

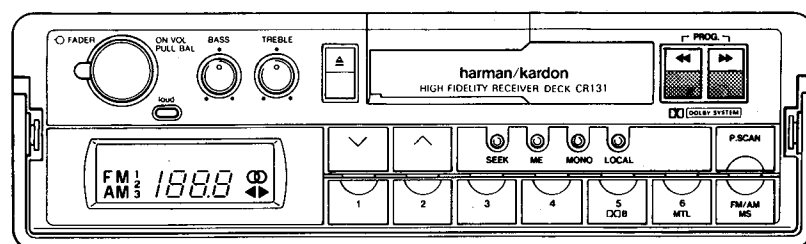
The Harman Kardon Model CR131

Manual 130A

HIGH FIDELITY RECEIVER/DECK

Technical Manual

CR131



harman/kardon

240 Crossways Park West, Woodbury, N.Y. 11797
1112-3152130A4 P-078804 1200 Printed in Japan

SPECIFICATIONS

● FM SECTION

	Nominal	Limit
Tuning Range	87.9MHz ~	107.9MHz
Usable Sensitivity	10dBf	≤ 16dBf
Quieting Sensitivity		
Mono	13.5dBf	≤ 20dBf
Stereo	30dBf	≤ 35dBf
Signal to Noise Ratio		
Mono	74dB	≥ 68dB
Stereo	67dB	≥ 60dB
IF Rejection (88.1MHz)	89dB	≥ 75dB
Image Rejection (98.1MHz)	55dB	≥ 50dB
AM Suppression	43dB	≥ 40dB
Capture Ratio	2.5dB	≥ 3dB
Selectivity (±400kHz)	74dB	≥ 56dB
Distortion (Stereo)		
(65dBf, 100%)	0.27%	≤ 0.5%
Frequency Response		
(±3dB)	20Hz ~	15kHz
MPX Separation at 1kHz	41dB	≥ 33dB
Output Level (75kHz dev.)	550mV	± 3dB

● AM SECTION

Tuning Range	630kHz ~	1620 kHz
Signal to Noise Ratio	48dB	≥ 45dB
IF Rejection (600 kHz)	60dB	≥ 50dB
Image Rejection (1400kHz)	55dB	≥ 50dB
Selectivity (±9kHz)	50dB	≥ 45dB
Sensitivity (1000kHz)	33 μ V	≤ 50 μ V

● AUDIO SECTION

	Nominal	Limit
Tone Control Action		
Bass (50Hz)	12dB	± 1.5dB
Treble (10kHz)	12dB	± 1.5dB
Loudness Action (50Hz/30kHz)	11dB	± 3dB/3dB ± 2dB
Output Impedance	680 Ω	
Line Output Level/Load	0.8V/10kohm	
Power Output per channel,		
4ohm at 1% THD, 20Hz to 20kHz	12Watts	

● CASSETTE TAPE DECK SECTION

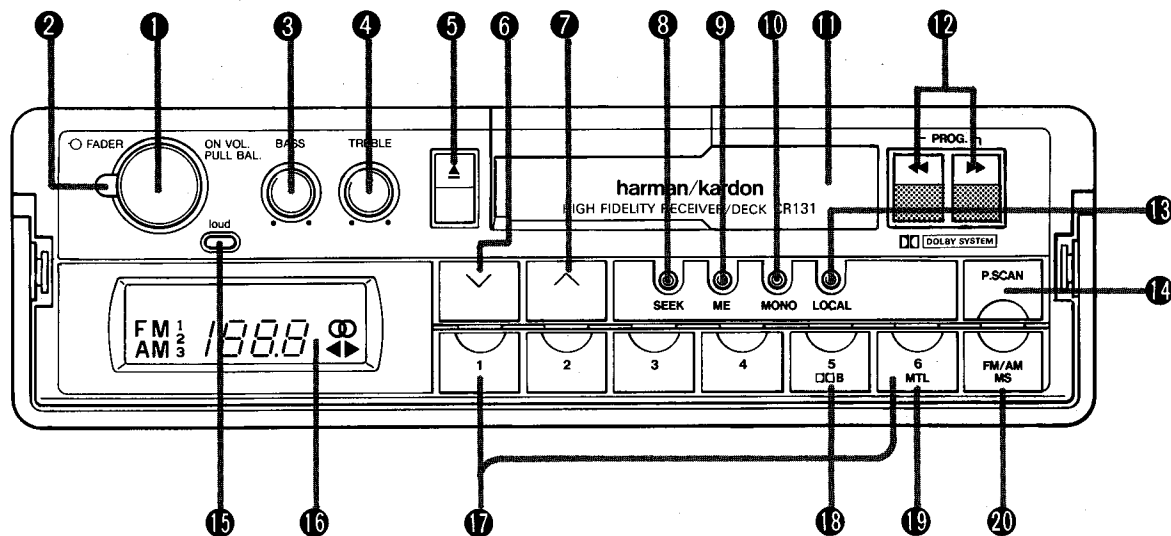
Wow and Flutter (WRMS)	0.09% ≤ 0.2%
Tape Speed (4.75cm/sec.)	+1% ≤ +3% -1%
FF and REW Time	
(for C-60 tape)	90sec. < 120sec.
Signal to Noise Ratio (CrO ₂)	
Dolby* NR Off	52dB ≥ 49dB
Dolby NR Type B	62dB ≥ 58dB
Distortion	1.2% ≤ 2%
Frequency Response	30Hz ~ 18kHz
Separation	46dB ≥ 35dB
Crosstalk	56dB ≥ 50dB
Output Level (Volume Max.)	775mV ± 3dB

These specifications are service target specs.

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

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

CONTROLS & INDICATORS



① ON-OFF switch/VOLUME control/BALANCE control

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. Pull it out and turn it clockwise or counterclockwise to balance the sound. It has center click to indicate the balance of the left and right channels.

② FADER control

This control adjusts the balance of front and rear level

when using a four-speaker system. Turn this control downward to increase the front level or upward to increase the rear level. Master volume can be adjusted using the VOLUME control knob. Set it to the center click position when using a control two-speaker system.

③ BASS control

This knob controls the low frequency sounds. Access the knob by pushing it, then turn it clockwise to boost or counterclockwise to reduce the low frequency sound level. It has center click to indicate flat frequency response.

④ TREBLE control

This knob controls the high frequency sounds. Access the knob by pushing it, then turn it clockwise to boost or counterclockwise to reduce the high frequency sound level. It has center click to indicate flat frequency response.

⑤ ▲ (eject) button

Push this button to eject the cassette.

⑥ ∨ (tuning down) button

When this is pressed, the tuner frequency decreases. In FM mode, frequency display moves in 0.2MHz steps. In AM, the display moves in 10kHz steps. If this button is pressed continuously, the frequencies are displayed in backwards order.

⑦ ∧ (tuning up) button

When this is pressed, the tuner frequency increases. If this button is pressed continuously, the frequencies are displayed in forwards order.

⑧ SEEK button

Press this button to search for a broadcast station. When this is pressed, the button illuminates, and activates the automatic seek function. Press the ∧ or ∨ button while the indicator is lit, to activate automatic scan. Once the broadcast signal is found, scanning stops automatically. To cancel the automatic seek mode, press this button once again.

⑨ ME(memory) button

This button is used to enter the preset stations. When this button is pressed, it illuminates for 5 seconds. This indicates that the memory standby state is activated.

⑩ MONO button

When an FM stereo signal is received poorly, press this button. The button will light and the signal will be received as a monaural broadcast.

⑪ Cassette loading slot

Insert a cassette here with the tape side to the right.

⑫ PROG. button

Press the ►► button to advance the tape at fast speed. Press the ◀◀ button to rewind the tape. To press the ►► and ◀◀ buttons at the same time, switch between the A and B sides of the cassette tape. At this time, the LCD display changes the indicator ◀ or ►.

⑬ LOCAL button

This feature allows the seek function to only stop at strong broadcasts.

⑭ P. SCAN button

This button is used to briefly sample the six stations that have been preset in the selected band.

⑮ Loud button

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

⑯ LCD display

When a broadcast is being received, the band (FM1, FM2, FM3, AM) and the frequency will be displayed. The  indicator will illuminate when an FM stereo broadcast is received. During playback, the ◀ or ► indicator will light and indicate the playback direction.

⑰ Preset memory button (1-6)

Press preset memory buttons to memorize a station, or to select the same station after it has been memorized. A total of 18 FM stations and 6 AM stations can be memorized.

⑱ Dolby B NR button

This button is used to play back a tape that has been recorded with Dolby B NR. When this button is pressed, the indicator lights up. If you are not using Dolby B NR, press this button once again.

⑲ MTL button

Press when using metal or CrO₂ tape. The indicator illuminates.

⑳ FM/AM (band)/MS (music search) button

In the tuner mode, press this button to select FM1, FM2, FM3 or AM. Each of these bands has six memory presets. The P. SCAN button will only scan the preset in the band selected.

In the tape playback mode, press this button to activate the music search mode. The indicator will light up. During this mode, pressing ►► or ◀◀ button will advance the tape to the beginning of the next song, or the beginning of the current song, respectively.

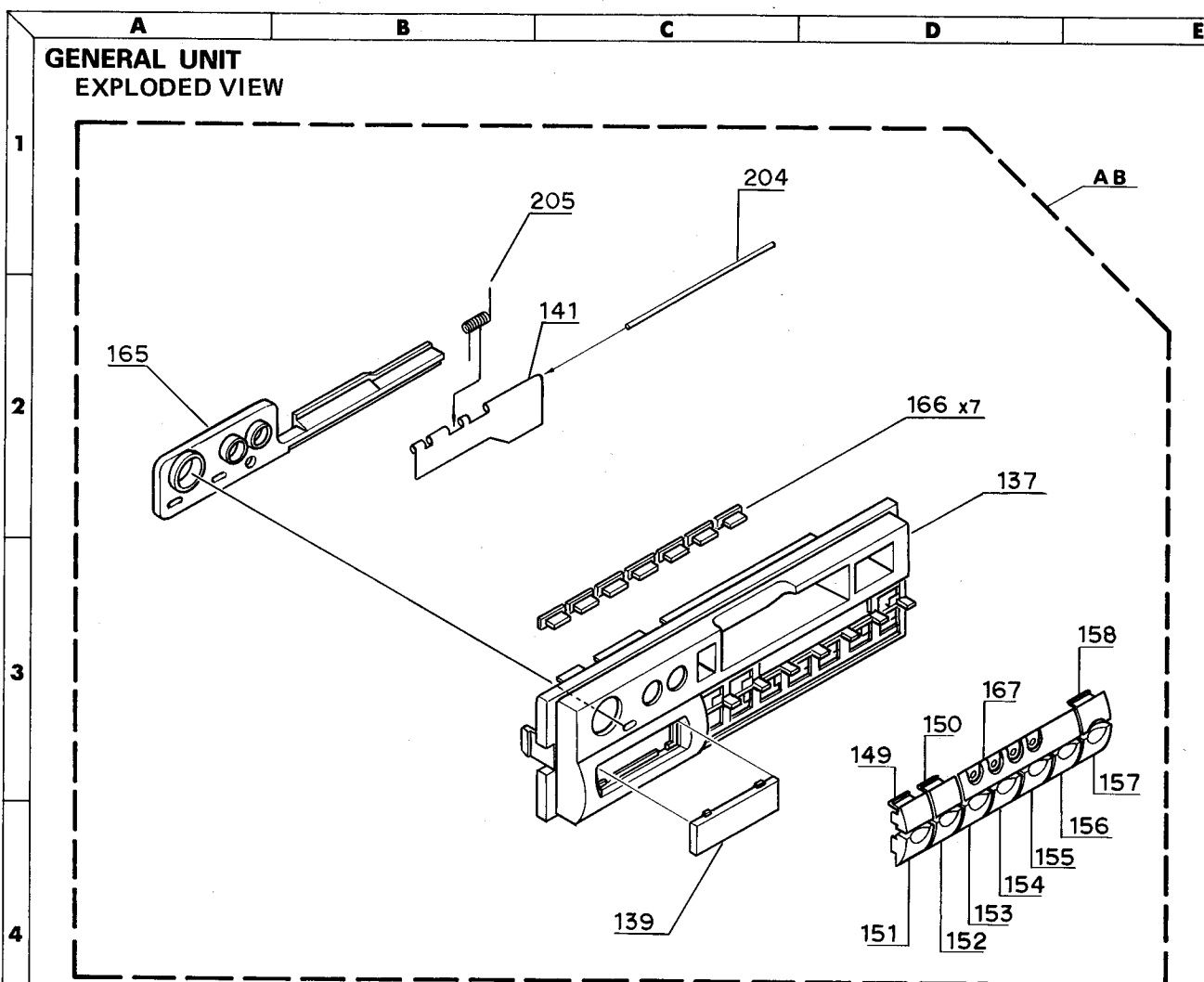
DISASSEMBLY PROCEDURES (REFER TO PAGES 4, 5, 6 AND 28)

1 CASSETTE TAPE PLAYER MECHANICAL ASSEMBLY (221) REMOVAL

1. Remove 2 screws (A), then remove Cabinet Top (AA).
2. Remove 3 screws (B), then remove Cabinet Bottom (136).
3. Remove 4 screws (C), then remove the Handle (169) and the Front Frame (140).
4. Pull out the Volume Knob (143), Fader Knob (144) and Bass and Treble Knobs (145). With releasing the right and left catches, remove the Front Panel (AB).
5. Remove 3 screws (D) and then remove the Cassette Tape Player Mechanical Assembly (221). Also disconnect the connectors (LCN201 and LCN202) from CN201 and CN202 on the PCB-1. Remove 4 screws (G), then Metal Fitting (184) from Cassette Tape Player Mechanical Assembly (221).

2 P.C. BOARDS REMOVAL

1. Remove the Cassette Tape Player Mechanical Assembly (221), referring to the previous step 1.
2. Remove 2 screws (H) and unsolder PCB-7, PCB-7 soldered pattern side of PCB-1, then remove the PCB-7.
3. Remove 15 screws (E). Remove the Metal Fittings (182) (183).
4. Remove the Loudness Knob (147), 3 nuts (E) and 1 screw (F). Remove PCB-5 with PCB-6 also disconnect the connectors (LCN501 and LCN102) from CN401 and CN402 on the PCB-6 and the connectors (LCN101 and LCN103) from CN302 and CN301 on the PCB-5. Pull out the PCB-4 from PCB-1. Unsolder pins of connectors CN501, CN502 and CN503 soldered pattern side of PCB-1, then remove the PCB-2 and PCB-3.



