ADDITIONAL

Service Manual

PIONEER

ORDER NO.
HRT-178-0

PORTABLE STEREO FM/SW/MW/LW RADIO CASSETTE RECORDER

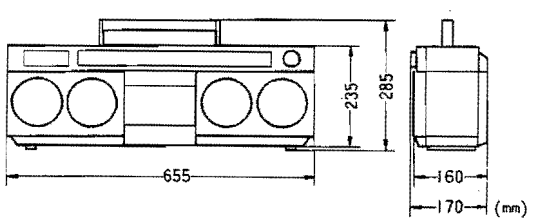
SK-909L HT,HB

Subject: The SK-909L/HT, HB manual is designed to be used together with Model SK-900/KC Service Manual (HRT-177). Refer to these service manuals for parts and adjustment, etc. which are not given in the manuals.

SPECIFICATIONS

Max. rated output Power	13W + 13W/8Ω, 5% THD.
Max. music power	40W (total music power)
Speaker	Air-tight cabinet, 12cm (5 in.) mechanical 2 way system with passive radiator
Recording/playback frequency characteristics	50~14,000Hz (±3dB) (Normal tape) 50~15,000Hz (±3dB) (CrO_2 tape) 50~16,000Hz (±3dB) (Metal tape)
Recording/playback S/N ratio	59dB (Dolby NR on, Normal tape) 51dB (Dolby NR off, Normal tape)
Input	AUX, PHONO, MIC (also functions as MIX MIC), EXT. ANT
Output	LINE OUT, PHONES
Subfunctions	Dolby NR, Tape selector (Metal/CrO_2-Normal), Auto/manual recording, Skip search, Music repeat, One side repeat, Automatic editor, Timer standby mechanism, 6-band graphic equalizer, FM muting, Stereo microphone mixing
Indicators	Red LEDs: CrO_2, METAL, AUTO EDITOR, REC, PHONO/AUX, AM, FM, FM MODE, STEREO, OPERATION, SKIP SEARCH (8) Green LEDs: DOLBY NR, PLAY, REW, FF, PAUSE, ONE SIDE REPEAT, MUSIC REPEAT, TAPE Others: ACCESS TUNING (two red, one green), LEVEL (stereo meter)
Frequency range	FM: 88~104MHz SW: 6~18MHz MW: 525~1,605kHz LW: 150~280kHz
Power source	220/240V AC, 50/60Hz; ten size "D" flashlight batteries (1.5V); EXT 15V DC (12~15V)
Dimensions (W×H×D)	655×235×160mm (25-3/4×9-1/4×6-1/4 in.)
Weight	9.9kg (21.8 lbs., without batteries)

Note: Specifications and design are subject to change without notice.



PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS OF AMERICA 1925E, Dominguez St., Long Beach, Calif. 90810
PIONEER ELECTRONIC (EUROPE) N.V. Luithagen-Haven 9, 2030 Antwerp, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

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- Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.

TRAPPING ADJUSTMENT

• Connection Diagram

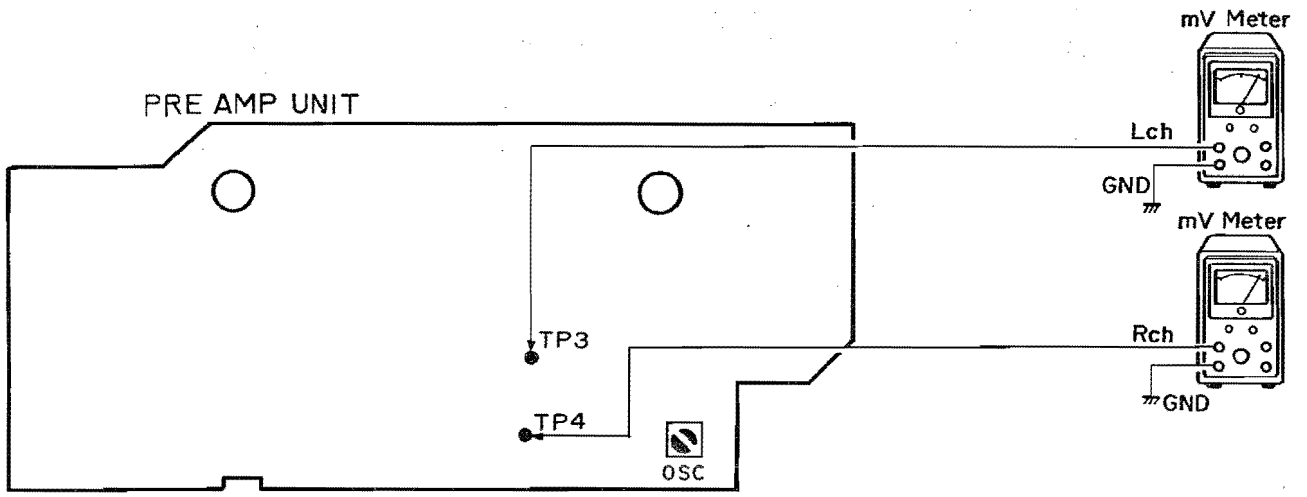


Fig. 1

• To Adjust

1. Put the unit into the record mode.
2. Turn the BFC switch to position "2." Adjust OSC so that the millivoltmeters show the smallest deflection.

AM IF ADJUSTMENT

- **Connection Diagram**

Generator Scope

Sweep center frequency 468kHz
Input gain 0.3Vp-p/cm

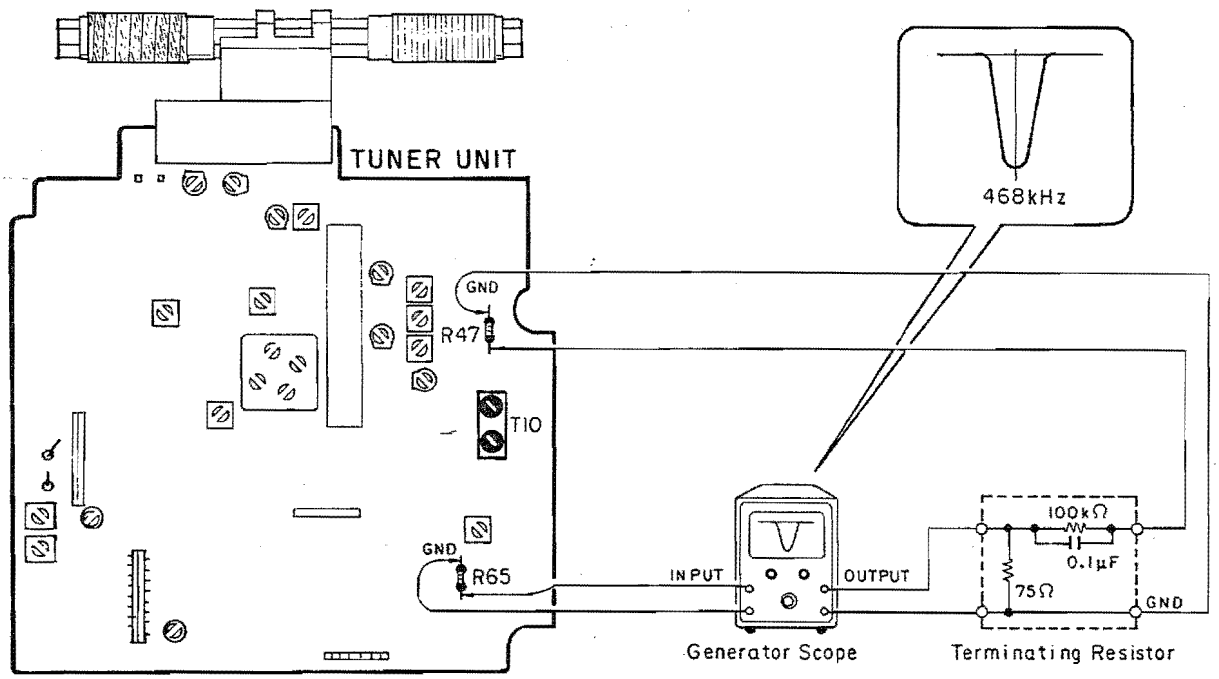


Fig. 2

- **To Adjust**

1. Apply the minimum output signal enabling the Generator Scope's U curve to be checked from the Generator scope and adjust T10 so that the amplitude of the curve is brought to its maximum and the symmetry is made optimum.

