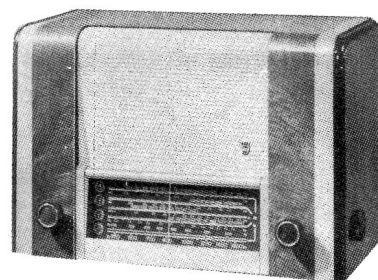




PHILIPS

SERVICE NOTES

Radio Receiver CM50A



SPECIFICATIONS

MODEL CM50A: Is a five tube superheterodyne receiver designed for use on A.C. power only. Five tuning ranges cover from 13.6 to 560 meters, 22MC to 535 kc. with bandspread on three short wave ranges.

PHILIPS TUBES: Converter 12SA7, I.F. Amplifier 12SK7GT, Detector, A.V.C. and 1st A.F. Amplifier 12SQ7GT, Audio Output 50L6GT, Rectifier 35Z5GT or 34Z5GT.

RANGE SWITCH POSITIONS AND TUNING RANGES:

- 1st—560—170 m,—535—1635 kc. (Special)
- 2nd—560—170 m,—535—1635 kc. (Normal)
- 3rd—120—37.5 m,—2.5—8.0 Mc.
- 4th—32.2—28.5 m,—9.3—10.5 Mc. Bandspread
- 5th—28.8—24.6 m,—10.4—12.2 Mc. Bandspread
- 6th—25.5—13.6 m,—14.6—22.0 Mc. Bandspread

INTERMEDIATE FREQUENCY: 455 kc.

AUDIO POWER OUTPUT: 2 watts

LOUDSPEAKER: Is a 6 inch permanent magnet dynamic with a voice coil D.C. resistance of 3.4 ohms.

ANTENNA AND GROUND: For optimum results an outside antenna is necessary. A secure ground connection should be made to a cold water pipe or to a grounding plate buried in damp ground.

CONTROLS: Left end to right end (looking at front).

1. On-Off Switch and Volume Control
2. Tone Switch
3. Wave Range Switch
4. Tuning Control

PHONOGRAPH CONNECTION: A connector is supplied to connect a pickup to the receiver. The circuit is designed to operate with a crystal or other high impedance pickup.

LINE VOLTAGE: 115 volts, 25 to 60 cycles.

CURRENT DRAIN: 0.65 amperes maximum.

CABINET DIMENSIONS: Width 17- $\frac{1}{2}$ inches
Height 11- $\frac{3}{4}$ inches
Depth 9 inches

SERVICE DATA

WAVE RANGE SWITCH: The schematic diagram shows each section of this switch in a straight line form. The short stator contacts are represented as solid squares; the long contacts as solid rectangles; and the rotor contacts as bars. All sections are shown in the extreme counterclockwise (14.6 to 22.0 Mc range or 6th)

position of the switch or the extreme clockwise rotation of the switch knob. As the switch rotates clockwise (knob counterclockwise) the rotor contacts move upwards through the 5th to the 1st Wave Range Switch positions as listed above. The exact location of each stator contact on its wafer is shown on a front view drawing of a switch wafer on the schematic diagram.

TO REMOVE CHASSIS

1. Disconnect the plug from power socket.
2. Remove Antenna and Ground connections.
3. Remove Back Cover and Control Knobs.
4. Disconnect the speaker from the chassis.
5. Remove chassis mounting screws.

ALIGNMENT OF RECEIVER

See that the Phonograph Switch is in the left position (from rear of chassis) for radio reception. With the variable capacitor fully closed, adjust the dial pointer on the beginning of the dial scale to the left of the 550 kc calibration mark. Place the tone

switch in the second position (one position to the right of full counterclockwise) and turn the volume control to the maximum volume (clockwise) position.

Equipment Required

OUTPUT INDICATOR: A high resistance A.C. voltmeter and an output transformer.

SIGNAL GENERATOR: A generator capable of supplying modulated signals between 455 kc and 22 Mc.

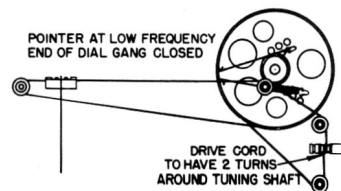
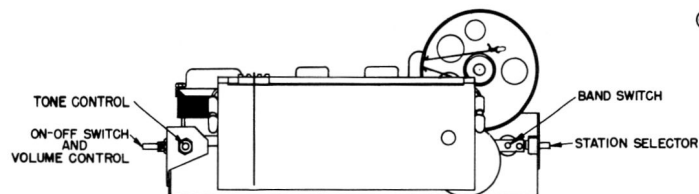
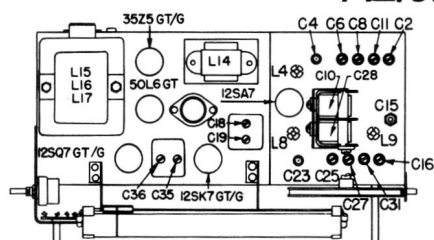
Equipment Connections and Alignment Procedure

OUTPUT INDICATOR: Connect the A.C. voltmeter across the voice coil of the speaker. During alignment, keep the output below 1.25 A.C. volts across the voice coil. If the meter is not sensitive enough to indicate 1.25 volts, connect the secondary of an output transformer across the speaker voice coil and connect the A.C. voltmeter across the primary. When using the latter method, the maximum output reading should be kept below 30 A.C. volts.