PARTS LIST

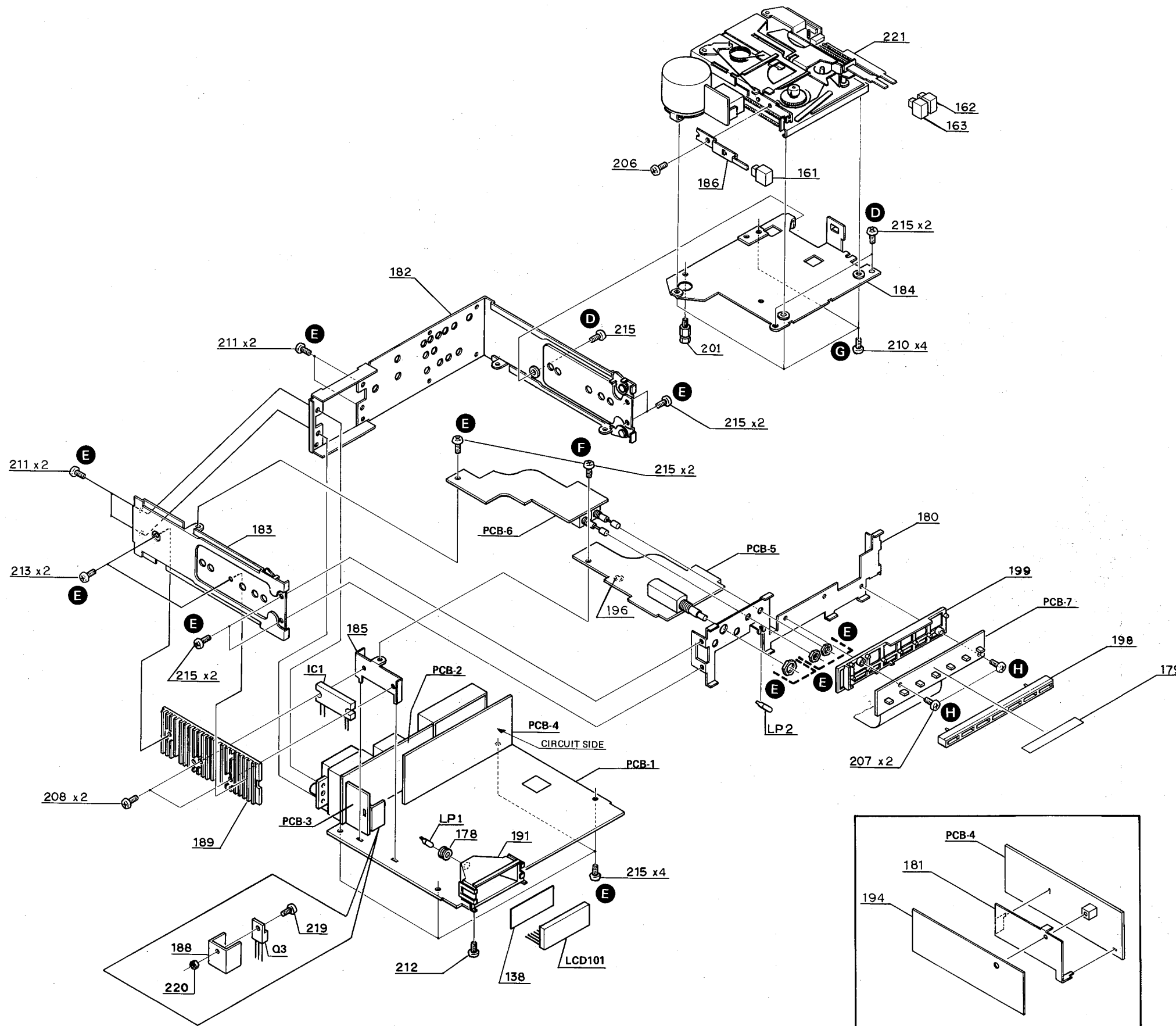
Ref. No.	Part No.	Description
AB	A442-CR131A	FRONT PANEL ASS'Y
137	1442-17901	PANEL
139	1532-15301	WINDOW
141	1614-00602	CASS LID
149	1662-37501	PUSH BUTTON
150	1662-37502	PUSH BUTTON
151	1662-37601	PUSH BUTTON
152	1662-37602	PUSH BUTTON
153	1662-37603	PUSH BUTTON
154	1662-37607	PUSH BUTTON

Ref. No.	Part No.	Description
155	1662-37605	PUSH BUTTON
156	1662-37606	PUSH BUTTON
157	1662-37701	PUSH BUTTON
158	1662-37801	PUSH BUTTON
165	1732-04501	INDICATOR
166	1732-04601	INDICATOR LED
167	1742-05101	ORNAMENT
204	2601-7152	SHAFT CASS
205	2651-0000207	SPRING CASS

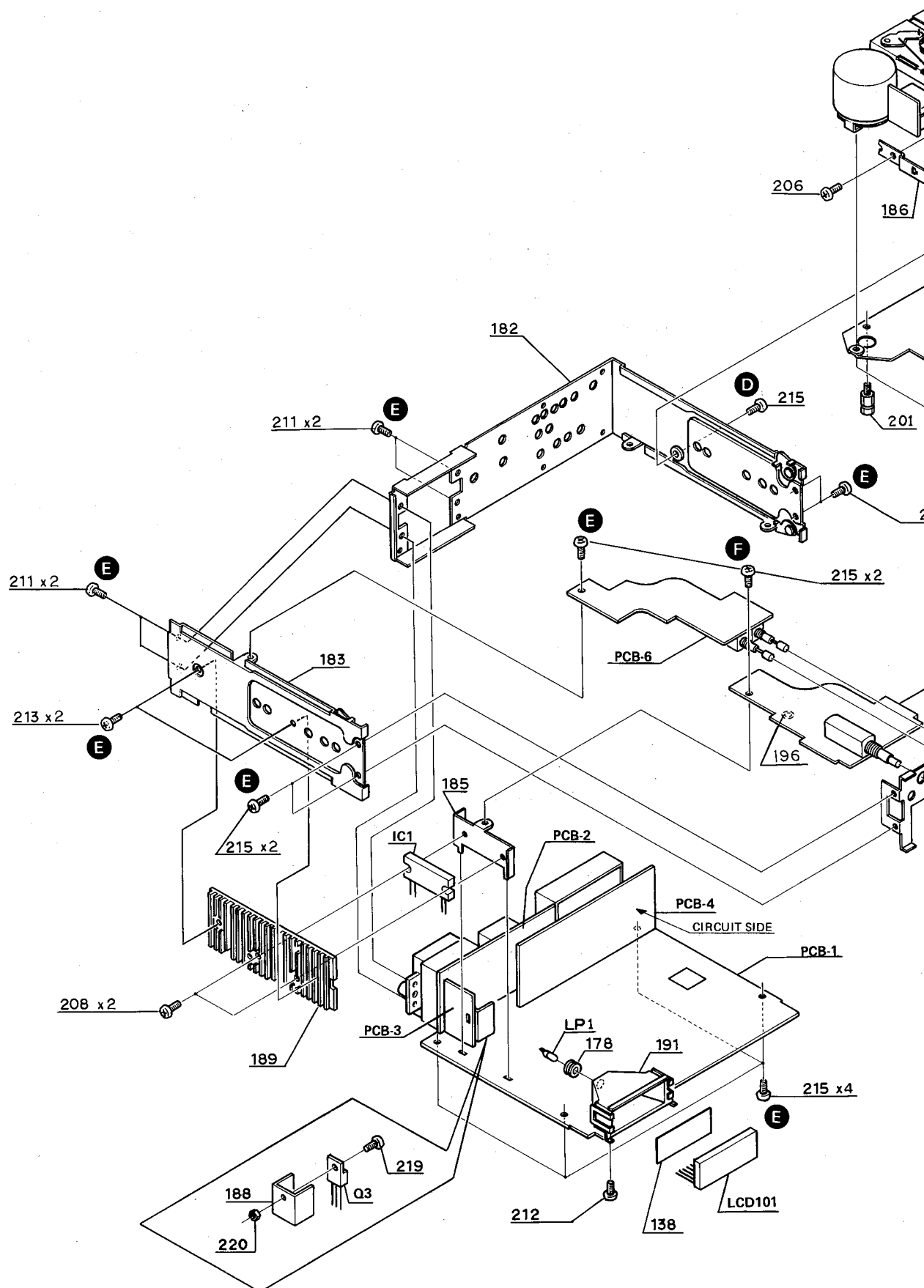
EXPLODED VIEW

PARTS LIST

Ref. No.	Part No.	Description
138	1511-14701	PLATE
161	1662-38201	PUSH BUTTON
162	1662-38301	PUSH BUTTON
163	1662-38401	PUSH BUTTON
178	2114-01306	BUSHING
179	2132-7158	SPACER
180	2211-7301	CHASSIS
181	2216-7171	SHIELD PLATE
182	2219-8224	METAL FITTG
183	2219-8225	METAL FITTG
184	2219-8229	METAL FITTG
185	2219-8222	METAL FITTG
186	2219-8223	METAL FITTG
188	2222-7194	HEAT SINK
189	2222-7242	HEAT SINK
191	2223-7059	REFLECTOR
194	2224-7123	INSULATOR
196	2402-0374	WASHER, PLSTC
198	2240-7343	HOLDER
199	2240-7344	HOLDER
201	2362-96742	BOSS, THREAD
206	2327-260329	SCREW, BND+
207	2327-260829	SCREW, BND+
208	2327-261029	SCREW, BND+
210	2327-300429	SCREW, BND+
211	2347-300827	SCREW, BND T+
212	2347-R0120052	SCREW, BND T+
213	2347-R0126082	SCREW, BND T+
215	2342-260527	SCREW, PAN T+
219	2327-R0130082	SCREW, BND+
220	2440-7016	NUT, SPECIAL
221	3115-00301	TAPE PLAYER MECHA
LCD101	5791-TP4K6011	LCD
LP1	5731-00501141	LAMP
LP2	5731-00402141	LAMP



