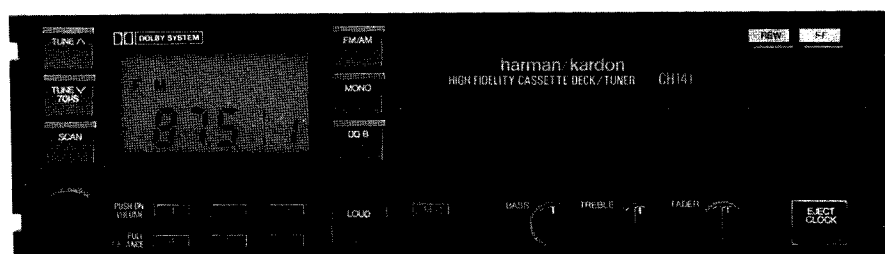


The Harman Kardon Model CH141

Manual 107A

HIGH FIDELITY CASSETTE DECK/TUNER

Technical Manual

**harman/kardon**240 Crossways Park West, Woodbury, N.Y. 11797
1112-3152107A1 P-088607 1850 Printed in Japan

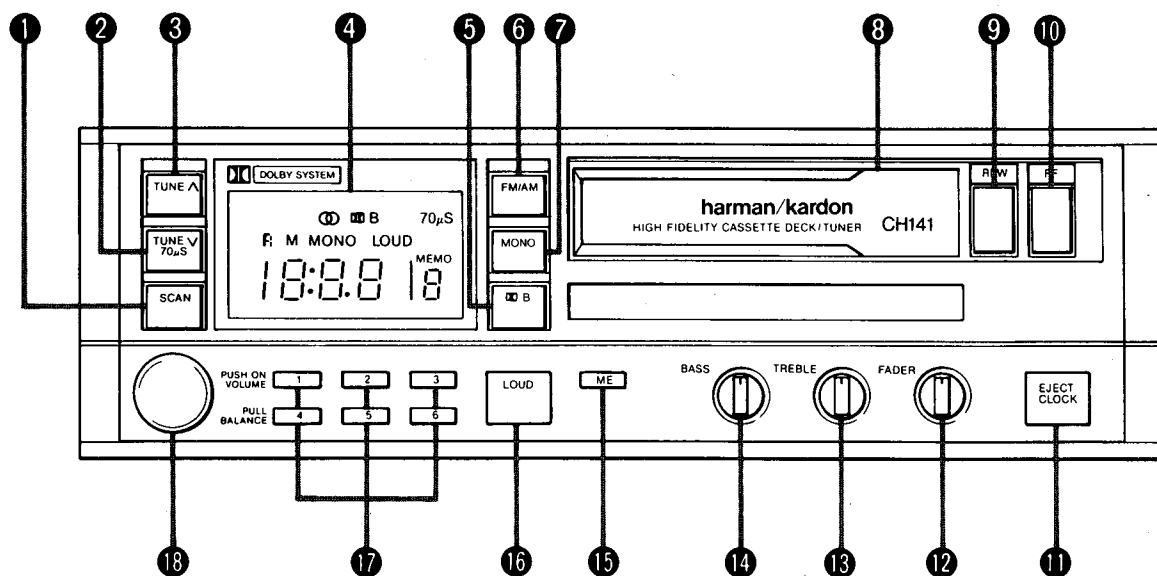
SPECIFICATIONS

	Nominal	Limit		Nominal	Limit
● FM SECTION			● CASSETTE TAPE DECK SECTION		
Tuning Range	87.5MHz ~ 107.9MHz		Wow and Flutter (WRMS)	0.09% ≤ 0.2%	
Usable Sensitivity	14.8dBf ≤ 18dBf		Tape Speed (4.75cm/sec.)	+1% ≤ +3% - 1%	
Quieting Sensitivity			FF and REW Time	125sec. ≤ 150sec.	
Mono	18dBf ≤ 23dBf		(for C-60 tape)		
Stereo	40dBf ≤ 45dBf		Signal to Noise Ratio (CrO ₂)		
Signal to Noise Ratio			Dolby NR Off	54dB ≥ 50dB	
Mono	72dB ≥ 66dB		Dolby NR	64dB ≥ 58dB	
Stereo	68dB ≥ 60dB		Distortion	1% ≤ 2%	
IF Rejection (88.1MHz)	80dB ≥ 75dB		Frequency Response	20Hz ~ 20kHz	
Image Rejection (98.1MHz)	50dB ≥ 40dB		Separation	40dB ≥ 35dB	
AM Suppression	50dB ≥ 44dB		Crosstalk	70dB ≥ 60dB	
Capture Ratio	1.5dB ≤ 3dB		Output Level (Volume Max.)	775mV ± 3dB	
Selectivity (±400kHz)	60dB ≥ 55dB				
Distortion (Stereo)	0.22% ≤ 0.4%		● GENERAL		
(65dBf, 100%)			Chassis Dimensions	7" × 2" × 5-7/8"	
Frequency Response (±3dB)	30Hz ~ 15kHz		(W × H × D)	(180 × 50 × 150 mm)	
MPX Separation at 1kHz	40dB ≥ 35dB		Weight	3lbs. (1.4kg)	
Output Level (75kHz dev.)	550mV ± 3dB		Power Supply	DC 13.8V (11-16V Usable), Negative Ground	
● AM SECTION			Current Consumption	0.6A	
Tuning Range	530kHz ~ 1620kHz		Accessories	Connector Assembly, Spare Fuse (1 pc.), Mounting Kits	
Signal to Noise Ratio	50dB ≥ 45dB				
IF Rejection (600kHz)	60dB ≥ 50dB				
Image Rejection (1400kHz)	55dB ≥ 50dB				
Selectivity (±9kHz)	50dB ≥ 45dB				
● AUDIO SECTION					
Tone Control Action					
Bass (50Hz)	11dB ± 1.5dB				
Treble (10kHz)	11dB ± 1.5dB				
Loudness Action (80Hz/10kHz)	10dB ± 3dB/3dB ± 2dB				
Output Impedance	500Ω				

This specification is the target of servicing. But, there is a case that the specification is not applicable to the measurement condition and instrument.

Specifications and components subject to change without notice. Overall performance will be maintained or improved.

CONTROLS & INDICATORS



① SCAN BUTTON

Push this button to operate scan function.

② TUNING DOWN / CLOCK MINUTES / 70μSEC (TAPE SELECTOR) BUTTON

Use this button for manual tuning. When this is pressed, the tuner frequency decreases. In FM mode, frequency display moves in 200kHz steps (50kHz steps for General model). In AM, the display moves in 10kHz steps (9kHz steps for the General model). If this button is pressed for more than a second, the display moves quickly and continuously until released. This button also controls the minutes displayed on the clock. To set the clock (minutes) time, push the memory button first. Then push this button. Tape selection can also be made when using metal or CrO₂ tape.

③ TUNING UP / CLOCK HOURS BUTTON

Use this button for manual tuning. When this is pressed, the tuner frequency increases. If this button is pressed for more than a second, the display moves quickly and continuously until released. This button also controls the hours displayed on the clock. To set the clock (hours) time, push the memory button first. Then push this button.

④ DISPLAY

This includes tuner frequency, clock, memory channel display, LOUD (loudness), MONO,  (stereo), 70μS (metal/CrO₂), Dolby NR indicator.

⑤ DOLBY* NR SWITCH

Press the button for playback using the Dolby NR system. The Dolby NR indicator illuminates. Press the switch again to turn off the Dolby NR system.

⑥ FM / AM BAND SELECT SWITCH**⑦ MONO SWITCH**

Mono mode: All FM broadcasts will be received as monaural broadcasts, regardless of whether or not they are in stereo. This mode may provide quieter, more listenable sound quality under poor reception conditions.

Auto-stereo mode: FM stereo reception is automatically selected when received at medium or high signal strength. When an FM monaural signal or a weak FM stereo signal is received, it automatically switches to the FM monaural mode.

⑧ CASSETTE LOADING SLOT**⑨ REW (REWIND) BUTTON**

Press this button to rewind the tape.

⑩ F.F (FAST FORWARD) BUTTON

Press this button to advance the tape at fast speed.

⑪ EJECT BUTTON / DISPLAY MODE SELECTOR

Push this button to eject the cassette. This also changes the display mode to clock (during tuner operation). When the unit is first turned on, it will automatically display the tuner frequency. Pushing the eject button changes the display from tuner frequency to clock for 5 seconds.

⑫ FADER CONTROL

This control adjusts the balance of front and rear level. Turn this control clockwise to decrease the front level or counterclockwise to decrease the rear level. It has center click to indicate the balance of the front and rear channels.

⑬ TREBLE CONTROL

This controls the high frequency sounds. Turn it clockwise to boost or counterclockwise to cut them. It has center click to indicate flat frequency response.

⑭ BASS CONTROL

This knob controls the low frequency sounds. Turn it clockwise to boost or counterclockwise to cut them. It has center click to indicate flat frequency response.

⑮ MEMORY BUTTON

This button is used to enter or change the preset stations or the clock setting. When this button is pressed, the MEMO indicator illuminates for 5 seconds. This indicates that the memory standby state is activated.

⑯ LOUDNESS BUTTON

When listening at a low level, the loudness button will create a more natural sound by emphasizing the low and high frequency ranges.

⑰ PRESET MEMORY BUTTONS

Press any one of the six Preset Memory buttons while the MEMO indicator is illuminating, and the frequency displayed is memorized at that Preset Memory button. Each button can memorize one frequency in both FM and AM bands. Once a station frequency is memorized, it can be recalled any time the same button is pressed.

⑱ VOLUME CONTROL / ON-OFF SWITCH (PUSH) / BALANCE CONTROL (PULL)

Push this knob to turn on the tuner. Push again to turn it off. This knob controls the sound level. Turning clockwise increases the sound volume and turning counterclockwise decreases it. This also controls the balance of the left and right channels. Turn it to clockwise or counterclockwise to balance the sound. It has center click to indicate the balance of the left and right channels.

* Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation. "Dolby" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

DISASSEMBLY PROCEDURES (REFER TO PAGES 5 AND 19)

① CASSETTE TAPE PLAYER MECHANICAL ASSEMBLY (102) REMOVAL

1. Remove the Cabinet Top (144) and Cabinet Bottom (145).
The Cabinet Top (144) and Cabinet Bottom (145) are fixed with projections, 3 at the front and rear each and 1 at the right and left each.
2. Pull out the Volume Knob (149) and Bass, Treble and Fader Knobs (151).
3. Remove screw ① and then with the right and left catches released, remove the Front Panel Assembly (101).
4. Remove 4 screws ② and then remove the Bracket (182).
5. Remove 5 screws ③ and then remove the Cassette Tape Player Mechanical Assembly (102) with the Mecha Control and Dolby NR P. C. Board (PCB-2). Also, disconnect the connectors (PCB-7, LCN202 and LCN203) from CN201, CN202 and CN203 on the PCB-2.
6. Remove screw ④ and unsolder the Cassette Power Switch and then remove the Mecha Control and Dolby NR P. C. Board (PCB-2).
7. Remove 4 screws ⑤ and then remove the Bracket (183) from the Cassette Tape Player Mechanical Assembly (102).

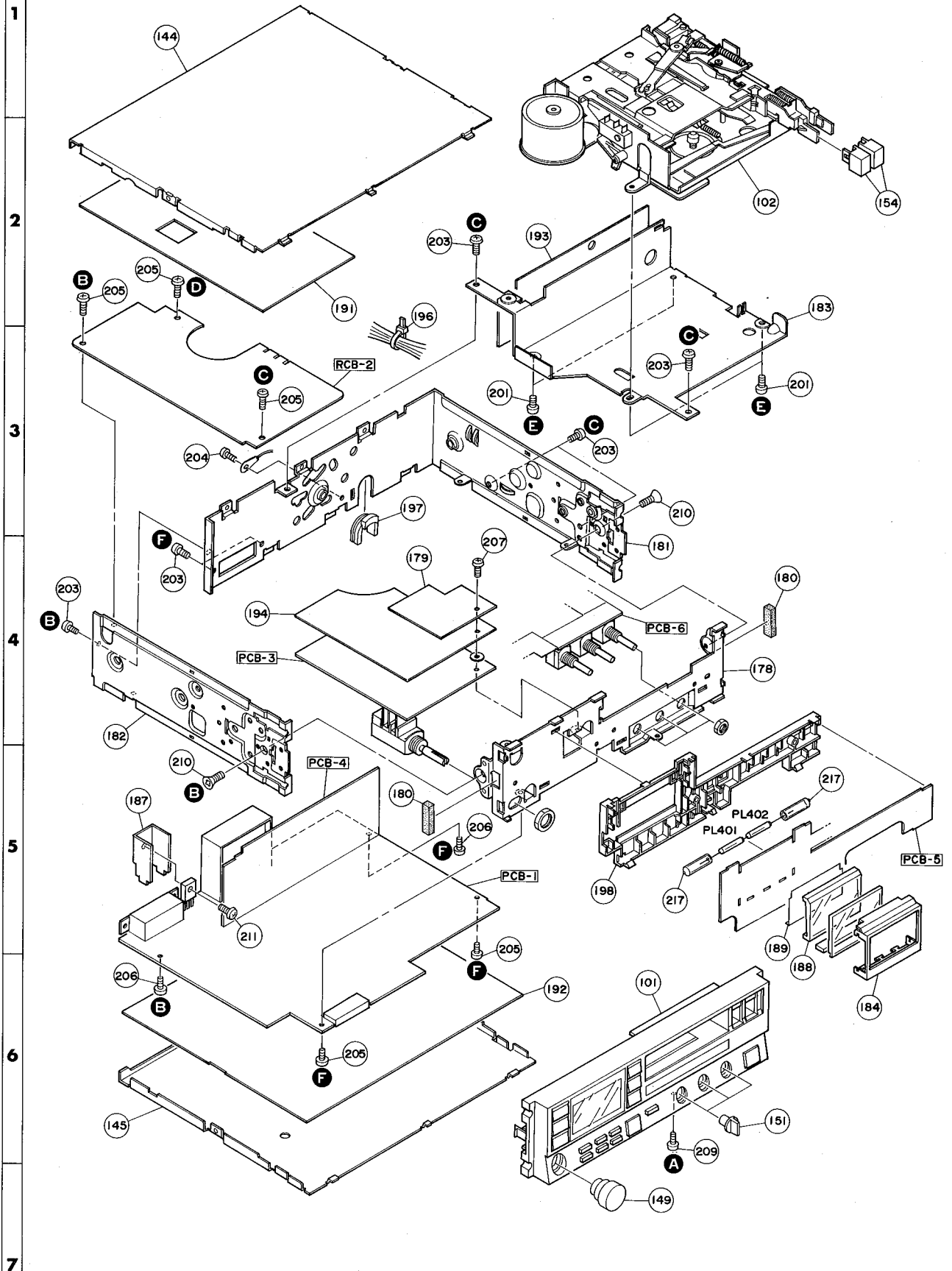
② MAIN P. C. BOARD (PCB-1) REMOVAL

1. Remove the Cassette Tape Player Mechanical Assembly (102), referring to the previous step ①.
2. Remove 5 screws ⑥ and then remove the Main P. C. Board (PCB-1) with the SIG Switching P. C. Board (PCB-4). Also, disconnect the connectors (LCN501, LCN502, LCN503 and LCN506) from the CN501, CN502, CN503 and CN506 on the Volume P. C. Board (PCB-3).

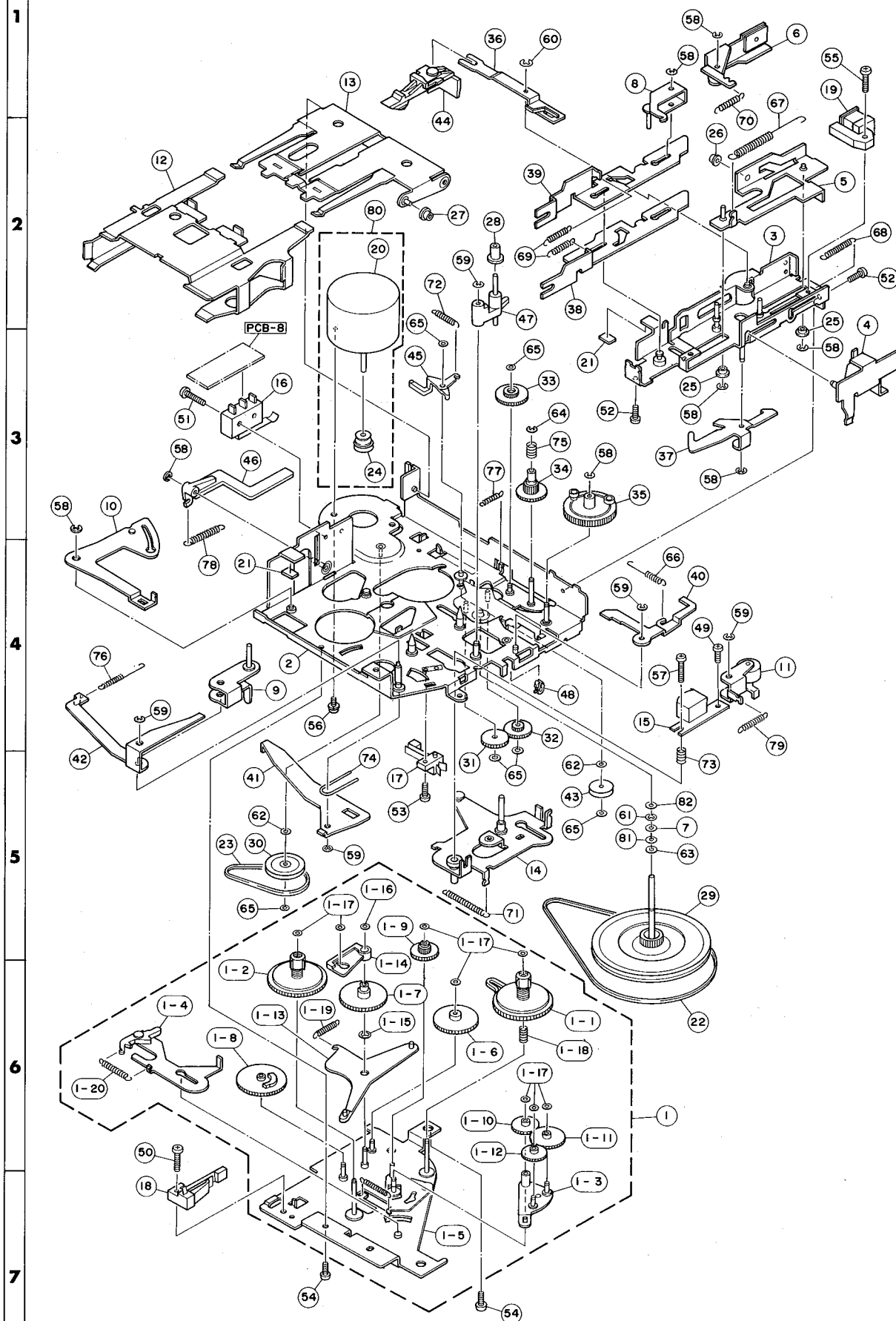
GENERAL UNIT PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
101	A442-CH141A	Front Panel Ass'y	189	2223-7055	Reflector
102	C112-CH141A	Cassette Tape Player Mechanical Ass'y	191	2224-7112	Insulator
144	1414-06201	Cabinet Top	192	2224-7113	Insulator
145	1414-06201	Cabinet Bottom	193	2224-7108	Insulator
149	1630-03301	Rotary Knob, Volume	194	2224-7114	Insulator
151	1632-14101	Rotary Knob, Bass, Treble, Fader	196	2240-7120	Holder
154	1662-17601	Push Button, F.F., Rew.	197	2240-7255	Holder
178	2211-7276	Chassis	198	2240-7256	Holder
179	2216-7164	Shield Plate	201	2327-300429	Screw (3×4mm)
180	2112-11780	Sponge	203	2342-300527	Screw (3×5mm)
181	2219-8112	Bracket	204	2342-3005D7	Screw (3×5mm)
182	2219-8067	Bracket	205	2342-260527	Screw (2.6×5mm)
183	2219-8068	Bracket	206	2342-2605D7	Screw (2.6×5mm)
184	2219-8069	Bracket	207	2347-260827	Screw (2.6×8mm)
187	2222-7194	Heat Sink	209	2347-200541	Screw (2×5mm)
188	2223-7054	Reflector	210	2323-300629	Screw (3×6mm)
			211	2557-300829	Screw (3×8mm)
			217	2603-7009	Sleeve