When the output indication increases, regulate the signal generator attenuator to restore the original indication.

SIGNAL GENERATOR: Connect the ground lead of the signal generator to the ground jack in the rear of the receiver and the output lead to the points indicated in the chart below, in series with the specified resistor or capacitor.

ALIGNMENT PROCEDURE



ALIGNMENT PROCEDURE

SIGNAL GENERATOR			RECEIVER			
Operation Steps	Output Connections to Receiver	Frequency	Range Switch	Tuning Capacitor	See Notes	Adjust in stated order for Maximum Output
1	To 12SK7GT Control Grid (4) through .05 mfd. Capacitor	455 kc	Pos. 2	Min.		2nd I.F. Trimmers C36, C35.
2	To Stator C10 through .05 mfd. Capacitor	455 kc	Pos. 2	Min.	A	1st I.F. Trimmers C19, C18.
3	To Antenna Contact through 200 mmf. Capacitor	600 kc	Pos. 2	600 kc		Broadcast Padded C15
4	To Antenna Contact through 200 mmf. Capacitor	1500 kc	Pos. 2	1500 kc	B	BC-Osc. Trimmer C16 BC-Ant. Trimmer C2
5	To Antenna Contact through 400 ohms Resistance	7.0 Mc	Pos. 3	7.0 Mc	C	SW-Osc. Trimmer C31 SW-Ant. Trimmer C11
6	To Antenna Contact through 400 ohms Resistance	2.9 Mc	Pos. 3	2.9 Mc	D	SW-Osc. Coil L9
7	To Antenna Contact through 400 ohms Resistance	21.5 Mc	Pos. 6	21.5 Mc	C	BS-Osc. Trimmer C23
8	To Antenna Contact through 400 ohms Resistance	15.2 Mc	Pos. 6	15.2 Mc	D	BS-Osc. Coil L8
9	To Antenna Contact through 400 ohms Resistance	21.5 Mc	Pos. 6	21.5 Mc	E	BS-Ant. Trimmer C4
10	To Antenna Contact through 400 ohms Resistance	15.2 Mc	Pos. 6	15.2 Mc	F	BS-Ant. Coil L4
11	To Antenna Contact through 400 ohms Resistance	11.6 Mc	Pos. 5	11.6 Mc	C	BS-Osc. Trimmer C25 BS-Ant. Trimmer C6
12	To Antenna Contact through 400 ohms Resistance	9.6 Mc	Pos. 4	9.6 Mc	C	BS-Osc. Trimmer C27 BS-Ant. Trimmer C8

ALIGNMENT NOTES

Note "A"—After step 2 has been completed, do not make any further adjustments of the 2nd I.F. Trimmers C36 and C35.

Note "B"—Return to 600 kc and tune receiver for maximum output, vary padder adjustment slightly and turn the tuning capacitor back and forth through maximum peak. Repeat until the greatest output is obtained.

Note "C"—Unscrew oscillator trimmer capacitor to minimum capacity (counterclockwise). Turn adjustment clockwise until the first

output peak is obtained. Make adjustments using this peak.

Note "D"—Check high frequency end of dial for accuracy. Adjust oscillator trimmer if necessary.

Note "E"—Rock tuning capacitor while adjusting antenna trimmer for maximum output.

Note "F"—Repeat operation 9.

[illegible]

FOR DEPENDABLE REPAIRS, USE ONLY GENUINE PHILIPS REPLACEMENT PARTS.