EXPLODED VIEW



F

G

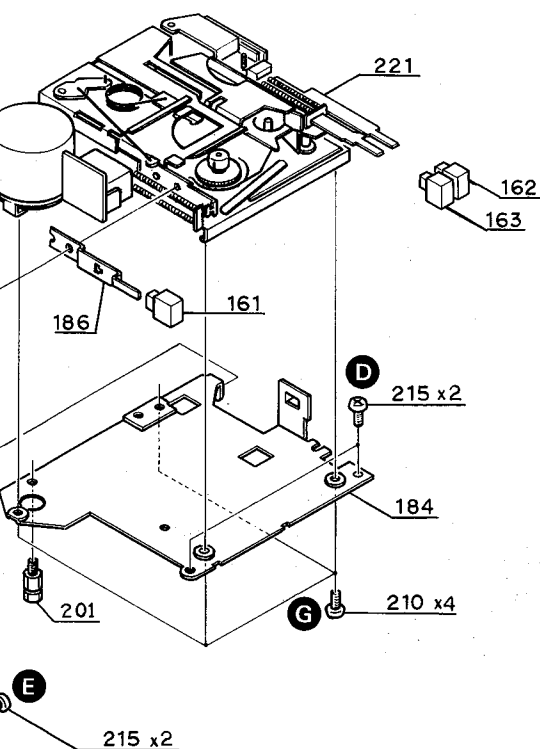
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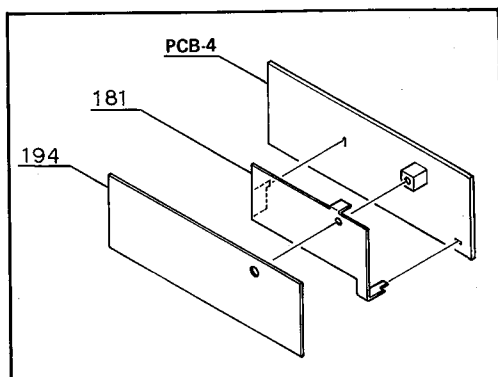
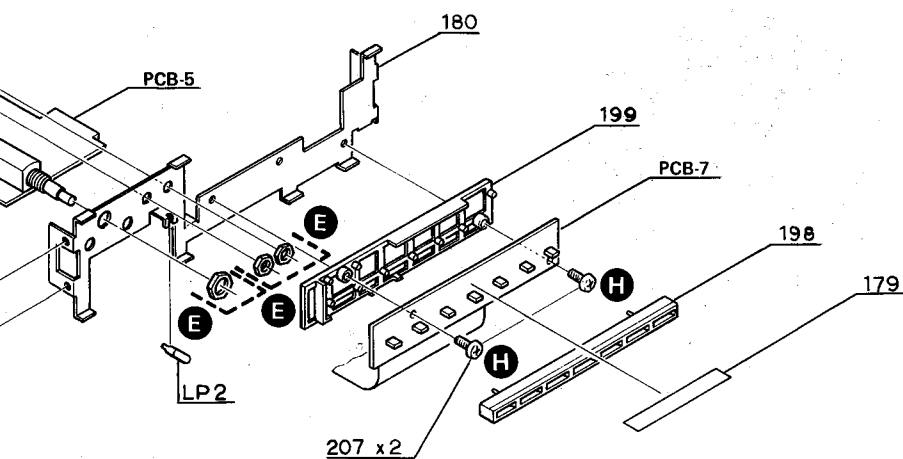
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207	2327-260829	SCREW, BND+
208	2327-261029	SCREW, BND+
210	2327-300429	SCREW, BND+
211	2347-300827	SCREW, BND T+
212	2347-R0120052	SCREW, BND T+
213	2347-R0126082	SCREW, BND T+
215	2342-260527	SCREW, PAN T+
219	2327-R0130082	SCREW, BND+
220	2440-7016	NUT, SPECIAL
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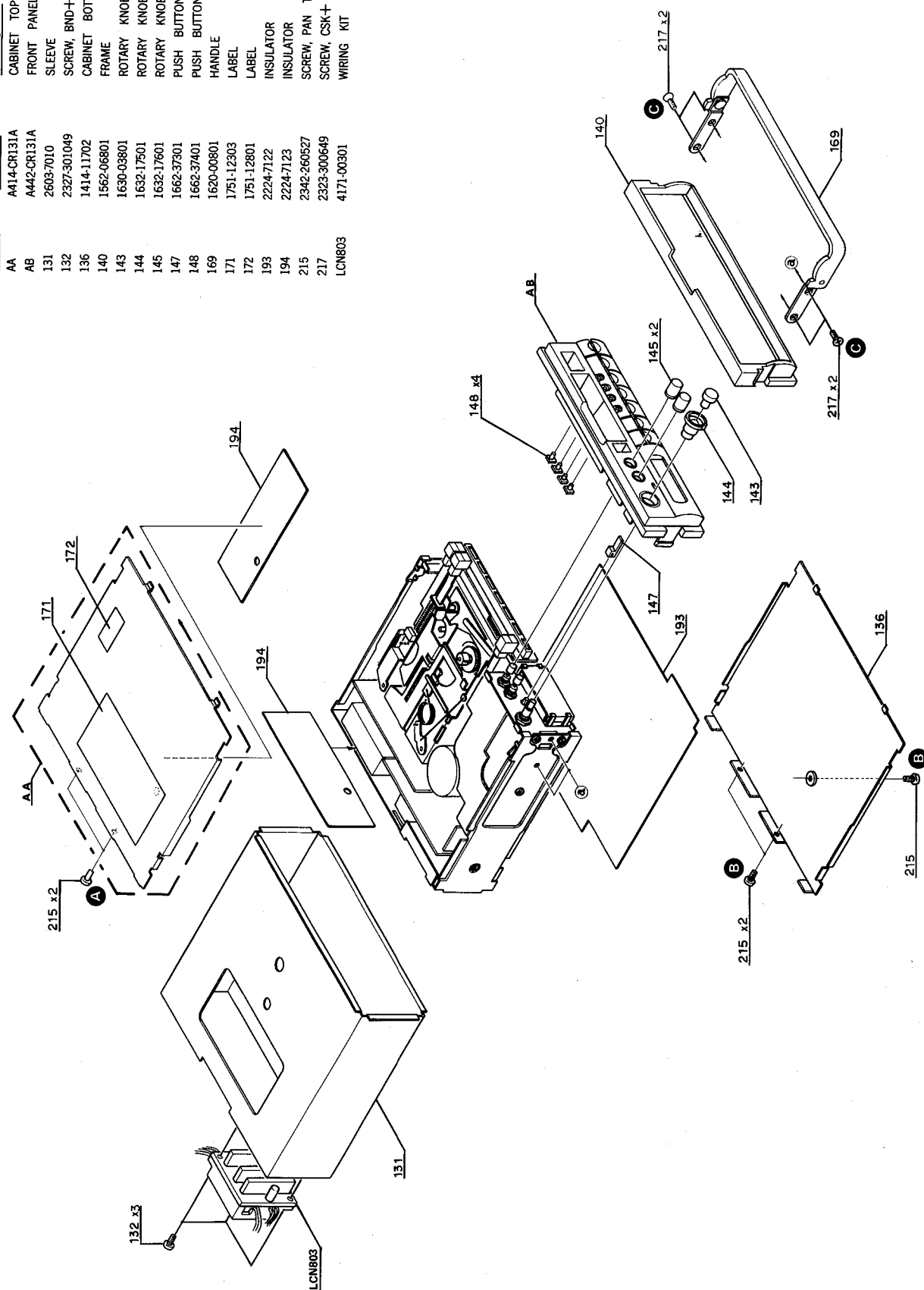
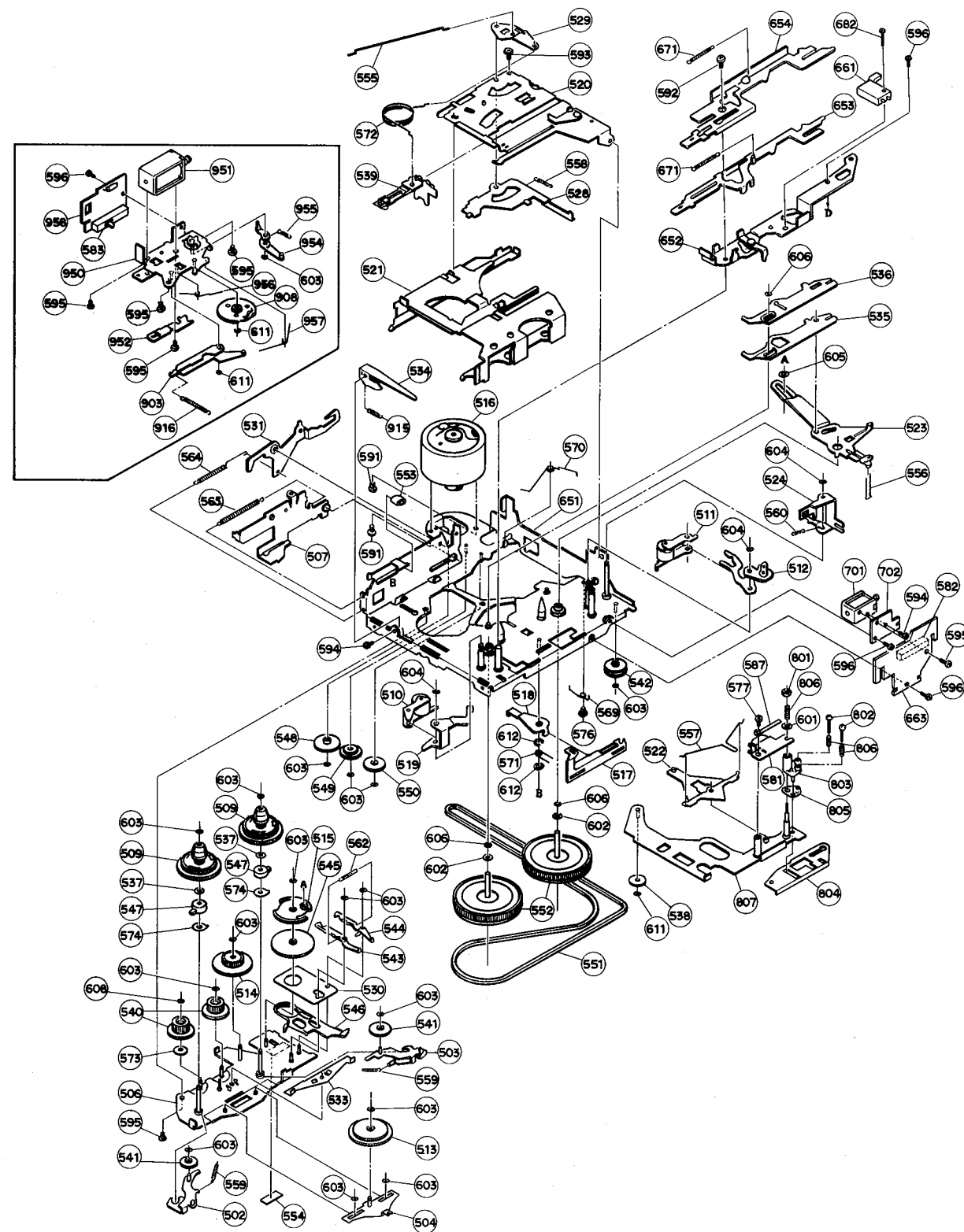
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PARTS LIST

Ref. No.	Part No.	Description
AA	A414-CR131A	CABINET TOP ASSY
AB	A442-CR131A	FRONT PANEL ASSY
131	2603-7010	SLEEVE
132	2327-301049	SCREW, BND+
136	1414-11702	CABINET BOTTOM
140	1562-06801	FRAME
143	1630-03801	ROTARY KNOB
144	1632-17501	ROTARY KNOB
145	1632-17601	ROTARY KNOB
147	1662-37301	PUSH BUTTON
148	1662-37401	PUSH BUTTON
169	1620-00801	HANDLE
171	1751-12303	LABEL
172	1751-12801	INSULATOR
193	2224-7122	INSULATOR
194	2224-7123	SCREW, PAN T+
215	2342-260527	SCREW, CSK+
217	2323-300649	SCREW, CSK+
LCN803	4171-00301	WIRING KIT

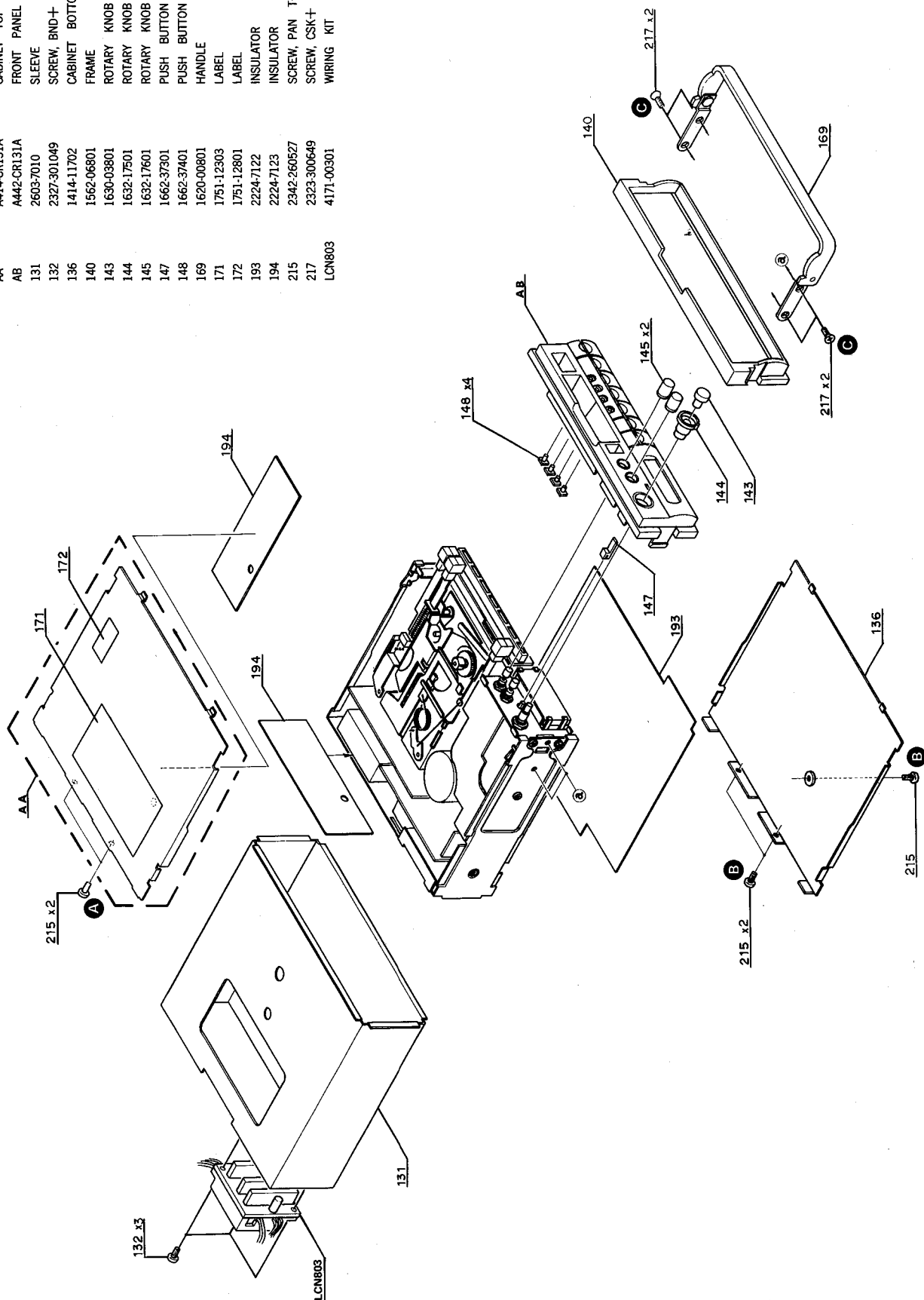
EXPLODED VIEW

CASSETTE TAPE PLAYER MECHANISM
EXPLODED VIEW

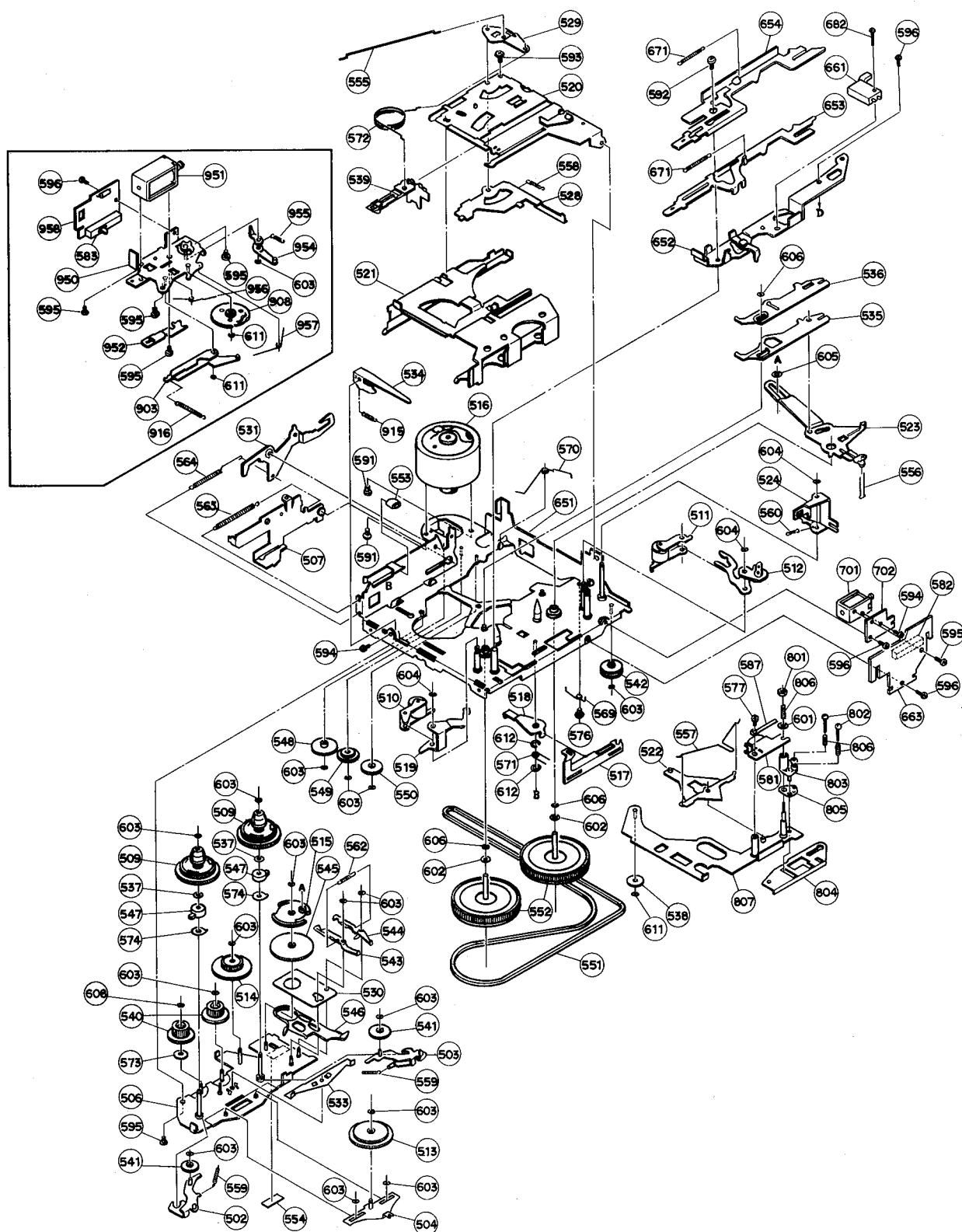
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172	1751-12801	LABEL
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194	2224-7123	INSULATOR
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217	2323-300649	SCREW, CSK+
LCN803	4171-00301	WIRING KIT