MW,LW TRACKING ADJUSTMENT

- **Connection Diagram**

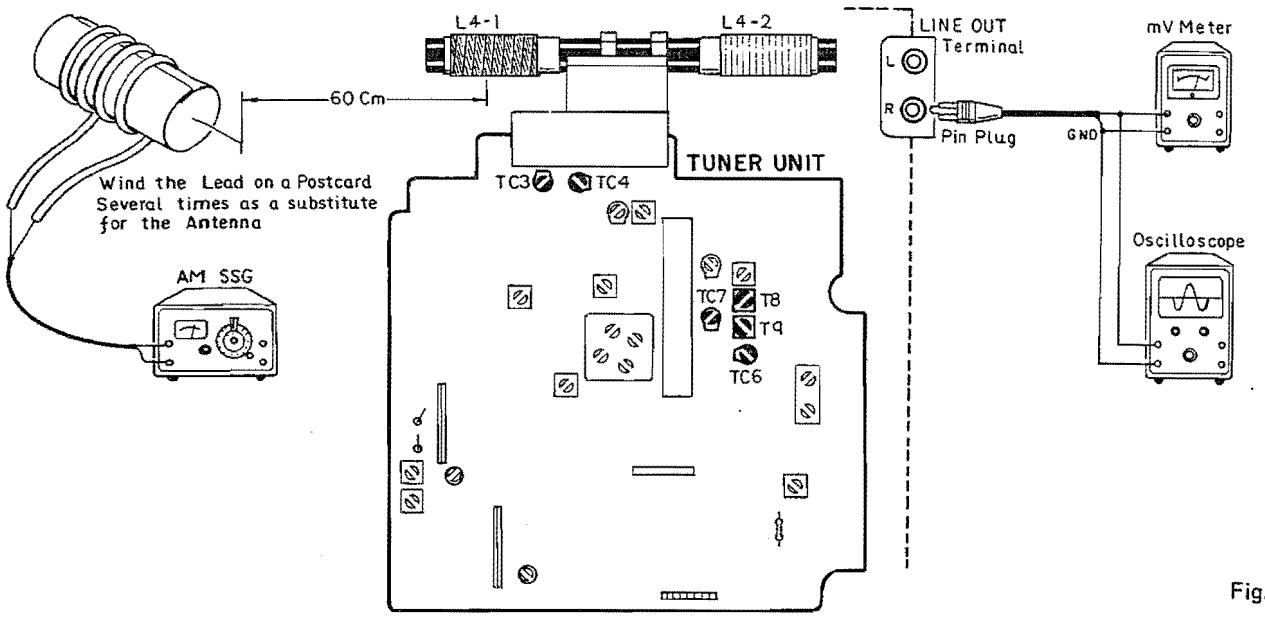


Fig. 3

- **To Adjust (MW)**

Frequency of SSG	Variable Capacitor Position	Adjusting Point	Remarks
1. 515 kHz (400 Hz, 30% modulation) output level 60 dB/m.	Maximum (turn the tuning knob counterclockwise until low end.)	T8	515 kHz can be received.
2. 1,650 kHz (400 Hz, 30% modulation) output level 60 dB/m.	Minimum (turn the tuning knob Clockwise until high end.)	TC7	1,650 kHz can be received.
3. Repeat (1) and (2) alternately and adjust so that 515 ~ 1,650 kHz are received.			
4. 600 kHz (400 Hz. 30% modulation) output level 40 ~ 50dB/m.	Tuned to 600 kHz.	L4-2 (MW coil of bar antenna)	Maximum output.
5. 1,450 kHz (400 Hz. 30% modulation) output level 40 ~ 50 dB/m.	Tuned to 1,450 kHz.	TC4	Maximum output.
6. Repeat (4) and (5) alternately and confirm that they are as specified.			

Note: After adjusting L4-2 (MW coil of bar antenna), melt electro wax soldering iron and fix it in position.

- **To Adjust (LW)**

Frequency of SSG	Variable Capacitor Position	Adjusting Point	Remarks
1. 140 kHz (400 Hz, 30% modulation) output level 40 ~ 60 dB/m.	Maximum (turn the tuning knob Counterclockwise until low end.)	T9	140 kHz can be received.
2. 300 kHz (400 Hz, 30% modulation) output level 40 ~ 60 dB/m.	Minimum (turn the tuning knob Clockwise until high end.)	TC6	300 kHz can be received.
3. Repeat (1) and (2) alternately and adjust so that 140 ~ 300 kHz are received.			
4. 150 kHz (400 Hz, 30% modulation) output level 40 ~ 50 dB/m.	Tuned to 150 kHz.	L4-1 (LW coil of bar antenna)	Maximum output.
5. 280 kHz (400 Hz, 30% molduation) output level 40 ~ 50 dB/m.	Tuned to 280 kHz.	TC3	Maximum output.
6. Repeat (4) and (5) alternately and confirm that they are as specified.			

Note: After adjusting L4-1 (LW coil of bar antenna), melt electro wax with soldering iron and fix it in position.

SW TRACKING ADJUSTMENT

- **Connection Diagram**

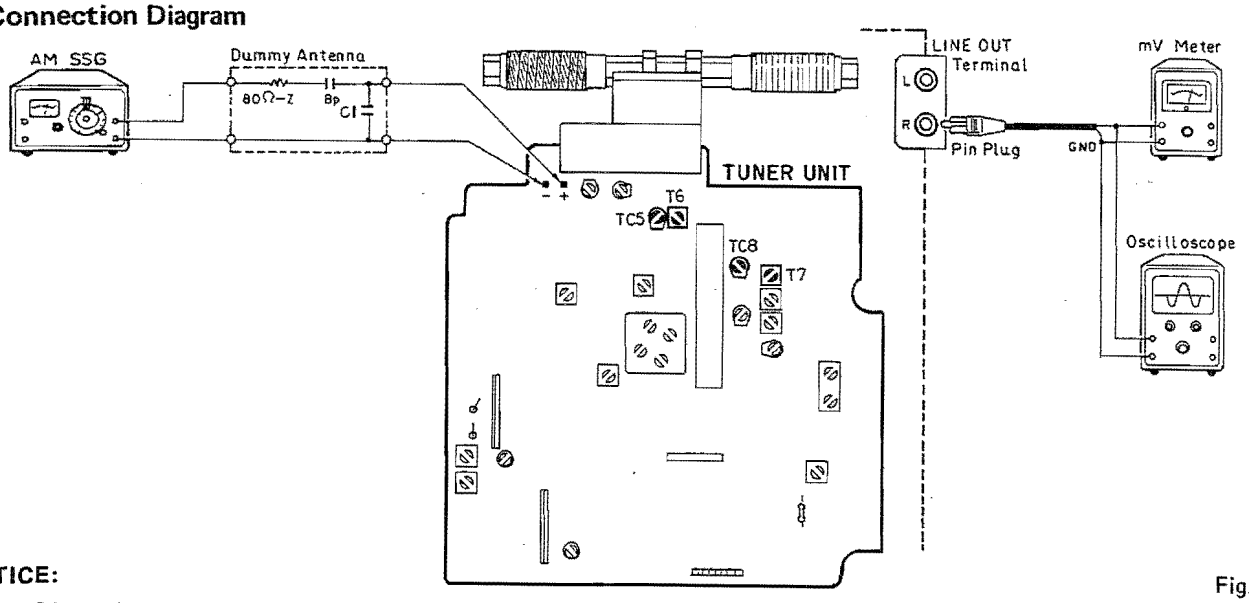


Fig. 4

NOTICE:

Select C1 so that total capacity of 80 pF is attained from the direction of the receiver jack.

Z: Output impedance of the SSG.

