

## SERVICE MANUAL No.240 SX Chassis



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### SPECIFICATION

FREQUENCY RANGE	
VHF Channels .....	54MHz ~ 88MHz 174MHz ~ 216MHz
UHF Channels .....	470MHz ~ 890MHz
INTERMEDIATE FREQUENCIES	
Picture I.F. Carrier .....	45.75MHz
Sound I.F. Carrier .....	41.25MHz
POWER INPUT .....	AC 120V 60Hz DC 12V Battery, Car battery
POWER RATING .....	DC 12W AC 25W
AUDIO POWER OUTPUT .....	0.5W
VIDEO RESPONSE .....	3.0MHz
SWEEP DEFLECTION .....	Magnetic
FOCUS .....	Electrostatic
ANTENNA INPUT IMPEDANCE .....	VHF 300ΩBalanced UHF 300ΩBalanced
PICTURE TUBE .....	9AGP4
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# IC • TRANSISTOR

July 1974

## SAFETY PRECAUTIONS

**WARNING:** Since the chassis of this receiver is connected to one side of the Mains Supply during operation, service should not be attempted by anyone unfamiliar with the precautions necessary when working on this type of equipment.

The following precautions should be observed:

1. Do not install, remove, or handle the picture tube in any manner unless shatter-proof goggles are worn. People not so equipped should be kept away while picture tubes are handled. Keep picture tube away from the body while handling.
2. When service is required, an isolation transformer should be inserted between power line and the receiver before any service is performed on a "HOT" chassis receiver.
3. When replacing a chassis in the cabinet, always replace all the protective devices are put back in place, such as; barriers, non-metallic knobs, adjustment and compartment cover or shields, isolation resistor-capacitor, etc.
4. When service is required, observe the original lead

dress. Extra precaution should be taken to assure correct lead dress in the high voltage circuitry area.

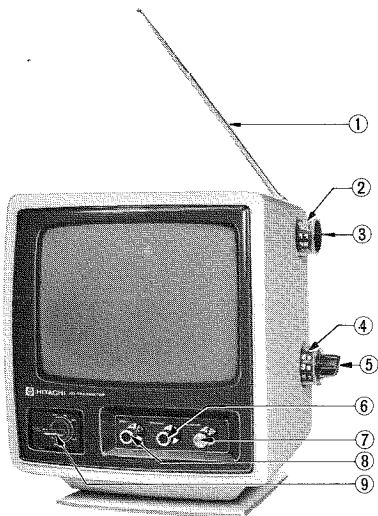
5. Always use the manufacturer's replacement component. Especially critical components as indicated on the circuit diagram should not be replaced by other makes.

Furthermore where a short circuit has occurred, replace those components that indicate evidence of overheating.

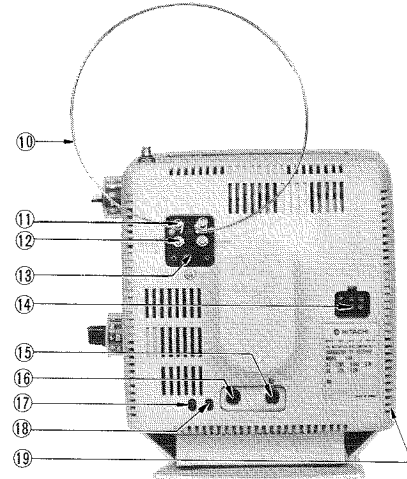
6. Before returning a serviced receiver to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the instrument by the manufacturer has become defective, or inadvertently defeated during servicing.

Therefore, the following checks are recommended for the continued protection of the customer and service technician.

## CONTROL



1. TELESCOPIC ANTENNA
2. VHF PRE-SET FINE TUNING
3. VHF CHANNEL SELECTOR
4. UHF FINE TUNING
5. UHF CHANNEL SELECTOR
6. CONTRAST
7. ON-OFF SWITCH, VOLUME CONTROL
8. BRIGHTNESS
9. SLEEP TIMER
10. LOOP ANTENNA



11. UHF ANTENNA TERMINAL
12. VHF ANTENNA TERMINAL
13. VHF ANTENNA EXT.-INT. SWITCH
14. POWER RECEPTACLE
15. H. HOLD
16. V. HOLD
17. V. LINEARITY
18. V. SIZE
19. EARPHONE JACK

# GENERAL ALIGNMENT INSTRUCTIONS

## 1. VIDEO I-F ALIGNMENT

TEST EQUIPMENT & CONNECTION (See Fig. 10)

- MARKER GENERATOR (35~50MHz) ..... Couple loosely to the out put cable of sweep generator  
 SWEEP GENERATOR (35~50MHz) ..... Connect the resistor (5.6K $\Omega$ ) and the capacitor (0.01 $\mu$ F) to the test point (TP) of tuner.  
 OSCILLOSCOPE ..... Connect the resistor (100K $\Omega$ ) to terminal (TP201).  
 BIAS SUPPLY ..... Add 2~6V of AGC voltage.

