ALIGNMENT

TEST EQUIPMENT

Allow a minimum of 10 minutes warm-up for test equipment and the tuner to be tested.
Maintain rated line voltage.
FM Signal Generator (FM SG)
Oscillascope
AC Voltmeter
Distortion Meter
MPX Signal Generator (MPX SG)
Frequency Counter
AM Sweep Generator (AM SG)
DC Voltmeter

GENERAL ALIGNMENT INSTRUCTION

Always observe response curve on oscilloscope during alignment procedure:

1. Do not apply signal from FM or AM stations. Apply signal from generator only.
2. Use of excessive signal from FM SG or AM SG can cause overloading of the tuner circuits. To properly align the tuner, adjust FM SG or AM SG output level control so that response curve on oscilloscope is not distorted.

FM SECTION

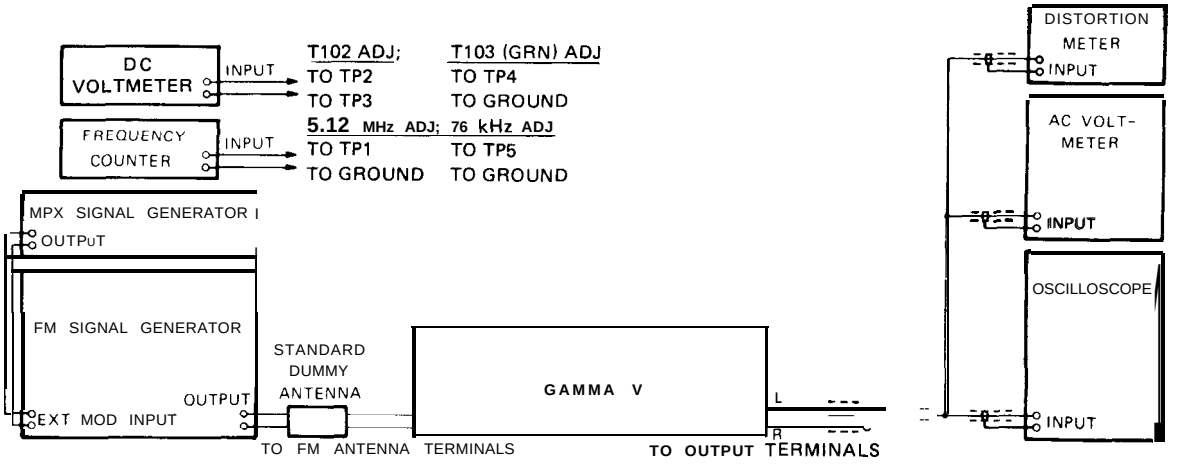


Figure 6. Test Equipment Hook-up

FREQUENCY SYNTHESIS TUNER SECTION

FM Front End Adjustment

This adjustment is factory preset and should not need readjustment.

5.12 MHz Crystal Controlled Oscillator Adjustment.

Set MAIN POWER switch (S1) to ON position and POWER switch (S2) to OFF position.
Connect frequency counter to test point "TP 1" (Photo 7).
Adjust C917 (Photo 7) for 5.12 MHz ± 20 Hz.

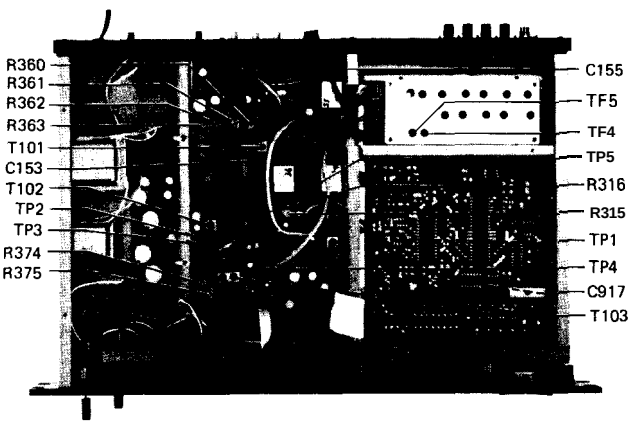


Photo 7. Adjustment Points

IF-AF SECTION

FM IF Alignment

STEP	FM SG FREQUENCY/ CALIBLATION	MODULATING FREQUENCY/ DEVIATION	SWITCHES OF THE TUNER	LED FREQUENCY DISPLAY	ADJUSTMENT POINT	PROCEDURE	REMARKS
1	98.1MHz/60dBμ	(No modulation)	A. DE-EMPHASIS to "NORMAL" B. MAIN POWER to "ON". C. POWER to "ON". D. MODE to "MONO". E. HI-BLEND to "OFF". F. IF BAND to "WIDE".	98.1MHz	T102 (Photo 7)	Connect DC voltmeter to test points "TP2", "TP3" (Photo 7) and adjust for 0 V.	
2					T103 (Green Core) (Photo 7)	Connect DC voltmeter to test point "TP4" (Photo 7) and ground and adjust for 0 ± 50 mV.	
3		400Hz/ mono [±75kHz]			T103 (Red Core) (Photo 7)	Adjust for minimum distortion.	
4	98.1MHz/0-6dBμ				T101 (Photo 7)	Adjust for maximum AC voltmeter deflection.	
5			A~E. Same as above. F. IF BAND to "NARROW".		TF4, TF5 (Photo 7)		
6	98.1MHz/60dBμ	10kHz/ mono [±75kHz]	A. DE-EMPHASIS to "25 μS". B~E. Same as above. F. IF BAND to "WIDE".		C155 (Photo 7)	Adjust for minimum distortion.	
7			A~E. Same as above. F. IF BAND to "NARROW".		C153 (Photo 7)		

FM MPX Alignment

STEP	FM SG FREQUENCY/ CALIBLATION	MODULATING FREQUENCY/ DEVIATION	SWITCHES OF THE TUNER	LED FREQUENCY DISPLAY	ADJUSTMENT POINT	PROCEDURE	REMARKS
1	98.1MHz/60dBμ	(No modulation)	A. DE-EMPHASIS to "NORMAL". B. MAIN POWER to "ON". C. POWER to "ON". D. MODE to "STEREO". E. HI-BLEND to "OFF". F. IF BAND to "WIDE".	98.1MHz	R315 (Photo 7)	Connect frequency counter to test point "TP5" (Photo 7) and adjust for 76kHz ±70Hz.	
2		400Hz/stereo [main (R+L) & sub (L-R): ±67.5kHz/19kHz pilot: ±7.5kHz]				Check that stereo lamp lights up and that audio outputs (left and right channel) are observed on scope when MUTING THRESHOLD knob is CCW.	
3		19kHz pilot only: ±7.5kHz			R316 (Photo 7)	Adjust for minimum 19kHz pilot leakage.	