- **To Adjust**

	Frequency of SSG	Variable Capacitor Position	Adjusting Point	Remarks
1.	5.8 MHz (400 Hz, 30% modulation) output level 40 ~ 60 dB/m.	Maximum (turn the tuning knob counterclockwise until low end.)	T7	5.8 MHz can be received.
2.	18.5 MHz (400 Hz, 30% modulation) output level 40 ~ 60 dB/m.	Minimum (turn the tuning knob clockwise until high end.)	TC8	18.5 MHz can be received.
3.	Repeat (1) and (2) alternately and adjust so that 5.8 ~ 18.5 MHz are received.			
4.	7 MHz (400 Hz, 30% modulation) output level 40 ~ 50 dB/m.	Tuned to 7 MHz.	T6	Maximum output.
5.	17 MHz (400 Hz, 30% modulation) output level 40 ~ 50 dB/m.	Tuned to 17 MHz.	TC5	Maximum output.
6.	Repeat (4) and (5) alternately and confirm that they are as specified.			

FM IF ADJUSTMENT

- **Connection Diagram**

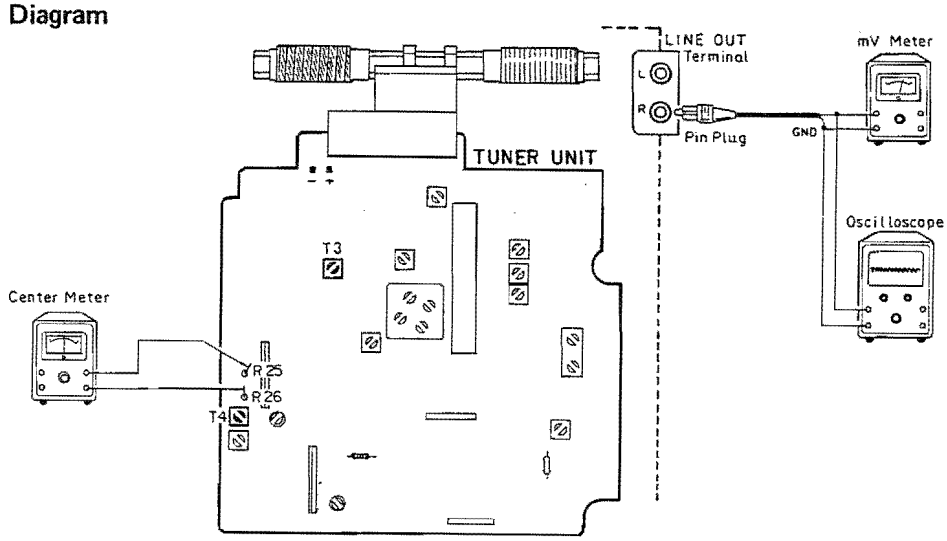


Fig. 5

- **To Adjust**

1. Adjust T3 so that noise level is highest at white noise.
2. Adjust T4 so that the center meter points to the center.

FM TRACKING ADJUSTMENT

- **Connection Diagram**

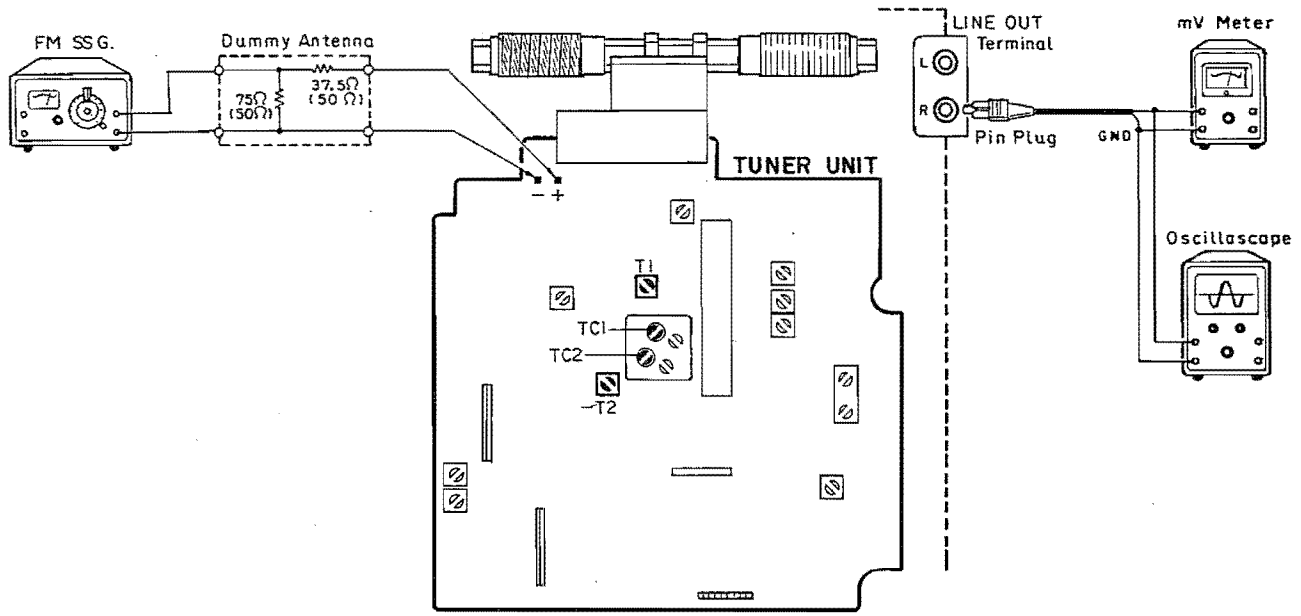


Fig. 6

- **To Adjust**

	Frequency of FM SSG	Variable Capacitor Position	Adjusting Point	Remarks
1.	87.5 MHz (400 Hz, 75 kHz deviation) output level 20 ~ 60 dB (μV).	Maximum (turn the tuning knob counterclockwise until low end.)	T2	87.5 MHz can be received.
2.	106 MHz (400 Hz, 75 kHz deviation) output level 20 ~ 60 dB (μV).	Minimum (turn the tuning knob clockwise until high end.)	TC2	106 MHz can be received.
3.	Repeat (1) and (2) alternately and adjust so that 87.5 ~ 106 MHz are received.			
4.	90 MHz (400 Hz, 75 kHz deviation) output level 20 ~ 30 dB (μV).	Tuned to 90 MHz.	T1	Maximum output.
5.	104 MHz (400 Hz, 75 kHz deviation) output level 20 ~ 30 dB (μV).	Tuned to 104 MHz.	TC1	Maximum output.
6.	Repeat (4) and (5) alternately and adjust until tracking error disappears.			

FM IF FINAL ADJUSTMENT

- **Connection Diagram**

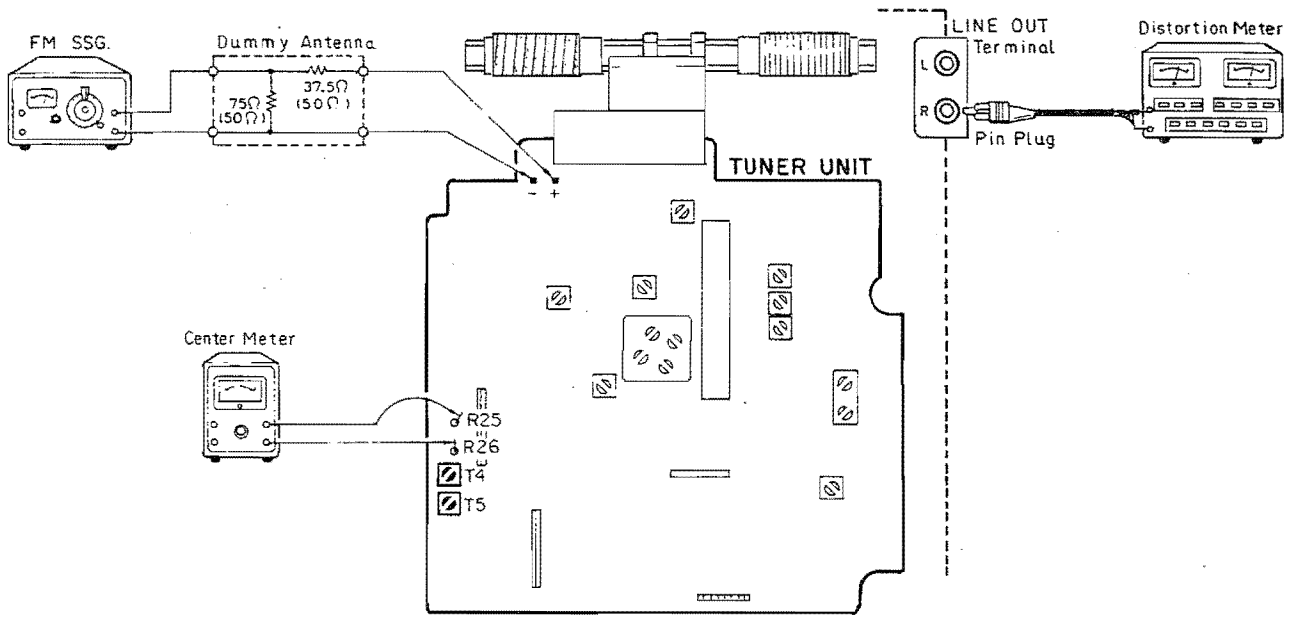


Fig. 7

- **To Adjust**

1. Adjust T4 so that the center meter points to the center when there is no signal.
2. Apply a signal of 82 MHz, 66 dB(μV) from the FM SSG and tune the tuner to the signal.
3. Adjust T5 so that distortion becomes minimum.
4. Turning T5 changes the center meter reading, and turning T4 changes the distortion value. Repeat items 1 and 3 to obtain the optimum result.

