

## SERVICE DATA

the hallicrafters co.  
A subsidiary of Northrop Corporation



## MODELS FM-46, 48, 52 AND 54

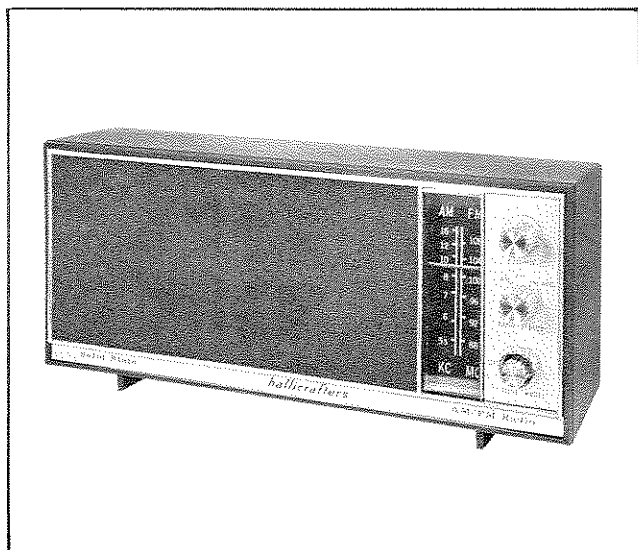


Figure 1. Hallicrafters Model FM 46-48.

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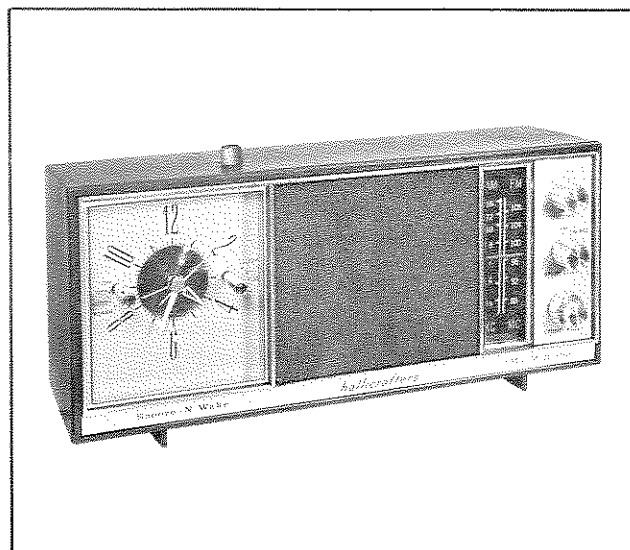


Figure 2. Hallicrafters Model FM 52-54.

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### GENERAL

The FM-46 and 52 are identical to the FM-48 and 54 respectively except the FM-46 and 52 have plastic cabinets and the FM-48 and 54 have wood cabinets. The FM-52 and 54 have the same components/circuitry as the FM-46 and 48 with the addition of an electrical clock and associated components/circuitry. Unless otherwise specified, all information contained herein, pertains to all four models. Asterisk (\*) and double-asterisk (\*\*) designate non-clock\* and clock\*\* models, respectively. For example:

\* Indicates information on FM-46 and 48 only.

\*\* Indicates information on FM-52 and 54 only.

### TECHNICAL SPECIFICATIONS

#### Transistors

Nine, plus eleven diodes

#### I.F. Frequencies

455 KHz and 10.7 MHz

#### Sensitivity

(AM) Nominal 150/uv/m

(FM) Nominal 5 uv

#### Tuning Ranges

(AM) 540-1600 KHz

(FM) 88-108 MHz

#### Image Rejection

(AM) Over 25 db

(FM) Over 37 db

#### Selectivity

(AM) 6-10 KHz at 6 db

#### I.F. Bandwidth

(FM) 150-250 KHz at 6 db

#### Audio Output

1000 Milliwatts (1.0 watt)

#### Hum and Noise

Under 8 uw

#### AFC Hold Range

Average  $\pm 300$  KHz

#### Speaker

\* 4" x 6" PM, 8 ohm

\*\*3-1/2" PM, 8 ohm

#### AGC Figure of Merit

40 db minimum

#### Antennas

Ferrite rod for AM

Line cord for FM

Provisions for external FM antenna

#### Power Source

105-125 V.A.C., 60 cycle

#### Dimensions (HWD)

5-1/2 x 13-1/8 x 3-1/2 inches

## DIAL CORD RESTRINGING

Before attempting to restring the dial cord, the rear of the case must be separated from the receiver, and the chassis removed. String the dial cord with the large pulley, fully counter-clockwise as shown in figure 3.

