

ELECTRICAL SPECIFICATIONS

Power Supply.....117 Volts D.C., or 117 Volts, 50-60 Cycles A.C.
 Frequency Range..... 532.5 to 1620 kc.
 Intermediate Frequency.....455 kc..
 Tuning..... Two gang capacitor
 Speaker.....4 inch PM, 3.2 ohm voice coil impedance
 Power Consumption.....30 Watts
 Power Output..... 1 watt undistorted, 1.5 watt maximum
 Sensitivity..... 800 Microvolts at 50 milliwatts Output
 Selectivity.....120 kc. broad at 1000 times signal at 1000 kc.

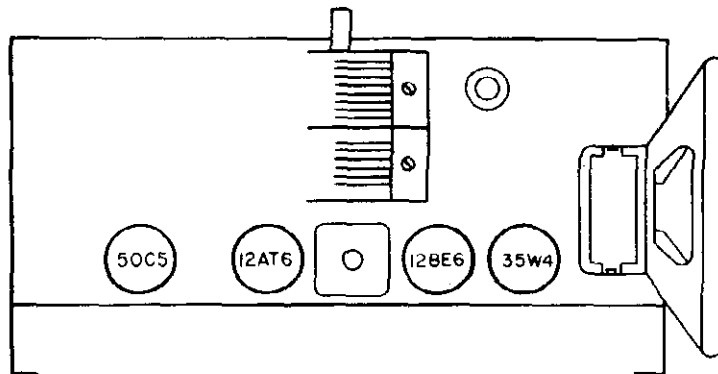
TUBE COMPLEMENT

12 BE 6Mixer and Oscillator
 12 SQ 7.....Detector, A.V.C. and 1st Audio
 50 C 5..... Audio Output
 35 W 4.....Power Rectifier

MODELS D2386,
D2387, D2388

TUBES

This receiver is shipped with the tubes in their proper sockets. If for some reason tubes have been removed, make certain they are reinserted into their proper sockets as shown below.



ALIGNMENT PROCEDURE

PRELIMINARY:

- Output meter connection..... Across 3.2 ohm speaker voice coil
- Output meter reading to indicate 0.05 watt across speaker voice coil.....0.4 volt
- Generator Modulation.....30%, 400 cycles
- Position of volume control..... maximum (fully clockwise)
- Position of pointer with Rotor full open (Plates out of mesh).....slightly beneath the 1620 kc calibration mark on the dial (pointer horizontal to light)

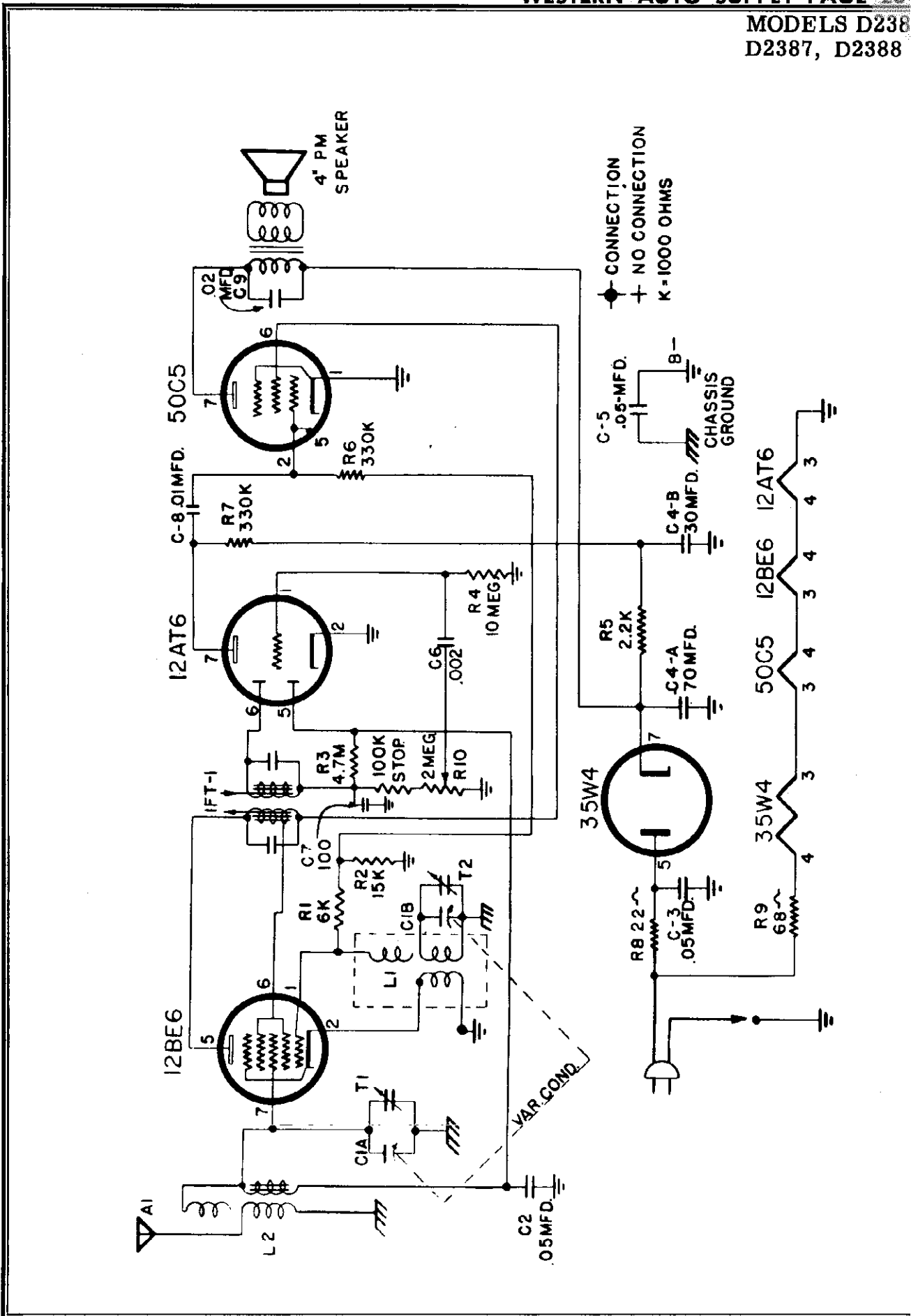
	Position of Variable	SIGNAL GENERATOR				Trimmer Adjustments (In order shown)
		Frequency	Dummy Antenna	Connection to Receiver	Ground Connection	
IF	Rotor Full Open (Plates out of mesh)	455 kc.	.1 mfd	Grid of 12BE6 (Pin 7)	B-	Input and Output Trimmers on I.F. Can T3 and T4
RF	Rotor Full Open (Plates out of mesh)	1620 kc.	75 mmf	Antenna Hank	Chassis	Oscillator Trimmer T2
	1400 kc.	1400 kc.	75 mmf	Antenna Hank	Chassis	Antenna Trimmer T1
	600 kc.	600	75 mmf	Antenna Hank	Chassis	(Check Point)*

*With a generator frequency of 600 Kc, tune the set to the point where maximum output is obtained, which should be approximately 600 Kc on the dial.

Align for maximum output. Reduce input as needed to keep output near 0.4 volts.

The alignment procedure should be done in the order given for greatest accuracy.

Always keep the output from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.



MODELS D2386,
D2387, D2388

PARTS LIST

When ordering parts, specify part number, model number and series.

Ref. No.	Part No.	Description
RESISTORS		
R1	180-126	6000 Ohms 1/2 W 20%
R2	180-115	15000 Ohms 1/2 W 20%
R3	180-122	4.7 Megohms 1/2 W 20%
R4	180-123	10 Megohms 1/2 W 20%
R5	180-124	2200 Ohms 1 W 20%
R6	180-109	330000 Ohms 1/2 W 20%
R7	180-109	330000 Ohms 1/2 W 20%
R8	180-113	22 Ohms 1/2 W 20%
R9	180-125	68 Ohms 1 W 20%
R10	120-104	2 Megohms, Volume control 100000 stop & switch

CONDENSERS

C1A-B	160-104	Variable Condenser
C2	152-104	.05 Mfd 200 Volt Paper
C3	152-105	.05 Mfd 400 Volt Paper
C4A-B	150-107	70x30 Mfd 150 Volt Electrolytic
C5	152-105	.05 Mfd 400 Volt Paper
C6	158-103	.002 Mfd 400 Volt Disc
C7	156-102	100 Mfd Ceramicon
C8	158-102	.01 Mfd 200 Volt Paper
C9	158-104	.02 Mfd 200 Volt Paper

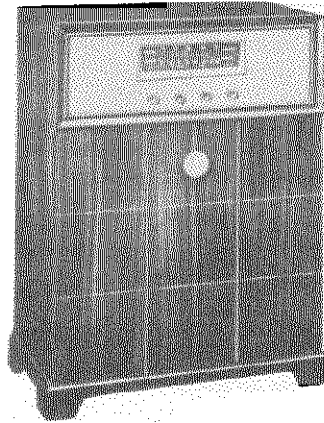
COILS & TRANSFORMERS

L2	132-104	Antenna Coil
L1	136-106	Oscillator Coil
T1	130-103	I F Transformer

CABINET and ACCESSORIES

210-103 WH	Cabinet, White D 2387 (In carton)
210-103 E	Cabinet, Ebony D 2386 (In carton)
210-103 R	Cabinet, Red D 2388 (In carton)
205-101	Insert Clear Radio
206-101 G	Gold Foil Face Radio
206-101 B	Blue Foil Face Radio
206-101 GR	Green Foil Face Radio
206-101 R	Red Foil Face Radio
220-104 E	Volume Control Knob Ebony
220-104 R	Volume Control Knob Red
220-104 WH	Volume Control Knob White
225-104 P	Cardboard Back
185-101	6 ft Line Cord
185-104	15 ft. Antenna Hank
170-105	4" PM Speaker with output Transformer

MODELS D1435
D1436A

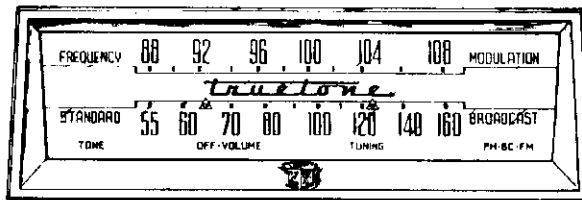


CHECK YOUR LINE VOLTAGE

Unless otherwise marked this radio must be operated on a supply of 105-125 volts AC, 60 cycles only. Do not connect the radio to a wall outlet unless

certain that the power supply is correct for the receiver. If in doubt, telephone your local power company before inserting the plug. Radios of this model which are to be used on other power supplies are marked accordingly.

8 TUBES



2 BANDS

FM BAND

88 - 108 MEGACYCLES
This band is calibrated in megacycles and covers the frequency modulation band of 88-108 megacycles. Reception in this band is usually limited to "line of sight" distances between the transmitting and receiving antennas. This is normally up to about 30 miles with approximately 45 miles being the extreme range.

BROADCAST BAND

540 - 1600 KILOCYCLES
This band is calibrated in channel numbers. To obtain the kilocycle number add a zero to the number on the dial scale.

TONE CONTROL

Use this knob to adjust the tone of the receiver. When turned clockwise the high notes will predominate and when turned counter-clockwise a deep bass effect will result.

BAND AND PHONO RADIO SWITCH

This control has three positions: FM, Broadcast and Phono. In the Phono position, the electrical circuits are connected for the reproduction of records played on the automatic record player.

ON-OFF SWITCH AND VOLUME CONTROL

The On-Off switch and Volume control are operated by the same knob. To turn the radio on, turn the knob clockwise until a click is heard. Allow approximately 30 seconds for the tubes to heat. Then continue to turn the knob clockwise to increase the volume.

TUNING KNOB

Use this control to tune in the desired station. Turn the knob until the station is heard. Then slowly rotate back and forth until the signal is clearest and strongest. If signal is too strong, reduce it by means of the volume control, not by using the tuning knob.

MODELS D1435A,
D1436A

GENERAL INFORMATION

ANTENNA

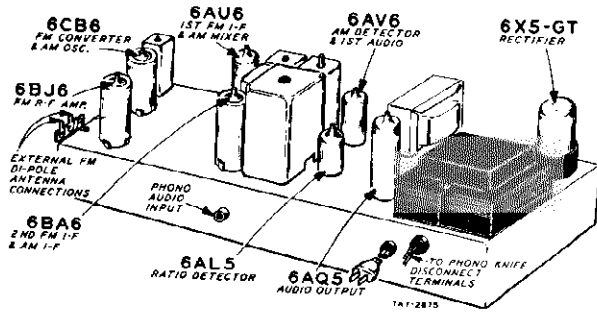
Two antennas are incorporated in the receiver, a True-tone Stratoscope Loop Antenna for the broadcast range and a folded dipole antenna for the FM (frequency modulation) range. For the reception of local or powerful nearby stations, or in areas where the signal strength is good, usually no other antenna will be required. However, in some locations for the reception of FM stations, or distant stations in the broadcast band, an outside antenna is essential.

As the need for an external antenna varies in different locations, it is suggested that the radio be tried with the two antennas in order to determine if an external antenna is needed. If it is felt that an additional antenna is needed a folded dipole antenna with a 300 ohm line lead-in should be used. This type of antenna will increase the signal pickup on the FM band. Attach two terminal clips (packed in the literature envelope) to the lead-in of the outside FM antenna. Then connect the lead-in to the terminal strip at the rear of the receiver (see tube position illustration.)

It should be remembered in conjunction with the erection of an FM folded dipole antenna that FM reception is usually limited to "line of sight" distances or up to about 45 miles. Before erecting a special antenna for FM reception it is best to make certain that an FM station exists in your area.

For some locations FM reception may prove satisfactory with the dipole antenna but an external antenna may be needed for broadcast reception. For these ranges a terminal is attached to the loop antenna to which an external antenna may be connected. The antenna should be 50 to 60 feet long, with not more than 30 feet of lead-in and should be erected as high as possible and at right angles to the nearest electric lines.

NOTE: An external ground connection is not required.



TUBES AND DIAL LAMP

The type designation of each tube is stamped on the tube and the radio chassis base. The correct positions in which the tubes must be installed are shown in the tube position illustration.

The tubes in the radio should be checked periodically by taking them out and having them tested.

When replacing the tubes, be sure that they are inserted in the proper sockets. To install a tube, insert the center guide pin into the center hole of the tube socket and turn the tube until the key drops into position. Then push the tube down until it is held firmly in the socket. To install a tube into a miniature type tube socket, line up the tube prongs with the holes in the socket and then gently push the tube down until it is held firmly in the socket. All tubes must be in their sockets to operate the radio. Use only No. 47 dial lamps.

IF THE RADIO FAILS TO OPERATE SATISFACTORILY

Recheck the foregoing instructions. If the radio still does not appear to operate satisfactorily, proceed as follows:

FIRST—Check Power Supply. Be sure there is power at the convenience outlet to which the radio is connected. To determine this, connect a lamp to the outlet and see whether or not the lamp lights.

Check the voltage and frequency of the power supply with that shown on the power rating label on the radio. If there is any doubt concerning the power supply, withdraw the plug from the outlet and consult the local power company before reinserting the plug.

SECOND—Check Tube Positions. See that the tubes are in the correct sockets as shown in the illustration.

Make certain that the tubes are operating. (Glass tubes will light very dimly.)

THIRD—Check Antenna. If an outside antenna is being used, inspect the antenna system to see that it is in good condition and not grounded at any point.

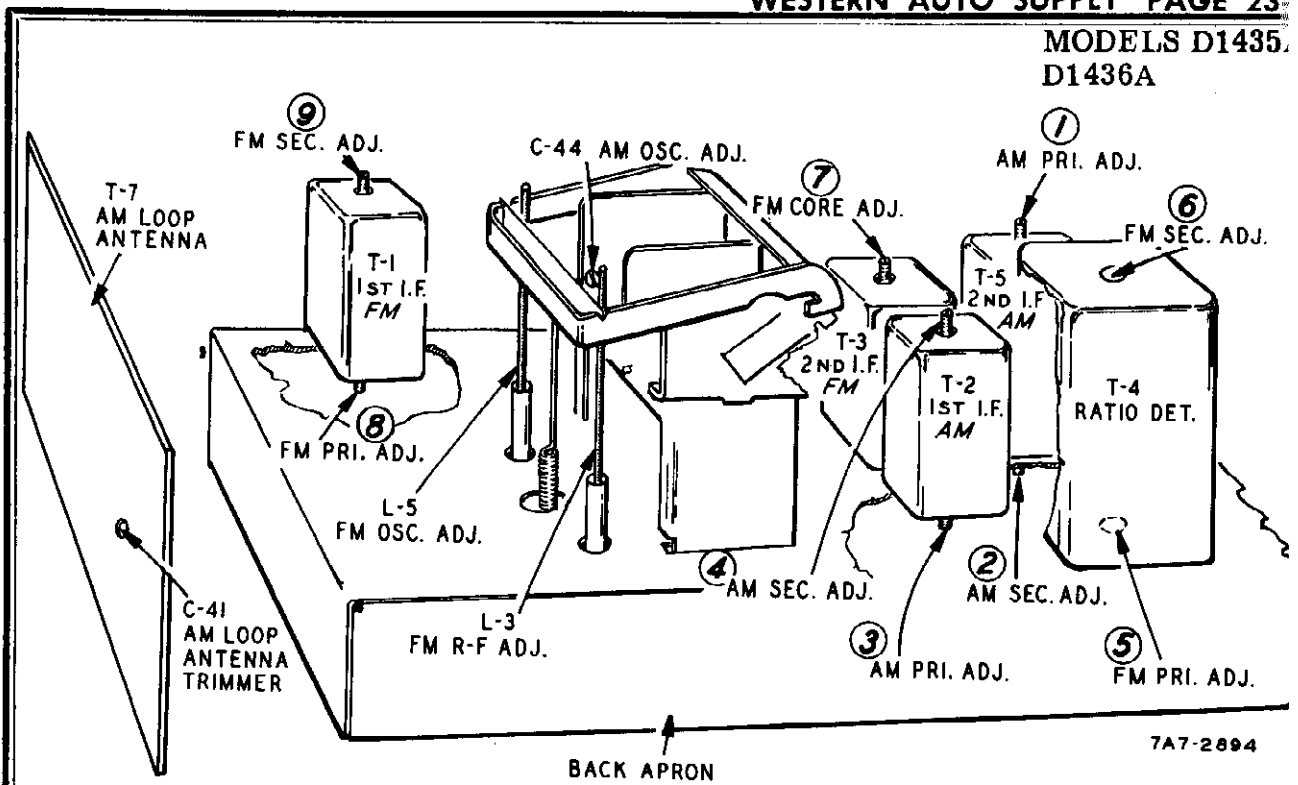
FOURTH—Test Tubes. Remove the tubes from the

radio, take them to your local radio dealer and have them tested either by means of a tube tester or by inserting them in a radio that is operating satisfactorily.

FIFTH—Service. If the radio does not function properly after the above procedure has been followed and the tubes have been tested, get in touch with the dealer from whom the radio was purchased or call in a competent radio technician.

FAULTY FM RECEPTION

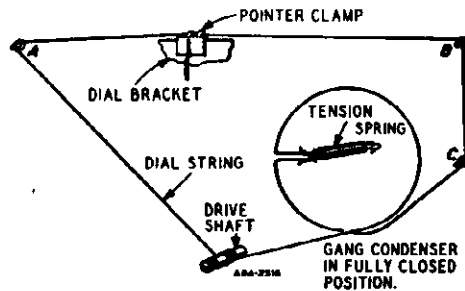
The requirements for FM reception are more critical than for Standard band broadcast or short wave reception. This includes the area in which the receiver is located, the type of antenna used, the distance the receiver is located from the station to be received and other factors not encountered in Standard band broadcast reception. It is to be noted that reception in the high frequency FM band is usually limited to "line of sight" distances or up to about 45 miles. Also tall buildings or other structures between the transmitter and the receiver may be found to affect reception. Reception under these conditions will sometimes be helped by the addition of an external folded dipole antenna with a 300 ohm line lead-in. Information concerning this is given in the Antenna paragraph.



7A7-2894

DRIVE CORD REPLACEMENT

Replacement of the drive cord may be accomplished as shown in the illustration. For this purpose use the new drive cord assembly listed in the Replacement Parts List. Turn the gang condenser until the plates are fully meshed. Then install the string as shown, winding three turns counter-clock-wise around the tuning shaft with the turns progressing away from the chassis. After the cord is installed, rotate the tuning shaft several times in order to take up any slack in the cord.



RECORD PLAYER CONNECTIONS

For models not equipped with built-in record player, a socket marked PHONO is provided on the back of the chassis for connection to an external record player or automatic record changer. When it is desired to play records through the radio, insert the connector on the cable of any standard record player into this socket. Turn the band switch to the phono position and use the volume control to adjust the sound level.

TUBE AND DIAL LAMP COMPLEMENT

1	6CB6	FM Converter and AM Oscillator
1	6BJ6	FM R-F Amplifier
1	6AU6	1st FM I-F and AM Mixer
1	6BA6	2nd FM I-F and AM I-F
1	6AV6	AM Detector and 1st Audio
1	6AL5	Ratio Detector
1	6AQ5	Audio Output
1	6X5-GT	Rectifier
2	No. 47	Dial Lamps

ELECTRICAL SPECIFICATIONS

Power Output -
117 volts AC-40 watts
60 cycles
60 watts phono operating

Power Output -
2.3 watts maximum
1.0 watts 10% distortion

Speaker - 6 inch PM dynamic

Frequency Ranges -
Broadcast 540-1600 KC
Frequency Modulation 88-108 MC

Intermediate Frequency -
AM 455 KC - FM 10.7 MC

Selectivity - AM - 45 KC broad at 1000 times signal,
Measured at 1000 KC
I.F. FM - 200 KC broad at 2 times down

AM Sensitivity - (For .5 watt output with external antenna)
15 microvolts average

FM Sensitivity - (For .5 watt output)
10 microvolts average

MODELS D1435A,
D1436A

**ALIGNMENT PROCEDURES
AM STAGES**

The following is required for aligning:

An All Wave Signal Generator Which Will Provide an Accurately Calibrated Signal at the Test Frequencies as Listed.

Output Indicating Meter, Non-Metallic Screwdriver, Dummy Antennas - .1 mf, and 50mmf.

Volume Control Maximum all Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for Several Minutes.

SIGNAL GENERATOR				GANG CONDENSER SETTING	ADJUST	ADJUST FOR
FREQUENCY SETTING	CONNECT GENERATOR OUTPUT TO	THROUGH DUMMY ANTENNA	CONNECT GROUND TO			
455 KC	Control Grid 6BA6 Pin No. 1	.1mf	Chassis Base	Rotor Fully Open	2nd I.F. Pri. (1) and Sec. (2)	Maximum Output
455 KC	Control Grid 6AU6 Pin No. 1 1st Det.	.1 mf	Chassis Base	Rotor Fully Open	1st I.F. Pri. (3) and Sec. (4)	Maximum Output
455 KC	Control Grid 6AU6 Pin No. 1	.1 mf	Chassis Base	Rotor Fully Open	2nd I.F. Pri. (1) and Sec. (2)	Maximum Output
1620 KC	Control Grid 6AU6 Pin No. 1	.1 mf	Chassis Base	Rotor Fully Open	Oscillator C-44	Maximum Output
1400 KC	External Antenna Terminal	50 mmf	Chassis Base	Turn Rotor to Max. Output. Set Pointer to 1400 KC See Note A	Antenna C-41	Maximum Output

NOTE A - If the pointer is not at 1400 KC on the dial, reset pointer to the 1400 KC mark on the dial scale.

FM STAGES

The following is required for aligning:

An accurately calibrated signal generator providing unmodulated signals at the test frequencies listed below.

Dummy antennas, 5000 mmf and 300 ohms,

V.T.V.M. having a range of approximately 3 volts.

Allow chassis and signal generator to heat up for several minutes.

SIGNAL GENERATOR			BAND SWITCH SETTING	GANG CONDENSER SETTING	ADJUST	ADJUST FOR
FREQUENCY SETTING	CONNECT GENERATOR OUTPUT TO	THROUGH DUMMY ANTENNA				
10.7 MC	6BA6 Pin 1	5000 mmf	FM	Rotor Fully Open	Ratio Det. Pri. (5)	Maximum Deflection (Note 1)
10.7 MC	6BA6 Pin 1	5000 mmf	FM	Rotor Fully Open	Ratio Det. Sec. (6)	(Note 2)
10.7 MC	6AU6 Pin 1	5000 mmf	FM	Rotor Fully Open	2nd I.F. Adj. (at top only) (7)	Maximum Deflection (Note 1)
10.7 MC	6BJ6 Pin 5	5000 mmf	FM	Rotor Fully Open	1st I.F. Adj. Pri. (8) and Sec. (9)-2nd I.F. Adj. (7) Ratio Det. Pri. (5) In order Shown	Maximum Deflection (Note 1)
10.7 MC	6BJ6 Pin 5	5000 mmf	FM	Rotor Fully Open	Ratio Det. Sec. (6)	(Note 2)
92 MC	FM Antenna Terminals	300 ohms	FM	Pointer to 92mc. on dial	Osc. Coil Adj. L-5	Maximum Deflection (Note 1)
92 MC	FM Antenna Terminals	300 ohms	FM	Pointer to 92mc on dial	R.F. Coil Adj. L-3	Maximum Deflection (Note 1)

FM ALIGNMENT NOTES

NOTE 1 - Connect V.T.V.M. common lead to chassis.
Connect D.C. probe to Pin 7, of 6AL5.
Input should be adjusted for approximately -3V. output.

NOTE 2 - Connect V.T.V.M. common lead to junction of R-14 and R-15.
Connect D.C. probe to junction of R-13 and C-30.
Adjust Ratio detector secondary for zero output.

MODELS D1435A,
D1436A

NOTICE: There is a model number label on the chassis. This label identifies the receiver as to chassis and issue letter. When ordering parts or writing, give ALL information on this label.

MISCELLANEOUS

12A509	6" P.M. Speaker	.....
4X1183	Escutcheon	.....
10A759	Knob (Mah)	.....
10A766	Knob (Beige)	.....
76X5	Resistor Capacitor Combination	.....
13X546	Line Cord and Plug Assembly	.....
2A437	Band Change Switch	.....
3A474	Tube Socket (Octal) (6X5)	.....
3A305	Phono Socket - Single Pin Tip	.....
3A426	Tube Socket (Miniature) (6AU6) (6AL5)	.....
	(6AV6) (6AQ5)	.....
3A458	Tube Socket (Miniature) (6BA6)	.....
3A473	Tube Socket (Miniature) (6CB6) (6BJ6)	.....
32X403	Tube Shield (6BJ6) (6BA6) (6CB6)	.....
	Cabinet No. 454 (Mag.)	.....
	Cabinet No. 460 (Oak)	.....

CAPACITORS

C-1A	14A223-1	Gang Condenser and Pulley Assy.	.....
C-1B			
C-2	47X622	470 mmf	Ceramic
C-3			
C-4			
C-9	47X507	.005 mf	Ceramic
C-14			
C-18			
C-22			
C-24			
C-36	47X617	15 mmf (Insulated)	Ceramic
C-48			
C-49	80X1	.001 mf	Ceramic
C-50			
C-5	47X619	.33 mf	Ceramic
C-6			
C-7	47X625	56 mmf	Ceramic
C-8			
C-10	47X616	9 mmf	Ceramic
C-12			
C-11	47X618	15 mmf (Non-Ins.)	Ceramic
C-13			
C-15	Part of T-1 (1st I-F Trans. F.M.)		
C-16			
C-17	Part of T-2 (1st I-F Trans. A.M.)		
C-19			
C-20	Part of T-3 (2nd I-F Trans. F.M.)		
C-21			
C-23	RCP 10W2503M .05 mf 200V	Tubular	.....
C-25			
C-26	Part of T-5 (2nd I-F Trans. A.M.)		
C-27			
C-28	Part of T-4 (Ratio Det.)		
C-29			
C-30	47X509	47 mmf	Ceramic
C-31	47X575	2700 mmf	Ceramic
C-32	47X623	390 mmf	Ceramic
C-33	RCP 10W2203M	.02 mf 200V	Tubular
C-34	47X471	68 mmf	Ceramic
C-35A	45X361	4 mf 100V -Dry Electrolytic	.....
C-35B	Part of 76X5 (See Miscellaneous)		
C-37	RCP 10W2502M	.005 mf 200V	Tubular
C-38	RCP 10W2103M	.01 mf 200V	Tubular
C-42	RCP 10W4104M	.1 mf 400V	Tubular
C-39	RCP 10W8502M	.005 mf 800V	Tubular
C-40	17A256	2-24 mmf	Trimmer
C-41	47X621	220 mmf	Ceramic
C-43	47X545	1500 mmf	Ceramic
C-45	45X406	40 mf 200V	200V Dry Electrolytic
C-46A		40 mf 25V	
C-46B			
C-46C			

RESISTORS

		Ohms	Watts	
R-1	B85333	33K	0.5	Carbon
R-2	B85222	2.2K	0.5	Carbon
R-3	B84184	180K	0.5	Carbon
R-4	B85102	1K	0.5	Carbon
R-21				
R-23				
R-5	B85475	4.7 meg.	0.5	Carbon
R-6	B84103	10K	0.5	Carbon
R-14				
R-15				
R-7	B84222	2.2K	0.5	Carbon
R-8	B84101	100	0.5	Carbon
R-9	B84682	6.8K	0.5	Carbon
R-10	B85335	3.3 meg.	0.5	Carbon
R-11	B85473	47K	0.5	Carbon
R-26				
R-12	B84474	470K	0.5	Carbon
R-13	B85273	27K	0.5	Carbon
R-16	B85106	10.0 meg.	0.5	Carbon
R-17	B85683	68K	0.5	Carbon
R-18	36X389	2.0 meg.		Volume Control
R-19	40X341	1.0 meg.		Tone Control
R-20A	Part of 76X5 (See Miscellaneous)			
R-20B				
R-22	B84393	39K	0.5	Carbon
R-24	B84330	33	0.5	Carbon
R-25	B85225	2.2 meg	0.5	Carbon
R-27	D84102	1K	2.0	Carbon
R-28	B84271	270	0.5	Carbon

TRANSFORMERS AND COILS

L-1	9A2305	Antenna Coil (F.M.)
L-2	9A2304	Filament Choke
L-3	9A2300	R-F. Coil (F.M.)
L-4	9A2306	Converter Cathode Choke
L-5	9A2305	Oscillator Coil (F.M.)
L-6	9A2303	Filament Choke
L-7	35A9	Choke
L-8	9A2302	Oscillator Coil (A.M.)
T-1	9A2310	1st I-F Trans. (F.M.)
T-2	9A2308	1st I-F Trans. (A.M.)
T-3	9A2309	2nd I-F Trans. (F.M.)
T-4	9A2260	Ratio Det. Trans.
T-5	9A2307	2nd I-F Trans. (A.M.)
T-6	51X162	Output Transformer
T-7	9A2311	"B" Range Loop Antenna
T-8	53X291	Power Transformer

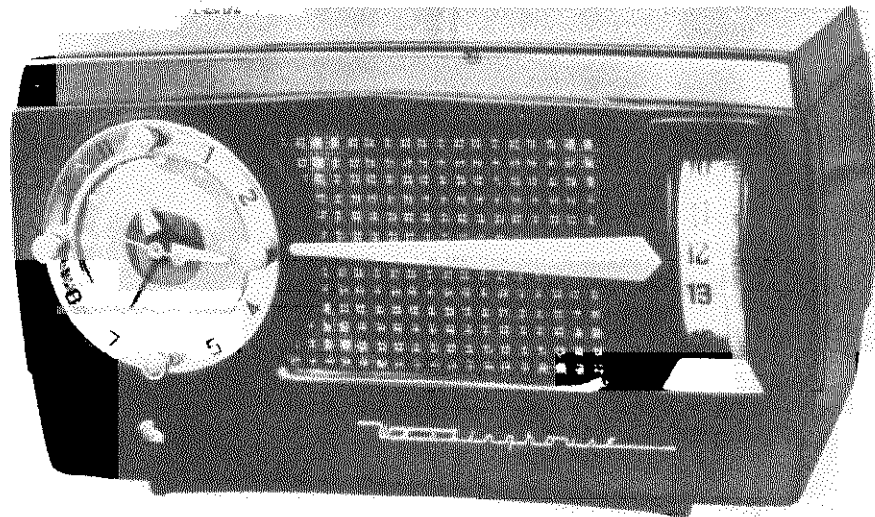
DIAL AND DRIVE ASSEMBLY

58X774	Dial Glass
15X260	Painter
19X192	"C" Washer (Mtg. Drive Shaft)
6X66	Rubber Grommet
25X1616	Dial Bracket
28X113	Drive Cord Tension Spring
7A103	No. 47 Pilot Light
7A199	Pilot Light Socket Assembly
10X90	Drive Cord Assembly
26X522	Drive Shaft

TYPE V-28A187 RECORD CHANGER PARTS

See Note	Motor Assembly, 60 Cycles
	105-125 Volts AC
V-2503G	Pickup Arm
10L3-J	Astatic Cartridge Complete with Needles
A1-J	Needle (1 Mil)
A3-J	Needle (3 Mil)

NOTE: Specify part number stamped on motor assembly.



SERVICE NOTES

SPECIFICATIONS

FREQUENCY RANGE: 540 to 1615 kc.

INTERMEDIATE FREQUENCY: 455 kc.

TUBE COMPLEMENT:

1 12BE6 Converter
 1 12BA6 I-F Amp.
 1 12AV6 Det., AVC, and 1st A-F Amp.
 1 50C5 Output Amp.
 1 35W4 Rectifier

POWER OUTPUT:

Undistorted 0.9 watt
 Maximum 1.5 watts

LOUDSPEAKER: 4" P.M.

OPERATING VOLTAGE: 105 to 120 volts, 60 cycles A-C

POWER CONSUMPTION:

Radio 35 watts
 Clock 2.5 watts

ALIGNMENT

It is recommended that the chassis be isolated from the power line by means of an isolation transformer.

Make certain that the dial pointer is correctly positioned.

While making the following adjustments, keep the volume control set for maximum output and the signal generator output attenuated to avoid AVC action.

Step	Connect Signal Generator to —	Signal Generator Frequency	Radio Dial	Adjust for Maximum Output —
1.	Stator of ant. tuning capacitor (A) through a 200 mmf capacitor	455 kc.	Minimum capacity	Top and bottom slugs of T2 and T1 in order given*
2.	Same as step 1	1615 kc.	Minimum capacity	Oscillator trimmer (D)
3.	Radiated signal	1400 kc.	1400 kc.	Antenna trimmer (B)

*It is recommended that a fiber aligning tool that snugly fits the slot in the powdered iron core be used to prevent chipping of the slot.