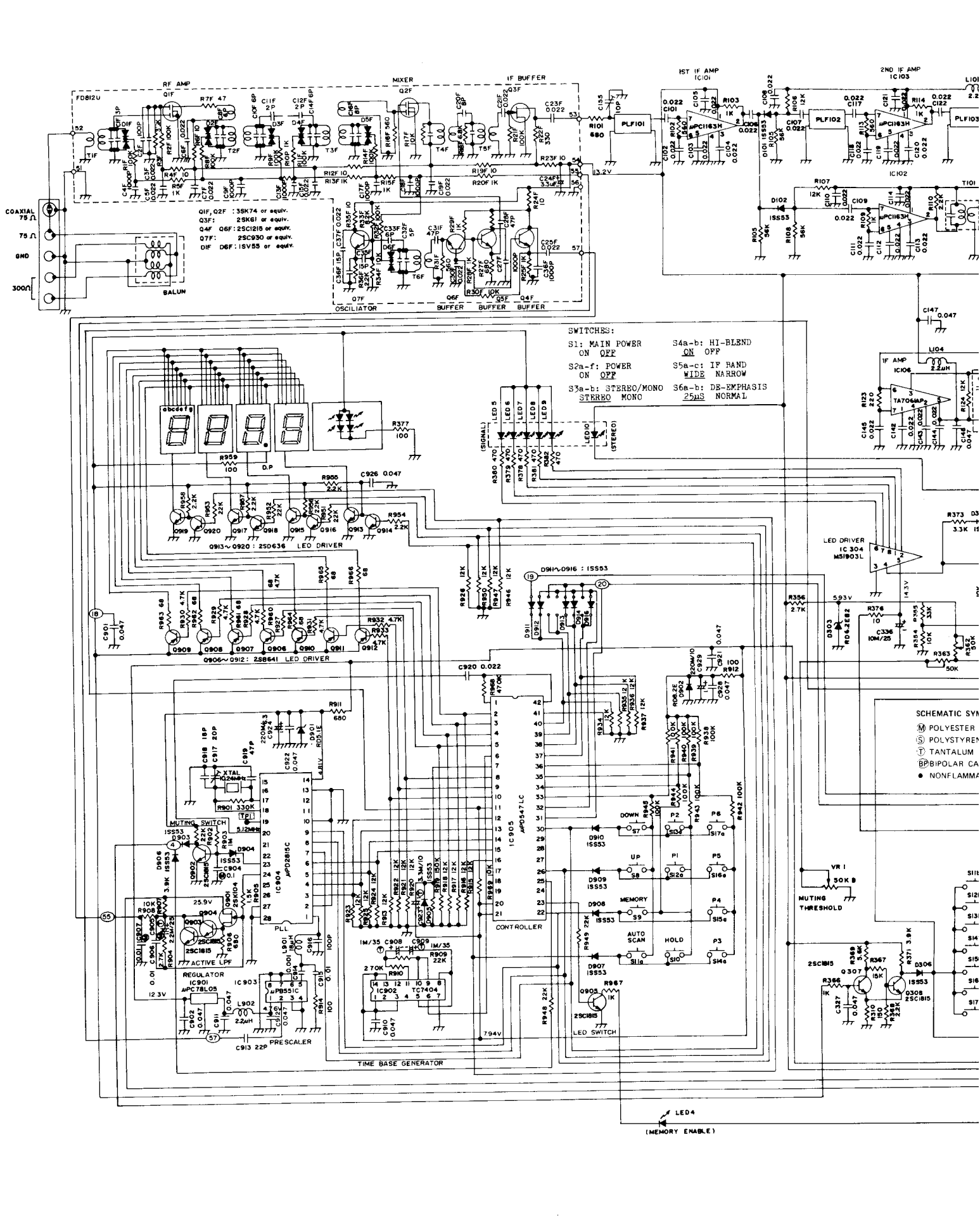
4		400Hz/stereo [main (L) & sub (L): ±67.5kHz; 19kHz pilot: ±7.5kHz]			R360 (Photo 7)	Adjust for maximum separation (or minimum output of right channel).	Both the separations (or both the outputs of right and left channels) should be equal.
5		400Hz/stereo [main (R) & sub (−R): ±67.5kHz; 19kHz pilot: ±7.5kHz]				Adjust for maximum separation (or minimum output of left channel).	
6		Same as Step 4.	A∼E. Same as above. F. IF BAND to "NARROW".		R361 (Photo 7)	Same as Step 4.	Same as above.
7		Same as Step 5.				Same as Step 5.	

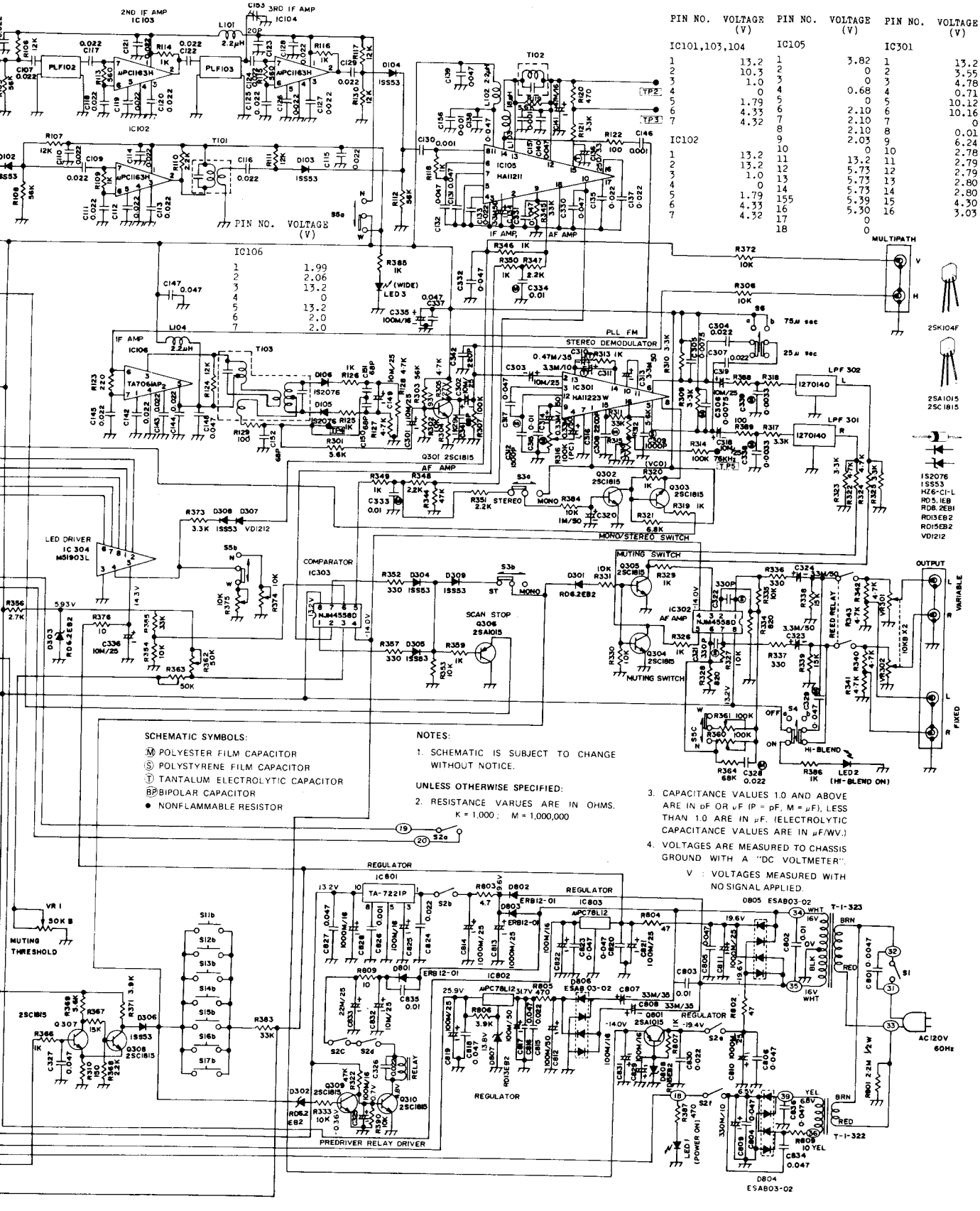
LED Signal-Strength Display Circuit Alignment

STEP	FM SG FREQUENCY/ CALIBLATION	MODULATING FREQUENCY/ DEVIATION	SWITCHES OF THE TUNER	LED FREQUENCY DISPLAY	ADJUSTMENT POINT	PROCEDURE	REMARKS
1	98.1MHz/60dBμ	400Hz mono [75kHz]	A. DE-EMPHASIS: either position. B. MAIN POWER to "ON". C. POWER to "ON". D. MODE to "MONO". E. HI-BLEND: either position. F. IF BAND to "WIDE".	98.1MHz	R375 (Photo 7)	Adjust unit five signal-strength display LED's light up.	
	98.1MHz/30-40 dBμ					Adjust until three signal-strength display LED's light up.	
	(No signal)					Adjust unit any signal-strength display LED no longer lights up.	
2	Same as Step 1.		A∼E. Same as above. F. IF BAND to "NARROW".		R374 (Photo 7)	Same as Step 1.	