## CHASSIS REMOVAL

To remove the chassis from the cabinet, lay the receiver face down and remove the three Philips head screws at the rear of the cabinet. Lifting the cabinet will expose the chassis which is attached to the cabinet front. Care should be exercised in lifting the cabinet as the power supply and antenna terminal are attached and the connections to the chassis may be broken.

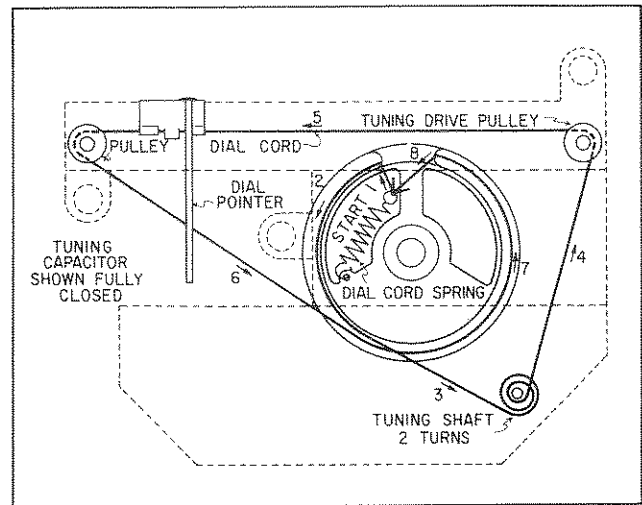
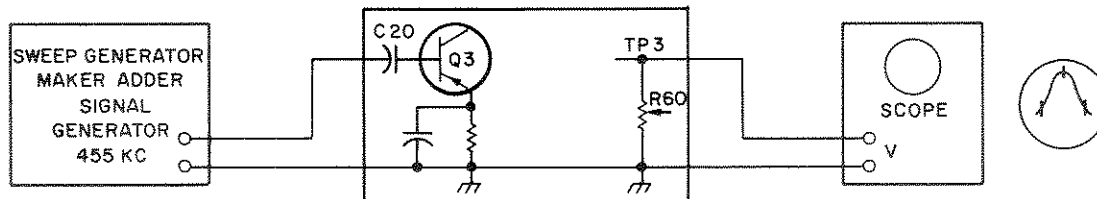


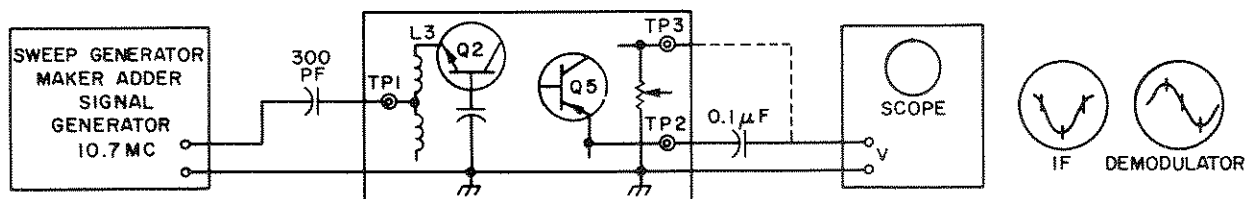
Figure 3. Dial Cord Restringing Diagram.

156-011085



156-011103

Figure 4. Connection for AM Alignment.



156-011104

Figure 5. Connection for FM Alignment.

## ALIGNMENT PROCEDURE

### TEST EQUIPMENT REQUIRED.

1. RF Signal Generator
2. IF Sweep Generator  
(centered at 455KC for AM and 10.7MC for FM)
3. VTVM
5. Oscilloscope

### GENERAL.

1. Set BAND SELECT switch to band being aligned.
2. VOL. control should be set to maximum except for IF alignment.
3. Signal input should be kept as low as possible.
4. Standard modulation for AM is 400 CPS at 30% Amplitude; 400 CPS at 22.5KC for FM.
5. Use non-metallic alignment tools.