GENERAL UNIT EXPLODED VIEW



CASSETTE MECHANISM EXPLODED VIEW



CASSETTE MECHANISM PARTS LIST

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
1	960-3420-05	Bottom Sub Assembly	32	613-0030-00	Loading Gear B
1-1	960-3421-01	Reel Base Assembly	33	613-0031-00	Loading Gear C
1-2	960-3422-02	Reel Base Assembly	34	613-0032-00	Loading Gear D
1-3	960-3433-03	FF Gear Plate Assembly	35	613-0033-00	Power Gear
1-4	960-3434-01	SW Plate Assembly	36	630-1511-03	Loading Link
1-5	960-3435-04	Bottom Plate Assembly	37	630-1513-01	Lock Link
1-6	613-0022-01	Gear A	38	630-1514-09	FF Lever
1-7	613-0023-01	Gear B	39	630-1515-09	REW Lever
1-8	613-0024-01	Cam Gear	40	630-1518-01	Lock Arm
1-9	613-0025-00	Idle Gear	41	630-1521-01	FF Link B
1-10	613-0026-01	FF Base Gear	42	630-1526-00	Replay Link B
1-11	613-0027-00	FF Gear	43	631-0370-00	Tension Pulley
1-12	613-0028-00	REW Gear	44	631-0392-04	Cassette Pack Stopper
1-13	631-0396-01	Sensing Link	45	631-0394-00	Cancel Link
1-14	631-0397-01	Replay Sensing	46	631-0395-01	SW Link
1-15	744-0006-01	Special E-stop Ring	47	631-0398-01	Eject Link
1-16	745-0692-00	Special Washer	48	631-0419-00	Clump
1-17	746-0628-01	Special Washer	49	714-2003-81	Screw
1-18	750-2155-00	Spring	50	714-2306-81	Screw
1-19	750-2217-00	Spring	51	714-2308-81	Screw
1-20	750-2218-00	Spring	52	714-2603-81	Screw
1-21	750-2219-00	Spring	53	714-2604-11	Screw
2	960-3423-04	Deck Plate Assembly	54	714-2604-81	Screw
3	960-3424-07	Frame Assembly	55	714-2606-11	Screw
4	960-3425-03	Loading Plate Assembly	56	716-0347-00	Screw
5	960-3426-07	Eject Plate Assembly	57	716-0482-01	Screw
6	960-3427-02	Plunger Plate A Assembly	58	743-1500-10	E-stop Ring
7	746-0732-00	Special Washer	59	743-2000-10	E-stop Ring
8	960-3429-02	Lock Plate Assembly	60	744-0006-01	Special E-stop Ring
9	960-3430-02	FF Link A Assembly	61	744-0024-01	Special E-stop Ring
10	960-3431-01	Replay Lever A Assembly	62	745-0645-00	Special Washer
11	960-3437-02	Pinch Roller Assembly	63	745-0646-00	Special Washer
12	606-0075-03	Cassette Pack Guide	64	744-0018-01	Special E-stop Ring
13	960-3439-02	Guide Arm Assembly	65	746-0628-01	Special Washer
14	960-3440-03	Head Plate Assembly	66	750-2219-00	Spring
15	011-0299-00	Playback Head	67	750-2220-01	Spring
16	013-2690-03	Lever Switch, Cassette Power	68	750-2221-01	Spring
17	013-3470-05	Lever Switch, FF	69	750-2222-00	Spring
18	013-3558-02	Lever Switch, Tape End	70	750-2223-01	Spring
19	015-0232-01	Plunger	71	750-2224-01	Spring
20	020-0366-00	DC Motor	72	750-2225-00	Spring
21	340-0398-00	Spacer	73	750-2226-00	Spring
22	602-0074-00	Belt A	74	750-2227-00	Spring
23	602-0075-00	Belt B	75	750-2228-00	Spring
24	603-0083-07	Motor Pulley	76	750-2229-00	Spring
25	610-0225-00	Guide Roller	77	750-2230-01	Spring
26	610-0225-01	Guide Roller	78	750-2231-00	Spring
27	610-0226-00	Guide Arm Roller	79	750-2232-00	Spring
28	610-0227-01	Eject Roller	80	960-3528-00	Motor Assembly
29	611-0065-01	Flywheel	81	746-0730-00	Special Washer
30	613-0021-01	Pulley Gear	82	746-0731-00	Special Washer
31	613-0029-00	Loading Gear A			

ALIGNMENT PROCEDURES (REFER TO PAGES 19 ~ 21)

ELECTRICAL ADJUSTMENT

1. Before adjustment

- Connect a 14V power supply to the Power Supply Lead (+ACC, +B and GND).
- Since head magnetization, dust accumulations, etc. are likely to introduce errors in the various characteristics, it is very important that the heads are properly demagnetized and cleaned before commencing any adjustment, particularly frequency response and head azimuth adjustment.

2. Instruments required

- Low frequency oscillator
- AC VTVM or dual channel AC VTVM
- Oscilloscope
- Wow/flutter meter
- Frequency counter

3. Test tapes

- Dolby NR level adjustment MTT-150 or TCC-130
- Azimuth adjustment TCC-153
- Playback frequency characteristic adjustment SCC-800
- Music Search operation confirmation MTT-250B

4. Standard load

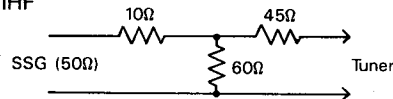
- Connect the resistor (10k Ω) and the capacitor (1000pF) to the line output.
- Standard output 200mV

5. General conditions (unless otherwise noted).

CONTROLS AND SWITCHES	SETTINGS
Balance	center
Bass	center
Treble	center
Fader	center
Dolby NR	off
70 μ sec.	off
Loudness	off
Mono	Mono

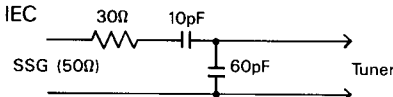
6. Dummy antenna

- FM : IHF



Measurement at receiver input level interm of available power.

- AM : IEC



Measurement at SSG terminal voltage (open).

	U. S. A. model	General model
FM Signal Generator	1kHz, 100% modulation	1kHz, 53% modulation
Stereo Modulator	L+R=45.5%, L-R=45.5%, 19kHz=9%	L+R=22.5%, L-R=22.5%, 19kHz=8%

TUNER SECTION

Step	Alignment	Connection Equipments	Mode	Measurement Frequency	Station display	Adjustment	For
1	Standard frequency	●Connect the Frequency Counter to TP3 (+) and ground (-).	AM		530kHz	VC401	980kHz $\pm$ 8Hz
2	IF	●Connect the FM Signal Generator to the Antenna jack through the FM dummy antenna. ●Connect Oscilloscope, Distortion Meter and AC Voltmeter to the line output.	FM	98.1MHz (17dBf)	98.1MHz	T101	Maximum output
3				98.1MHz (65dBf)	98.1MHz	T101	Adjust so that the same and maximum output is obtained on both Low Frequency side and High Frequency side when the FM Signal Generator is shifted to both sides by the same amount from 98.1MHz (65dBf).
4				98.1MHz (65dBf)	98.1MHz	VR101	Minimum distortion
5	Sub-carrier rejection	●Connect the Stereo Modulator to FM Signal Generator. Connect the FM Signal Generator to the Antenna jack through the FM dummy antenna.	Stereo FM	98.1MHz (65dBf)	98.1MHz	VR112	Minimum output at 19kHz pilot signal only by Stereo Modulator.
6	Separation	●Connect Oscilloscope, Distortion Meter and AC Voltmeter to the line output.	Stereo FM	98.1MHz (65dBf)	98.1MHz	VR113	Adjust so that the right channel output becomes minimum when only the left channel of the Stereo Modulator is modulated.
7						VR113	Adjust so that the left channel output becomes minimum when only the right channel of the Stereo Modulator is modulated.
8				98.1MHz (35dBf)	98.1MHz	VR111	Adjust so that the separation becomes 30dB $\pm$ 3dB.
9				Repeat step 6.			
				Repeat step 7 for optimum sensitivity.			

■ TAPE SECTION

Step	Alignment	Connection Equipments	Test Tape	Mode	Adjustment	For
1	Dolby NR level	● Connect the AC VTVM or dual channel AC VTVM to TP1 (Lch), TP2 (Rch) and ground.	MTT-150 or TCC-130	PB	VR203 (L ch) VR204 (R ch)	300mV
2	Azimuth	● Connect the AC VTVM or dual channel AC VTVM to the line output.	TCC-153	PB	Azimuth screw	Maximum output (Refer to the next page for the details.)
3	Playback frequency characteristic		SCC-800	PB	VR201 (L ch) VR202 (R ch)	Check if the specification is satisfied and if not, adjust as specified.

HEAD REPLACEMENT AND ADJUSTMENT

① Head replacement

1. Remove the Cassette Tape Player Mechanical Assembly from the main unit according to the disassembly procedure.
2. Remove the **A** portion of the Loading Link. (See Fig.1)
3. Remove the 2 screws **B** in Fig.1 and remove the Frame Assembly, Cassette Pack Guide and Guide Arm Assembly, and then replace the head.

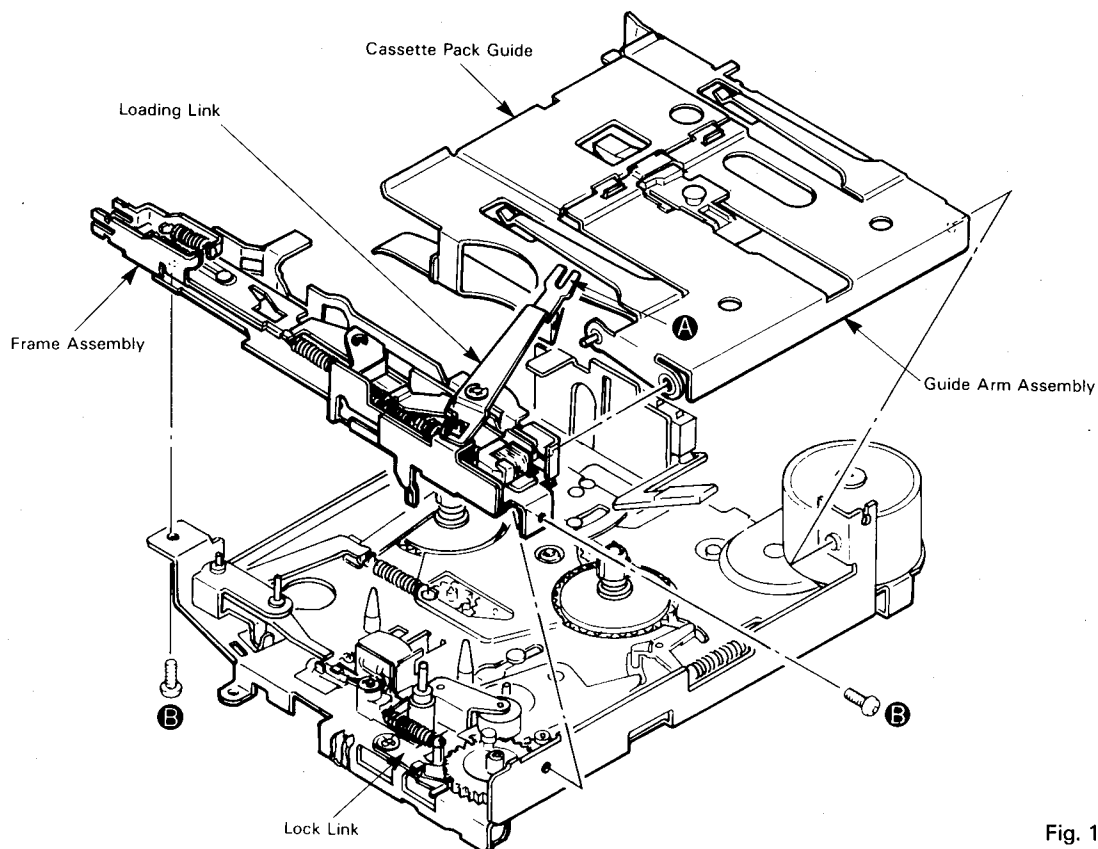


Fig. 1

② Head height confirmation

1. Install the M-300 Head Gauge plate.
2. Release the Lock Link to allow the head and pinch roller to lift up (in the same state as when playing back).
3. Check to make sure that the adjustment chip does not contact the tape guide of the head. (See Fig.2)

● After the head replacement and height confirmation, clean the head and pinch roller where the tape runs against and then install them.

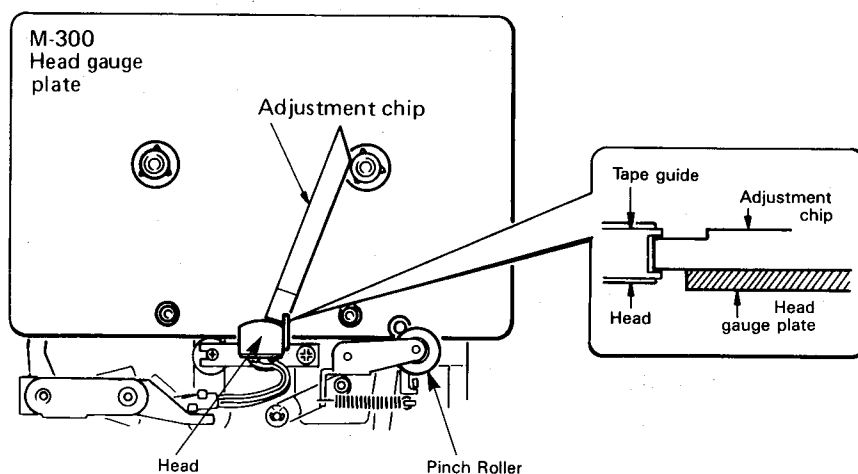


Fig. 2

③ Azimuth adjustment

- Adjust the azimuth upon completion of the main unit assembly (with both upper and lower covers installed).
1. Connect the power source (DC14V) to the power supply lead to make the main unit ready to operate.

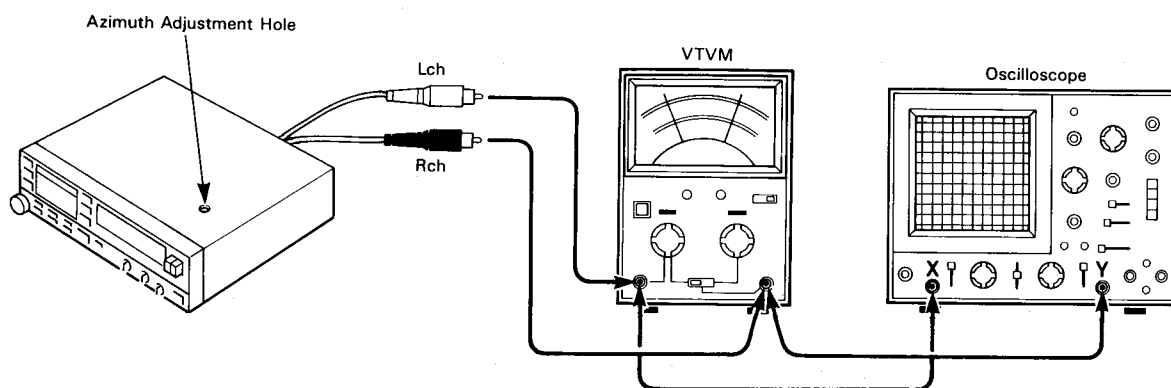


Fig. 3

2. Connect the dual channel AC VTVM and 2ch oscilloscope to the line output.
3. Play back the test tape (TCC-153) and adjust the azimuth screw with a phillips screwdriver inserted into the azimuth adjustment hole in the upper cover. Adjust so that the same maximum VTVM value is indicated on both left channel and right channel and also so that the phase is within $0^\circ \pm 90^\circ$ while watching the lissajous's waveform.