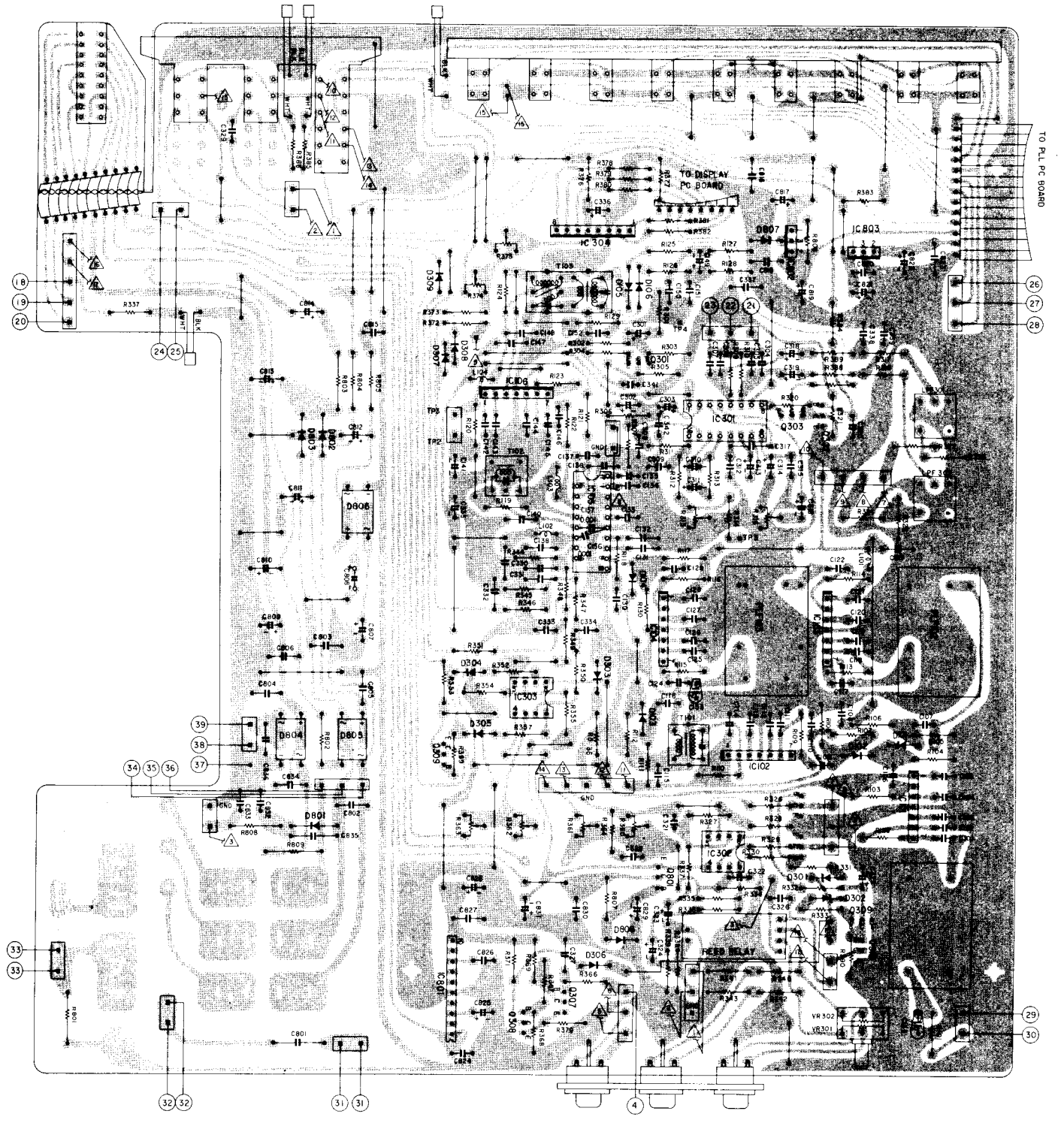
Muting Threshold Adjustment

STEP	FM SG FREQUENCY/ CALIBLATION	MODULATING FREQUENCY/ DEVIATION	SWITCHES OF THE TUNER	LED FREQUENCY DISPLAY	ADJUSTMENT POINT	PROCEDURE	REMARKS
1	98.1MHz/40dBμ	400Hz/ mono[±75kHz]	A. DE-EMPHASIS to "NORMAL". B. MAIN POWER to "ON". C. POWER to "ON". D. MODE to "STEREO". E. HI-BLEND to "OFF". F. IF BAND to "WIDE". G. MUTING THRESHOLD to full CW.	98.1MHz	R362 (Photo 7)	Adjust until audio output is observed on scope.	Repeat steps 1and 2 several times.
2	98.1MHz/10dBμ				R363 (Photo 7)	Adjust until audio output is no longer present on scope.	


RF AMP
MIXER
IF BUFFER
1ST IF AMP IC101
2ND IF AMP IC103
IC102
FD8120
COAXIAL 75Ω
75Ω
GND
300Ω
BALUN
Q1F, Q2F : 3SK74 or equiv.
Q3F: 2SK61 or equiv.
Q4F Q6F: 2SC1215 or equiv.
Q7F: 2SC930 or equiv.
D1F D6F: 1SV55 or equiv.
OSCILLATOR
BUFFER
BUFFER
BUFFER
SWITCHES:
S1: MAIN POWER ON OFF
S2a-f: POWER ON OFF
S3a-b: STEREO/MONO STEREO MONO
S4a-b: HI-BLEND ON OFF
S5a-c: IF BAND WIDE NARROW
S6a-b: DE-EMPHASIS 25μS NORMAL
LED 5
LED 6
LED7
LED8
LED9
LED10
(SIGNAL)
(STEREO)
D.P
0913~0920 : 2SD636 LED DRIVER
0906~0912 : 2SB641 LED DRIVER
D911~D916 : 1SS53
LED DRIVER IC 304 M51903L
IF AMP IC106
TA7064AP
MUTING SWITCH
ACTIVE LPF
REGULATOR IC901 μPC78L05
PLL IC904 μPD2815C
CONTROLLER IC905 μPD547LC
PRESCALER IC903 μPB551C
TIME BASE GENERATOR IC902 TC7404
LED SWITCH
DOWN
UP
MEMORY
AUTO SCAN
HOLD
MUTING THRESHOLD
VR1 50K B
SCHEMATIC SYM
(M) POLYESTER
(S) POLYSTYREN
(T) TANTALUM
(BP) BIPOLAR CA
• NONFLAMMA
LED4
(MEMORY ENABLE)