CASSETTE TAPE PLAYER MECHANISM **EXPLODED VIEW**



PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
502	D002-E11/1	GEAR PLATE ASS'Y A	594	M2 x 2	PRECISION SCREW
503	D002-E11/2	GEAR PLATE ASS'Y B	595	M2 x 3	PRECISION SCREW
504	D003-E05	FR GEAR PLATE ASS'Y	596	M2 x 3	PRECISION SCREW
506	D010-D02	REEL PLATE ASS'Y	601	Z200-E03/58	WASHER
507	D012-E05/2	EJECT LEVER ASS'Y	602	Z204-E01/5	PS WASHER
509	D016-E12/2	REEL GEAR ASS'Y	603	Z205-E01/1	PS WASHER
510	D017-E11/1	PINCH ROLLER ASS'Y A	604	Z205-E01/3	PS WASHER
511	D017-E11/2	PINCH ROLLER ASS'Y B	605	Z205-E01/7	PS WASHER
512	D022-E09	TURN LEVER ASS'Y	606	Z205-E01/8	PS WASHER
513	D040-E02	FR GEAR ASS'Y	608	Z204-E01/13	PS WASHER
514	D043-E01	TAKE UP GEAR ASS'Y	611	Z100-E01/01	E RING
515	D044-E01	CHANGE GEAR ASS'Y	612	Z100-E01/08	E RING
516	D025-E07/1	MOTOR ASS'Y	651	D001-CD10/2	MAIN CHASSIS ASS'Y
517	D112-E06	FR CAM B	652	D013-E08/2	SIDE PLATE ASS'Y
518	D112-E07	FR CAM C	653	D155-DE14/1	FR LEVER A
519	D112-E10	FR CAM D	654	D155-DE15/1	FR LEVER B
520	D008-E05	ACTION PLATE ASS'Y	661	MLS-15	MICRO LEAF SWITCH
521	D122-C03	CASSETTE CASE	663	PC-249-2	SWITCH P.C.B (A)
522	D152-E06	CHANGE LINK A	671	Z701-E36	FR LEVER SPRING
523	D152-D03	CHANGE LINK B	682	M1.7 x 6	PRECISION SCREW
524	D154-E07	FR CANCELL PLATE	701	D030-E10	SOLENOID (APS)
528	D174-E07	TURN PLATE A	702	D206-E03	SUPPORT PLATE
529	D174-E08	TURN PLATE B	801	M1.7	NUT
530	D184-E02	THRUST SHEET	802	D230-E04	SCREW
531	D192-E02	ACTION ARM	803	D231-E01	AZIMATH CAM
533	D201-E03	SENDER LEVER A	804	D232-E01	AZIMATH CAM PLATE A
534	D202-E06	LOCK PLATE B	805	D232-E02	AZIMATH CAM PLATE B
535	D214-E03	CHANGE LEVER A	806	Z712-E16	SPRING
536	D214-E04	CHANGE LEVER B	807	D006-E11/4	HEAD PLATE ASS'Y
537	D135-E06	FRICTION FELT B	950	D027-E03	SUB SHASSIS ASS'Y
538	D117-E16	HEAD PLATE ROLLER B	903	D041-E02/1	MOVING ARM ASS'Y
539	D121-C02	CASSETTE PUSHER	951	D030-E08	PLAY SOLENOID
540	D146-E09	TAKE UP GEAR C	952	D166-E13	ACTUATOR A
541	D146-E10	TAKE UP GEAR D	954	D034-E06	LOCK PLATE C ASS'Y
542	D151-E06/2	IDLE PULLEY	908	D220-C03	SETTING GEAR
543	D156-E05	CAM HOOK A	955	Z701-E32	SPRING
544	D156-E06	CAM HOOK B	916	Z702-E92	SPRING
545	D196-E02	CHANGE GEAR A	915	Z702-E93	SPRING
546	D201-D04	SENDER LEVER B	956	Z722-E06	SPRING
547	D201-E04	SENDER LEVER C	957	Z722-E07	SPRING
548	D212-E08	IDLE GEAR A	958	PC-236-1	SWITCH P.C.B (B)
549	D212-E11	IDLE GEAR B			
550	D212-E10	IDLE GEAR C			
551	D144-E11	BELT			
552	D145-D03	FLY WHEEL			
553	CR60.3-5-6 m/m	TUBE			
554	D135-E08	FELT			
555	D165-E02	COUPLING BAR			
556	D166-E10	ACTUATOR B			
557	D197-E02	PINCH ROLLER SPRING			
558	Z701-E27	SPRING (TURN PLATE)			
559	Z701-E28	SPRING (TAKE UP GEAR PLATE)			
560	Z701-E29	SPRING (FR CANCELL PLATE)			
562	Z702-E85	SPRING (CAM HOOK)			
563	Z702-E86	SPRING (EJECT LEVER)			
564	Z702-E87	SPRING (ACTION ARM)			
569	Z722-E03	SPRING (SENDER LEVER B)			
570	Z722-E04	SPRING (CHANGE GEAR)			
571	Z723-E12	SPRING (FR CAM)			
572	Z730-E01	SPRING (TURN)			
573	P504-E05/3	SPRING			
574	P504-E15	SPRING			
576	D230-E02	SCREW (SENDER)			
577	M2 x 5	HEAD STUD SCREW			
581	617-65-13	HEAD			
582	MIS-AC-3-2S or P061-D4612	SLIDE SWITCH			
583	MIS-AC-3-2N or P061-D451Z	SLIDE SWITCH			
587	D211-E03	CLAMP			
591	M2.6 x 3	SCREW (PAN)			
592	M2.6 x 4.5	SCREW (SEMS)			
593	M2 x 4	PRECISION SCREW			

ALIGNMENT PROCEDURES

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
- Digital volt meter
- Oscilloscope
- Frequency counter

3. Test tapes

- Dolby NR level adjustment MTT-150 or TCC-130
- Azimuth adjustment TCC-153
- Playback frequency characteristic adjustment TCC-162C (NORMAL)
TCC-262 (METAL)
- Music Search operation confirmation MTT-250B
or MTT-112SP

4. Standard load

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

FM Signal Generator	1kHz, 100% modulation
Stereo Modulator	L+R=45.5%, L-R=45.5%, 19kHz=9%

TUNER SECTION

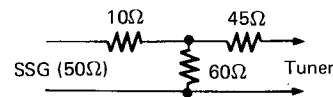
Step	Alignment	Connection Equipments	Mode	Measurement Frequency	Station Display	Adjustment	For
1	IF	● Connect the FM Signal Generator to the Antenna jack through the FM dummy antenna. ● Connect Oscilloscope, Distortion Meter and AC Voltmeter to the line output.	FM	98.1MHz (17dBf)	98.1MHz	T601	Maximum output
2				98.1MHz (65dBf)	98.1MHz	VR601	Minimum distortion
3				98.1MHz (65dBf)	98.1MHz	T601	Connect the digital Voltmeter to TP1 and TP2 on PCB-4. Adjust so that the reading of the digital Voltmeter is $0 \pm 25\text{mV}$.
4	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.	FM Stereo	98.1MHz (65dBf)	98.1MHz	VR604	Minimum output at 19kHz pilot signal only by Stereo Modulator
5	Separation	● Connect Oscilloscope, Distortion Meter and AC Voltmeter to the line output.	FM Stereo	98.1MHz (71dBf)	98.1MHz	VR603	Adjust so that the right channel output becomes minimum when only the left channel of the Stereo Modulator is modulated
						VR603	Adjust so that the left channel output becomes minimum when only the right channel of the Stereo Modulator is modulated.
6				98.1MHz (51dBf)	98.1MHz	VR602	Adjust so that the Separation becomes 30dB
7				Repeat Step 5.			
8				Repeat Step 6 for optimum separation.			

5. General conditions (unless otherwise noted).

CONTROLS AND SWITCHES	SETTINGS
Balance	center
Bass	center
Treble	center
Fader	center
Dolby NR	off
ME	off
MS	off
MTL	off
Loudness	off
Ext. loop	Local
Mono	off

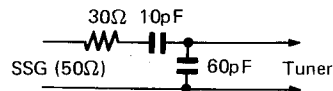
6. Dummy antenna

● FM:IHF



Measurement at receiver input level interm of available power.

● AM:IEC



Measurement at SSG terminal voltage (open).

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 TP3 (Lch), TP4 (Rch) and ground.	MTT-150 or TCC-130	PB	VR201 (L ch) VR202 (R ch)	245mV
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		TCC-162C (NORMAL) TCC-262C (METAL)	PB	VR203 (L ch) VR204 (R ch)	Check if the specification is satisfied and if not, adjust as specified.
4	Music search (confirmation)		MTT-250B or MTT-112SP			Check to make sure that the music search operates properly.

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 three screws (A), (B), (C), (D) and (E), then remove the Frame Assembly. And then replace the head.

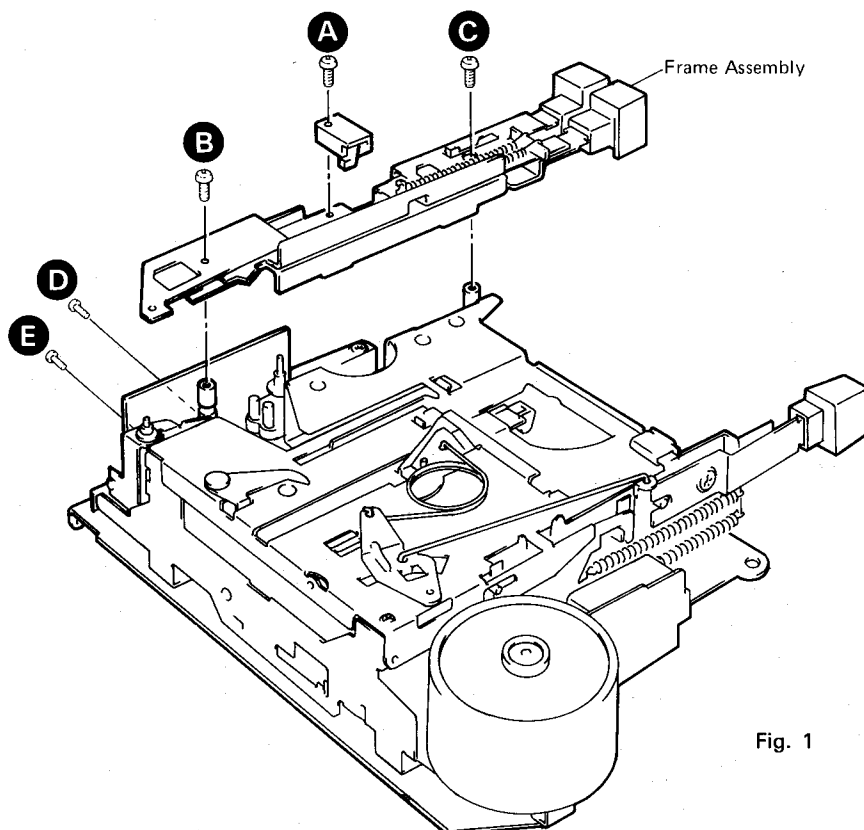


Fig. 1

2 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.

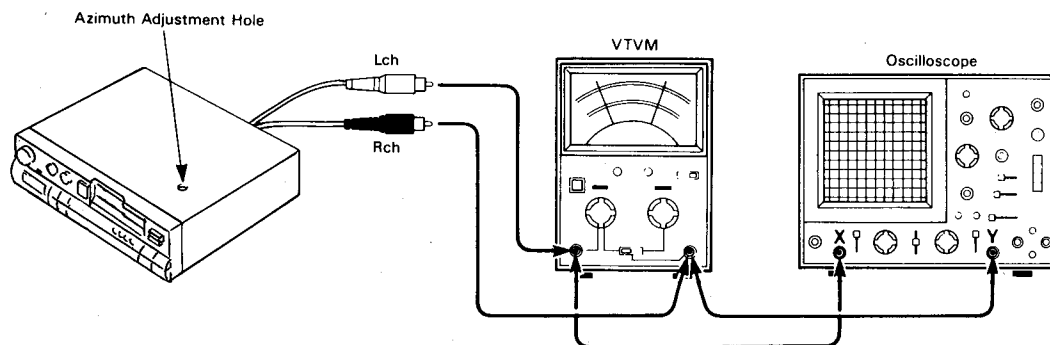


Fig. 2

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.
4. Forward and reverse.

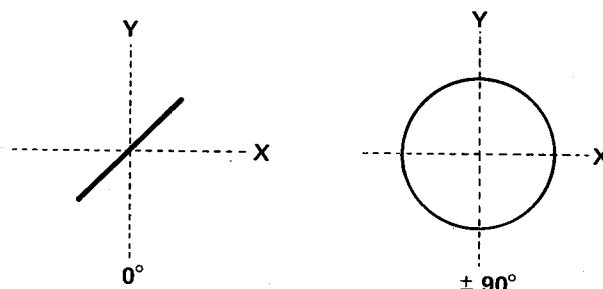
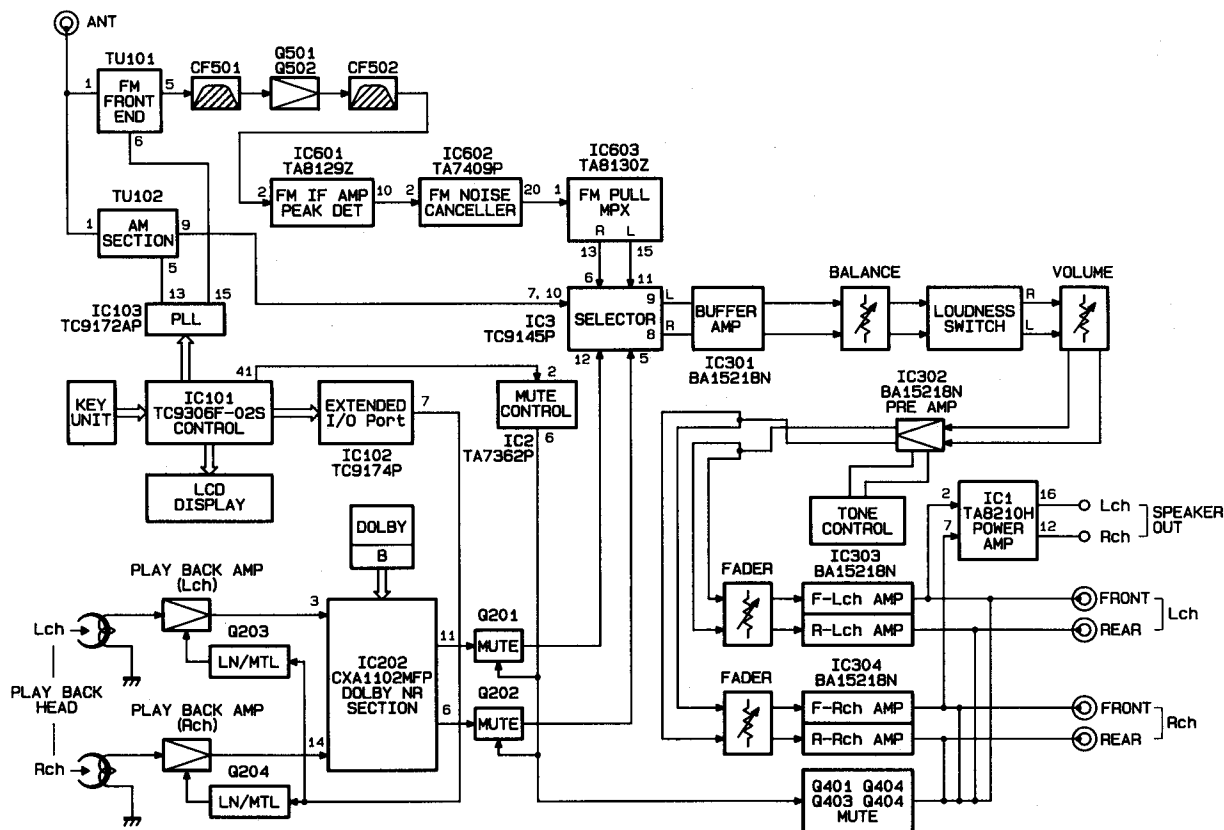