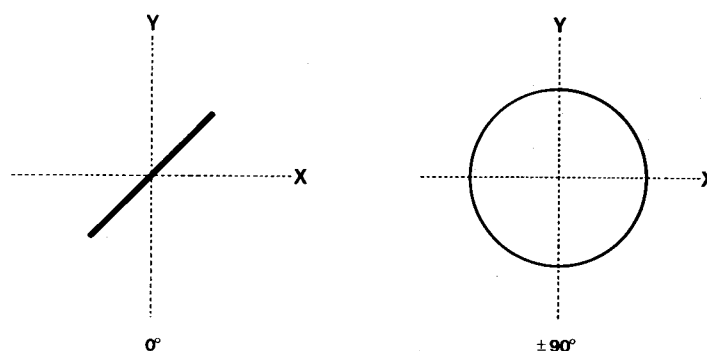
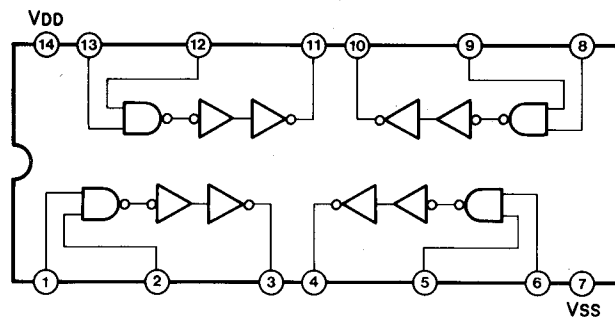


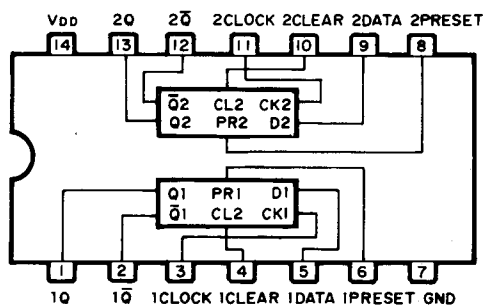
Fig. 4

IC BLOCK DIAGRAM

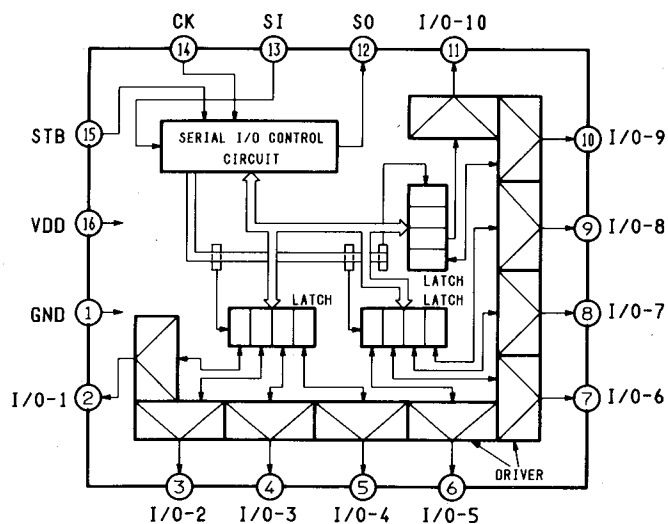
IC3 : TC4011BP



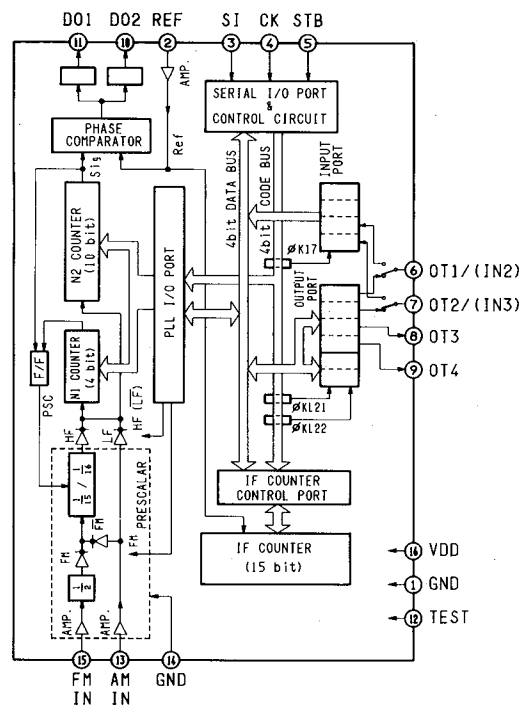
IC4 : TC4013BP



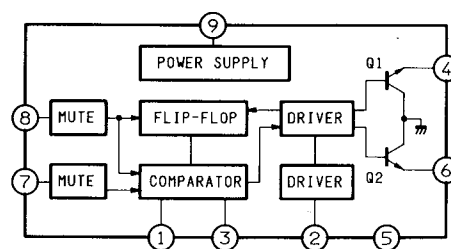
IC6 : TC9173P



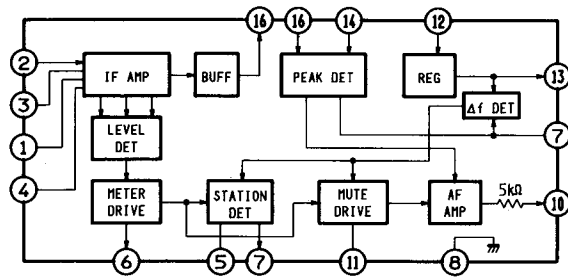
IC7 : TC9172P



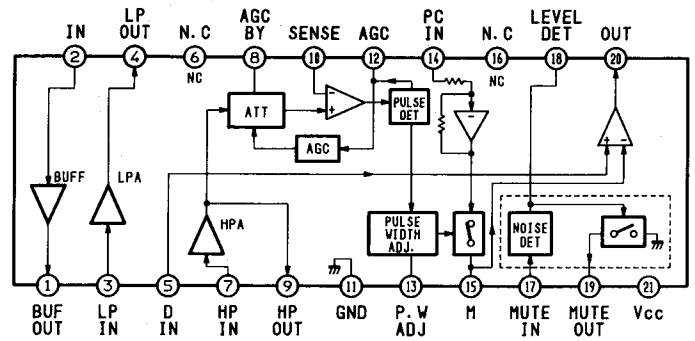
IC8 : TA7362P



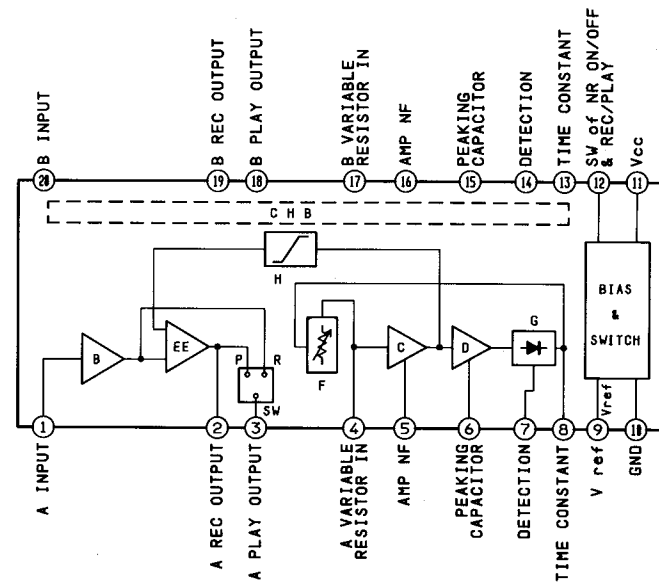
IC101 : TA7411AP



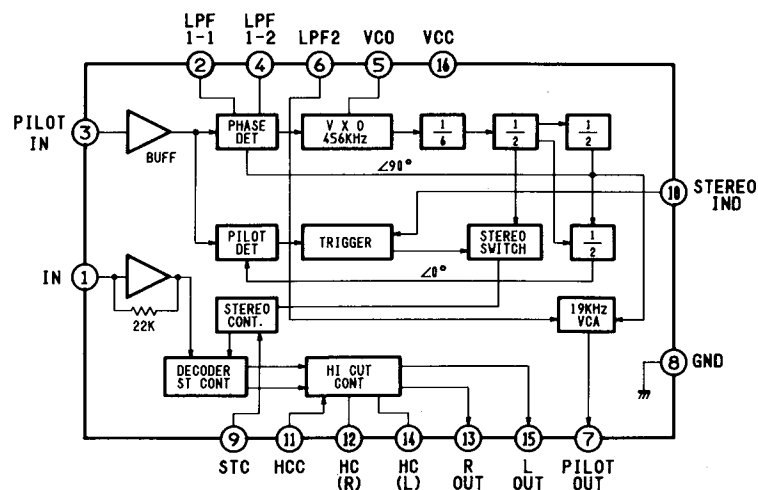
IC102 : TA7409P



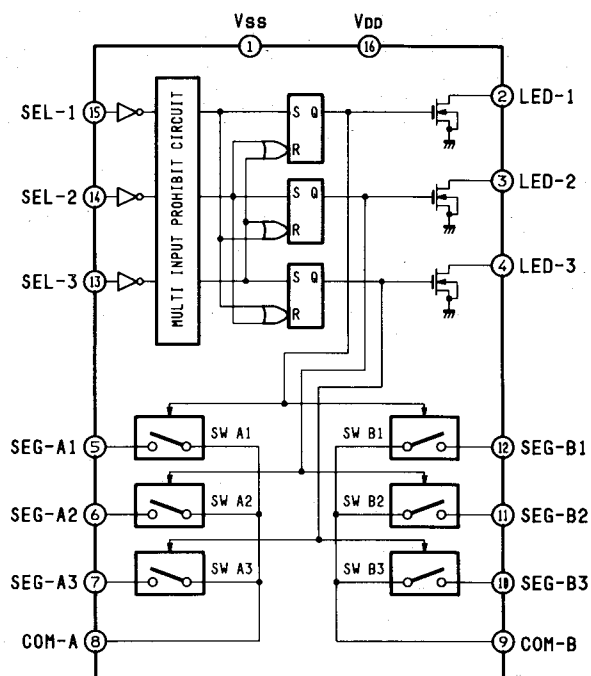
IC201 : TA7719P



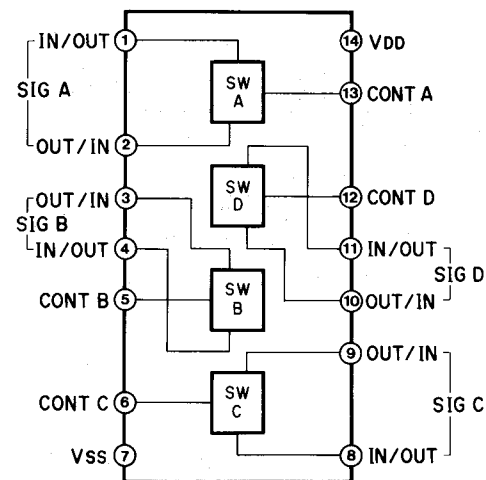
IC103 : TA7413AP



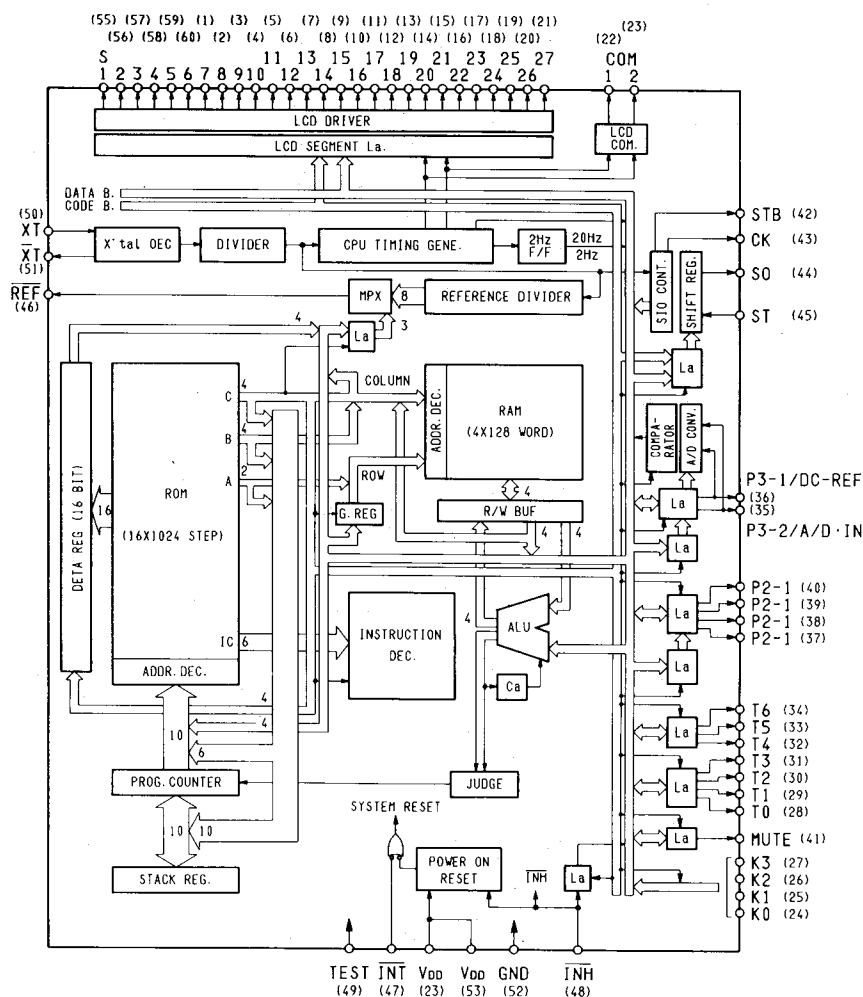
IC301 : TC9145P



IC501 : TC4066BP



IC401 : TC9302F-009



ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
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PCB-1 MAIN P. C. BOARD

CONTROLS

VR101	5101-47170715	470ΩB
VR111	5101-10301927	10kΩB
VR112	5101-47370715	47kΩB
VR113	5101-10301927	10kΩB

CAPACITORS

C2	5345-105F0961	1μF/50V, EC
C4	5345-107A0961	100μF/6.3V, EC
C5	5345-108C046	1000μF/16V, EC
C6	5345-226C043	22μF/16V, EC
C7	5345-475F043	4.7μF/50V, EC
C8	5345-107B0962	100μF/10V, EC
C9	5345-104F0961	0.1μF/50V, EC
C10	5345-106C0961	10μF/16V, EC
C11	5345-104F0961	0.1μF/50V, EC
C14	5345-107A043	100μF/6.3V, EC
C17	5345-107A043	100μF/6.3V, EC
C18	5345-108C046	1000μF/16V, EC
C22	5345-105F043	1μF/50V, EC
C24	5345-335F043	3.3μF/50V, EC
C25	5345-106C0961	10μF/16V, EC
C26	5345-336C043	33μF/16V, EC
C101	5345-106C0961	10μF/16V, EC
C109	5345-105F0961	1μF/50V, EC
C110	5345-225F0961	2.2μF/50V, EC
C111	5359-271541	270pF/100V, PC
C112	5345-106C0961	10μF/16V, EC
C113	5345-105F0961	1μF/50V, EC
C115	5345-106C0961	10μF/16V, EC
C116	5345-106C0961	10μF/16V, EC
C117	5359-271541	270pF/100V, PC
C118	5359-271541	270pF/100V, PC
C119	5359-681541	680pF/100V, PC
C120	5359-681541	680pF/100V, PC
C123	5359-271541	270pF/100V, PC
C124	5359-271541	270pF/100V, PC
C127	5345-226C0961	22μF/16V, EC
C129	5345-104F0961	0.1μF/50V, EC
C130	5345-104F0961	0.1μF/50V, EC
C132	5345-106C0961	10μF/16V, EC
C133	5345-104F0961	0.1μF/50V, EC
C134	5345-106C0961	10μF/16V, EC
C135	5345-106C0961	10μF/16V, EC
C137	5345-477B041	470μF/10V, EC
C138	5359-101541	100pF/100V, PC
C140	5345-474F0952	0.47μF/50V, EC
C141	5345-474F0952	0.47μF/50V, EC
C142	5345-225F0952	2.2μF/50V, EC
C143	5345-105F0961	1μF/50V, EC
C144	5345-105F0961	1μF/50V, EC
C148	5345-477C046	470μF/16V, EC
C151	5345-106C0961	10μF/16V, EC
C152	5345-476C0961	47μF/16V, EC
C153	5345-335F0961	3.3μF/50V, EC
C155	5345-105F0961	1μF/50V, EC
C156	5345-107B0962	100μF/10V, EC
C161	5345-336C0961	33μF/16V, EC

INTEGRATED CIRCUITS

IC3	5654-TC4011BP	TC4011BP
IC5	5654-TC4013BP	TC4013BP
IC6	5654-TC9173P	TC9173P
IC7	5654-TC9172P	TC9172P
IC8	5652-TA7362P	TA7362P
IC101	5653-TA7411AP	TA7411AP
IC102	5653-TA7409P	TA7409P
IC103	5653-TA7413AP	TA7413AP

TRANSISTORS

Q1	5613-2878(B)	2SC2878(B)
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Ref. No.	Part No.	Description
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Q2	5613-2878(B)	2SC2878(B)
Q3	5613-RN1203	RN1203
Q4	5611-RN2203	RN2203
Q5	5613-RN1203	RN1203
Q6	5613-RN1203	RN1203
Q7	5613-RN1203	RN1203
Q8	5611-RN2203	RN2203
Q9	5613-2603(E)	2SC2603(E) or (F)
Q10	5613-2603(E)	2SC2603(E) or (F)
Q11	5613-RN1203	RN1203
Q12	5613-RN1203	RN1203
Q13	5611-1359(Y)	2SA1359(Y) or (O)
Q14	5613-2603(E)	2SC2603(E) or (F)
Q16	5611-RN2203	RN2203
Q17	5613-2878(B)	2SC2878(B)
Q18	5613-2878(B)	2SC2878(B)
Q19	5611-RN2203	RN2203
Q25	5611-RN2203	RN2203
Q102	5613-2603(E)	2SC2603(E) or (F)
Q103	5613-2058(N)	2SC2058(N) or (P)
Q104	5613-2058(N)	2SC2058(N) or (P)
Q105	5613-2603(E)	2SC2603(E) or (F)
Q106	5613-1775(F)	2SC1775(F)
Q107	5613-2320L(F)	2SC2320L(F)
Q108	5613-3667(O)	2SC3667(O)
Q109	5611-1427(O)	2SA1427(O)
Q110	5613-RN1203	RN1203
Q111	5613-RN1203	RN1203
Q112	5613-2603(E)	2SC2603(E) or (F)

DIODES

D1	5631-ISS133	ISS133
D2	5631-ISS133	ISS133
D3	5635-RD5R1EB2	ZD, RD5.1EB2
D4	5631-IS2473	IS2473
D5	5631-ISS133	ISS133
D6	5635-HZ11B-2L	ZD, HZ11B-2L
D7	5632-S5566B	S5566B
D10	5635-RD5R1EB2	ZD, RD5.1EB2
D11	5635-RD5R1EB2	ZD, RD5.1EB2
D12	5632-S5566B	S5566B
D13	5632-S5566B	S5566B
D14	5632-S5566B	S5566B
D21	5631-ISS133	ISS133
D22	5631-ISS133	ISS133
D23	5631-ISS133	ISS133
D24	5635-RD5R1EB2	ZD, RD5.1EB2
D25	5635-RD3R3EB	ZD, RD3.3EB
D101	5631-ISS133	ISS133

COILS

L101	5995-1R0269	
L102	5995-221269	220μH
L103	5995-4R7269	4.7μH

TRANSFORMERS

T101	5572-00115	
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MISCELLANEOUS

TU101	6114-7137	FM Tuner Ass'y 
TU101	6114-7136	FM Tuner Ass'y 
TU102	6110-3	AM Tuner Ass'y
SO101	4474-198	Antenna Socket
CF101	5671-7120A	Ceramic Filter 
//	5671-7142A	Ceramic Filter 
CF102	5671-7120A	Ceramic Filter 
//	5671-7142A	Ceramic Filter 
CF131	5693-CSB456FB	Ceramic Filter
CN1	4443-1871121	Connector, 18 Pos.
CN2	4443-1171129	Connector, 11 Pos.
LCN202	4163-1314018	CLW, 13 Pos.
LCN203	4163-0610018	CLW, 6 Pos.
LCN501	4163-0308018	CLW, 3 Pos.