STEP	SWEEP GENERATOR	MARKER GENERATOR	ADJUST	REMARKS	
1.	Adjust 47.25MHz trap coil	35 ~ 50MHz	47.25MHz, 400Hz Modulation	L203	Adjust so that the signal of 400Hz in oscilloscope may be minimum.
2.	Adjust 39.75MHz trap coil	35 ~ 50MHz	39.75MHz, 400Hz Modulation	L202	Adjust so that the signal of 400Hz in oscilloscope may be minimum.
3.	Adjust 41.25MHz trap coil	35 ~ 50MHz	41.25MHz, 400Hz Modulation	L204	Adjust so that the signal of 400Hz in oscilloscope may be minimum.
4.	Adjust video IF coil	35 ~ 50MHz	44.0MHz, 400Hz Modulation	L201	Adjust so that the signal of 400Hz in oscilloscope may be maximum.
5.	Adjust video IF transformer, coil	35 ~ 50MHz	45.75MHz 42.75MHz Modulation	T201 L207	Adjust so that the signal in oscilloscope become Fig. 11

If the same characteristic as that of Fig. 11 does not appear, readjust STEP 1. ~ STEP 5.

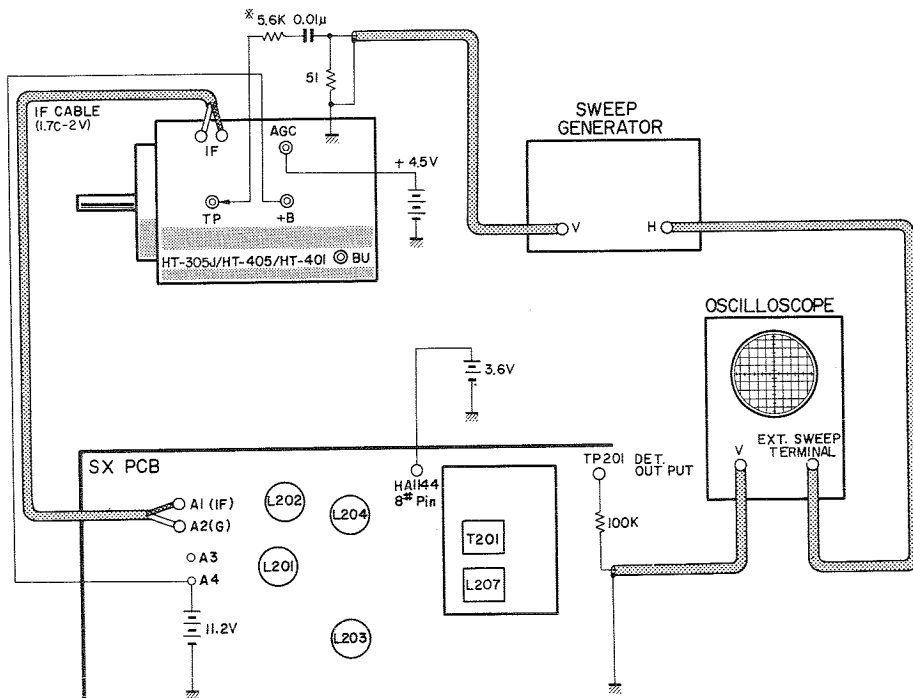


Fig. 10

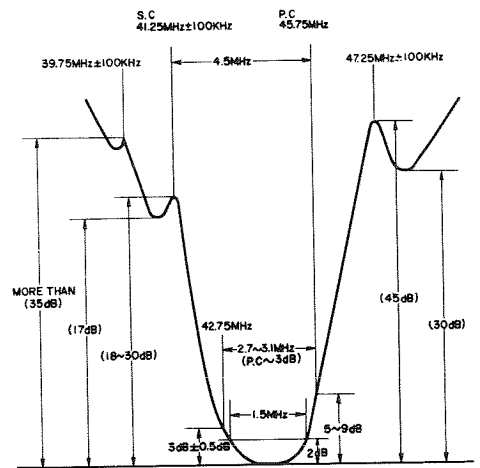


Fig. 11

\* WHEN USED HT-40I VHF TUNER, NOT NECESSARY TO CONNECT 5.6K $\Omega$  RESISTOR.

## 2. SOUND I-F ALIGNMENT

TEST EQUIPMENT & CONNECTION (See Fig. 12)

SIGNAL GENERATOR ..... Connect capacitor (0.01 $\mu$ F) to the TP201.  
 DC VOLTMETER ..... Connect as Fig. 12.  
 HIGH FREQUENCY VOLTMETER ..... Connect to R510.  
 OSCILLOSCOPE ..... Connect to S1 terminal

STEP	TEST EQUIPMENT	ADJUST	REMARKS
1	DC V.T.V.M connect to IC3.	T401	Adjust T401 so that the indication of DC V.T.V.M may be maximum.
2.	HIGH FREQUENCY V.T.V.M connect to R510	L502	Adjust L502 so that the indication of HIGH FREQUENCY V.T.V.M may be minimum.
3.	Repeat adjustment of STEP 1.		
4.	DC V.T.V.M connect to T402 (A)	T402 (PINK)	Adjust T402 (PINK) so that the indication of DC V.T.V.M may be maximum.
5.	DC V.T.V.M connect to C406 (B)	T402 (BLUE)	Adjust T402 (BLUE), for exactly one-half of the previous reading.