### AM ALIGNMENT

STEP	SIGNAL SOURCE	INPUT SIGNAL FREQUENCY	CONNECTION	DIAL SETTING	REMARKS	ADJUST
1.	Sweep Generator	455KC 450, 455, 460KC markers	Q3 base through C20	Tuning capacitor fully closed. (max. capacity)	Max. gain with symmetrical curve centered at 455KC (See fig. 4)	T6, T7, T8
2.	Signal Generator	520 KC 30% AM modulated	Loop or piece of wire placed near AM antenna	Tuning capacitor fully closed. (max. capacity)	Same as step 1	L6
3.	Same as step 2	1650 KC 30% AM modulated	Same as step 2	Tuning capacitor fully open (min. capacity)	Same as step 1	C62
4.	Same as step 2	600 KC 30% AM modulated	Same as step 2	600 KC	Refer to note 1	L5-AM coil
5.	Same as step 2	1400 KC 30% AM modulated	Same as step 2	1400 KC	Same as step 1	C61
6.	Repeat steps 2, 3, 4, and 5 until no further improvement is obtained.					

### FM ALIGNMENT

STEP	SIGNAL SOURCE	INPUT SIGNAL FREQUENCY	CONNECTION	DIAL SETTING	REMARKS	ADJUST
1.	Sweep Generator	10.7 MC 10.55, 10.7, 10.8 MC markers	TP1 through a 300 pf capacitor	Tuning capacitor fully closed. (max. capacity)	Maximum gain with symmetri- cal "S" curve centered at 10.7 MC (See fig. 5)	T1, T2, T3
2.	Signal Generator	86 MC 30% FM modulated	Loosely coupled to FM external antenna ter- minal	Tuning capacitor fully closed. (max. capacity)	Adjust for max- imum output (TP3)	L4
3.	Same as step 2	110 MC 30% FM modulated	Same as step 2	Tuning capacitor fully open (min. capacity)	Same as step 2	C63
4.	Same as step 2	88 MC 30% FM modulated	Same as step 2	88 MC	Same as step 2	L2
5.	Same as step 2	108 MC 30% FM modulated	Same as step 2	108 MC	Same as step 2	C60
6.	Repeat steps 2, 3, 4, and 5 until no further improvement is obtained.					

### NOTES:

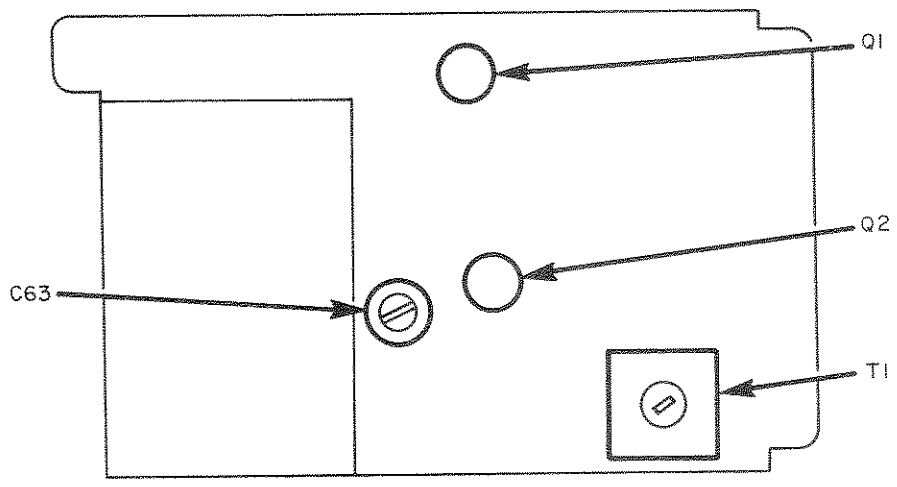
1. Check alignment of the receiver antenna coil by bringing a piece of powdered iron (such as a coil slug) near the antenna loop stick, then a piece of brass. If powdered iron increases the output, the loop requires more inductance. If brass increases the output, the loop requires less inductance. Change the loop inductance by sliding the coil toward the center of the ferrite core to increase inductance, or away to decrease inductance.