Ref. No.	Part No.	Description
LCN502	4163-0213018	CLW, 2 Pos.
LCN506	4163-0807018	CLW, 8 Pos.
LUG1	4211-4	Lug Terminal

PCB-2 MECHA CONTROL AND DOLBY NR P. C. BOARD

RESISTORS		
R212	5171-8R2572	8.2Ω, 1W, MR
R213	5171-8R2572	8.2Ω, 1W, MR

CONTROLS		
VR201	5101-10201927	1kΩ
VR202	5101-10201927	1kΩ
VR203	5101-20301927	22kΩB
VR204	5101-20301927	22kΩB

CAPACITORS		
C201	5345-104F043	0.1μF/50V, EC
C202	5345-477C046	470μF/16V, EC
C220	5345-476C041	47μF/16V, EC
C221	5345-477B0962	470μF/10V, EC
C231	5345-106C041	10μF/16V, EC
C232	5345-106C041	10μF/16V, EC
C233	5359-101541	100pF/100V, PC
C234	5359-101541	100pF/100V, PC
C235	5345-227B0962	220μF/10V, EC
C236	5345-227B0962	220μF/10V, EC
C239	5345-106C041	10μF/16V, EC
C240	5345-106C041	10μF/16V, EC
C245	5345-477B0962	470μF/10V, EC
C246	5345-477B0962	470μF/10V, EC
C247	5345-475E041	4.7μF/35V, EC
C248	5345-475E041	4.7μF/35V, EC
C249	5359-821541	820pF/100V, PC
C250	5359-821541	820pF/100V, PC
C251	5345-106C041	10μF/16V, EC
C252	5345-106C041	10μF/16V, EC
C259	5345-106C041	10μF/16V, EC
C260	5345-106C041	10μF/16V, EC
C267	5345-226C041	22μF/16V, EC
C268	5345-227B0962	220μF/10V, EC
C269	5345-477B0962	470μF/10V, EC
C277	5345-226C041	22μF/16V, EC

INTEGRATED CIRCUITS		
IC201	5652-TA7719P	TA7719P

TRANSISTORS		
Q201	5613-1775(F)	2SC1775(F)
Q202	5613-1775(F)	2SC1775(F)
Q203	5613-1775(F)	2SC1775(F)
Q204	5613-1775(F)	2SC1775(F)
Q205	5613-2603(F)	2SC2603(F) or (E)
Q206	5613-2603(F)	2SC2603(F) or (E)
Q207	5613-RN1203	RN1203
Q208	5613-RN1203	RN1203
Q209	5613-2236(Y)	2SC2236(Y) or (O)
Q210	5613-RN1203	RN1203
Q211	5613-2236(Y)	2SC2236(Y) or (O)

DIODES		
D201	5631-ISS133	ISS133
D203	5631-ISS133	ISS133

COILS		
L201	5995-223189	22mH
L202	5995-223189	22mH
L207	5995-150269	15mH

MISCELLANEOUS		
CN201	4443-0871121	Connector, 8 Pos.
CN202	4443-1371119	Connector, 13 Pos.
CN203	4443-0671119	Connector, 6 Pos.
LUG2	4211-4	Lug Terminal G

Ref. No.	Part No.	Description
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PCB-3 VOLUME P. C. BOARD

CONTROLS		
VR501/VR502/VR503	5112-1030118	10kΩB, Volume/ Tuner Power/ Balance

CAPACITORS		
C501	5345-108C046	1000μF/16V, EC
C505	5345-474F043	0.47μF/50V, EC
C506	5345-474F043	0.47μF/50V, EC
C509	5345-106C041	10μF/16V, EC
C510	5345-106C041	10μF/16V, EC
C511	5345-227B0962	220μF/10V, EC
C512	5345-227B0962	220μF/10V, EC
C513	5345-106C041	10μF/16V, EC
C514	5345-106C041	10μF/16V, EC
C515	5345-154F0951	0.15μF/50V, EC
C516	5345-154F0951	0.15μF/50V, EC
C521	5345-476C041	47μF/16V, EC
C522	5345-476C041	47μF/16V, EC
C523	5345-106C043	10μF/16V, EC
C524	5345-106C043	10μF/16V, EC
C525	5345-106C043	10μF/16V, EC
C526	5345-106C043	10μF/16V, EC
C527	5345-335F043	3.3μF/50V, EC
C528	5345-335F043	3.3μF/50V, EC
C529	5345-335F043	3.3μF/50V, EC
C530	5345-335F043	3.3μF/50V, EC
C533	5345-108C046	1000μF/16V, EC
C534	5345-106C043	10μF/16V, EC

INTEGRATED CIRCUITS		
IC501	5654-TC4066BP	TC4066BP

TRANSISTORS		
Q502	5613-RN1203	RN1203
Q503	5613-RN1203	RN1203
Q505	5611-999L(F)	2SA999L(F)
Q506	5611-999L(F)	2SA999L(F)
Q507	5613-2320L(F)	2SC2320L(F)
Q508	5613-2320L(F)	2SC2320L(F)
Q509	5613-2320L(F)	2SC2320L(F)
Q510	5613-2320L(F)	2SC2320L(F)
Q511	5611-1115(F)	2SA1115(F)
Q512	5611-1115(F)	2SA1115(F)
Q513	5611-1115(F)	2SA1115(F)
Q514	5611-1115(F)	2SA1115(F)
Q515	5613-2320L(F)	2SC2320L(F)
Q516	5613-2320L(F)	2SC2320L(F)
Q517	5613-2320L(F)	2SC2320L(F)
Q518	5613-2320L(F)	2SC2320L(F)

MISCELLANEOUS		
CN501	4443-0371119	Connector, 3 Pos.
CN502	4443-0271119	Connector, 2 Pos.
CN503	4443-0471119	Connector, 4 Pos.
CN504	4443-0971121	Connector, 9 Pos.
CN505	4443-0571133	Connector, 5 Pos.
CN506	4443-0871119	Connector, 8 Pos.

PCB-4 SIG SWITCHING P. C. BOARD

CAPACITORS		
C301	5345-104F043	0.1μF/50V, EC
C302	5345-227B0962	220μF/10V, EC
C303	5345-225F041	2.2μF/50V, EC
C304	5345-225F041	2.2μF/50V, EC
C305	5345-106C041	10μF/16V, EC
C306	5345-106C041	10μF/16V, EC
C307	5345-106C041	10μF/16V, EC
C309	5345-106C043	10μF/16V, EC
C310	5345-106C043	10μF/16V, EC
C315	5345-106C043	10μF/16V, EC

Ref. No.	Part No.	Description
C341	5345-106C043	10 μ F/16V, EC
C342	5345-106C043	10 μ F/16V, EC

INTEGRATED CIRCUITS

IC301	5653-TC9145P	TC9145P
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TRANSISTORS

Q301	5613-RN1203	RN1203
Q302	5613-2320L(F)	2SC2320L(F)
Q303	5613-2320L(F)	2SC2320L(F)

MISCELLANEOUS

CN301	4443-047175	Connector, 4 Pos.
CN302	4443-047175	Connector, 4 Pos.
CN303	4443-077175	Connector, 7 Pos.
CN304	4443-067175	Connector, 6 Pos.
LCN503	4163-0415018	CLW, 4 Pos.

PCB-5 LCD P. C. BOARD**INTEGRATED CIRCUITS**

IC401	5654-9302F09	TC9302F-009
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TRANSISTORS

Q401	5613-2603(E)	2SC2603(E) or (F)
Q402	5611-RN2203	RN2203
Q403	5613-2603(E)	2SC2603(E) or (F)

DIODES

D402	5631-ISS133	ISS133
D403	5631-ISS133	ISS133
D404	5631-ISS133	ISS133
D405	5631-ISS133	ISS133
D406	5631-ISS133	ISS133
D407	5631-ISS133	ISS133
D408	5631-ISS133	ISS133
D409	5631-ISS133	ISS133
D410	5631-ISS133	ISS133
D411	5631-ISS133	ISS133
D412	5631-ISS133	ISS133
D413	5631-ISS133	ISS133
D416	5631-ISS133	ISS133
D417	5631-ISS133	ISS133 

MISCELLANEOUS

LCD1	5791-CA4D1021	Liquid Crystal Display
X401	5691-00720022	Crystal Osc.
VC401	5371-610	Trimmer Capacitor
PL401	5731-0637173	Lamp
PL402	5731-0637173	Lamp
PL403	5731-1407270	Lamp
PL404	5731-1407270	Lamp
PL405	5731-1407270	Lamp
S401	4431-A017163	Push Switch, Tuning Up
S402	4431-A017163	Push Switch, Tuning Down
S403	4431-A017163	Push Switch, Scan
S404	4431-A017163	Push Switch, FM/AM
S405	4431-A017163	Push Switch, Mono
S406	4431-A017163	Push Switch, Dolby NR
S407	4431-A017163	Push Switch, Preset M1
S408	4431-A017163	Push Switch, Preset M2
S409	4431-A017163	Push Switch, Preset M3
S410	4431-A017163	Push Switch, Preset M4
S411	4431-A017163	Push Switch, Preset M5
S412	4431-A017163	Push Switch, Preset M6
S413	4431-A017163	Push Switch, Loudness
S414	4431-A017163	Push Switch, Memory
S419	4431-A017163	Push Switch, Eject/Clock
	4443-Z20667	Connector, Liquid Crystal Display

Ref. No.	Part No.	Description
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PCB-6 TONE CONTROL P. C. BOARD**CONTROLS**

VR505/ VR506	5110-104018	100k Ω C, Bass
VR507/ VR508	5110-503028	50k Ω C, Treble
VR509/ VR510	5110-104038	100k Ω W, Fader

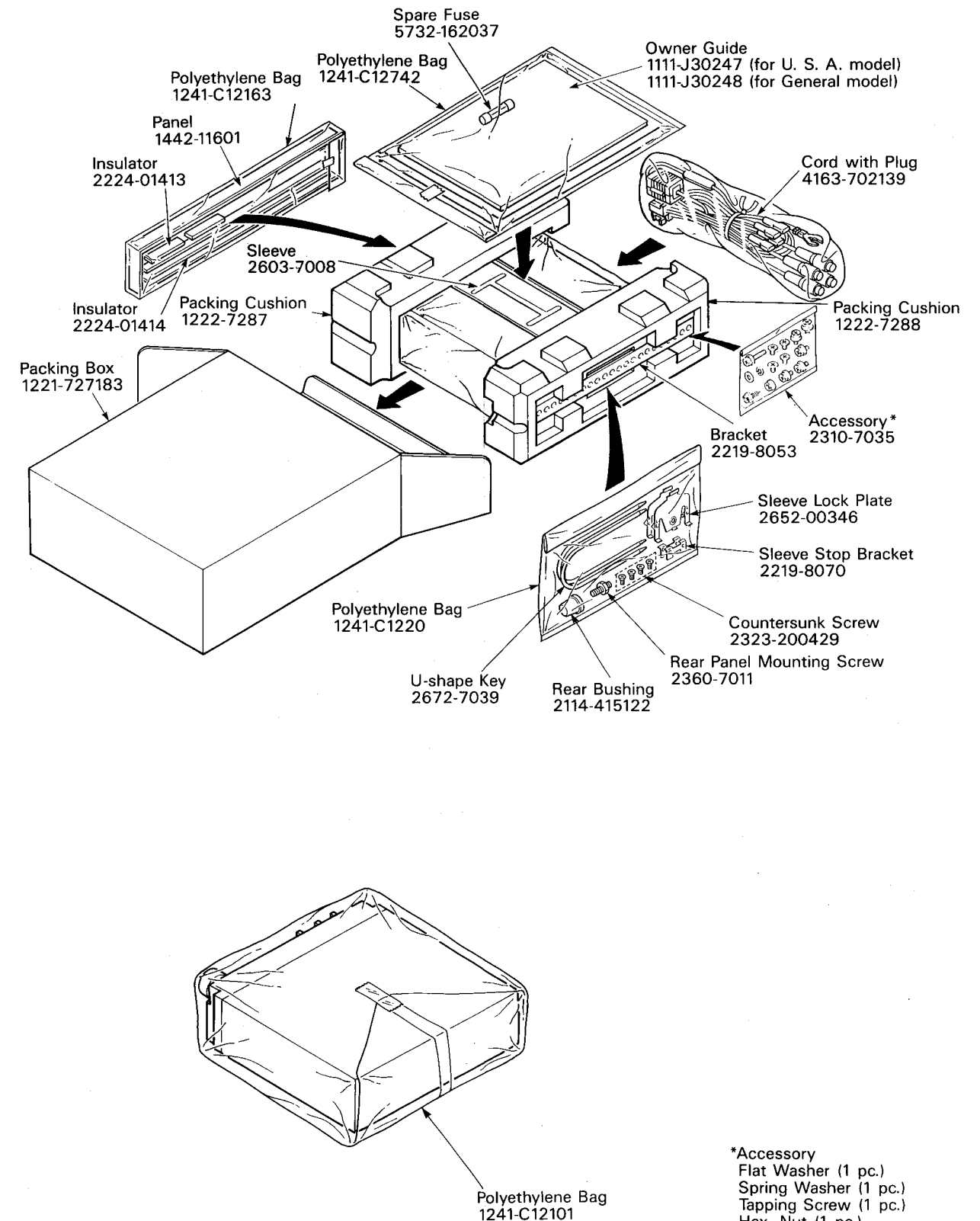
NOTE

Parts with the following marks are used only in the models intended for particular markets.

 : U.S.A. model
 : General model

KEY TO ABBREVIATIONS

FR : Fuse Resistor
 MR : Metal Resistor
 CR : Cement Resistor
 CAR : Carbon Resistor
 EC : Electrolytic Capacitor
 PC : Polypropylene Capacitor
 MC : Mica Capacitor
 CC : Ceramic Capacitor
 MPC : Metalized Polyester Capacitor
 SPC : Special Capacitor
 ZD : Zener Diode
 CLW : Connector with Lead Wire

PACKAGE

*Accessory
 Flat Washer (1 pc.)
 Spring Washer (1 pc.)
 Tapping Screw (1 pc.)
 Hex. Nut (1 pc.)
 Bolt (large) (1 pc.)
 Bolt (small) (5 pcs.)
 Countersink Bolt (4 pcs.)

Ref. No.	Part No.	Description
C341	5345-106C043	10 μ F/16V, EC
C342	5345-106C043	10 μ F/16V, EC

INTEGRATED CIRCUITS

IC301	5653-TC9145P	TC9145P
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TRANSISTORS

Q301	5613-RN1203	RN1203
Q302	5613-2320L(F)	2SC2320L(F)
Q303	5613-2320L(F)	2SC2320L(F)

MISCELLANEOUS

CN301	4443-047175	Connector, 4 Pos.
CN302	4443-047175	Connector, 4 Pos.
CN303	4443-077175	Connector, 7 Pos.
CN304	4443-067175	Connector, 6 Pos.
LCN503	4163-0415018	CLW, 4 Pos.

PCB-5 LCD P. C. BOARD

INTEGRATED CIRCUITS

IC401	5654-9302F09	TC9302F-009
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TRANSISTORS

Q401	5613-2603(E)	2SC2603(E) or (F)
Q402	5611-RN2203	RN2203
Q403	5613-2603(E)	2SC2603(E) or (F)

DIODES

D402	5631-ISS133	ISS133
D403	5631-ISS133	ISS133
D404	5631-ISS133	ISS133
D405	5631-ISS133	ISS133
D406	5631-ISS133	ISS133
D407	5631-ISS133	ISS133
D408	5631-ISS133	ISS133
D409	5631-ISS133	ISS133
D410	5631-ISS133	ISS133
D411	5631-ISS133	ISS133
D412	5631-ISS133	ISS133
D413	5631-ISS133	ISS133
D416	5631-ISS133	ISS133
D417	5631-ISS133	ISS133 

MISCELLANEOUS

LCD1	5791-CA4D1021	Liquid Crystal Display
X401	5691-00720022	Crystal Osc.
VC401	5371-610	Trimmer Capacitor
PL401	5731-0637173	Lamp
PL402	5731-0637173	Lamp
PL403	5731-1407270	Lamp
PL404	5731-1407270	Lamp
PL405	5731-1407270	Lamp
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S403	4431-A017163	Push Switch, Scan
S404	4431-A017163	Push Switch, FM/AM
S405	4431-A017163	Push Switch, Mono
S406	4431-A017163	Push Switch, Dolby NR
S407	4431-A017163	Push Switch, Preset M1
S408	4431-A017163	Push Switch, Preset M2
S409	4431-A017163	Push Switch, Preset M3
S410	4431-A017163	Push Switch, Preset M4
S411	4431-A017163	Push Switch, Preset M5
S412	4431-A017163	Push Switch, Preset M6
S413	4431-A017163	Push Switch, Loudness
S414	4431-A017163	Push Switch, Memory
S419	4431-A017163	Push Switch, Eject/Clock
	4443-ZZ0667	Connector, Liquid Crystal Display

Ref. No.	Part No.	Description
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PCB-6 TONE CONTROL P. C. BOARD

CONTROLS

VR505/ VR506	5110-104018	100k Ω C, Bass
VR507/ VR508	5110-503028	50k Ω C, Treble
VR509/ VR510	5110-104038	100k Ω W, Fader

NOTE

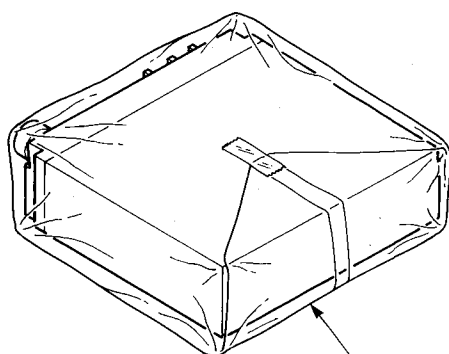
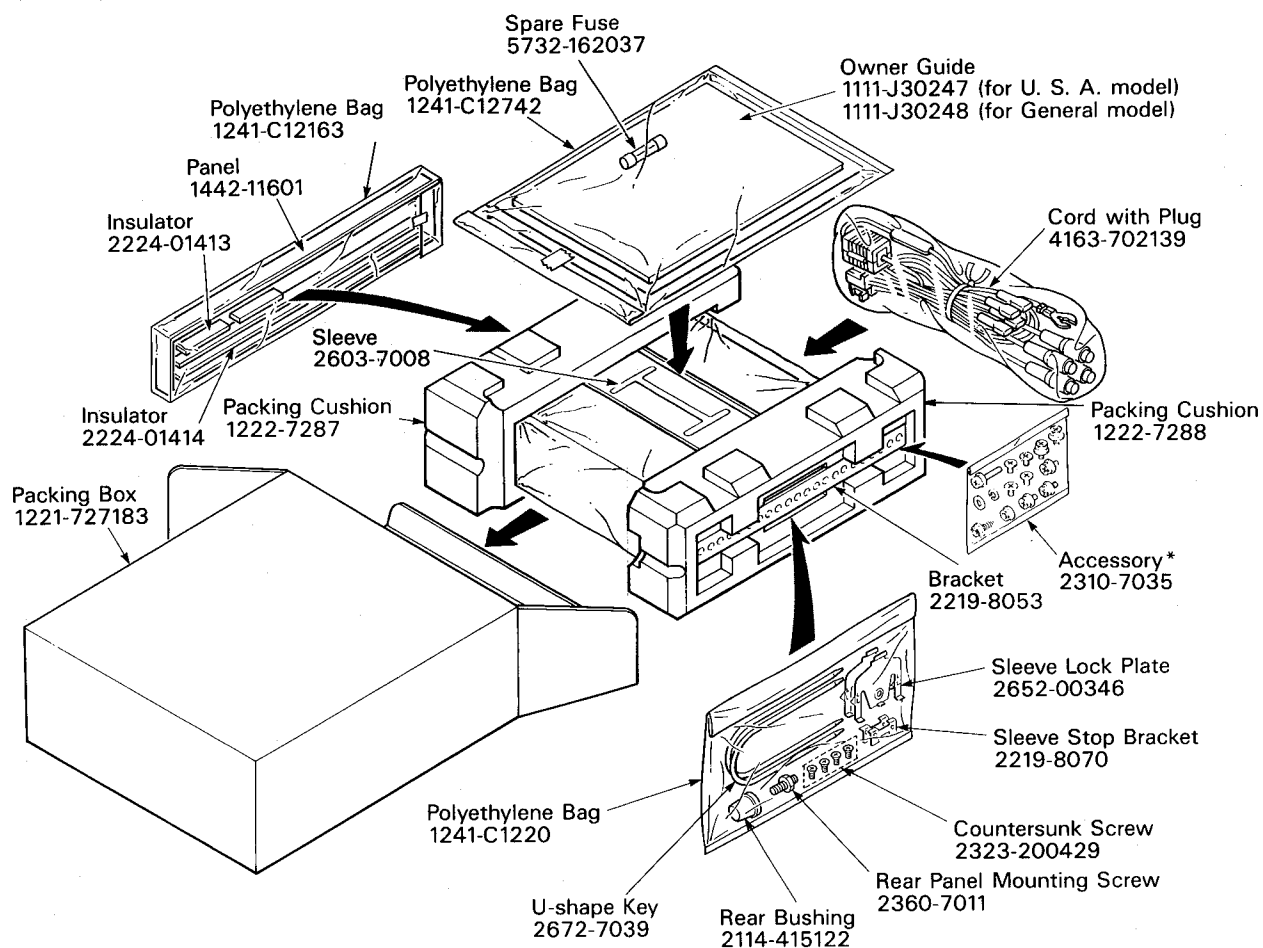
Parts with the following marks are used only in the models intended for particular markets.