FM MPX ADJUSTMENT

• Connection Diagram

Stereo Modulator

Modulation frequency 1kHz
Modulation ratio 100%
Pilot signal ..... 7.5kHz deviation
Main signal ..... 67.5kHz deviation

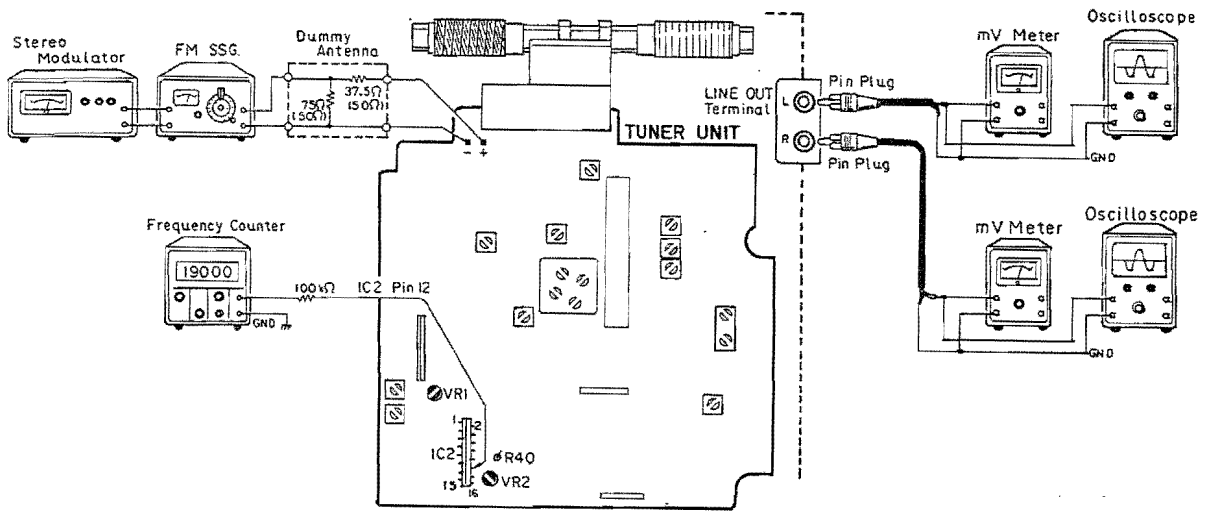
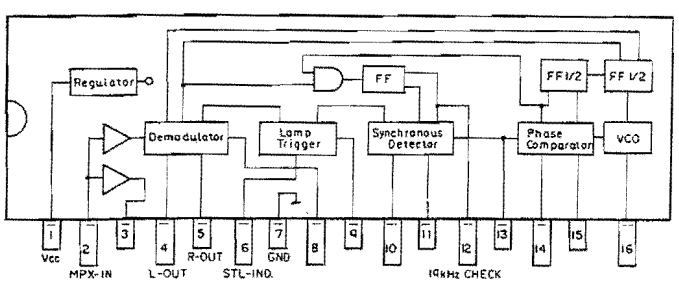


Fig. 8

• To Adjust

1. Apply a signal of 82 MHz, 10dB from the FM SSG, and tune the tuner to the signal.
2. Set the output of the FM SSG to 60 dB, and turn the modulation off.
3. Adjust VR2 so that the counter indicates within ±20 Hz of 19 kHz.
4. Check the separation. If the separation is not less than 25dB cut the body of R40.
5. Set the output of the FM SSG to 26 dB. Then adjust VR1 so that the tuning indicator (green) lights.

LA3365



EXPLODED VIEW

- **Parts List**

NOTE

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ : GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts whose parts numbers are omitted are subject to being not supplied.*

Cabinet (Page 48)

		SK-900/KC		SK-909L/HT,HB	
Mark	No.	Part No.	Description	Part No.	Description
★	12.	HXA-739	Front Case Assy	HXA-837	Front Case Assy
	41.	HXA-760	Support Panel Unit	HXA-844	Support Panel Unit
★	42.	HAC-233	Knob (BFC)	HAC-231	Knob (BFC)
★	71.	HNS-473	Rear Case	HNS-547	Rear Case
★		——	——	HAA-198	Knob (BAND)

Chassis (1) (Page 51)

		SK-900/KC		SK-909L/HT,HB	
Mark	No.	Part No.	Description	Part No.	Description
	8.	HXA-841	Back Plate Unit	HXA-842	Back Plate Unit
	66.	HXA-847	Tuning Assy	HXA-791→retired	Tuning Assy

HXA-847

Chassis (2) (Page 54)

		SK-900/KC		SK-909L/HT,HB	
Mark	No.	Part No.	Description	Part No.	Description
	1.	HWH-117	Main Amp Assy	HWH-118	Main Amp Assy
⚠	5.	HKP-107	Socket	HKP-109	Socket
	7.	BNC30P100FMC	Screw (Dial Pulley)	HBA-140	Screw (Dial Pulley)
★★	47.	HSK-119	Switch (BFC)	——	Deleted
⚠ ★	54.	HTT-160	Power Transformer	HTT-166	Power Transformer, 220V 240V AC
	71.	HNM-330	Shield	HNM-300	Shield
	75.	HNC-507	Washer	HBE-124	Washer
	84.	HTX-137	Antenna Unit	HTX-131	Antenna Unit
	85.	HCL-110	Variable Capacitor	HCL-114	Variable Capacitor
	86.	HDE-203	Connector (7P)	HDE-255	Connector (7P)
	94.	HWE-157	Tuner Unit	HWE-162	Tuner Unit
	95.	CNV-863	AC Cap	CNV-977	AC Cap
	97.	HKR-103	Fuse Holder	HKR-102	Fuse Holder
⚠ ★★	98.	HEK-116	Fuse, 5A	HEK-115	Fuse, 4A
★★		——	——	HSH-123	Switch (BFC)
		——	——	BNC30P080FMC	Screw (BFC)
		——	——		Holder (BFC)
		——	——		P.C.Board (BFC)
★★		——	——	HSD-120	Switch (Voltage Selector)
★★		——	——	HSH-124	Switch (BAND)
		——	——		Bracket (BAND)

Page 51

SK-900/KC		SK-909L/HT,HB	
Assembly	**Unit**	**Assembly**	**Unit**
Amp Assy (HWX-367)	LED Unit (A) Switch Unit Mic Amp Unit Control Unit Pre Amp Unit	Amp Assy (HWX-368)	LED Unit (A) Switch Unit Mic Amp Unit Control Unit Pre Amp Unit BFC Switch Unit

Packing Method (Page 69)

SK-900/KC				SK-909L/HT,HB	
Mark	**No.**	**PartNo.**	**Description**	**Part No.**	**Description**
	2-1.	HRB-171	Owner's Manual (English)	HRB-179	Owner's Manual (English)
	2-2.	HRB-172	Owner's Manual (French)	HRD-171	Owner's Manual (SK-909L/HT) (French, German)
⚠	2-3.	CDG-029	AC Cord	HDV-101	Cord Assy (SK-909L/HT)
				HDV-102	Cord Assy (SK-909L/HB)
				HRN-102	Card
				HRN-103	Card (SK-909L/HT)
	7.		Carton		Carton (SK-909L/HT)
					Carton (SK-909L/HB)