MODELS H-355T5,
H-345T5; Ch. V-2157-5

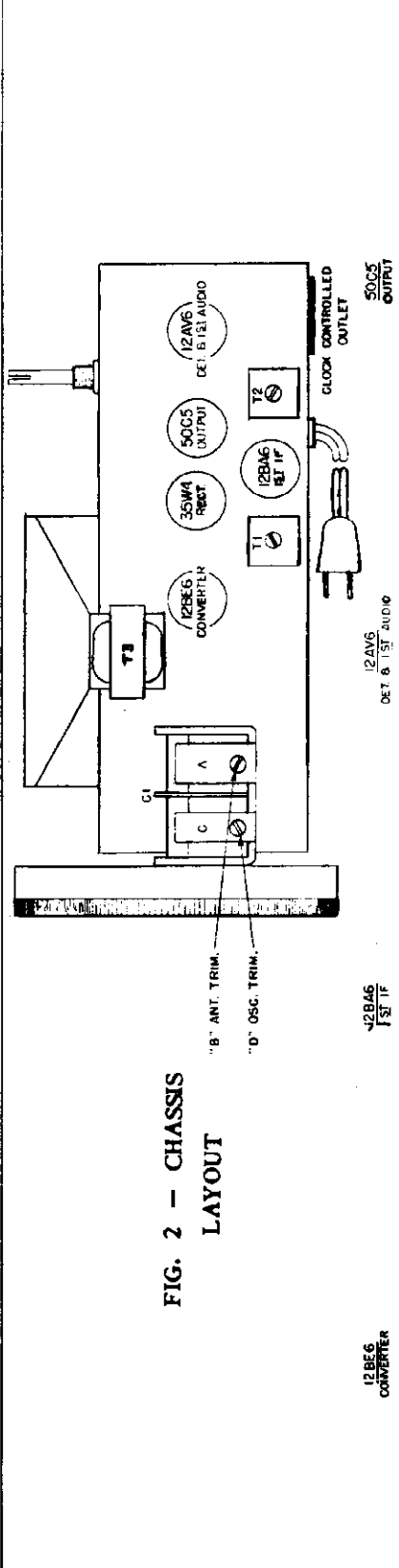


FIG. 2 - CHASSIS
LAYOUT

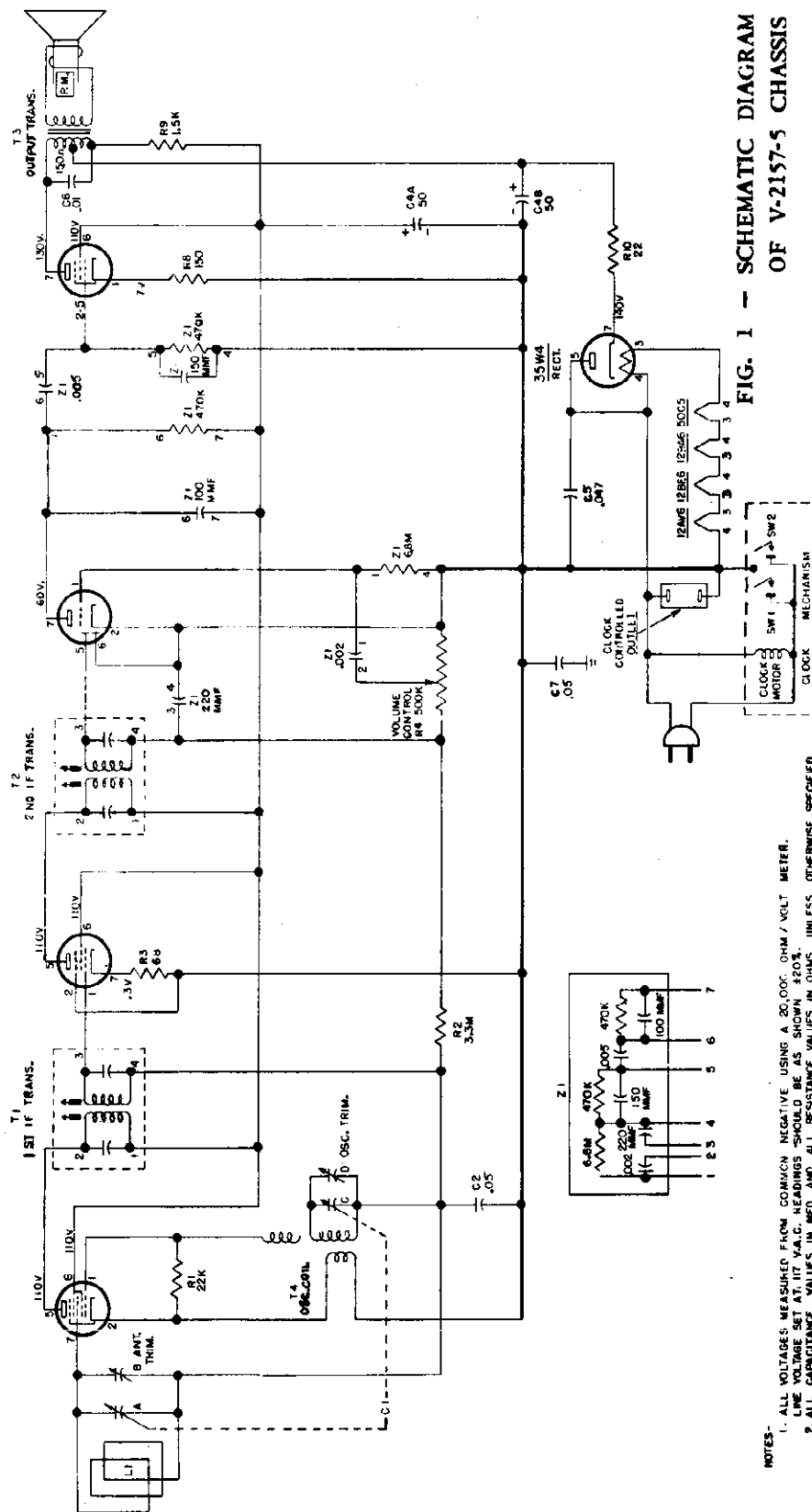


FIG. 1 - SCHEMATIC DIAGRAM
OF V-2157-5 CHASSIS

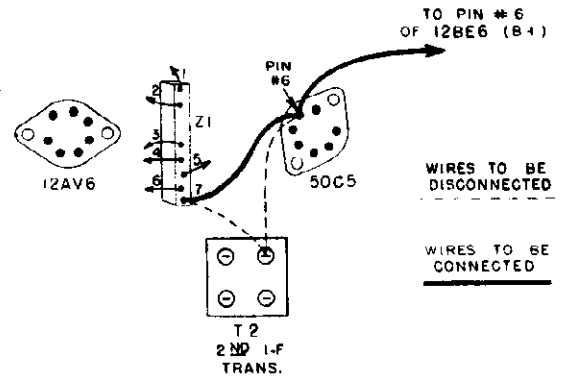
- NOTES-
1. ALL VOLTAGES MEASURED FROM COMMON NEGATIVE USING A 20,000 OHM/VOLT METER. THE METER MUST BE CALIBRATED AT 100.0 V.D.C. LEADINGS MUST BE SHOWN ON IT.
 2. ALL CAPACITANCE VALUES IN MFD. AND ALL RESISTANCE VALUES IN OHMS, UNLESS OTHERWISE SPECIFIED.

PRODUCTION CHANGES IN V-2157-5 CHASSIS

WIRING CHANGE TO PREVENT "MOTORBOATING" — In later production, a possible cause of motorboating is eliminated by a slight rearrangement of wiring. The changes, which are physical in nature and involve no schematic changes, are illustrated at the right. If motorboating occurs in a chassis that does not contain the change, proceed as follows:

1. Remove the wire that is connected between pin #6 of the 50C5 and the 2nd I-F transformer.
2. Disconnect lead #7 of the multiple capacitor and resistor assembly (Z1) from the 2nd I-F transformer, and connect it to pin #6 of the 50C5 socket.
3. Connect an insulated wire between pin #6 of the 50C5 socket and pin #6 of the 12BE6 socket.

INCREASE IN WATTAGE OF R10 — In later production, the wattage of R10 (22 ohms) is increased from 1/2 w. to 1 w. to prevent resistor burn-



BOTTOM VIEW OF V-2157-5 CHASSIS SHOWING CHANGE TO ELIMINATE "MOTORBOATING"

out. The part number of the 1 watt resistor is RC30AE220M, and its list price is \$0.10. The parts list should be changed accordingly.

PARTS LIST FOR MODELS H-355T5 AND H-356T5

When ordering parts, specify model number of set in addition to part number and description of part.

CABINET AND MISCELLANEOUS

Part No.	Description	List Price Each
V-1248-1	Cabinet, H-355T5 (less front grille, baffle and pointer)	\$5.75*
V-1248-2	Cabinet, H-356T5 (less front grille, baffle and pointer)	5.75*
V-5426	Clip, I-F mounting	.03
V-10783-2	Dial	.90
V-10782-1	Grille, front	.60
V-10784-1	Knob, volume (H-355T5)	.10
V-10784-2	Knob, volume (H-356T5)	.10
V-10774-4	Pointer (H-355T5)	.55
V-10774-5	Pointer (H-356T5)	.55
V-10052	Shield, chassis bottom	.45
V-9888-2	Socket, 12BE6, 50C5, 35W4	.12
V-9888-3	Socket, 12AV6, 12BA6	.14
V-5405	Socket, molded power (clock controlled AC)	.28
V-10079-2	Speaker, 4" PM (includes T3)	5.50*

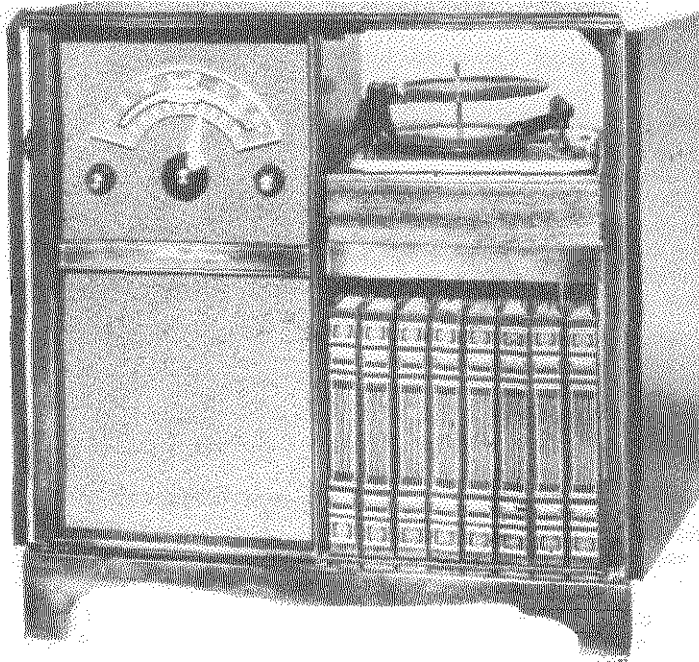
V-2157-5 CHASSIS

Ref. No.	Part No.	Description	List Price Each
C1	V-10788-1	Capacitor, variable	\$2.50
C2	RCP10W2503M	Capacitor, .05 mfd 200 v.	.20
C4	V-9991	Capacitor, electrolytic, 50-50 mfd 150 v.	1.65
C5	V-10157-4473M	Capacitor, .047 mfd 400 v.	.30
C6	RCP10W4103M	Capacitor, .01 mfd 400 v.	.20
C7	RCP10W4503M	Capacitor, .05 mfd 400 v.	.24
L1	V-10785-1	Loop, antenna	1.25*
R1	RC20AE223M	Resistor, 22,000 ohms 1/2 w.	.05
R2	RC20AE335M	Resistor, 3.3 megohm 1/2 w.	.05
R3	RC20AE680M	Resistor, 68 ohms 1/2 w.	.05
R4	V-9993-5	Control, volume, 500,000 ohms	.80
R8	RC20AE151M	Resistor, 150 ohms 1/2 w.	.06
R9	RC30AE152M	Resistor, 1500 ohms 1 w.	.30
R10	RC20AE220M	Resistor, 22 ohms 1/2 w.	.07
T1	V-9735-1	Transformer, I-F	1.25
T2	V-9735-1	Transformer, I-F	1.25
T3	V-10079-2	Transformer, audio (includes speaker)	5.50*
T4	V-9992	Transformer, oscillator	.55
Z1	V-10789-1	Multiple capacitor and resistor assembly	.90

*Price includes Federal Excise Tax

NOTE: All prices are subject to change without notice

MODEL H-357C10,
Ch. V-2180-5



SERVICE NOTES

SPECIFICATIONS

FREQUENCY RANGES:

Amplitude Modulation 540 to 1615 kc.
Frequency Modulation 88 to 108 mc.

1 6C4 Phase Inverter
2 6V6GT Output Amp.
1 5Y3GT Rectifier

INTERMEDIATE FREQUENCIES:

Amplitude Modulation 455 kc.
Frequency Modulation 10.7 mc.

POWER OUTPUT:

Undistorted 6.5 watts
Maximum 7.5 watts

TUBE COMPLEMENT:

1 6BJ6 RF Amplifier (FM)
1 12AT7 Mixer-osc.
2 6BA6 I-F Amp.
1 6AL5 Ratio Det. (FM)
1 6AV6 Det. and AVC (AM) and A-F Amp.

LOUDSPEAKER: 10" PM

OPERATING VOLTAGE:

..... 105 to 120 volts, 60 cycles AC

POWER CONSUMPTION (radio): 75 watts

ALIGNMENT BROADCAST BAND

Connect an output meter across the speaker voice coil.

While making the following adjustments, keep the volume control set for maximum output, the tone control set for maximum treble, and the signal generator output attenuated to avoid AVC action.

Step	Connect Signal Generator to —	Signal Generator Frequency	Radio Dial Setting	Adjust
1	Set the band switch to AM.			
2	Stator of tuning capacitor (A) through 0.1 mfd capacitor	455 kc.	minimum capacity	Pri. and sec. of T7 and T6 for max. output in order given
NOTE: If the I-F transformers are badly mis-aligned, it may be impossible to obtain sufficient output using the above system. In this event, it will be necessary to align each transformer separately. Start with the last I-F transformer and work forward, connecting the signal generator to the control grid of the tube preceding the transformer under alignment.				
3	Radiated signal (no actual connection)	1615 kc.	minimum capacity	AM osc. trimmer (D) for max. output
4	Radiated signal (no actual connection)	1400 kc.	tune to signal	AM ant. trimmer (B) for max. output (rock-in adjustment)

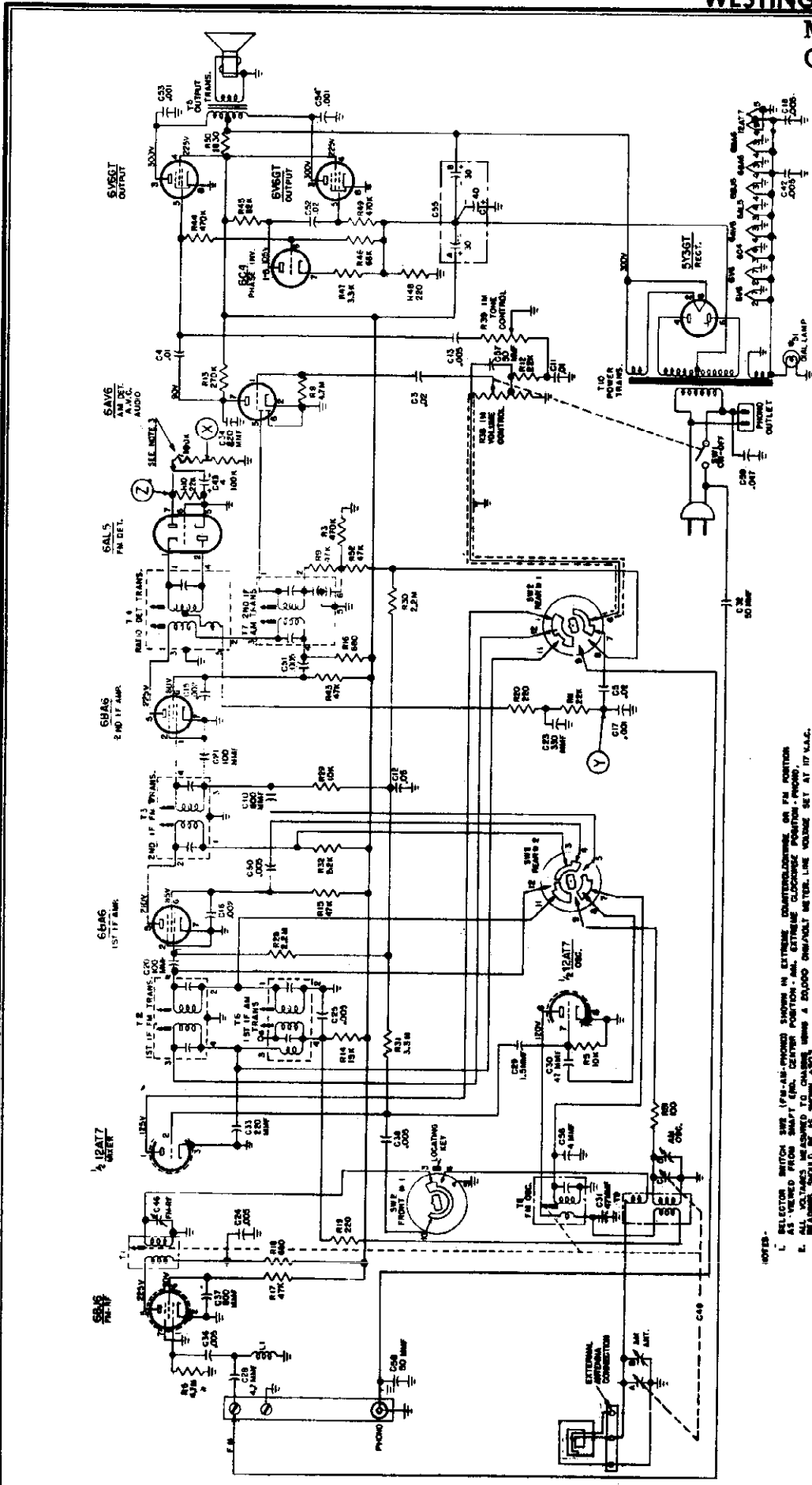


FIG. 1 - SCHEMATIC DIAGRAM OF V-2180-5 CHASSIS

- NOTES -
1. SELECTOR SWITCH SWR (FM-AM) SHOWN IN EXTREME COUNTERCLOCKWISE OR FM POSITION AS VIEWED FROM SWAYT END. CENTER POSITION - AM. EXTREME CLOCKWISE POSITION - PHONO.
 2. ALL VOLTAGES MEASURED TO CHASSIS UNLESS OTHERWISE SPECIFIED.
 3. TO BE INSTALLED FOR CUMULATIVE ONLY.
 4. ALL CAPACITANCE VALUES IN PFD. AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.

MODEL H-357C10,
Ch. V-2180-5

FM BAND

Do not align the FM circuits until all AM adjustments have been completed.

Step	Connect Signal Generator to —	Signal Generator Frequency	Radio Dial Setting	Adjust
1	Set the band switch to FM			
2	Connect two 100,000 ohm resistors (the resistances must be equal within 5 per cent) between pin No. 7 of the 6AL5 tube and ground as shown on the schematic diagram.			
3	Connect a V.T.V.M. between points "X" and "Y" (see schematic diagram).			
4	Pin No. 2 of 12AT7 through a .01 mfd mica capacitor	10.7 mc.	minimum capacity	Sec. of T4 for zero (use medium strength signal)
5	Connect the V.T.V.M. between point "Z" and ground			
6	Same as step 4	10.7 mc.	minimum capacity	Pri. of T4 and pri. and sec. of T3 and T2 for max.
7	Reconnect the V.T.V.M. between points "X" and "Y" and increase the signal strength 10 times.			
8	Same as step 4	10.7 mc.	minimum capacity	Recheck sec. of T4 for zero voltage
9	Reconnect the V.T.V.M. between point "Z" and ground			
10	Same as step 4	10.7 mc.	minimum capacity	Pri. of T4 for maximum voltage
11	Remove the two 100,000 ohm resistors that were inserted in step 2			
12	FM ant. terminal through a 300 ohm non-inductive resistor	98 mc.	98 mc.	FM osc. core for maximum voltage
13	Same as step 12	98 mc.	98 mc.	FM R-F trimmer (C46) for maximum voltage
14	Same as step 12	105 mc.	tune to signal	FM R-F core for maximum voltage
15	Same as step 12	90 mc.	tune to signal	FM R-F trimmer (C46) for maximum voltage (rock-in)
16	Recheck steps 14 and 15 for tracking			

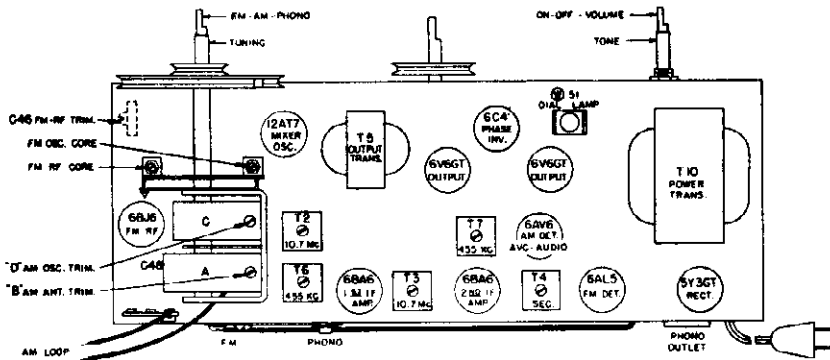


FIG. 2 - TOP VIEW OF CHASSIS

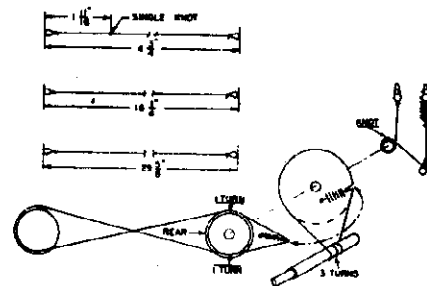


FIG. 3 - DIAL DRIVE

PARTS LIST FOR MODEL H-357C10

When ordering parts, specify model number of set in addition to part number and description of part.

CABINET AND MISCELLANEOUS

Part No.	Description	List Price Each		
V-1230-1	Cabinet	\$87.10**	V-9845-1	Cover, back (record changer) ..... .50
V-6415-4	Cable, phono pickup .....	.55	V-10308-1	Dial
V-4898-1	Catch, bullet .....	.06	V-8576	Doors, matched pair (less hardware) 35.00
V-5426	Clip, IF mounting .....	.03	V-8577	Drawer, record changer (complete) 12.50
V-3219S-1	Cord, dial drive (100' spool)	1.40	V-10604-1	Escutcheon, dial
				1.30

Part No.	Description	List Price Each	Ref. No.	Part No.	Description	List Price Each
V-10307-1	Grille assembly	5.00	C50	V-5596	Capacitor, .005 mfd	.25
V-9091-1	Hinge, upper L.H. and lower R.H.	.30	C51	V-5596	Capacitor, .005 mfd	.25
V-9091-2	Hinge, upper R.H. and lower L.H.	.30	C52	RCP10W4203M	Capacitor, .02 mfd 400 v.	.18
V-10338-1	Hub, pointer	.65	C53	RCP10W6102M	Capacitor, .001 mfd 600 v.	.18
V-9104-9	Knob, tuning (rear)	.20	C54	RCP10W6102M	Capacitor, .001 mfd 600 v.	.18
V-10408-5	Knob, band	.35	C55	V-10806-1	Capacitor, elec., 30-30 mfd 400 v. and 40 mfd 25 v.	3.00
V-10408-2	Knob, off-on-volume	.30	C56	R2CC20UJ040D	Capacitor, 4 mmf	.30
V-9104-10	Knob, tone (rear)	.25	C57	V-5658-10	Capacitor, 50 mmf	.13
No. 51	Lamp, pilot	.08	C58	V-5658-10	Capacitor, 50 mmf	.13
V-10808-1	Loop, AM antenna	\$ 1.50	C59	V-10157-4473M	Capacitor, .047 mfd 400 v.	.30
V-10318-2	Nameplate, Westinghouse	.60		V-9676-1	Core, FM tuning	.55
V-10310-1	Pointer, dial	.70	L1	V-10644-1	Reactor, RF	.15
V-4967	Pull, door	.60	R3	RC20AE474K	Resistor, 470,000 ohms 1/2 w.	.05
V-10815-1	Pulley and shaft assy., pointer	.50	R5	RC20AE103M	Resistor, 10,000 ohms 1/2 w.	.05
V-10357-1	Pulley assy., gang	.35	R6	RC20AE475M	Resistor, 4.7 megohms 1/2 w.	\$.05
V-10038-1	Shield, miniature tube (6BJ6)	.06	R8	RC20AE475M	Resistor, 4.7 megohms 1/2 w.	.05
V-10649-1	Shield, miniature tube (12AT7)	.30	R9	RC20AE473M	Resistor, 47,000 ohms 1/2 w.	.05
V-10133-2	Socket, miniature wafer (12AT7)	.60	R10	RC20AE223K	Resistor, 22,000 ohms 1/2 w.	.06
V-3246S	Socket, octal wafer (6V6GT)	.21	R11	RC20AE223M	Resistor, 22,000 ohms 1/2 w.	.05
V-9888-1	Socket, miniature wafer (all 7-pin tubes)	.13	R12	RC20AE223M	Resistor, 22,000 ohms 1/2 w.	.05
V-4514-1	Socket, molded octal (5Y3GT)	.17	R13	RC20AE274K	Resistor, 270,000 ohms 1/2 w.	.06
V-5405	Socket, phono AC	.28	R14	RC30AE153K	Resistor, 15,000 ohms 1 w.	.11
V-10809-1	Socket, pilot lamp	.35	R15	RC20AE473M	Resistor, 47,000 ohms 1/2 w.	.05
V-9770-1	Speaker, 10" PM	8.00**	R16	RC20AE681M	Resistor, 680 ohms 1/2 w.	.06
V-6795-3	Spring, dial drive	.03	R17	RC20AE473M	Resistor, 47,000 ohms 1/2 w.	.05
V-4900-1	Strike, bullet	.03	R18	RC20AE681M	Resistor, 680 ohms 1/2 w.	.06
V-6136	Terminal board, antenna-phono	.26	R19	RC20AE221M	Resistor, 220 ohms 1/2 w.	.05
			R20	RC20AE221M	Resistor, 220 ohms 1/2 w.	.05
			R28	RC20AE225M	Resistor, 2.2 megohms 1/2 w.	.06
			R29	RC20AE103M	Resistor, 10,000 ohms 1/2 w.	.05
			R30	RC20AE225M	Resistor, 2.2 megohms 1/2 w.	.06
			R31	RC20AE335M	Resistor, 3.3 megohms 1/2 w.	.05
			R32	RC20AE222M	Resistor, 2200 ohms 1/2 w.	.05
			R38	V-10330-2	Control, volume, 1 meg. (assy consists of R38, R39 & SW1)	2.35
			R39	V-10330-2	Control, tone, 1 meg. (assy consists of R38, R39 & SW1)	2.35*
			R43	RC20AE473M	Resistor, 47,000 ohms 1/2 w.	.05
			R44	RC20AE474M	Resistor, 470,000 ohms 1/2 w.	.04
			R45	RC20AE823K	Resistor, 82,000 ohms 1/2 w.	.05
			R46	RC20AE683K	Resistor, 68,000 ohms 1/2 w.	.05
			R47	RC20AE332J	Resistor, 3300 ohms 1/2 w.	.15
			R48	RC40AE221K	Resistor, 220 ohms 2 w.	.20
			R49	RC20AE474M	Resistor, 470,000 ohms 1/2 w.	.04
			R50	V-6984-16	Resistor, 1830 ohms 5 w.	.35
			R51	RC20AE101M	Resistor, 100 ohms 1/2 w.	.05
			R52	RC20AE473M	Resistor, 47,000 ohms 1/2 w.	.05
			*SW1	V-10330-2	Switch, on-off (assy consists of R38, R39 and SW1)	2.35
			SW2	V-10810-1	Switch, FM-AM-PHONO selector	2.55
			T1	V-10642-1	Transformer, FM RF	.85
			T2	V-9688	Transformer, 1st FM IF	1.50
			T3	V-9642	Transformer, 2nd FM IF	1.50
			T4	V-9828	Transformer, ratio detector	2.05
			T5	V-10813	Transformer, audio	2.00
			T6	V-10619	Transformer, 1st AM IF	2.20
			T7	V-10350-1	Transformer, 2nd AM IF	1.35
			T8	V-10643-1	Transformer, FM oscillator	1.30
			T9	V-10944-1	Transformer, AM oscillator	.90
			T10	V-10811	Transformer, power (replacement for V-6667 or V-10811)	11.10

V-2180-5 CHASSIS

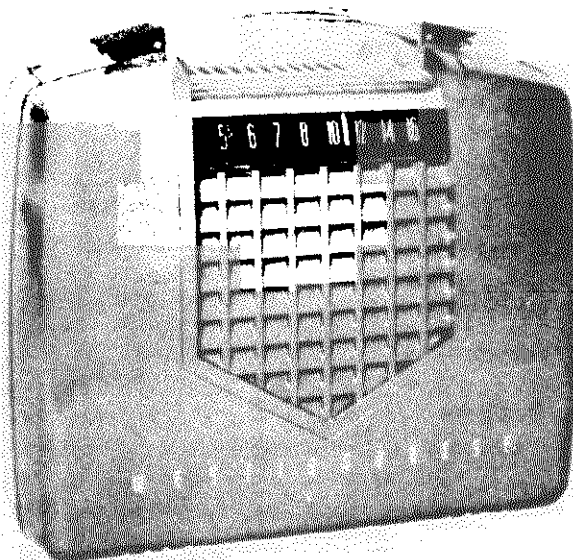
Ref. No.	Part No.	Description	List Price Each
C3	RCP10W2203M	Capacitor, .02 mfd 200 v.	\$.20
C4	RCP10W2103M	Capacitor, .01 mfd 200 v.	.20
C5	RCP10W2203M	Capacitor, .02 mfd 200 v.	.20
C10	V-9863-1	Capacitor, 800 mmf	.20
C11	RCP10W4103M	Capacitor, .01 mfd 400 v.	.20
C12	RCP10W2503M	Capacitor, .05 mfd 200 v.	.20
C13	RCP10W4502M	Capacitor, .005 mfd 400 v.	.17
C15	RCP10W6202M	Capacitor, .002 mfd 600 v.	.17
C16	RCP10W6202M	Capacitor, .002 mfd 600 v.	.17
C17	RCP10W6102M	Capacitor, .001 mfd 600 v.	.17
C18	V-5596	Capacitor, .005 mfd	.25
C20	R4CC21YY101M	Capacitor, 100 mmf	.19
C21	R4CC21YY101M	Capacitor, 100 mmf	.19
C23	RCM30A331M	Capacitor, 330 mmf	.25
C24	V-5596	Capacitor, .005 mfd	.25
C25	V-5596	Capacitor, .005 mfd	.25
C28	V-9926-3	Capacitor, 4.7 mmf	.07
C29	V-5658-9	Capacitor, 1.5 mmf	.07
C30	R2CC30RK470K	Capacitor, 47 mmf	.30
C31	V-10710-1	Capacitor, 47 mmf	.19
C32	V-5658-10	Capacitor, 50 mmf	.13
C33	V-10710-2	Capacitor, 220 mmf	.19
C34	V-10710-2	Capacitor, 220 mmf	.19
C36	V-5596	Capacitor, .005 mfd	.25
C37	V-9863-1	Capacitor, 800 mmf	.20
C38	V-5596	Capacitor, .005 mfd	.25
C42	V-5596	Capacitor, .005 mfd	.25
C43	V-4637	Capacitor, elec. 4 mfd 50 v.	.85
C46	V-10640-1	Capacitor, FM RF trimmer	.25
C48	V-10662-1	Capacitor, variable (A, B, C and D)	2.95

*Sold only as complete assembly. Price shown covers complete assembly.

**Price includes Federal Excise Tax.

NOTE: All prices are subject to change without notice.

MODELS H-331P4U, -333P4U, Ch. V-2164-U



SPECIFICATIONS

FREQUENCY RANGE: 540 to 1615 kc.

INTERMEDIATE FREQUENCY: 455 kc.

TUBE COMPLEMENT:

- 1 1R5 Converter
- 1 1U4 I-F Amp.
- 1 1U5 Det., AVC and 1st A-F Amp.
- 1 3V4 Power Output Amp.

POWER OUTPUT:

Maximum 0.23 watt
 Undistorted 0.12 watt

POWER SUPPLY:

Battery Operation:

- 1 "A" Battery (4.5 v.) — Eveready 736, Ray-O-Vac P93A, or Burgess F3
- 1 "B" Battery (90 v.) — Eveready 490, Ray-O-Vac 4390, or Burgess N60

Line Operation:

105 to 120 volts, 50 - 60 cycles A-C; or D-C

CURRENT CONSUMPTION (Battery Operation):

- "A" Battery 0.1 Amp.
- "B" Battery 0.014 Amp.

POWER CONSUMPTION (Line Operation):

..... 15 watts

POWER CORD PLUG. FOR BATTERY OPERATION THIS PLUG MUST BE INSERTED AS SHOWN. FOR OPERATION ON HOUSE CURRENT THIS PLUG MUST BE INSERTED INTO AN ELECTRIC OUTLET.

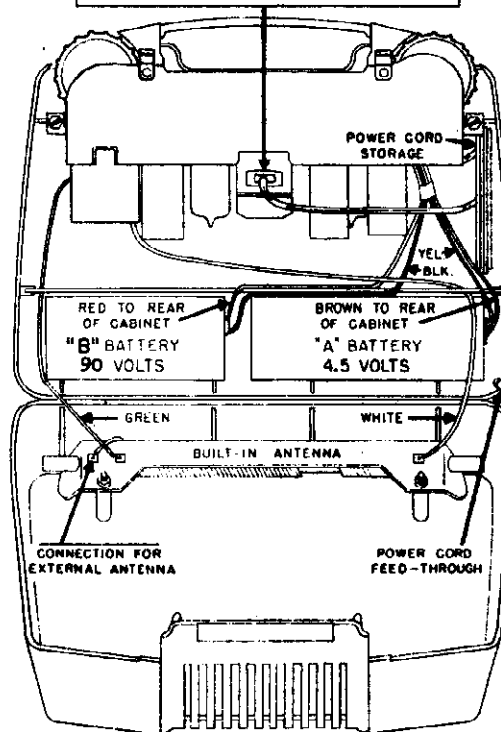


FIG. 1 — REAR VIEW WITH COVER OPEN

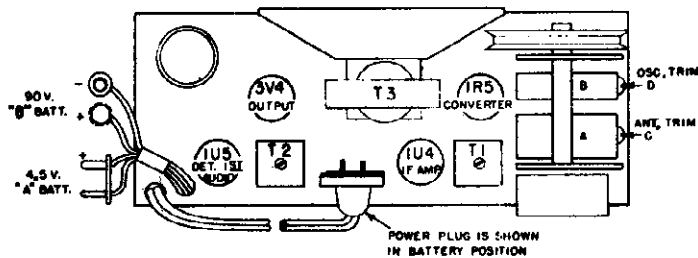


FIG. 2 — CHASSIS LAYOUT

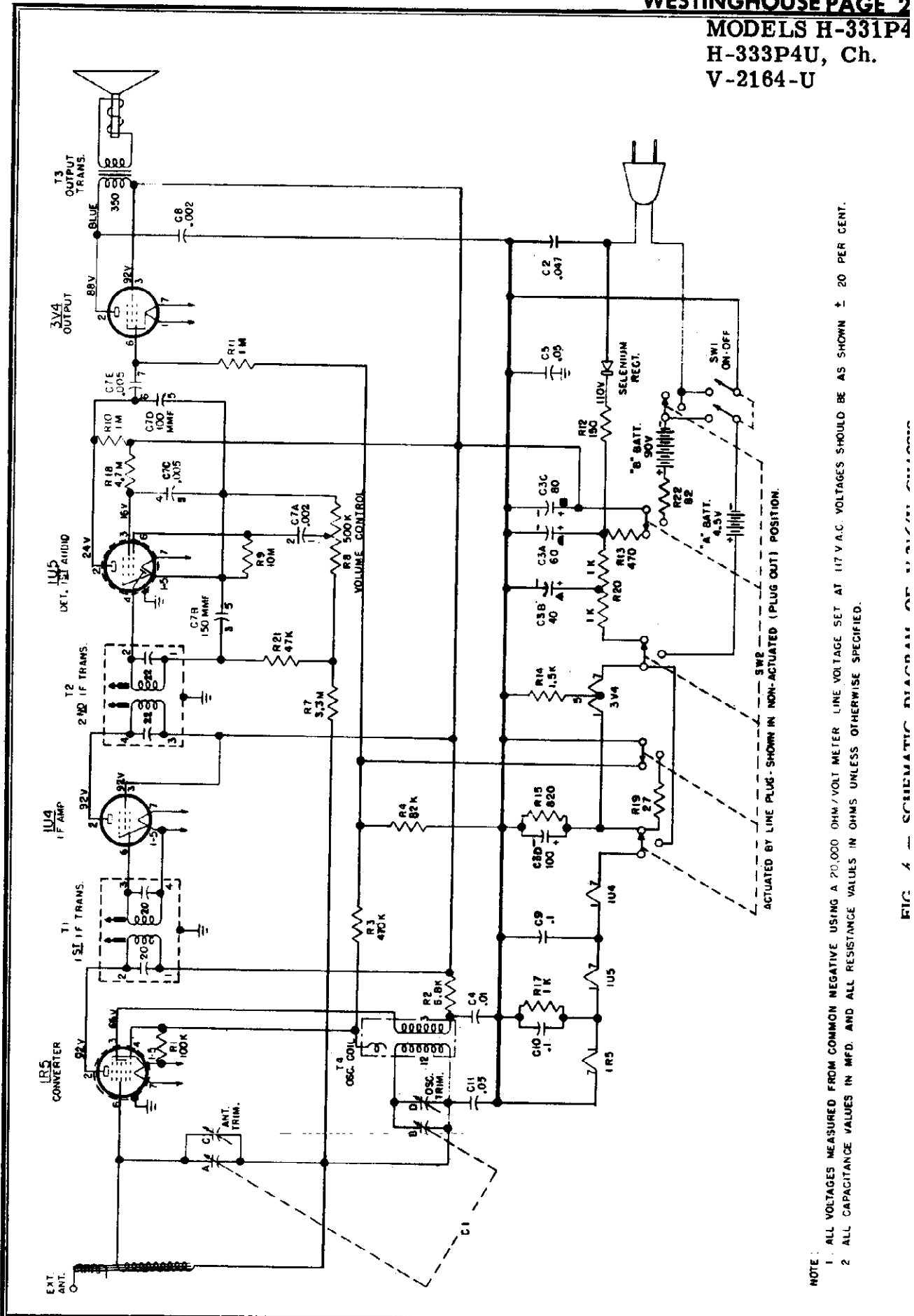
ALIGNMENT

It is recommended that the chassis be isolated from the power line by means of an isolation transformer.