	: U.S.A. model
	: General model

KEY TO ABBREVIATIONS

FR	: Fuse Resistor
MR	: Metal Resistor
CR	: Cement Resistor
CAR	: Carbon Resistor
EC	: Electrolytic Capacitor
PC	: Polypropylene Capacitor
MC	: Mica Capacitor
CC	: Ceramic Capacitor
MPC	: Metalized Polyester Capacitor
SPC	: Special Capacitor
ZD	: Zener Diode
CLW	: Connector with Lead Wire

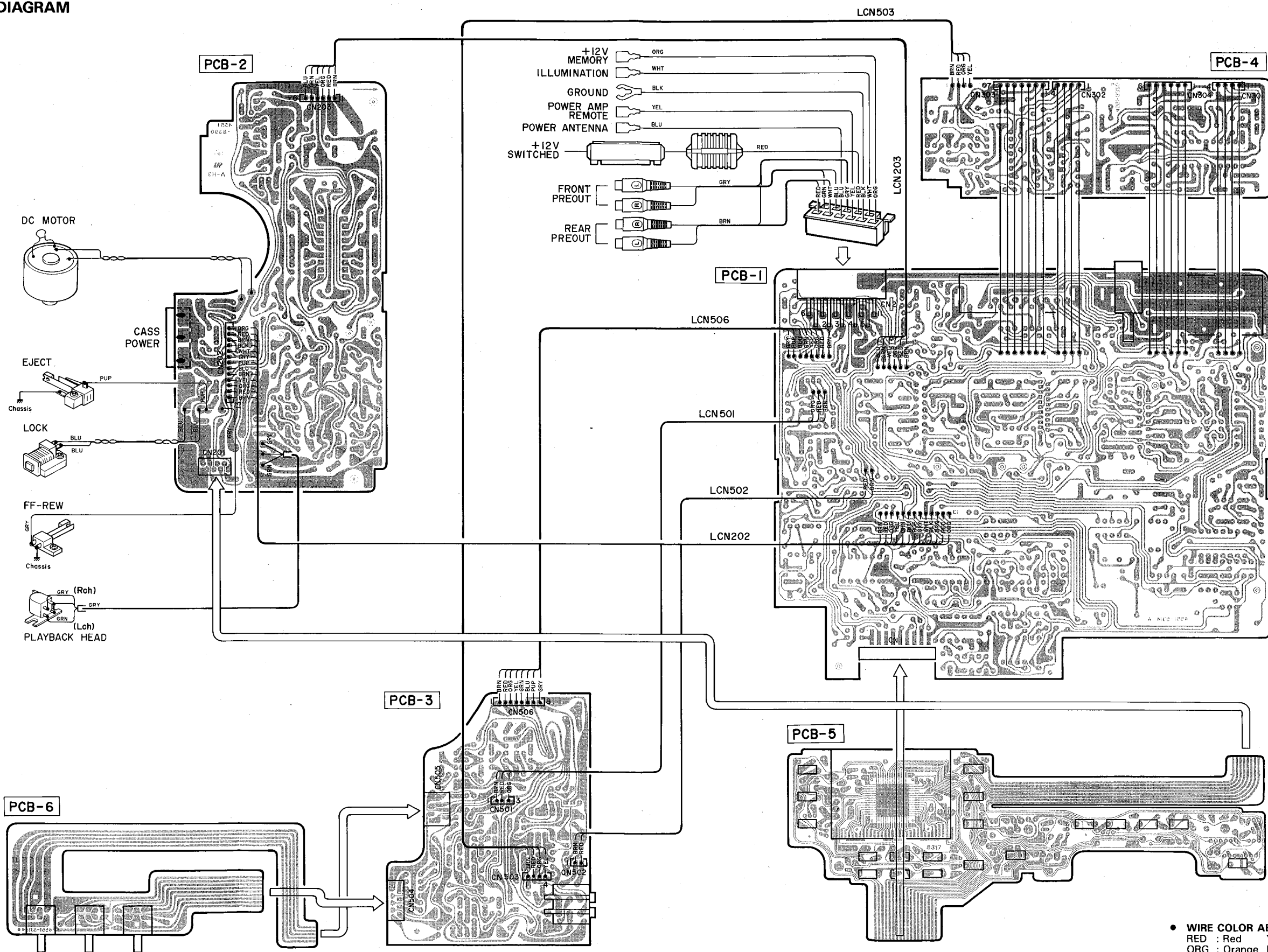
PACKAGE



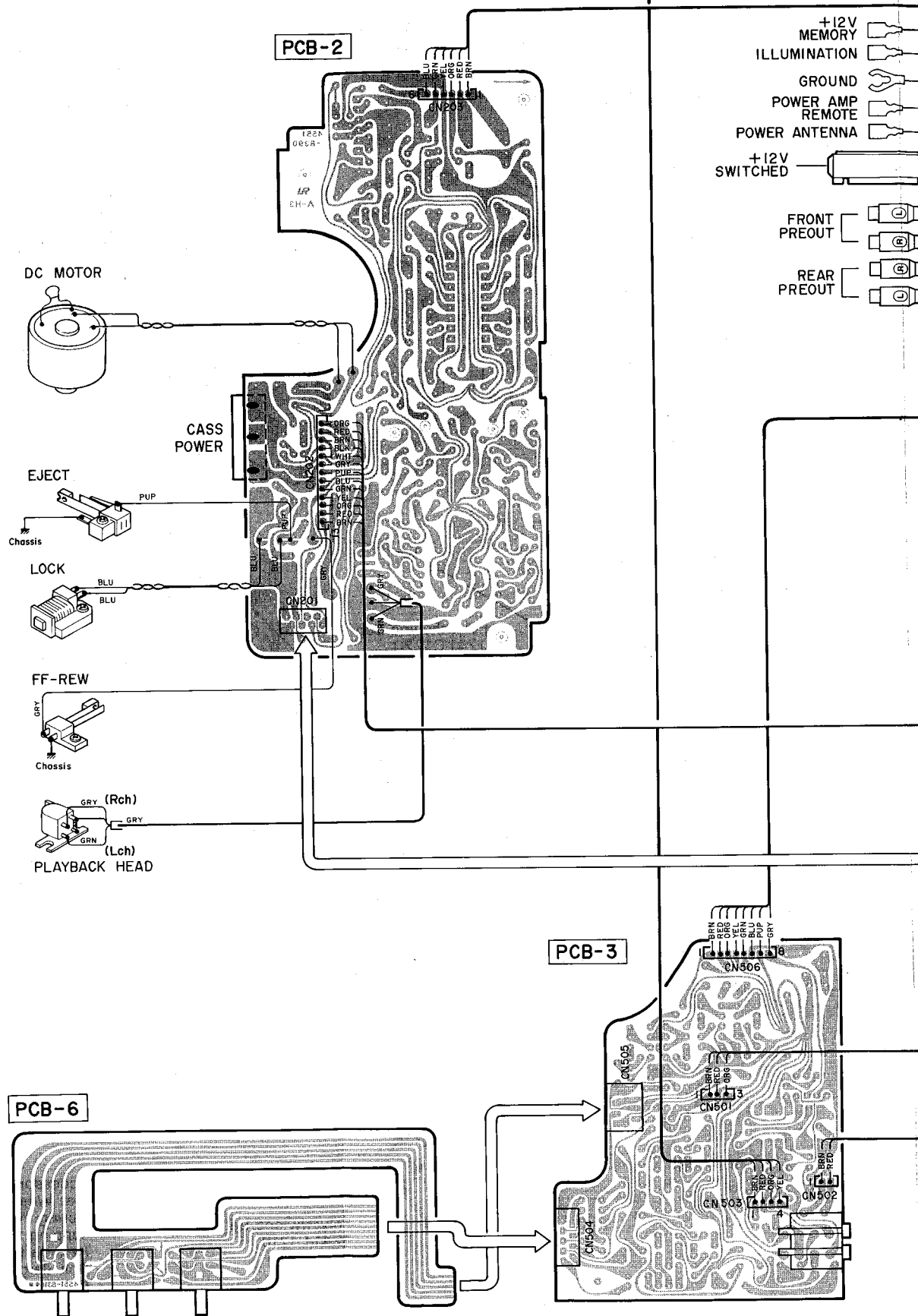
Polyethylene Bag
1241-C12101

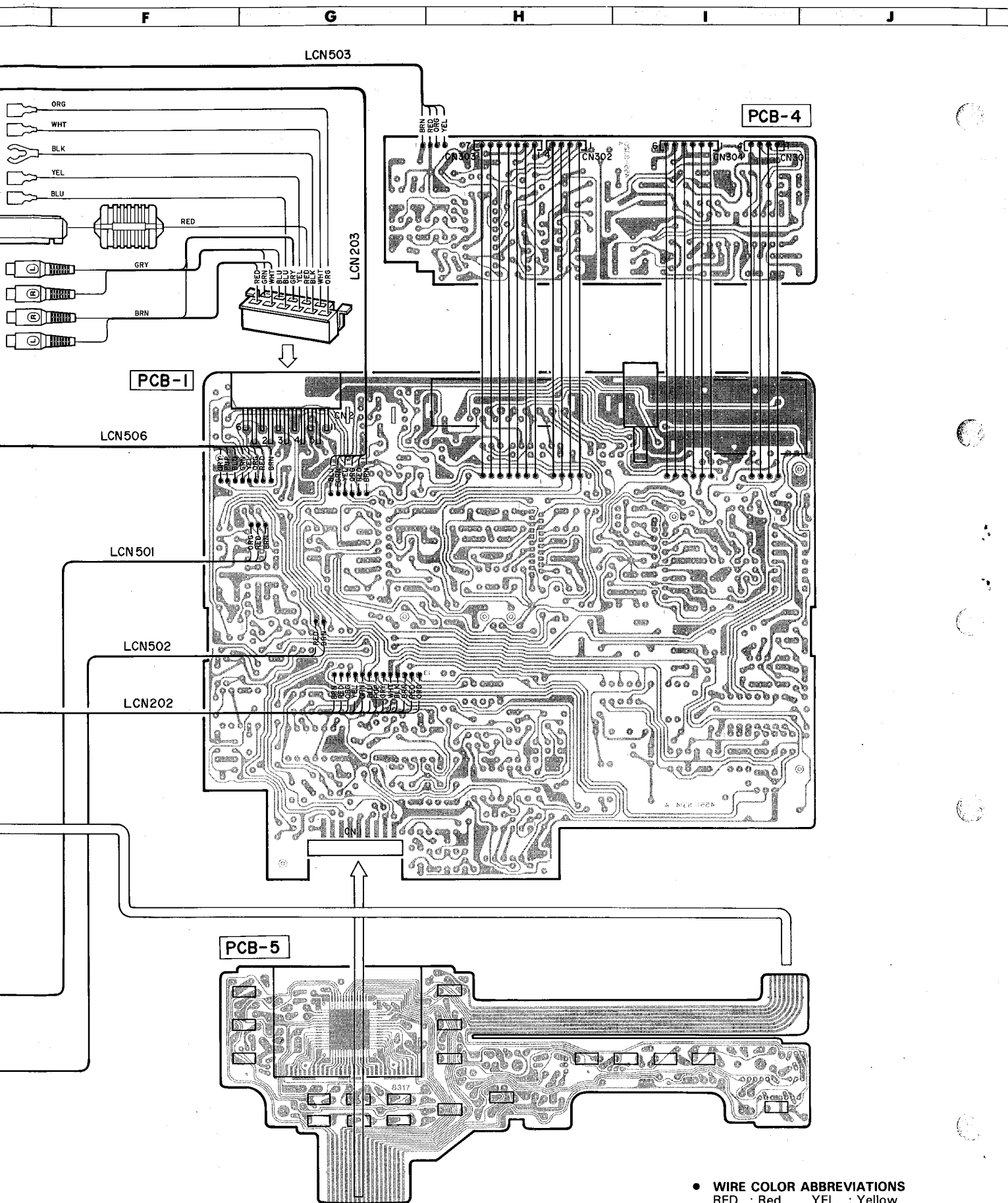
*Accessory
 Flat Washer (1 pc.)
 Spring Washer (1 pc.)
 Tapping Screw (1 pc.)
 Hex. Nut (1 pc.)
 Bolt (large) (1 pc.)
 Bolt (small) (5 pcs.)
 Countersink Bolt (4 pcs.)

WIRING DIAGRAM



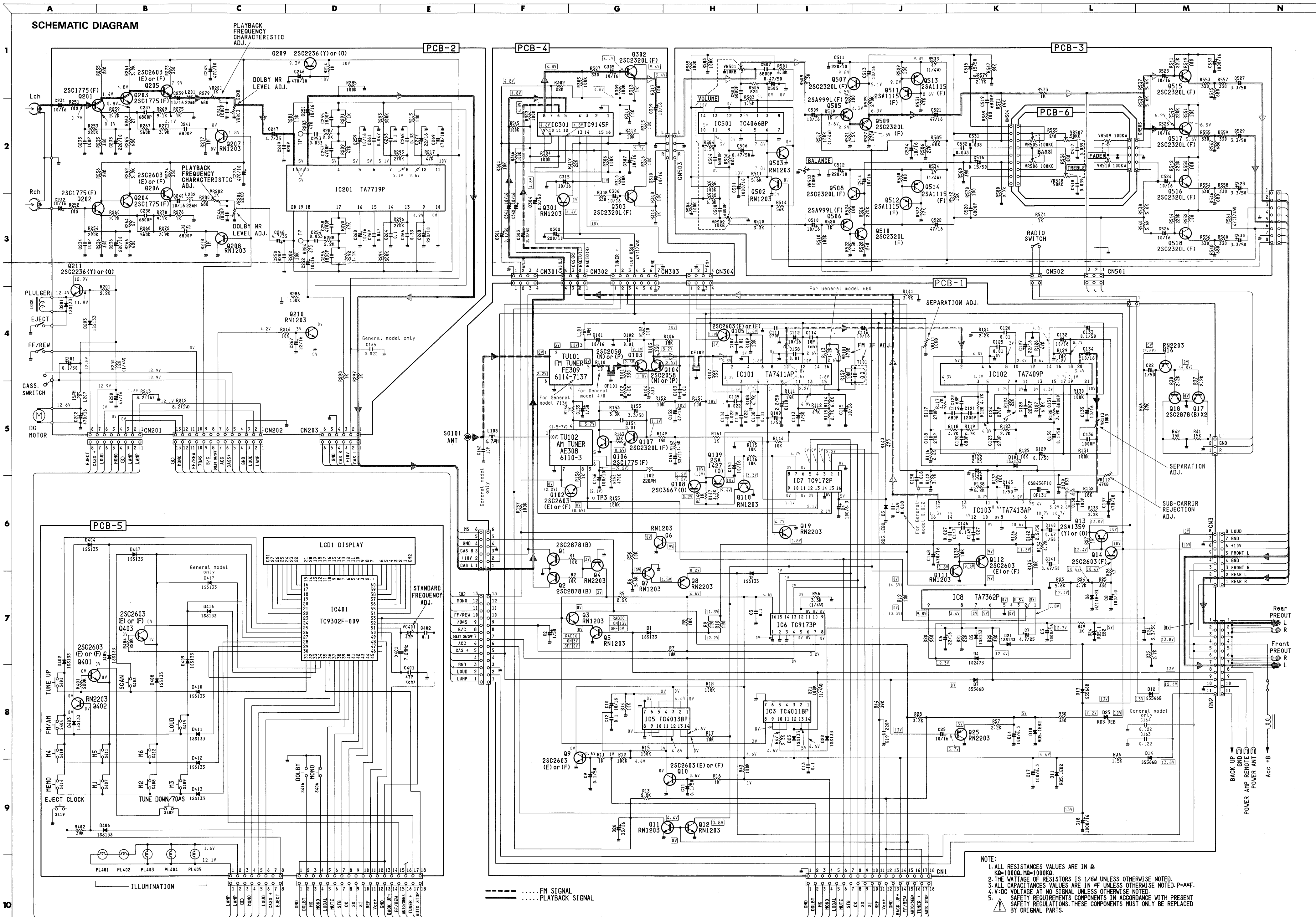
WIRING DIAGRAM





• **WIRE COLOR ABBREVIATIONS**

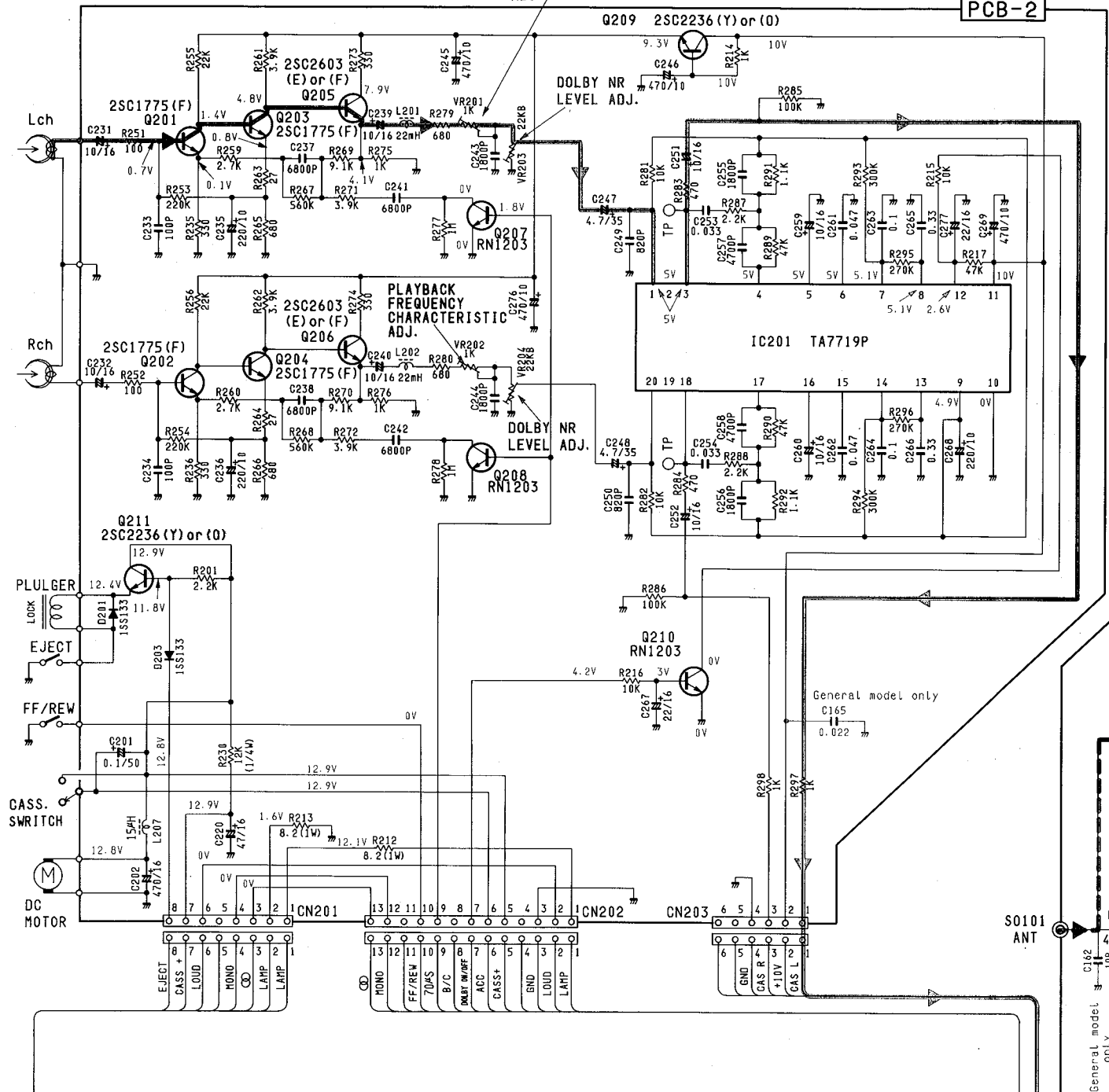
RED : Red	YEL : Yellow
ORG : Orange	PUP : Purple
BLU : Blue	PIK : Pink
WHT : White	GRY : Gray
GRN : Green	BRN : Brown
BLK : Black	