ELECTRICAL PARTS LIST

NOTE:
When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω 56 × 10^1 561 ..... RD1/4PS 5 6 1 J
47kΩ 47 × 10^3 473 ..... RD1/4PS 4 7 3 J
0.5Ω OR5 .....RN2H 0 R 5 K
1Ω 010 ..... RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ 562 × 10^1 .....RN1/4SR 5 6 2 1 F

- *For your parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.*
  ★ ★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

Tuner Unit (HWE-162)

MISCELLANEOUS

Mark	Part No.	Symbol & Description	
★★	LA1140	IC1	
★★	LA3365	IC2	
★★	M51204L	IC3	
★★	2SC1674-L	Q1	
★★	2SC1674-L or 2SC2786-L	Q2	
★★	2SC1675-L or 2SC2787-L	Q3,Q8,Q9	
★★	2SC1675 or 2SC2787-L	Q4	
★★	2SC945-P or 2SC1815-GR	Q5,Q10—Q13	
★★	2SC461-B or 2SC380TM-O	Q6,Q7	
★	VACANT	D1	
★	1S1555 or 1S2076 or DS442B	D2,D5,D11,D12	
★	1S188FM-1	D3,D7	
★	DS442B	D4,D8—D10,D13,D14	
	VACANT	D6	
	CTF-010	L1	Ferri-Inductor, 2.2μH
	CTF-039	L2	Ferri-Inductor
	HTF-115	L3	Ferri-Inductor, 0.47μH
	HTX-131	L4	Antenna Unit
	VACANT	L5	
	HTC-192	L6,L7	Coil
	CTC-061	T1	Coil
	HTC-135	T2	Coil
	CTC-028 or CTC-040	T3	Coil
	CTC-122	T4	Coil
	CTC-123	T5	Coil
	HTC-139	T6	Coil
	HTC-177	T7	Coil
	HTC-164	T8	Coil
	HTC-189	T9	Coil
	HTE-129	T10	Coil
	HTE-124	T11	Coil
	HCL-114	TC1,TC2,VC1—VC4	Variable Capacitor
	HCG-108	TC3,TC6	Trimmer
	CCG-069	TC4,TC5,TC7,TC8	Trimmer
	HWW-106	BPF	Filter
	CTF-038	CF1,CF2	Ceramic Filter
★	CCP-145	VR1	Volume, 10kΩ (B)
★	CCP-143	VR2	Volume, 4.7kΩ (B)
★★	HSH-125	S1	Switch (BAND)

RESISTORS

Mark	Part No.	Symbol & Description
	RD¼PM □□□J	R1—R7, R10—R20, R22—R24,R28—R39, R42, R44—R47, R49—R56, R58—R68, R70, R71, R73—R75, R83—R85
	RD¼VM □□□J	R21, R25—R27, R40, R41, R48, R57, R69, R76—R82
	VACANT	R8,R9,R43,R72

CAPACITORS

Mark	Part No.	Symbol & Description
	CCDSL 100D 50	C1,C2
	CCDRH 180J 50	C3
	CKDYF 103Z 25	C4,C11,C20,C22,C82
	CCDCH 030C 50	C5
	CCDSH 330J 50	C6,C17
	VACANT	C7
	CCDCH 100D 50	C8
	CCDCH 010C 50	C9
	CCDSL 101K 50	C10,C51
	CKPYX 103N 25	C12,C19,C21,C80
	VACANT	C13,C14
	CCDLH 300J 50	C15
	CCDRH 100D 50	C16
	CCDSH 180J 50	C18,C62
	CKDYF 403Z 25	C23, C24, C29, C30, C32, C49, C59, C67,C71—C73,C86,C87
	CEA 470M 10L	C25,C28,C58,C74
	CCDSL 330K 50	C26,C35
	CEA 010M 50L	C27,C37,C42,C44,C47,C83
	CEA 2R2M 50L	C31,C84
	CEA 4R7M 25L	C33
	CKPYY 223N 16	C34,C55
	VACANT	C36
	CQMA 473K 50	C38
	CQSH 102J 50	C39
	CEA R47M 50L	C40,C41
	CKDYB 561K 50	C43,C57
	CQMA 153K 50	C45,C46
	CEA 100M 16L	C48,C75
	CCDRH 040D 50	C50
	CCDSH 120J 50	C52
	CCDSH 050D 50	C53
	CCDSH 470J 50	C54
	CKDYD 103M 50	C56,C68,C69,C77,C78
	CCDSH 060D 50	C60
	CCDUJ 150J 50	C61
	CCDPH 181J 50	C63
	CQPA 562J 50	C64
	CQSH 361J 50	C65
	CQSH 271J 50	C66
	CQMA 182K 50	C70
	CCDSL 101J 50	C76
	VACANT	C79
	CQMA 333K 50	C81
	CEAR15M 50	C85
	CCDSL390K 50	C88,C89

BFC Switch Unit

Mark	Part No.	Symbol & Description	
★★	HSH-123	S1	Switch (BFC)
	CKDYB 272K 50	C251	

Main Amp Unit (Page 64)

SK-900/KC			SK-909L/HT,HB	
Mark	Part No.	Symbol & Description	Part No.	Symbol & Description
	RD¼VS 331J	R28	RD½PS 331J	R28
	RD¼VS 393J	R30	RD½PS 391J	R30
	RD½PS 335J	R38	—	Deleted

Fuse Unit (Page 65)

SK-900/KC			SK-909L/HT,HB	
Mark	Part No.	Symbol & Description	Part No.	Symbol & Description
⚠ ★★	HEK-116	Fuse,5A	HEK-115	Fuse,4A

Pre Amp Unit (Page 65)

SK-900/KC			SK-909L/HT,HB	
Mark	Part No.	Symbol & Description	Part No.	Symbol & Description
	HTX-126	OSC	HTX-132	OSC
	CKPYB102 K50	C93	CKDYB 272 K50	C93

Control Unit (Page 66)

SK-900/KC				SK-909L/HT,HB	
Mark	Part No.	Symbol & Description		Part No.	Symbol & Description
★★	HSK-119	S2	Switch (BFC)	—	Deleted