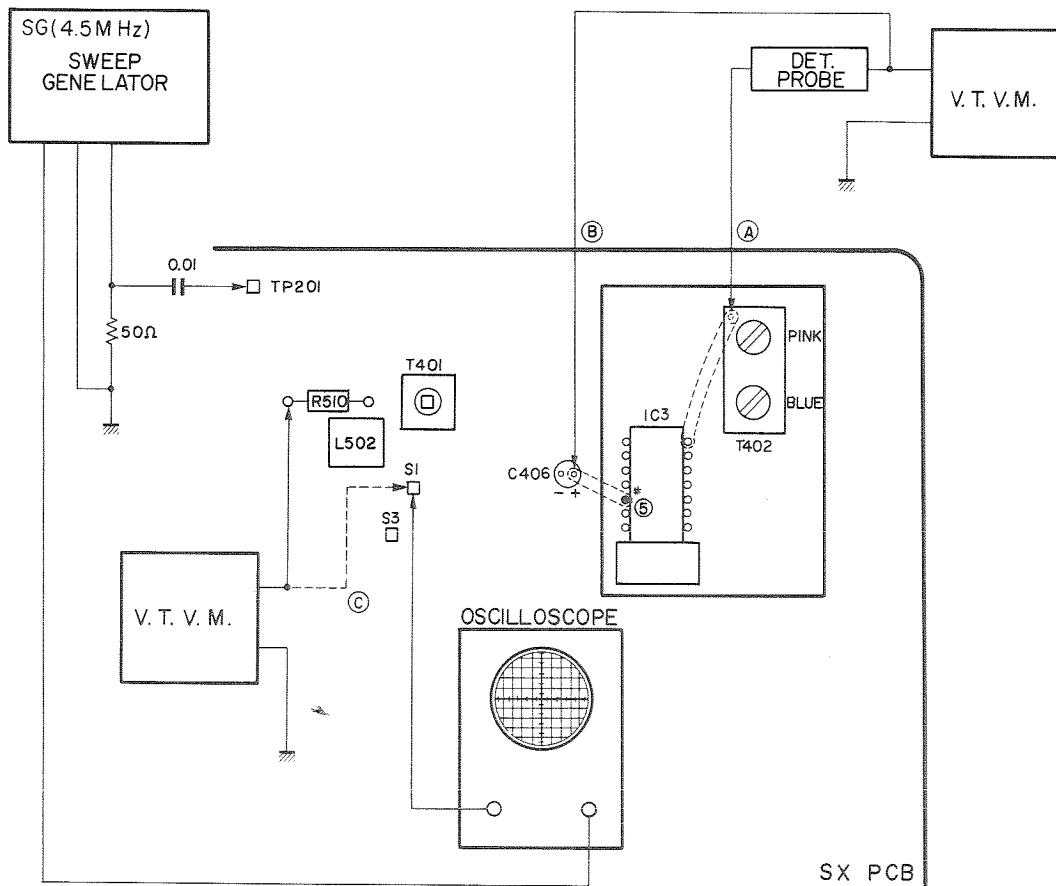


Fig. 12

### 3. AGC ALIGNMENT

#### TEST EQUIPMENT CONNECTION

DC VOLTMETER ..... Connect to the terminal A3 (Tuner AGC. terminal) and earth.

STEP	ADJUST	REMARKS
Connect the Test Pattern of 61dB to VHF antenna terminal for the alignment of R209.		
1	Adjust the AGC R209	Adjust R209 so that the DC VOLTMETER will indicate $3.9V \pm 0.1V$

### 4. HORIZONTAL DEFLECTION ALIGNMENT

STEP	ADJUST	REMARKS
1	Horizontal oscillator adjustment R709	Adjust R709 so that oscillation frequency may be 15.734KHz. To measure the frequency, see the frequency counter or picture drift.