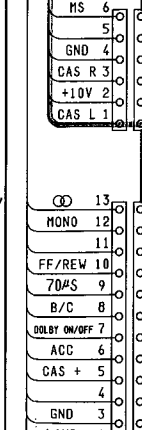
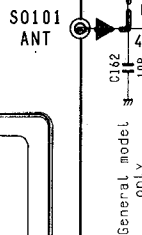
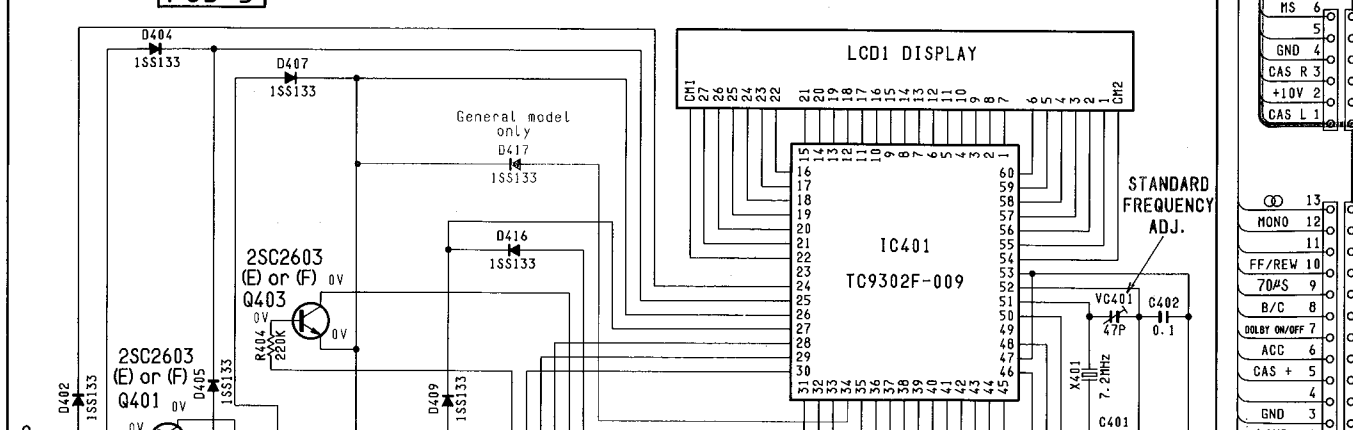
SCHEMATIC DIAGRAM

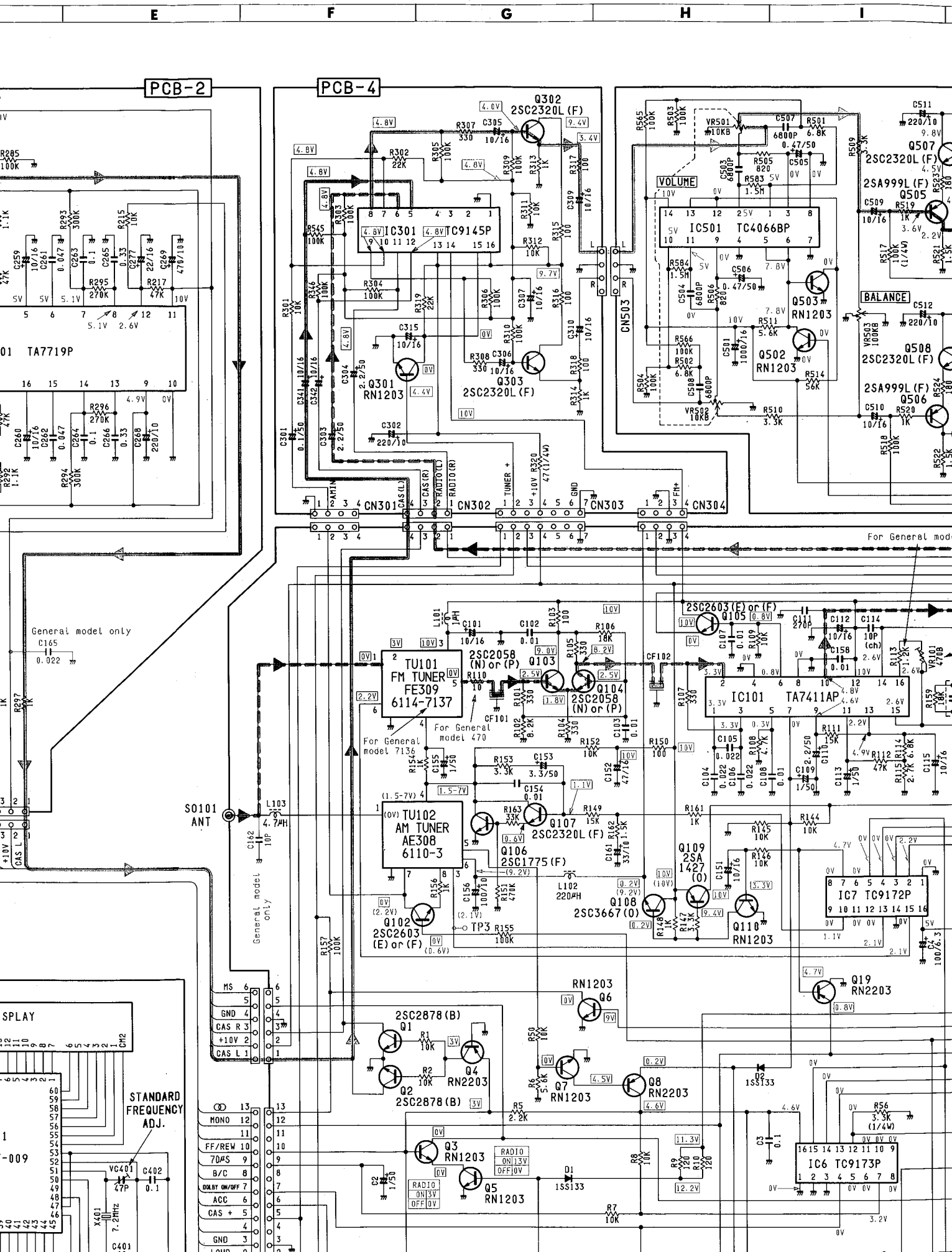
PLAYBACK
FREQUENCY
CHARACTERISTIC
ADJ.

PCB-2



PCB-5





4

5

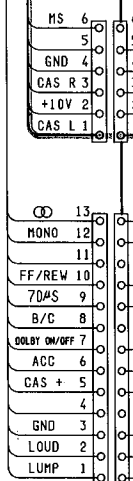
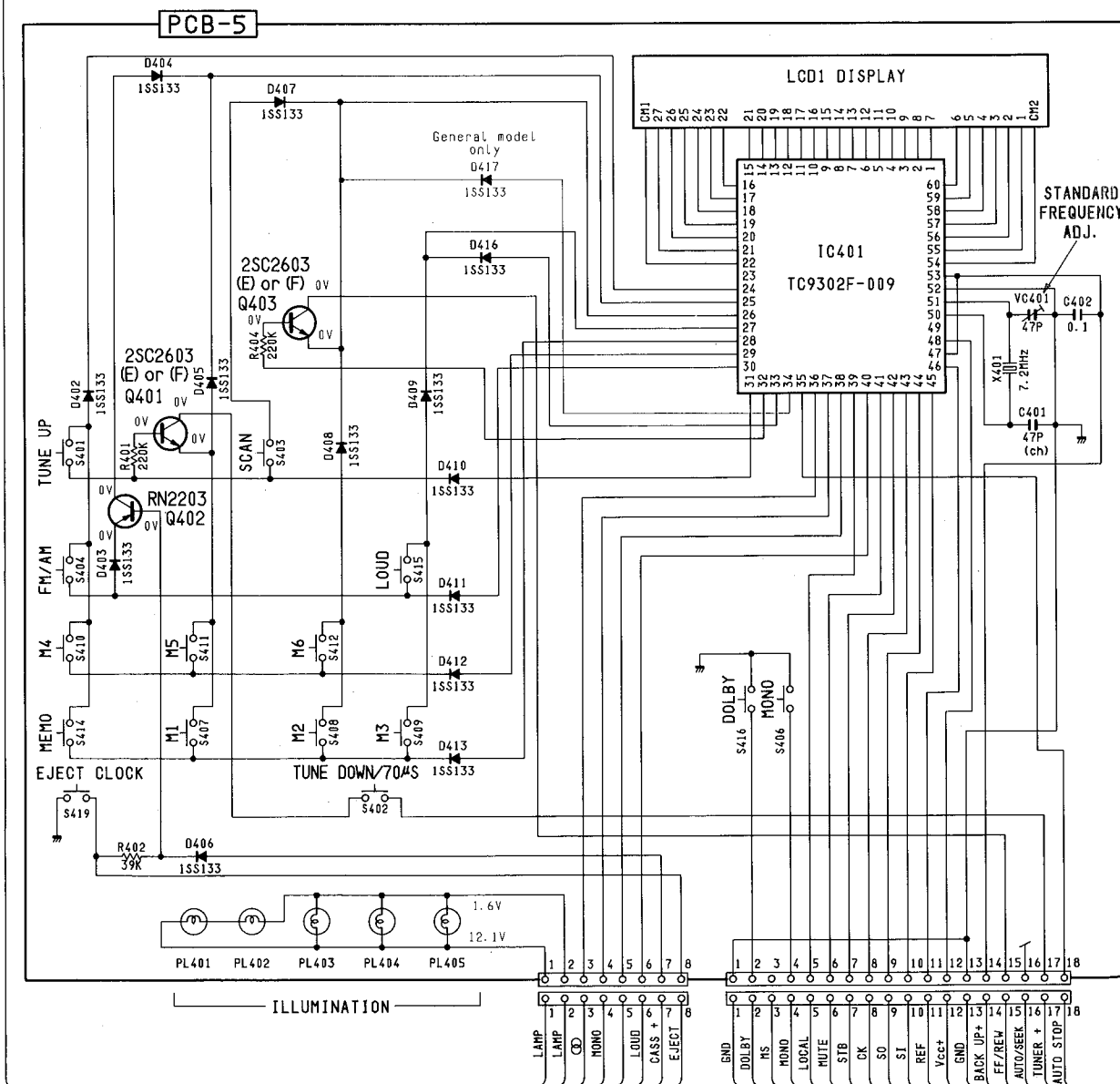
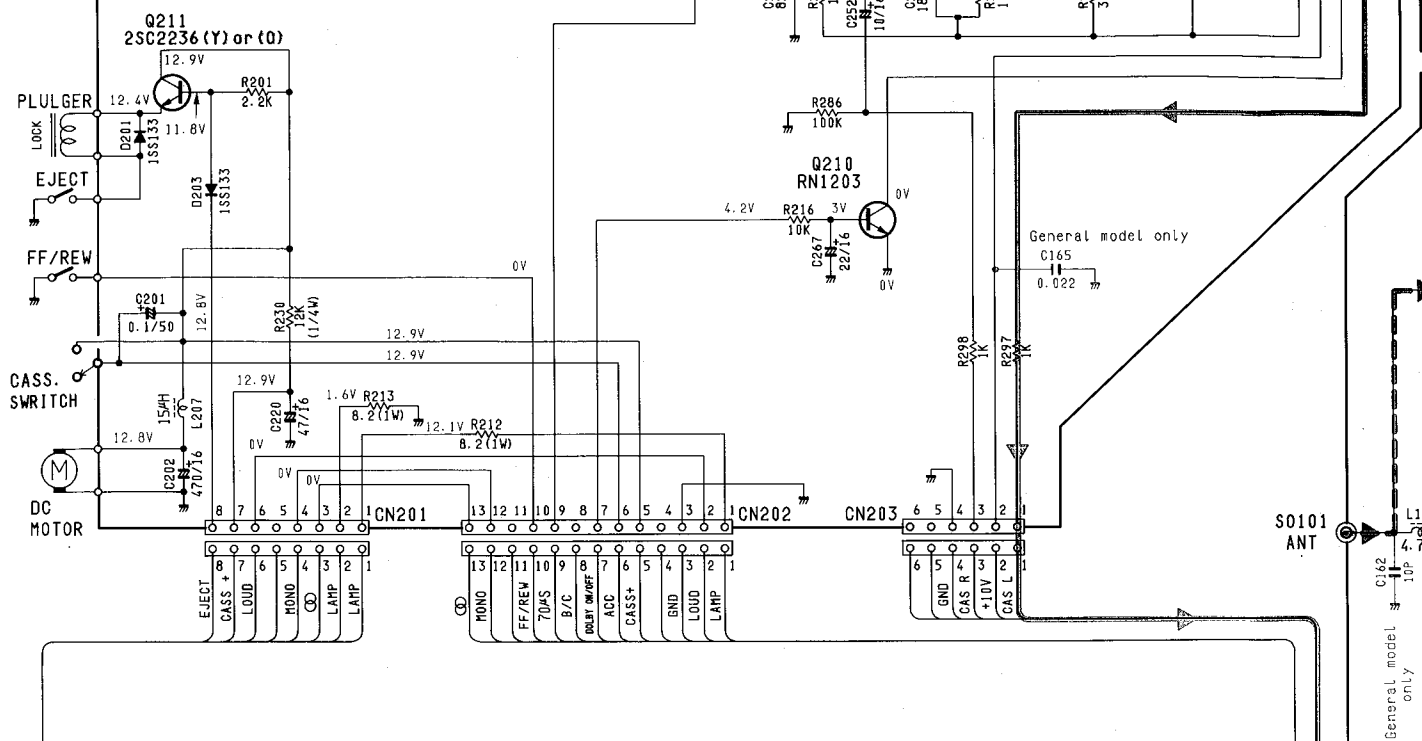
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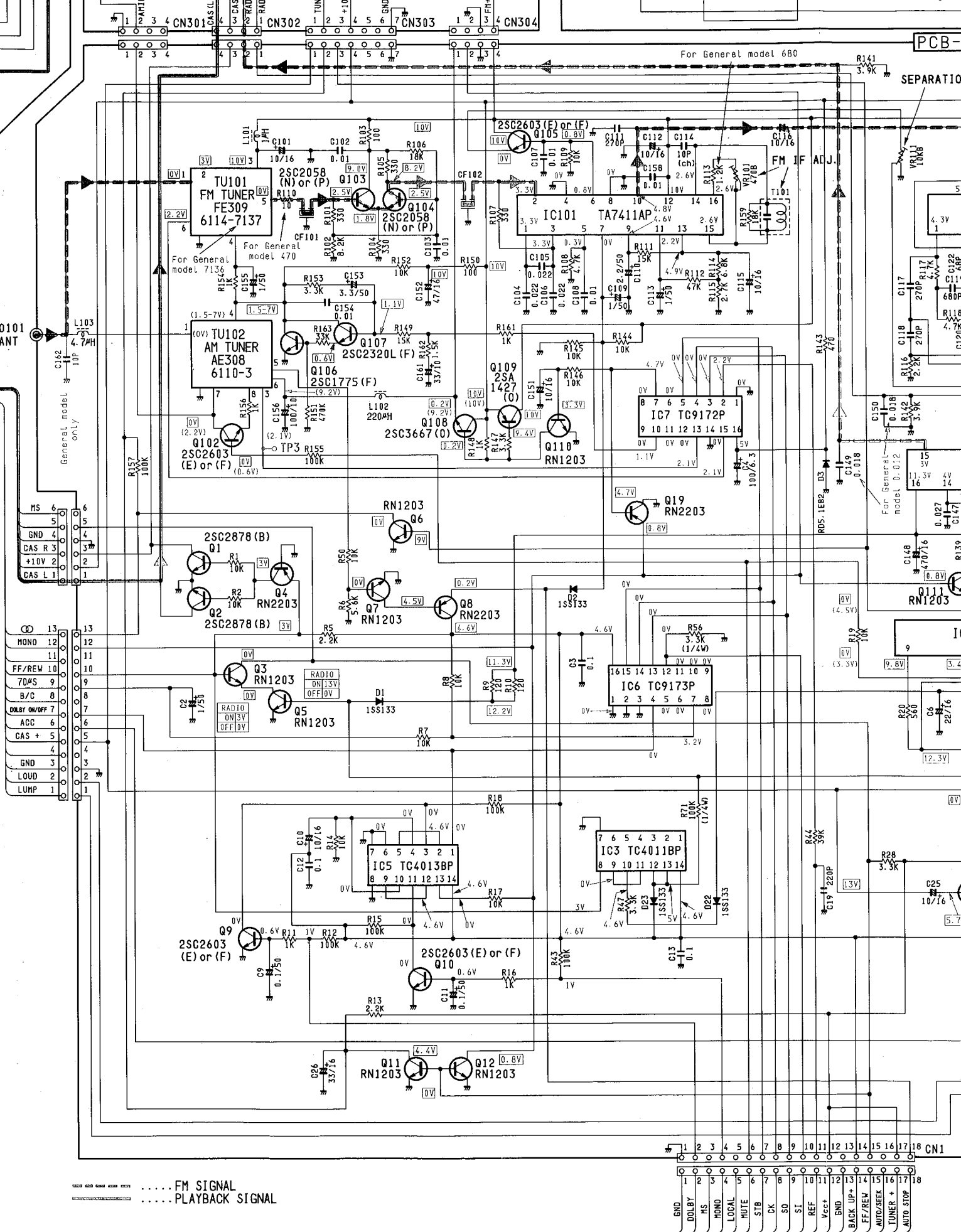
7