ERRATA SHEET  
MODELS FM 46, 48, 52 and 54

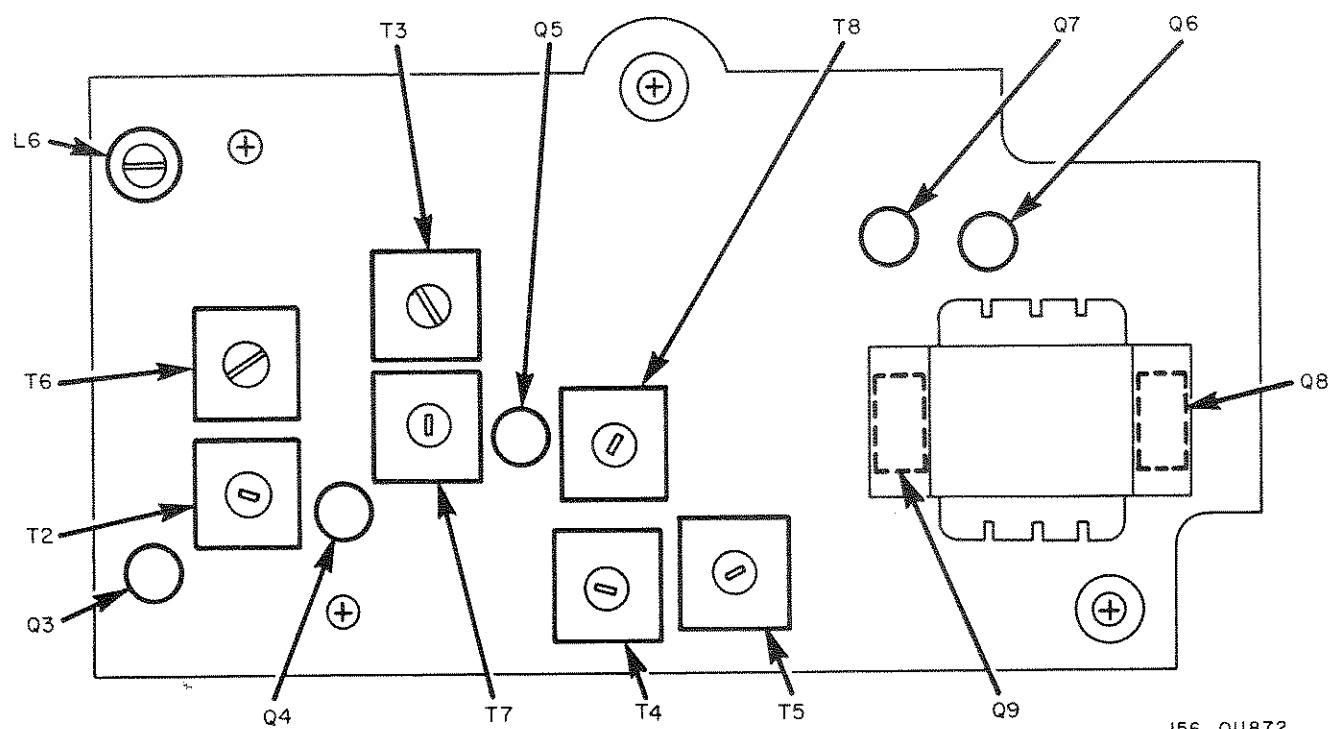
1. The reference designation of C2, connected between the selector switch arm of S1B and the junction of R12 and the base of Q3, should be changed to C20 in the schematic diagram, figure 8.
2. In the Service Repair Parts List under Transistors and Diodes the following corrections should be made to Q1, Q2 and CR6:

Q1	Transistor, type 2SC645(A)	120-004496
Q2	Transistor, type 2SC645(C)	120-004497
CR6,9	Transistor, type MA51A	120-004498

Form Number 094-904863  
Pack with Service Data  
Sheet 094-904761



156-011874



156-011872

Figure 6. Top View Showing Component Location.