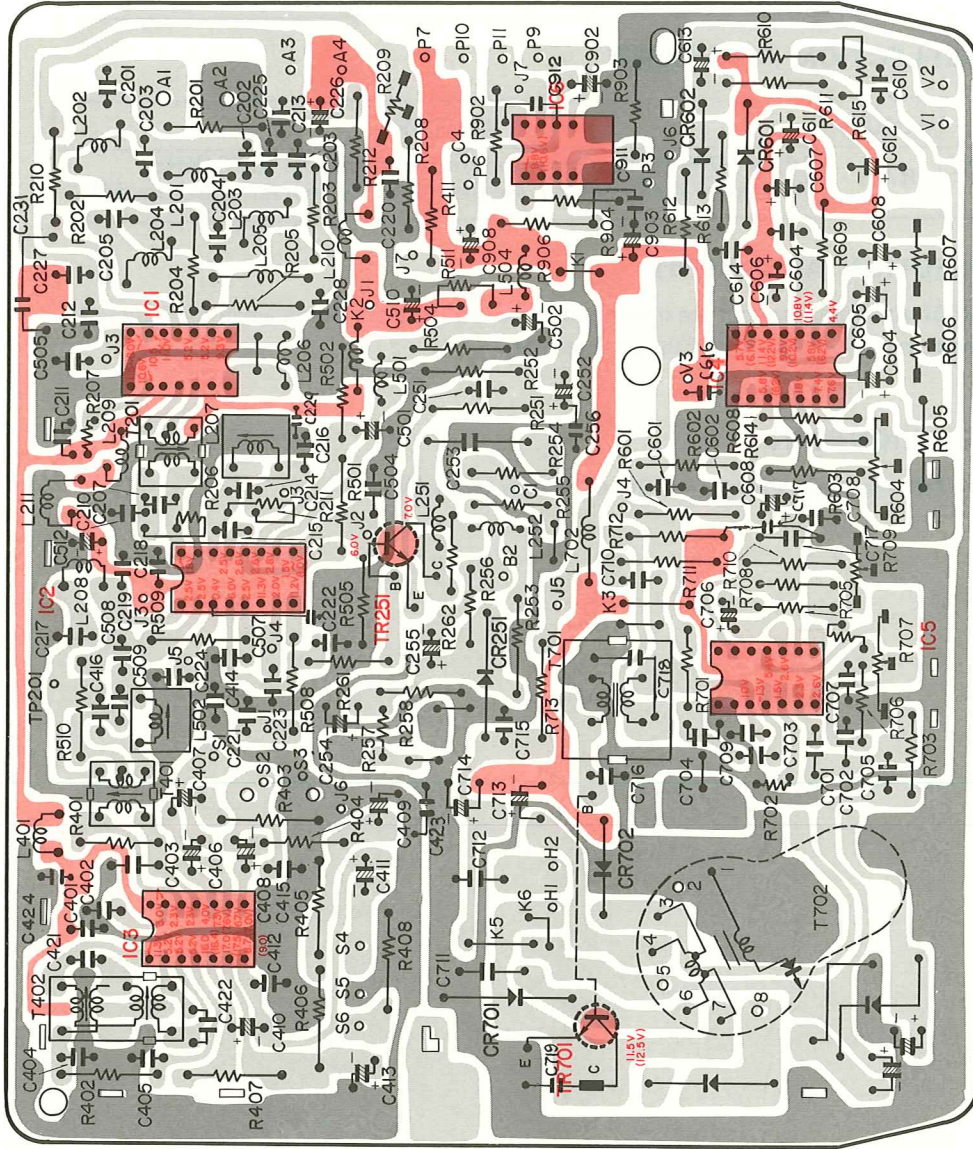
### 5. VERTICAL DEFLECTION ALIGNMENT

Adjust R606 and R607 alternately so that the linearity may be optimum condition when the inside of the largest circle of test pattern reaches the edge of the picture tube.