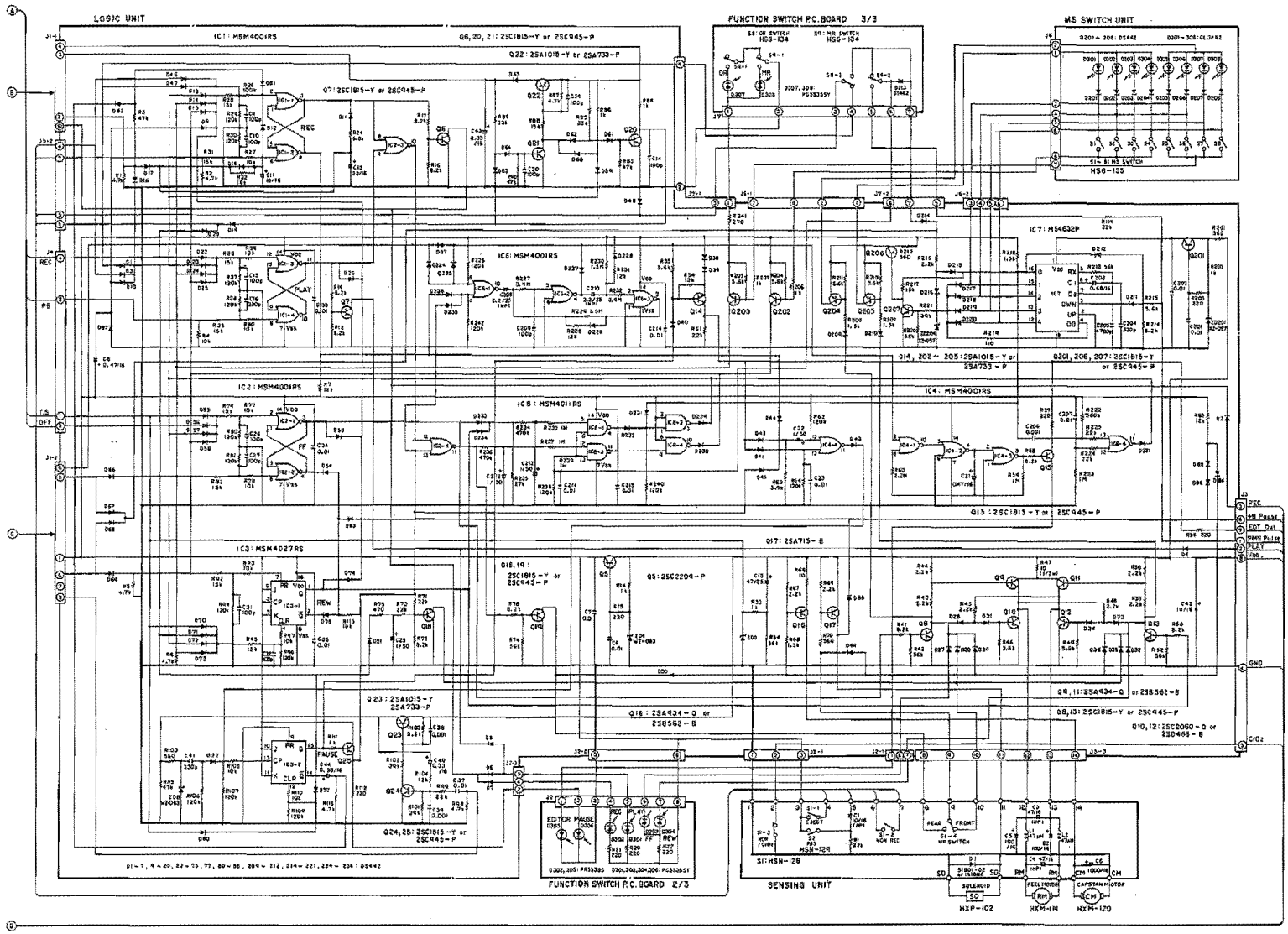

LOGIC UNIT
FUNCTION SWITCH P.C.BOARD 3/3
MS SWITCH UNIT
FUNCTION SWITCH P.C.BOARD 2/3
SENSING UNIT
HXP-102
HXM-IR
HXM-120

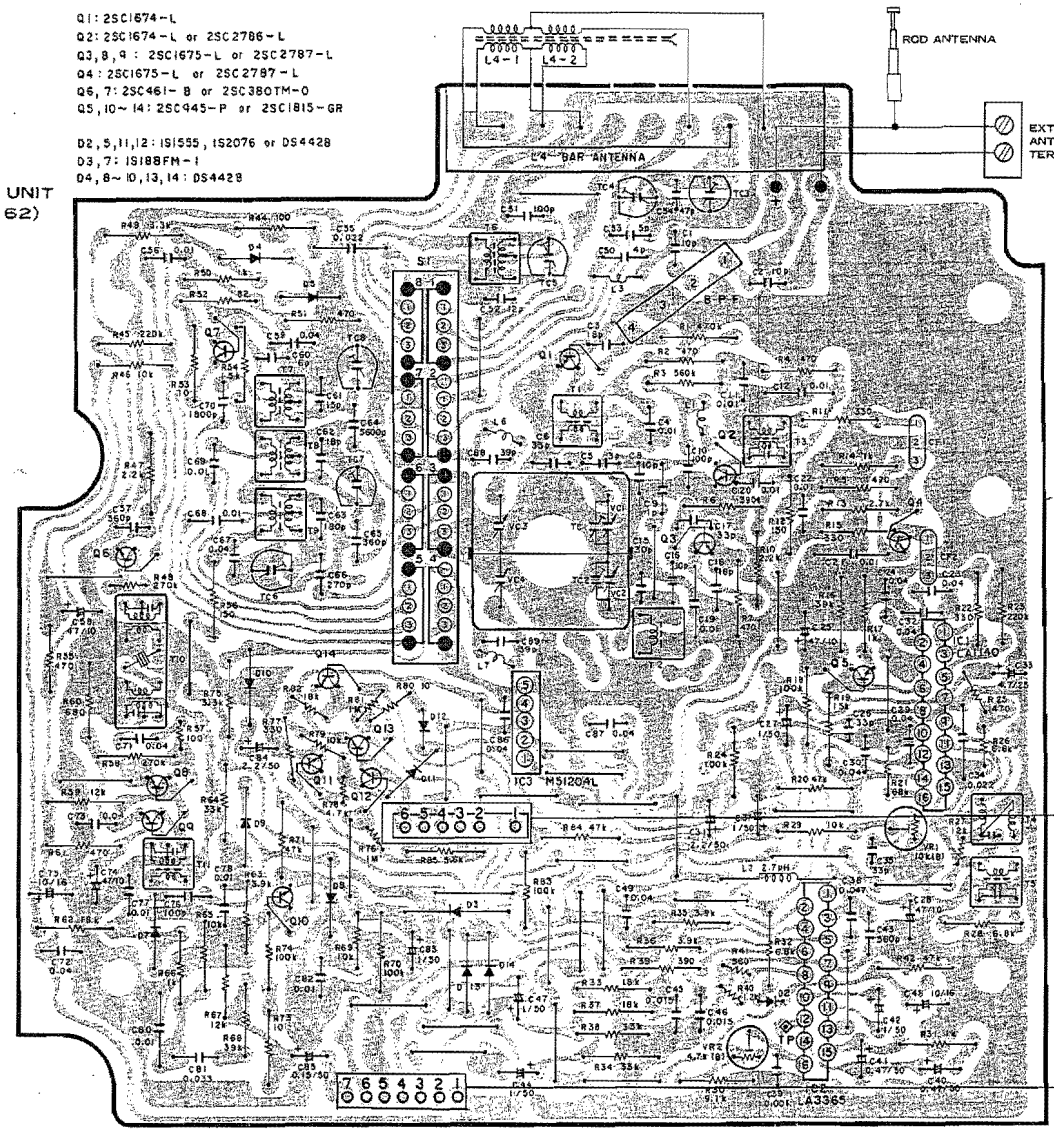
Fig. 10

CONNECTION DIAGRAM

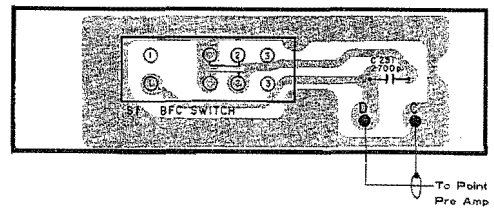
Q1: 2SC1674-L
Q2: 2SC1674-L or 2SC2786-L
Q3, 8, 9: 2SC1675-L or 2SC2787-L
Q4: 2SC1675-L or 2SC2787-L
Q6, 7: 2SC461-B or 2SC3807M-O
Q5, 10~14: 2SC945-P or 2SC1815-GR

D2, 5, 11, 12: 1S1555, 1S2076 or DS4428
D3, 7: 1S188FM-1
D4, 8~10, 13, 14: DS4428

TUNER UNIT
(HWE-162)



BFC SWITCH UNIT



Q, IC	Q6	Q9 Q8 Q7	Q10 Q11 Q14 Q13 Q12	IC3 Q1	Q3 Q2	IC2 Q5 Q4	IC1
ADJ	T10	TC6 TC8 TC7 T7 T8 T9		T6 TC5 TC2 TC1 TC4 TC3 R40 VR2 T3 L4 T1 T2		VR1	T4 T5