2ND IF AMP
IC103
3RD IF AMP
IC104
IC102
IC105
HA11211
IF AMP
AF AMP
IC106
TA7061AP
IF AMP
PLL FM
STEREO DEMODULATOR
IC301
HA11223W
LED DRIVER
IC 304
M51903L
COMPARATOR
IC303
SCAN STOP
Q306
2SA1015
MUTING SWITCH
IC302
AF AMP
NJM4558D
MUTING SWITCH
REGULATOR
IC801
TA-7221P
REGULATOR
IC803
REGULATOR
IC802
REGULATOR
PREDRIVER RELAY DRIVER
MULTIPATH
2SK104F
2SA1015
2SC1815
LPF 302
LPF 301
MONO/STEREO SWITCH
VARIABLE
FIXED
HI-BLEND
LED2
(HI-BLEND ON)
MUTING THRESHOLD
VR1
50K B
AC120V
60Hz
T-1-323
T-1-322
DB04
ESAB03-02
PIN NO. VOLTAGE (V)
IC106
1 1.99
2 2.06
3 13.2
4 0
5 13.2
6 2.0
7 2.0
PIN NO. VOLTAGE (V)
IC101,103,104
1 13.2
2 10.3
3 1.0
4 0
5 1.79
6 4.33
7 4.32
IC102
1 13.2
2 13.2
3 1.0
4 0
5 1.79
6 4.33
7 4.32
PIN NO. VOLTAGE (V)
IC105
1 3.82
2 0
3 0
4 0.68
5 0
6 2.10
7 2.10
8 2.10
9 2.03
10 0
11 13.2
12 5.73
13 5.73
14 5.73
155 5.39
16 5.30
17 0
18 0
PIN NO. VOLTAGE (V)
IC301
1 13.2
2 3.55
3 4.78
4 0.71
5 10.12
6 10.16
7 0
8 0.01
9 6.24
10 2.78
11 2.79
12 2.79
13 2.80
14 2.80
15 4.30
16 3.03
IS2076
ISS53
HZ6-CI-L
RD5.1EB
RD8.2EB1
RDI3EB2
RDI5EB2
VDI212
SCHEMATIC SYMBOLS:
(M) POLYESTER FILM CAPACITOR
(S) POLYSTYRENE FILM CAPACITOR
(T) TANTALUM ELECTROLYTIC CAPACITOR
(BP) BIPOLAR CAPACITOR
• NONFLAMMABLE RESISTOR
NOTES:
1. SCHEMATIC IS SUBJECT TO CHANGE WITHOUT NOTICE.
UNLESS OTHERWISE SPECIFIED:
2. RESISTANCE VARUES ARE IN OHMS. K = 1,000 ; M = 1,000,000
3. CAPACITANCE VALUES 1.0 AND ABOVE ARE IN pF OR μF (P = pF, M = μF), LESS THAN 1.0 ARE IN μF. (ELECTROLYTIC CAPACITANCE VALUES ARE IN μF/WV.)
4. VOLTAGES ARE MEASURED TO CHASSIS GROUND WITH A "DC VOLTMETER".
V : VOLTAGES MEASURED WITH NO SIGNAL APPLIED.

V



IF-AF PC Board (Bottom View)

PARTS LIST

NOTES:

1. ★ The KEY NUMBER (#) marked with a (★) on parts list relate to numbers of three digits with a (◯).
2. + Numberals in file indicate the quantity of parts used in one type.
3. ++
   - TR : Transistor
   - FET : Field effect transistor
   - VR : Volume control (Variable resistor)
   - RES : Carbon film fixed resistor
   - MO-RES : Metal oxide film fixed resistor
   - CE-RES : Cemented wirewound fixed resistor
   - NF : Nonflamable
   - C-CAP : Ceramic capacitor
   - E-CAP : Aluminium electrolytic capacitor
   - M-CAP : Polyester film capacitor
   - S-CAP : Polystyrene film capacitor
   - T-CAP : Tantalum electrolytic capacitor
   - BP-CAP : Bipolar electrolytic capacitor

   E-CAP, T-CAP and BP-CAP values (1 x 10uf) are in (1) uF, (10) WV.
4. Assemblies and parts are subject to charge without notice.
5. Parts ordering procedure:
   - A. Do NOT USE THE "KEY" NUMBER AND "SYMBOL" NUMBER. (these are control # for the factory only)
   - B. Include in any order
     - a. Part number.
     - b. Part description.
     - c. Model number.

     (any of the above lacking from an order may delay shipment of that order.)

KEY NO.	SYMBOL NO.	W-type-u+	DESCRIPTION ++	PART NO.
			PACKING MATERIALS & ACCESSORIES	
		1	Carton	9825410
		1	Pad (L)	9840730
		1	Pad (R)	9840740
		1	Sack, polyethylene cloth	9640650
		1	Sack (#13), polyethylene cloth	9640320
		1	Manual (E), instruction	960236E
			Manual (SEI), instruction	960263F
		1	Cloth, polishing	9690040
		1	Cord 2T-1 (NK), pin plug	962014A
		1	Antenna, FM. Q-MATCH	4581360
		1	Sack (#1), polyethylene cloth	9640590
		1	Dryer, SILICA GEL	9690010
			CABINET ASSEMBLY	
		1	Panel, front–(GOLD MODEL)	7884110
★		1	Panel, front–(BLACK MODEL)	7884120
		6	Screw, PTS 3φx6	814306S
★		4	LED, GD-4-207RD	5060010
		3	Holder, LED	7903060
		1	Cloth, DUST COV2430 – for power switch	7001980
★		1	Window, dial smoke	7802320
		1	Knob, 15GL-8LS – POWER (GOLD MODEL)	7841110
★		1	Knob, 15BK-8LS – POWER (BLACK MODEL)	7841120
		1	Knob, 12GL-8D – MUTING THRESHOLD (GOLD MODEL)	7841090
★		1	Knob, 12BK-8D – MUTING THRESHOLD (BLACK MODEL)	7841100
		3	Guide (GE)	7801480
		3	Push button, P5208L-4E – MUTING ON-STEREO ↔ MONO, HI-BLEND, IF BAND (GOLD MODEL)	7851860
★		3	Push button, P520BL-4E – MUTING ON-STEREO ↔ MONO, HI-BLEND, IF-BAND (BLACK MODEL)	7851980
		3	Spring (V)	7440400
		3	Stop, button	7401460
		9	Guide (GS)	7401470
		9	Push button, P416SL-4SQ – (GOLD MODEL)	7851870
★		9	Push button, P416BL-4SQ – (BLACK MODEL)	7851990
		9	Spring(V)	7440400
		9	Stop, button	7401460
★		1	Lever, tuning – (GOLD MODEL)	7851850
		1	Lever, tuning – (BLACK MODEL)	7851970
		1	Arm, tuning	7031940
		2	Screw, PTS 3φx8	814308S
		1	Holder, lever	7031930
		2	Screw, PMS 3φx5	810305S
★		1	Cover, metal	7820850
		4	Washer, W4φ BLK	893104W
		4	Screw, TFTS 4φx10 BLK	887410W
		4	Screw, PTS 3φx6 BLK	814306W
★		1	Plate, bottom	7325120
		9	Screw, PTS 3φx6	814306S
★		4	Foot (TG)	7401350
		4	Screw, PTS 3φx8	814308S
			CHASSIS ASSEMBLY	
			(1) (Front Plate Assembly)	
		8	Screw, PTS 3φx6	814306S
			(1) (Back Plate Assembly)	
		8	Screw, PTS 3φx6 BLK	814306W
★		1	Angle (R), side	7226580
★		1	Angle (R), chassis	7226600
		1	Bushing (B312-250), snap	7401100
★		1	Bracket (F), PC board	7226620
		4	Screw, PTS 3φx6	814306S
★		1	Bracket (B), PC board	7226560
		2	Screw, PTS 3φx6	814306S
★		1	Bracket, front end	7226610
		2	Screw, PTS 3φx6	814306S
★		1	Holder (B), front end	7226570
		4	Screw, PTS 3φx6	814306S
★		1	Front End, FD811U	4910110
		6	Screw, PTS 3φx6	814306S
★		1	Angle (L), chassis	7226590
		2	Lug, solder	440000D
		2	Washer, TW(I) 3φ	893403U

PART ORDERING PROCEDURE - - - - - Do NOT USE THE "KEY" NUMBER AND "SYMBOL" NUMBER. (these are control # for the factory only.) Include in any order: a. Part number, b. Part description, c. Model number. (any of the above lacking from an order may delay shipment of that order.)