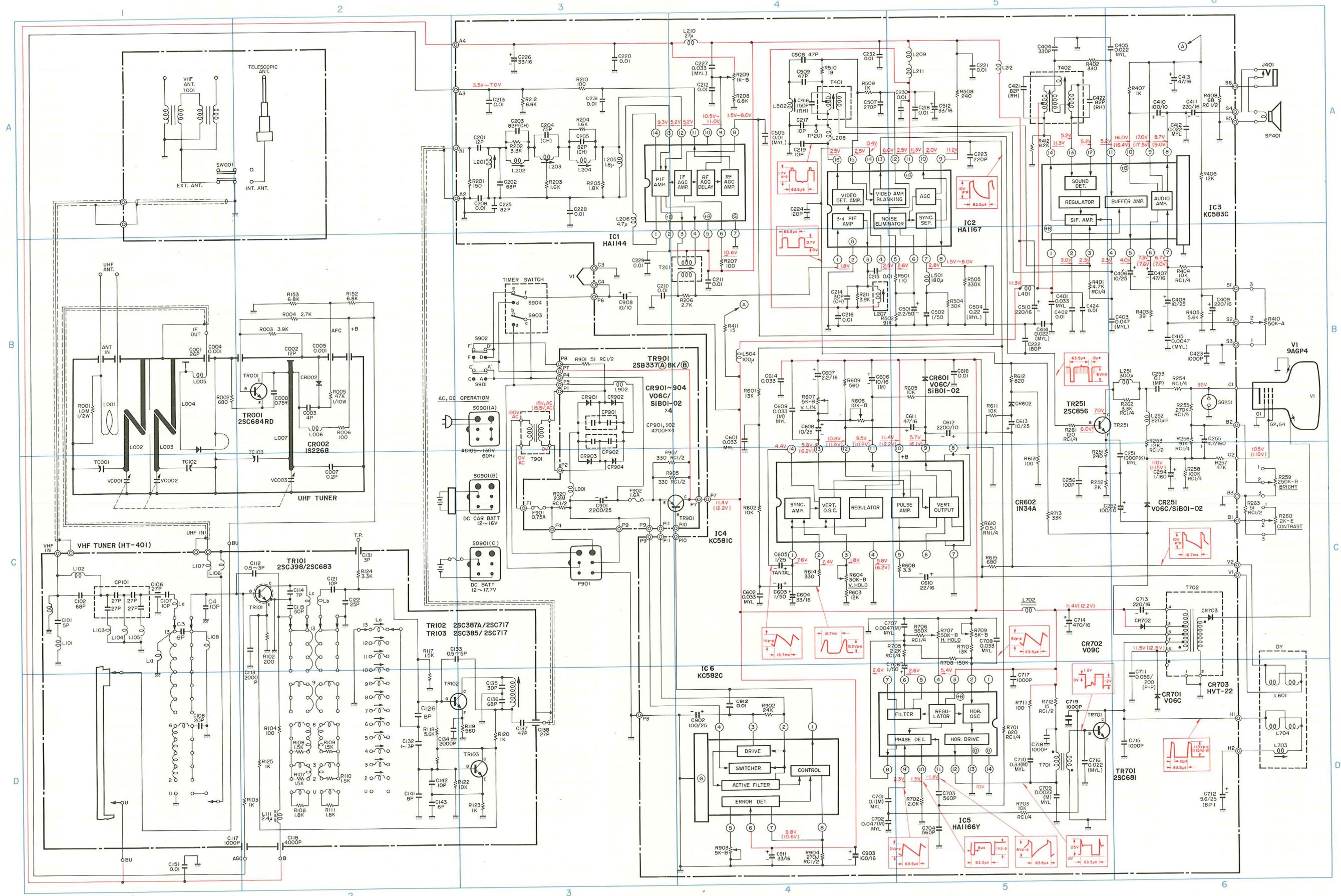
### 6. POWER SOURCE ALIGNMENT

Adjust R903 so that the indication voltage of meter of P7 may be 11.4V.

PRINTED CIRCUIT BOARD  
[SX TYPE]



BASIC CIRCUIT SCHEMATIC DIAGRAM (1-48)



REPLACEMENT PARTS LIST

NOTE: 1. "PLACE" means the place of each part in the circuit diagram.  
2. The \* marked parts are newly adopted ones.