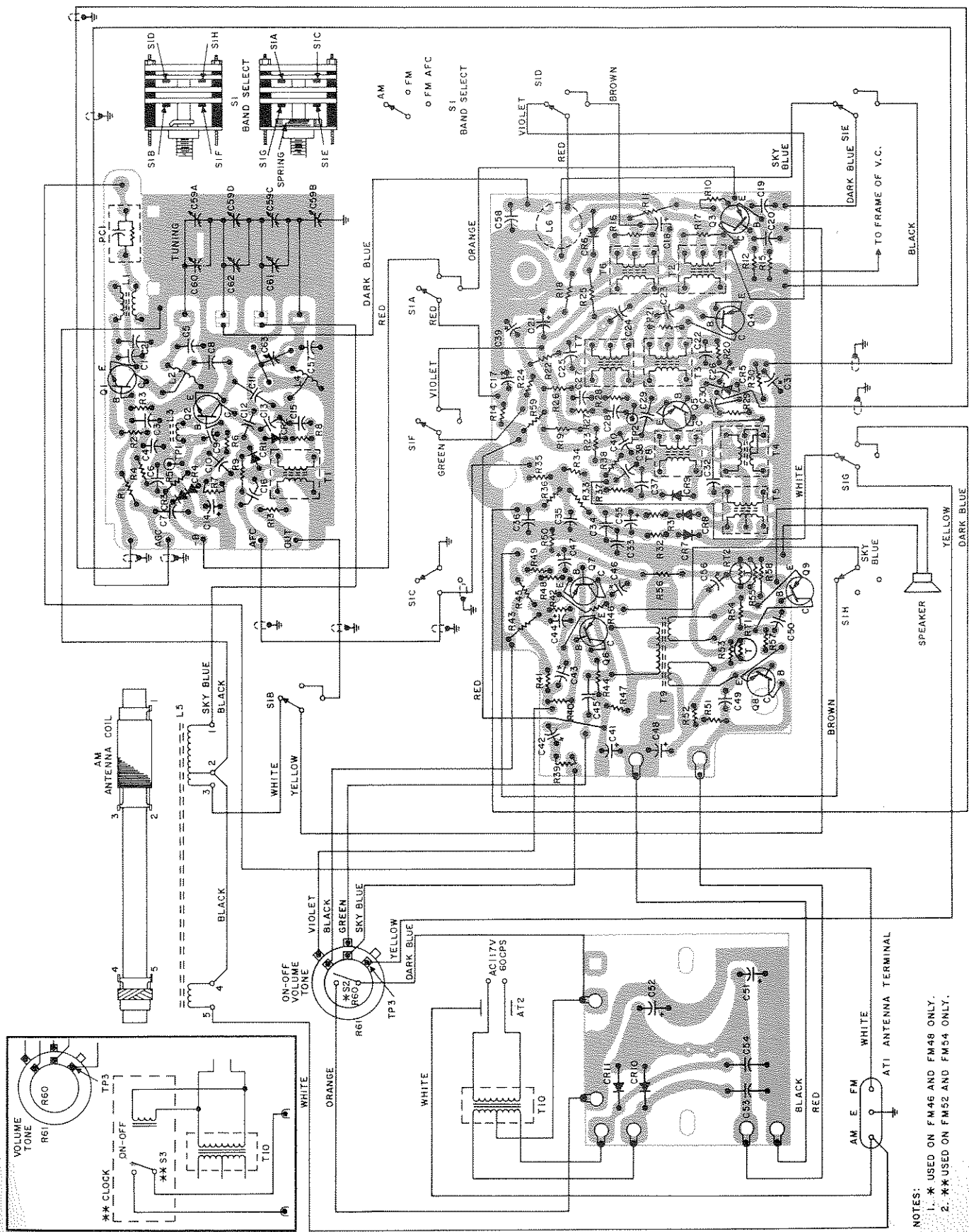


Figure 7. Printed Circuit Board Diagram.

- NOTES:
- \* USED ON FM46 AND FM48 ONLY.
  - \*\* USED ON FM52 AND FM54 ONLY.