Fig. 3

BLOCK DIAGRAM



CIRCUIT DESCRIPTION

●FM Signal

The signal sent from the antenna is high frequency amplified in the front end (TU101), combined with the output of the local oscillator, converted into a signal of 10.7MHz intermediate frequency and output from pin 5. The 10.7MHz signal is amplified in the intermediate frequency amplifier consisting of CF501, Q501, Q502 and CF502 and fed to pin 2 of IC601. There, it passes through the sextuple IF amplifier and is detected by differential peak detector and audio signal come out from pin 10 after passing through the AF amplifier. Then it is fed to pin 2 and come out from pin 20 of the noise canceller IC (IC602) and again fed to pin 1 of IC603. IC603 detects pilot signal from the signal which has been fed and produces 38kHz signal, whereby the stereo signal is demodulated and sent out from pin 13 for the right channel and pin 15 for the left into the selector.

●AM Signal

The signal fed from the antenna is tuned, high frequency amplified, combined, intermediate frequency amplified and detected in the AM section (TU102) and sent out from pin 9 into the selector.

●Muting Circuit

When tuning frequency is being scanned or preset channel is changed, pin 41 of IC101 becomes high level and Q107 turns ON. Then the output of the AM section is muted and at the same time, a high level is supplied to pin 2 of IC2, which causes pin 6 of IC2 to become low level and Q2, Q101 (front-L ch), Q402 (front-R ch), Q403 (rear-L ch), Q404 (rear-R ch) to turn ON. And thus the input lines of the power amplifier and pre output lines are muted.

●Muting While Operating Tape

When the operation is in FF or REW mode and tuner switch is off, cathode of D15 becomes high level. As the high level signal is supplied to pin 2 of IC2, its pin 6 becomes low level, and Q2, Q401 (front-L ch), Q402 (front-R ch), Q403 (rear-L ch), Q404 (rear-R ch) turn ON. As a result, the input lines of the power amplifier and pre output lines are muted and at the same time, Q201 (L ch) and Q202 (R ch) turn ON and thus the playback amplifier is also muted.

When tuner switch is on in FF or REW mode, Q9 turns on and anode of D15 becomes low level to disable muting. At the same time, Q10 turns on and Q11 and Q8 turn off to switch the SELECTOR into tuner mode. As a result, tuner sound come out.

●Playback Signal

The signal sent from the playback head is amplified by the playback amplifier consisting of IC202, and fed to pin 3 (L ch) and pin 14 (R ch) of IC202. After passing through the dolby circuit (B) in IC202, the signal is sent out from pin 6 (L ch), and pin 11 (R ch) into the selector.

TERMINAL FUNCTIONS

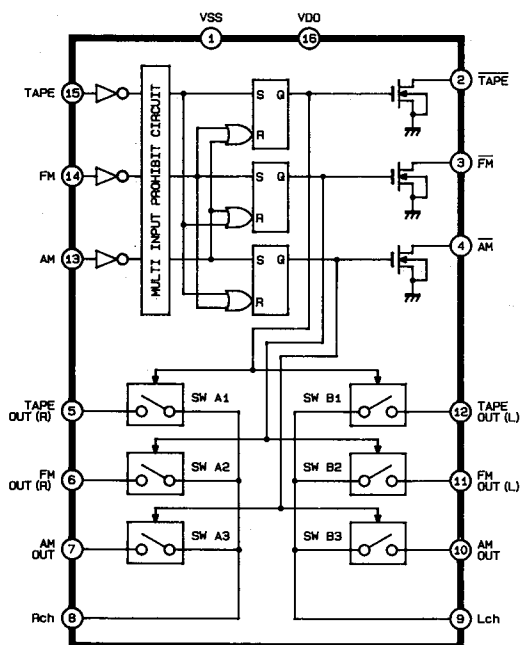
IC number	Terminal number	Port name	Terminal code	I/O	Outline of functions	
IC101					Segment name COM1	Segment name COM2
	1	S7	S7	O	Received frequency display	Point 2 on level meter
	2	S8	S8	O	Received frequency display	Received frequency display
	3	S9	S9	O	Point 1 on level meter	Received frequency display
	4	S10	S10	O	Received frequency display	Received frequency display
	5	S11	S11	O	Received frequency display	Received frequency display
	6	S12	S12	O	Received frequency display	Received frequency display
	7	S13	S13	O	Received frequency display	Received frequency display
	8	S14	S14	O	Received frequency display	Received frequency display
	9	S15	S15	O	Received frequency display	Received frequency display
	10	S16	S16	O	Received frequency display	Received frequency display
	11	S17	S17	O	Received frequency display	Received frequency display
	12	S18	S18	O	Received frequency display	Received frequency display
	13	S19	S19	O	Received frequency display	Received frequency display

IC number	Terminal number	Port name	Terminal code	I/O	Outline of functions	
IC101					Segment name COM1	Segment name COM2
	14	S20	S20	O	Received frequency display	Received frequency display
	15	S21	S21	O	Received frequency display	Received frequency display
	16	S22	S22	O	Point 5 on level meter	Store mode (MEMORY)
	17	S23	S23	O		Received frequency display
	18	S24	S24	O	Received frequency display	Received frequency display
	19	S25	S25	O	MW band	FM stereo
	20	S26	S26	O	MW band	FM band
	21	S27	S27	O	LW band	SW band
	22	COM1	COM1	O	Common 1	
	23	V _{DD}	V _{DD}	I	Power supply	
	24	K0	K0	I	Key input	
	25	K1	K1	I	Key input	
	26	K2	K2	I	Key input	
	27	K3	K3	I	Key input	
	28	T0	T0	O	Key timing output	
	29	T1	T1	O	Key timing output	
	30	T2	T2	O	Key timing output	
	31	T3	T3	O	Key timing output	
	32	T4	T4	O	Key timing output	
	33	T5	T5	O	Key timing output	
	34	T6	T6	O	Key timing output	
	35	P3-2	AD IN	I	AD IN signal strength display input	
	36	P3-1	VREF	I	AD IN reference voltage input	
	37	P2-4	LOCAL IF	O	LOCAL DX select control output (FM, MW, LW)	
	38	P2-3	MONO	O	Forced output of mono control (FM mode only)	
	39	P2-2	AUTO-STOP	I	Stop signal input	
	40	P2-1	R-I	I	Remote control serial data input	
	41	MUTE	MUTE	O	Mute output	
	42	STB	STB	I	Strobe signal input	
	43	CK	CK	I	Serial clock signal input	
	44	SO	SO	O	Serial data output	
	45	SI	SI	I	Serial data input	
	46	REF	REF	I	Reference frequency input	

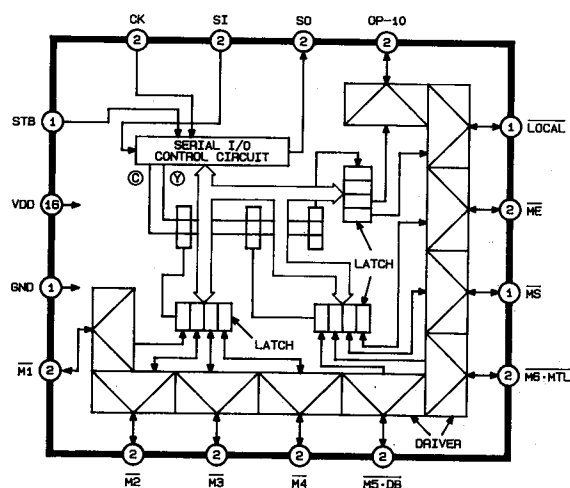
IC number	Terminal number	Port name	Terminal code	I/O	Outline of functions	
IC101					Segment name COM1	Segment name COM2
	47	$\overline{\text{INT}}$	$\overline{\text{INT}}$	I	Initialize input terminal	
	48	$\overline{\text{INH}}$	$\overline{\text{INH}}$	I	Normal mode (H level) Inhibit mode (L level)	
	49	TEST	TEST	I	Test terminal	
	50	XT	XT	O	Clock output	
	51	$\overline{\text{XT}}$	$\overline{\text{XT}}$	O	Clock output	
	52	GND	GND	—	GND pin	
	53	V _{DD}	V _{DD}	I	Power supply	
	54	COM2	COM2	O		Common 2
	55	S1	S1	O	Preset ch	Received frequency display
	56	S2	S2	O	Received frequency display	Received frequency display
	57	S3	S3	O	Received frequency display	Received frequency display
	58	S4	S4	O	Received frequency display	Received frequency display
	59	S5	S5	O	Point 4 on level meter	FM/SW unit
	60	S6	S6	O	Point 3 on level meter	MW/LW unit
IC103	1	GND	GND	I	GND terminal	
	2	REF	Reference frequency	I	Input signal (reference frequency) is supplied from controller side. Built-in amplifier, C coupling, small amplitude.	
	3	SI	Serial input	I/O	Serial I/O port Set divide order and divide means, data for control IF counter and I/O port transmit and receive between controller and this terminal. SI, CK, STB=schmidt trigger input.	
	4	CK	Clock signal input			
	5	STB	Strobe signal input			
	6	FM	Output port	O	General purpose output port, use high frequency selector and control signal output.	
	7	AM				
	8	LOCAL				
	9					
	10	Phase Comp. Output	Phase comparator output	O	Tri-state output of phase comparator, is parallel output.	
	11					
	12	TEST	Test terminal	I	Test mode control input, with built-in pull down resistor. Normally, this terminal use "open" "or" "GND".	
	13	AM _{IN}	AM local osc. input	I	Programable counter input, when AM band. Built-in amplifier, C coupling, small amplitude.	
	14	GND	Pre scaler section GND	I	Built-in pre scaler GND terminal.	
	15	FM _{IN}	FM local osc. input	I	Pre scaler input, when FM band. Built-in amplifier (f max=120 MHz), C coupling, small amplitude.	
	16	V _{DD}	Power supply	I	Voltage supply (5V $\pm$ 10%)	



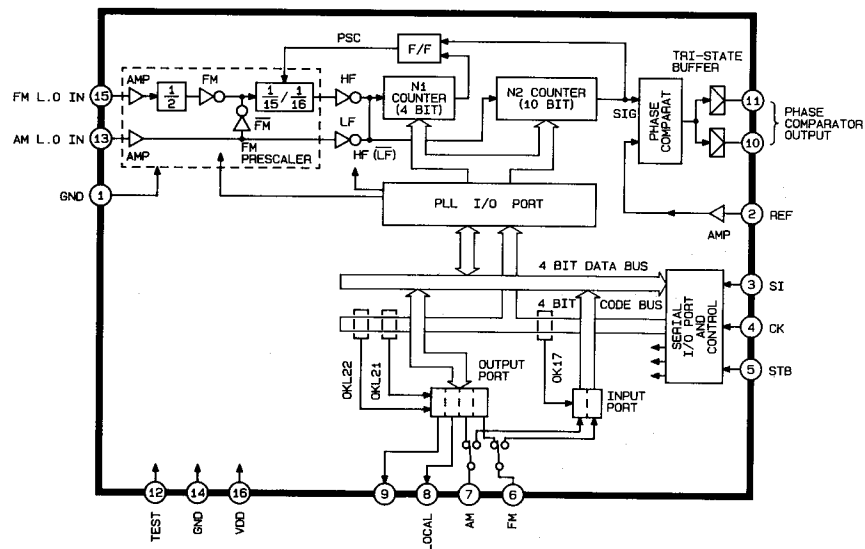
**IC3
TC9145P
(SIGNAL SELECTOR)**



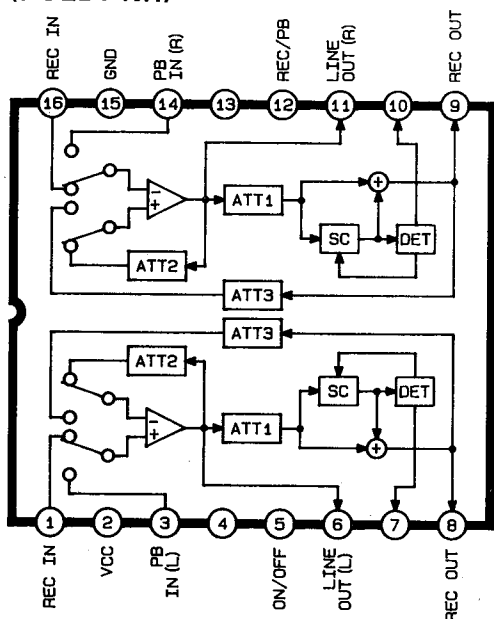
**IC102
TC9174P
(EXTENDED OUTPUT PORT)**



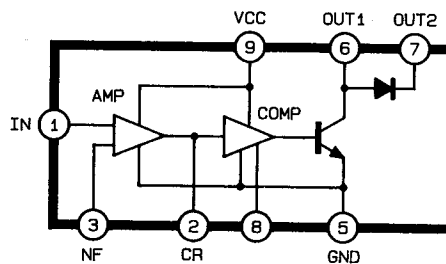
**IC103
TC9172AP
(PLL, PRE SCALER)**



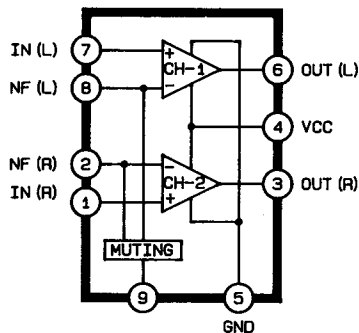
IC202
CXA1102F
(DOLBY NR)