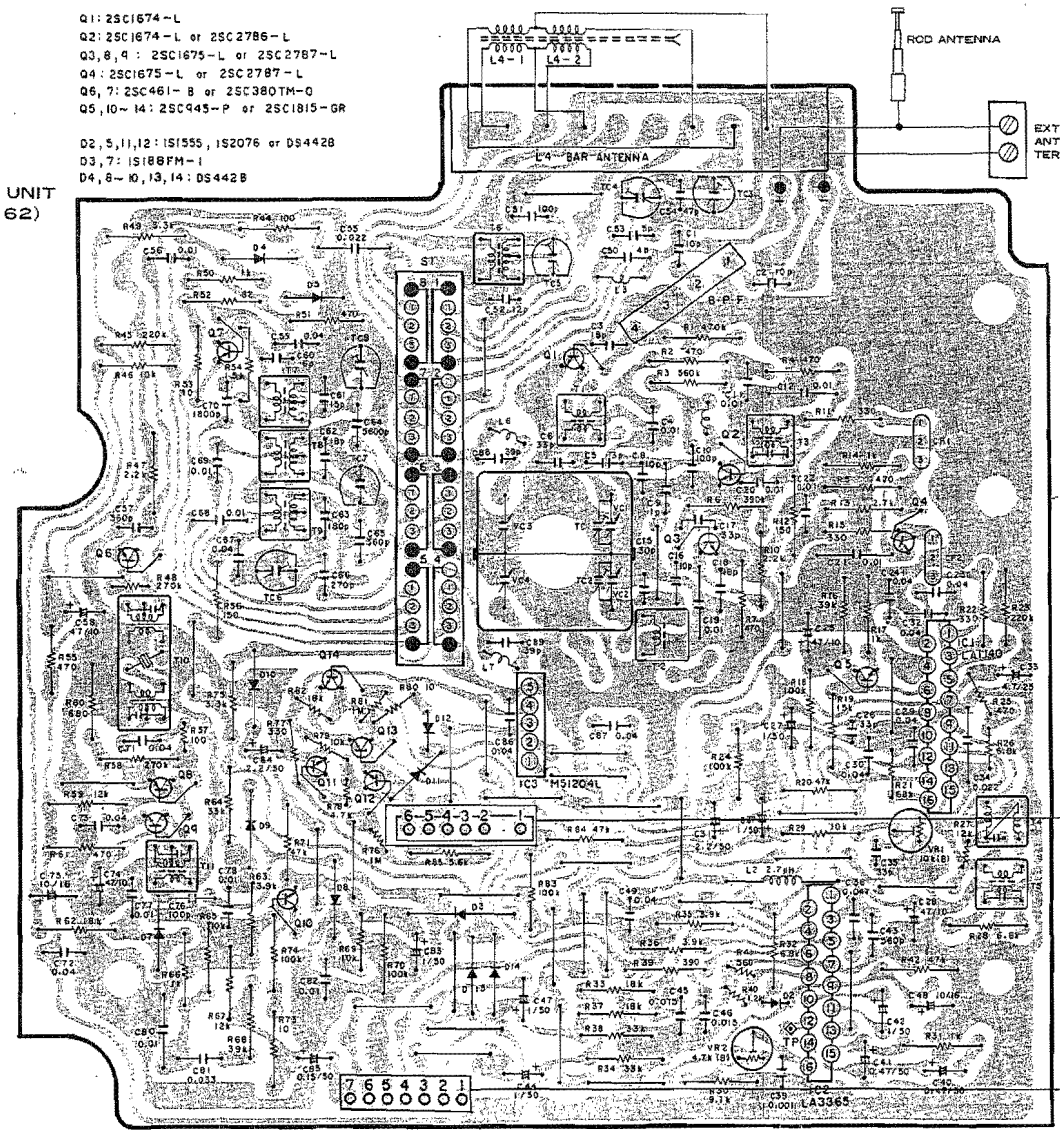
Fig. 11

CONNECTION DIAGRAM

Q1: 2SC1674-L
Q2: 2SC1674-L or 2SC2786-L
Q3,8,9 : 2SC1675-L or 2SC2787-L
Q4: 2SC1675-L or 2SC2787-L
Q6, 7: 2SC461-B or 2SC380TM-O
Q5, 10~14: 2SC945-P or 2SC1815-GR

D2, 5, 11, 12: 1S1555, 1S2076 or DS4428
D3, 7: 1S188FM-1
D4, 8~10, 13, 14: DS4428

TUNER UNIT
(HWE-162)