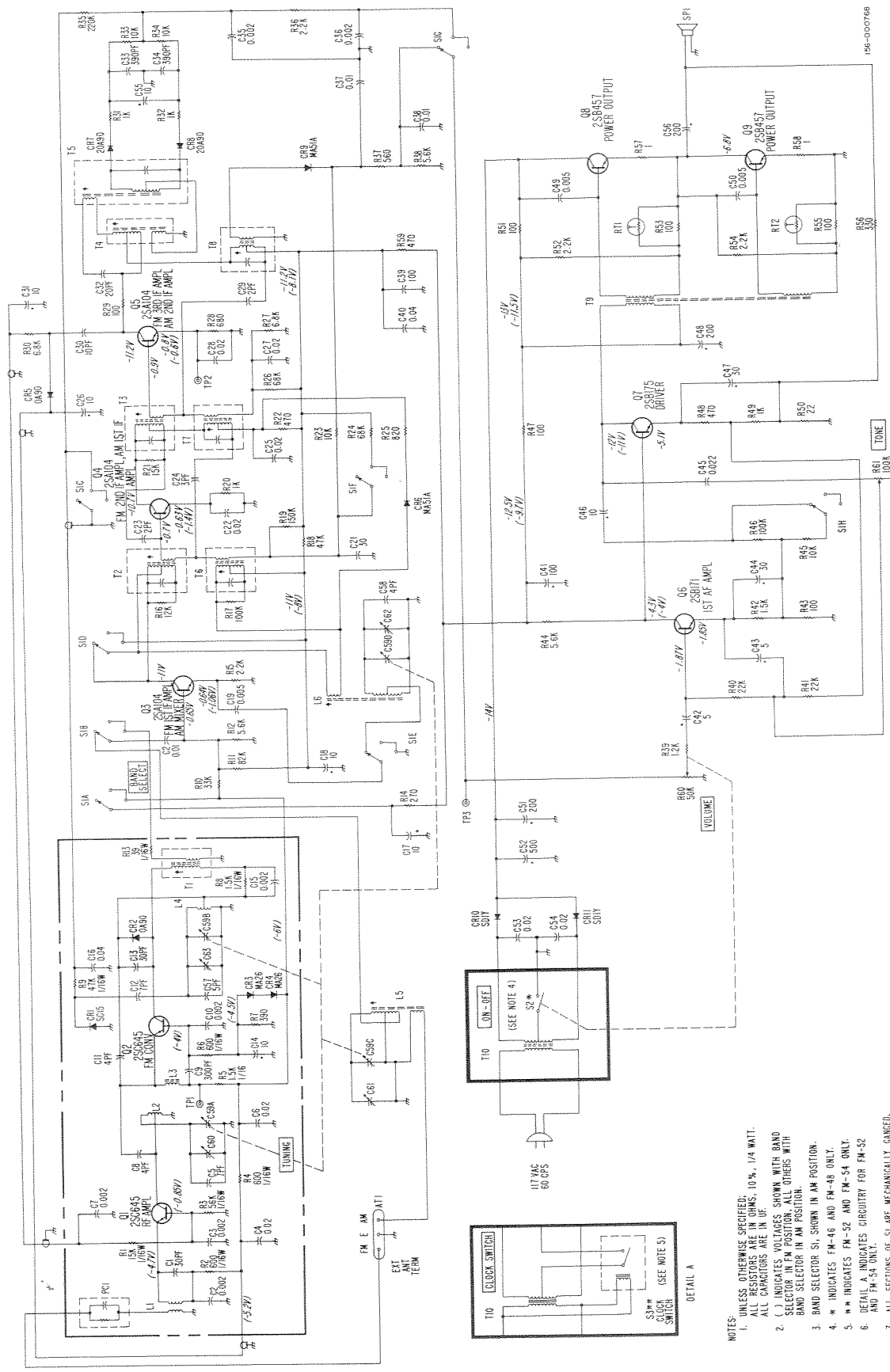
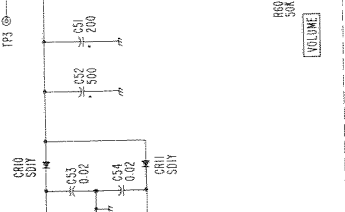
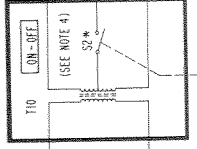
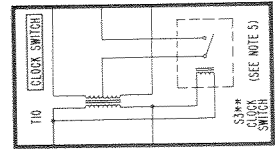


Figure 8. Schematic Diagram. Models FM 46, 48, 52 and 54.