8

9

10

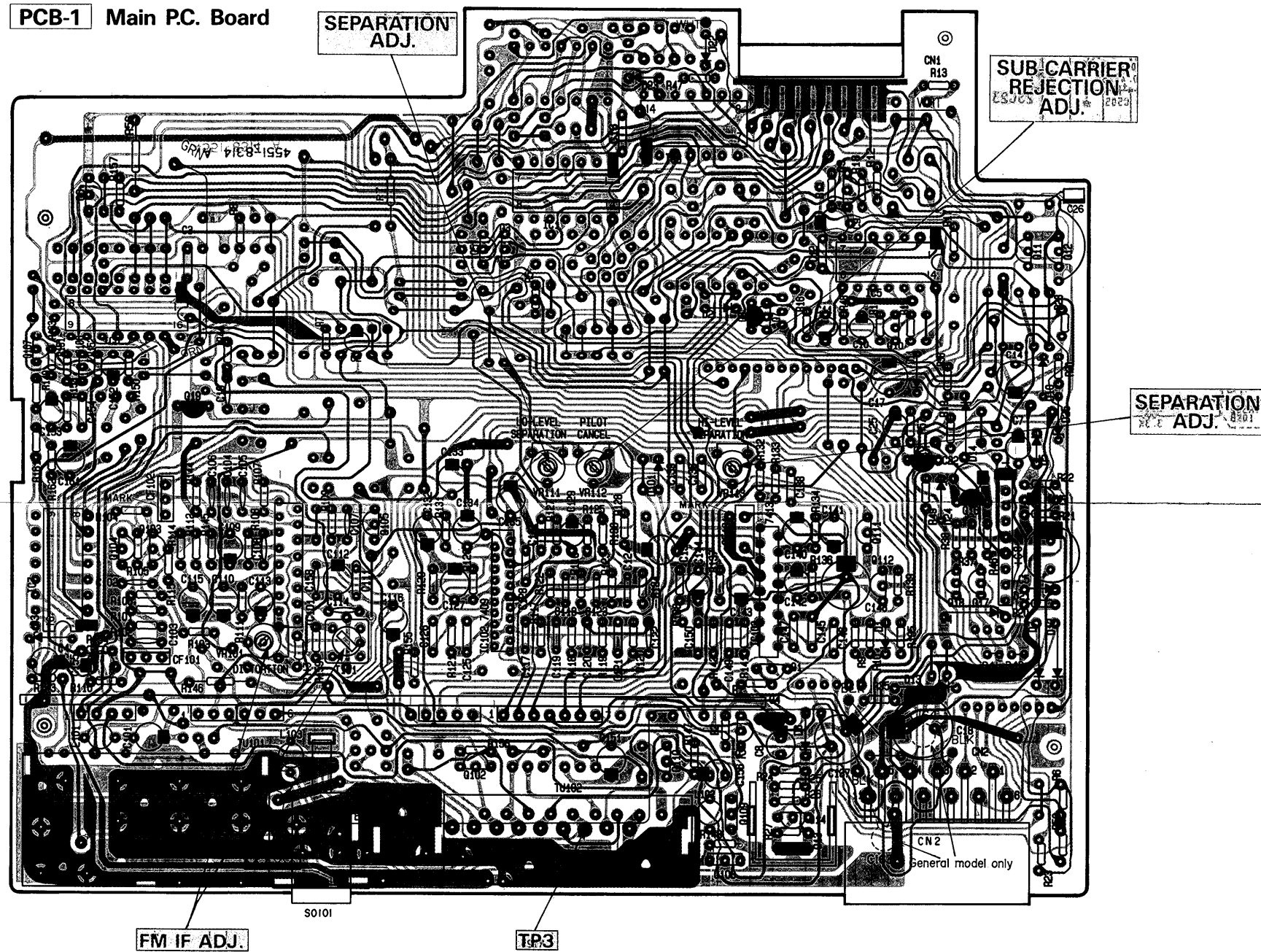




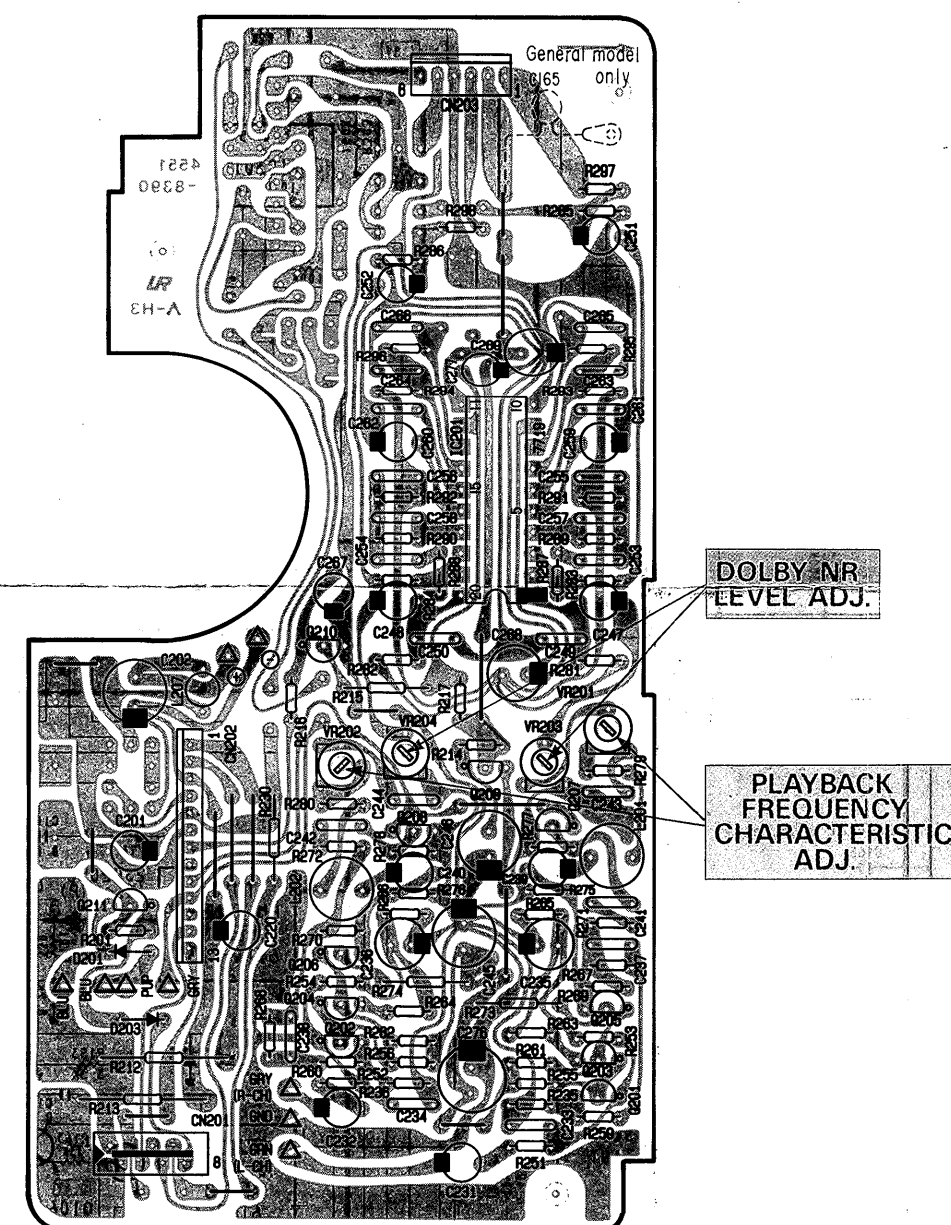


P. C. BOARDS

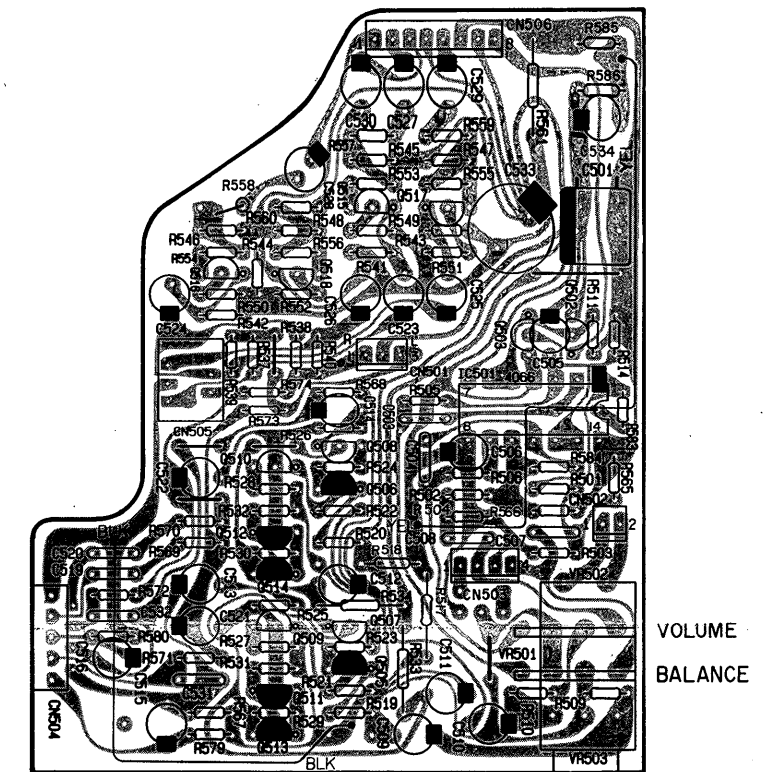
PCB-1 Main P.C. Board



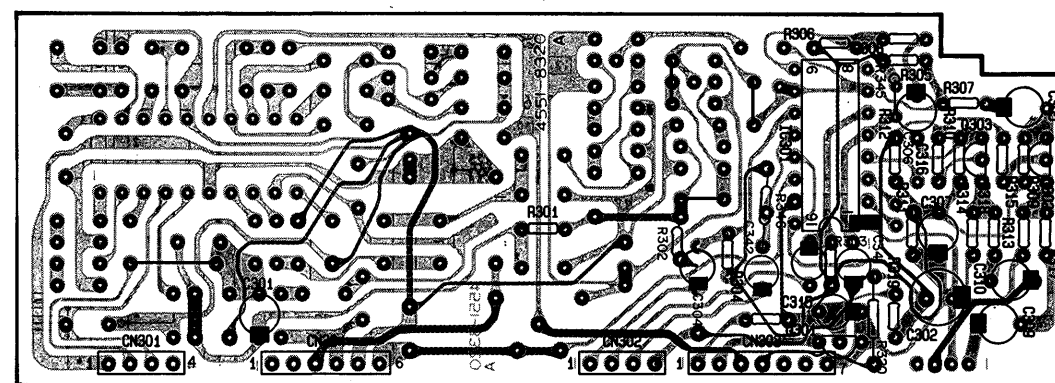
PCB-2 Mecha Control and Dolby NR P.C. Board



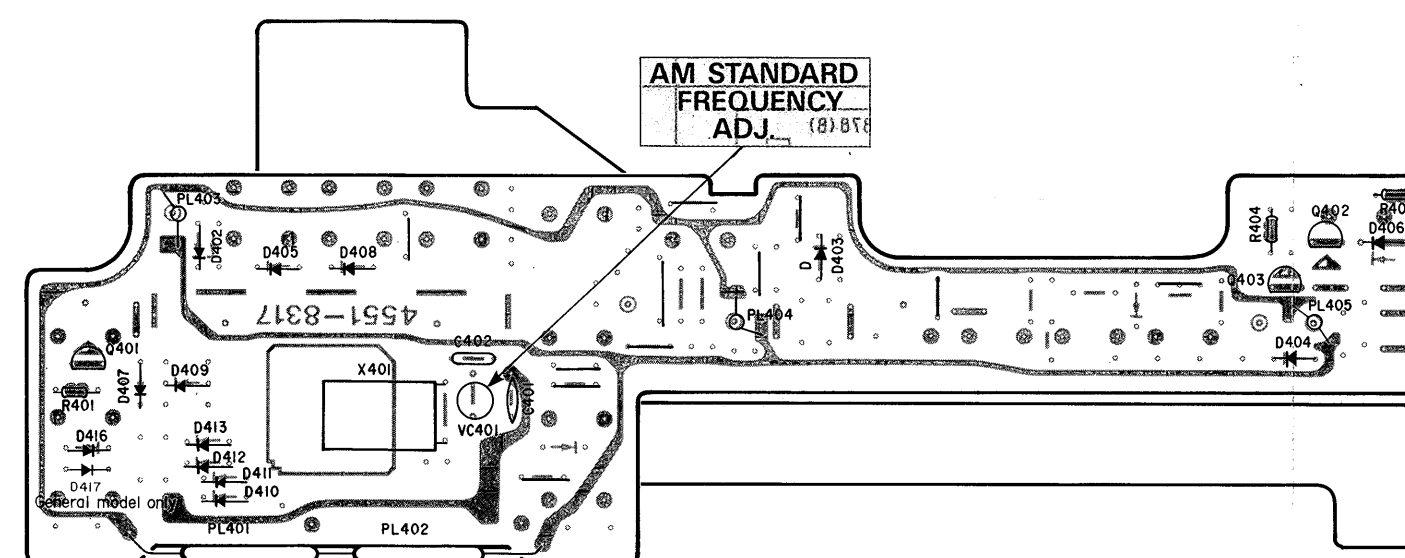
PCB-3 Volume P.C. Board



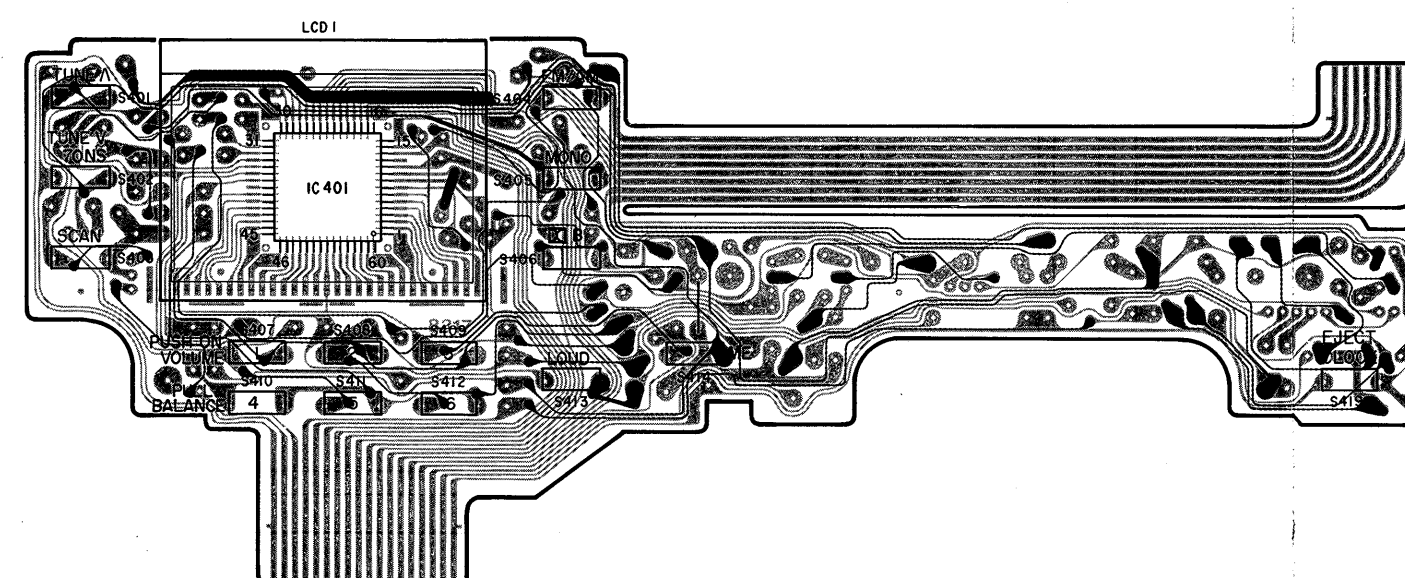
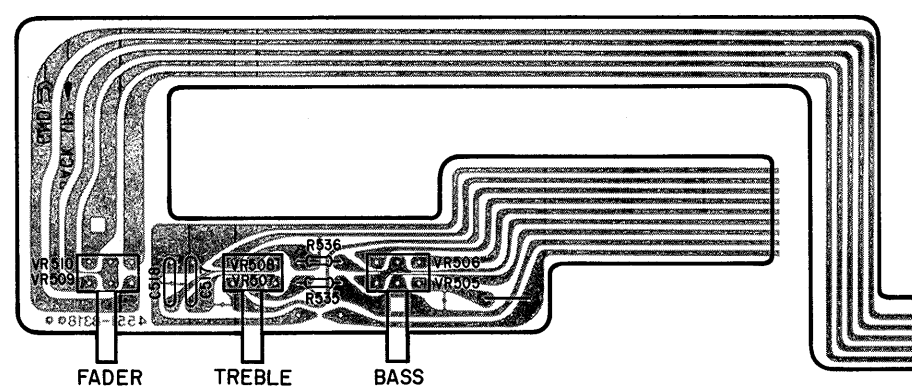
PCB-4 SIG Switching P.C. Board



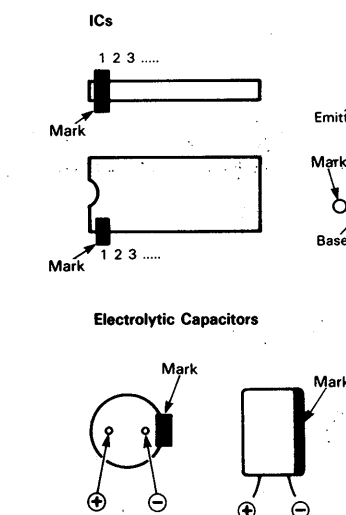
PCB-5 LCD P.C. Board



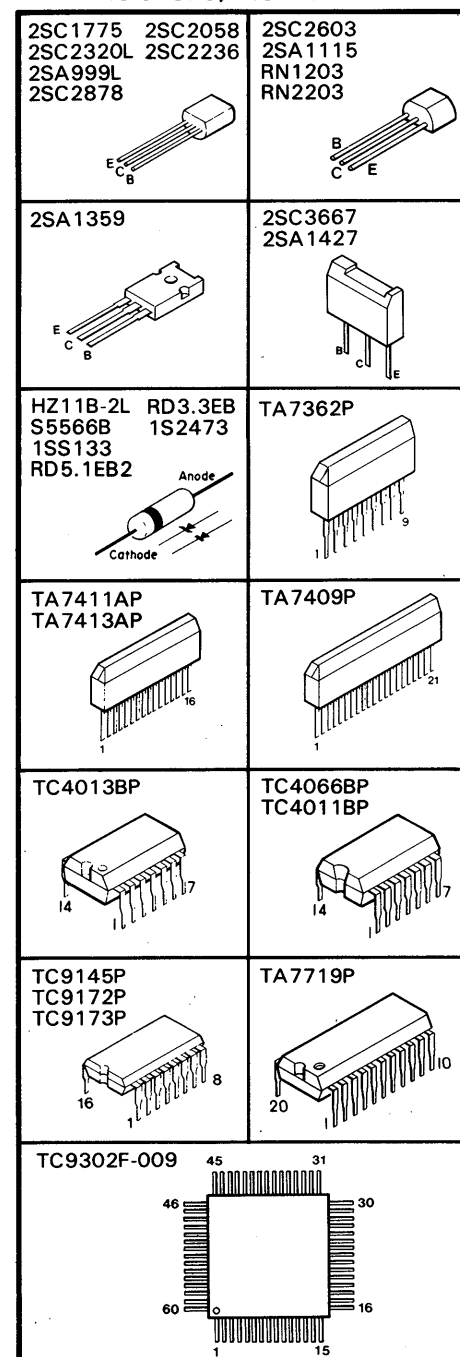
PCB-6 Tone Control P.C. Board



NOTE:
In the figures of the P. C. Boards, a mark is provided on the base side of the transistor.