BFC SWITCH UNIT

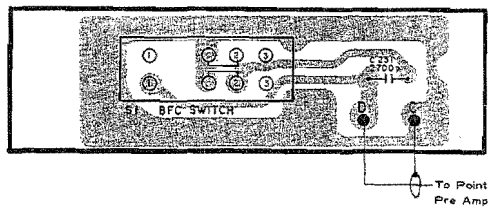


Fig. 11

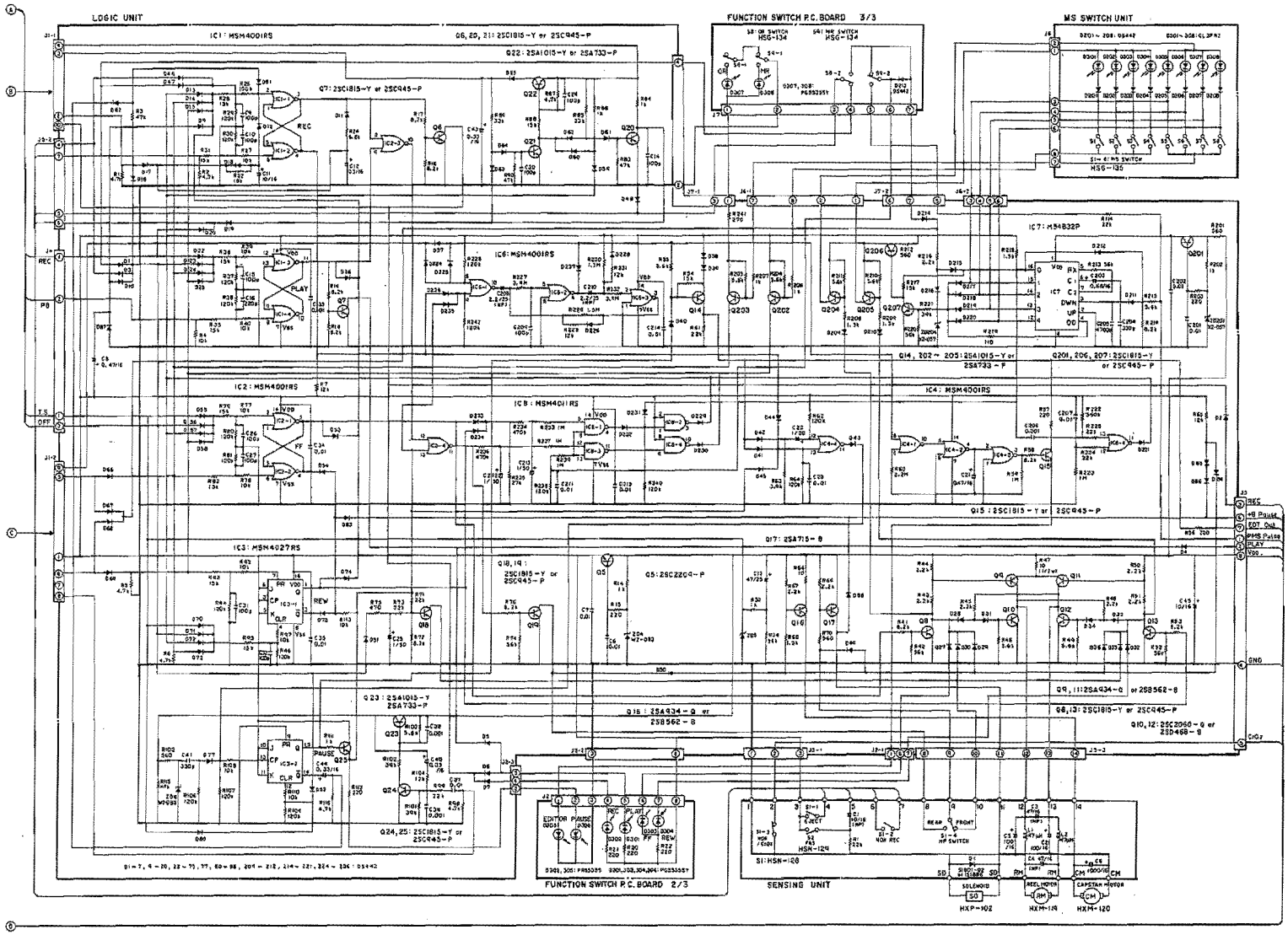
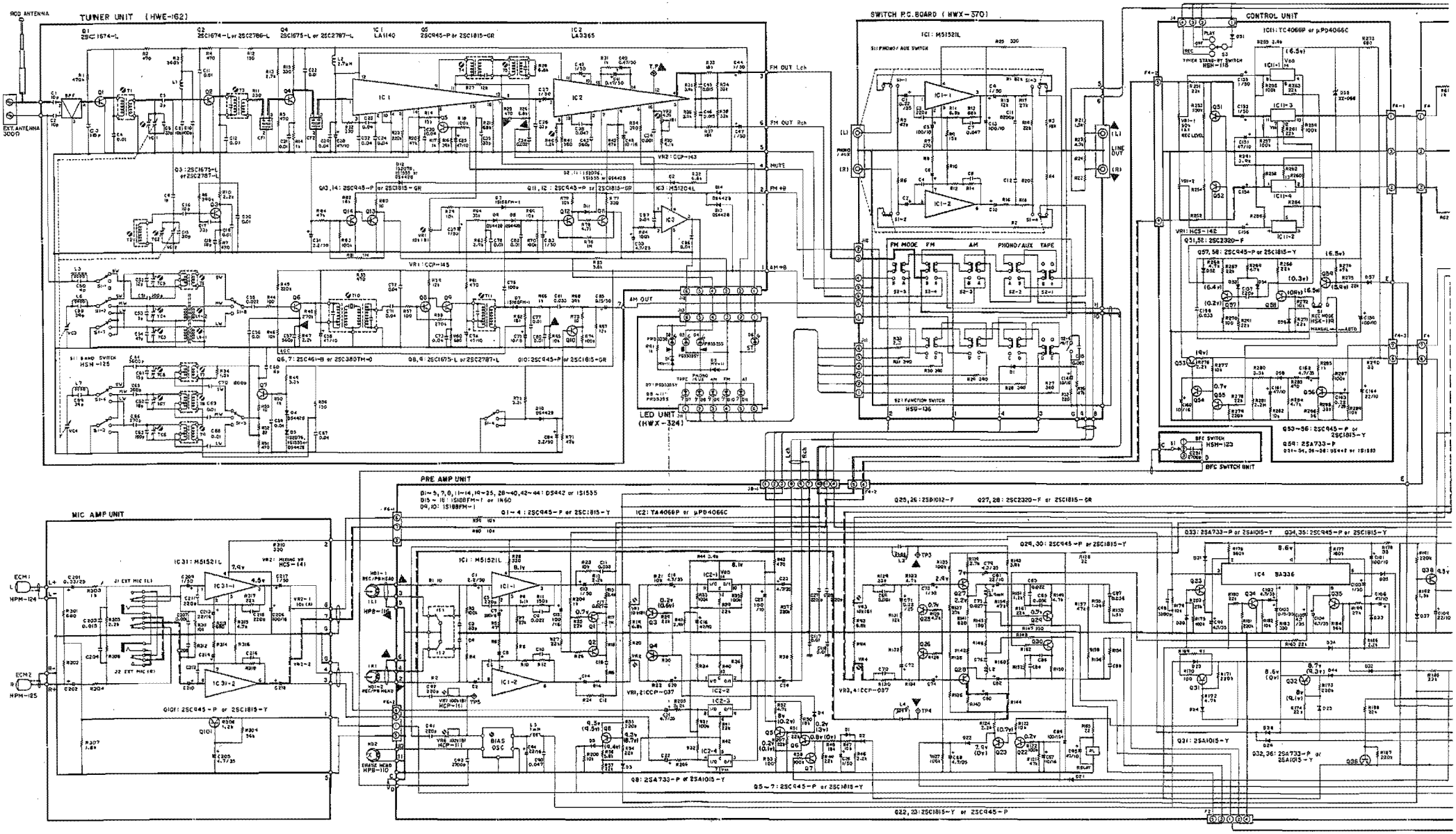
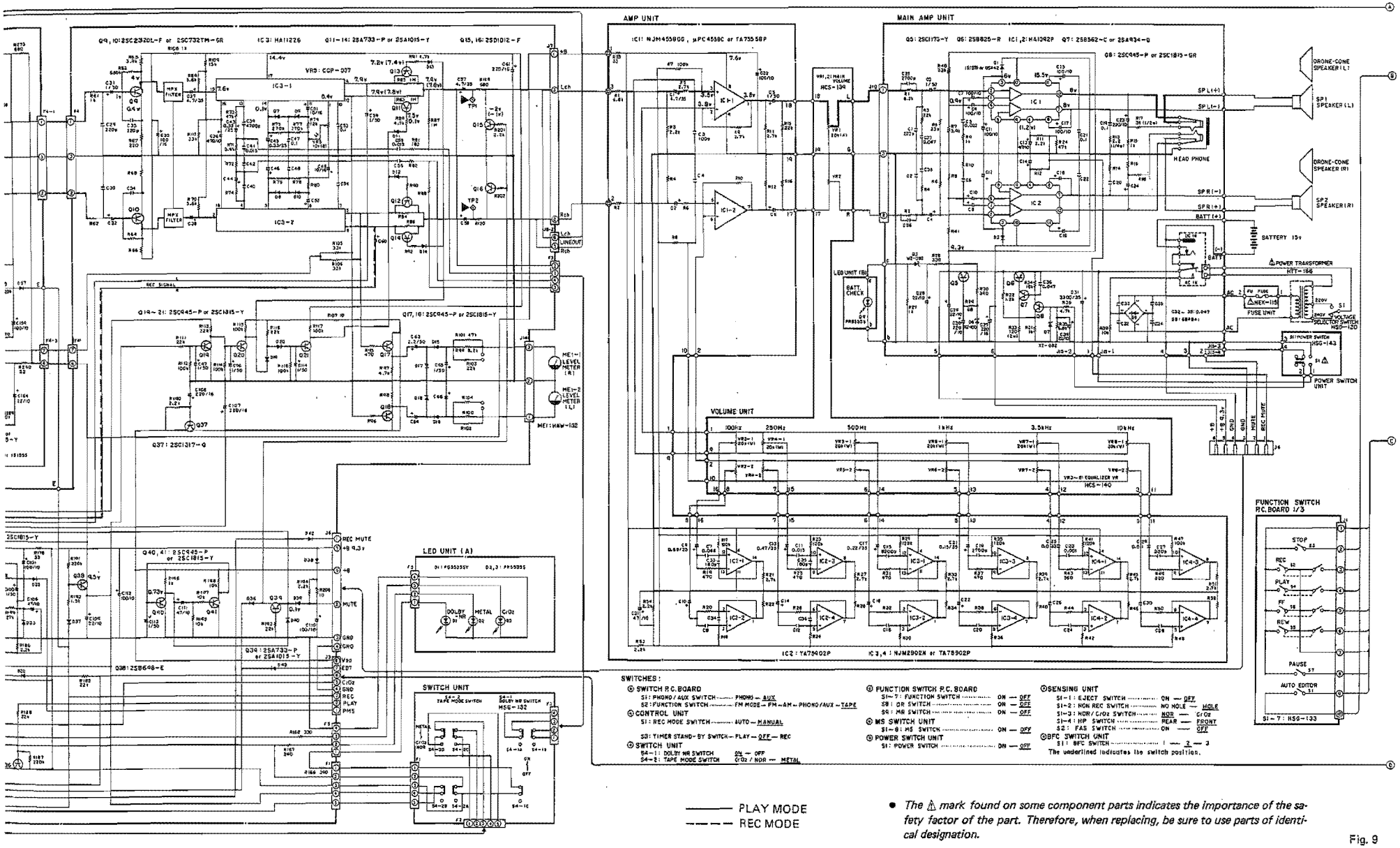

LOGIC UNIT
FUNCTION SWITCH P.C.BOARD 3/3
MS SWITCH UNIT
FUNCTION SWITCH P.C.BOARD 2/3
SENSING UNIT
SOLENOID
REEL MOTOR
CAPSTAN MOTOR
HXP-102
HXM-120
HXM-120

Fig. 10

SCHEMATIC CIRCUIT DIAGRAM





- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

Fig. 9

SK-909L

SCHEMATIC CIRCUIT DIAGRAM