While making the following adjustments, keep the volume control set for maximum output and the signal generator output attenuated to avoid AVC action.

Step	Connect Signal Generator to —	Signal Generator Frequency	Radio Dial	Adjust for Maximum Output —
1	Stator of R-F tuning capacitor (A) through a 0.1 mfd	455 kc.	minimum capacity	Top and bottom slugs in 2nd and 1st I-F trans. in order given*
2	Same as step 1	1615 kc.	minimum capacity	Osc. trimmer (D)
3	Radiated Signal	1400 kc.	1400 kc.	Ant. trimmer (C)

*It is recommended that a fiber aligning tool that snugly fits the slot in the powdered iron core be used to prevent chipping of the slot.



NOTE:
 1. ALL VOLTAGES MEASURED FROM COMMON NEGATIVE USING A 20,000 OHM/VOLT METER. LINE VOLTAGE SET AT 117 V A.C. VOLTAGES SHOULD BE AS SHOWN ± 20 PER CENT.
 2. ALL CAPACITANCE VALUES IN MFD. AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.

FIG. 4 - SCHEMATIC DIAGRAM OF RECEIVER

MODELS H-331P4U, H-333P4U, Ch. V-2164-U

PARTS LIST FOR MODELS H-331P4U AND H-333P4U

When ordering parts specify model number of set in addition to part number and description of part.

Ref. No.	Part No.	Description	Part No.	Description
C1	V-10417-1	Capacitor, variable (A, B, C, and D)		
C2	V-10157-4473M	Capacitor, .047 mfd 400 v.		
C3	V-6552-2	Capacitor, electrolytic (A, B, C and D)		
C4	V-9863-3	Capacitor, .01 mfd	V-6120-5	Background, dial
C5	RCP10W2503M	Capacitor, .05 mfd 200 v.	V-1234-2	Cabinet, H-331P4U (green)
C8	V-9863-2	Capacitor, .002 mfd	V-1234-3	Cabinet, H-333P4U (brown)
C9	RCP10W2104M	Capacitor, .1 mfd 200 v.	V-10416-1	Cable assembly, battery
C10	RCP10W2104M	Capacitor, .1 mfd 200 v.	V-5426	Clip, IF mounting
C11	RCP10W2503M	Capacitor, .05 mfd 200 v.	V-4349-4	Cord, AC power
	V-9446-2	Rectifier, selenium	V-3219S-1	Cord, dial (100' spool)
R1	RC20AE104M	Resistor, 100,000 ohms 1/2 w	V-10853-1	Escutcheon, dial
R2	RC20AE682M	Resistor, 6800 ohms 1/2 w	V-10438-1	Handle
R3	RC20AE474M	Resistor, 470,000 ohms 1/2 w	V-10420-1	Knob, H-331P4U
R4	RC20AE823K	Resistor, 82,000 ohms 1/2 w	V-10420-2	Knob, H-333P4U
R7	RC20AE335M	Resistor, 3.3 megohms 1/2 w	V-10921-1	Loop, antenna (iron core)
R8	V-9993-3	Control, volume, 500,000 ohms (consists of R8 and SW1)	V-10422-2	Pointer, dial
R9	RC20AE106M	Resistor, 10 megohms 1/2 w	V-4169-2	Shield, tube (1R5, 1U5)
R10	RC20AE105M	Resistor, 1 megohms 1/2 w	V-9888-3	Socket, miniature wafer (all tubes)
R11	RC20AE105M	Resistor, 1 megohms 1/2 w	V-10401-1	Speaker, 4" PM (includes T3)
R12	V-6067-8	Resistor, 150 ohms 4 w	V-5687	Spring, back cover hinge
R13	RC20AE471K	Resistor, 470 ohms 1/2 w	V-6795-3	Spring, dial drive
R14	RC20AE152K	Resistor, 1500 ohms 1/2 w		
R15	RC20AE821K	Resistor, 820 ohms 1/2 w		
R17	RC20AE102M	Resistor, 1000 ohms 1/2 w		
R18	RC20AE475M	Resistor, 4.7 megohm 1/2 w		
R19	RC20AE270K	Resistor, 27 ohms 1/2 w		
R20	V-10435-2	Resistor, ballast, 2000 ohms		
R21	RC20AE473M	Resistor, 47,000 ohms 1/2 w		
R22	RC20AE820K	Resistor, 82 ohms 1/2 w		
SW1	V-9993-3	Switch, on-off (consists of R8 and SW1)		
SW2	V-10426-1	Switch, line-battery		
T1	V-6972-5	Transformer, 1st IF		
T2	V-6972-6	Transformer, 2nd IF		
T3	V-10401-1	Transformer, audio output		
T4	V-5661-2	Transformer, oscillator		

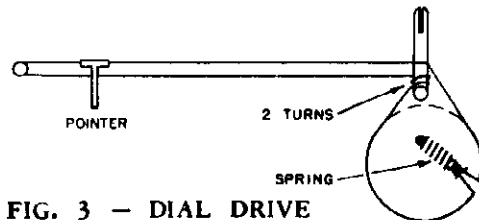


FIG. 3 - DIAL DRIVE

MODELS H-331P4U AND H-333P4U

The following changes are incorporated in later production of the V-2164U chassis:

1. To improve the operation of the HF oscillator at low line voltage, the dropping resistor for the pin #3 grid of the 1R5 tube (R2) is changed to 22,000 ohms, and the grid return resistor for the 1R5 and 3V4 tubes (R4) is changed to 150,000 ohms.

2. An improved line-battery switch (SW2) is used in later production. In chassis containing the improved switch which is designated V-10426-2, the 82 ohm resistor (R22) in series with the positive lead of the B battery is not used, and the battery is connected directly to the switch.

3. To prevent B battery leakage when the line plug is inserted for battery operation and the on-off switch is in off position, the connecting points for the negative lead from the A battery and the negative lead from the B battery are interchanged. The negative lead from the B battery now connects to the point where the A battery negative lead previously connected, and vice versa.

The parts list should be changed to read as follows:

R2	RC20AE223M	Resistor, 22,000 ohms 1/2 w	\$.05
R4	RC20AE154M	Resistor, 150,000 ohms 1/2 w	.04
SW2	V-10416-2	Switch, line-battery	1.15

MODELS H-331E
H-332P4, H-333E
Ch. V-2164

MODELS H-331P4U AND H-333P4U

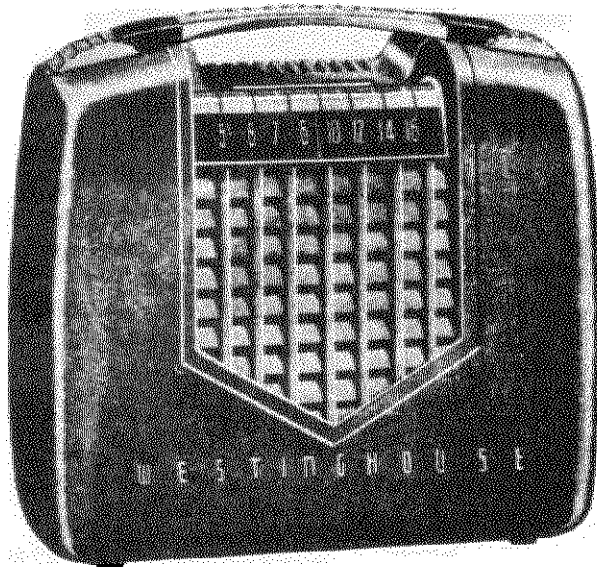
The following changes are included in later production:

1. In some chassis, a 12 mmf capacitor (C12) is added in parallel with the antenna tuning section of the variable capacitor (C1) to assure that the antenna circuit can be aligned correctly.
2. C10, connected from common negative to the filaments of the 1R5 and 1U5, is removed from the chassis.

3. The suffix "U" is removed from the model number and the chassis number. This change does not indicate a change in either the model or the chassis; e.g., model H-331P4 is the same as model H-331P4U and chassis V-2164 is the same as chassis V-2164U.

The following items should be added to the parts list:

- | | |
|------------------|---|
| C7 V-9703-1 | Capacitor, multiple (consists of A, B, C, and D) \$. |
| C12 R3CC20SL120K | Capacitor, 12 mmf |



MODEL H-332P4

(MAROON)

CHASSIS V-2164

SERVICE NOTES

For service information on Model H-332P4, refer to the H-331P4U and H-333P4U service notes and any supplementary information thereto. With the exception of coloring, Model H-332P4 is the same as Model H-331P4U and H-333P4U.

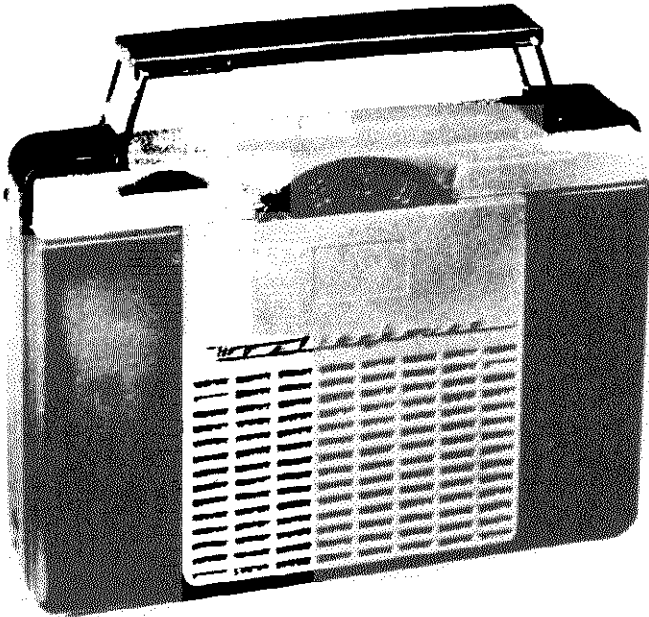
The cabinet and knob for Model H-332P4 are listed below. Other parts for this model are the same as those listed in the H-331P4U and H-333P4U service notes.

Part No.	Description	List Price Each
✚ V-1234-4	Cabinet, H-332P4 (maroon)	\$ 6.50*
✚ V-10420-3	Knob, H-332P4	.20

✚ New part number listed for the first time in Westinghouse radio or television service information.
* Price includes Federal Excise Tax.

NOTE: All prices are subject to change without notice.

MODELS H-414P4,
H-415P4, Ch. V-2182-2



SERVICE NOTES

SPECIFICATIONS

FREQUENCY RANGE: 540 to 1600 kc.

INTERMEDIATE FREQUENCY: 455 kc.

TUBE COMPLEMENT:

- 1 1R5 Converter
- 1 1U4 IF Amplifier
- 1 1U5 Det., AVC and 1st AF Amp.
- 1 3V4 Power Output Amp.

BATTERIES:

- 1 "A" Battery (1.5 v.), Size D - Eveready 950, Burgess No. 2, or Ray-O-Vac No. 2.
- 1 "B" Battery (67.5 v.) - Eveready 467, Burgess XX45, or Ray-O-Vac 4367

CURRENT CONSUMPTION:

- "A" Battery 0.25 amp.
- "B" Battery008 amp.

POWER OUTPUT:

- Undistorted075 watt
- Maximum18 watt

LOUDSPEAKER: 2" x 3" PM

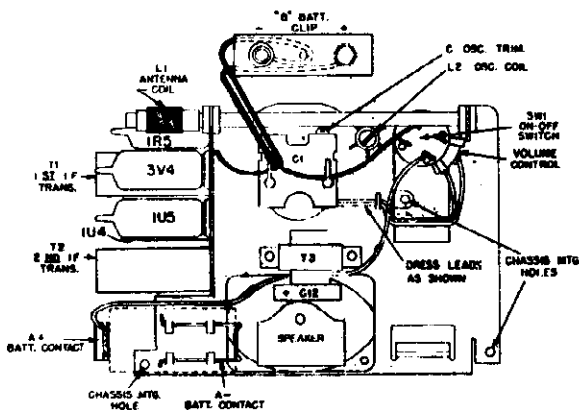


FIG. 2 - REAR VIEW OF
V-2182-2 CHASSIS



FIG 3 - TOOL REQUIRED
FOR IF ALIGNMENT

For service information on Model H-415P4, refer to the H-414P4 service notes and any supplementary information thereto. With the exception of the cabinet color, Model H-415P4 is the same as Model H-414P4.

ALIGNMENT

While making the following adjustments keep the volume control set for maximum output and the signal generator output attenuated to avoid AVC action.

Step	Connect Signal Generator to --	Signal Generator Frequency	Radio Dial	Adjust for Maximum Output --
1	Stator of RF section of tuning capacitor C1 through a .01 mfd capacitor.	455 kc.	Minimum capacity	Top and bottom slugs of 2nd and 1st IF transformers in order given. SEE NOTE.
2	Radiated signal	1400 kc.	1400 kc.	Osc. trimmer "C" (rock-in)
3	Radiated signal	600 kc.	600 kc.	Slug in osc. coil (L2) (rock-in)
4	Repeat steps 2 and 3			

NOTE: An aligning tool with a slender shaft and a hex head is required to align the IF transformers. A suitable tool is illustrated in Fig. 3. The bottom slugs as well as the top slugs are adjusted from the top of the transformers. To reach the bottom slugs, insert the slender shaft end of the aligning tool all the way through the top slug.

REMOVAL OF PARTS

TO REMOVE BACK COVER -- Insert the edge of a coin into the slot in the bottom of the cabinet, and twist the coin.

TO REMOVE FIRST IF TRANSFORMER --

1. Lift antenna (L1) from its mounts and lay it to one side.
2. Remove the leads from under the clamps on the back of the tuning capacitor. **NOTE:** Be sure to dress the wires back in their original positions when parts are remounted -- see LEAD DRESS.
3. Dismount the tuning capacitor, C1, by removing its three mounting screws.
4. Disconnect the wires from the 1st IF transformer.
5. Unsolder and bend the transformer mounting lugs, and lift out the transformer.

TO REMOVE SECOND IF TRANSFORMER --

1. Disconnect the wires from the 2nd IF transformer.
2. Unsolder and bend the transformer mounting lugs, and lift out the transformer.

LEAD DRESS

To prevent feedback, the leads from the volume control must be dressed away from the audio output transformer and its plate lead. The plate lead must be dressed under the clip on the rear of the tuning capacitor. See Fig. 2.

The "R" battery leads should be dressed close to the chassis and should run under the clinon at the rear of the

H-415P4 CABINET PARTS

MODELS H-414P4,
H-415P4, Ch. V-2182

Part No.	Description	List Price Each
∠ V-1267-5	Cabinet assy., includes back cover, handle, clips and grill cloth.	*
V-11167-2	Clip, handle	.06
∠ V-8709	Cover, back	*
∠ V-11111-5	Dial	.23
∠ V-11110-5	Handle, less clips	*
∠ V-11112-5	Knob, off-on-volume. Add to V-2182-2	
	Chassis parts list.	.23
∠ V-5662-3	Cable, "B" Battery	*

PARTS LIST FOR MODEL H-414P4

Cabinet and Miscellaneous		List Price Each
∠ V-1267-4	Cabinet	**
V-11167-2	Clip, handle	.06
V-11127-1	Contact, A ∠ battery	.06
V-11136-1	Contact, A-battery	.06
V-11111-4	Dial	**
V-11110-4	Handle	**
V-11112-4	Knob	**
V-11142-1	Socket 7Pin miniature molded (1U5 and 3V4)	.17
V-11142-2	Socket 7Pin miniature molded (1R5 and 1U4)	.17
V-11135-1	Speaker, "2x3" oval P.M.	5.75*

V-2182-2 CHASSIS

C1 V-11126-1	Capacitor, variable (A, B, and C)	2.50
C2 V-5596	Capacitor, .005 mfd.	.25
C3 V-10710-4	Capacitor, 4 mmf.	.17
C4 V-9863-4	Capacitor, .0015 mfd.	.20
C5 RC10W2503M	Capacitor, .05 mfd 200V	.20
C7 V-10710-5	Capacitor, 100 mfd.	.17
C8 V-5596	Capacitor, .005 mfd.	.25
C9 V-10710-5	Capacitor, 100 mmf.	.17
C10 V-9863-2	Capacitor, .002 mfd.	.20
C11 V-9863-2	Capacitor, .002 mfd.	.20
C12 V-6321-2	Capacitor, 10 mfd. 90V	1.05
∠ L1 V-11132-2	Loop, antenna (iron core)	**
L2 V-11128-1	Coil, oscillator	.95
R1 RC20AE104K	Resistor, 100,000 ohm ½W	.05
R2 RC20AE153K	Resistor, 15,000 ohms ½W	.05
R3 RC20AE475M	Resistor, 4.7 megohms ½W	.05
R4 RC20AE335M	Resistor, 3.3 megohms ½W	.05
R5 RC20AE473M	Resistor, 47,000 ohms ½W	.05
R6 V-11129-1	Control, volume, 2 megohms (Consists of R6 and SW. 1)	1.20
R7 RC20AE475M	Resistor, 4.7 megohms ½W	.05
R9 RC20AE105M	Resistor, 1 megohms ½W	.05
R10 RC20AE335M	Resistor, 3.3 megohms	.05
R11 RC20AE391K	Resistor, 390 ohms ½W	.08
T1 V-11138-1	Transformer, 1st IF	1.65
T2 V-11138-2	Transformer, 2nd IF	1.65
T3 V-11139-1	Transformer, Audio output	2.00

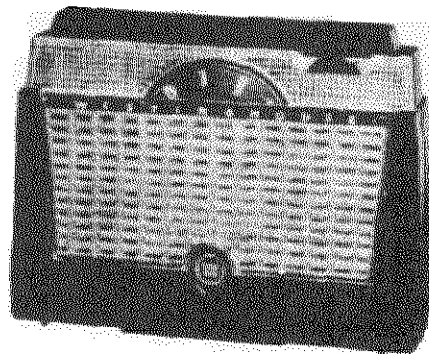
∠ New Part listed for first time in Westinghouse Television or Radio service information.

* Includes Federal Excise Tax.

** Price Furnished on Request.

NOTE: All prices subject to change without notice.

MODELS H-409P4,
H-410P4, H-411P4,
Ch. V-2185-1



CHASSIS V-2185-1

MODEL H-377

AC POWER SUPPLY (OPTIONAL)

SERVICE NOTES

SPECIFICATIONS

FREQUENCY RANGE: 540 to 1600 kc.

INTERMEDIATE FREQUENCY: 455 kc.

TUBE COMPLEMENT:

- 1 1R5 Converter
- 1 1U4 IF Amplifier
- 1 1U5 Det., AVC and 1st AF Amp.
- 1 3V4 Power Output Amp.

POWER OUTPUT:

Battery Operation:

Undistorted075 watt
Maximum18 watt

Line Operation (with H-377 power supply):

Undistorted12 watt
Maximum22 watt

LOUDSPEAKER: 3½" x 3½" PM

BATTERIES:

"A" Battery (1.5 v.), Size G — Ray-O-Vac No. 8R, Burgess No. 21R, Eveready No. 964, or General No. 77.

NOTE: Smaller 1.5 v. (size D) batteries can be used as "A" batteries by rotating the A+ battery contact 180 degrees (see Fig. 2). Batteries recommended are Ray-O-Vac No. 2, Burgess No. 2R, or Eveready No. 950.

"B" Battery (67.5 v.) — Ray-O-Vac No. 946, Burgess No. P45, or Eveready No. 477.

LINE VOLTAGE (H-377 POWER SUPPLY):

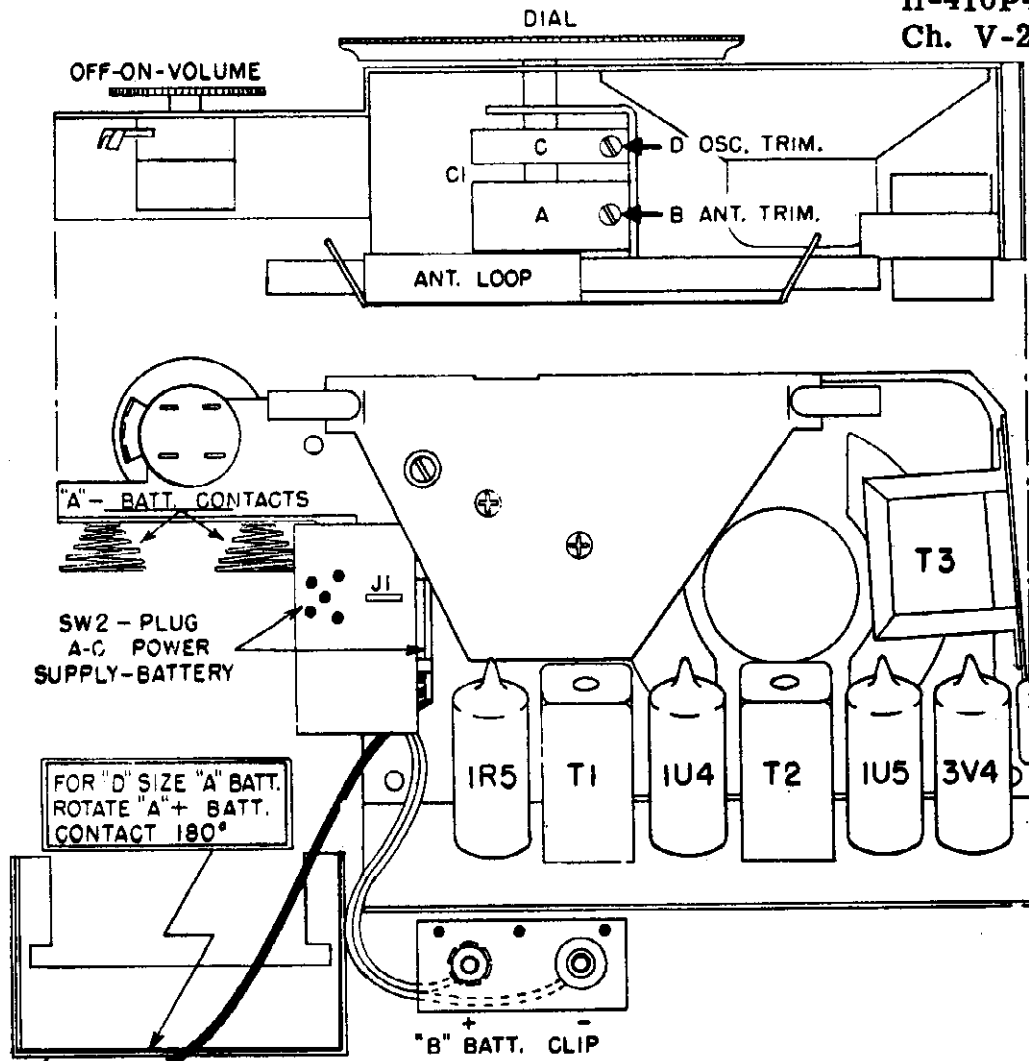
..... 105 to 120 volts, 50 to 60 cycles AC

CURRENT CONSUMPTION:

"A" Battery 0.25 amp.
"B" Battery008 amp.

POWER CONSUMPTION (H-377 POWER SUPPLY):

..... 4 watts



REAR VIEW OF V-2185-1 CHASSIS

ALIGNMENT

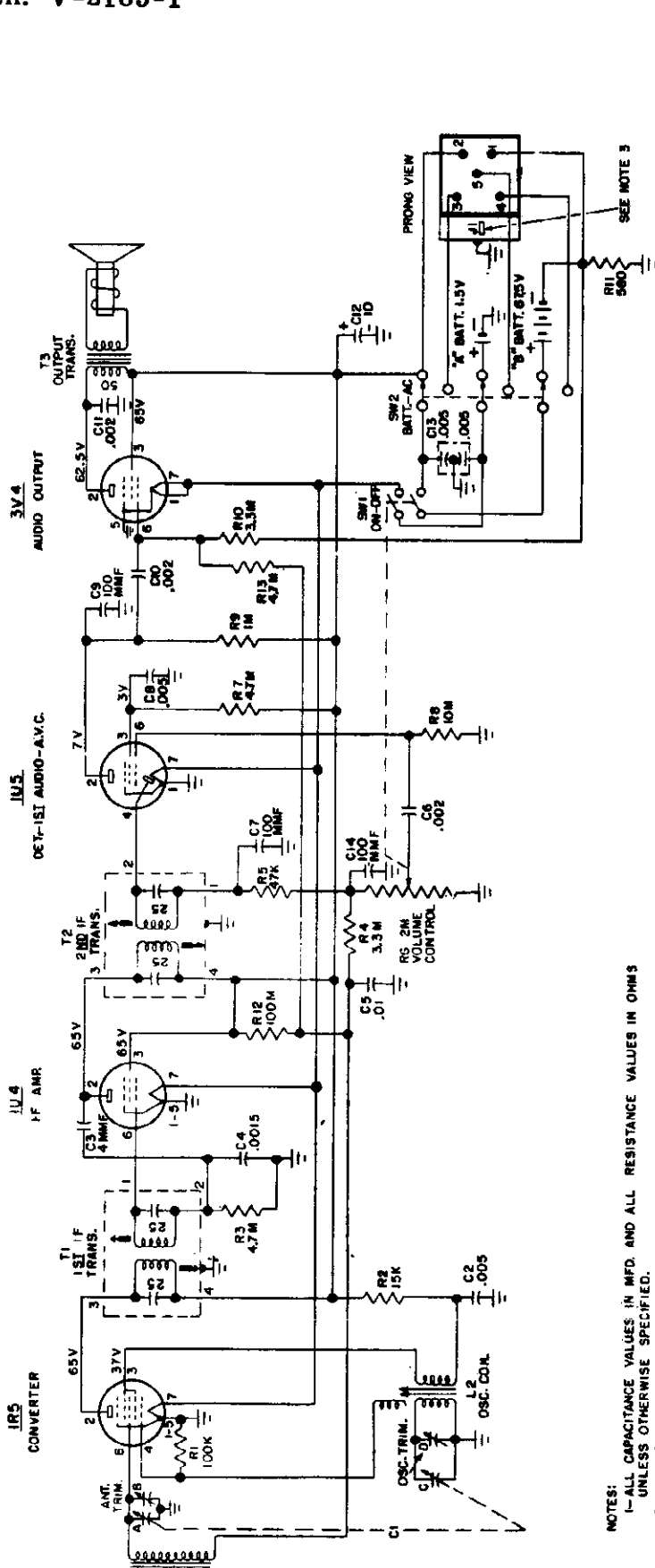
While making the following adjustments keep the volume control set for maximum output and the signal generator output attenuated to avoid AVC action.

Step	Connect Signal Generator to —	Signal Generator Frequency	Radio Dial	Adjust for Maximum Output —
1	Stator of RF section of tuning capacitor C1 through a .01 mfd capacitor	455 kc.	Minimum capacity	Top and bottom slugs of 2nd and 1st IF transformers in order given. SEE NOTE.
2	Radiated signal	1625 kc.	1625 kc.	Osc. trimmer "D" (rock-in)
3	Radiated signal	1400 kc.	1400 kc.	Ant. trimmer "B"
4	Repeat steps 2 and 3			

NOTE: When adjusting the IF transformers, it is recommended that a fiber aligning tool which snugly fits the slot in the powdered iron core be used to prevent chipping of the slot.

TO REMOVE BACK COVER — Insert the edge of a coin into the slot in the top of the cabinet, and twist the coi

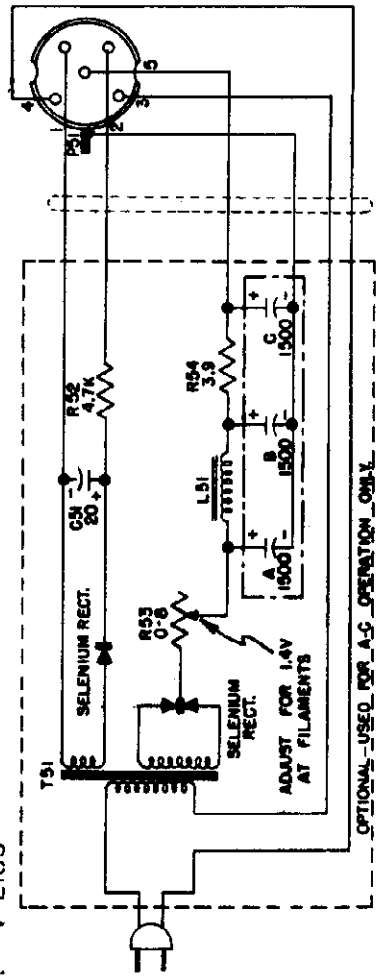
MODELS H-409P4,
H-410P4, H-411P4,
Ch. V-2185-1



SCHMATIC DIAGRAM

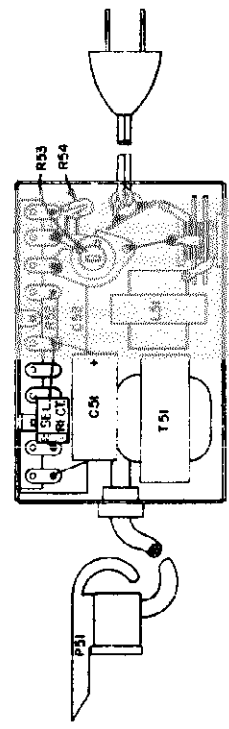
CHASSIS NO. V-2185

- NOTES:
- 1- ALL CAPACITANCE VALUES IN MFD. AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.
 - 2- ALL VOLTAGES MEASURED FROM CHASSIS (GND.) USING A 20,000 OHM/VOLT METER. VOLTAGES SHOWN ARE BATTERY READINGS AND SHOULD BE ± 20 PER CENT.
 - 3- SW2 ACTUATED BY BLADE (P51) ON FEMALE PLUG OF AUXILIARY POWER SUPPLY THROUGH J4.



SCHMATIC DIAGRAM

H-377



MODEL H-377 AC POWER SUPPLY

MODELS H-409P4
H-410P4, H-411P4
Ch. V-2185-1

PARTS LIST FOR MODELS H-409P4, H-410P4 AND H-411P4

When ordering parts, specify model number of set in addition to part number and description of part.

CABINET AND MISCELLANEOUS

Part No.	Description	List Price Each	Part No.	Description	List Price Each
✦ V-11949-1	Cabinet assy. (H-409P4), includes back cover, handle, baffle and grille cloth	\$ **	✦ V-8655	Cover assy., back (H-411P4)	\$ **
✦ V-11949-2	Cabinet assy. (H-410P4), includes back cover, handle, baffle and grille cloth	**	✦ V-11941-1	Dial	.90
✦ V-11949-3	Cabinet assy. (H-411P4), includes back cover, handle, baffle and grille cloth	**	✦ V-11938-1	Handle, (H-409P4)	**
✦ V-11930	Cable assy., (B battery clip and leads)	**	✦ V-11938-2	Handle, (H-410P4)	**
✦ V-8653	Cover assy., back (H-409P4)	**	✦ V-11938-3	Handle, (H-411P4)	**
✦ V-8654	Cover assy., back (H-410P4)	**	✦ V-11942-1	Knob, (H-409P4)	.20
			✦ V-11942-2	Knob, (H-410P4)	.20
			✦ V-11942-3	Knob, (H-411P4)	.20
			✦ V-11142-2	Socket, miniature molded 7 pin (1U4)	.17
			V-11142-3	Socket, miniature molded 7 pin (1R5, 1U5, 3V4)	.17
			✦ V-11924-1	Speaker, 3 1/2" PM	3.80*

V-2185-1 CHASSIS

Ref. No.	Part No.	Description	List Price Each	Ref. No.	Part No.	Description	List Price Each
✦ C1	V-11919-1	Capacitor, variable (A,B,C,D)	\$ 2.50	R2	RC20AE153K	Resistor, 15,000 ohms 1/2 w.	.05
C2	R2CC62Z5Z502P	Capacitor, .005 mfd	.20	R3	RC20AE475M	Resistor, 4.7 megohms 1/2 w.	.05
C3	R1CC61S2L409F	Capacitor, 4 mmf	.20	R4	RC20AE335M	Resistor, 3.3 megohms 1/2 w.	.05
C4	R2CC61Z5Z152P	Capacitor, .0015 mfd	.20	R5	RC20AE473M	Resistor, 47,000 ohms 1/2 w.	.05
C5	R2CC63Z5Z103P	Capacitor, .01 mfd	.20	R6	V-11129-1	Control, volume 2 megohms	1.20
C6	R2CC61Z5Z202P	Capacitor, .002 mfd	.15	R7	RC20AE475M	Resistor, 4.7 megohms 1/2 w.	.05
C7	R1CC61S3N101M	Capacitor, 100 mmf	.20	R8	RC20AE106M	Resistor, 10 megohms 1/2 w.	.05
C8	R2CC62Z5Z502P	Capacitor, .005 mfd	.20	R9	RC20AE105M	Resistor, 1 megohm 1/2 w.	.05
C9	R1CC61S3N101M	Capacitor, 100 mmf	.20	R10	RC20AE335M	Resistor, 3.3 megohms 1/2 w.	.05
C10	R2CC61Z5Z202P	Capacitor, .002 mfd	.15	R11	RC20AE561K	Resistor, 560 ohms 1/2 w.	.04
C11	R2CC61Z5Z202P	Capacitor, .002 mfd	.15	R12	RC20AE107M	Resistor, 100 megohms 1/2 w.	.10
✦ C12	V-6321-4	Capacitor, elec. 10 mfd, 90 volts	1.10	R13	RC20AE475M	Resistor, 4.7 megohms 1/2 w.	.05
C13	V-9044-1	Capacitor, dual, .005-.005 mfd	.39	SW1	V-11129-1	Switch, on-off (consists of R6 and SW1)	1.20
C14	R1CC61S3N101M	Capacitor, 100 mfd	.20	✦ SW2	V-12211-1	Switch, assembly (AC power supply battery)	**
✦ L1	V-11921-1	Loop, antenna (iron core)	1.95	✦ T1	V-11925-1	Transformer, 1st IF	1.65
✦ L2	V-11128-2	Coil, AM oscillator	.95	✦ T2	V-11925-1	Transformer, 2nd IF	1.65
R1	RC20AE104M	Resistor, 100,000 ohms 1/2 w.	.05	✦ T3	V-11926-1	Transformer, audio output	1.70

PARTS LIST FOR MODEL H-377 AC POWER SUPPLY

Ref. No.	Part No.	Description	List Price Each	Ref. No.	Part No.	Description	List Price Each
	V-5847-3	Bushing, strain relief (AC cord) (H-377)	\$.10	L51	V-11303-1	Reactor, filter	\$ 1.60
P51	V-11296-1	Cable assy., AC power supply (H-377)	2.85		V-11302-1	Rectifier, selenium 250 ma (A voltage)	1.85
	V-4349-1	Cord, AC power	.70		V-11189-1	Rectifier, selenium 12 ma (B voltage)	1.55
C51	V-6321-3	Capacitor, elec., 20 mfd 150 v.	1.25	R52	RC30AF472K	Resistor, 4700 ohms 1 w.	.09
C52	V-11184-1	Capacitor, elec., 1500 mfd 3 v., 1500 mfd 2 v., and 1500 mfd 1.5 v.	4.50	R53	V-11345-1	Resistor, adjustable	.40
				R54	V-6067-10	Resistor, 3,900 ohms 1 w.	.20
				T51	V-11304-1	Transformer, power	2.45

✦ New part number listed for the first time in Westinghouse radio or television service information.
* Price includes Federal Excise Tax.
** Price furnished on request.

NOTE: All prices are subject to change without notice.

The 7H04Z1 chassis incorporates a superneterodyne circuit with two stages of IF, on the FM Band, and two stages on the AM Band, There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7H04Z1 or any AC-DC chassis, a line isolation transformer (110-V input to 110-V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

The IF transformers and the discriminator transformer are the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF and discriminator transformers, tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the others.

FM IF Alignment: Reasonably accurate alignment can be made by following the procedure outlined in this service note.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

Alignment of this chassis will, in most cases, be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

- (a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).
- (b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).
- (c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.
- (d) Loosen Slugs by applying a hot iron to the cement.