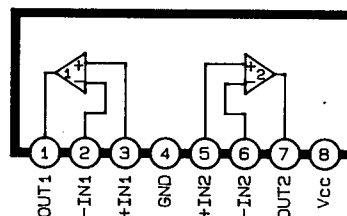
IC203
LA2000
(MUSIC SERCH)



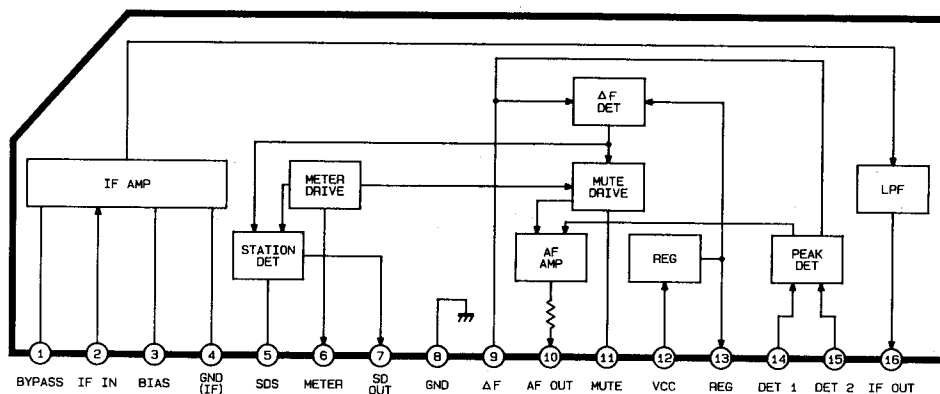
IC204
TA7325P
(PLAYBACK AMP)



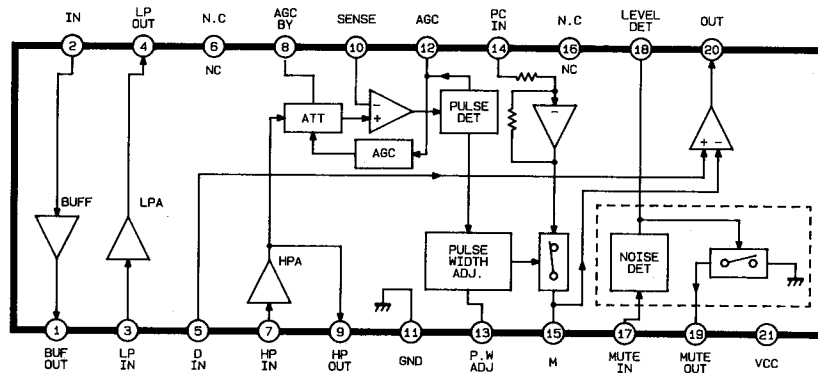
IC301 IC302
IC303 IC304
BA15218N
(OP AMP)



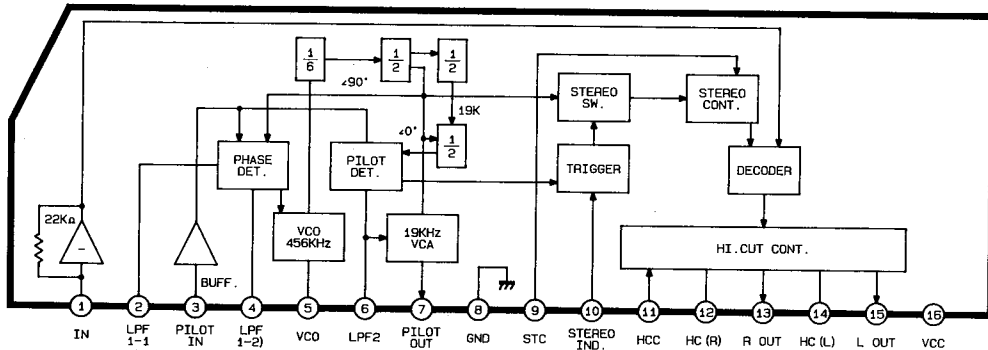
IC601
TA8129Z
(FM IF AMP, PEAK DET)



IC602
TA7409P
(FM NOISE CANCELLER)



IC603
TA8130Z
(FM PLL MPX)



ELECTRICAL PARTS LIST

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

CAPACITORS

637	C1	5354-S010J124	CAP, MYL .12 μ
637	C2	5354-S010J124	CAP, MYL .12 μ
636	C3	5354-S010J124	CAP, MYL .12 μ
636	C4	5354-S010J124	CAP, MYL .12 μ
626	C5	5345-476C0356	CAP, MINI ELE 47 μ /16V
626	C6	5345-476C0356	CAP, MINI ELE 47 μ /16V
633	C7	5345-336B0356	CAP, MINI ELE 33 μ /10V
633	C8	5345-336B0356	CAP, MINI ELE 33 μ /10V
635	C9	5359-S040K151	CAP, PPP 150P
635	C10	5359-S040K151	CAP, PPP 150P
624	C11	5345-227B0962	CAP, MINI ELE 220 μ /10V
623	C12	5345-S04CM108	CAP, MINI ELE 1000 μ /16V
631	C13	5345-476C0356	CAP, MINI ELE 47 μ /16V
628	C14	5345-107A0356	CAP, MINI ELE 100 μ /6.3V
628	C15	5345-107A0356	CAP, MINI ELE 100 μ /6.3V
625	C16	5345-475D0356	CAP, MINI ELE 4.7 μ /25V
623	C17	5345-S04CM108	CAP, MINI ELE 1000 μ /16V
622	C18	5345-477B0962	CAP, MINI ELE 470 μ /10V
627	C19	5345-107B0356	CAP, MINI ELE 100 μ /10V
626	C20	5345-476C0356	CAP, MINI ELE 47 μ /16V
634	C23	5345-226C0356	CAP, MINI ELE 22 μ /16V
630	C24	5345-104F0356	CAP, MINI ELE .1 μ /50V
629	C25	5345-106C0356	CAP, MINI ELE 10 μ /16V
632	C26	5345-106C0356	CAP, MINI ELE 10 μ /16V
627	C27	5345-107B0356	CAP, MINI ELE 100 μ /10V
632	C30	5345-106C0356	CAP, MINI ELE 10 μ /16V
621	C31	5345-475D0356	CAP, MINI ELE 4.7 μ /25V
621	C32	5345-475D0356	CAP, MINI ELE 4.7 μ /25V
422	C101	5350-S010Z473	CAP, SPE .047F
424	C102	5345-107A0356	CAP, MINI ELE 100 μ /6.3V
423	C103	5345-476B0951	CAP, MINI ELE 47 μ /10V
431	C104	5354-S010J104	CAP, MYL .1 μ
434	C105	5361-390JCH	CAP, CER 39P
435	C106	5361-330JCH	CAP, CER 33P
424	C107	5345-107A0356	CAP, MINI ELE 100 μ /6.3V
424	C108	5345-107A0356	CAP, MINI ELE 100 μ /6.3V
425	C109	5345-107B0356	CAP, MINI ELE 100 μ /10V
426	C110	5345-105F0356	CAP, MINI ELE 1 μ /50V
427	C111	5345-476C0356	CAP, MINI ELE 47 μ /16V
428	C112	5345-335F0356	CAP, MINI ELE 3.3 μ /50V
432	C113	5359-S040J103	CAP, PPP .01 μ
429	C114	5345-336B0356	CAP, MINI ELE 33 μ /10V
430	C115	5345-106C0356	CAP, MINI ELE 10 μ /16V
425	C116	5345-107B0356	CAP, MINI ELE 100 μ /10V
455	C117	5361-102K918	CAP, CER 1000P
725	C201	5345-106C0356	CAP, MINI ELE 10 μ /16V
725	C202	5345-106C0356	CAP, MINI ELE 10 μ /16V
725	C203	5345-106C0356	CAP, MINI ELE 10 μ /16V
725	C204	5345-106C0356	CAP, MINI ELE 10 μ /16V
722	C221	5345-105F0356	CAP, MINI ELE 1 μ /50V
722	C222	5345-105F0356	CAP, MINI ELE 1 μ /50V
677	C223	5359-S040J152	CAP, PPP 1500P
677	C224	5359-S040J152	CAP, PPP 1500P
678	C225	5359-S040J273	CAP, PPP .027 μ
678	C226	5359-S040J273	CAP, PPP .027 μ
671	C227	5345-106C0356	CAP, MINI ELE 10 μ /16V
671	C228	5345-106C0356	CAP, MINI ELE 10 μ /16V
676	C229	5359-S040J223	CAP, PPP .022 μ
676	C230	5359-S040J223	CAP, PPP .022 μ
672	C231	5345-107A0356	CAP, MINI ELE 100 μ /6.3V
672	C232	5345-107A0356	CAP, MINI ELE 100 μ /6.3V
671	C233	5345-106C0356	CAP, MINI ELE 10 μ /16V
671	C234	5345-106C0356	CAP, MINI ELE 10 μ /16V
675	C235	5359-S040K101	CAP, PPP 100P
675	C236	5359-S040K101	CAP, PPP 100P
726	C237	5345-684F0951	CAP, MINI ELE .68 μ /50V
726	C238	5345-684F0951	CAP, MINI ELE .68 μ /50V
723	C239	5345-107A0356	CAP, MINI ELE 100 μ /6.3V
698	C240	5345-474F0356	CAP, MINI ELE .47 μ /50V
699	C241	5345-224F0356	CAP, MINI ELE .22 μ /50V
700	C242	5345-475F0356	CAP, MINI ELE 4.7 μ /50V

Ser. No.	Ref. No.	Part No.	Description
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701	C243	5345-476C0356	CAP, MINI ELE 47 μ /16V
724	C244	5345-107B0356	CAP, MINI ELE 100 μ /10V
673	C247	5345-107B0356	CAP, MINI ELE 100 μ /10V
702	C250	5345-225F0356	CAP, MINI ELE 2.2 μ /50V

RESISTORS

642	R1	5135-2R2522	RES, CBN 1/2P 2.2
642	R2	5135-2R2522	RES, CBN 1/2P 2.2
642	R3	5135-2R2522	RES, CBN 1/2P 2.2
642	R4	5135-2R2522	RES, CBN 1/2P 2.2
647	R5	5232-152J16P	RES, CBN 1/6P 1.5K
647	R6	5232-152J16P	RES, CBN 1/6P 1.5K
648	R7	5232-152J16P	RES, CBN 1/6P 1.5K
648	R8	5232-152J16P	RES, CBN 1/6P 1.5K
649	R9	5232-102J16P	RES, CBN 1/6P 1K
649	R10	5232-102J16P	RES, CBN 1/6P 1K
646	R12	5232-470J16P	RES, CBN 1/6P 47
650	R13	5232-272J16P	RES, CBN 1/6P 2.7K
651	R14	5232-222J16P	RES, CBN 1/6P 2.2K
652	R15	5232-472J16P	RES, CBN 1/6P 4.7K
653	R16	5232-103J16P	RES, CBN 1/6P 10K
649	R17	5232-102J16P	RES, CBN 1/6P 1K
654	R18	5232-561J16P	RES, CBN 1/6P 560
653	R19	5232-103J16P	RES, CBN 1/6P 10K
655	R20	5232-333J16P	RES, CBN 1/6P 33K
656	R21	5232-223J16P	RES, CBN 1/6P 22K
643	R22	5135-152522	RES, CBN 1/2P 1.5K
652	R23	5232-472J16P	RES, CBN 1/6P 4.7K
657	R24	5232-331J16P	RES, CBN 1/6P 330
646	R25	5232-470J16P	RES, CBN 1/6P 47
649	R26	5232-102J16P	RES, CBN 1/6P 1K
653	R27	5232-103J16P	RES, CBN 1/6P 10K
651	R28	5232-222J16P	RES, CBN 1/6P 2.2K
658	R29	5232-104J16P	RES, CBN 1/6P 100K
659	R32	5232-101J16P	RES, CBN 1/6P 100
652	R33	5232-472J16P	RES, CBN 1/6P 4.7K
641	R34	5135-390522	RES, CBN 1/2P 39
651	R35	5232-222J16P	RES, CBN 1/6P 2.2K
659	R36	5232-101J16P	RES, CBN 1/6P 100
653	R37	5232-103J16P	RES, CBN 1/6P 10K
656	R38	5232-223J16P	RES, CBN 1/6P 22K
658	R39	5232-104J16P	RES, CBN 1/6P 100K
659	R40	5232-101J16P	RES, CBN 1/6P 100
656	R41	5232-223J16P	RES, CBN 1/6P 22K
656	R42	5232-223J16P	RES, CBN 1/6P 22K
658	R43	5232-104J16P	RES, CBN 1/6P 100K
658	R44	5232-104J16P	RES, CBN 1/6P 100K
658	R45	5232-104J16P	RES, CBN 1/6P 100K
658	R46	5232-104J16P	RES, CBN 1/6P 100K
653	R47	5232-103J16P	RES, CBN 1/6P 10K
653	R49	5232-103J16P	RES, CBN 1/6P 10K
653	R50	5232-103J16P	RES, CBN 1/6P 10K
653	R51	5232-103J16P	RES, CBN 1/6P 10K
660	R52	5232-334J16P	RES, CBN 1/6P 330K
639	R53	5173-270571	RES, MTL 2P 27
439	R105	5232-121J16P	RES, CBN 1/6P 120
439	R106	5232-121J16P	RES, CBN 1/6P 120
440	R107	5232-121J16P	RES, CBN 1/6P 120
440	R108	5232-121J16P	RES, CBN 1/6P 120
440	R109	5232-121J16P	RES, CBN 1/6P 120
440	R110	5232-121J16P	RES, CBN 1/6P 120
440	R111	5232-121J16P	RES, CBN 1/6P 120
440	R112	5232-121J16P	RES, CBN 1/6P 120
440	R113	5232-121J16P	RES, CBN 1/6P 120
441	R114	5232-181J16P	RES, CBN 1/6P 180
441	R115	5232-181J16P	RES, CBN 1/6P 180
443	R118	5232-472J16P	RES, CBN 1/6P 4.7K
444	R119	5232-102J16P	RES, CBN 1/6P 1K
445	R120	5232-471J16P	RES, CBN 1/6P 470
446	R121	5232-103J16P	RES, CBN 1/6P 10K
447	R122	5232-562J16P	RES, CBN 1/6P 5.6K
444	R123	5232-102J16P	RES, CBN 1/6P 1K
448	R124	5232-332J16P	RES, CBN 1/6P 3.3K
445	R125	5232-471J16P	RES, CBN 1/6P 470
444	R126	5232-102J16P	RES, CBN 1/6P 1K