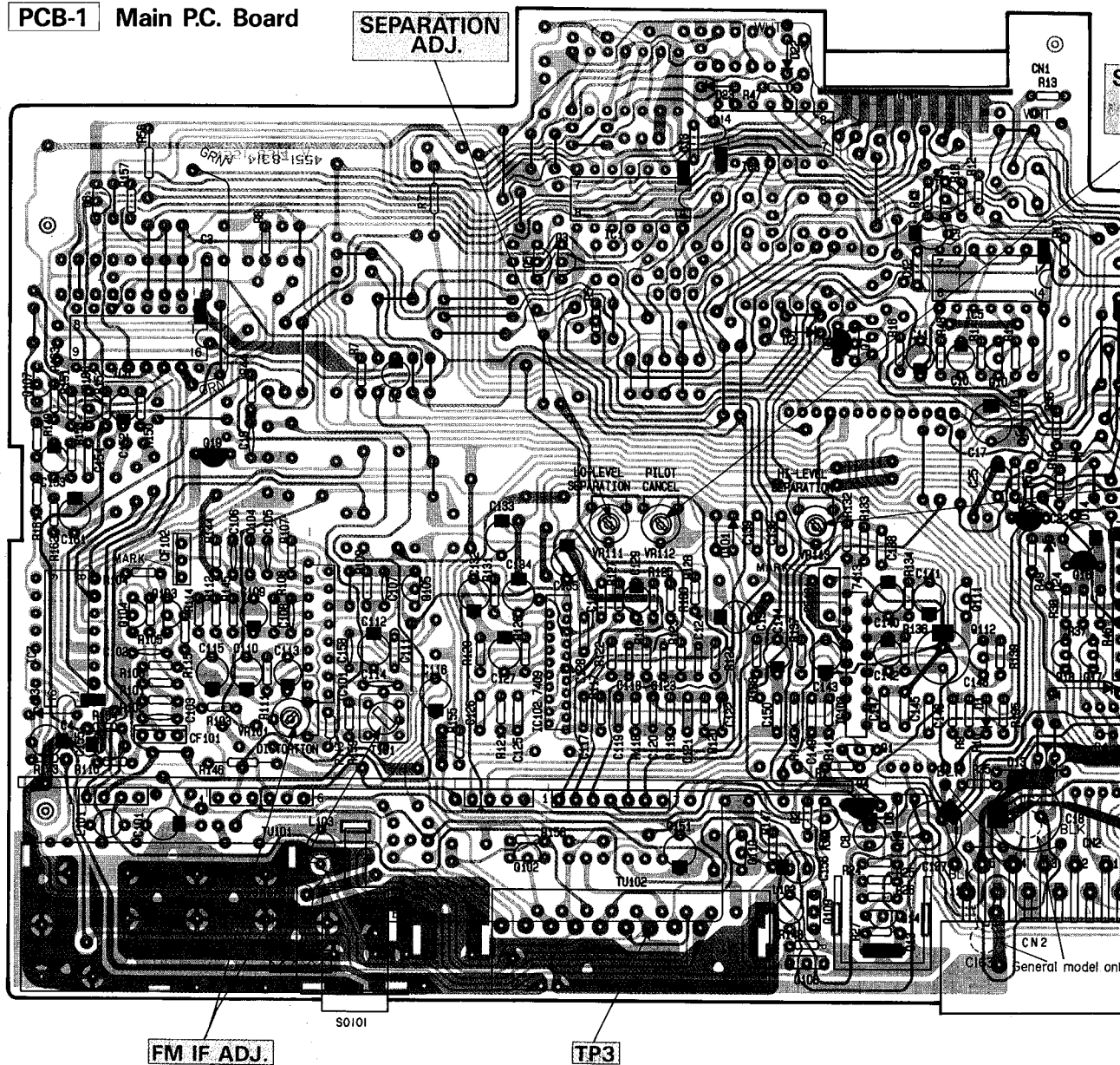


PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICs..

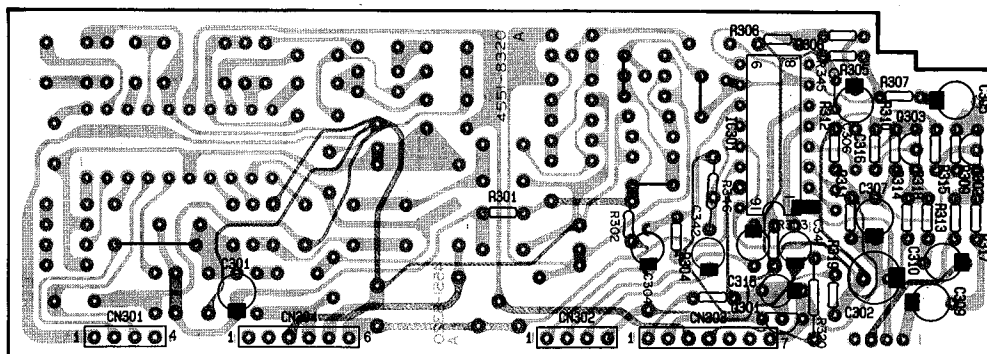


P. C. BOARDS

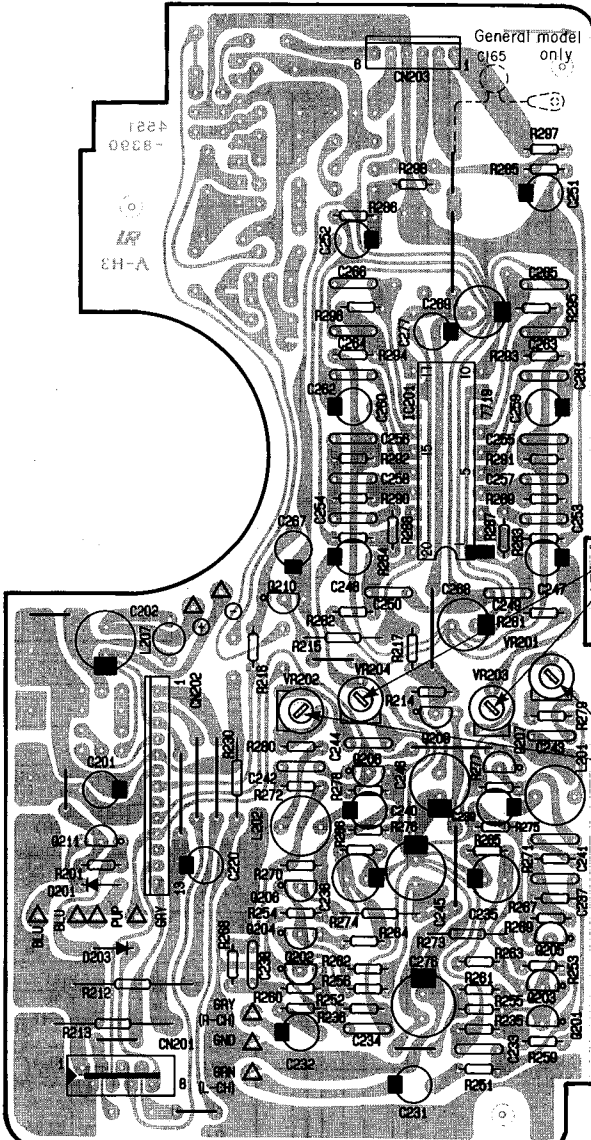
PCB-1 Main P.C. Board



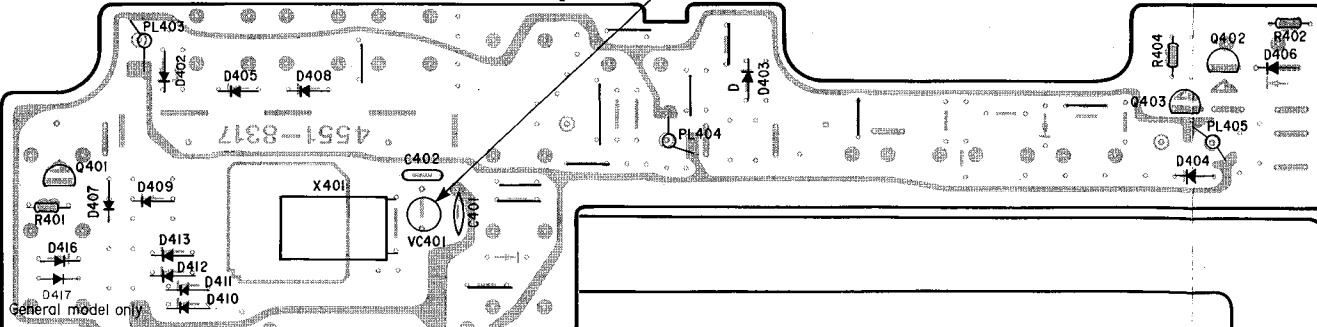
PCB-4 SIG Switching P.C. Board



**Mecha Control and Dolby
NR P.C. Board**



LCD P.C. Board

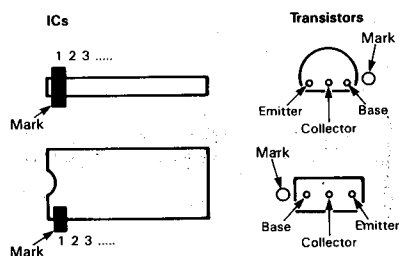


VOLUME
BALANCE

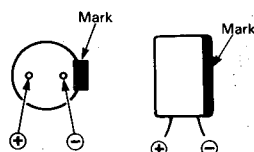
**DOLBY NR
LEVEL ADJ.**

**PLAYBACK
FREQUENCY
CHARACTERISTIC
ADJ.**

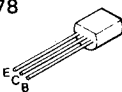
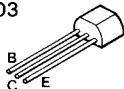
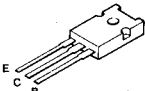
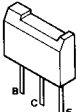
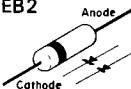
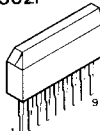
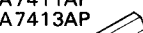
NOTE:
In the figures of the P. C. Boards, a mark is provided on the base side of the transistor.

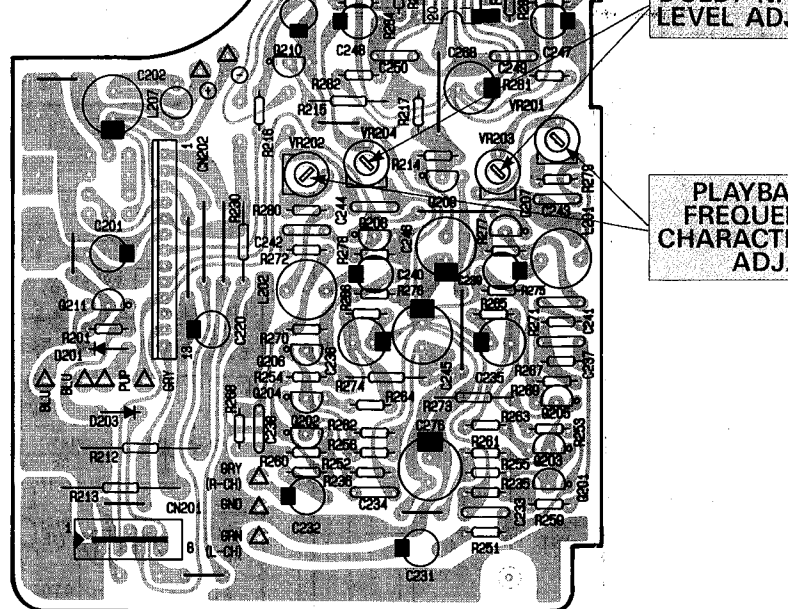
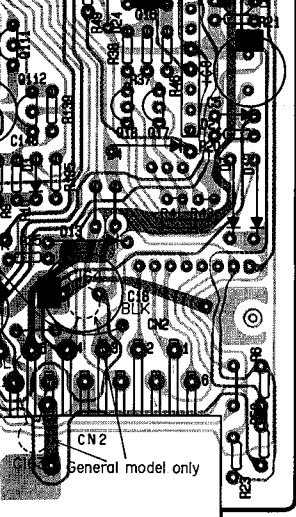


Electrolytic Capacitors

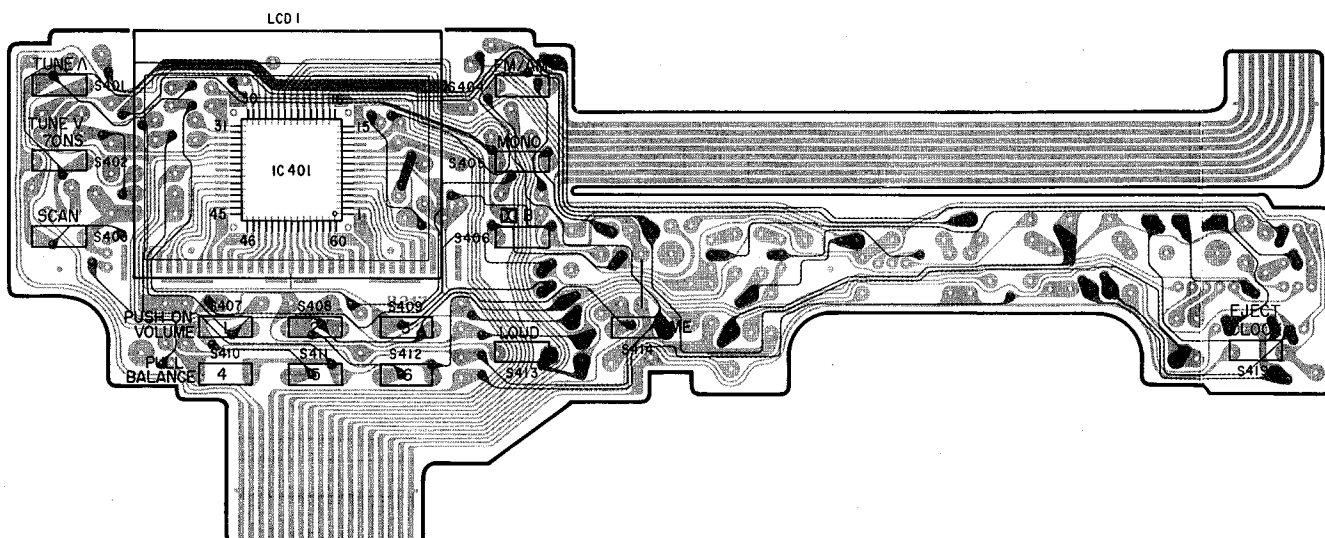
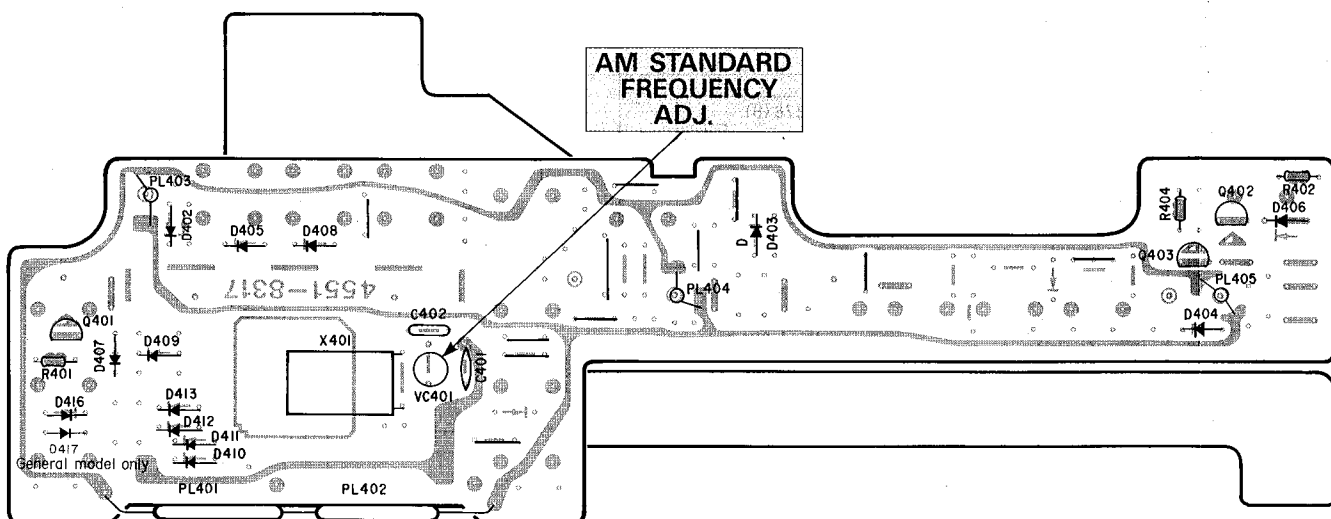


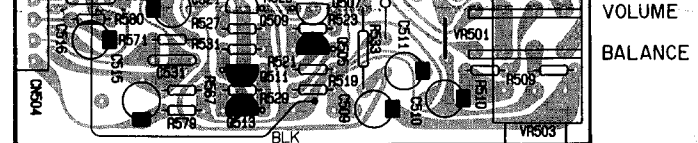
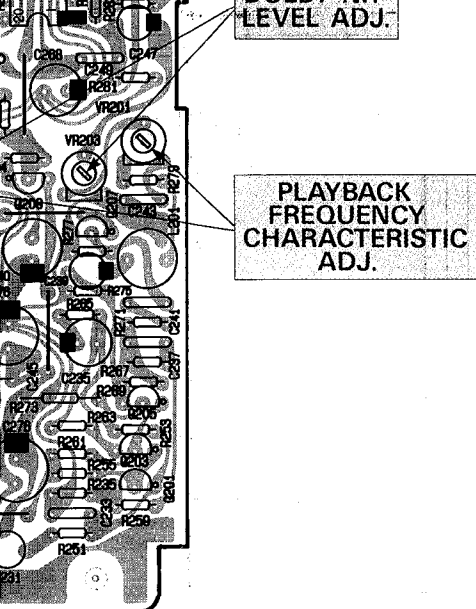
PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICS..

2SC1775 2SC2058 2SC2320L 2SC2236 2SA999L 2SC2878 	2SC2603 2SA1115 RN1203 RN2203 
2SA1359 	2SC3667 2SA1427 
HZ11B-2L RD3.3EB S5566B 1S2473 1SS133 RD5.1EB2 	TA7362P 
TA7411AP TA7413AP 	TA7409P 

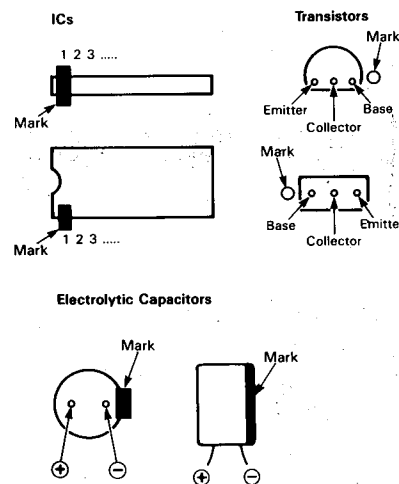


PCB-5 LCD P.C. Board





NOTE:
In the figures of the P. C. Boards, a mark is provided on the base side of the transistor.



PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICS..

2SC1775 2SC2320L 2SA999L 2SC2878	2SC2058 2SC2236	2SC2603 2SA1115 RN1203 RN2203
2SA1359	2SC3667 2SA1427	
HZ11B-2L S5566B 1SS133 RD5.1EB2	RD3.3EB 1S2473	TA7362P
TA7411AP TA7413AP		TA7409P
TC4013BP		TC4066BP TC4011BP
TC9145P TC9172P TC9173P		TA7719P
TC9302F-009		