PLACE	SYM-BOL NO.	STOCK NO.	DESCRIPTION			PLACE	SYM-BOL NO.	STOCK NO.	DESCRIPTION		
<b>CAPACITOR</b>						B5	C504	0276113	Ceramic	0.22μF ±20%	50WV
A3	C201	0248662	Ceramic	12pF ±5%	50WV	A4	C505	0275011	Ceramic	0.01μF ±10%	50WV
A3	C202	0248680	Ceramin	68pF ±5%	50WV	A4	C507	0248734	Ceramic	270pF ±10%	50WV
A3	C203	0246462	Ceramic	82pF ±5%	50WV	A4	C508	0248716	Ceramic	47pF ±10%	50WV
A3	C204	0246461	Ceramic	75pF ±5%	50WV	A4	C509	0248716	Ceramic	47pF ±10%	50WV
A3	C205	0246462	Ceramic	82pF ±5%	50WV	B5	C510	0252532	Electrolytic	220μF	16WV
A3	C208	0244171	Ceramic	0.01μF <sup>+80%</sup> / <sub>-20%</sub>	50WV	A5	C512	0252523	Electrolytic	33μF	16WV
B3	C210	0244171	Ceramic	0.01μF <sup>+80%</sup> / <sub>-20%</sub>	50WV	B4	C601	0275114	Ceramic	0.033μF ±20%	50WV
B4	C211	0244171	Ceramic	0.01μF <sup>+80%</sup> / <sub>-20%</sub>	50WV	C4	C602	0275114	Ceramic	0.033μF ±20%	50WV
A4	C212	0244171	Ceramic	0.01μF <sup>+80%</sup> / <sub>-20%</sub>	50WV	C4	C603	0252811	Electrolytic	1μF	50WV
A3	C213	0244171	Ceramic	0.01μF <sup>+80%</sup> / <sub>-20%</sub>	50WV	C4	C604	0252523	Electrolytic	33μF	16WV
B4	C214	0246451	Ceramic	30pF ±5%	50WV	C4	C605	0292706	Tantal	1μF	25WV
B4	C215	0244171	Ceramic	0.01μF <sup>+80%</sup> / <sub>-20%</sub>	50WV	B4	C606	0251077	Electrolytic	10μF	16WV
B4	C216	0244171	Ceramic	0.01μF <sup>+80%</sup> / <sub>-20%</sub>	50WV	B4	C607	0251073	Electrolytic	2.2μF	16WV
A4	C217	0248650	Ceramic	10pF ±0.5pF	50WV	B4	C608	0252621	Electrolytic	10μF	25WV
A5	C218	0244171	Ceramic	0.01μF <sup>+80%</sup> / <sub>-20%</sub>	50WV	B4	C609	0275114	Ceramic	0.033μF ±20%	50WV
A4	C219	0248650	Ceramic	10pF ± 0.5pF	50WV	C5	C610	0252522	Electrolytic	22μF	16WV
A3	C220	0244171	Ceramic	0.01μF <sup>+80%</sup> / <sub>-20%</sub>	50WV	B5	C611	0252525	Electrolytic	47μF	16WV
A5	C221	0244171	Ceramic	0.01μF <sup>+80%</sup> / <sub>-20%</sub>	50WV	B5	C612	0252337	Electrolytic	2200μ	10WV
B5	C222	0248690	Ceramic	180pF ± 5%	50WV	B5	C613	0252621	Electrolytic	10μF	25WV
A5	C223	0248732	Ceramic	220pF ±10%	50WV	B4	C614	0275014	Ceramic	0.033μF ±10%	50WV
A4	C224	0248726	Ceramic	120pF ±10%	50WV	B5	C616	0244171	Ceramic	0.01μF <sup>+80%</sup> / <sub>-20%</sub>	50WV
A3	C226	0252523	Electrolytic	33μF	16WV	D4	C701	0276111	Ceramic	0.1μF ±20%	50WV
A4	C227	0275114	Polyester film	0.033μF ±20%	50WV	D5	C702	0275115	Ceramic	0.047 ±20%	50WV
A3	C228	0244171	Ceramic	0.01μF ±10%	50WV	D5	C703	0244115	Ceramic	560pF ±10%	50WV
B3	C229	0244171	Ceramic	0.01μF <sup>+80%</sup> / <sub>-20%</sub>	50WV	D5	C704	0244115	Ceramic	560pF ±10%	50WV
A5	C230	0244171	Ceramic	0.01μF <sup>+80%</sup> / <sub>-20%</sub>	50WV	D5	C706	0252811	Electrolytic	1μF	50WV
C6	C251	0274011	Polyester film	1000pF ±10%	50WV	C5	C707	0274115	Ceramic	0.0047μF±20%	50WV
C6	C252	0252331	Electrolytic	100μF	10WV	C5	C708	0275024	Ceramic	0.0033μF±5%	50WV
B6	C253	0261151	Polypropylene	0.1μF ±20%	150WV	D5	C709	0274113	Ceramic	0.0022μF±20%	50WV
C6	C254	0257535	Electrolytic	1μF	160WV	D5	C710	0275114	Ceramic	0.033μF ±20%	50WV
B6	C255	0257537	Electrolytic	4.7μF	160WV	D6	C711	0299923	Ceramic	0.056μF ±10%	200WV
C5	C256	0248724	Ceramic	100pF ±10%	50WV	D6	C712	0252655	Electrolytic	5.6μF	25WV
B5	C401	0275114	Ceramic	0.033μF ±20%	50WV	C6	C713	0252532	Electrolytic	220μF	16WV
B5	C402	0244171	Ceramic	0.01μF <sup>+80%</sup> / <sub>-20%</sub>	50WV	C5	C714	0252565	Electrolytic	470μF	16WV
B5	C403	0275015	Polyester film	0.047μF ±10%	50WV	D6	C715	0244501	Ceramic	1000pF ±10%	500WV
A5	C404	0248736	Ceramic	330pF ±10%	50WV	D5	C716	0275013	Ceramic	0.022μF ±10%	50WV
A5	C405	0275013	Polyester film	0.022μF ±10%	50WV	C5	C717	0244101	Ceramic	1000pF ±10%	50WV
B6	C406	0252621	Electrolytic	10μF	25WV	D5	C718	0244101	Ceramic	1000pF ±10%	50WV
B6	C407	0252525	Electrolytic	47μF	16WV	D5	C719	0244501	Ceramic	1000pF ±10%	50WV
B6	C408	0252621	Electrolytic	10μF	25WV	C3	C901	0252637	Electrolytic	2200μF	25WV
B6	C409	0252532	Electrolytic	220μF	16WV	D4	C902	0252631	Electrolytic	100μF	25WV
A6	C410	0252331	Electrolytic	100μF	10WV	D4	C903	0252531	Electrolytic	100μF	16WV
A6	C411	0252532	Electrolytic	220μF	16WV	B3	C908	0252321	Electrolytic	10μF	10WV
A6	C412	0275013	Polyester film	0.022μF ±10%	50WV	D4	C911	0252523	Electrolytic	3.3μF	16WV
A6	C413	0252525	Electrolytic	47μF	16WV	C4	C912	0244171	Electrolytic	0.01μF	16WV
B5	C414	0275113	Polyester film	0.022μF ±20%	50WV	<b>RESISTOR</b>					
B6	C415	0244165	Ceramic	0.0047μF	50WV	A3	R201	0114135	Carbon film	150Ω ±5%	SRD½P
A4	C416	0248058	Ceramic	150pF ±5%	50WV	A3	R202	0131679	Composition	3.3KΩ ±5%	RC½GF
A5	C421	0248052	Ceramic	82pF ±5%	50WV	A3	R203	0114166	Carbon film	1.6KΩ ±5%	SRD½P
A5	C422	0248052	Ceramic	82pF ±5%	50WV	A3	R204	0114166	Carbon film	1.6KΩ ±5%	SRD½P
B6	C423	0244101	Ceramic	1000pF ±10%	50WV	A3	R205	0114167	Carbon film	1.8KΩ ±5%	SRD½P
B5	C424	0244171	Ceramic	0.01μF <sup>+80%</sup> / <sub>-20%</sub>	50WV	B4	R206	0137611	Carbon film	2.7KΩ ±5%	SRD½P
B5	C501	0252817	Electrolyte	2.2μF	50WV	B4	R207	0137551	Carbon film	100Ω ±5%	SRD½P
B5	C502	0252811	Electrolytic	1μF	50WV						