MODEL H723Z1,
Ch. 7H04Z1

NO.	DIAG. NO.	DESCRIPTION	PRICE
46-859		Dial Assembly	
46-860		Band Switch Knob	.15
46-900		Tuning Control Knob	.15
59-251		Volume Control Knob	.10
80-69		Dial Pointer	.70
80-444		Dial Cord Tension Spring	.05
80-580		Tuner Arm Tension Spring	.06
188-150		Tuner Arm Stop Spring	
S-14524		Retaining Ring (1 used on S-17334 & S-17467)	.55
S-14525		Capacitor Pulley & Cam Assembly	.75
S-17334		Tuner Arm Assembly	.45
S-17336		Tuning Shaft Brkt. & Ins. Strip Assembly	.15
S-17467		Brkt. & Pulley Assembly	.60
S-18442		Dial Cord & Eyelet Assembly	
20-355	L1	Coils & Chokes	
95-1102	T3A	F.M. Antenna Coil	1.60
95-1150	T1,T3	3rd. I.F. Trans. - 455 Kc.	2.25
95-1153	T4	1st. & 3rd. I.F. Trans. - 10.7 Mc (2 used)	2.25
95-1251	T1A	Disc. Trans. - 10.7 Mc	1.60
S-13871	L2	1st. I.F. Trans. - 455 Kc	1.65
S-13694	L3	2nd. I.F. Trans. - 10.7 Mc & 455 Kc	.75
S-15733	L4	F.M. Detector Coil Assembly	.65
		Broadcast Osc. Coil Assembly	.55
		F.M. Osc. Coil Assembly	
22-3	C6	Condensers	
22-5	C7	.01 Mfd. Ceramic (8 used)	.26
22-6	C22	170 Mmfd. Ceramic (Disc.)	.26
22-229	C21	500V	.20
22-448	C13	600V	.20
22-829	C11	.05 Mfd.	.20
22-830	C15	.02 Mfd.	.20
22-1126	C23	.01 Mfd.	.20
22-1158	C16	.05 Mfd.	.20
22-1220	C14	.002 Mfd. Ceramic	.33
22-1367	C9	50 Mmfd. Ceramic	.33
22-1506	C8	22 Mmfd. Ceramic (3 used)	.40
22-1676	C20	.001 Mfd. Ceramic	3.00
22-1742	C1	Two Section Gang Cond.	2.50
22-1757	C17, 18	Elect. Cond. 40 Mfd.-150V x 80 Mfd. 150V	.20
22-1766	C10	.68 Mmfd. Ceramic	.26
22-1775	C24	.047 Mfd.	.35
22-1852	C5	7.5 Mmfd. Ceramic	.26
22-1887	C19	25 Mmfd. Ceramic	.30
22-2112	C27	.001 Mfd. Ceramic	.50
22-2276	C26	Dual Ceramic .01 Mfd. -.01 Mfd. 500V	
63-686	R18	Resistors	
63-1450	R13	150 ohm W.W. 1/2W 10% Ins. Res.	.24
63-1744	R2	22 ohm W.W. 1W 20% Ins. Res.	.21 (2 used)
63-1758	R5	100 ohm 1/2W 20% Ins. Res.	.21 (6 used)
63-1782	R11	220 ohm 1/2W 10% Ins. Res.	.21
63-1800	R14	820 ohm 1/2W 20% Ins. Res.	.21 (2 used)
		2200 ohm	
63-1828	R4	10K ohm	.21
63-1835	R15	15K ohm	.21
63-1856	R19	47K ohm	.21 (2 used)
63-1870	R8	100K ohm	.21 (3 used)
63-1876	R16	150K ohm	.21 (2 used)
63-1898	R17	470K ohm	.21 (2 used)
63-1912	R9	1 Megohm	.21 (2 used)
63-1926	R7	2.2 Megohm	.21 (3 used)
63-1940	R3	4.7 Megohm	
63-2143	R10	Volume Control & Switch	1.81
63-2424	RZ1	39 ohm W.W. 1W 10% Ins. Res.	.30
63-3137	R12	1000'' W.W. 5W 20% Ins. Res.	
11-85		Miscellaneous	.65
12-1070		Line Cord & Plug (6 ft.)	.25
14-1350		Wavemagnet Mfg. Brkt.	
16-656		Plastic Cabinet for H723Z1	
49-707	SP1	Packing Carton	6.00
		5 1/4'' PM Speaker	
		Cone & Voice Coil	
		Output Trans.	
54-129		Speed Nut (9 used on Baffle & Grille Cloth)	.01
57-1717		Chassis Bottom Plate	.30
57-1721		Emblem Plate	.25
58-200		Two Prong Plug	.15
78-806		Miniature Tube Socket	.35
78-850		Miniature Tube Socket	.20
78-869		Miniature Tube Socket	.15
78-870		Miniature Tube Socket (3 used)	.15
80-884		Ground Spring	.03
83-1056		Wavemagnet Mfg. Strip	.07
83-1829		Insulator Strip	.01
85-516	S1	Band Switch	.03
93-94		Insulating Shoulder Washer	.03
93-1097		Insulating Washer	.18
94-485		Insulating Bushing	
97-293		Chassis Mfg. Stud	.02
110-180		Grill Cloth	.01
112-281		#10 x 3/4'' Truss Hd. ST St. Br. (2 used)	.02
114-297		Chassis Mfg.	.01
		#6 x 1/4'' Hex Hd. ST (1 used on S-17467 & 6 used 57-717)	.01
114-356		#6 x 1/4'' Hex Hd. ST (used on 212-7)	.02
126-618		Tube Shield	.02
139-98		Speaker Baffle	.40
149-64		Iron Core & Spring (2 used)	.01
159-69		Plug Button (4 used on S-17366)	.40
196-153		Speaker Gasket	.10
202-697		F.M. Instruction Book	1.80
202-898		Instruction Book	1.25
212-7	SE1	Selenium Rectifier	1.50
S-14957	L5	Wavemagnet Assembly	
S-17366		Cabinet Back Assembly (complete)	
S-18434		Band Switch Ext. Shaft Assembly	

Prices shown are suggested list prices and are subject to change without notice.

zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

Alignment of this chassis will, in most cases, be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

(a) A vacuum tube voltmeter with isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

(b) An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

(c) The signal generator output should be kept just high enough to get an indication on the meter.

(d) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

(e) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

(f) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(g) Loosen Slugs by applying a hot iron to the cement.

The 7H04Z2 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and two stages on the AM Band. There is one stage of RF amplification on the FM Band.

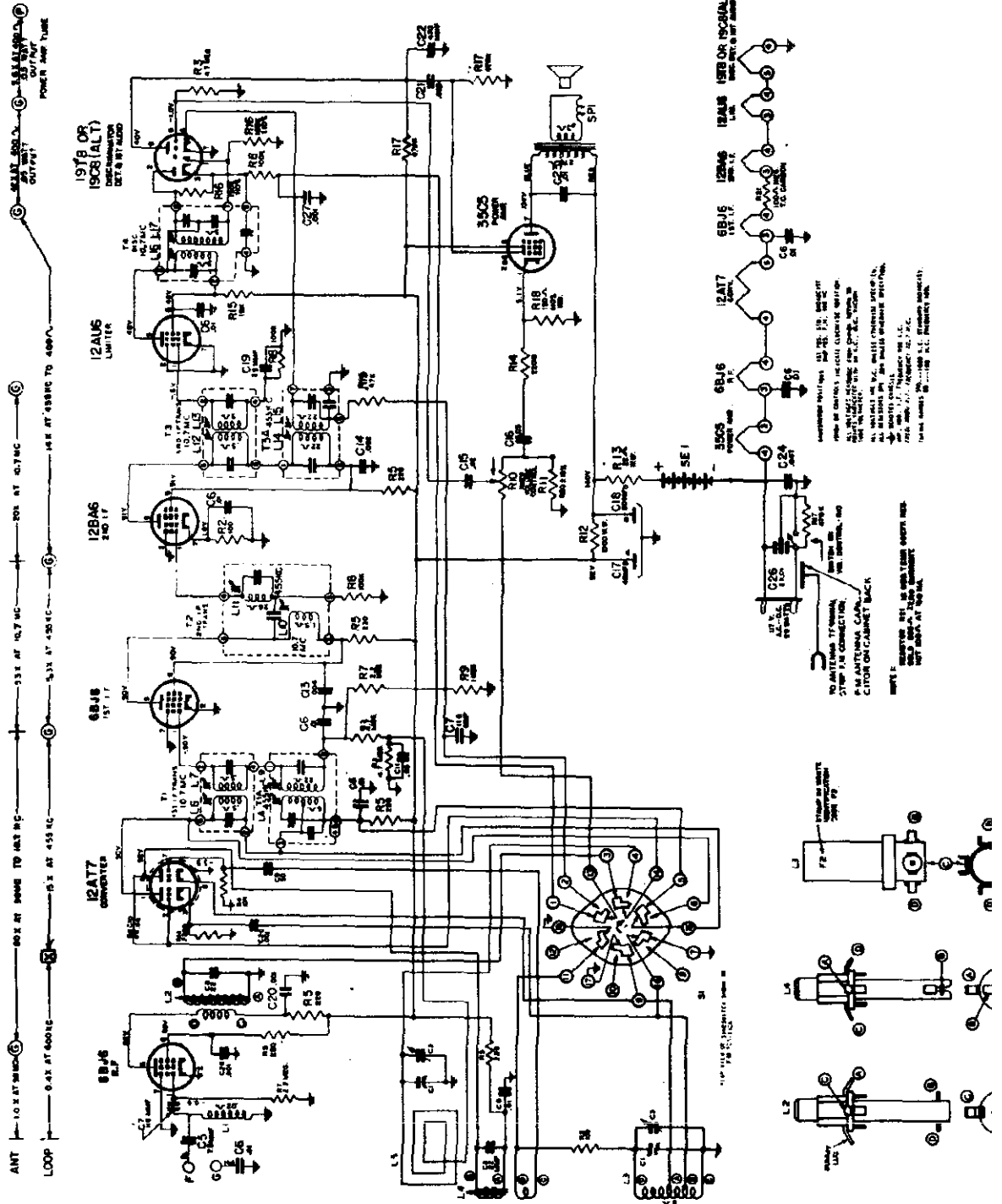
When adjustments are made on the 7H04Z2 or any AC-DC chassis, a line isolation transformer (110-V input to 110-V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

The IF transformers and the discriminator transformer are the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF and discriminator transformers, tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the others.

FM IF Alignment: Because of the wide bandpass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel. The instruction book for the Zenith Model 800 Signal Generator (Form Z8001) covers complete FM alignment procedure. If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined in this service note.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for

MODEL H723Z2 CHASSIS 7H04Z2



MODEL H723Z2,
Ch. 7H04Z2

PARTS LIST

PART NO.	DIAG. NO.	DESCRIPTION	PRICE	PART NO.	DIAG. NO.	DESCRIPTION	PRICE
H723Z2 (Chassis 7H04Z2)							
46-859		Dial Assembly	.15	63-1800 R14		Resistors (Continued)	
46-860		Dial Switch Knob	.15	63-1828 R4		2200 ohm 1/4W 20% Ins.	.21
46-900		Tuning Control Knob	.10	63-1835 R15		10K ohm 1/4W 20% Ins.	.21
59-251		Volume Control Knob	.10	63-1835 R15		15K ohm 1/4W 20% Ins.	.21
80-49		Dial Pointer	.70	63-1856 R19		47K ohm 1/4W 20% Ins.	.21
80-494		Dial Cord Tension Spring	.05	63-1870 R8		100K ohm 1/4W 20% Ins.	.21
80-580		Tuner Arm Tension Spring	.05	63-1876 R16		50K ohm 1/4W 10% Ins.	.21
80-817		Tuner Arm Stop Spring	.06	63-1898 R17		470K ohm 1/4W 20% Ins.	.21
80-817		Tuner Spring	.12	63-1912 R9		1 Megohm 1/4W 20% Ins.	.21
80-817		Tuner Arm Pressers Spring	.12	63-1926 R7		2.2 Megohm 1/4W 20% Ins.	.21
188-150		Retaining Ring (1 used on S-17334 & S-17467)	.02	63-1940 R3		4.7 Megohm 1/4W 20% Ins.	.21
S-14524		Capacitor Pulley & Cam Assembly	.55	63-2143 R10		Volume Control & Switch Special Resistor	1.81
S-14525		Tuner Arm Assembly	.75	63-2197 R21		1K ohm 1/4W 5W 20% Ins.	.70
S-17334		Tuner Shaft & Pulley Assembly	.45				
S-17336		Tuning Shaft Brkt. & Ins. Strip Assembly	.15				
S-17467		Brkt. & Pulley Assembly	.60				
S-18442		Dial Cord & Eyelet Assembly	.10				
Coils & Chokes							
20-355 L1		F.M. Antenna Coil	.15				
95-1162 T3A		3rd. I.P.F. Transformer - 455 Kc	1.60				
95-1160 T1,T3		1st. & 3rd. I.P.F. Transformer - 10.7 Mc (2 used)	2.25				
95-1153 T4		Discriminator Transformer - 10.7 Mc	2.25				
95-1250 T1A		1st. I.P.F. Transformer - 455 Kc	1.60				
95-1251 T2		2nd. I.P.F. Transformer - 10.7 Mc & 455 Kc	1.65				
S-13871 L2		F.M. Detector Coil Assembly	.75				
S-15694 L3		Broadcast Osc. Coil Assembly	.65				
S-15733 L4		F.M. Oscillator Coil Assembly	.55				
Condensers							
22-3 C6		.01 Mfd. Ceramic (8 used)	500V				
22-5 C7		110 Mfd. Ceramic (2 used) (Disc)	500V				
22-6 C22		470 Mfd. Ceramic	500V				
22-229 C21		.005 Mfd.	500V				
22-448 C13		.004 Mfd.	500V				
22-429 C11		.05 Mfd.	200V				
22-430 C15		.02 Mfd.	200V				
22-1126 C23		.01 Mfd.	400V				
22-1158 C16		.05 Mfd.	200V				
22-1220 C14		.002 Mfd.	600V				
22-1387 C9		50 Mfd. Ceramic	500V				
22-1676 C20		22 Mfd. Ceramic (2 used)	500V				
22-1742 C1		.001 Mfd. Ceramic (3 used)	500V				
22-1751 C17,C18		Two Section Gang Condenser	150V				
22-1766 C10		.68 Mfd. Ceramic	500V				
22-1775 C24		.047 Mfd.	400V				
22-1852 C5		7.5 Mfd. Ceramic	500V				
22-1887 C19		25 Mfd. Ceramic	500V				
22-2112 C27		.001 Mfd.	500V				
22-2276 C26		Dual Ceramic .01 Mfd. - .01 Mfd.	500V				
Resistors							
63-686 R18		150 ohm 1/4W 10% Ins.	Res.				
63-1450 R13		22 ohm 1/4W 20% Ins.	Res.				
63-1744 R2		100 ohm 1/4W 20% Ins.	Res. (2 used)				
63-1756 R5		220 ohm 1/4W 20% Ins.	Res. (5 used)				
63-1782 R11		820 ohm 1/4W 10% Ins.	Res.				
Miscellaneous							
11-85		Line Cord & Plug (6 ft. lg.)	.65				
12-1070		Wavemagnet Mfg. Brkt.	.25				
14-1350		Plastic Cabinet for H723Z2	6.25				
16-556		Packing Carton	6.00				
49-707 SP1		5 1/4" P.M. Speaker	1.73				
54-129		208-707 Cone & Voice Coil	1.67				
54-271		Speed Nut (9 used on Baffle & Grille Cloth)	.01				
57-1717		6-32x1/4" Balast Steel (6 used on IP's)	.30				
57-1721		Chassis Bottom Plate	.25				
58-200		Emblem, Plate	.10				
78-280		Two Prong Plug	.15				
78-886		Miniature Tube Socket	.35				
78-890		Miniature Tube Socket	.20				
78-889		Miniature Tube Socket (3 used)	.15				
78-870		Miniature Tube Socket	.03				
80-884		Ground Spring	.03				
83-1056		Wavemagnet Mfg. Strip	.03				
83-1520		Rectifier Ins. Strip	.03				
83-1640		I.P.F. Trans. Support Strip (6 used)	.03				
83-1829		Insulator Strip	.07				
85-516 S1		Band Switch	1.50				
93-94		Insulating Shoulder Washer	.01				
93-1097		Insulating Washer	.01				
94-485		Insulating Bushing	.03				
97-293		Chassis Mfg. Stud (2 used)	.18				
110-180		Grille Cloth	.75				
112-281		610x3/4" Brass Hd. S.T. St. Br. (2 used)	.02				
114-297		Chassis Mfg.	.01				
114-356		65x1/4" Hex Hd. S.T. (1 used on S-17467 & 6 used on S-1717)	.01				
114-356		65x1-1/4" Hex Hd. S.T. (used only on 212-7)	.02				
114-394		6-32x1/2" Hex Hd. S.T. (used only on 212-13)	.02				
126-618		Tube Shield	.20				
139-98		Speaker Baffle	.20				
149-64		Iron Core & Spring (2 used)	.40				
159-69		Plug Button (4 used on S-17366)	.01				
196-153		Speaker Gasket	.40				
202-697		F.M. Instruction Book	.10				
202-915		Instruction Book	.10				
212-7 SFL		Selenium Rectifier (or 212-13)	1.80				
S-14957 L5		Wavemagnet Assembly	1.25				
S-17366		Cabinet Back Assembly (Complete)	1.50				
S-18534		Band Switch Exp. Shaft Assembly	.85				

Prices shown are suggested list prices, and are subject to change without notice.

The 7H02Z1 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and two stages on the AM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7H02Z1 or any AC-DC chassis, a line isolation transformer (110-V input to 110-V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

The I.F. transformers and the discriminator transformer are the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF and discriminator transformers, tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Reasonably accurate alignment can be made by following the procedure outlined in this service note.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

Alignment of this chassis will, in most cases, be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

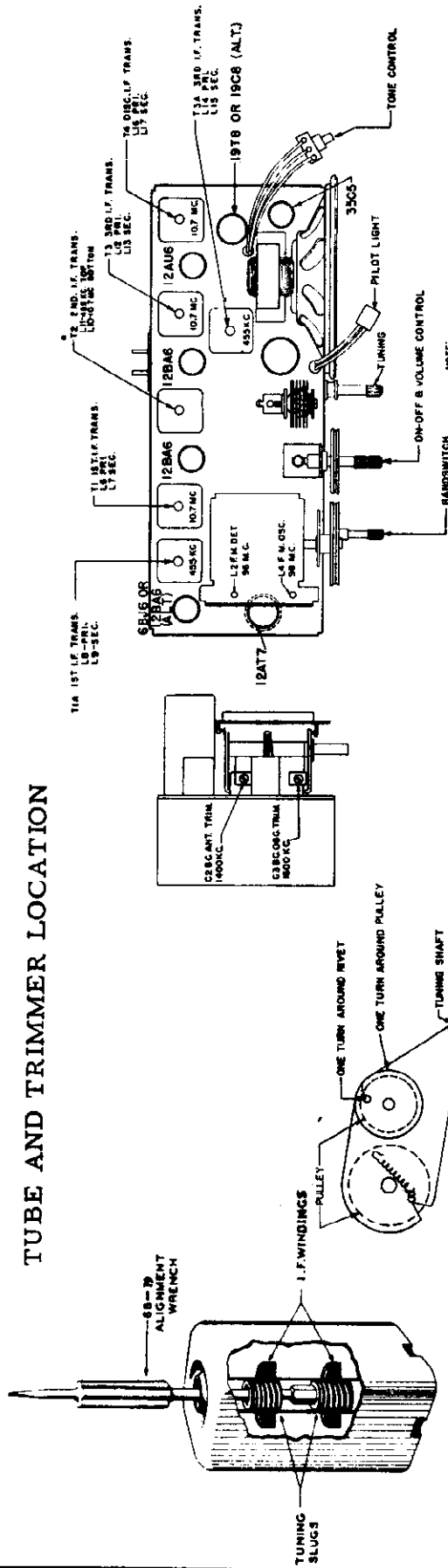
An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

- (a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).
- (b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).
- (c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.
- (d) Loosen Slugs by applying a hot iron to the cement.

MODEL H724Z1,
Ch. 7H02Z1

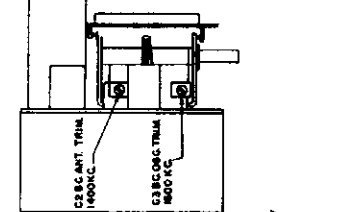
TUBE AND TRIMMER LOCATION

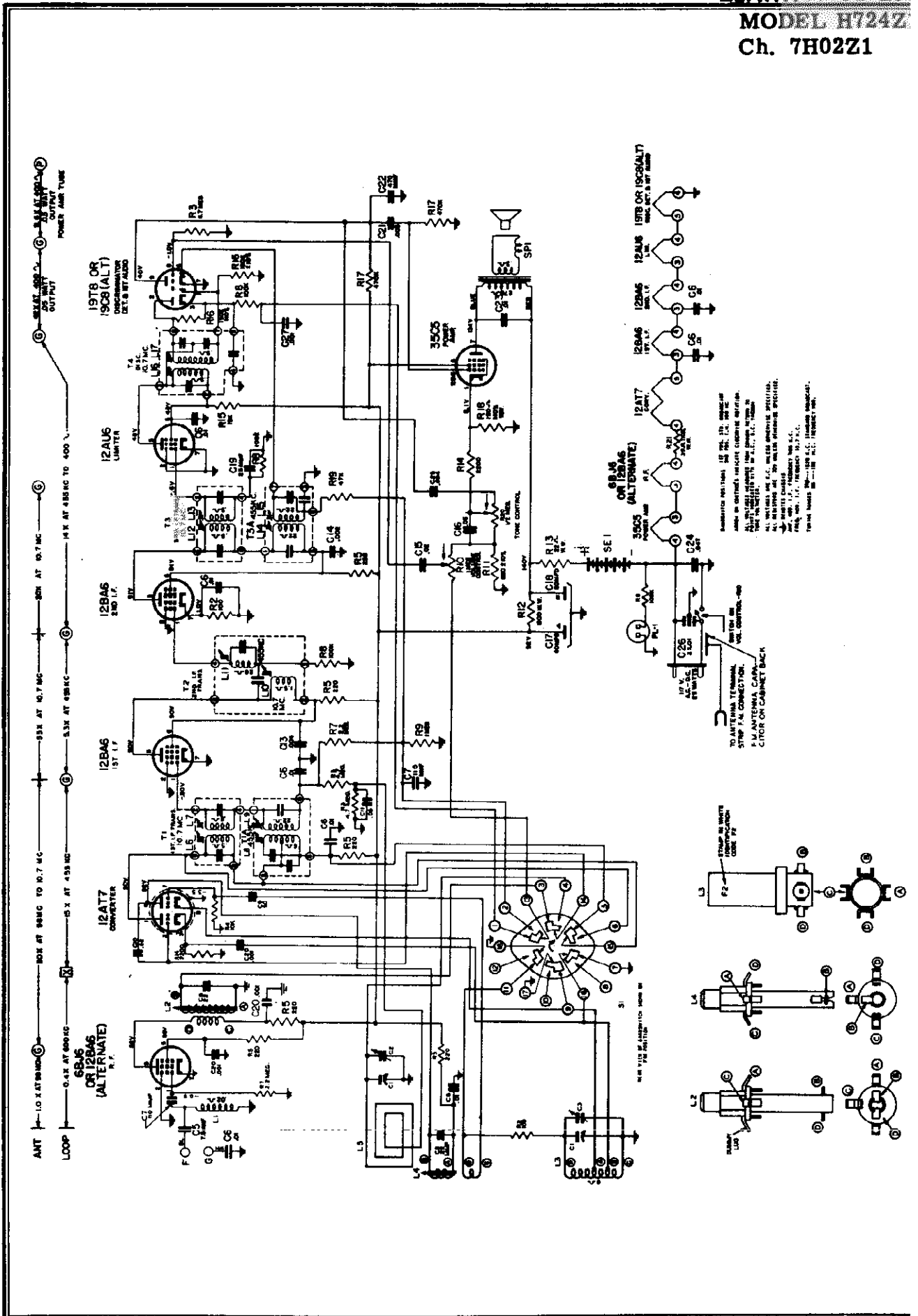


ALIGNMENT PROCEDURE

Operation	Connect Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 1 12A7 Converter	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L8, 9, 11, 14, 15	Align I. F. channel for maximum output.
2	2 turns loosely cpid. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C3	Set oscillator to dial scale.
3	2 turns loosely cpid. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C2	Align antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L16 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L17 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L12 and L13 Prim. and Sec. of 3rd IF trans.	Align 3rd IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L10 Prim. of 2nd IF transformer	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12A17 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM 100		L6 and L7 Prim. and Sec. of 1st IF transformer	Align 1st IF transformer for maximum reading.
9 (c)	Antenna Post FM (re-move line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L4 Osc. Coil Slug	Set Oscillator to dial scale.
10 (c) (d)	Antenna Post FM (re-move line ant.)	270 ohms	98 Mc. Unmodulated	FM 100	98 Mc.	L2 Det. Coil Slug	Align det. stage to maximum reading

Detail of IF Transformer





MODEL H724Z1,
Ch. 7H02Z1

PARTS LIST

PART NO.	DIAG. NO.	DESCRIPTION	PRICE	PART NO.	DIAG. NO.	DESCRIPTION	PRICE
<u>DIAL ASSEMBLY</u>							
26-463		Dial Scale		63-1782	R11	820 Ohm W.W. 1/2W 10% Ins. Res.	.21
46-859		Bandswitch Knob	.15	63-1800	R14	2200 Ohm W.W. 1/2W 20% (2 used) Ins. Res.	.21
46-860		Tuning Control Knob	.15	63-1828	R4	10K Ohm W.W. 1/2W 20% Ins. Res.	.21
46-900		Vol. Control Knob	.15	63-1835	R15	15K Ohm W.W. 1/2W 20% Ins. Res.	.21
46-901		Tone Control Knob	.10	63-1856	R19	47K Ohm W.W. 1/2W 20% Ins. Res.	.21
59-251		Dial Pointer	.70	63-1870	R8	100K Ohm W.W. 1/2W 20% (4 used) Ins. Res.	.21
78-932		Dial Light Socket Assem.		63-1876	R16	150K Ohm W.W. 1/2W 10% (2 used) Ins. Res.	.21
80-69		Dial Cord Tension Spring	.05	63-1898	R17	470K Ohm W.W. 1/2W 20% (2 used) Ins. Res.	.21
80-444		Tuner Arm Tension Spring	.05	63-1912	R9	1 Megohm W.W. 1/2W 20% Ins. Res.	.21
80-580		Tuner Arm Stop Spring	.06	63-1926	R7	2.2 Megohm W.W. 1/2W 20% (2 used) Ins. Res.	.21
100-105	PL1	Neon Indicator Bulb	.11	63-1940	R3	4.7 Megohm W.W. 1/2W 20% (3 used) Ins. Res.	.21
171-11		Pilot Light Jewel	.20	63-2143	R10	Volume Control & Switch	1.81
188-150		Retaining Ring (1 used on S-17334 & 1 used with S-17467)		63-2144	R20	Tone Control	1.20
S-14524		Cond. Pulley & Cam Assem.	.55	63-2424	R21	39 Ohm W.W. 1W 10% Ins. Res.	.30
S-14525		Tuner Arm Assem.	.75	63-3137	R12	1000 Ohm W.W. 5W 20% Ins. Res.	
S-17334		Tuning Shaft & Pulley Assem.	.45	<u>MISCELLANEOUS</u>			
S-17336		Tuning Shaft Brkt & Ins. Strip Assem.	.15	11-85		Line Cord & Plug (6 ft. lg)	.65
S-17467		Brkt. & Pulley Assem.	.60	12-1070		Wavemagnet Mtg. Brkt.	.25
S-18442		Dial Cord & Eyelet Assem.		14-1273		Plastic Cabinet for H724Z1	5.50
<u>COILS & CHOKES</u>				16-657		Packing Carton	
20-355	L1	F.M. Ant. Coil		43-165		Handle Housing	1.00
95-1102	T3A	3rd I.F. Trans. - 455 kc	1.60	49-689	SP1	5 1/4" PM Speaker	6.00
95-1150	T1,T3	1st & 3rd I.F. Trans. - 10.7 Mc. (2 used)	2.25			ZC 5091 Cone & Voice Coil	1.73
95-1153	T4	Disc. Trans. - 10.77 Mc.	2.25			TS2035 Output Trans.	1.40
95-1250	T1A	1st I.F. Trans. - 455 kc	1.60	54-129		Speed Nut (9 used on Baffle & Grill Cloth)	.01
95-1251	T2	2nd I.F. Trans. - 10.7 Mc & 455 kc	1.65	54-279		3/8-32x1/2" Hex Nut Steel St. Br. (used on chassis)	.02
S-13871	L2	F.M. Detector Coil Assem.	.75	57-1717		Chassis Bottom Plate	.30
S-15694	L3	Broadcast Osc. Coil Assem.	.65	57-1721		Emblem Plate	.25
S-15733	L4	F.M. Osc. Coil Assem.	.55	58-200		Two Prong A.C. Plug	
<u>CONDENSERS</u>				78-806		Miniature Tube Socket	.15
22-3	C6	.01 Mfd. Ceramic (8 used)	500V .26	78-850		Miniature Tube Socket	.35
22-4	C25	.004 Mfd. Ceramic	500V .26	78-869		Miniature Tube Socket	.20
22-5	C7	110 Mmfd. Ceramic (Disc.) (2 used)	500V .26	78-870		Miniature Tube Socket (3 used)	.15
22-6	C22	470 Mmfd. Ceramic	500V .26	78-871		Miniature Tube Socket	.15
22-229	C21	.005 Mfd.	500V .20	80-884		Ground Spring	
22-448	C13	.004 Mfd.	600V .20	83-1056		Wavemagnet Mtg. Strip	.03
22-829	C11	.05 Mfd.	200V .20	83-1789		Handle Strip (Rubber) (1/2 used)	.07
22-830	C15	.02 Mfd.	600V .20	83-1829		Insulator Strip	.07
22-1126	C23	.01 Mfd.	400V .20	83-1931		Handle Strip (Rubber) (1/2 used)	.10
22-1158	C16	.05 Mfd.	200V .20	85-516	S1	Band Switch	
22-1220	C14	.002 Mfd.	600V .20	93-94		Ins. Shoulder Washer (used with 85-516)	.01
22-1367	C9	50 Mmfd. Ceramic	500V .33	93-487		1/16x.144x3/8 Washer (2 used on 43-165)	.01
22-1506	C8	22 Mmfd. Ceramic (2 used)	500V .33	93-1097		Insulating Washer (used with 85-516)	
22-1676	C20	.001 Mfd. Ceramic (3 used)	500V .40	94-485		Insulating Bushing (used with 85-516)	.03
22-1742	C1	Two Section Gang Cond.	3.00	97-293		Chassis Mtg. Stud (2 used)	.18
22-1757	C17,C18	Elect. Cond. - 40 Mfd. - 150Vx80 Mfd.	150V 2.50	110-180		Grill Cloth	
22-1766	C10	.68 Mmfd. Ceramic	500V .20	112-281		#10x3/4 Truss Hd. ST St. Br (2 used on Chassis Mtg.)	.02
22-1775	C24	.047 Mfd.	400V .26	114-297		#6x1/4" Hex. Hd. S.T. (6 used on 57-1717)	.01
22-1852	C5	7.5 Mmfd. Ceramic	500V .35	114-356		#6x1 1/4" Hex. Hd. S.T. (used on 212-7)	.02
22-1887	C19	25 Mmfd. Ceramic	500V .26	114-366		#6x3/8 Hex. Hd. S.T. (2 used on 43-165)	.02
22-2112	C27	.001 Mfd. Ceramic	500V .30	126-618		Tube Shield	.02
22-2276	C26	Dual Ceramic Cond. -.01 Mfd. -.01 Mfd.	500V .50	139-98		Speaker Baffle	
<u>RESISTORS</u>				149-64		Iron Core & Spring (2 used)	.40
63-686	R18	150 Ohm W.W. 1/2W 10% Ins. Res.	.21	159-69		Plug Button (4 used on S-17366)	.01
63-1450	R13	22 Ohm W.W. 1W 20% Ins. Res.	.24	196-153		Speaker Gasket	.40
63-1744	R2	100 Ohm W.W. 1/2W 20% (2 used) Ins. Res.	.21	199-103		Flexible Handle Sleeve	.35
63-1758	R5	220 Ohm W.W. 1/2W 20% (6 used) Ins. Res.	.21	202-697		F.M. Inst. Book	.10
				202-897		Instruction Book	
				212-7	SE1	Selenium Rectifier	1.80
				S-13210		Strap & Rivet Assem. (Handle)	.20
				S-14957	L5	Wavemagnet Assem.	1.25
				S-17366		Cabt. Back Assem (complete)	1.50
				S-18434		Band Switch Ext. Shaft Assem.	

The 7H02Z2 chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and two stages on the AM Band. There is one stage of RF amplification on the FM Band.

When adjustments are made on the 7H02Z2 or any AC-DC chassis, a line isolation transformer (110-V input to 110-V output) is recommended in order to avoid a "hot" chassis. If an isolation transformer is not available, check the AC voltage between chassis and bench ground, and if there is any indication of voltage, reverse the plug before handling the set.

The I.F. transformers and the discriminator transformer are the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF and discriminator transformers, tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Reasonably accurate alignment can be made by following the procedure outlined in this service note.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

Alignment of this chassis will, in most cases, be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.