KEY NO.	SYMBOL NO.	W-type-u[+]	DESCRIPTION [++]	PART NO.
		2	Screw. PTS 3φx6	814306S
*		1	Angle(L), side	7226630
*		1	Transformer, power. T-1-322 – 120V only	1103220
		2	Washer. TW(I) 3φ	893403U
		2	Nut. 1N 3φ	892013S
		2	Screw. PMS 4φx8	810408S
*		1	Transformer, power. T-1-323 – 120V only	1103230
		2	Plate, power transformer mounting	7031290
		2	Screw. PMS 4φx8	810408S
			(1) (PLL PC Board Assembly)	
		4	Screw. PTS 3φx6	814306S
		1	Plate (L), shielding – bottom	7226540
		1	Plate (U), shielding – top	7226550
		7	Screw. PTS 3φx6	814306S
		1	Rivet, plastic push. FNRP 3x4.5	7401190
			(1) (IF-AF PC Board Assembly)	
		5	Screw. PTS 3φx6	814306S
		2	Screw. PMS 3φx5	810305S

FRONT PLATE ASSEMBLY

*		1	Plate, front	7325140
*		1	Bracket, front panel	7031800
*		1	Angle (L), front	7031970
		4	Screw. PTS 3φx6	814306S
		1	Guide, display – ((GOLD MODEL))	7401490
		1	Guide, display – ((BLACK MODEL))	7401500
		1	Window (G), dial smoke	7802330
		2	Holder, window	7031950
		2	Screw. PTS 3φx6	814306S
		1	Bracket, microswitch	7031980
		2	Screw. PTS 3φx6	814306S
*	S7,S8	2	Micro-switch. VV5-1A44	4060060
		2	Screw. PTS 3φx16	814316S
		2	Screw. PTS 2.6φx16	814216S
		2	Pad, switch	7001940
*		1	PC Board, display	4612620
		1	LED. GL-6R201	5060070
		1	LED. MHz display	5060100
		2	LED. GL-2PG1 (GRN)	5060080
		4	LED. GL-2AR1 (RED)	5060090
*		1	Cable (8-220), ribbon	606211E
		2	Rivet, Plastic push. FNRP 3x4.5	7401190
	VR1	1	VR B50kohm – MUTING THRESHOLD	4310540

BACK PLATE ASSEMBLY

*		1	Plate, back	7325130
		1	Cord, AC line. DP-70	606007A
*		1	Stopper, cord. SR-3P-4	7400620
		1	Bracket (W), cord	7031460
		2	Screw. PTS 3φx6 BLK	814306S

KEY NO.	SYMBOL NO.	W-type-u[+]	DESCRIPTION [++]	PART NO.
*		1	Terminal (5P), antenna	4450540
		2	Screw. PTS 3φx10 BLK	814310W
*		1	PC Board, antenna	4620280
*		1	Balun	1210420
		1	Plug (P-2128), coaxial	4530530
	S1	1	Switch (ESD-394T), slide – MAIN POWER	4020480
	S6	1	Switch (SL-13), slide – DE-EMPHASIS	4020440
		4	Screw. PMS 3φx6 BLK	810306W
		2	Lug, solder	440000D
		2	Washer, TW(I) 3φ	893403V
		2	Nut. 1N 3φ	892013S
		2	Screw. PMS 3φx6 BLK	810306W
*		1	Knob. P2BK-16LVD – LEVEL	7851800

PLL PC BOARD ASSEMBLY

	C901~C903	3	C-CAP 0.047uf 80, –20% 50V YG	231473Z
	C904	1	M-CAP 0.1uf 10% 50V	222104K
	C905	1	T-CAP 25D2.2uf	252312M
	C906,907	2	M-CAP 0.01uf 5% 50V	222103J
	C908,C909	2	T-CAP 35D1uf	252410M
	C910~C912	3	C-CAP 0.047uf 80, –20% 50V YG	231473Z
	C913	1	C-CAP 22pf 10% 50V SL	232220K
	C914	1	C-CAP 0.001uf 10% 50V SL	231102K
	C915	1	C-CAP 0.01uf 80, –20% 50V YG	231103Z
	C916	1	C-CAP 470pf 10% 50V SL	232471K
	C917	1	Capacitor, 20pf trimmer	4241060
	C918	1	C-CAP 18pf 10% 50V SL	232180K
	C919	1	C-CAP 47pf 10% 50V SL	232470K
	C920	1	C-CAP 0.022uf 80, –20% 50V YG	231223Z
	C921,C922	2	C-CAP 0.047uf 80, –20% 50V YG	231473Z
	C923	1	T-CAP 10D3.3uf	252113M
	C924	1	E-CAP 6.3R220uf	211032Q
	C925~C927	3	C-CAP 0.047uf 80, –20% 50V YG	231473Z
	C928	1	C-CAP 0.022uf 80, –20% 50V YG	231223Z
	C929	1	E-CAP 10R220uf	211132Q
	D901	1	Zener Diode. RD5.1EB	502045S
	D902	1	Zener Diode. RD8.2EB1	502052S
	D903~D914	12	Diode. 1SS53	501023S
	D915		– Deleted –	
	D916	1	Diode. 1SS53	501023S
	IC901	1	IC μPC78L05	518062S
	IC902	1	IC TC7404P	518064S
	IC903	1	IC μPC551C	518059S
	IC904	1	IC μPD2815C	518058S
	IC905	1	IC μPD547LC	518057S
	L901	1	Inductor, 8uh 5%	1210850
	L902	1	Inductor, 2.2uh 20%	1210860
	Q901	1	FET 2SK104(F)	516026S
	Q902~Q905	4	TR 2SC1815 (O, Y)	511018S
	Q906~Q912	7	TR 2SB641 (R, Q)	511101S
	Q913~Q920	8	TR 2SD636 (R, Q)	513101S
	R901	1	RES 330kohm 5% ¼W	328334J
	R902	1	RES 22kohm 5% ¼W	328223J
	R903	1	RES 1megohm 5% ¼W	328105J
	R904	1	RES 2.7kohm 5% ¼W	328272J
	R905	1	RES 1.5kohm 5% ¼W	328152J
	R906	1	RES 680ohm 5% ¼W	328681J
	R907	1	RES 3.9kohm 5% ¼W	328392J
	R908	1	RES 10kohm 5% ¼W	328103J
	R909	1	RES 22kohm 5% ¼W	328223J

PART ORDERING PROCEDURE ····· Do NOT USE THE "KEY" NUMBER AND "SYMBOL" NUMBER. (these are control # for the factory only.) Include in any order: a. Part number, b. Part description, c. Model number. (any of the above lacking from an order may delay shipment of that order.)