PLACE	SYM-BOL NO.	STOCK NO.	DESCRIPTION			PLACE	SYM-BOL NO.	STOCK NO.	DESCRIPTION		
A4	R208	0114181	Carbon film	6.8KΩ ±5%	SRD½P	C5	R707	0153716	Control	50KΩ-B	H. HOLD
A4	R209	0151252	Control	1KΩ-B	AGC	C5	R708	0131755	Composition	150KΩ ±5%	RC½GF
A3	R210	0114131	Carbon film	100Ω ±5%	SRD½P	C5	R709	0151254	Control	5KΩ-B	H. SUB.
B4	R211	0137615	Carbon film	3.9KΩ ±5%	SRD½P	C5	R710	0114204	Carbon film	13KΩ	SRD½P
A3	R212	0114181	Carbon film	6.8KΩ ±5%	SRD½P	D6	R711	0114131	Carbon film	100Ω ±5%	SRD½P
C5	R251	0114140	Carbon film	240Ω ±5%	SRD½P	D5	R712	0134291	Composition	15Ω ±10%	RC½GF
C5	R252	0114168	Carbon film	2KΩ ±5%	SRD½P	C5	R713	0114213	Carbon film	33KΩ ±5%	SRD½P
B6	R253	0134386	Composition	12KΩ ±10%	RC½GF	B3	R901	0134033	Composition	51Ω ±5%	SRD½P
B6	R254	0131667	Composition	1KΩ ±5%	RC½GF	D4	R902	0114210	Carbon film	24KΩ ±5%	SRD½P
B6	R255	0131761	Composition	270KΩ ±5%	RC½GF	D4	R903	0151085	Control	5KΩ-B	+B ADJ.
C6	R257	0137667	Composition	47KΩ ±5%	SRD½P	D4	R904	0134051	Composition	270Ω ±5%	SRD½P
C6	R258	0131751	Composition	100KΩ ±5%	RC½GF	C3	R905	0134053	Composition	330Ω ±5%	RC½GF
C6	R259	0153668	Control	250KΩ-B	BRIGHT	D4	R906	0114005	Carbon film	3.3Ω ±5%	SRD½P
C6	R260	0153247	Control	2KΩ-E	CONT.	C3	R907	0134053	Composition	330Ω ±5%	RC½GF
B5	R261	0131627	Composition	120Ω ±5%	RC½GF	C3	R920	0134428	Composition	2.2MΩ ±10%	SRD½P
B6	R262	0131679	Composition	2KΩ ±5%	RC½GF	<b>SEMICONDUCTOR</b>					
B5	R401	0131683	Composition	4.7KΩ ±5%	RC½GF	B5	TR251	2320051	Silicon	2SC856	
A5	R402	0114143	Carbon film	330Ω ±5%	SRD½P	D5	TR701	2321121	Selicon	2SC681	
B6	R403	0114055	Carbon film	39Ω ±5%	SRD½P	C3	TR901	2320541	Germanium	2SB337 (A)	
B6	R404	0131709	Composition	10KΩ ±5%	RC½GF	A4	IC 1	2360151	HA1144		
B6	R405	0114179	Carbon film	5.6KΩ ±5%	SRD½P	A4	IC 2	2360261	HA1167		
A6	R406	0114203	Carbon film	12KΩ ±5%	SRD½P	A6	IC 3	2360291	KC583C		
A6	R407	0114161	Carbon film	1KΩ ±5%	SRD½P	C4	IC 4	2360271	KC581C		
A6	R408	0134299	Composition	68Ω ±10%	RC½GF	D5	IC 5	2360252	HA1166Y		
B6	R410	0153250	Control	50KΩ-A	VOLUME	D4	IC 6	2360281	KC582C		
B4	R411	0114011	Carbon film	5.6Ω ±5%	SRD½P	C6	CR251	2331121	Silicon	SIB01-02	
B5	R412	0131702	Composition	8.2KΩ ±10%	RC½GF	B5	CR601	2331121	Silicon	SIB01-02	
B5	R501	0114132	Carbon film	110Ω ±5%	SRD½P	B5	CR602	0575001	Germanium	1N34A	
B5	R502	0114224	Carbon film	91KΩ ±5%	SRD½P	D6	CR701	2330251	Silicon	VO6C	
B5	R504	0114212	Carbon film	30KΩ ±5%	SRD½P	C6	CR702	2330551	Silicon	VO9C	
B5	R505	0114293	Carbon film	330KΩ ±5%	SRD½P	B3	CR901	2331121	Silicon	SIB01-02	
A5	R508	0114140	Carbon film	240Ω ±5%	SRD½P	B3	CR902	2331121	Silicon	SIB01-02	
A4	R509	0114161	Carbon film	1KΩ ±5%	SRD½P	B3	CR903	2331121	Silicon	SIB01-02	
A4	R510	0114047	Carbon film	18Ω ±5%	SRD½P	B3	CR904	2331121	Silicon	SIB01-02	
B4	R601	0114204	Carbon film	13KΩ ±5%	SRD½P	<b>COIL</b>					
C4	R602	0114201	Carbon film	10KΩ ±5%	SRD½P	A3	L201	2140881	IFT		
C4	R603	0114203	Carbon film	12KΩ ±5%	SRD½P	A3	L202	2140888	IFT		
C4	R604	0151303	Control	30KΩ-B	V.HOLD	A3	L203	2141453	IFT		
B5	R605	0114201	Carbon film	10KΩ ±5%	SRD½P	A3	L204	2140881	IFT		
B4	R606	0151267	Control	10KΩ-B	V.SIZE	A3	L205	2121304	Peaking coil	1.8μH	
B4	R607	0151254	Control	5KΩ-B	V.LIN.	A3	L206	2121439	Peaking coil	4.7μH	
C5	R608	0114005	Carbon film	3.3Ω ±5%	SRD½P	B4	L207	2121171	IF coil		
B4	R609	0114149									