Ser. No.	Ref. No.	Part No.	Description	Ser. No.	Ref. No.	Part No.	Description
449	R127	5232-152J16P	RES, CBN 1/6P 1.5K	608	Q10	5613-RN1207	XISTOR, NPN R
450	R128	5232-332J16P	RES, CBN 1/6P 3.3K	608	Q11	5613-RN1207	XISTOR, NPN R
451	R129	5232-333J16P	RES, CBN 1/6P 33K	611	Q12	5611-RN2203	XISTOR, PNP R
452	R130	5232-474J16P	RES, CBN 1/6P 470K	408	Q102	5613-RN1201	XISTOR, NPN R
448	R131	5232-332J16P	RES, CBN 1/6P 3.3K	407	Q103	5613-RN1207	XISTOR, NPN R
446	R132	5232-103J16P	RES, CBN 1/6P 10K	414	Q104	5611-RN2203	XISTOR, PNP R
442	R133	5232-101J16P	RES, CBN 1/6P 100	414	Q105	5611-RN2203	XISTOR, PNP R
444	R134	5232-102J16P	RES, CBN 1/6P 1K	407	Q106	5613-RN1207	XISTOR, NPN R
444	R135	5232-102J16P	RES, CBN 1/6P 1K	410	Q107	5613-2603 (E) OR (F)	XISTOR, NPN R
453	R136	5232-104J16P	RES, CBN 1/6P 100K	409	Q108	5613-RN1203	XISTOR, NPN R
451	R137	5232-333J16P	RES, CBN 1/6P 33K	411	Q109	5613-2320L (F)	XISTOR, NPN R
444	R138	5232-102J16P	RES, CBN 1/6P 1K	412	Q110	5613-1775 (F)	XISTOR, NPN R
436	R139	5135-102522	RES, CBN 1/2P 1K	409	Q111	5613-RN1203	XISTOR, NPN R
436	R141	5135-102522	RES, CBN 1/2P 1K	414	Q112	5611-RN2203	XISTOR, PNP R
446	R142	5232-103J16P	RES, CBN 1/6P 10K	407	Q113	5613-RN1207	XISTOR, NPN R
446	R143	5232-103J16P	RES, CBN 1/6P 10K	413	Q114	5613-3668 (O) OR (Y)	XISTOR, NPN R
734	R201	5232-222J16P	RES, CBN 1/6P 2.2K	415	Q115	5611-1428 (O) OR (Y)	XISTOR, PNP R
734	R202	5232-222J16P	RES, CBN 1/6P 2.2K	414	Q116	5611-RN2203	XISTOR, PNP R
730	R203	5135-102522	RES, CBN 1/2P 1K	716	Q201	5614-1450 (T)	XISTOR, NPN A
730	R204	5135-102522	RES, CBN 1/2P 1K	716	Q202	5614-1450 (T)	XISTOR, NPN A
731	R205	5232-104J16P	RES, CBN 1/6P 100K	665	Q203	5613-RN1201	XISTOR, NPN R
731	R206	5232-104J16P	RES, CBN 1/6P 100K	665	Q204	5613-RN1201	XISTOR, NPN R
729	R207	5135-471522	RES, CBN 1/2P 470	667	Q205	5611-RN2203	XISTOR, PNP R
729	R208	5135-471522	RES, CBN 1/2P 470	666	Q206	5613-RN1207	XISTOR, NPN R
732	R220	5232-333J16P	RES, CBN 1/6P 33K	717	Q208	5613-RN1203	XISTOR, NPN R
731	R222	5232-104J16P	RES, CBN 1/6P 100K	718	Q210	5611-RN2203	XISTOR, PNP R
690	R223	5232-105J16P	RES, CBN 1/6P 1M	696	Q211	5611-1428 (O) OR (Y)	XISTOR, PNP R
690	R224	5232-105J16P	RES, CBN 1/6P 1M	695	Q214	5613-RN1207	XISTOR, NPN R
689	R225	5232-152J16P	RES, CBN 1/6P 1.5K	694	Q215	5613-RN1203	XISTOR, NPN R
689	R226	5232-152J16P	RES, CBN 1/6P 1.5K	712	Q216	5613-2925 (T)	XISTOR, NPN R
688	R227	5232-222J16P	RES, CBN 1/6P 2.2K	711	Q217	5613-2603 (E) OR (F)	XISTOR, NPN R
688	R228	5232-222J16P	RES, CBN 1/6P 2.2K			DIODES	
687	R229	5232-124J16P	RES, CBN 1/6P 120K	615	D1	5631-1SS133	DIODE, DET
687	R230	5232-124J16P	RES, CBN 1/6P 120K	613	D2	5632-S5566B	DIODE, RECT
686	R231	5232-152J16P	RES, CBN 1/6P 1.5K	615	D3	5631-1SS133	DIODE, DET
686	R232	5232-152J16P	RES, CBN 1/6P 1.5K	618	D4	5635-RD5R1EB2	DIODE, ZENER
685	R233	5232-121J16P	RES, CBN 1/6P 120	615	D5	5631-1SS133	DIODE, DET
685	R234	5232-121J16P	RES, CBN 1/6P 120	619	D6	5635-HZ6B-1L	DIODE, ZENER
684	R235	5232-101J16P	RES, CBN 1/6P 100	617	D7	5632-S5566B	DIODE, RECT
684	R236	5232-101J16P	RES, CBN 1/6P 100	615	D8	5631-1SS133	DIODE, DET
684	R237	5232-101J16P	RES, CBN 1/6P 100	616	D9	5631-1S2473	DIODE, DET
691	R238	5232-332J16P	RES, CBN 1/6P 3.3K	615	D10	5631-1SS133	DIODE, DET
733	R239	5232-433J16P	RES, CBN 1/6P 43K	620	D11	5635-HZ11B-2L	DIODE, ZENER
704	R241	5232-104J16P	RES, CBN 1/6P 100K	615	D14	5631-1SS133	DIODE, DET
704	R242	5232-104J16P	RES, CBN 1/6P 100K	615	D15	5631-1SS133	DIODE, DET
705	R243	5232-274J16P	RES, CBN 1/6P 270K	615	D16	5631-1SS133	DIODE, DET
707	R245	5232-472J16P	RES, CBN 1/6P 4.7K	417	D101	5631-1SS133	DIODE, DET
707	R246	5232-472J16P	RES, CBN 1/6P 4.7K	417	D103	5631-1SS133	DIODE, DET
706	R247	5232-101J16P	RES, CBN 1/6P 100	417	D104	5631-1SS133	DIODE, DET
703	R250	5232-103J16P	RES, CBN 1/6P 10K	417	D105	5631-1SS133	DIODE, DET
708	R251	5232-102J16P	RES, CBN 1/6P 1K	417	D106	5631-1SS133	DIODE, DET
708	R252	5232-102J16P	RES, CBN 1/6P 1K	417	D107	5631-1SS133	DIODE, DET
713	R255	5232-222J16P	RES, CBN 1/6P 2.2K	417	D108	5631-1SS133	DIODE, DET
703	R256	5232-103J16P	RES, CBN 1/6P 10K	417	D109	5631-1SS133	DIODE, DET
709	R257	5232-332J16P	RES, CBN 1/6P 3.3K	417	D110	5631-1SS133	DIODE, DET
		INTEGRATED CIRCUITS		418	D111	5631-1S2473	DIODE, DET
603	IC1	5653-TA8210H	IC, LINEAR	419	D112	5635-HZ6B-1L	DIODE, ZENER
604	IC2	5653-TA7362P	IC, LINEAR	420	D113	5635-RD5R1EB2	DIODE, ZENER
605	IC3	5654-TC9145P	IC, DIGITAL	418	D114	5631-1S2473	DIODE, DET
403	IC101	5654-T9306F25	IC, DIGITAL	417	D117	5631-1SS133	DIODE, DET
404	IC102	5654-TC9174P	IC, DIGITAL	668	D201	5631-1SS133	DIODE, DET
405	IC103	5654-TC9172AP	IC, DIGITAL	720	D206	5631-1SS133	DIODE, DET
714	IC202	5653-CXA1102F	IC, LINEAR	697	D207	5631-1SS133	DIODE, DET
693	IC203	5653-LA2000	IC, LINEAR			COILS	
664	IC204	5653-TA7325P	IC, LINEAR	456	L101	5995-221269	COIL W/CORE
		TRANSISTORS		682	L203	5995-223296	COIL W/CORE
607	Q1	5613-2603 (E) OR (F)	XISTOR, NPN R	682	L204	5995-223296	COIL W/CORE
612	Q2	5611-RN2201	XISTOR, PNP R			CONTROLS	
610	Q3	5612-1375	XISTOR, PNP A	680	VR201	5101-20301934	RES, SEMI FIX 20K
607	Q4	5613-2603 (E) OR (F)	XISTOR, NPN R	680	VR202	5101-20301934	RES, SEMI FIX 20K
607	Q5	5613-2603 (E) OR (F)	XISTOR, NPN R	679	VR203	5101-20201934	RES, SEMI FIX 2K
609	Q6	5613-3668 (O) OR (Y)	XISTOR, NPN R	679	VR204	5101-20201934	RES, SEMI FIX 2K
611	Q8	5611-RN2203	XISTOR, PNP R				
608	Q9	5613-RN1207	XISTOR, NPN R				

Ser. No. Ref. No. Part No. Description

MISCELLANEOUS

820	CN201	4443-0301140	CONNECTOR
804	CN202	4443-02701006	CONNECTOR
808	CN601	4443-01801006	CONNECTOR
809	CN602	4443-01801003	CONNECTOR
771	LP1	5731-00501141	LAMP
770	LP2	5731-00402141	LAMP
458	TU102	6110-004	AM TUNER
402	XL101	5691-00720027	XTAL, OSC
401	LCD101	5791-TP4K6011	LCD
823	LCN101	4163-S0204101	CONNECTOR W/W
824	LCN102	4163-S0204500	CONNECTOR W/W
825	LCN103	4163-02401003	CONNECTOR W/W
830	LCN108	4163-02901009	CONNECTOR W/W

PCB-2 FM RF P.C. BOARD

CAPACITORS

476	C501	5345-106C0356	CAP, MINI ELE 10 μ /16V
477	C502	5361-223Z921	CAP, CER .022 μ
477	C503	5361-223Z921	CAP, CER .022 μ

RESISTORS

479	R501	5232-101J16P	RES, CBN 1/6P 100
480	R502	5232-330J16P	RES, CBN 1/6P 33
481	R503	5232-331J16P	RES, CBN 1/6P 330
484	R504	5232-103J16P	RES, CBN 1/6P 10K
483	R505	5232-391J16P	RES, CBN 1/6P 390
481	R506	5232-331J16P	RES, CBN 1/6P 330
482	R507	5232-223J16P	RES, CBN 1/6P 22K

TRANSISTORS

469	Q501	5613-2058 (N) OR (P)	XISTOR, NPN R
469	Q502	5613-2058 (N) OR (P)	XISTOR, NPN R

COILS

463	L501	5995-2R2269	COIL W/CORE
464	L502	5995-4R7269	COIL W/CORE

MISCELLANEOUS

467	CF501	5671-2036GKA	FILTER, CER S
467	CF502	5671-2036GKA	FILTER, CER S
805	CN502	4443-047175	CONNECTOR
807	CN503	4443-087175	CONNECTOR
802	CN803	4443-01901017	CONNECTOR
461	TU101	6114-7136	FM TUNER
822	LCN501	4163-S0206101	CONNECTOR W/W

PCB-3 I/O P.C. BOARD

DIODES

614	D17	5632-S5566B	DIODE, RECT
614	D18	5632-S5566B	DIODE, RECT

MISCELLANEOUS

806	CN501	4443-067175	CONNECTOR
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PCB-4 FM DET & MPX P.C. BOARD

CAPACITORS

533	C602	5361-103M920	CAP, CER .01 μ
516	C603	5359-S040K271	CAP, PPP 270P
529	C604	5354-S010J104	CAP, MYL .1 μ
509	C605	5345-106C0356	CAP, MINI ELE 10 μ /16V
530	C606	5361-120JRH	CAP, CER 12P
531	C607	5361-223Z921	CAP, CER .022 μ
531	C608	5361-223Z921	CAP, CER .022 μ
531	C609	5361-223Z921	CAP, CER .022 μ
533	C610	5361-103M920	CAP, CER .01 μ
510	C611	5345-105F0356	CAP, MINI ELE 1 μ /50V
511	C612	5345-225F0356	CAP, MINI ELE 2.2 μ /50V
512	C613	5345-104F0356	CAP, MINI ELE .1 μ /50V
509	C614	5345-106C0356	CAP, MINI ELE 10 μ /16V
509	C615	5345-106C0356	CAP, MINI ELE 10 μ /16V
518	C616	5359-S040J103	CAP, PPP .01 μ
518	C617	5359-S040J103	CAP, PPP .01 μ

Ser. No. Ref. No. Part No. Description

513	C618	5345-225F0356	CAP, MINI ELE 2.2 μ /50V
509	C619	5345-106C0356	CAP, MINI ELE 10 μ /16V
512	C620	5345-104F0356	CAP, MINI ELE .1 μ /50V
509	C621	5345-106C0356	CAP, MINI ELE 10 μ /16V
517	C622	5359-S040K271	CAP, PPP 270P
517	C623	5359-S040K271	CAP, PPP 270P
532	C624	5361-680J917	CAP, CER 68P
519	C625	5359-S040J681	CAP, PPP 680P
520	C626	5359-S040J122	CAP, PPP 1200P
519	C627	5359-S040J681	CAP, PPP 680P
517	C628	5359-S040K271	CAP, PPP 270P
516	C629	5359-S040K271	CAP, PPP 270P
521	C630	5359-S040J222	CAP, PPP 2200P
522	C631	5359-S040J682	CAP, PPP 6800P
512	C632	5345-104F0356	CAP, MINI ELE .1 μ /50V
512	C633	5345-104F0356	CAP, MINI ELE .1 μ /50V
509	C634	5345-106C0356	CAP, MINI ELE 10 μ /16V
523	C635	5359-S040J102	CAP, PPP 1000P
514	C636	5345-474F0356	CAP, MINI ELE .47 μ /50V
514	C637	5345-474F0356	CAP, MINI ELE .47 μ /50V
511	C638	5345-225F0356	CAP, MINI ELE 2.2 μ /50V
527	C639	5359-S040J273	CAP, PPP .027 μ
528	C640	5354-S010J104	CAP, MYL .1 μ
524	C641	5359-S040J273	CAP, PPP .027 μ
525	C642	5359-S040J333	CAP, PPP .033 μ
510	C643	5345-105F0356	CAP, MINI ELE 1 μ /50V
510	C644	5345-105F0356	CAP, MINI ELE 1 μ /50V
526	C645	5359-S040J183	CAP, PPP .018 μ
526	C646	5359-S040J183	CAP, PPP .018 μ
515	C647	5345-107B0356	CAP, MINI ELE 100 μ /10V
531	C648	5361-223Z921	CAP, CER .022 μ
531	C649	5361-223Z921	CAP, CER .022 μ