KEY NO.	SYMBOL NO.	W-type-u+	DESCRIPTION++	PART NO.
	R910	1	RES 270kohm 5% ¼W	328274J
	R911	1	RES 680ohm 5% ¼W	328681J
	R912	1	RES 100ohm 5% ¼W	328101J
	R913	1	RES 12kohm 5% ¼W	328123J
	R914	1	RES 100ohm 5% ¼W	328101J
	R915~R918	4	RES 12kohm 5% ¼W	328123J
	R919	1	RES 150kohm 5% ¼W	328154J
	R920~R926	7	RES 12kohm 5% ¼W	328123J
	R927~R933	1	RES 4.7kohm 5% ¼W	328472J
	R934~R937	4	RES 12kohm 5% ¼W	328123J
	R938~R945	8	RES 100kohm 5% ¼W	328104J
	R946,R947	2	RES 12kohm 5% ¼W	328123J
	R948,R949	2	RES 22kohm 5% ¼W	328223J
	R950	1	RES 12kohm 5% ¼W	328123J
	R951~R954	4	RES 22kohm 5% ¼W	328223J
	R955~R958	4	RES 2.2kohm 5% ¼W	328222J
	R959	1	RES 100ohm 5% ¼W	328101J
	R960~R966	7	RES 68ohm 5% ¼W	328680J
	R967	1	RES 1kohm 5% ¼W	328102J
	R968	1	RES 470kohm 5% ¼W	328474J
	R909	1	RES 10kohm 5% ¼W	328103J
		1	X'tal, 10, 24 MHz	1280440
		1	Holder (P), PC board	7031990
		2	Cable (13-110), ribbon	606209E
		1	Socket (28P), IC – for IC904	4510130
		1	Socket (42P), IC – for IC905	4510120

KEY NO.	SYMBOL NO.	W-type-u+	DESCRIPTION++	PART NO.
	R101	1	RES 680ohm 5% ¼W	328681J
	R102	1	RES 560ohm 5% ¼W	328561J
	R103	1	RES 1kohm 5% ¼W	328102J
	R104,R105	2	RES 5.6kohm 5% ¼W	328563J
	R106,R107	2	RES 12kohm 5% ¼W	328123J
	R108	1	RES 5.6kohm 5% ¼W	328563J
	R109	1	RES 1kohm 5% ¼W	328102J
	R110	1	RES 2.2kohm 5% ¼W	328222J
	R111	1	RES 12kohm 5% ¼W	328123J
	R112	1	RES 56kohm 5% ¼W	328563J
	R113	1	RES 560ohm 5% ¼W	328561J
	R114	1	RES 1kohm 5% ¼W	328102J
	R115	1	RES 560ohm 5% ¼W	328561J
	R116	1	RES 1kohm 5% ¼W	328102J
	R117	1	RES 12kohm 5% ¼W	328123J
	R118	1	RES 1kohm 5% ¼W	328102J
	R119	1	RES 5.6kohm 5% ¼W	328562J
	R120	1	RES 470ohm 5% ¼W	328471J
	R121	1	RES 4.7kohm 5% ¼W	328472J
	R122	1	RES 100ohm 5% ¼W	328101J
	R123	1	RES 220ohm 5% ¼W	328221J
	R124	1	RES 5.6kohm 5% ¼W	328562J
	R125,R126	2	RES 1kohm 5% ¼W	328102J
	R127,R128	2	RES 4.7kohm 5% ¼W	328472J
	R129	1	RES 100ohm 5% ¼W	328101J
	R130	1	RES 12kohm 5% ¼W	328123J
	T101	1	Transformer, FM IF – red	1240180
	T102	1	Transformer, FM IF – black	1240330
	T103	1	Transformer, FM discriminator	1240320

IF-AF PC BOARD ASSEMBLY

(IF SECTION)

C101~C122	22	C-CAP 0.022uf 80, –20% 50V YG		231223Z
C123	1	C-CAP 0.047uf 80, –20% 50V YG		231473Z
C124~C129	6	C-CAP 0.022uf 80, –20% 50V YG		231223Z
C130	1	C-CAP 0.001uf 80, –20% 50V YG		231102Z
C131,C132	2	C-CAP 0.047uf 80, –20% 50V YG		231473Z
C133	1	C-CAP 0.022uf 80, –20% 50V YG		231223Z
C134	1	C-CAP 50R3.3uf		211513Q
C135	1	C-CAP 0.022uf 80, –20% 50V YG		231223Z
C136	1	T-CAP 25D3.3uf		252313M
C137	1	C-CAP 0.022uf 80, –20% 50V YG		231223Z
C138~C140	3	C-CAP 0.047uf 80, –20% 50V YG		231473Z
C141	1	E-CAP 16R47uf		211225Q
C142	1	C-CAP 0.022uf 80, –20% 50V YG		231223Z
C146	1	C-CAP 0.001uf 80, –20% 50V YG		231102Z
C147,C148	2	C-CAP 0.047uf 80, –20% 50V YG		231473Z
C149	1	E-CAP 16R10uf		211220Q
C150~C152	3	C-CAP 68pf 10% 50V SL		232680K
C153,C154	2	C-CAP 10pf 10% 50V SL		232100K
C155	1	Capacitor, 10pf trimmer		4241050
C156,C157	2	C-CAP 0.001uf 80, –20% 50V YG		231102Z
D101~D104	4	Diode. 1SS53		501023S
D105,D016	2	Diode. 1S2076		501019S
IC101~IC104	4	IC μPC1163H		518060S
IC105	1	IC HA11211		518052S
IC106	1	IC TA7061AP		518047S
L101,L102	2	Inductor, 2.2uh 20%		1210860
L103	1	Inductor, 18uh 5%		1210850
L104	1	Inductor, 2.2uh 20%		1210860
PLF101	1	Filter (62401), phase linear		1280350
PLF102	1	Filter (61801), phase linear		1280470
PLF103	1	Filter (61401), phase linear		1280350

(MPX SECTION)

C301~C303	3	E-CAP 25R10uf		211320Q
C304	1	M-CAP 0.022uf 5% 50V		222223J
C305,C306	2	M-CAP 0.0075uf 5% 100V		228752J
C307	1	M-CAP 0.022uf 5% 50V		222223J
C308	1	S-CAP 2200pf 5% 50V		223222V
C309	1	S-CAP 1000pf 5% 50V		223102V
C310	1	T-CAP 35D0.47uf		252405M
C311	1	T-CAP 10D3.3uf		252113M
C312	1	S-CAP 1500pf 5% 50V		223152V
C313	1	E-CAP 50R3.3uf LC		211513L
C314	1	E-CAP 50R3.3uf		211503Q
C315	1	M-CAP 0.01uf 10% 50V		222103K
C316	1	E-CAP 50R0.33uf		211503Q
C317	1	C-CAP 0.047uf 80, –20% 50% YG		231473Z
C318,C319	2	E-CAP 25R10uf		211320Q
C320	1	E-CAP 50R1uf		211510Q
C321,C322	2	S-CAP 330pf 5% 50V		223331V
C323,C324	2	E-CAP 50R3.3uf LC		211513L
C325	1	E-CAP 16R100uf		211230Q
C326	1	C-CAP 0.022uf 80, –20% 50% YG		231223Z
C327	1	C-CAP 0.047uf 80, –20% 50% YG		231473Z
C328	1	M-CAP 0.022uf 5% 50V		222223J
C329	1	M-CAP 0.047uf 5% 50V		222473J
C330~C332	2	C-CAP 0.047uf 80, –20% 50V YG		231473Z
C333,C334	2	M-CAP 0.01uf 10% 50V		222103K
C335	1	E-CAP 16R100uf		211230Q
C336	1	E-CAP 25R10uf		211320Q
C337	1	C-CAP 0.047uf 80, –20% 50% YG		231473Z
C338,C339	2	M-CAP 0.0033uf 5% 50V		222332J
C341	1	C-CAP 68pf 10% 50V SL		232680K
C342	1	C-CAP 220pf 10% 50V SL		232221K
D301~D303	3	Zener Diode, HZ6-C1-L		502047S
D304~D306	3	Diode. 1SS53		501023S
D307	1	Diode. VD1212		505016S
D308,D309	2	Diode. 1SS53		501023S

PART ORDERING PROCEDURE ----- Do NOT USE THE "KEY" NUMBER AND "SYMBOL" NUMBER. (these are control # for the factory only.) Include in any order: a. Part number, b. Part description, c. Model number. (any of the above lacking from an order may delay shipment of that order.)