CAPACITORS

TRANSFORMERS & COILS

			CODE NO.
C1	10 mmf.	Mica	512-018
C2, C11, C31	3-35 mmf.	Trimmer	511-004
C3, C22	35 mmf.	Silver Mica	513-010
C4, C23	3-30 mmf.	Trimmer	511-014
C5	150 mmf.	Silver Mica	513-004
C6, C8, C25, C27	10-160 mmf.	Trimmer	511-008
C7	200 mmf.	Silver Mica	513-006
C9	150 mmf. $\pm 5\%$	Silver Mica	513-003
C10, C28	13.0-498.8 mmf.	2-Gang Variable	510-005
C12, C14	100 mmf.	Mica	512-001
C13, C32	.05 mf.	200V.	515-211 or 515-204
C15	250-525 mmf.	Padder	511-001
C16	1.6-18 mmf.	Trimmer	511-015
C17, C20	75 mmf.	Silver Mica	513-007
C18, C19, C35, C36	7-45 mmf.	Trimmer	511-011
C21	0.1 mf.	200V.	515-210 or 515-201
C24	150 mmf.	Ceramican	514-004
C26	200 mmf.	Ceramican	514-003
C29	150 mmf. $\pm 5\%$	Ceramican	514-001
C30	2340 mmf. $\pm 3\%$	Silver Mica	513-009
C33, C38	50 mmf.	Mica	512-011
C34, C37	140 mmf. $\pm 5\%$	Silver Mica	513-008
C39, C40	40-40 mf.	250V.	516-007
C41	.025 mf.	115V. A.C.	515-105 or 515-104
C42	.02 mf.	200V.	515-213 or 515-208
C43	.005 mf.	200V.	515-214 or 515-602
C44, C47	.05 mf.	400V.	515-405 or 515-401
C45	.002 mf.	600V.	515-617 or 515-605
C46	200 mmf.	Mica	512-007
C48	.25 mf.	25V.	516-003
C49	.01 mf.	600V.	515-614 or 515-603
C50	8 mf.	150V.	516-006
C51	0.1 mf.	400V.	515-406 or 515-402
C52	.005 mf.	600V.	515-612 or 515-602

RESISTORS

				CODE NO.
R1, R5	22,000 ohms	$\frac{1}{2}$ watt		501-002
R2	33,000 ohms	$\frac{1}{2}$ watt		501-041
R3	10 ohms	$\frac{1}{2}$ watt		501-029
R4	470,000 ohms	$\frac{1}{2}$ watt		501-026
R6	8,200 ohms	1 watt		502-013
R7	2.2 Megohms	$\frac{1}{2}$ watt		501-006
R9, R10	68,000 ohms	$\frac{1}{2}$ watt		501-009
R11	1 Megohm	Volume Control		505-005
R12	10 Megohms	$\frac{1}{2}$ watt		501-031
R13	39,000 ohms	$\frac{1}{2}$ watt		501-012
R14	10,000 ohms	$\frac{1}{2}$ watt		501-023
R15	220,000 ohms	$\frac{1}{2}$ watt		501-003
R16	470,000 ohms	$\frac{1}{2}$ watt		501-004
R17	150 ohms	$\frac{1}{2}$ watt		501-001
R18	100 ohms	$\frac{1}{4}$ watt		501-505
R19	15,000 ohms	1 watt		502-014

		CODE NO.
L1, L2	B.C. Antenna Coil Assembly	070-045
L3, L4	B.S. Antenna Coil Assembly	070-046
L5, L6	S.W. Antenna Coil Assembly	070-047
L7, L9	B.C. & S.W. Oscillator Coil Assembly	070-048
L8	B.S. Oscillator Coil Assembly	070-049
L10, L11	1st I.F. Transformer	060-017
L12, L13	2nd I.F. Transformer	060-018
L14	Filter Choke Assembly	050-021
L15, L16, L17	Power Transformer	050-007
L18, L19	Output Transformer	050-027

MISCELLANEOUS

	CODE NO.
Antenna & Ground Plate	120-049
Antenna & Ground Banana Plug	571-113
Back Cover	303-091
Cabinet, Wood with Baffle	030-025
Dial Glass, Standard	331-011
Dial Lamp, 6-8 V.	643-003
Dial Lamp Socket Assembly, Right	570-103
Dial Lamp Socket Assembly, Left	570-104
Dial Pointer & Slider Assembly	110-094
Dial Drive Cord 1-1/3 yds.	595-002
Dial Drive Cord Pulley	310-010
Dial Drive Cord Spring	310-005
Dial Cushion, Felt	303-018
Dial Mask, Brown	332-520
Iron Core Adjustment for L4, L8 & L9	609-004
Iron Core Locking Nut	531-003
Knob, Volume Control, Tuning	572-015
Knob, Wave Range	572-016
Knob, Tone Control	572-014
Knob Set Screw	524-505
Line Cord & Plug	100-003
Phonograph Connector, Male	571-107
Phonograph Connector, Female	571-128
Phonograph Switch	080-004
Range Switch, Section 1	080-018
Range Switch, Section 2	080-041
Range Switch, Section 3	080-040
Range Switch, Section 4	080-017
Range Switch Clicker Plate & Shaft Assembly	080-021
Range Switch Gear & Hub Assembly, Fibre	120-033
Range Switch Gear & Hub Set Screw	524-501
Range Switch Indicator Dial	110-129
Screw, Chassis Mounting	520-040
Speaker, 6" P.M.	041-008
Speaker Grille	627-009
Speaker Plug	571-118
Speaker Socket	571-119
Speaker Socket Contacts	571-105
Tone Control Switch	080-042
Tube Grid Plate Shield Assembly	120-021
Tube Socket Octal	570-001
Tuning Drum & Hub Assembly	110-093
Tuning Shaft	310-030
Washers, Rubber, Chassis Mounting 1/16" thick	542-018
Washers, Rubber, Chassis Mounting 9/32" thick	542-028