- NOTES:
1. UNLESS OTHERWISE SPECIFIED: ALL RESISTORS ARE IN OHMS, 10%, 1/4 WATT. ALL CAPACITORS ARE IN UF.
  2. ( ) INDICATES VOLTAGES SHOWN WITH BAND SELECTOR IN FM POSITION, ALL OTHERS WITH BAND SELECTOR IN AM POSITION.
  3. BAND SELECTOR S1, SHOWN IN AM POSITION.
  4. \* INDICATES FM-46 AND FM-48 ONLY.
  5. \*\* INDICATES FM-52 AND FM-54 ONLY.
  6. DETAIL A INDICATES CIRCUITRY FOR FM-52 AND FM-54 ONLY.
  7. ALL SECTIONS OF S1 ARE MECHANICALLY GANGED.



156-000788

## SERVICE REPAIR PARTS LIST

Schematic Symbol	Description	Hallcrafters Part Number	Schematic Symbol	Description	Hallcrafters Part Number
<b>CAPACITORS</b>					
C1,13	30 pf, 50V ceramic	120-004529	L3	Coil, FM RF choke	120-004481
C2,3,7,10,15,35,36	.002 uf, 50V ceramic	120-004429	L4	Coil, FM oscillator	120-004477
C4,6,22,25,27,28,53,54	.02 uf, 50V ceramic	120-004512	L5	Coil, AM antenna	120-004478
C5,12	7 pf, 50V ceramic	120-004528	L6	Coil, AM oscillator	120-004476
C8,11,58	4 pf, 50V ceramic	120-004526	T1	Transformer, 10.7 MC IF	120-004489
C9	300 pf, 50V ceramic	120-004530	T2	Transformer, 10.7 MC IF	120-004485
C14,26,31	10 uf, 15V electrolytic	120-004520	T3	Transformer, 10.7 MC IF	120-004486
C16,40	.04 uf, 50V ceramic	120-004513	T4	Transformer, 10.7 MC IF	120-004487
C17,18,46	10 uf, 15V electrolytic	120-004520	T5	Transformer, 10.7 MC IF	120-004488
C19	.005 uf, 50V mylar	120-004514	T6	Transformer, 455 KC IF	120-004482
C20,37,38	.01 uf, 50V ceramic	120-004511	T7	Transformer, 455 KC IF	120-004483
C21,44	30 uf, 3V electrolytic	120-004521	T8	Transformer, 455 KC IF	120-004484
C23,29	2 pf, 50V ceramic	120-004504	T9	Transformer, audio input	120-004490
C24	3 pf, 50V ceramic	120-004505	T10	Transformer, power	120-004491
C30	10 pf, 50V ceramic	120-004507	<b>*TRANSISTORS AND DIODES</b>		
C32	20 pf, 50V ceramic	120-004508	Q1	Transistor, type 2SC645	120-004496
C33,34	390 pf, 25V styrol	120-004516	Q2	Transistor, type 2SC645	120-004497
C39,41	100 uf, 15V electrolytic	120-004523	Q3,4,5	Transistor, type 2SA104	120-004492
C42,43	5 uf, 6V electrolytic	120-004517	Q6	Transistor, type 2SB171	120-004493
C45	.022 uf, 50V mylar	120-004515	Q7	Transistor, type 2SB175	120-004494
C47	30 uf, 6V electrolytic	120-004522	Q8,9	Transistor, type 2SB457	120-004495
C48,51	200 uf, 15V electrolytic	120-004536	CR1	Diode, type SC15	120-004502
C49,50	.005 uf, 50V ceramic	120-004510	CR2,5	Diode, type OA92	120-004499
C52	500 uf, 15V electrolytic	120-004537	CR3,4	Diode, type MA26	120-004500
C55	10 uf, 3V electrolytic	120-004518	CR6	Diode, type MA51A	120-004498
C56	200 uf, 10V electrolytic	120-004524	CR7,8	Diode, type 2OA90	120-004629
C57	5 pf, 50V ceramic	120-004527	CR10,11	Diode, type SD-1Y or FR-1P	120-004503
C59A,B,C,D	Variable, TUNING (includes C60,81,62)	120-004538	<b>*Diode types MA26 and 2OA90 are directly interchangeable.</b>		
C63	Trimmer	120-004539	<b>MISCELLANEOUS</b>		
<b>*RESISTORS</b>					
R1	15K ohm, 1/16 watt	120-004571	S1A,B,C,D,E,F	Switch, rotary (BAND-SELECT)	120-004574