MODEL H724Z2
Ch. 7H02Z2

PARTS LIST

PART NO.	DIAG. NO.	DESCRIPTION	PRICE	PART DIAG. NO.	DESCRIPTION	PRICE	PART NO.	DIAG. NO.	DESCRIPTION	PRICE	
H724Z2 Maroon-Grey-Green (Chassis 7H02Z2)											
25-463		Dial Scale	1.50	22-448	C13	.004 Mfd.	600V	49-609	SP1	Miscellaneous (Cont'd)	6.00
46-859		Bandswitch Knob (Maroon Model only)	.15	22-827	C11	.05 Mfd.	200V				1.75
46-860		Tuning Control Knob (Maroon Model only)	.15	22-830	C15	.02 Mfd.	600V				1.40
46-900		Volume Control Knob (Maroon Model only)	.15	22-1126	C23	.01 Mfd.	400V	54-129		8x2-2035	Coils & Yokes Coil
46-901		Tone Control Knob (Maroon Model only)	.10	22-1158	C16	.05 Mfd.	200V	54-139		8x2-2035	Coils & Yokes Coil
46-962		Bandswitch Knob (Grey Model only)	.20	22-1220	C14	.002 Mfd.	600V	57-117		3/8-32x3/4	Hex Nut Steel St. Br. (used on chassis)
46-963		Tuning Control Knob (Grey Model only)	.15	22-1367	C9	50 Mmfd. Ceramic	500V	57-121		Chassis Bottom Plate	
46-964		Volume Control Knob (Grey Model only)	.15	22-1506	C8	22 Mmfd. Ceramic (2 used)	500V	58-200		Enamel Plate	
46-965		Tone Control Knob (Green Model only)	.15	22-1742	C1	.001 Mfd. Ceramic (3 used)	500V	78-400		Two Free A.C. Plug	
46-966		Bandswitch Knob (Green Model only)	.20	22-1757	C17,18	Two Section Gas Cond.	500V	78-406		Miniature Tube Socket	
46-967		Volume Control Knob (Green Model only)	.15	22-1756	C10	Elect. Cond.-40 Mfd.-150Vx80Mm.	150V	78-869		Miniature Tube Socket	
46-968		Tone Control Knob (Green Model only)	.15	22-1775	C24	.041 Mfd. Ceramic	500V	78-870		Miniature Tube Socket (3 used)	
46-969		Tone Control Knob (Green Model only)	.15	22-1775	C24	.041 Mfd. Ceramic	500V	80-884		Ground Spring	
46-970		Dial Pointer	.70	22-1852	C5	7.5 Mmfd. Ceramic	500V	80-884		Wavemagnet Mtg. Strip	
46-971		Dial Cord Tension Spring	.90	22-1887	C19	25 Mmfd. Ceramic	500V	81-1056		Rectifier Ins. Strip	
46-972		Tuner Arm Tension Spring	.05	22-2112	C27	.001 Mfd. Ceramic	500V	83-1520		I.P. Trans. Support Strip (6 used)	
46-973		Tuner Arm Stop Spring	.05	22-2276	C26	Dual Ceramic Cond.-.01 Mfd.-.01 Mfd. 500V	.50	83-1789		Handle Strip (Rubber)	
46-974		Tuner Arm Spring	.06					83-1829		Insulator Strip	
46-975		Tuner Arm Pressure Spring	.12					85-1931		Handle Strip (Rubber)	
46-976		Tuner Arm Pressure Spring	.12					85-516	S1	Band Switch	
46-977		Neon Indicator Bulb	.11	63-686	R18	150 Ohm WW 1W 10% Ins.	Res.	89-191		Ins. Shoulder Washer (used with 85-516)	
46-978	PL1	Philco Light Lens	.20	63-1430	R13	22 ohm 1W 20% Ins.	Res.	93-94		1/16x.14x2/8 Washer (2 used on 45-516)	
46-979		Resonating Ring (1 used on 8-17334 & 1 read with 8-17467)	.02	63-1754	R2	220 ohm 1W 20% Ins.	Res. (2 used)	93-487		Insulating Washer (used with 85-516)	
46-980		Cond. Pulley & Cam Assembly	.55	63-1752	R5	820 ohm 1W 10% Ins.	Res. (6 used)	93-1097		Insulating Washer (used with 85-516)	
46-981		Tuner Arm Assembly	.75	63-1800	R14	2200 ohm 1W 20% Ins.	Res. (2 used)	94-485		Insulating Bushing (used with 85-516)	
46-982		Tuning Shaft & Pulley Assembly	.45	63-1828	R4	10K ohm 1W 20% Ins.	Res.	97-293		Chassis Mtg. Stud (2 used)	
46-983		Tuning Shaft Brkt. & Ins. Strip Asscm.	.15	63-1835	R15	15K ohm 1W 20% Ins.	Res.	110-180		Grille Cloth (Maroon Model only)	
46-984		Dial Cord & Eyelet Assembly	.60	63-1856	R19	47K ohm 1W 20% Ins.	Res.	112-281		410x3/4 Trans Hd. S.T. 8. Br. (2 used on Chassis Mtg.)	
46-985		Dial Cord & Eyelet Assembly	.10	63-1870	R8	100K ohm 1W 20% Ins.	Res.	114-297		46x1/4" Hex Hd. S.T. (6 used on 57-1117)	
46-986		F.M. Antenna Coil	.15	63-1876	R16	470K ohm 1W 10% Ins.	Res. (4 used)	114-354		46x1/4" Hex Hd. S.T. (used only on 212-7)	
46-987	L1	3rd. I.P. Trans.-459KC	1.00	63-1926	R7	2.2 Megohm 1W 20% Ins.	Res. (2 used)	114-366		46x3/8" Hex Hd. S.T. (2 used on 43-165)	
46-988	T1,T3	1st. & 3rd. I.P. Trans.-10.7 MC (2 used)	2.25	63-1912	R9	1 Megohm 1W 20% Ins.	Res. (3 used)	114-394		6-32x1/2" Hex Hd. S.T. (used only with 212-13)	
46-989	T4	Disc. Trans.-10.7 MC	2.25	63-1940	R3	4.7 Megohm 1W 20% Ins.	Res. (2 used)	124-618		Tube Shield	
46-990	T1A	1st. I.P. Trans.-459KC	1.00	63-2144	R10	2.2 Megohm 1W 20% Ins.	Res. (2 used)	149-54		Speaker Gasket	
46-991	T2	2nd. I.P. Trans.-10.7 MC & 459KC	1.85	63-2184	R20	200 ohm 1W 20% Ins.	Res. (3 used)	159-59		Iron Core & Spring (2 used)	
46-992	L2	F.M. Deflector Coil Assembly	.75	63-2197	R21	100 ohm 1W 20% Ins.	Res. (2 used)	196-153		Plug Button (4 used on S-17346)	
46-993	L3	Broadcast Ovc. Coil Asscm.	.65	63-3137	R12	1000 ohm WW 3W 20% Ins.	Res.	199-161		Speaker Baffle (Maroon Model only)	
46-994	L4	F.M. Osc. Coil Assembly	.35					202-697		Flexible Handle Sleeve (Green Model only)	
Condensers											
22-3	C6	.01 Mfd. Ceramic (6 used)	.26	11-85		Line Cord & Plug (6 ft. lg.)	.65	202-914		F.M. Instruction Book	.20
22-4	C25	.004 Mfd. Ceramic	.50	12-1070		Wavemagnet Mtg. Brkt.	.25	212-7	SE1	Selenium Rectifier (for 212-13)	1.90
22-5	C7	110 Mmfd. Ceramic (3 used)	.26	14-1273		Plastic Cabinet for H724Z2-Maroon Table Model	5.50	S-13210		Strip & Rivet Asscm. (Handle)	.20
22-6	C22	470 Mmfd. Ceramic	.46	14-1396		Plastic Cabinet for H724Z2-Grey Table Model	5.50	S-14957	L5	Wavemagnet Assmly	1.25
22-229	C21	.005 Mfd.	.30	14-1399		Plastic Cabinet for H724Z2-Green Table Model	8.50	S-17466		Cabinet Back Assembly	1.50
				16-457		Packing Carton		S-18434		Band Switch Ext. Shaft Assmly	.65
				43-165		Handle Mounting	1.00	S-18711		Baffle & Grille Cloth Assm. (Grey Model only)	.50
								S-18713		Baffle & Grille Cloth Assm. (Green Model only)	.50

Prices shown are suggested list prices, and are subject to change without notice.

2/19/52

MODELS J880, J880R,
Waldorf, Ch. 8H20Z

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band	Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 Converter 2 turns loosely cpd. to wavemagnet	.05 Mfd.	455 Kc. Modulated	BC	600 Kc.	L9, 10, 12 15 & 16	Align 1. F. channel for maximum output.
2	2 turns loosely cpd. to wavemagnet		1600 Kc. Modulated	BC	1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpd. to wavemagnet		1400 Kc. Modulated	BC	1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM		L17 coil slug Primary discr.	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 12AU6 limiter.	.05 Mfd.	10.7 Mc. Unmodulated	FM		L18 coil slug sec. of discr.	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 12BA6 2nd. I F.	.05 Mfd.	10.7 Mc. Unmodulated	FM		L13 and L14 Pri. & Sec. of 3rd. IF trans.	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 12BA6 1st. IF.	.05 Mfd.	10.7 Mc. Unmodulated	FM		Adjust L11 for maximum reading.	Align 2nd IF transformer for maximum reading.
8 (c)	Pin 2 (grid) on 12AT7 converter tube socket.	.05 Mfd.	10.7 Mc. Unmodulated	FM		L7 and L8 Prim. and Sec. of 1st. IF transformer.	Align 1st. IF transformer for maximum reading.
9 (c)	Antenna Post FM (Re- move line ant.)	270 ohms	98 Mc. Unmodulated	FM	98 Mc.	L5 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated	FM	98 Mc.	L3 Det. Coil Slug	Align det. stage to maximum reading.

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000,000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (half discriminator load).

(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis.

(d) Loosen Slugs by applying a hot iron to the cement.

MODELS J880,
J880R, Ch. 8H20Z

PARTS LIST

Part No.	Diag. No.	Description	Price	Part No.	Diag. No.	Description	Price
<u>Dial Assembly</u>							
78-895		Dial Light Socket & Wire	.45	22-1506	C10	22 Mmfd. Ceramic	.33
80-69		Dial Cord Spring	.05	22-1507	C28	25 Mmfd. Ceramic	.30
80-746		Pulley Retaining Spring	.02	22-1676	C11	.001 Mfd. Ceramic	.40
80-747		Dial Cord Spring	.10	22-1717	C20	.001 Mfd.	.20
114-262		8-32 x 7/16" x 1/4" A.F. Hex Hd. S.T. (2 used on S-17149)	.02	22-1762	C12	1 Mmfd. Ceramic	.20
114-297		6-32 x 1/4" lg. x 1/4" Hex. Hd. (2 used on S-17165)	.01	22-1775	C18	.047 Mfd. (Molded)	.26
148-122		Tuner Arm	.20	22-1863	C23	10 Mmfd. Ceramic	.25
188-30		Retaining Ring (Used on S-17155)	.02	22-2104	C1	Three Section Variable	3.80
S-17149		Dial Scale & Brkt. Assem.	.20	22-2105	C26, 27	Elect. 80-40 Mfd.	3.00
S-17155		Tuning Shaft & Pulley Assem.	1.50	22-2140	C6	15 Mmfd. Ceramic	.20
S-17157		Pointer & Pulley Assem.	.35	22-2154	C25	Elect. 10 Mfd.	1.25
S-17158		Dial Cord & Eyelet Assem. (Long)	.07	22-2240	C16	Trimmer Cond.	.40
S-17159		Dial Cord & Eyelet Assem. (Short)	.06	22-2276	C29	Dual Ceramic .01 Mfd. (3 used) 500V	.50
S-17165		Brkt. & Pulley Bushing Assem.	.35	<u>Resistors</u>			
<u>Coils & Chokes</u>							
20-337	L22	R.F. Choke Coil (6 Used)	.20	63-1726	R33	39 Ohm	.21
95-1102	T3B	2nd. I. F. Trans.	1.60	63-1744	R14	100 Ohm	.21
95-1150	T3A	2nd. I. F. Trans.	1.50	63-1758	R1	220 Ohm	.21
95-1153	T4	Discriminator Transf.	1.50	63-1768	R4	390 Ohm	.21
95-1201	T1A	1st. I. F. Trans.	1.50	63-1772	R6	470 Ohm	.21
95-1248	T1B	1st. I. F. Trans.	1.60	63-1782	R21	820 Ohm	.21
95-1255	T2	2nd. I. F. Trans.	1.65	63-1806	R25	3300 Ohm	.21
S-12603	L20	Phono Osc. Coil Assem.	.75	63-1814	R17	4700 Ohm	.21
S-13997	L21	Filament Choke Coil Assem.	.40	63-1827	R5	10K Ohm	.21
S-15691	L5	F.M. Osc. Coil Assem.	.40	63-1828	R29	10K Ohm	.21
S-15743	L3	F.M. Detector Coil Assem.	.65	63-1834	R28	15K Ohm	.21
S-16344	L4	Broadcast Detector Coil Assem.	.60	63-1845	R24	27K Ohm	.21
S-16345	L6	Broadcast Osc. Coil Assem.	.60	63-1856	R10	47K Ohm	.21
S-16408	L2	Antenna Choke Coil Assem.	.25	63-1859	R34	56K Ohm	.21
<u>Condensers</u>							
22-3	C7	.01 Mfd. Ceramic	.26	63-1870	R20	100K Ohm	.21
22-4	C21	.004 Mfd. Ceramic	.26	63-1876	R30	150K Ohm	.21
22-5	C8	110 Mmfd. Ceramic (or 22-1669) (3 used)	.26	63-1884	R8	220K Ohm	.21
22-177	C19	.2 Mfd.	.33	63-1898	R9	470K Ohm	.21
22-669	C22	.01 Mfd.	.20	63-1912	R12	1 Megohm	.21
22-827	C15	.1 Mfd.	.23	63-1926	R7	2.2 Megohm	.21
22-854	C5	.05 Mfd.	.20	63-1940	R32	4.7 Megohm	.21
22-1220	C24	.0005 Mfd.	.20	63-1947	R3	6.8 Megohm	.21
22-1367	C14	.002 Mfd.	.20	63-1954	R13	10 Megohm	.21
	C13	50 Mmfd. Ceramic	.33	63-1981	R26	120 Ohm	.24
				63-2068	R18, 19	Two Section Candohm	1.00
				63-2091	R15	820 Ohm W.W. 1/2W 20% Ins. Res.	.21
				63-2093	R27	47 Ohm W.W. 1W 10% Ins. Res.	.24
				63-2131	R22	Volume Control & Switch	1.81
				63-2132	R11	Tone Control	1.20

PART NO.	DIAG. NO.	DESCRIPTION	PRICE	PART NO.	DIAG. NO.	DESCRIPTION	PRICE
44-25		Phono Jack	.12	57-1284		Strike Plate (2 used)	.05
54-139		3/8-32 x 9/16 Nut (1 ea. used on 63-2131 & 63-2132)	.01	57-1481		Esc. Clamping Plate (4 used)	.02
54-271		6-32 x 1/4" Nut steel cad. (1 ea. used on 95-1102-95-1150-1251-1153 & 2 ea. used on 95-1201 & 1248)	.01	57-1658		Escutcheon	4.00
58-128		Two Prong Plug	.15	57-1772		Chassis Bottom Plate	.30
78-755		Octal Tube Socket (2 used)	.18	70-86		#6x5/8 Washer Hd. Wood Screw (12 used to Mt. Backs)	.60C
78-869		Miniature Tube Socket	.20	72-81		#8x3/4 Phill Flt. Hd. Wood Screw St. Br. (6 used to Mt S-15536)	.02
78-870		Miniature Tube Socket (3 used)	.15	78-847		Two Contact Socket (Cabt. Back)	.10
78-871		Miniature Tube Socket	.15	80-604		Hinge Spring (2 used)	.15
78-896		Three Contact Socket	.10	80-830		Record Changer Mtg. Spring (4 used)	.03
78-903		Miniature Tube Socket (9 Contact)	.30	80-865		Ground Spring	.05
80-780		Iron Core Tension Spring (3 used)	.05	80-868		Ground Spring	.15
80-781		Tuner Arm Tension Spring	.06	93-1059		Felt Washer (used on 46-873)	.01
80-865		Ground Spring (2 used)	.05	97-293		Chassis Mtg. Insulating Stud (3 used)	.18
80-868		Ground Spring (2 used)	.05	100-97		Pilot Light Bulb	.25
85-505	S2	S. P. D. T. Switch (Ant.)	.90	114-128		#10x1-1/16 Hex Washer Hd. S. T.	1.81C
85-506	S1	Band Switch	3.25			(3 used on chassis Mtg.)	.01
93-1039		Gang Mtg. Cup Washer (2 used)	.01	114-297		#6x1/4" Hex Hd. S. T. Screw (used on 57-1772)	.02
95-1188	T6	Auto Trans.	4.30	114-341		#6x3/8" Hex Hd. S. T. (2 used on Esc. Mtg.)	.02
95-1272	T5	Speaker Output Trans.	2.00	114-350		#8x7/16" Hex Hd. S. T. (4 used on Esc. Mtg.)	.05
126-618		Miniature Tube Shield	.02	156-35		Bullet Catch (2 used)	.01
149-95		Iron Core & Spring	.30	159-50		Plug Button (2 used on Esc. Mtg.)	.03
S-16838		Speaker Cable & Eyelet Assem.	.35	165-9		Slide (2 used)	.03
				165-14		Knob Clamping Ring (46-876)	.50
				188-54		Dial Glass	.10
				192-138		F. M. Instruction Book	.40
				202-697		Radio & Phono Instruction Book	--
2-256		Cabinet Back (Phono Section)	.65	202-893		Cobramatic Record Changer	--
11-85		Line Cord & Plug 6 ft.	.65	S-14029		Record Changer Compl. Hinge Brkt. & Link Assembly (2 used)	.50
14-1335		Cabinet for J880 Console Combination Model	--	S-15536		Cobra Tone Arm Cartridge Assem.	3.50
14-1335R		Cabinet for J880R Console Combination Model	--			Record Adapter Plug & Envelope Assem.	.60
16-728		Packing Carton	--	S-15780		Low Impedance Loop & Clip Assem.	.60
19-169		Record Changer Mtg. Clip (2 used)	.07	S-16419		Record Changer Mtg. Frame & Arm Assem.	8.00
23-23		Wire Connector (used on S-16841)	.05	S-17005	L1	Vol. Control Knob Assem.	.25
46-873		Tone Control Knob	.10	S-17167		Loop Loading Coil Assem.	.65
46-876		Tuning Knob	.15	S-17328	L19	Cabinet Back Assem. (Complete)	3.00
46-899		Band Switch Knob	.15				
49-702	SP1	12" PM Speaker	10.00	S-17871			
		ZC 1216E Cone & Voice Coil	4.60				

**MODELS J1083E Wilshire, J1083EZ,
J1086 Westchester, J1086R, J1086RZ,
J1087 Picardy, J1087Z, Ch. 10H20Z**

The 10H20Z chassis incorporates a superheterodyne circuit with two stages of IF, on the FM Band, and two stages on the AM Band. There is one stage of RF amplification on all bands.

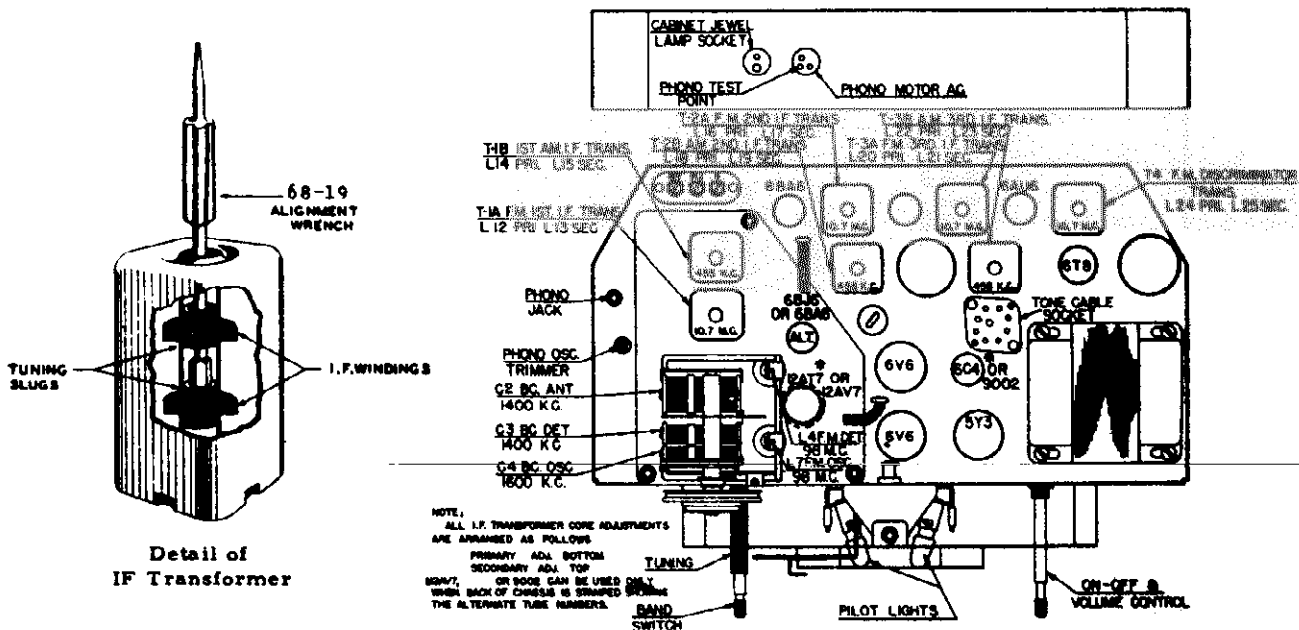
FM RF Alignment: The tuning slugs are attached to threaded shafts and the slugs are varied in the field of the coils by turning the shafts clockwise or counter-clockwise. After adjustment the shafts must be secured with a drop of speaker cement.

AM and FM Alignment: The AM and FM IF transformers in this receiver are of the new permeability tuned type. The advantage of an IF transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these IF transformers the tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

FM IF Alignment: Because of the wide band pass, it is desirable to use a FM signal generator and a cathode ray oscilloscope when aligning the FM IF channel.

If visual alignment equipment is unavailable, reasonably accurate alignment can be made by following the procedure outlined below.

FM Discriminator Alignment: When the secondary of the discriminator is aligned (operation 5) use sufficient signal input to get a good positive and negative indication before setting the slug for zero reading. A center zero indicating meter is recommended for this adjustment, but is not absolutely necessary. Reversing the leads of a non-zero center meter, or observing closely when the meter starts to go to the left (negative) of zero will give the same results.

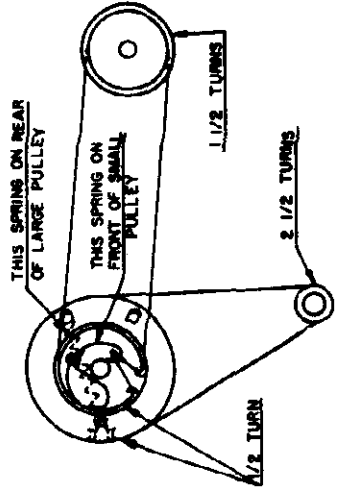


TUBE AND TRIMMER LOCATION

MODELS J1083E, J1083EZ, J1086
J1086R, J1086RZ, J1087, J1087Z,
Ch. 10H20Z

ALIGNMENT PROCEDURE

Operation	Connect Oscillator To	Dummy Antenna	Input Signal Frequency	Band Set Dial To	Adj. Trimmers	Purpose
1	Pin 2 12AT7 or 12AV7 Converter 2 turns loosely cpld. to wavemagnet	.05 Mfd.	455 Kc. Modulated 1600 Kc.	BC 600 Kc.	Adj. Pri. and Sec. T1B, T2B, T3B	Align I. F. channel for maximum output.
2	2 turns loosely cpld. to wavemagnet		Modulated 1400 Kc.	BC 1600 Kc.	C4	Set oscillator to dial scale.
3	2 turns loosely cpld. to wavemagnet		Modulated 10.7 Mc.	BC 1400 Kc.	C3, C2	Align detector and antenna stage.
4 (a)	Pin 1 (grid) on 6AU6 limiter.	.05 Mfd.	Unmodulated 100	FM	Adj. Primary of Discriminator T4	Align primary of discriminator for maximum reading.
5 (b)	Pin 1 (grid) on 6AU6 limiter.	.05 Mfd.	Unmodulated 100	FM	Adj. Secondary of Discriminator T4	Adjust secondary of discriminator for zero reading.
6 (c)	Pin 1 (grid) on 6BA6 2nd. I.F.	.05 Mfd.	Unmodulated 100	FM	Adj. Pri. and Sec. T3A	Align 3rd. IF transformer for maximum reading.
7 (c)	Pin 1 (grid) on 6BA6 1st. IF. Pin 2 (grid) on 12AT7 or 12AV7 converter tube socket	.05 Mfd.	Unmodulated 100	FM	Adj. Pri. and Sec. T2A	Align 2nd IF transformer for maximum reading.
8 (c)	Antenna Post FM (Re-move line ant.)	.05 Mfd.	10.7 Mc. Unmodulated 100	FM	Adj. Pri. and Sec. T1A	Align 1st. IF transformer for maximum reading.
9 (c)		270 ohms	98 Mc. Unmodulated 100	FM	L7 Osc. Coil Slug.	Set Oscillator to dial scale.
10 (c) (d)		270 ohms	98 Mc. Unmodulated 100	FM	L4 Det. Coil Slug	Align det. stage to maximum reading.



DIAL CORD DRIVE

IMPORTANT

Alignment of this chassis will in most cases be unnecessary unless an IF or RF transformer is replaced or the adjustments have been tampered with.

NOTE: If 12AT7 is replaced by a 12AV7 or vice versa the RF portion of this receiver must be realigned.

Correct alignment can only be made if the following procedure is followed:

A vacuum tube voltmeter with an isolation resistor of 2,000-000 ohms in series with the hot lead will serve for FM adjustments. This lead should be shielded.

An AC output meter connected across the primary or secondary of the output transformer will be satisfactory for all AM adjustments.

The signal generator output should be kept just high enough to get an indication on the meter.

In the event the Receiver oscillates during phono operation, adjust C16 4-80 mmf. capacitor to a point at which the oscillation ceases.

This position of no oscillation will sometimes vary with different cartridges, and in this case readjustment of C16 must be made.

(a) Vacuum Tube Voltmeter Lug 7 on discriminator transformer to chassis (Half discriminator load).

(b) Vacuum Tube Voltmeter Lug 5 on discriminator transformer to chassis (Full discriminator load).

(c) Vacuum Tube Voltmeter from Limiter Grid to Chassis

(d) Loosen Slugs by applying a hot iron to the cement.

MODELS J1083E, J1083E
J1086, J1086R, J1086RZ,
J1087, J1087Z, Ch. 10H20

PARTS LIST

PART NO.	DIAG. NO.	DESCRIPTION	PRICE	PART NO.	DIAG. NO.	DESCRIPTION	PRICE
<u>MISCELLANEOUS (CONT'D.)</u>				<u>CABINET PARTS J1083EZ</u>			
93-965		Rubber Washer (used on S-13800)	.02	J1083EZ is the same as J1083E except the following:			
93-1039		Gang Cond. Mtg. Cup Washer (2 used)	.01	S-18560		Record changer slide assembly (2 used)	
95-1252	T5	Speaker Output Trans.	2.50	S-18563		Record changer mtg. frame.	
95-1253	T6	Pwr. Trans.	12.50	14-1364		Console Combination Cabinet	
113-43		6-32 x 5/16 Hex Hd. S.T. (used on S-17258)	.03	14-1364		#8 x 1" R.H.W.S Steel Shipping bolt for changer (2 used)	
114-39		8-32 x 1/4 lg. x 1/4 Hex Hd. (2 used on S-17258 & 4 used on 57-1736)	.60	72-102		#6 x 1/2" Phillips F.H.W.S. Steel black zinc (6 used)	
126-618		Miniature Tube Shield	.02	72-103		#10 x 2 1/2" F.H.W.S. Steel black zinc (2 used)	
148-122		Tuner Arm	.20	112-846		#8 x 3/8" Phillips Pan Hd. Self tapping screw type "A" Cad. or Zinc (5 used)	
149-95		Iron Core & Spring (2 used)	.30	152-208		Record Changer stop block.	
S-17257		Speaker Cable & Eyelet Assem.	.35	203-422		Phono Caution Tag.	
<u>CABINET PARTS J1083E</u>				<u>CABINET PARTS J1086</u>			
2-260		Cabinet Back (Phono Section)	3.25	Model J1086 is the same as J1086R except the following:			
14-1343		Cabinet for J1083E-Console Combination Model	---	2-267		Cabinet Back (Phono & Record Storage Section)	2.2
16-730		Packing Carton	---	14-1349		Cabinet for J1086 Console Combination Model	---
17-121		Cable Clamp	.20	<u>CABINET PARTS J1086R</u>			
19-9		Cable Clip	.03	Model J1086R is the same as J1083E except the following:			
19-169		Record Changer Mtg. Clip (2 used)	.07	2-266		Cabinet Back (Phono & Record Storage Section)	2.2
36-47		Record Changer Handle	1.15	14-1349R		Cabinet for J1086R-Console Combination Model	---
46-876		Tuning Control Knob	.15	16-737		Packing Carton	---
46-899		Band Switch Knob	.15	57-1284		Strike Plate (2 used)	.0
49-703	SP1	12" PM Speaker	10.00	156-35		Bullet Catch (2 used)	.0
		2C1216F Cone & Voice Coil	4.60	166-57		Tack Bumper (4 used)	.0
57-1270		Strike Plate (2 used)	.05	<u>CABINET PARTS J1086RZ</u>			
57-1481		Escutcheon Clamping Plate (4 used)	.02	J1086RZ is the same as J1086R and uses the same cabinet parts as J1083Z, except:			
57-1666		Radio Dial Esc.	4.50	14-1366R		Console Combination Cabinet	
57-1736		Chassis Bottom Plate	.60	<u>CABINET PARTS J1087</u>			
70-3		#5 x 1/2" R.H.W.S. Steel N.P. (used on 19-9 & 2 used 83-1220)	.85C	Model J1087 is the same as J1083E except the following:			
70-86		#6 x 5/8" Washer Hd. Wood Screw St. Br. (8 used to Mt. Back & 1 used on 17-121)	.60C	2-262		Cabinet Back (Phono & Record Storage Section)	2.00
78-891		Pilot Light Socket & Wire	.60	14-1345		Cabinet for J1087 - Console Combination Model	---
80-604		Hinge Spring (2 used)	.15	16-731		Packing Carton	---
80-830		Record Changer Mtg. Spring (4 used)	.03	<u>CABINET PARTS J1087Z</u>			
80-865		Ground Spring	.05	J1087Z is the same as J1087 and uses the same cabinet parts as J1083Z, except:			
80-868		Ground Spring	.15	14-1365		Console Combination Cabinet	
83-728		Chassis Mtg. Spring (2 used)	.02	<u>RADIOORGAN ESCUTCHEON ASSEM.</u>			
83-1220		Pilot Light Socket Mtg. Strip.	.03	76-444		Radiorgan Knob Shaft	
90-367		Pilot Light Tube	.01	114-297		#6 x 1/4" Hex Hd. S.T. (2 used on S-17252 & S-17253)	
93-168		Rubber Shoulder Washer (4 used on Chassis Mtg.)	.07	S-17246		Radiorgan Knob & Eyelet Assem. (Treble)	
93-965		Rubber Washer (4 used on chassis Mtg.)	.02	S-17247		Radiorgan Knob & Eyelet Assem. (Voice)	
100-67		Pilot Light Bulb	.11	S-17248		Radiorgan Knob & Eyelet Assem. (Alto)	
114-39		#8 x 1/4" Hex Hd. S.T. (4 used on 57-1736)	.01	S-17249		Radiorgan Knob & Eyelet Assem. (Bass)	
114-353		#6 x 1/4" Hex Hd. S.T. (6 used on Esc. Mtg.)	.02	S-17250		Radiorgan Knob & Eyelet Assem. (Lo Bass)	
114-354		Chassis Mtg. Screw (4 used)	.07	S-17251		Radiorgan Knob & Eyelet Assem. (Normal)	
156-33		Bullet Catch (2 used)	.05	S-17252		Radiorgan Esc. & Knob Assem. (R.H.)	1.1
159-50		Plug Button (2 used)	.01	S-17253		Radiorgan Esc. & Knob Assem. (L.H.)	1.1
165-13		Metal Glide (4 used)	.02	S-17255		Radiorgan Cable Assem.	2.4
166-57		Tack Bumper (4 used)	.03				
171-7		Pilot Light Lens	.20				
188-54		Knob Clamping Ring (46-876)	.02				
192-138		Dial Glass	.50				
202-697		F.M. Instruction Book	.10				
202-894		Radio-Phono Instruction Book	.30				
S-14029		Variable Speed Record Changer	---				
S-15780		Cobra Tone Arm Cartridge	3.50				
S-16419		Record Adapter Plug & Envelope Assem.	.60				
S-17060		Wire & Terminal Assem.	.10				
S-17167		Vol. Control Knob Assem.	.25				
S-17328	LZ	Loop Loading Coil Assembly	.65				
S-17917	L1	Low Impedance Loop, Clip & Strip Assem.	.75				
S-18215		Record Changer Mtg. Frame Assem.	2.00				

MODELS J1083E, J1083EZ,
J1086, J1086R, J1086RZ,
J1087, J1087Z, Ch. 10H20Z

COILS & CHOKES

20-337	L11	R.F. Choke Coil (10 used)	.20
95-1150	T2A,3A	2nd. & 3rd. I.F. Trans. (F.M.)	1.50
95-1153	T4	Discriminator Trans.	1.50
95-1201	T1A	1st. I.F. Trans. (F.M.)	1.50
95-1248	T1B	1st. I.F. Trans. (B.C.)	1.60
95-1249	T2B	2nd. I.F. Trans. (B.C.)	1.60
95-1254	T3B	3rd. I.F. Trans. (B.C.)	1.60
S-12603	L8	Phono Osc. Coil Assem.	.75
S-13800	L9	Tone Choke Assem.	.60
S-13997	L10	Filament Choke Coil Assem.	.40
S-15691	L7	F.M. Osc. Coil Assem.	.40
S-15743	L4	F.M. Det. Coil Assem.	.65
S-16344	L5	Broadcast Det. Coil Assem.	.60
S-16345	L6	Broadcast Osc. Coil Assem.	.60
S-16408	L3	Ant. Choke Coil Assem.	.25

CONDENSERS

22-3	C13	.01 Mfd. Ceramic (9 used)	500V	.26
22-5	C22	110 Mmfd. Ceramic (or 22-1669) (4 used)	500V	.26
22-171	C10	.05 Mfd.	600V	.33
22-178	C33	.05 Mfd.	200V	.20
22-348	C32	.001 Mfd. (Molded)	500V	.26
22-492	G14	.002 Mfd.	600V	.20
22-829	C5	.05 Mfd. (2 used)	200V	.20
22-830	C23	.02 Mfd. (2 used)	600V	.20
22-1203	C28	.001 Mfd. (2 used)	600V	.20
22-1220	C17	.002 Mfd. (2 used)	600V	.20
22-1256	C27	75 Mmfd. (molded)	500V	.20
22-1367	C12	50 Mmfd. Ceramic	500V	.33
22-1506	C9	22 Mmfd. Ceramic (2 used)	500V	.33
22-1531	C24	.2 Mfd.	200V	.20
22-1612	C29AB			
	C29BB	Elect. 40 Mfd. 40 Mfd.	450V	3.50
22-1645	C25	330 Mmfd. (molded)	500V	.20
22-1668	C21	200 Mmfd. Ceramic	500V	.20
22-1676	C7	.001 Mfd. Ceramic (4 used)	500V	.40
22-1745	C18	250 Mmfd. Ceramic	500V	
22-1761	C31	50 Mmfd. Ceramic	500V	.20
22-1762	C11	1 Mmfd. Ceramic	500V	.20
22-1782	C19	.0047 Mfd. (molded)	600V	.26
22-1802	C26	.002 Mfd.	1600V	.26
22-1863	C15	10 Mmfd. Ceramic	500V	.25
22-1887	C20	25 Mmfd. Ceramic	500V	.26
22-2104	C1	Three Section Variable		3.80
22-2140	C6	15 Mmfd. Ceramic (2 used)	500V	.20
22-2243	C30AB			
	C30BB	Elect. 20 Mfd. - 350V x 40 Mfd.	450V	3.00
22-2251	C16	Trimmer Cond.		.35
22-2276	C34	Dual Ceramic .01 Mfd. - .01 Mfd.	500V	.50

DIAL ASSEMBLY

78-898		Dial Light Socket & Wire	.35
80-69		Dial Cord Spring	.05
80-746		Pulley Retaining Spring	.02
80-747		Dial Cord Spring	.10
100-67	PL1	Dial Light Bulb	.11
188-30		Retaining Ring (used on S-17155)	.02
S-17155		Tuning Shaft & Pulley Assem.	.35
S-17157		Pointer & Pulley Assem.	.55
S-17158		Dial Cord & Eyelet Assem. (Long)	.07
S-17159		Dial Cord & Eyelet Assem. (Short)	.06
S-17258		Dial Scale & Brkt. Assem.	1.50
S-17261		Brkt. & Pulley Bushing Assem.	.30

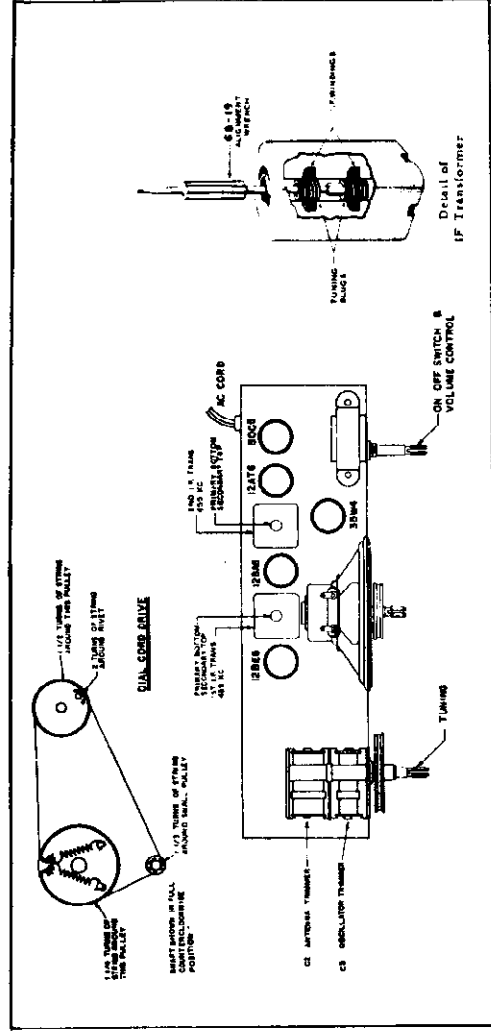
RESISTORS

63-966	R12	4700 ohm 2W 20% Carb. Res.	.19
63-1193	R39	5600 ohm 2W 10% Ins. Res. (used only when 12AV7 is used or 63-2064)	.36
63-1452	R26	270 ohm W.W. 2W 10% Ins. Res.	.33
63-1716	R4	22 ohm 1/2W 20% (or 63-2446 if req.) Ins. Res.	.21
63-1722	R16	33 ohm 1/2W 10% Ins. Res.	.21
63-1723	R2	33 ohm 1/2W 20% Ins. Res.	.21
63-1744	R17	100 ohm 1/2W 20% Ins. Res.	.21
63-1758	R3	220 ohm 1/2W 20% Ins. Res. (3 used)	.21
63-1764	R24	330 ohm 1/2W 10% Ins. Res.	.21
63-1771	R8	470 ohm 1/2W 10% Ins. Res.	.21
63-1772	R7	470 ohm 1/2W 20% Ins. Res.	.21
63-1778	R20	680 ohm 1/2W 20% Ins. Res.	.21
63-1786	R9	1000 ohm 1/2W 20% Ins. Res. (used only when 12AT7 is used)	.21
63-1793	R14	1500 ohm 1/2W 20% Ins. Res.	.21
63-1799	R32	2200 ohm 1/2W 10% Ins. Res.	.21
63-1813	R19	4700 ohm 1/2W Ins. Res.	.21
63-1820	R36	6800 ohm 1/2W 10% Ins. Res.	.21
63-1827	R6	10K ohm 1/2W 10% Ins. Res. (2 used)	.21
63-1842	R22	22K ohm 1/2W 20% Ins. Res. (2 used)	.21
63-1845	R23	27K ohm 1/2W 10% Ins. Res.	.21
63-1848	R30	33K ohm 1/2W 10% Ins. Res.	.21
63-1849	R13	33K ohm 1/2W 20% Ins. Res.	.21
63-1856	R10	47K ohm 1/2W 20% Ins. Res.	.21
63-1862	R38	68K ohm 1/2W Ins. Res.	.21
63-1869	R29	100K ohm 1/2W 10% Ins. Res.	.21
63-1870	R21	100K ohm 1/2W 20% Ins. Res.	.21
63-1876	R27	150K ohm 1/2W 10% Ins. Res. (2 used)	.21
63-1884	R11	220K ohm 1/2W 20% Ins. Res. (3 used)	.21
63-1890	R25	330K ohm 1/2W 10% Ins. Res. (2 used)	.21
63-1897	R33	470K ohm 1/2W 10% Ins. Res.	.21
63-1898	R34	470K ohm 1/2W 20% Ins. Res.	.21
63-1912	R1	1 Megohm 1/2W 20% Ins. Res.	.21
63-1926	R5	2.2 " 1/2W 20% Ins. Res. (4 used)	.21
63-1940	R28	4.7 " 1/2W 20% Ins. Res.	.21
63-2091	R18	820 ohm W.W. 1/2W 20% Ins. Res.	.21
63-2138	R37AB R37BB	Candohm	1.10
63-2139	R31	Volume Control & Switch	1.81
63-2141	R15	22K ohm 2W 20% Ins. Res.	.33
63-2142	R35	130 ohm 5W 10% Zipohm	.43

MISCELLANEOUS

11-85		Line Cord & Plug (6 ft. lg.)	.65
19-212		Transformer Mtg. Clip (2 used on 95-1252)	.04
54-306		Speed Nut (used on S-13800)	.06
57-1736		Chassis Bottom Plate	.60
78-580		Nine Contact Socket	.22
78-644		Phono Connector Socket	.12
78-755		Octal Tube Socket (3 used)	.18
78-807		Miniature Tube Socket	.15
78-869		Miniature Tube Socket	.20
78-870		Miniature Tube Socket (3 used)	.15
78-871		Miniature Tube Socket	.15
78-896		Three Contact Socket	.10
78-897		Two Contact Socket	.10
78-903		Miniature Tube Socket (9 contact)	.30
80-780		Iron Core Tension Spring (3 used)	.05
80-781		Tuner Arm Tension Spring	.06
80-865		Ground Spring	.05
80-868		Grounding Spring	.15
85-505	S2	S.P.D.T. Switch (Ant.)	.90
85-508	S1	Band Switch	3.25

S-19007 L1 Wavemagnet Assembly (K510 & K510Y)
 S-19024 Wavemagnet Assembly (K510Y)
 Prices shown are suggested list prices and are subject to change without notice.



TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I.F. TRANSFORMERS.

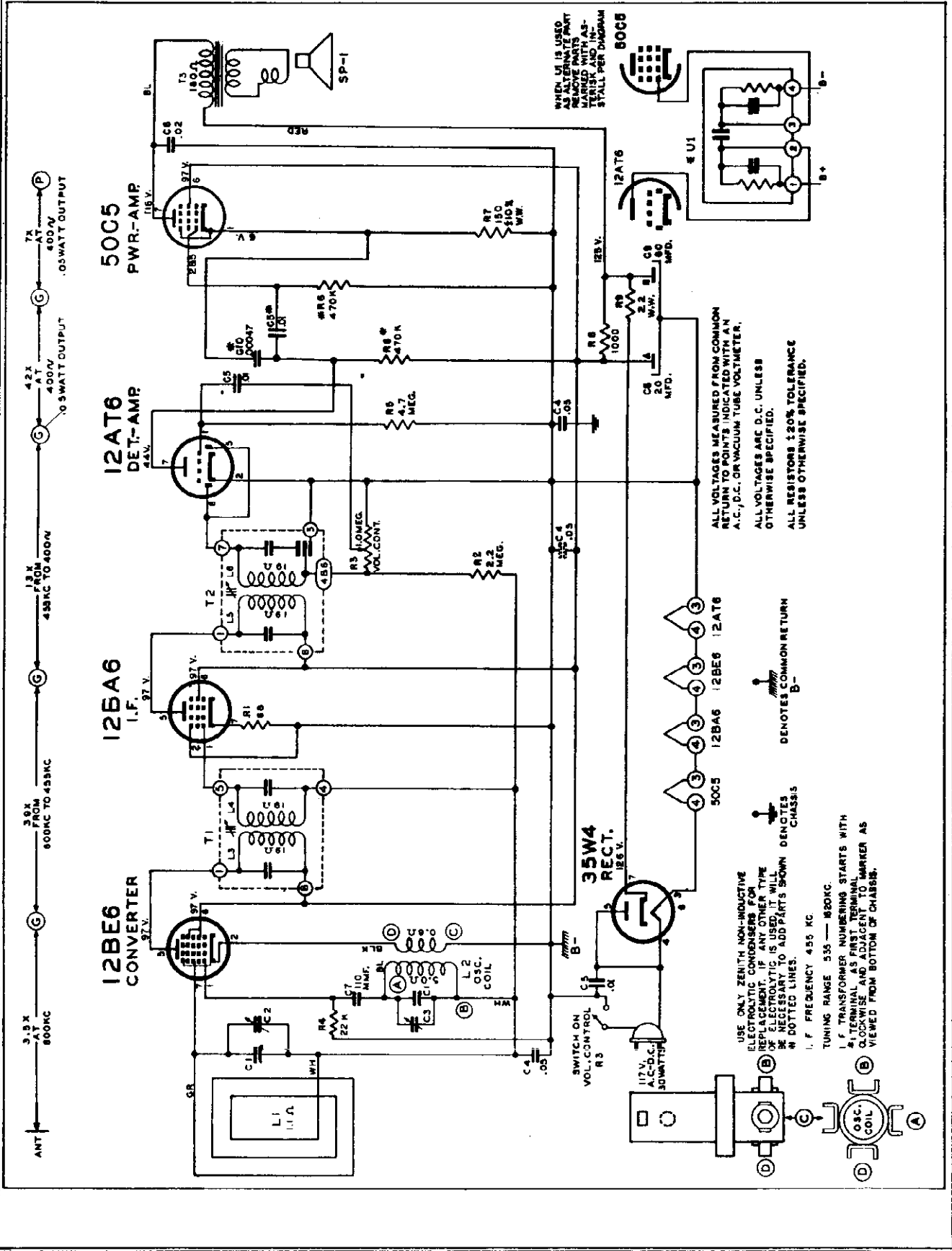
The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I.F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I.F. transformers the tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	L3, L4, L5, L6	Align I.F. for maximum output
2	One Turn Loop Coupled Loosely to Wave Magnet	---	1600 Kc.	1600 Kc.	C3	Set Oscillator to Dial Scale.
3	---	---	1400 Kc.	1400 Kc.	C2	Align Antenna

PART NO.	DIAG. NO.	PARTS LIST DESCRIPTION	PRICE
26-473		Dial Scale	.15
46-860		Tuning & Vol. Control Knob (K510 (2 used))	
46-1001		Tuning & Vol. Control Knob (K510Y (2 used))	
46-1002		Tuning & Vol. Control Knob (K510Y (2 used))	
59-273		Dial Pointer	.03
60-209		Dial Cord Tension Spring (2 used)	.25
S-15684		Pointer Pulley & Shaft Assembly	
S-18993		Dial Cord & Eyelet Assembly	
S-18994		Tuning Shaft & Pulley Assembly	
S-18994		Pulley Mtg. Strip & Bushing Assembly	
COILS & CROKES			
95-1101	T1	1st IF Transformer	1.60
95-1102	T2	2nd IF Transformer	1.60
105-28	U1	Complete Unit (consists of 22-3, 22-6 & two 63-1899 Res. 470 K ohm, 1/2W 20% Ins. Res.)	.80
S-14842	L2	Oscillator Coil Assembly	
CONDENSERS			
22-3	C5	.01 Mfd. Ceramic	.26
22-5	C7	110 Mfd. Ceramic	.25
22-829	C4	.05 Mfd. Ceramic	.20
22-1379	C6	.02 Mfd. Ceramic	.20
22-2414	C8,9	Electrolytic 80 Mfd., 20 Mfd.	
22-2415	C1	Two Section Variable	
RESISTORS			
63-586	R7	150 ohm 1/2W WW 10% Ins. Res.	.21
63-1450	R9	22 ohm 1W WW 20% Ins. Res.	.24
63-1574	R8	1K ohm 1W WW 20% Ins. Res.	.24
63-1737	R1	68 ohm 1/2W WW 20% Ins. Res.	.21
63-1842	R4	22K ohm 1/2W WW 20% Ins. Res.	.21
63-1926	R2	2.2 Megohm 1/2W WW 20% Ins. Res.	.21
63-1940	R5	4.7 Megohm 1/2W WW 20% Ins. Res.	.21
63-2806	R3	Vol. Control & Switch	
MISCELLANEOUS			
11-85		Line Cord & Plug	.65
14-1444		Plastic Cabinet K510	
14-1446		Plastic Cabinet K510Y	
14-1447		Plastic Cabinet K510Y	
16-810		Packing Carton	
48-721	SP1	4" PM Speaker	.01
54-139		6-20x7/16" S.T. Palmut (for 63-2806)	.01
54-267		6-32x5/15" Palmut (for 95-1101, 95-1102)	.01
57-1823		Emblem Plate	.01
64-251		Brass Eyelet (used on S-18996)	.15
78-806		Miniature Tube Socket (2 used)	.15
78-807		Miniature Tube Socket (3 used)	.03
83-1640		Support Strip (used on 95-1101, 95-1102)	.01
93-415		#6 Shakeproof Lockwasher (22-2415)	.01
94-334		Bushing (Mtg. 22-2415)	.01
95-1308	T3	Output Transformer	2.25
110-139		Grille Cloth	.15
112-597		6-20x7/16 S.T. Screw (2 used on chassis mtg.)	.02
114-59		8-32x1/4 Hex Hd. S.T. Screw	.01
114-57		6-32x7/16x1/4 Hex Hd. Screw (3 used on Gang Mtg.)	.01
114-283		6-20x3/8x1/4 Hex Hd. S.T. Screw (2 used on Spr. Mtg.)	.01
125-81		Strain Relief Grommet (Male)	.05
125-82		Strain Relief Grommet (Female)	.05
159-69		Trimount Stud (4 used Wavemagnet Mtg.)	.01
188-32		Retaining Ring (for S-18994)	.02

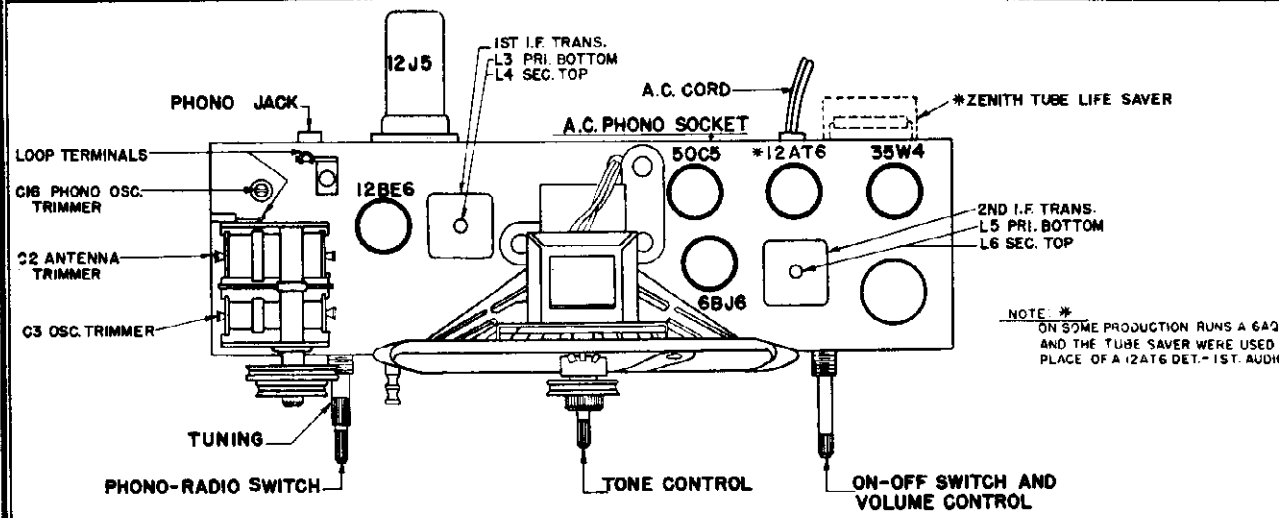
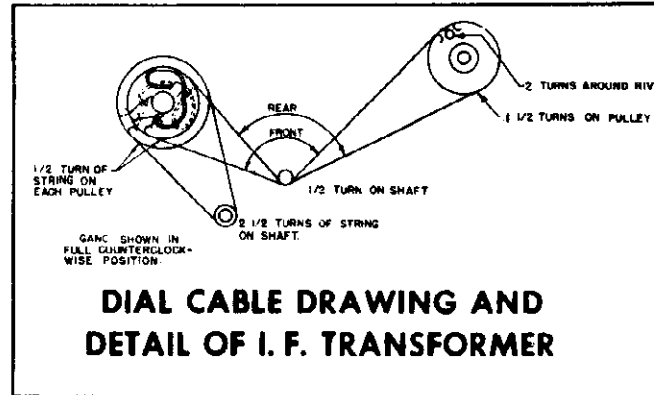
MODELS K510, K510W,
K510Y, Ch. 5K02



The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I.F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I.F. transformers the tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

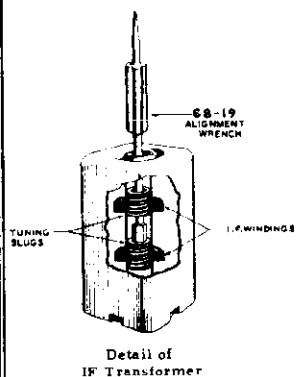
In the event the receiver oscillates during phono operation, adjust C16 4-80 mmf. capacitor to a point at which the oscillation ceases.

This position of no oscillation will sometimes vary with different cartridges, and in this case readjustment of C16 must be made.



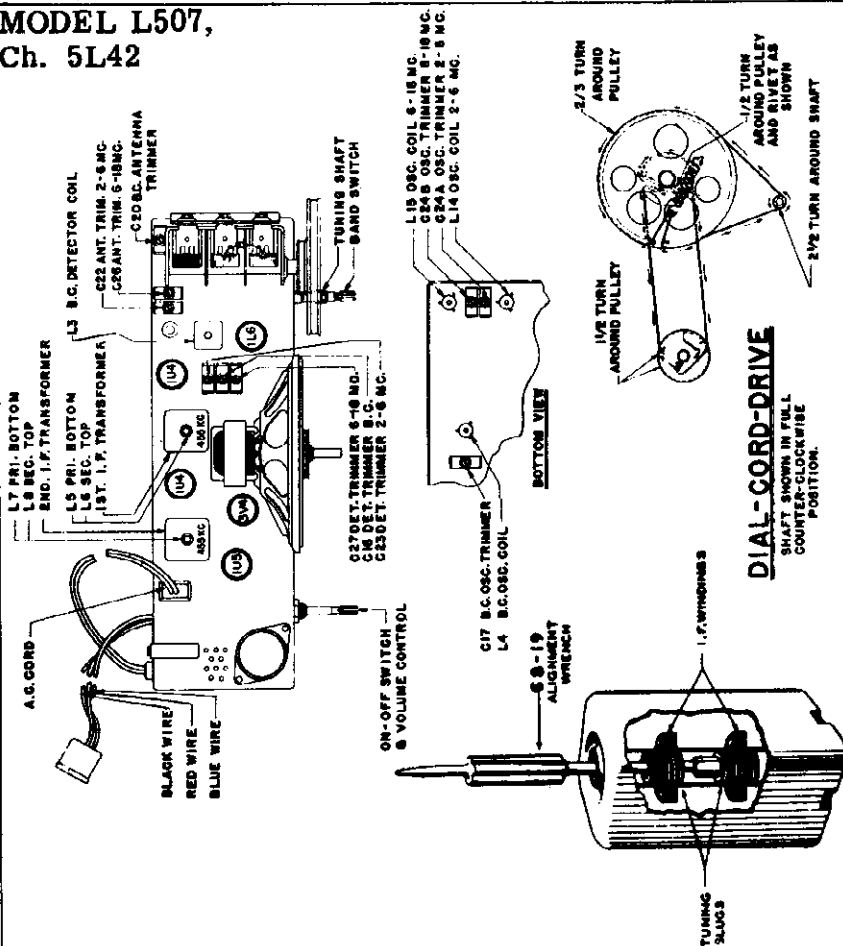
TUBE AND TRIMMER LOCATION

ALIGNMENT PROCEDURE



OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	L3, 4, 5, 6	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	C-3	Set Oscil. to Dial Sc
3		--	1400 Kc.	1400 Kc.	C-2	Align Ant Stage

MODEL L507,
Ch. 5L42



TUBE, TRIMMER LOCATION AND DIAL CABLE DRAWING ALIGNMENT PROCEDURE

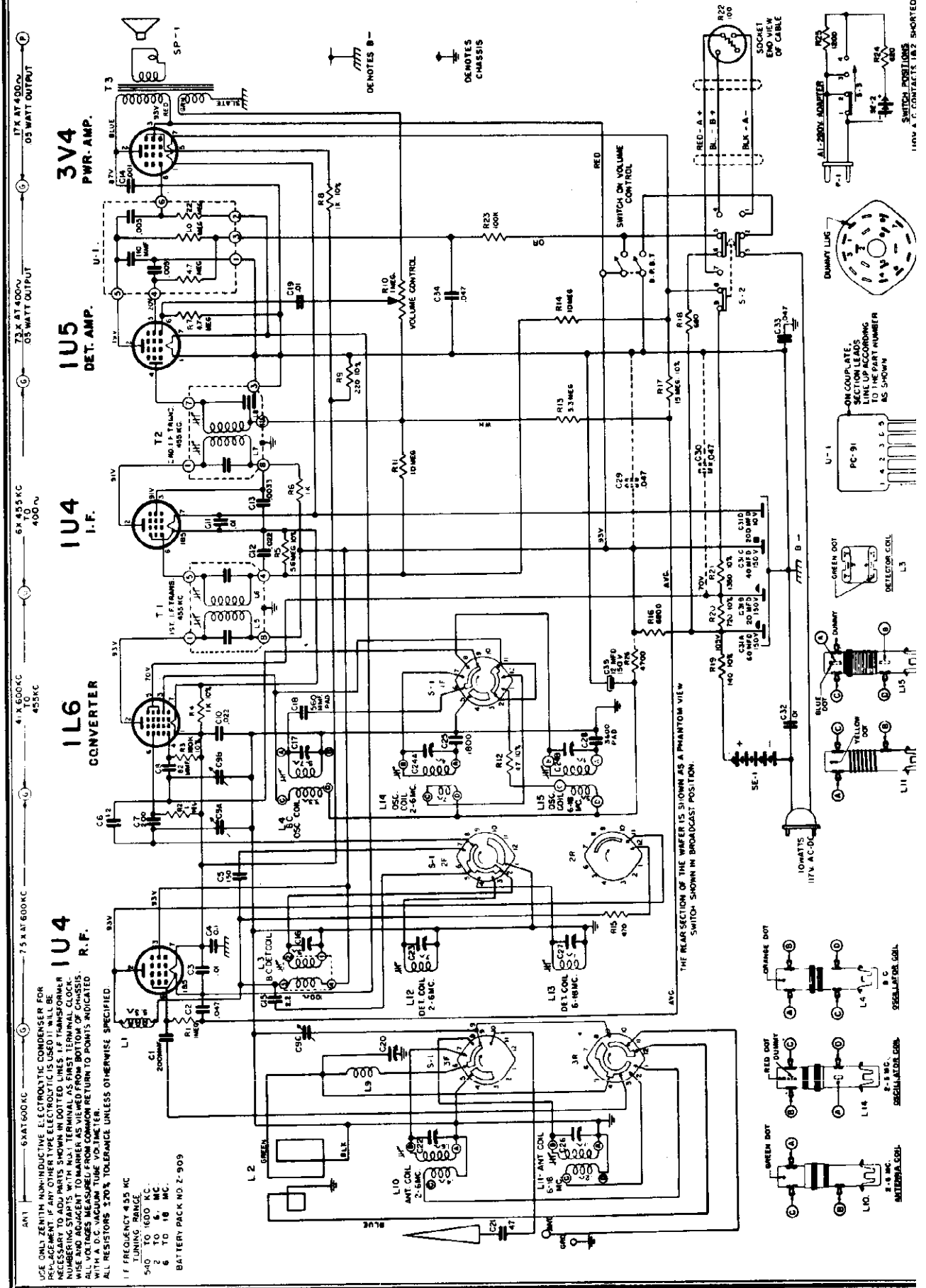
Chassis 5L42 features a high gain tuned RF stage ahead of a conventional superheterodyne circuit. There are two continuous coverage bands, one covering 2-6 megacycles and one covering 6-18 megacycles.

If removal of the chassis from the cabinet ever becomes necessary this should be done with care. The alignment of chassis 5L42 is conventional. However, care must be exercised when making adjustments, and the alignment procedure must be followed exactly. A signal generator of reasonable accuracy and good attenuation must be used. An output meter (AC) of the copper oxide rectifier type with a range of 1 to 30 volts in several steps is necessary to get accurate output readings. Alignment wrenches should be of the non-metallic type, especially when making adjustments at the higher frequencies.

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I.F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I.F. transformers the tuning wrench 68-19 can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

ALIGNMENT PROCEDURE

Operation	Connect Generator To	Dummy Ant.	Input Sig. Frequency	Band	Set Dial At	Trimmers	Purpose	
1	Positive Lead To Converter Grid Negative Lead To B-	.47 mfd	455 KC	A	Gang Closed	L5, 6, 7, 8	Align I.F.	
2	Positive Lead To R. F. Grid Negative Lead To B-		1620 KC	A	Gang Max. Open	Adjust C17 Osc. To Max.	Set Osc. To Dial Scale	
3			1400 KC	A	1400 KC	Adj. C16 Det. for Max.	Detector Alignment	
4			1400 KC	A	1400 KC	Adj. C20 Ant. for Max.	Antenna Alignment	
5			600 KC	A	Rock Gang At 600 KC	Adj. L4 Slug for Max.	Adjust 600 KC for Max.	
6	Repeat Operations 2, 3, 4, & 5.							
7	Detector coil S-19981 secondary can be adjusted for maximum sensitivity at 600 KC, however it is preset at the factory and should need no adjustment.							
8	Positive To Wave Rod Antenna Socket Negative To Chassis	20 mmfd	6.1 MC	B	Gang Max. Open	Adj. C24A for Max.	Set Osc. To Dial Scale	
9	"	"	5.5 MC	B	Rock Gang At 5.5 MC	Adj. C23 Det. for Max.	Detector Alignment	
10	"	"	5.5 MC	B	Rock Gang At 5.5 MC	Adj. C22 Ant. for Max.	Antenna Alignment	
11	"	"	2.1 MC	B	Rock Gang At 2.1 MC	Adj. L14 Osc. for Max.	Set Osc. To Dial Scale	
12	Repeat Operations 8, 9, 10 & 11.							
13	Detector coil S-19989 secondary can be adjusted for maximum sensitivity at 2.1 MC, however it is preset at the factory and should need no adjustment.							
14	Positive To Wave Rod Antenna Socket Negative To Chassis	20 mmfd	18.1 MC	C	Gang Max. Open	Adj. C 24B for Max.	Set Osc. To Dial Scale	
15	"	"	16.0 MC	C	Rock Gang At 16.0 MC	Adj. C27 Det. for Max.	Detector Alignment	
16	"	"	16.0 MC	C	Rock Gang At 16.0 MC	Adjust C26 Ant. for Max.	Antenna Alignment	
17	"	"	6.1 MC	C	Rock Gang At 6.1 MC	Adjust L15 for Max.	Set Osc. To Dial Scale	
18	Repeat Operations 14, 15, 16 & 17.							
19	Detector coil S-19990 secondary can be adjusted for maximum sensitivity at 6.1 MC, however it is preset at the factory and should need no adjustment.							



ANT 1 6AAT 600 KC
 7.5 M AT 600 KC
 6.1 X 600-4C TO 400 ~
 5.4 455 KC
 73 X AT 400 ~
 0.5 WATT OUTPUT
 17 X AT 400 ~
 0.5 WATT OUTPUT

1L6 CONVERTER
 IF FREQUENCY 455 KC
 TUNING RANGE
 540 TO 1600 KC
 5. MC
 6. TO 16 MC
 BATTERY PACK NO. Z-909

1U4 R.F.
 1ST I.F. FRAM: 455 KC
 2ND I.F. FRAM: 455 KC

1U5 DET. AMP.
 VOLUME CONTROL

3V4 PWR. AMP.
 SWITCH ON VOLUME CONTROL

THE REAR SECTION OF THE WIPER IS SHOWN AS A PHANTOM VIEW SWITCH - SHOWN IN BROADCAST POSITION.

10-4815 117 V. A.C. D.C.
 110V. 2.0 AMP. 117V. 2.0 AMP. SHORTED
 ALL 250V. ADAPTER
 SOCKET AND WIRE OF CABLE
 DUMMY LUG
 ON COUPLER SECTION LEADS LINE UP ACCORDING TO THE PART NUMBER AS SHOWN
 PC-91
 1 2 3 4 5
 DETECTOR COIL
 L3
 GREEN DOT
 RED DOT
 ORANGE DOT
 BLUE DOT
 YELLOW DOT
 GREEN DOT
 SEE LABEL ON COIL
 2-5 MC. ANTENNA COIL
 L10
 2-5 MC. ANTENNA COIL
 L14

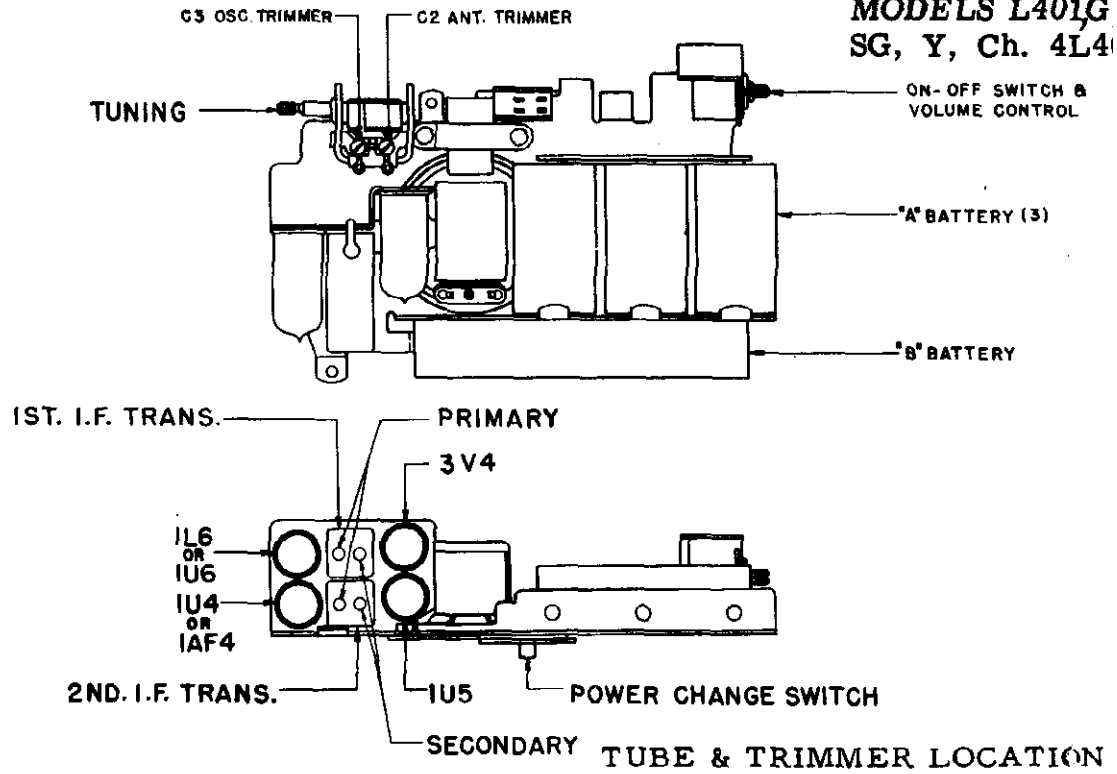
PAGE 23-34 ZFNTH
MODEL L507, Ch. 5L42

Part No.	Diag. No.	Description	Price	Part No.	Diag. No.	Description	Price
CHASSIS PARTS							
*12-1891		Gang mtg. bracket	.15	64-7		1/8 Dia x 5/32 Hex	
15-51		Cable socket cap 5 insule- tor (part of S-18111)	.09	64-27		(2 mt. 78-274)	
22-3	C3, 11, 19	.01 mfd ceramic disc. (4 used)	.25	64-88		1/8 Dia x 1/8 rivet (1 mt.)	.01
22-1862	C21	47 mfd mica	.25	64-88		83-1106-83-1257	.01
22-1763	C15	2.2 mfd ceramic	.20	64-183		.088 Dia x 1/8 rivet (2 mt. ea. 78-782)	.01
22-1765	C4	1.2 mfd ceramic	.20	64-253		78-806-79-807	.01
22-1777	C2, 28, 30,	.1 mfd molded PD	.25	78-274		78-806-79-807	.01
22-1778	33, 34	.047 mfd molded PD (2 used)	.25	78-543		Socket, electrolytic	.03
22-1843	C18	\$60 mfd molded mica	.30	78-782		Socket, battery cable (part of S-18111)	.13
22-2056	C35	Electrolytic 12 mfd mica	1.20	78-806		Socket, min. tube (2 used)	.25
22-2082	C28	3500 mfd molded mica	.65	78-807		Socket, min. tube (2 used)	.15
22-2071	C10	.022 mfd PD (2 used)	.25	78-844		Socket, adaptor	.25
22-2127	C14	.001 mfd molded	.25	80-69		Dial cord, tension spring	.05
22-2157	C13	.0033 mfd PD	.25	80-747		Dial cord, tension spring	.10
22-2410	C31A, B,	Electrolytic 60/150V, 40/150V, 20/150V, 200/10V	4.00	83-1106		Two lug terminal strip	.04
22-2471	C5	150 mfd ceramic disc	.25	83-1257		Three lug term. strip	.06
22-2472	C1, 7	200 mfd ceramic disc	.25	83-2081		Insulating strip (for 212-5)	.02
22-2473	C17	Ceramic siltyle section trim- mer & bracket	.40	83-2116		Antenna terminal strip	.25
22-2474	C24A, B	Ceramic dial section trimmer & bracket	.70	85-520	S2	Power change over switch	1.00
22-2475	C16, 20, 22, 23, 26, 27	Ceramic single section trim- mer (6 used)	.30	85-528	S1	Band switch	3.10
22-2476	C9A, B, C	Three section gang	5.50	89-827		3/8 int. lockwasher (1 mt. 85-528)	.02
22-2485	C8	82 mfd mica	.25	94-295		Mtg. bushing (3 mt. gang)	.04
22-2488	C25	1800 mfd mica	.60	94-334		Mtg. bushing (3 mt. speaker)	.01
49-734		Speaker 5 1/4 PM	6.00	93-35		Washer (1 mt. speaker)	.01
54-34		6-32 x 1/2 hex nut (1 speaker mtg.)	.01	95-1345	T3	Output transformer (part of 49-734)	2.00
54-139		3/8-32 x 9/16 pdnut (1 mt. vol. control)	.01	95-1348	T1	1st I F transformer	2.00
54-140		3/8-32 x 9/16 hex nut (1 mt. band switch)	.03	95-1350	T2	2nd I F transformer	2.00
54-267		6-32 x 5/16 pdnut (1 mt. ea. 212-5-95-1349-95-1350)	.01	105-31		Coilplate unit	.90
57-1520	R12	Adaptor socket cover plate	.15	112-806		6-32 x 1/2 hex hd mach screw (1 mt. speaker)	.02
63-1729	R12	47 Ohm 1/2 W	.21	113-8		screw (1 mt. ea. 22-2473 & 4)	.02
63-1744	R22	100 Ohm 1/2 W	.21	113-13		No. 6-32 x 7/16 hex hd mach screw (3 mt. gang)	.02
63-1757	R6	220 Ohm 1/2 W	.21	113-33		No. 4-40 x 1/2 hex hd mach screw (2 mt. 85-520)	.02
63-1771	R15	470 Ohm 1/2 W	.21	113-37		6-32 x 1/2 hex hd mach screw (2 mt. speaker)	.03
63-1778	R18	680 Ohm 1/2 W (2 used)	.21	114-287		6-32 x 1/2 hex hd self tap screw (3 mt. gang, 2 mt. 83-2116, 1 mt. 57-1520)	.01
63-1785	R4, 8	1 K Ohm 1/2 W	.21	114-308		No. 6-32 x 1/2 hex hd self tap screw (1 mt. 212-5)	.01
63-1788	R6	1 K Ohm 1/2 W	.21	125-17		Rubber grommet (3 mt. gang - 3 mt. speaker)	.03
63-1814	R26	4700 Ohm 1/2 W	.21	125-81		Strain relief grommet	.03
63-1821	R18	6800 Ohm 1/2 W	.21	125-82		Strain relief grommet	.05
63-1870	R23	100 K Ohm 1/2 W	.21	149-85		Iron core (S-19988-S-19990- S-19993)	.10
63-1880	R3	180 K Ohm 1/2 W	.21	149-110		Iron core (S-19987-S-19988- S-19991-S-19992)	.15
63-1812	R1, 2	1 meg Ohm 1/2 W (2 used)	.20	186-65		Rubber bumper	.02
63-1933	R13	3.3 meg Ohm 1/2 W	.21	188-60		Retaining ring	.02
63-1940	R7	4.7 meg Ohm 1/2 W	.21	188-147		Retaining ring (for pointer shaft)	.02
63-1943	R5	5.6 meg Ohm 1/2 W	.21	199-178		Tuning shaft sleeve	.15
63-1954	R11, 14	10 meg Ohm 1/2 W (2 used)	.20	212-5	SE)	Selenium rectifier	1.80
63-1860	R17	15 meg Ohm 1/2 W	.21	S-16047	L9	Antenna loading coil	.45
63-2010	R20, 21	Two section condohm	.60				
63-2014	R19	140 Ohm 4W W	.38				
63-2852	R10	Volume control & swtch	1.81				
63-3181		3300 Ohm 1/2 W	.21				
64-4		1/8 Dia x 1/2 rivet (2 mt. 78-844)	.01				

Prices shown are suggested list prices and are subject to change without notice.

Prices shown are suggested list prices and are subject to change without notice.