PLACE	SYM-BOL NO.	STOCK NO.	DESCRIPTION	PLACE	SYM-BOL NO.	STOCK NO.	DESCRIPTION
C5	L702	2120041	Filter coil				
B3	L901	2120331	Filter coil				
B3	L902	2120331	Filter coil				
<b>TRANSFORMER</b>							
B4	T201	2141392	IFT				
A4	T401	2141361	IFT				
A5	T402	2141372	Discriminater transformer				
D5	T701	2270402	Horizontal drive				
C6	T702	2430951	F.B.T				
B3	T901	2210548	Power transformer				
B3	CP901	2790083	Compound component				
B3	CP902	2790083	Compound component				
<b>MISCELLANEOUS</b>							
		2750092	Antenna-Telescopic antenna				
		2750051	Antenna-Loop antenna				
		2682461	Antenna terminal board				
*		3155074	Cover assembly (IVORY)				
*		3155075	Cover assembly (BLUE)				
		2440604	Deflection yoke				
		2730062	Earphone				
		2670531	Earphone jack				
		3190355	Front filter assembly				
*		3214943	Front frame assembly (IVOLY)				
*		3214944	Front frame assembly (BLUE)				
	F901	2720052	Fuse 0.75A				
	F902	0591207	Fuse 1.6A				
		4770871	Handle assembly				
		3254157	Knob-VHF channel				
		3255442	Knob-UHF channel				
		3255321	Knob-VHF Pre-set tuning				
		3254361	Knob-Volume				
		3254191	Knob-Contrast, Brightness				
		3255732	Knob-UHF fine tuning				
		3254203	Knob-Sleep timer				
		2740703	Power cord				
	SG251	2340031	Spark gap				
		2570082	Sleep timer assembly				
		2503671	SX P.C.B assembly				
		2410481	Speaker 8cm				
		2650574	Socket-C.P.T socket				
		3726134	Swivel base (Upper)				
		3726144	Swivel base (Bottom)				
		2421251	Tuner-VHF tuner HT-401				
		2421531	Tuner-UHF tuner HU-354				
		2350224	Tube-C.P.T 9AGP4				

Printed Circuit Board Assy  
Listed for reference only.  
Not considered replacement  
parts.



# HITACHI

## HITACHI SALES CORPORATION OF AMERICA

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<b>Mid-Western Regional Office:</b>	1400 Morse Ave., Elk Grove Village Chicago, Ill. 60067	Tel. 312-593-1550
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<b>Western Regional Office:</b>	401 West Artesia Blvd., Compton Calif. 90220	Tel. 213-774-5151

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