R2,4,6	600 ohm, 1/16 watt	120-004569		Dial pointer	*120-004575 ** 120-004640
R3	56K ohm, 1/16 watt	120-004573		Dial cord drum	*120-004586 ** 120-004641
R5,8	1.5K ohm, 1/16 watt	120-004570		Dial cord with spring	*120-004587 ** 120-004642
R7	390 ohm	120-004566		Radiator, transistor (2)	*120-004588 ** 120-004643
R9	47K ohm, 1/16 watt	120-004572		Antenna coupling	120-004589
R10	33K ohm	120-004560		Shield, metal, L plate	*120-004590 ** 120-004644
R11	82K ohm	120-004562		Speaker	*120-004591 ** 120-004645
R12,36,44	5.6K ohm	120-004554		Knob, TUNING	*120-004592 ** 120-004646
R13	39 ohm, 1/16 watt	120-004568		Knob, BAND-SELECT	*120-004593 ** 120-004647
R14	270K ohm	120-004544		Knob, VOL.	*120-004594 ** 120-004648
R15,36,52,54	2.2K ohm	120-004553		Knob, TONE	*120-004595 ** 120-004649
R16	12K ohm	120-004557		Vinyl net, TUNING	*120-004596 ** 120-004650
R17,46	100K ohm	120-004563		Vinyl net, BAND-SELECT	*120-004597 ** 120-004651
R18	47K ohm, 1/16 watt	120-004572		Vinyl net, VOL. and TONE	*120-004598 ** 120-004652
R19	150K ohm	120-004564		Brass plate, FM antenna	120-004600
R20,31,32,49	1K ohm	120-004550		Thermistor, type 23D-25 (2)	120-004620
R21	15K ohm	120-004558		Holder, antenna Coil (2)	*120-004599 ** 120-004653
R22,48,59	470 ohm	120-004546		Post, stdoff front cabinet (long)	*120-004600 ** 120-004601
R23,33,34	10K ohm	120-004556		Post, stdoff front cabinet	** 120-004654
R24,26	68K ohm	120-004561	AT1	Terminal, external antenna	120-004602
R25	820K ohm	120-004549		Shaft, TUNING	120-004603
R27,30	6.8K ohm	120-004555		Cramp feeder cord	120-004604
R28	680 ohm	120-004548		Dial cord pulley (2)	120-004605
R29,43,47,51,53,55	100 ohm	120-004543		Cabinet, plastic	*120-004575 ** 120-004630
R35	220K ohm	120-004565		Cabinet front, plastic	*120-004576 ** 120-004631
R37	560 ohm	120-004547		Speaker grille	*120-004577 ** 120-004632
R39	1.2K ohm	120-004551		Trim, (Hallcrafters)	*120-004578 ** 120-004633
R40,41	22K ohm	120-004559		Indicator plate, TUNING, BAND-SELECT TONE and VOL.	*120-004579 ** 120-004634
R42	1.5K ohm	120-004552		Dial plate	*120-004580 ** 120-004635
R50	22 ohm	120-004541		Dial cover, plastic	*120-004581 ** 120-004636
R56	330 ohm	120-004545		Dial back plate, metal	*120-004582 ** 120-004637
R57,58	1 ohm	120-004540		Seal, aluminum	*120-004583 ** 120-004638
R60,61	50K ohm, variable VOL. and TONE, includes S2	120-004567		Medalion "H"	*120-004584 ** 120-004639
<b>COILS AND TRANSFORMERS</b>					
L1	Coil, FM antenna	120-004479		Clock window	** 120-004672
L2	Coil, FM RF	120-004480		Clock assembly (telechron 4410-025-01)	** 120-004956
				Button, Clock snooze	** 120-004669
				Knob, clock adjust	** 120-004673
				Knob, clock SLEEP and FUNCTION SW. (2)	** 120-004668
				Spring, SNOOZE BUTTON	** 120-004671
				Adapter, SNOOZE BUTTON	** 120-004670
				Poly-bag, clock parts	** 120-004667
				Shaft clock	** 120-004673

\*Unless otherwise stated, all resistors are carbon type, 1/4 watt.