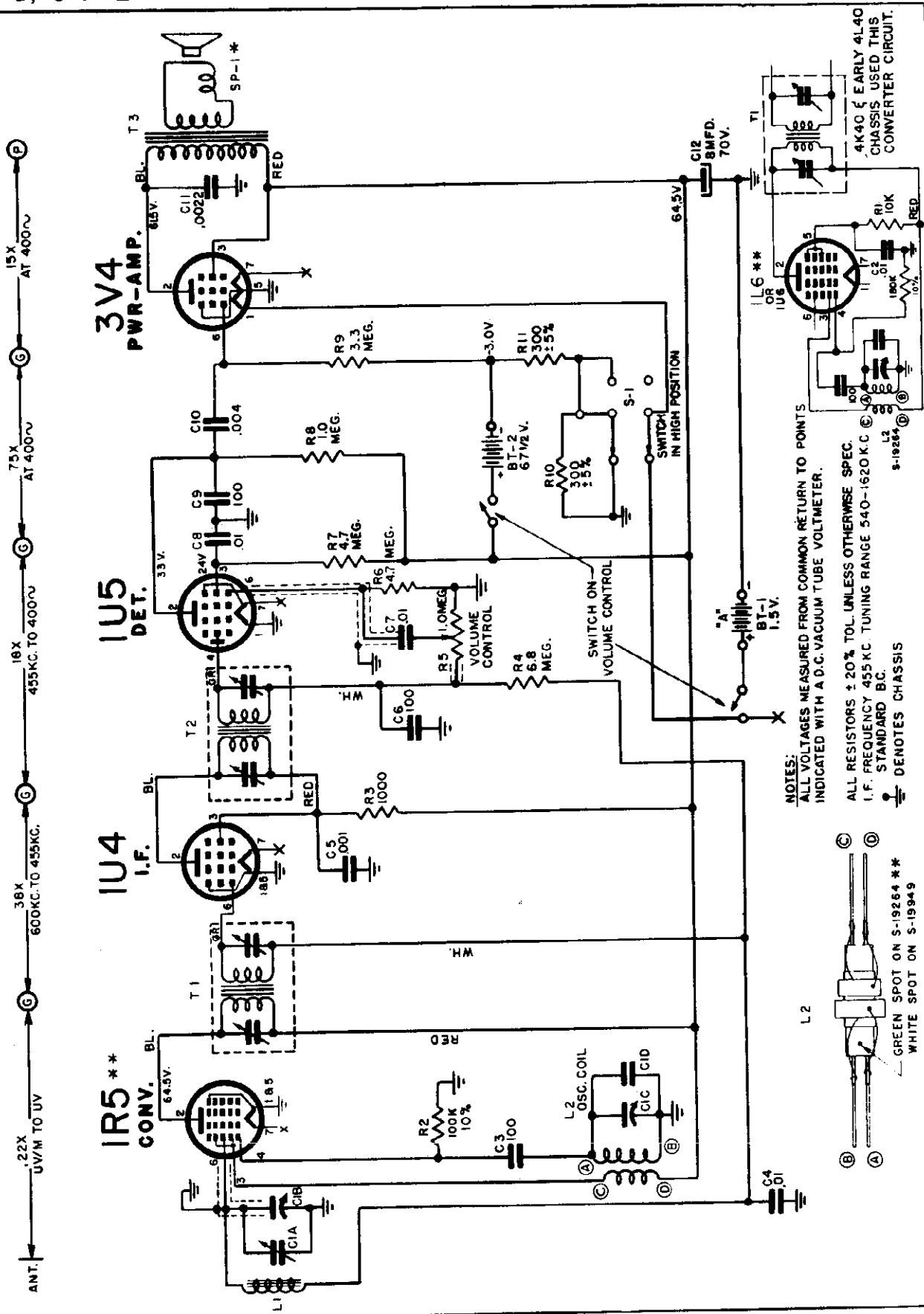
Prices shown are suggested list prices and are subject to change without notice.



ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	BAND	SET DIAL TO	TRIMMERS	PURPOSE
1	Converter Grid	.1 Mfd	455 Kc.	BC	600 Kc.	Adjust pri. and sec. trimmers for maximum output.	I.F. Alignment
2	Connect a .1 mfd capacitor across the generator output. Advance the generator output and place the capacitor approximately six inches from the receiver.		1600 Kc.	BC	1600 Kc.	Osc. Trim. C3	Set Oscillator to scale
3			1400 Kc.	BC	1400 Kc.	Ant. Trim. C2	Align Wavemagnet

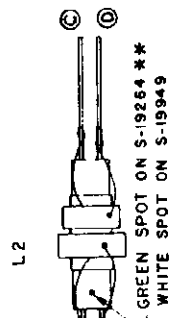
Part No.	Diag No.	Description	Price	Part No.	Description	Price
12-1940		Bracket (gang mg.)	.15	5-19664	Shield & strip assem. (has clamp for loop)	.20
12-1941		Tube mtg. bracket	.20	5-19949	Oscillator coil assem. (used with IR5 section for tube)	1.25
22-3	C2, 4, 7, 8	.01 Mfd. Ceramic disc. 500V (3 used)	.26	Cabinet Parts		
22-4	C10	.004 mfd Ceramic disc. 500V	.26	12-1938	Swivel bracket (Part of cabinet front)	.10
22-7	C5	.001 mfd Ceramic disc. 500V	.26	10-591	Packing carton	
22-1669	C3, 6, 9, C1A, 1B,	100 Mmfd Ceramic disc. 500V (3 used)	.20	19-240	Handle swivel clip (2 used)	.10
22-2432	1C, 1D	Gang cond.	3.50	26-482	Dial scale L401G & SG	.60
22-2433	C12	Electrolytic 8/70V	1.10	26-486	Dial scale L401Y	.60
22-2436	C11	.0022 mufd PD 200V	.30	26-487	Dial scale L401R	.60
49-755	SP1	Speaker 2 1/2" PM	3.50	36-58	Cabinet handle L401G & SG	.95
52-555		Shielded lead	.20	36-65	Cabinet handle L401Y	.95
52-650		Shielded lead	.20	46-1027	Knob, volume L401G, G & SG	.40
54-139		3/8-32x9/16 Palnut (1 mt. 63-1553)	.01	46-1061	Knob, tuning L401Y	.40
63-1553	R5	Volume control & switch	1.81	46-1062	Knob, volume L401R	.40
63-1762	R10, 11	500 ohm 1/2W lns. 5% (2 used)	.23	46-1028	Knob, tuning L401G & SG	.40
63-2786	R7	2 K ohm 1/2W lns. 20%	.23	46-1065	Knob, tuning L401Y	.40
63-1869	R2	100K ohm 1/2W lns. 20%	.21	46-1066	Knob, tuning L401R	.40
63-1912	R8	1 Meg ohm 1/2W lns. 20%	.21	57-1905	Swivel support plate (2 part of cabinet front)	.95
63-1935	R9	3.3 Meg ohm 1/2W lns. 20%	.21	57-1925	Emblem L401R, G & SG	.20
63-1940	RA, 7	4.7 Meg ohm 1/2W lns. 20%	.21	57-1845	Emblem L401Y	.20
63-1947	R4	6.8 Meg ohm 1/2W lns. 20%	.21	64-5	1/8 Dia x 7/32 Rivet (2 mt. ea. 8-19272--12-1938 S-19271)	.01
64-6		1/8 Dia. x 3/16 Rivet (2 mt. 5-19267)	.01	114-248	6-20 x 5/16 hex hd self tap screw (3 mt. chassis)	.01
64-7		1/8 Dia. x 5/32 Rivet (2 mt. 95-1922)	.01	189-155	Clamping ring	.04
64-27		1/8 Dia x 1/8 Rivet (1 mt. 80-922--2mt. 83-1106)	.01	189-161	Knob, clamping ring (volume)	.02
64-88		.088 Dia x 1/8 Rivet (2 mt. ea. 78-782)	.01	202-979	Instruction book	
64-353		Brass eyelet (2 mt. 83-2058--2 mt. 85-525)	.01	5-19271	Bracket & stud (Part of cabinet rear)	.15
64-434		Brass eyelet (2 mt. 83-2058)	.01	5-19272	Bracket & clip (Part of cabinet front)	.10
78-782		Socket, min. tube (4 used)	.25	5-19273	Cabinet front L401G	6.25
80-922		Battery tension spring (3 used)	.06	5-19444	Cabinet front L401Y	7.25
83-1106		Two lug terminal strip	.04	5-19445	Cabinet front L401R	7.25
83-2058		Terminal strip	.02	8-19933	Cabinet front L401SG	6.25
85-525		Switch (high-low)	.38	5-19274	Cabinet rear L401G	4.25
95-1350	T1	1st IF transformer	1.85	5-19448	Cabinet rear L401Y	5.25
95-1361	T2	2nd IF transformer	1.85	5-19934	Cabinet rear L401G	4.25
95-1362	T3	Speaker transformer	2.00	5-20111	Baffle & grille cloth L401Y	.65
112-405		4-40 x 3/16 blind hd mach screw (1 mt. speaker)	.01	5-20112	Baffle & grille cloth L401R	.65
112-446		4-40 x 1/4 blind hd mach screw (1 mt. speaker)	.01	5-20113	Baffle & grille cloth L401G & SG	.65
113-9		8-32 x 1/4 hex hd (1 mt. ea. 12-1940--12-1941)	.02	One #4 battery kit required when used		
113-17		6-32 x 1/4 rd hd mach screw (2 mt. 22-2432)	.02	Consists of 3 1/2 Volt A battery		
114-365		8-32 x 3/8 hex hd self tap screw (1 mt. 5-19664)	.05	1 #1 Volt B battery		
5-19266	L1	Iron core loop assem.	1.85	Leather carrying case available (see PDM-345)		
5-19267		Battery contact strip assem.	.20	Prices shown are suggested list prices and are subject to change without notice.		
5-19949		Battery contact & strip assem.	.35	194-140		



NOTES:
ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER.

ALL RESISTORS ± 20% TOL UNLESS OTHERWISE SPEC.
I.F. FREQUENCY 455 KC TUNING RANGE 540-1620 K.C. @ STANDARD BC.

⊕ DENOTES CHASSIS



L2
GREEN SPOT ON S-19264 **
WHITE SPOT ON S-19949

4K40 & EARLY 4L40 CHASSIS USED THIS CONVERTER CIRCUIT.

S-19264 ⊕

S-19264 ⊕

S-19264 ⊕

S-19264 ⊕

S-19264 ⊕

S-19264 ⊕

S-19264 ⊕

S-19264 ⊕

S-19264 ⊕

S-19264 ⊕

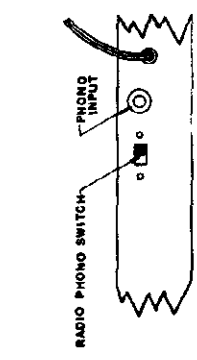
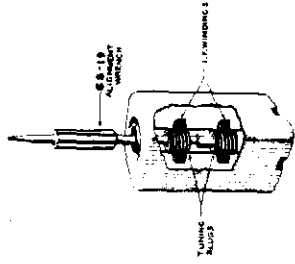
S-19264 ⊕

S-19264 ⊕

S-19264 ⊕

S-19264 ⊕

S-19264 ⊕



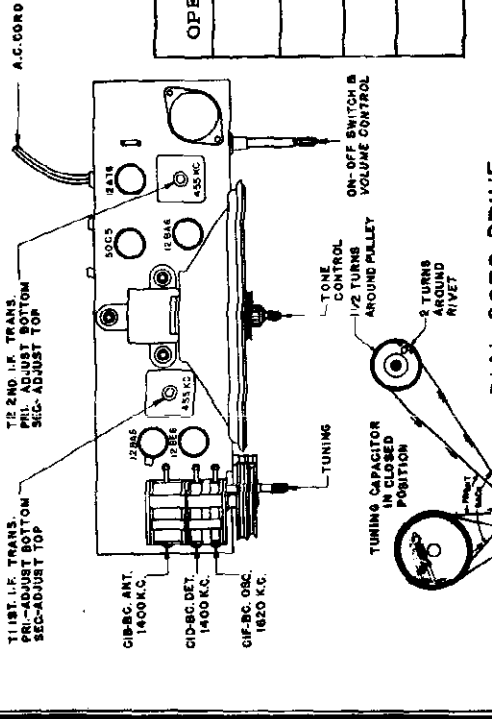
TUBE, TRIMMER LOCATION, DIAL CABLE DRAWING AND DETAILED VIEW OF I. F. TRANSFORMERS.

The I.F. transformers incorporated in this receiver are of the new permeability tuned type. The advantage of an I. F. transformer of this type is its extreme stability under various humidity and temperature conditions. The upper coil is the secondary and the lower the primary. When adjusting these I. F. transformers the tuning wrench can be inserted into the top slug, rotated until maximum output is obtained and then dropped down to the lower slug and the same operation repeated. The tuning wrench is so designed that turning one slug does not affect the adjustment of the other.

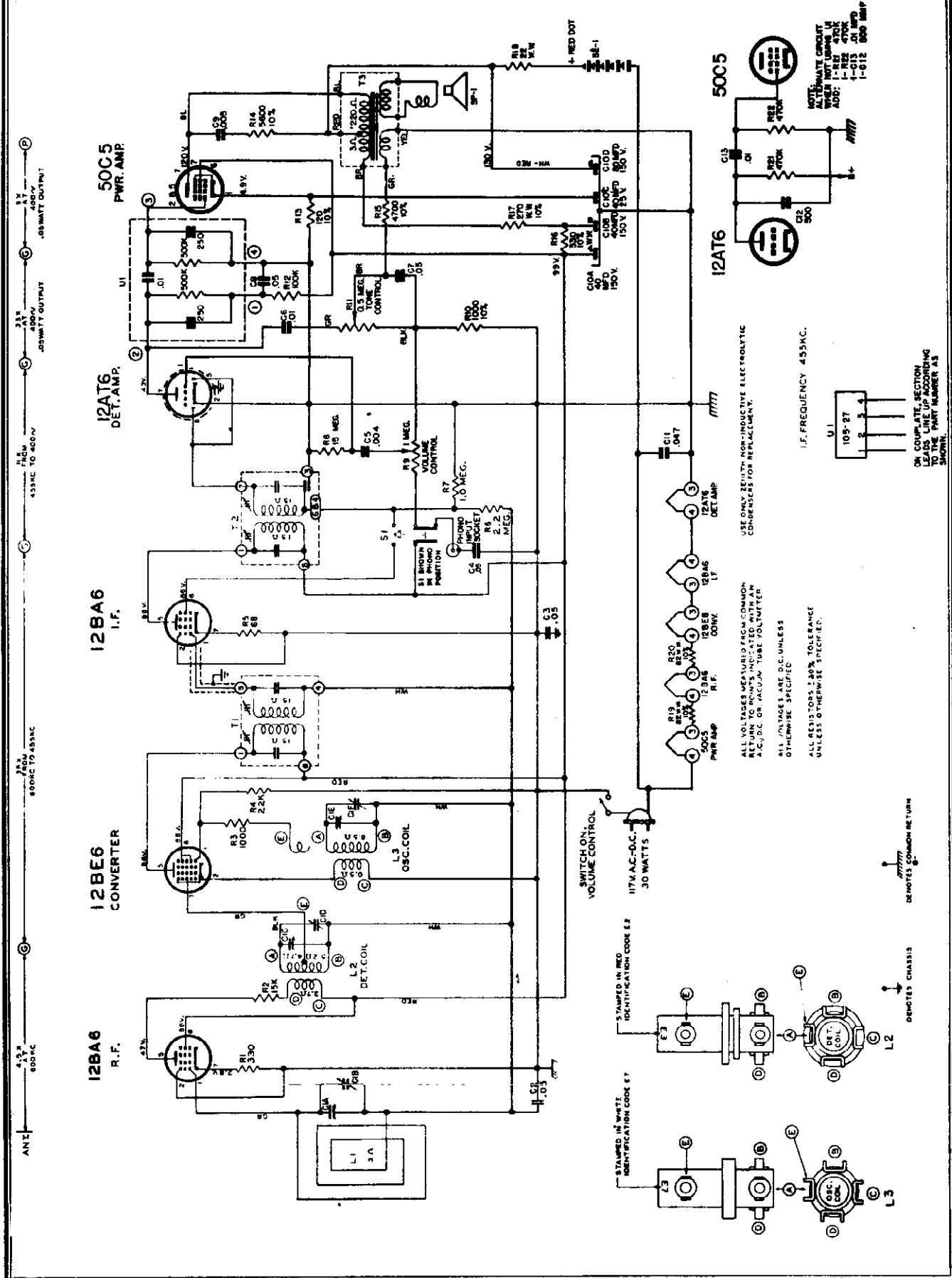
ALIGNMENT PROCEDURE

OPERATION	CONNECT TO OSCILLATOR	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE	
						Adjust Primary & Secondary Slug	For I.F. Alignment
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	CIF	Set Oscillator to Dial Scale	Detector Alignment
2	Single Turn Loosely Coupled to Wave Magnet	---	1600 Kc.	1600 Kc.	CID	Antenna Alignment	
3		---	1400 Kc.	1400 Kc.	CIB		
4		---	1400 Kc.	1400 Kc.			

Part No.	Description	Price
21-85	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-86	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-87	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-88	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-89	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-90	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-91	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-92	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-93	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-94	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-95	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-96	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-97	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-98	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-99	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-100	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-101	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-102	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-103	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-104	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-105	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-106	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-107	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-108	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-109	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-110	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-111	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-112	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-113	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-114	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-115	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-116	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-117	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-118	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-119	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-120	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-121	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-122	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-123	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-124	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-125	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-126	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-127	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-128	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-129	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-130	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-131	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-132	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-133	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-134	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-135	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-136	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-137	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-138	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-139	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-140	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-141	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-142	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-143	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-144	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-145	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-146	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-147	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-148	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-149	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-150	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-151	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-152	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-153	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-154	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-155	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-156	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-157	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-158	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-159	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-160	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-161	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-162	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-163	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-164	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-165	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-166	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-167	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-168	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-169	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-170	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-171	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-172	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-173	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-174	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-175	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-176	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-177	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-178	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-179	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-180	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-181	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-182	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-183	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-184	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-185	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-186	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-187	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-188	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-189	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-190	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-191	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-192	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-193	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-194	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-195	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-196	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85
21-197	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST TOP	2.85
21-198	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST TOP	2.85
21-199	1/2" I.F. TRANS. PRM-ADJUST TOP SEC-ADJUST BOTTOM	2.85
21-200	1/2" I.F. TRANS. PRM-ADJUST BOTTOM SEC-ADJUST BOTTOM	2.85



MODELS K526W,
Y, Ch. 5K04



USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSERS FOR REPLACEMENT.

ALL VOLTAGES MEASURED FROM COMMON POINT UNLESS OTHERWISE SPECIFIED.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS: 20% TOLERANCE UNLESS OTHERWISE SPECIFIED.

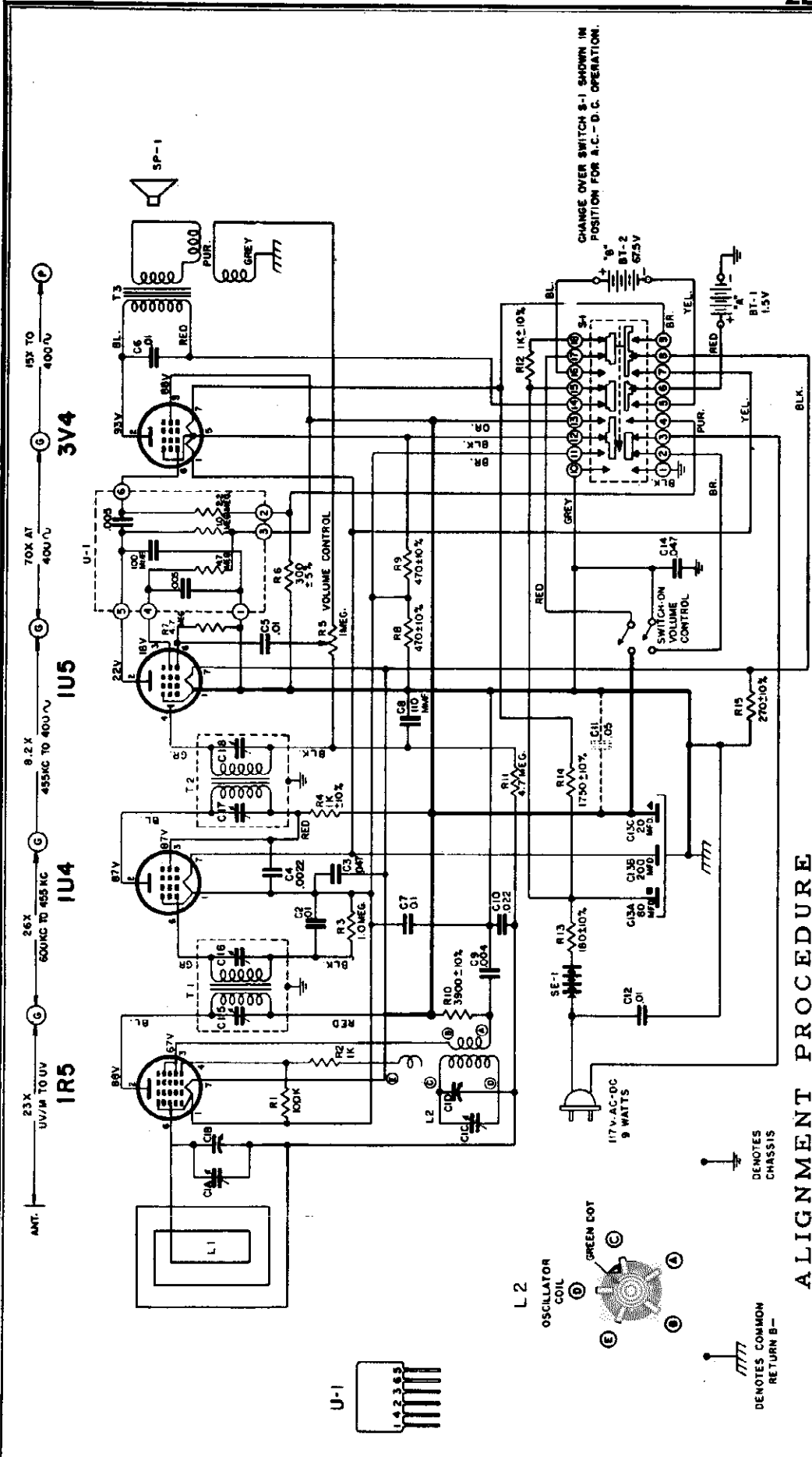
I.F. FREQUENCY 455 KC.

ON COMPLETE SECTION LEADS LINE UP ACCORDING TO THE PART NUMBER 45

DENOTES COMMON RETURN

DENOTES CHASSIS

NOT IN WHITE CIRCUIT
WHILE NOT LAMP
1 - RES 470K
1 - RES 470K
1 - 012 500 OHM



NOTE: USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSER FOR REPLACEMENT. IF ANY OTHER TYPE OF ELECTROLYTIC IS USED IT WILL BE NECESSARY TO ADD PARTS SHOWN IN DOTTED LINES.

ALL VOLTAGES ARE MEASURED FROM COMMON RETURN TO POINTS INDICATED WITH A D.C. VACUUM TUBE VOLTMETER.

ALL RESISTORS ARE $\pm 20\%$ TOLERANCE UNLESS OTHERWISE SPECIFIED.

I.F. FREQUENCY 455 KC TUNING RANGE 535-1620 KC STANDARD B.C.

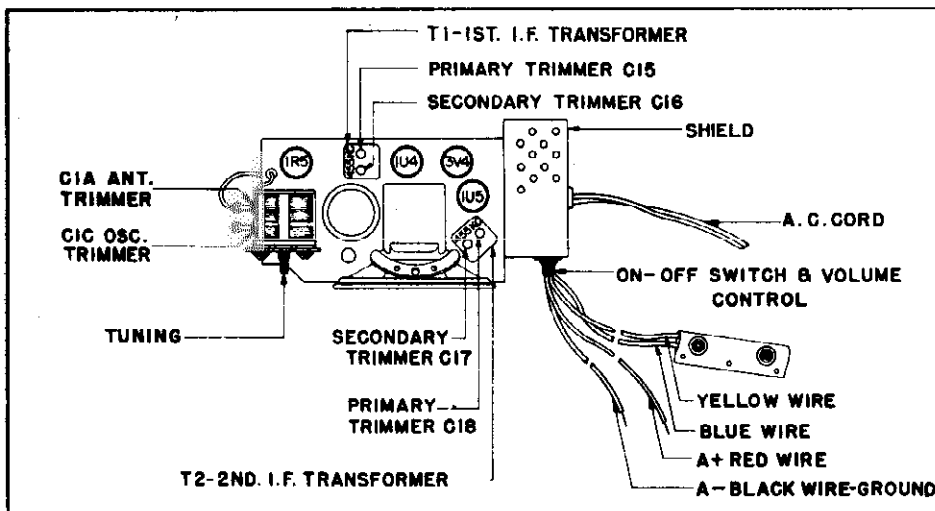
ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	C15, 16, 17, 18	For I.F. Alignment
2	Single Turn Loosely Coupled to Wavemagnet	----	1600 Kc.	1600 Kc.	C1C	Set Oscillator to Dial Scale
3		----	1400 Kc.	1400 Kc.	C1A	Antenna Alignment

MODELS L403F,
G, R, Y, Ch. 4L41

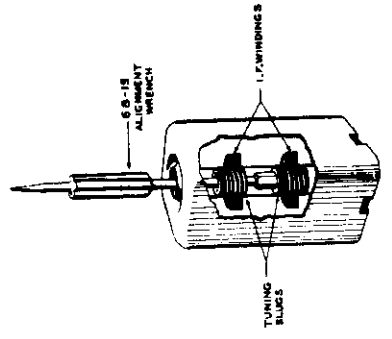
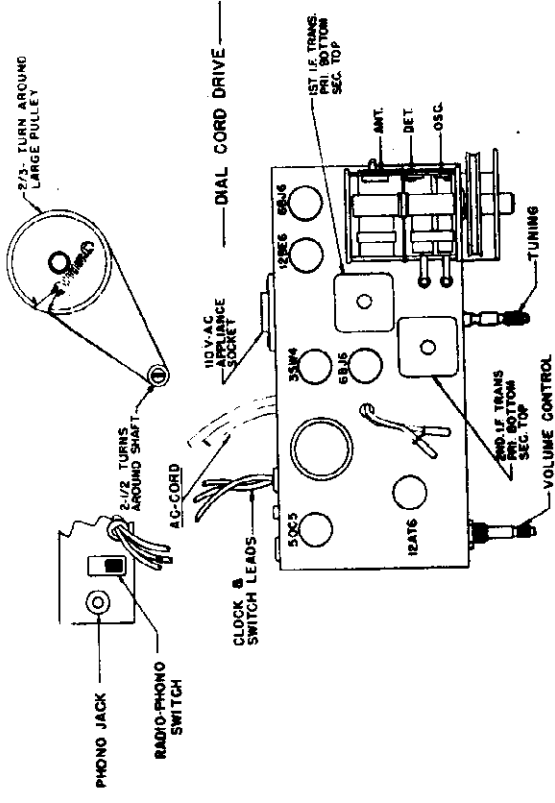
MODEL L403Y, R, G, F				Cabinet Parts		
CHASSIS 4L41						
Part No.	Diag. No.	Description	Price			
11-104		Line Cord & plug - 7 ft.	.65	12-1958	Mounting bracket R.H. (used on cabinet front)	.10
12-1956		Gang - mtg. bracket	.15	12-1959	Mounting bracket L.H. (used on cabinet front)	.10
12-1957		Mtg. bracket (Power switch vol. control & rectifier)	.15	14-1522	Cabinet front L403Y (black)	3.00
17-128		Clamp (for Electrolytic)	.10	14-1524	Cabinet front L403R (maroon)	3.00
22-3	C2	.01 Mfd. Ceramic disc. 500V (3 used)	.26	14-1525	Cabinet front L403G (gray)	3.00
22-4	C9	.004 Mfd. Ceramic disc. 500V	.26	14-1527	Cabinet front L403F (green)	3.00
22-5	C8	.110 Mfd. Ceramic disc. 500V	.26	14-1528	Cabinet back L403Y	2.25
22-1775	C14	.047 Mfd. Molded P.D. 400V	.26	14-1529	Cabinet back L403R	2.25
22-1777	C7	.1 Mfd. Molded P.D. 200V	.26	14-1530	Cabinet back L403G	2.25
22-1778	C3	.047 Mfd. Molded P.D. 200V	.26	16-866	Cabinet back L403F	2.25
22-1846	C6	.01 Mfd. Molded P.D. 400V	.20	24-620	Packing carton	
22-2072	C10	.022 Mfd. Molded P.D. 400V	.24	36-6A	Cover (used on cabinet front)	.15
22-2161	C4	.0022 Mfd. Molded P.D. 200V	.24		Handle L403Y	.50
22-2445	C1A, C1B, C1C, C1D	Two Section gang	3.50	36-69	Handle L403R	.50
22-2446	C13A, C13B, C13C	Electrolytic 80/150V 200/10V 20/150V	2.75	36-70	Handle L403G	.50
49-730	SP-1	Speaker 3 1/2" PM	5.00	36-71	Handle L403F	.50
52-633		Perforated twin conductor cable (4 gang)		40-127	Hinge	.20
94-34		6-32x1/4 Hex nut (mt. 49-1)	.01	46-1084	Knob, volume (L403Y, R&F)	.30
94-139		3/8-32x9/16 Hex Nut (1 mt. 63-3168)	.01	46-1085	Knob, volume L403G	.30
94-267		6-32x5/16 Flatnut (1 for 114-316)	.01	46-1089	Knob, tuning (L403Y, R&F)	.30
94-271		6-32x5/16 Hex Flatnut (2 mt. ea. IF trans.)	.01	46-1090	Knob, tuning (L403G)	.30
63-1761	R15	270 ohm 1/2 W Ins. 10%	.21	54-338	Speed Nut (2 used)	.04
63-1762	R6	300 ohm 1/2 W Ins. 5%	.21	54-339	Speed Nut	.04
63-1771	R8	470 ohm 1/2 W Ins. 10% (2 used)	.21	57-1721	Emblem plate (L403Y, R&F)	.25
63-1785	R12	1 K ohm 1/2 W Ins. 10% (2 used)	.21	57-1904	Emblem plate (L403G)	.25
63-1786	R2	1 K ohm 1/2 W Ins. 20%	.21	59-288	Dial pointer	.30
63-1810	R10	3900 ohm 1/2 W Ins. 10%	.21	64-5	1/8x7/32 Rivet (Part of S-19581)	.01
63-1870	R1	100 K ohm 1/2 W Ins. 20%	.21	64-6	1/8x3/16 Rivet (Part of S-19581)	.01
63-1912	R3	1 Megohm 1/2 W Ins. 20%	.21	64-7	1/8x3/32 Rivet (Part of S-19581)	.01
63-1940	R11	4.7 Megohm 1/2 W Ins. 20% (2 used)	.21	64-27	1/8x1/8 Rivet (Part of S-19581)	.01
63-2819	R14	1750 ohm 5W WW Ins. 10%	.75	80-903	Ground spring (used on cabinet back)	.03
63-2821	R13	180 ohm 4 W WW Ins. 10%	.40	80-932	Latch spring (used on cabinet back)	.10
63-3168	R5	Volume control & switch	1.81	80-933	Contact spring (Part of S-19581)	.15
64-27		1/8 Dia x 1/8 Rivet (3 used)	.01	83-2083	Armitc strip (used with cabinet handle)	.04
64-151		.088 Dia x 3/32 Rivet (2 mt. ea. 78-782)	.01	83-2084	Battery contact strip (Part of S-19581)	.04
64-246		Brass eyelet (1 used with Electrolytic)	.01	83-2087	Contact mtg. strip (Part of S-19581)	.15
69-1	6-32 x 1/2	Rd Hd Mach. Screw (1 mt. 63-2819)	.03	86-30	Terminal (Part of S-19581)	.02
69-259		8-32x3/8 Phil Rd Hd Mach Screw (1 mt. 49-730)	.02	86-221	Terminal (Part of S-19581)	.02
78-782		Socket, 7 contact molded min. (4 used)	.25	93-975	Washer (Part of S-19581)	.01
83-1513		B Battery term strip	.25	112-880	6-20x5/16 phil pan hd self tap screw (3 mt. hinge)	.02
83-2081		Armitc strip (used with 212-5)	.25	112-889	6-32x3/8 phil pan hd self tap screw (1 mt. chassis)	.04
85-454	S-1	Power change over switch	2.00	112-900	6-20x3/8 phil pan hd self tap screw (3 used)	.02
93-125		6 Int. lockwasher (49-1)	.01	114-192	6-20x7/16 hex hd self tap screw (4 mt. chassis)	.01
93-126		8 Int. lockwasher (49-259)	.01	114-248	6-20x5/16 hex hd self tap screw (2 mt. handle)	.01
93-1020		Fibre washer (2--69-1)	.01	114-294	6-20x1/4 hex hd self tap screw (mt. shield)	.02
94-334		Gang mtg. bushing (3 used)	.01	114-297	6-32x1/4 hex hd self tap screw (4 mt. 24-620 1 ea. 12-1958 & 9)	.01
94-812		Coil insert (Part of Osc. coil)	.05	114-421	5-40 x 1/4 hex hd self tap screw (4 mt. grille)	.02
95-1330	T1	1st IF transformer	1.85	126-709	Shield plate	.15
95-1331	T2	2nd IF transformer	1.85	138-63	Cabinet grille (L403Y R&F)	1.75
95-1332	T3	Output transformer	2.00	138-65	Cabinet grille (L403G)	1.75
105-31	U-1	Couplete unit	.99	159-86	Trimount (3 mt. shield)	.01
113-10		6-32x1/16 Hex hd. mach. screw (2 mt. 12-1957)	.02	159-177	Line cord sleeve	.06
113-40		6-32x1/4 Phil rd hd. mach screw (2 mt. 12-1958)	.02	202-956	Instruction book	.20
113-15		6-32x5/16 Hex hd mach screw (3 mt. gang)	.02	5-19581	Battery carrier assem.	.95
114-275		6-32x5/16 Hex hd mach screw (1 mt. 22-2446)	1.20	5-19584	Wavemagnet	2.25
114-297		6-32x1/4 hex hd self tap screw (5 used speaker)	.01	5-19588	Bracket & strip (Part of S-19581)	.10
114-316		6-32x1-1/4 hex hd mach screw (1 mt. 212-5)	.02	5-19639	Bracket & bushing (for handle used on cab. front)	.10
125-47		Rubber grommet (3 mt. gang)	.03			
125-81		Strain relief grommet (11-104)	.05			
125-82		Strain relief grommet (11-104)	.05			
126-706		Shield	.15			
149-85		Iron core (Part of Osc. coil S-19960)	.10			
212-5	SE-1	Selenium rectifier 75 MA	1.80			
S-19640	L2	Oscillator coil				

TUBE AND TRIMMER LOCATION



Clock and Timer Note:

The clock and timer assemblies used in this receiver are manufactured by Telechron. Face parts, such as hands, knobs, scales, bezel, etc., are not available through local Telechron service depots. We suggest that all clock and timer assemblies complete (less the rear cover and bushing) be returned to your local Zenith Distributor for repair or replacement. Be sure to pack all clock and timer assemblies individually and carefully to prevent damage in shipment.