KEY NO.	SYMBOL NO.	W-type-u+	DESCRIPTION++	PART NO.
	IC301	1	IC HA11223W	518054S
	IC302	1	IC NJM4558D	518056S
	IC303	1	IC NJM4558D	518056S
	IC304	1	IC M51903L	518065S
	LPF301	1	Filter, 38 kHz low pass	1270140
	LPF302	1	Filter, 38 kHz low pass	1270140
	Q301~Q305	5	TR 2SC1815 (O, Y)	511018S
	Q306	1	TR 2SA1015 (Y)	510102S
	Q307~Q310	4	TR 2SC1815 (O, Y)	511018S
	R301	1	RES 5.6kohm 5% ¼W	328562J
	R302	1	RES 10kohm 5% ¼W	328103J
	R303	1	RES 56kohm 5% ¼W	328563J
	R304	1	RES 1kohm 5% ¼W	328102J
	R305	1	RES 4.7kohm 5% ¼W	328472J
	R306	1	RES 10kohm 5% ¼W	328103J
	R307	1	RES 100kohm 5% ¼W	328104J
	R309,R310	2	RES 3.3kohm 5% ¼W	328332J
	R311	1	RES 33kohm 5% ¼W	328333J
	R312	1	RES 5.6kohm 5% ¼W	328562J
	R313	1	RES 1kohm 5% ¼W	328102J
	R314	1	RES 100kohm 5% ¼W	328104J
	R315	1	Potentiometer, 3.3kohm – HVR-RVG-10B	4300820
	R316	1	Potentiometer, 100kohm – HVR-RVA-7B	4300790
	R317,R318	2	RES 3.3kohm 5% ¼W	328332J
	R319	1	RES 680ohm 5% ¼W	328681J
	R320	1	RES 1kohm 5% ¼W	328102J
	R321	1	RES 6.8kohm 5% ¼W	328682J
	R322	1	RES 4.7kohm 5% ¼W	328472J
	R323	1	RES 3.3kohm 5% ¼W	328332J
	R324	1	RES 4.7kohm 5% ¼W	328472J
	R325	1	RES 3.3kohm 5% ¼W	328332J
	R326	1	RES 1kohm 5% ¼W	328102J
	R327	1	RES 10kohm 5% ¼W	328103J
	R338	1	RES 820ohm 5% ¼W	328821J
	R329	1	RES 1kohm 5% ¼W	328102J
	R330,R331	2	RES 10kohm 5% ¼W	328103J
	R332	1	RES 4.7kohm 5% ¼W	328473J
	R333	1	RES 10kohm 5% ¼W	328103J
	R334	1	RES 820ohm 5% ¼W	328821J
	R335	1	RES 10kohm 5% ¼W	328103J
	R336,R337	2	RES 330ohm 5% ¼W	328331J
	R338,R339	2	RES 15kohm 5% ¼W	328153J
	R340~R343	4	RES 4.7kohm 5% ¼W	328472J
	R344	1	RES 47kohm 5% ¼W	328473J
	R345	1	RES 33kohm 5% ¼W	328333J
	R346	1	RES 1kohm 5% ¼W	328102J
	R347,R348	2	RES 2.2kohm 5% ¼W	328222J
	R349,R350	2	RES 1kohm 5% ¼W	328102J
	R351	1	RES 2.2kohm 5% ¼W	328222J
	R352	1	RES 330ohm 5% ¼W	328331J
	R353,R354	2	RES 20kohm 5% ¼W	328103J
	R355	1	RES 33kohm 5% ¼W	328333J
	R356	1	RES 2.7kohm 5% ¼W	328272J
	R357	1	RES 330ohm 5% ¼W	328331J
	R359	1	RES 1kohm 5% ¼W	328102J
	R360,R361	2	Potentiometer, 100kohm – HVR-RVA-7B	4300790
	R362,R363	2	Potentiometer, 50kohm – HVR-RVA-7B	4300780
	R364	1	RES 68kohm 5% ¼W	328683J
	R366	1	RES 1kohm 5% ¼W	328102J
	R367	1	RES 15kohm 5% ¼W	328153J
	R368	1	RES 2.2kohm 5% ¼W	328222J
	R369	1	RES 5.6kohm 5% ¼W	328562J
	R370	1	RES 150ohm 5% ¼W	328151J
	R371	1	RES 3.9kohm 5% ¼W	328392J
	R372	1	RES 10kohm 5% ¼W	328103J
	R373	1	RES 3.3kohm 5% ¼W	328332J
	R374,R375	2	Potentiometer, 10kohm – HVR-RVA-7B	4300770
	R376	1	RES 10ohm 5% ¼W	328100J
	R377	1	RES 100ohm 5% ¼W	328101J
	R378~R382	5	RES 470ohm 5% ¼W	328471J
	R303	1	RES 33kohm 5% ¼W	328333J
	R384	1	RES 10kohm 5% ¼W	328103J
	R385,R386	2	RES 1kohm 5% ¼W	328102J
	R387	1	RES 470ohm 5% ¼W	328471J
	R388,R389	2	RES 100ohm 5% ¼W	328101J
	R390	1	RES 10kohm 5% ¼W	328103J
506		1	Relay, reed. URT-103	1700200
*507		1	Terminals, pin jack. CB, 2Px3 (CE)	4446020
508		2	Screw. PTS 3φx10 BLK	814310W

(POWER SUPPLY SECTION)