MODELS L622, F, G, W CHASSIS 6L03

QTY	NO.	DESCRIPTION	PRICE
1	1-287	Clock Back LAMP	2.15
1	1-288	Clock Back LAMP	2.15
1	1-289	Clock Back LAMP	2.15
1	1-290	Clock Back LAMP	2.15
1	1-291	Clock Back LAMP	2.15
1	1-292	Clock Back LAMP	2.15
1	1-293	Clock Back LAMP	2.15
1	1-294	Clock Back LAMP	2.15
1	1-295	Clock Back LAMP	2.15
1	1-296	Clock Back LAMP	2.15
1	1-297	Clock Back LAMP	2.15
1	1-298	Clock Back LAMP	2.15
1	1-299	Clock Back LAMP	2.15
1	1-300	Clock Back LAMP	2.15
1	1-301	Clock Back LAMP	2.15
1	1-302	Clock Back LAMP	2.15
1	1-303	Clock Back LAMP	2.15
1	1-304	Clock Back LAMP	2.15
1	1-305	Clock Back LAMP	2.15
1	1-306	Clock Back LAMP	2.15
1	1-307	Clock Back LAMP	2.15
1	1-308	Clock Back LAMP	2.15
1	1-309	Clock Back LAMP	2.15
1	1-310	Clock Back LAMP	2.15
1	1-311	Clock Back LAMP	2.15
1	1-312	Clock Back LAMP	2.15
1	1-313	Clock Back LAMP	2.15
1	1-314	Clock Back LAMP	2.15
1	1-315	Clock Back LAMP	2.15
1	1-316	Clock Back LAMP	2.15
1	1-317	Clock Back LAMP	2.15
1	1-318	Clock Back LAMP	2.15
1	1-319	Clock Back LAMP	2.15
1	1-320	Clock Back LAMP	2.15
1	1-321	Clock Back LAMP	2.15
1	1-322	Clock Back LAMP	2.15
1	1-323	Clock Back LAMP	2.15
1	1-324	Clock Back LAMP	2.15
1	1-325	Clock Back LAMP	2.15
1	1-326	Clock Back LAMP	2.15
1	1-327	Clock Back LAMP	2.15
1	1-328	Clock Back LAMP	2.15
1	1-329	Clock Back LAMP	2.15
1	1-330	Clock Back LAMP	2.15
1	1-331	Clock Back LAMP	2.15
1	1-332	Clock Back LAMP	2.15
1	1-333	Clock Back LAMP	2.15
1	1-334	Clock Back LAMP	2.15
1	1-335	Clock Back LAMP	2.15
1	1-336	Clock Back LAMP	2.15
1	1-337	Clock Back LAMP	2.15
1	1-338	Clock Back LAMP	2.15
1	1-339	Clock Back LAMP	2.15
1	1-340	Clock Back LAMP	2.15
1	1-341	Clock Back LAMP	2.15
1	1-342	Clock Back LAMP	2.15
1	1-343	Clock Back LAMP	2.15
1	1-344	Clock Back LAMP	2.15
1	1-345	Clock Back LAMP	2.15
1	1-346	Clock Back LAMP	2.15
1	1-347	Clock Back LAMP	2.15
1	1-348	Clock Back LAMP	2.15
1	1-349	Clock Back LAMP	2.15
1	1-350	Clock Back LAMP	2.15
1	1-351	Clock Back LAMP	2.15
1	1-352	Clock Back LAMP	2.15
1	1-353	Clock Back LAMP	2.15
1	1-354	Clock Back LAMP	2.15
1	1-355	Clock Back LAMP	2.15
1	1-356	Clock Back LAMP	2.15
1	1-357	Clock Back LAMP	2.15
1	1-358	Clock Back LAMP	2.15
1	1-359	Clock Back LAMP	2.15
1	1-360	Clock Back LAMP	2.15
1	1-361	Clock Back LAMP	2.15
1	1-362	Clock Back LAMP	2.15
1	1-363	Clock Back LAMP	2.15
1	1-364	Clock Back LAMP	2.15
1	1-365	Clock Back LAMP	2.15
1	1-366	Clock Back LAMP	2.15
1	1-367	Clock Back LAMP	2.15
1	1-368	Clock Back LAMP	2.15
1	1-369	Clock Back LAMP	2.15
1	1-370	Clock Back LAMP	2.15
1	1-371	Clock Back LAMP	2.15
1	1-372	Clock Back LAMP	2.15
1	1-373	Clock Back LAMP	2.15
1	1-374	Clock Back LAMP	2.15
1	1-375	Clock Back LAMP	2.15
1	1-376	Clock Back LAMP	2.15
1	1-377	Clock Back LAMP	2.15
1	1-378	Clock Back LAMP	2.15
1	1-379	Clock Back LAMP	2.15
1	1-380	Clock Back LAMP	2.15
1	1-381	Clock Back LAMP	2.15
1	1-382	Clock Back LAMP	2.15
1	1-383	Clock Back LAMP	2.15
1	1-384	Clock Back LAMP	2.15
1	1-385	Clock Back LAMP	2.15
1	1-386	Clock Back LAMP	2.15
1	1-387	Clock Back LAMP	2.15
1	1-388	Clock Back LAMP	2.15
1	1-389	Clock Back LAMP	2.15
1	1-390	Clock Back LAMP	2.15
1	1-391	Clock Back LAMP	2.15
1	1-392	Clock Back LAMP	2.15
1	1-393	Clock Back LAMP	2.15
1	1-394	Clock Back LAMP	2.15
1	1-395	Clock Back LAMP	2.15
1	1-396	Clock Back LAMP	2.15
1	1-397	Clock Back LAMP	2.15
1	1-398	Clock Back LAMP	2.15
1	1-399	Clock Back LAMP	2.15
1	1-400	Clock Back LAMP	2.15
1	1-401	Clock Back LAMP	2.15
1	1-402	Clock Back LAMP	2.15
1	1-403	Clock Back LAMP	2.15
1	1-404	Clock Back LAMP	2.15
1	1-405	Clock Back LAMP	2.15
1	1-406	Clock Back LAMP	2.15
1	1-407	Clock Back LAMP	2.15
1	1-408	Clock Back LAMP	2.15
1	1-409	Clock Back LAMP	2.15
1	1-410	Clock Back LAMP	2.15
1	1-411	Clock Back LAMP	2.15
1	1-412	Clock Back LAMP	2.15
1	1-413	Clock Back LAMP	2.15
1	1-414	Clock Back LAMP	2.15
1	1-415	Clock Back LAMP	2.15
1	1-416	Clock Back LAMP	2.15
1	1-417	Clock Back LAMP	2.15
1	1-418	Clock Back LAMP	2.15
1	1-419	Clock Back LAMP	2.15
1	1-420	Clock Back LAMP	2.15
1	1-421	Clock Back LAMP	2.15
1	1-422	Clock Back LAMP	2.15
1	1-423	Clock Back LAMP	2.15
1	1-424	Clock Back LAMP	2.15
1	1-425	Clock Back LAMP	2.15
1	1-426	Clock Back LAMP	2.15
1	1-427	Clock Back LAMP	2.15
1	1-428	Clock Back LAMP	2.15
1	1-429	Clock Back LAMP	2.15
1	1-430	Clock Back LAMP	2.15
1	1-431	Clock Back LAMP	2.15
1	1-432	Clock Back LAMP	2.15
1	1-433	Clock Back LAMP	2.15
1	1-434	Clock Back LAMP	2.15
1	1-435	Clock Back LAMP	2.15
1	1-436	Clock Back LAMP	2.15
1	1-437	Clock Back LAMP	2.15
1	1-438	Clock Back LAMP	2.15
1	1-439	Clock Back LAMP	2.15
1	1-440	Clock Back LAMP	2.15
1	1-441	Clock Back LAMP	2.15
1	1-442	Clock Back LAMP	2.15
1	1-443	Clock Back LAMP	2.15
1	1-444	Clock Back LAMP	2.15
1	1-445	Clock Back LAMP	2.15
1	1-446	Clock Back LAMP	2.15
1	1-447	Clock Back LAMP	2.15
1	1-448	Clock Back LAMP	2.15
1	1-449	Clock Back LAMP	2.15
1	1-450	Clock Back LAMP	2.15
1	1-451	Clock Back LAMP	2.15
1	1-452	Clock Back LAMP	2.15
1	1-453	Clock Back LAMP	2.15
1	1-454	Clock Back LAMP	2.15
1	1-455	Clock Back LAMP	2.15
1	1-456	Clock Back LAMP	2.15
1	1-457	Clock Back LAMP	2.15
1	1-458	Clock Back LAMP	2.15
1	1-459	Clock Back LAMP	2.15
1	1-460	Clock Back LAMP	2.15
1	1-461	Clock Back LAMP	2.15
1	1-462	Clock Back LAMP	2.15
1	1-463	Clock Back LAMP	2.15
1	1-464	Clock Back LAMP	2.15
1	1-465	Clock Back LAMP	2.15
1	1-466	Clock Back LAMP	2.15
1	1-467	Clock Back LAMP	2.15
1	1-468	Clock Back LAMP	2.15
1	1-469	Clock Back LAMP	2.15
1	1-470	Clock Back LAMP	2.15
1	1-471	Clock Back LAMP	2.15
1	1-472	Clock Back LAMP	2.15
1	1-473	Clock Back LAMP	2.15
1	1-474	Clock Back LAMP	2.15
1	1-475	Clock Back LAMP	2.15
1	1-476	Clock Back LAMP	2.15
1	1-477	Clock Back LAMP	2.15
1	1-478	Clock Back LAMP	2.15
1	1-479	Clock Back LAMP	2.15
1	1-480	Clock Back LAMP	2.15
1	1-481	Clock Back LAMP	2.15
1	1-482	Clock Back LAMP	2.15
1	1-483	Clock Back LAMP	2.15
1	1-484	Clock Back LAMP	2.15
1	1-485	Clock Back LAMP	2.15
1	1-486	Clock Back LAMP	2.15
1	1-487	Clock Back LAMP	2.15
1	1-488	Clock Back LAMP	2.15
1	1-489	Clock Back LAMP	2.15
1	1-490	Clock Back LAMP	2.15
1	1-491	Clock Back LAMP	2.15
1	1-492	Clock Back LAMP	2.15
1	1-493	Clock Back LAMP	2.15
1	1-494	Clock Back LAMP	2.15
1	1-495	Clock Back LAMP	2.15
1	1-496	Clock Back LAMP	2.15
1	1-497	Clock Back LAMP	2.15
1	1-498	Clock Back LAMP	2.15
1	1-499	Clock Back LAMP	2.15
1	1-500	Clock Back LAMP	2.15

ALIGNMENT PROCEDURE

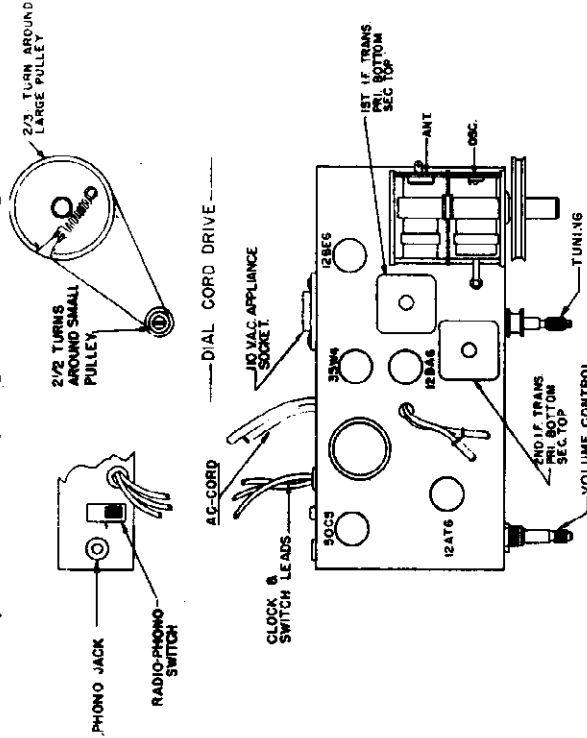
OPERATION	CONNECT TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	Set Oscillator to Dial Scale
3		--	1400 Kc.	1400 Kc.	Detector Alignment
		--	1400 Kc.	1400 Kc.	Align Antenna Stage

MODEL L518

CHASSIS 5L03

MODEL L518

Clock and Timer Note:
The clock and timer assemblies used in this receiver are manufactured by Telechron. Face parts, such as hands, knobs, scales, bezel, etc., are not available through local Telechron service depots. We suggest that all clock and timer assemblies complete (less the rear cover and bushing) be returned to your local Zenith Distributor for repair or replacement. Be sure to pack all clock and timer assemblies individually and carefully to prevent damage in shipment.



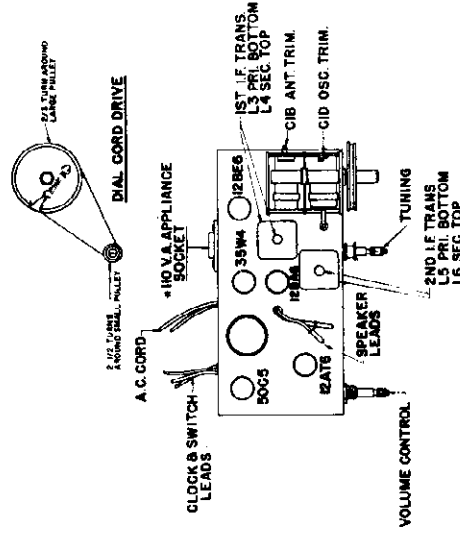
PART NO.	DIAG. NO.	DESCRIPTION	PRICE
124-17		Rubber Grommet (3 mt. ass)	.02
144-55		Knob, Alarm, Radio, Auto off-L518	.02
144-56		Knob, Alarm, Radio, Auto off-L518	.02
144-57		Knob, Alarm, Radio, Auto off-L518	.02
144-58		Knob, Alarm, Radio, Auto off-L518	.02
144-59		Knob, Alarm, Radio, Auto off-L518	.02
144-60		Knob, Alarm, Radio, Auto off-L518	.02
144-61		Knob, Alarm, Radio, Auto off-L518	.02
144-62		Knob, Alarm, Radio, Auto off-L518	.02
144-63		Knob, Alarm, Radio, Auto off-L518	.02
144-64		Knob, Alarm, Radio, Auto off-L518	.02
144-65		Knob, Alarm, Radio, Auto off-L518	.02
144-66		Knob, Alarm, Radio, Auto off-L518	.02
144-67		Knob, Alarm, Radio, Auto off-L518	.02
144-68		Knob, Alarm, Radio, Auto off-L518	.02
144-69		Knob, Alarm, Radio, Auto off-L518	.02
144-70		Knob, Alarm, Radio, Auto off-L518	.02
144-71		Knob, Alarm, Radio, Auto off-L518	.02
144-72		Knob, Alarm, Radio, Auto off-L518	.02
144-73		Knob, Alarm, Radio, Auto off-L518	.02
144-74		Knob, Alarm, Radio, Auto off-L518	.02
144-75		Knob, Alarm, Radio, Auto off-L518	.02
144-76		Knob, Alarm, Radio, Auto off-L518	.02
144-77		Knob, Alarm, Radio, Auto off-L518	.02
144-78		Knob, Alarm, Radio, Auto off-L518	.02
144-79		Knob, Alarm, Radio, Auto off-L518	.02
144-80		Knob, Alarm, Radio, Auto off-L518	.02
144-81		Knob, Alarm, Radio, Auto off-L518	.02
144-82		Knob, Alarm, Radio, Auto off-L518	.02
144-83		Knob, Alarm, Radio, Auto off-L518	.02
144-84		Knob, Alarm, Radio, Auto off-L518	.02
144-85		Knob, Alarm, Radio, Auto off-L518	.02
144-86		Knob, Alarm, Radio, Auto off-L518	.02
144-87		Knob, Alarm, Radio, Auto off-L518	.02
144-88		Knob, Alarm, Radio, Auto off-L518	.02
144-89		Knob, Alarm, Radio, Auto off-L518	.02
144-90		Knob, Alarm, Radio, Auto off-L518	.02
144-91		Knob, Alarm, Radio, Auto off-L518	.02
144-92		Knob, Alarm, Radio, Auto off-L518	.02
144-93		Knob, Alarm, Radio, Auto off-L518	.02
144-94		Knob, Alarm, Radio, Auto off-L518	.02
144-95		Knob, Alarm, Radio, Auto off-L518	.02
144-96		Knob, Alarm, Radio, Auto off-L518	.02
144-97		Knob, Alarm, Radio, Auto off-L518	.02
144-98		Knob, Alarm, Radio, Auto off-L518	.02
144-99		Knob, Alarm, Radio, Auto off-L518	.02
144-100		Knob, Alarm, Radio, Auto off-L518	.02
144-101		Knob, Alarm, Radio, Auto off-L518	.02
144-102		Knob, Alarm, Radio, Auto off-L518	.02
144-103		Knob, Alarm, Radio, Auto off-L518	.02
144-104		Knob, Alarm, Radio, Auto off-L518	.02
144-105		Knob, Alarm, Radio, Auto off-L518	.02
144-106		Knob, Alarm, Radio, Auto off-L518	.02
144-107		Knob, Alarm, Radio, Auto off-L518	.02
144-108		Knob, Alarm, Radio, Auto off-L518	.02
144-109		Knob, Alarm, Radio, Auto off-L518	.02
144-110		Knob, Alarm, Radio, Auto off-L518	.02
144-111		Knob, Alarm, Radio, Auto off-L518	.02
144-112		Knob, Alarm, Radio, Auto off-L518	.02
144-113		Knob, Alarm, Radio, Auto off-L518	.02
144-114		Knob, Alarm, Radio, Auto off-L518	.02
144-115		Knob, Alarm, Radio, Auto off-L518	.02
144-116		Knob, Alarm, Radio, Auto off-L518	.02
144-117		Knob, Alarm, Radio, Auto off-L518	.02
144-118		Knob, Alarm, Radio, Auto off-L518	.02
144-119		Knob, Alarm, Radio, Auto off-L518	.02
144-120		Knob, Alarm, Radio, Auto off-L518	.02
144-121		Knob, Alarm, Radio, Auto off-L518	.02
144-122		Knob, Alarm, Radio, Auto off-L518	.02
144-123		Knob, Alarm, Radio, Auto off-L518	.02
144-124		Knob, Alarm, Radio, Auto off-L518	.02
144-125		Knob, Alarm, Radio, Auto off-L518	.02
144-126		Knob, Alarm, Radio, Auto off-L518	.02
144-127		Knob, Alarm, Radio, Auto off-L518	.02
144-128		Knob, Alarm, Radio, Auto off-L518	.02
144-129		Knob, Alarm, Radio, Auto off-L518	.02
144-130		Knob, Alarm, Radio, Auto off-L518	.02
144-131		Knob, Alarm, Radio, Auto off-L518	.02
144-132		Knob, Alarm, Radio, Auto off-L518	.02
144-133		Knob, Alarm, Radio, Auto off-L518	.02
144-134		Knob, Alarm, Radio, Auto off-L518	.02
144-135		Knob, Alarm, Radio, Auto off-L518	.02
144-136		Knob, Alarm, Radio, Auto off-L518	.02
144-137		Knob, Alarm, Radio, Auto off-L518	.02
144-138		Knob, Alarm, Radio, Auto off-L518	.02
144-139		Knob, Alarm, Radio, Auto off-L518	.02
144-140		Knob, Alarm, Radio, Auto off-L518	.02
144-141		Knob, Alarm, Radio, Auto off-L518	.02
144-142		Knob, Alarm, Radio, Auto off-L518	.02
144-143		Knob, Alarm, Radio, Auto off-L518	.02
144-144		Knob, Alarm, Radio, Auto off-L518	.02
144-145		Knob, Alarm, Radio, Auto off-L518	.02
144-146		Knob, Alarm, Radio, Auto off-L518	.02
144-147		Knob, Alarm, Radio, Auto off-L518	.02
144-148		Knob, Alarm, Radio, Auto off-L518	.02
144-149		Knob, Alarm, Radio, Auto off-L518	.02
144-150		Knob, Alarm, Radio, Auto off-L518	.02
144-151		Knob, Alarm, Radio, Auto off-L518	.02
144-152		Knob, Alarm, Radio, Auto off-L518	.02
144-153		Knob, Alarm, Radio, Auto off-L518	.02
144-154		Knob, Alarm, Radio, Auto off-L518	.02
144-155		Knob, Alarm, Radio, Auto off-L518	.02
144-156		Knob, Alarm, Radio, Auto off-L518	.02
144-157		Knob, Alarm, Radio, Auto off-L518	.02
144-158		Knob, Alarm, Radio, Auto off-L518	.02
144-159		Knob, Alarm, Radio, Auto off-L518	.02
144-160		Knob, Alarm, Radio, Auto off-L518	.02
144-161		Knob, Alarm, Radio, Auto off-L518	.02
144-162		Knob, Alarm, Radio, Auto off-L518	.02
144-163		Knob, Alarm, Radio, Auto off-L518	.02
144-164		Knob, Alarm, Radio, Auto off-L518	.02
144-165		Knob, Alarm, Radio, Auto off-L518	.02
144-166		Knob, Alarm, Radio, Auto off-L518	.02
144-167		Knob, Alarm, Radio, Auto off-L518	.02
144-168		Knob, Alarm, Radio, Auto off-L518	.02
144-169		Knob, Alarm, Radio, Auto off-L518	.02
144-170		Knob, Alarm, Radio, Auto off-L518	.02
144-171		Knob, Alarm, Radio, Auto off-L518	.02
144-172		Knob, Alarm, Radio, Auto off-L518	.02
144-173		Knob, Alarm, Radio, Auto off-L518	.02
144-174		Knob, Alarm, Radio, Auto off-L518	.02
144-175		Knob, Alarm, Radio, Auto off-L518	.02
144-176		Knob, Alarm, Radio, Auto off-L518	.02
144-177		Knob, Alarm, Radio, Auto off-L518	.02
144-178		Knob, Alarm, Radio, Auto off-L518	.02
144-179		Knob, Alarm, Radio, Auto off-L518	.02
144-180		Knob, Alarm, Radio, Auto off-L518	.02
144-181		Knob, Alarm, Radio, Auto off-L518	.02
144-182		Knob, Alarm, Radio, Auto off-L518	.02
144-183		Knob, Alarm, Radio, Auto off-L518	.02
144-184		Knob, Alarm, Radio, Auto off-L518	.02
144-185		Knob, Alarm, Radio, Auto off-L518	.02
144-186		Knob, Alarm, Radio, Auto off-L518	.02
144-187		Knob, Alarm, Radio, Auto off-L518	.02
144-188		Knob, Alarm, Radio, Auto off-L518	.02
144-189		Knob, Alarm, Radio, Auto off-L518	.02
144-190		Knob, Alarm, Radio, Auto off-L518	.02
144-191		Knob, Alarm, Radio, Auto off-L518	.02
144-192		Knob, Alarm, Radio, Auto off-L518	.02
144-193		Knob, Alarm, Radio, Auto off-L518	.02
144-194		Knob, Alarm, Radio, Auto off-L518	.02
144-195		Knob, Alarm, Radio, Auto off-L518	.02
144-196		Knob, Alarm, Radio, Auto off-L518	.02
144-197		Knob, Alarm, Radio, Auto off-L518	.02
144-198		Knob, Alarm, Radio, Auto off-L518	.02
144-199		Knob, Alarm, Radio, Auto off-L518	.02
144-200		Knob, Alarm, Radio, Auto off-L518	.02

ALIGNMENT PROCEDURE

OPERATION	CONNECT TO OSCILLATOR	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	Adjust Primary & Secondary Slugs	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	--	1600 Kc.	1600 Kc.	OSC	Set Oscillator to Dial Scale
3		--	1400 Kc.	1400 Kc.	ANT	Align Antenna Stage

Clock and Timer Note:

The clock and timer assemblies used in this receiver are manufactured by Telechron. Face parts, such as hands, knobs, scales, bezel, etc., are not available through local Telechron service depots. We suggest that all clock and timer assemblies complete (less the rear cover and bushing) be returned to your local Zenith Distributor for repair or replacement. Be sure to pack all clock and timer assemblies individually and carefully to prevent damage in shipment.



Part No.	Description	Price
46-985	Knob, alarm - radio - auto off L520G (3 used)	.25
46-1222	Knob, volume - tuning (2 used) L520	.25
46-1224	Knob, volume - tuning L520W (2 used)	.25
46-1225	Knob, volume - tuning L520C (2 used)	.25
46-1226	Knob, volume - tuning L520F (2 used)	.25
48-1262	Knob, volume tuning L520R (2 used)	4.50
49-1713	Speaker 4" PM	.01
54-227	Hex nut (3 mt. S-19252)	.25
57-1721	Dial background plate L520G	.70
57-1854	Dial background plate L520W	.70
57-1855	Dial background plate L520	.70
57-1856	Dial background plate L520F	.70
57-1857	Dial background plate L520R	.30
59-280	Pointer L520G, F, R	.30
59-281	Pointer L520W	.30
59-282	Pointer L520	.30
93-501	#4 int. lockwasher (1 mt. 19-208)	.01
93-805	Steel washer (1 mt. 19-208)	.01
102-792	Clock set instruction label	.02
112-773	6-20 x 3/8 phil pan hd self tap screw	.03
112-829	(4 mt. wavemagnet & back)	.02
114-294	10-32 x 1/2 truss hd mach screw (2 mt. chassis)	.02
114-297	6-20 x 1/4 hex hd self tap screw (2 mt. speaker)	.02
114-395	6-32 x 1/4 hex hd self tap screw (2 mt. dial backgd. plate)	.01
188-102	6-20 x 5/16 hex hd self tap screw (1 mt. dial backgd. plate, 2 mt. clock assem.)	.05
192-155	Clamping ring (for pointer)	.35
196-206	Crystal (2 used)	.25
202-999	Instruction book	13.50
S-19224 U1	Clock assem. L520G	13.50
S-19225 U1	Clock assem. L520W	13.50
S-19226 U1	Clock assem. L520	13.50
S-19227 U1	Clock assem. L520F	13.50
S-19262	Clock cover assem.	.30
S-20558 L1	Wavemagnet & back assem.	1.50
S-20988	Clock assem. L520R	

Prices shown are suggested list prices and are subject to change without notice.

ALIGNMENT PROCEDURE

OPERATION	CONNECT OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	L3, 4, 5, 6	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	---	1600 Kc.	1600 Kc.	CID	Set Oscillator to Dial Scale
3		---	1400 Kc.	1400 Kc.	CIB	Align Antenna Stage

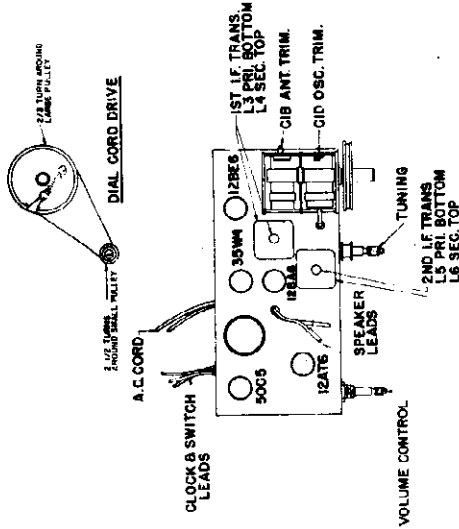
Part No.	Description	Price
11-111	Line cord & plug	1.15
22-3	.01 mfd ceramic disc. 500V (3 used)	.26
22-6	.00047 mfd ceramic disc. 500V	.26
22-829	C7, C8, C10 .05 mfd 200V (2 used)	.20
22-1182	C6 .01 mfd 400V	.20
22-1866	C2 250 mfd ceramic 500V	.25
22-2351	C11A, C11B Electrolytic 80/150V 40/150V	2.40
22-2386	C1A, C1B, Two section variable	3.00
54-139	C1C, C1D	
54-271	Palnut (1 mt. 63-2393)	.01
61-265	1 K ohm 1 W ins. 10%	.24
63-1450	R9 22 ohm 1 W WW ins. 20%	.24
63-1737	R2 68 ohm 1/2 W ins. 20%	.21
63-1842	R1 22 K ohm 1/2 W ins. 20%	.21
63-1898	R6, R7 470 K ohm 1/2 W ins. 20% (2 used)	.21
63-1926	R4 2.2 meg ohm 1/2 W ins. 20%	.21
63-1940	R5 4.7 meg ohm 1/2 W ins. 20%	.21
63-1977	R8 150 ohm 1 W ins. 10%	.24
63-2393	R3 Volume control	1.20
78-275	Socket, electrolytic	.03
78-806	Socket, min. tube (4 used)	.15
78-807	Socket, min. tube	.15
78-940	Socket, two contact	.30
80-209	Dial cord tension spring	.03
83-1841	Line cord terminal strip	.10
83-1862	Line cord insulating	.05
93-2	Brass washer (2 mt. 95-1354)	.01
94-295	Gang mg. bushing (3 used)	.04
95-1101	T1 1st. IF transformer	1.60
95-1102	T2 2nd IF transformer	1.60
95-1354	T3 Output transformer	3.00
113-13	6-32 x 7/16 hex hd mach screw (2 mt. gang)	.02
114-67	6-32 x 7/16 hex hd mach screw (1 mt. gang)	.01
125-17	Rubber grommet (3 mt. gang)	.03
166-65	Retaining ring (for S-18514)	.02
188-149	Dial cord & eyelist	.06
S-18509	Tuning shaft & pulley	.35
S-18514	Oscillator coil assem.	.70
S-18616	L2 Twisted wire cable	.20

Cabinet Parts

14-1621	Cabinet, plastic table model L520	7.00
14-1623	Cabinet, plastic table model L520W	9.00
14-1624	Cabinet, plastic table model L520G	9.00
14-1625	Cabinet, plastic table model L520F	9.00
14-1647	Cabinet, plastic table model L520R	9.00
16-942	Packing carton	.02
19-208	Cable clamp	.65
26-480	Radio dial scale L520, W, G, F	.65
26-481	Clock dial scale L520, W, G, F	.25
46-904	Knob, alarm - radio - auto off (3 used) L520	.25
46-905	Knob, alarm - radio - auto off L520R (3 used)	.25
46-940	Knob, alarm - radio - auto off L520W (3 used)	.25
46-951	Knob, alarm - radio - auto off L520F (3 used)	.25

Clock and Timer Note:

The clock and timer assemblies used in this receiver are manufactured by Telechron. Face parts, such as hands, knobs, scales, bezel, etc., are not available through local Telechron service depots. We suggest that all clock and timer assemblies complete (less the rear cover and bushing) be returned to your local Zenith Distributor for repair or replacement. Be sure to pack all clock and timer assemblies individually and carefully to prevent damage in shipment.



Cabinet Parts

14-1357	Cabinet - plastic table model L515Y	4.50
14-1385	Cabinet - plastic table model L515	4.50
14-1612	Cabinet - plastic table model L515W	6.50
14-1613	Cabinet - plastic table model L515F	6.50
14-1614	Cabinet - plastic table model L515C	6.50
16-930	Packing carton	.02
19-208	Cable clamp	.45
26-466	Dial scale	.25
46-904	Knob, alarm - radio - auto off (3 used) L515, W.F.G.	.25
46-905	Knob, alarm - radio - auto off (3 used) L515, W.F.G.	.25
46-941	Knob, volume - tuning (2 used) L515, W.F.G.	.20
46-943	Knob, volume - tuning (2 used) L515	.20
49-713	Speaker 4" PM	4.50
54-227	Hex nut (3 mt. S-18925)	.01
57-1782	Clock escutcheon	.40
59-265	Dial painter L515, W.F.C	.30
59-267	#4 int. lockwasher (for 19-208)	.01
93-501	Steel washer (for 19-208)	.01
102-1002	Clock set instruction label	.02
112-824	10-32 x 1/2 truss hd mach screw (2 mt. chassis)	.02
114-248	6 x 5/16 hex hd self tap screw (2 mt. speaker)	.01
114-395	6-20 x 5/16 hex hd self tap screw (3 mt. S-18925)	.05
159-69	Trimount stud (4 mt. wavemagnet & back)	.04
188-134	Clamping ring (for 59-265 or 59-267)	.15
192-145	Crystal gasket	.20
196-186	Instruction book	13.50
202-696	Clock assem. L515	13.50
S-18534	Clock assem. L515Y, W.F.G	.35
S-18629	Clock cover assem.	1.50
S-18925	Wavemagnet & back assem.	
S-20393 L1		

Prices shown are suggested list prices and are subject to change without notice.

PRICE

DESCRIPTION

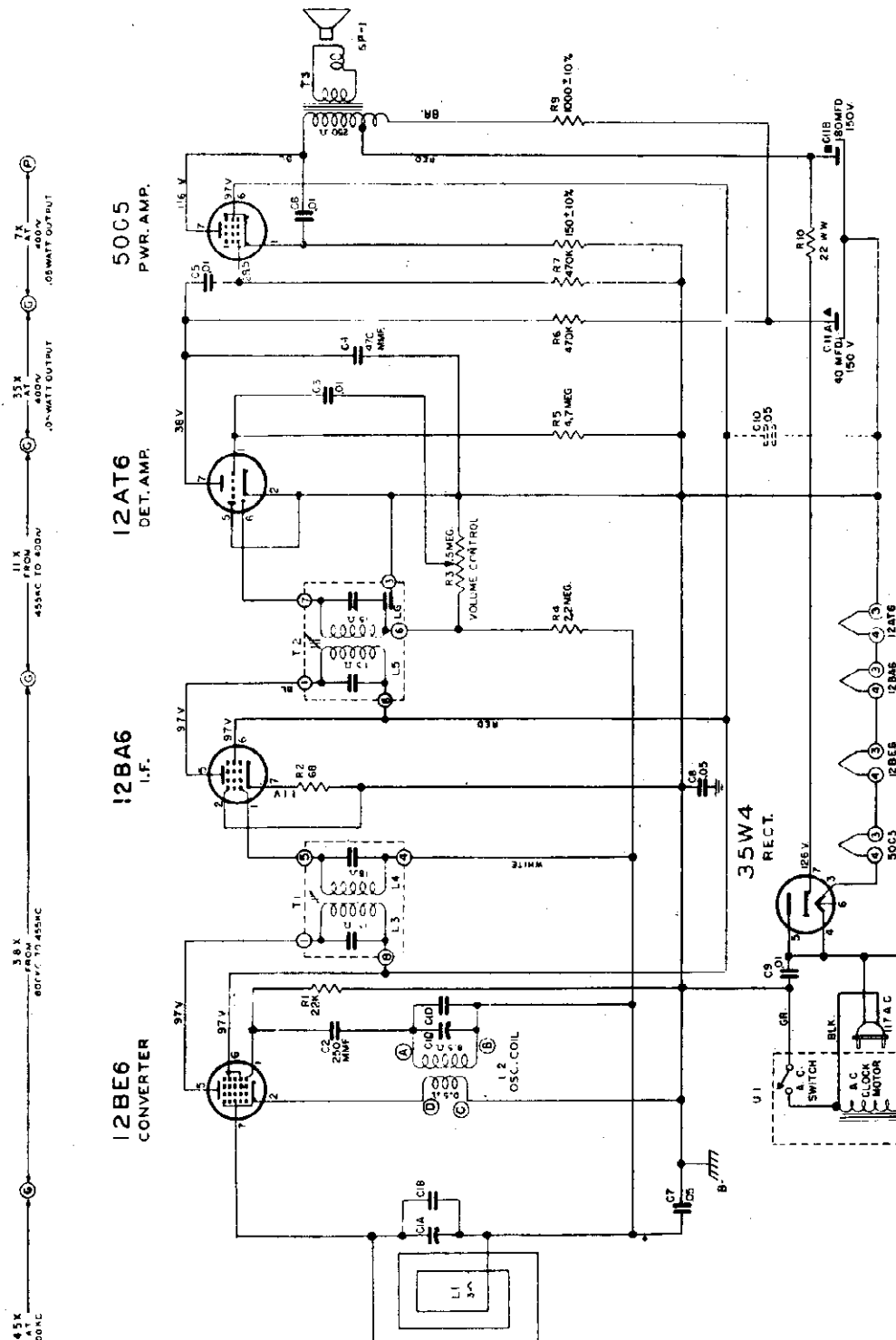
Chassis Parts

11-104	Line cord & plug	.65
22-3	C3, C5, C9 .01 mid ceramic disc, 500V (3 used)	.26
22-6	C4 .00047 mid ceramic disc, 500V	.26
22-6	C7, C8, C10 .05 mid 200V (2 used)	.20
22-1182 C6	.01 mid 400V	.25
22-1666 C2	250 minid ceramic 500V	2.40
22-2336 C1A, C1B	Electrolytic 80/150V 40/150V	3.00
22-2336 C1A, C1B, C1C, C1D	Two section variable	
54-139	Paint (used on volume control)	.01
54-271	Paint (1 mt. ea. 95-1101, 1102)	.01
63-965 R9	1 K ohm 1/2 W ins, 10%	.24
63-1450 R10	22 ohm 1/2 W ins, 20%	.24
63-1737 R2	68 ohm 1/2 W ins, 20%	.21
63-1842 R1	22 K ohm 1/2 W ins, 20%	.21
63-1898 R6, R7	470 K ohm 1/2 W ins, 20% (2 used)	.21
63-1926 R4	2.2 meg ohm 1/2 W ins, 20%	.21
63-1940 R5	4.7 meg ohm 1/2 W ins, 20%	.21
63-1977 R8	150 ohm 1 W ins, 10%	.24
63-2393 R3	Volume control	1.20
78-275	Socket, electrolytic	.03
78-807	Socket, min tube (4 used)	.15
80-209	Socket, min tube	.03
83-792	Dial cord tension spring	.03
94-295	Line cord insulating strip	.01
95-1101 T1	Brass washer (2 mt. 95-1354)	.04
95-1102 T2	Gang mg. bushing (3 used)	1.60
95-1354 T3	1 st LF transformer	3.00
113-13	Output transformer	3.00
114-67	6-32 x 7/16 hex hd mach screw (2 mt. gang)	.02
125-17	6-32 x 7/16 hex hd mach screw (1 mt. gang)	.01
166-65	Rubber grommet (3 mt. gang)	.03
188-149	Rubber bumper (gang)	.02
S-18509	Retaining ring (for S-18514)	.06
S-18514 L2	Dial cord & eyelet	.35
S-18616 L2	Tuning shaft & pulley	.70
S-19291	Oscillator coil assem. Twisted wire cable	.25

ALIGNMENT PROCEDURE

OPERATION	CONNECT TO OSCILLATOR TO	DUMMY ANTENNA	INPUT SIG. FREQUENCY	SET DIAL AT	TRIMMERS	PURPOSE
1	Converter Grid	.5 Mfd.	455 Kc.	600 Kc.	L3, 4, 5, 6	For I. F. Alignment
2	One Turn Loop Coupled Loosely to Wave Magnet	---	1600 Kc.	1600 Kc.	C1D	Set Oscillator to Dial Scale
					C1R	Align Antenna

MODELS L515, F,
G, W, Y, Ch. 5L06



IF FREQUENCY 455KC.
TUNING RANGE
535 — 1620KC.

ALL VOLTAGES MEASURED FROM COMMON RETURN TO POINT INDICATED WITH AN A.C. OR D.C. ON A TUBE VOLTMETER. ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.

USE ONLY ZENITH NON-INDUCTIVE ELECTROLYTIC CONDENSERS FOR REPLACEMENT. IF ANY OTHER TYPE OF ELECTROLYTIC IS USED, IT IS NECESSARY TO STOP THE SHOWN INDICATED LINES.

IF TRANSFORMER NUMBERING STARTS WITH "1" TERMINAL, AS FIRST TERMINAL CLOCKWISE AND ADJACENT TO MARKER AS VIEWED FROM BOTTOM OF TRANSFORMER.