	C801	1	C-CAP 0.047uf 100, –0% 125VAC	239472C
	C802,C803	2	C-CAP 0.01uf 100, –0% 500V	238103P
	C804~C806	3	C-CAP 0.047uf 80, –20% 50V YG	231473Z
	C807,C808	2	E-CAP 35R33uf	211423Q
	C809	1	E-CAP 10R330uf	211133S
	C810,C811	2	E-CAP 25R1000uf	211340S
	C812	1	E-CAP 50R100uf	211530S
	C813,C814	2	E-CAP 25R1000uf	211340S
	C815	1	C-CAP 0.022uf 80, –20% 50V YG	231223Z
	C816	1	C-CAP 0.047uf 80, –20% 50V YG	231473Z
	C817	1	E-CAP 50R100uf	211530S
	C818	1	C-CAP 0.047uf 80, –20% 50V YG	231473Z
	C819	1	E-CAP 35R100uf	211430S
	C820	1	C-CAP 0.047uf 80, –20% 50V YG	231473Z
	C821	1	E-CAP 25R100uf	211330Q
	C822	1	E-CAP 16R100uf	211230Q
	C823	1	C-CAP 0.047uf 80, –20% 50V YG	231473Z
	C824	1	C-CAP 0.022uf 80, –20% 50V YG	231223Z
	C825	1	E-CAP 16R100uf	211230Q
	C826	1	C-CAP 0.001uf 80, –20% 50V YG	231102Z
	C827	1	C-CAP 0.047uf 80, –20% 50V YG	231473Z
	C828	1	E-CAP 16R1000uf	211240S
	C829	1	E-CAP 16R100uf	211230Q
	C830	1	C-CAP 0.022uf 80, –20% 50V YG	231223Z
	C831	1	E-CAP 16R100uf	211230Q
	C832	1	E-CAP 25R10uf	211320Q
	C833	1	E-CAP 25R22uf	211322Q
	C834	1	C-CAP 0.047uf 80, –20% 50V YG	231473Z
	C835	1	C-CAP 0.01uf 100, –0% 500V	238103P
	C836	1	C-CAP 0.047uf 80, –20% 50V YG	231473Z
	D801~D803	3	Diode. ERB12-01	560050S
	D804~D806	3	Diode Bridge. ESAB03-02	560051S
	D807	1	Zener Diode. RD13EB2	502049S
	D808	1	Zener Diode. RD15EB2	502050S
	IC801	1	IC TA7221P	518063S
	IC802	1	IC μPC78L12	518061S
	IC803	1	IC μPC78L12	518061S
	Q801	1	TR 2SA1015(Y)	510102S
	R801	1	RES 2.2megohm 10% ½W	325225K
	R802	1	NF-MO-RES 47ohm 5% ½W	360470L
	R803	1	NF-MO-RES 4.7ohm 5% ½W	360478L
	R804	1	NF-MO-RES 47ohm 5% ½W	360470L
	R805	1	NF-MO-RES 470ohm 5% ½W	360471L
	R806	1	RES 3.9kohm 5% ¼W	328392J
	R807	1	RES 1kohm 5% ¼W	328102J
	R808,R809	2	NF-MO-RES 10ohm 5% ½W	360100L

PART ORDERING PROCEDURE ----- Do NOT USE THE "KEY" NUMBER AND "SYMBOL" NUMBER. (these are control # for the factory only.) Include in any order: a. Part number, b. Part description, c. Model number. (any of the above lacking from an order may delay shipment of that order.)

KEY NO.	SYMBOL NO.	W-type-u+	DESCRIPTION++	PART NO.
			(Others)	
*509	S3+S4+S5	1	Switch, 3-section pushbutton. SUF33 – SUF33 – MUTING ON-STEREO ↔ MONO, HI-BLEND, IF-BAND	4041030
*510	S9+ ··· +S17	1	Switch, 9-section pushbutton. SUH92	4041020
	VR301+VR302	1	VR B10kohmx2 – LEVEL	4320810
511		1	Sleeve, shielding – for T103	7032040
512		1	Heat Sink (R) – for IC801	7082020
513		1	Screw. PMS 3ϕx5	810305S
*514		1	Cable (10-40), ribbon	606210E
515		4	Socket (3021-2-N), mini – for LED's	4510090

PLL PC BOARD

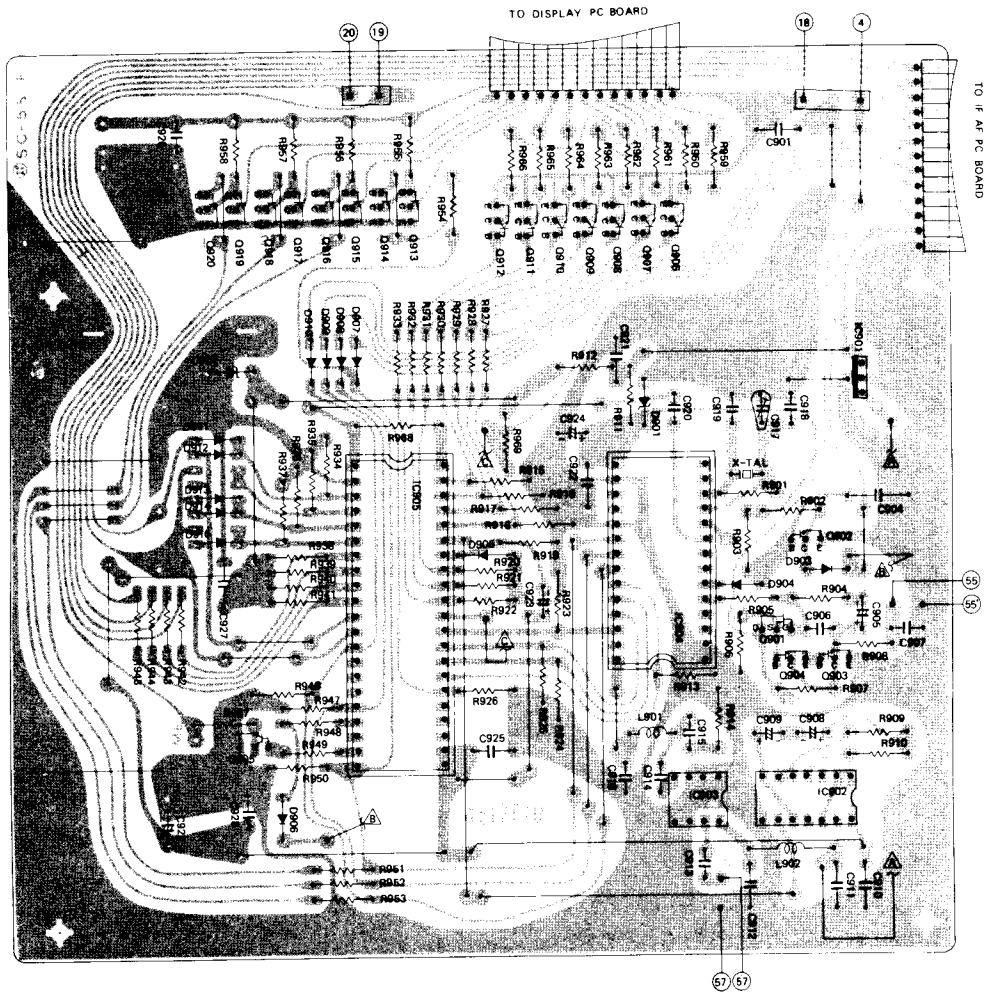
Interconnecting Wiring Guide

- (4) To 4 , IF-AF PC BOARD
- (18) To 18 , IF-AF PC BOARD
- (19) To 19 , IF-AF PC BOARD
- (20) To 20 , IF-AF PC BOARD
- (55) To B2, FRONT END
- (55) To B2 GND, FRONT END
- (57) To F OUT, FRONT END
- (57) To GROUND (F OUT), FRONT END

IF-AF PC BOARD

Interconnecting Wiring Guide

- (4) To 4 , PLL PC BOARD
- (18) To 18 , PLL PC BOARD
- (19) To 19 , PLL PC BOARD
- (20) To 20 , PLL PC BOARD
- (24) (25) To MUTING THRESHOLD VOLUME CONTROL
- (26) To MICROSWITCH S8(UP)
- (27) To MICROSWITCH S7(DOWN)
- (28) To MICROSWITCHES S8, S7
- (29) To IF OUT, FRONT END
- (30) To GROUND (IF OUT), FRONT END
- (31) To AC LINE
  To MAIN POWER SWITCH S1
- (32) To P. TRANSFORMER T-1-323, BRN
  To P. TRANSFORMER T-1-322, BRN
- (33) To AC LINE
  To P. TRANSFORMER T-1-323, RED
  To P. TRANSFORMER T-1-322, RED
- (34) To P. TRANSFORMER T-1-323, WHT
- (35) To P. TRANSFORMER T-1-323, WHT
- (36) To P. TRANSFORMER T-1-323, YEL
- (37) To CHASSIS GROUND
- (38) To P. TRANSFORMER T-1-323, BLK
- (39) To P. TRANSFORMER T-1-323, YEL



PLL PC Board (Bottom View)