RESISTORS

536	R602	5232-331J16P	RES, CBN 1/6P 330
537	R603	5232-103J16P	RES, CBN 1/6P 10K
538	R604	5232-122J16P	RES, CBN 1/6P 1.2K
534	R605	5232-562J16P	RES, CBN 1/6P 5.6K
534	R606	5232-562J16P	RES, CBN 1/6P 5.6K
537	R607	5232-103J16P	RES, CBN 1/6P 10K
539	R608	5232-153J16P	RES, CBN 1/6P 15K
540	R609	5232-333J16P	RES, CBN 1/6P 33K
553	R610	5232-681J16P	RES, CBN 1/6P 680
542	R611	5232-822J16P	RES, CBN 1/6P 8.2K
537	R612	5232-103J16P	RES, CBN 1/6P 10K
537	R613	5232-103J16P	RES, CBN 1/6P 10K
544	R614	5232-473J16P	RES, CBN 1/6P 47K
548	R615	5232-104J16P	RES, CBN 1/6P 100K
541	R616	5232-222J16P	RES, CBN 1/6P 2.2K
545	R617	5232-472J16P	RES, CBN 1/6P 4.7K
545	R618	5232-472J16P	RES, CBN 1/6P 4.7K
545	R619	5232-472J16P	RES, CBN 1/6P 4.7K
545	R620	5232-472J16P	RES, CBN 1/6P 4.7K
546	R621	5232-223J16P	RES, CBN 1/6P 22K
547	R622	5232-272J16P	RES, CBN 1/6P 2.7K
541	R623	5232-222J16P	RES, CBN 1/6P 2.2K
537	R624	5232-103J16P	RES, CBN 1/6P 10K
543	R625	5232-682J16P	RES, CBN 1/6P 6.8K
550	R626	5232-392J16P	RES, CBN 1/6P 3.9K
551	R627	5135-104522	RES, CBN 1/2P 100K
548	R628	5232-104J16P	RES, CBN 1/6P 100K
549	R629	5232-183J16P	RES, CBN 1/6P 18K
545	R630	5232-472J16P	RES, CBN 1/6P 4.7K
537	R631	5232-103J16P	RES, CBN 1/6P 10K
550	R632	5232-392J16P	RES, CBN 1/6P 3.9K
550	R633	5232-392J16P	RES, CBN 1/6P 3.9K
537	R634	5232-103J16P	RES, CBN 1/6P 10K
537	R635	5232-103J16P	RES, CBN 1/6P 10K
554	R650	5232-224J16P	RES, CBN 1/6P 220K
540	R651	5232-333J16P	RES, CBN 1/6P 33K

INTEGRATED CIRCUITS

491	IC601	5653-TA8129Z	IC, LINEAR
492	IC602	5653-TA7409P	IC, LINEAR
493	IC603	5653-TA8130Z	IC, LINEAR

Ser. No.	Ref. No.	Part No.	Description
TRANSISTORS			
495	Q601	5613-2603 (E) OR (F)	XISTOR, NPN R
496	Q602	5611-RN2201	XISTOR, PNP R
497	Q603	5611-RN2203	XISTOR, PNP R
DIODES			
499	D601	5631-1SS133	DIODE, DET
500	D603	5635-HZ6B-1L	DIODE, ZENER
TRANSFORMER			
502	T601	5572-10301	DISCRI 7
CONTROLS			
505	VR601	5101-50102934	RES, SEMI FIX 500
506	VR602	5101-10302934	RES, SEMI FIX 10K
506	VR603	5101-10302934	RES, SEMI FIX 10K
507	VR604	5101-50302934	RES, SEMI FIX 50K
MISCELLANEOUS			
810	CN603	4443-01701006	CONNECTOR
811	CN604	4443-01701003	CONNECTOR
503	CO601	5693-CSB456F4	OSC, CER

PCB-5 PRE AMP P.C. BOARD

CAPACITORS			
558	C301	5345-106C0356	CAP, MINI ELE 10 μ /16V
558	C302	5345-106C0356	CAP, MINI ELE 10 μ /16V
569	C303	5354-S010J823	CAP, MYL .082 μ
569	C304	5354-S010J823	CAP, MYL .082 μ
567	C305	5359-S040K331	CAP, PPP 330P
567	C306	5359-S040K331	CAP, PPP 330P
559	C307	5345-105F0356	CAP, MINI ELE 1 μ /50V
559	C308	5345-105F0356	CAP, MINI ELE 1 μ /50V
560	C309	5345-226C0356	CAP, MINI ELE 22 μ /16V
560	C310	5345-226C0356	CAP, MINI ELE 22 μ /16V
565	C311	5353-010934	CAP, MCA 1P
565	C312	5353-010934	CAP, MCA 1P
561	C313	5345-476C0356	CAP, MINI ELE 47 μ /16V
561	C314	5345-476C0356	CAP, MINI ELE 47 μ /16V
559	C315	5345-105F0356	CAP, MINI ELE 1 μ /50V
559	C316	5345-105F0356	CAP, MINI ELE 1 μ /50V
559	C317	5345-105F0356	CAP, MINI ELE 1 μ /50V
559	C318	5345-105F0356	CAP, MINI ELE 1 μ /50V
562	C319	5345-107B0356	CAP, MINI ELE 100 μ /10V
562	C320	5345-107B0356	CAP, MINI ELE 100 μ /10V
562	C321	5345-107B0356	CAP, MINI ELE 100 μ /10V
563	C322	5345-107A0356	CAP, MINI ELE 100 μ /6.3V
RESISTORS			
571	R301	5232-331J16P	RES, CBN 1/6P 330
571	R302	5232-331J16P	RES, CBN 1/6P 330
572	R303	5232-681J16P	RES, CBN 1/6P 680
572	R304	5232-681J16P	RES, CBN 1/6P 680
573	R305	5232-102J16P	RES, CBN 1/6P 1K
573	R306	5232-102J16P	RES, CBN 1/6P 1K
575	R307	5232-392J16P	RES, CBN 1/6P 3.9K
575	R308	5232-392J16P	RES, CBN 1/6P 3.9K
576	R309	5232-333J16P	RES, CBN 1/6P 33K
576	R310	5232-333J16P	RES, CBN 1/6P 33K
571	R311	5232-331J16P	RES, CBN 1/6P 330
571	R312	5232-331J16P	RES, CBN 1/6P 330
577	R313	5232-473J16P	RES, CBN 1/6P 47K
577	R314	5232-473J16P	RES, CBN 1/6P 47K
578	R315	5232-274J16P	RES, CBN 1/6P 270K
578	R316	5232-274J16P	RES, CBN 1/6P 270K
573	R317	5232-102J16P	RES, CBN 1/6P 1K
573	R318	5232-102J16P	RES, CBN 1/6P 1K
574	R319	5232-104J16P	RES, CBN 1/6P 100K
574	R320	5232-104J16P	RES, CBN 1/6P 100K
579	R321	5232-562J16P	RES, CBN 1/6P 5.6K
579	R322	5232-562J16P	RES, CBN 1/6P 5.6K
579	R323	5232-562J16P	RES, CBN 1/6P 5.6K
579	R324	5232-562J16P	RES, CBN 1/6P 5.6K
574	R325	5232-104J16P	RES, CBN 1/6P 100K
574	R326	5232-104J16P	RES, CBN 1/6P 100K
574	R327	5232-104J16P	RES, CBN 1/6P 100K

Ser. No.	Ref. No.	Part No.	Description
574	R328	5232-104J16P	RES, CBN 1/6P 100K
581	R329	5232-101J16P	RES, CBN 1/6P 100
573	R330	5232-102J16P	RES, CBN 1/6P 1K
574	R331	5232-104J16P	RES, CBN 1/6P 100K
574	R332	5232-104J16P	RES, CBN 1/6P 100K
580	R337	5232-122J16P	RES, CBN 1/6P 1.2K

INTEGRATED CIRCUITS

556	IC301	5653-BA15218N	IC, LINEAR
556	IC302	5653-BA15218N	IC, LINEAR
556	IC303	5653-BA15218N	IC, LINEAR
556	IC304	5653-BA15218N	IC, LINEAR

CONTROLS

781	VR301	5112-S0201503	RES, V CBN 5 GANG w/SWITCH
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MISCELLANEOUS

778	S302	4431-S0608102	SWITCH, PUSH
812	CN301	4443-0301141	CONNECTOR
813	CN302	4443-0401141	CONNECTOR
826	LCN503	4163-02601006	CONNECTOR W/W
831	LCN504	4163-02902005	CONNECTOR W/W

PCB-6 TONE & BUFFER P.C. BOARD

CAPACITORS			
586	C401	5345-106D0356	CAP, MINI ELE 10 μ /25V
586	C402	5345-106D0356	CAP, MINI ELE 10 μ /25V
586	C403	5345-106D0356	CAP, MINI ELE 10 μ /25V
586	C404	5345-106D0356	CAP, MINI ELE 10 μ /25V
588	C405	5359-S040J273	CAP, PPP .027 μ
588	C406	5359-S040J273	CAP, PPP .027 μ
591	C407	5354-154593	CAP, MYL .15 μ
591	C408	5354-154593	CAP, MYL .15 μ
589	C409	5359-S040J682	CAP, PPP 6800P
589	C410	5359-S040J682	CAP, PPP 6800P
590	C411	5354-S010J393	CAP, MYL .039 μ
590	C412	5354-S010J393	CAP, MYL .039 μ
RESISTORS			
593	R401	5232-681J16P	RES, CBN 1/6P 680
593	R402	5232-681J16P	RES, CBN 1/6P 680
593	R403	5232-681J16P	RES, CBN 1/6P 680
593	R404	5232-681J16P	RES, CBN 1/6P 680
594	R405	5232-222J16P	RES, CBN 1/6P 2.2K
594	R406	5232-222J16P	RES, CBN 1/6P 2.2K
595	R407	5232-122J16P	RES, CBN 1/6P 1.2K
595	R408	5232-122J16P	RES, CBN 1/6P 1.2K
596	R409	5232-222J16P	RES, CBN 1/6P 2.2K
596	R410	5232-222J16P	RES, CBN 1/6P 2.2K
596	R411	5232-222J16P	RES, CBN 1/6P 2.2K
596	R412	5232-222J16P	RES, CBN 1/6P 2.2K
597	R413	5232-153J16P	RES, CBN 1/6P 15K
597	R414	5232-153J16P	RES, CBN 1/6P 15K
598	R415	5232-272J16P	RES, CBN 1/6P 2.7K
598	R416	5232-272J16P	RES, CBN 1/6P 2.7K
595	R417	5232-122J16P	RES, CBN 1/6P 1.2K
595	R418	5232-122J16P	RES, CBN 1/6P 1.2K
599	R419	5232-121J16P	RES, CBN 1/6P 120
599	R420	5232-121J16P	RES, CBN 1/6P 120
600	R421	5232-331J16P	RES, CBN 1/6P 330
600	R422	5232-331J16P	RES, CBN 1/6P 330

TRANSISTORS

584	Q401	5614-1450 (T)	XISTOR, NPN A
584	Q402	5614-1450 (T)	XISTOR, NPN A
584	Q403	5614-1450 (T)	XISTOR, NPN A
584	Q404	5614-1450 (T)	XISTOR, NPN A

CONTROLS

782	VR401/402	5110-S0201104	RES, V CBN 100K
783	VR403/404	5110-S0201503	RES, V CBN 50K

MISCELLANEOUS

816	CN401	4443-0601141	CONNECTOR
815	CN402	4443-0401141	CONNECTOR

Ser. No.	Ref. No.	Part No.	Description
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PCB-7 FRONT P.C. BOARD

RESISTORS

437	R101	5232-561J16P	RES, CBN 1/6P 560
438	R102	5232-102J16P	RES, CBN 1/6P 1K
437	R103	5232-561J16P	RES, CBN 1/6P 560
437	R104	5232-561J16P	RES, CBN 1/6P 560

MISCELLANEOUS

773	S101	4437-00301	SWITCH, PU-TC
773	S102	4437-00301	SWITCH, PU-TC
773	S103	4437-00301	SWITCH, PU-TC
773	S104	4437-00301	SWITCH, PU-TC
773	S105	4437-00301	SWITCH, PU-TC
773	S106	4437-00301	SWITCH, PU-TC
773	S107	4437-00301	SWITCH, PU-TC
773	S108	4437-00301	SWITCH, PU-TC
773	S109	4437-00301	SWITCH, PU-TC
773	S110	4437-00301	SWITCH, PU-TC
776	S111	4437-00201	SWITCH, PU-TC
776	S112	4437-00201	SWITCH, PU-TC
776	S113	4437-00201	SWITCH, PU-TC
776	S114	4437-00201	SWITCH, PU-TC
768	LED101	5637-851RCPP	LED
768	LED102	5637-851RCPP	LED
768	LED103	5637-851RCPP	LED
768	LED104	5637-851RCPP	LED
768	LED105	5637-851RCPP	LED
768	LED106	5637-851RCPP	LED
768	LED107	5637-851RCPP	LED
765	LED113	5637-LN01301C	LED
765	LED114	5637-LN01301C	LED
765	LED115	5637-LN01301C	LED
765	LED116	5637-LN01301C	LED
765	LED117	5637-LN01301C	LED
765	LED118	5637-LN01301C	LED
765	LED119	5637-LN01301C	LED
765	LED120	5637-LN01301C	LED
765	LED121	5637-LN01301C	LED
765	LED122	5637-LN01301C	LED
765	LED123	5637-LN01301C	LED
765	LED124	5637-LN01301C	LED
765	LED125	5637-LN01301C	LED
765	LED126	5637-LN01301C	LED

ABBREVIATIONS IN PARTS LIST

CAPACITORS

CAP, MINI ELE : Electrolytic
 CAP, CER : Ceramic
 CAP, PPP : Polypropylene
 CAP, MYL : Mylar
 CAP, MCA : Mica
 CAP, MINI BP : Bipolar
 CAP, ELE BP : Electrolytic Bipolar
 470 μ : 470 μ F
 6800p : 6800pF
 .047 μ : 0.047 μ F

RESISTORS

RES, CBN 1/6P : Carbon 1/6W
 RES, FUSE : Fuse
 RES, CEM 5P : Cement 5W
 RES, MTL 1P : Metal 1W
 2.2K : 2.2k Ω
 220 : 220 Ω

TRANSISTORS

XISTOR : Transistor
 FET : Field Effect Transistor

CONTROLS

RES, SEMI FIX : Semi-fixed Resistor

CHASSIS MISCELLANEOUS PARTS LIST

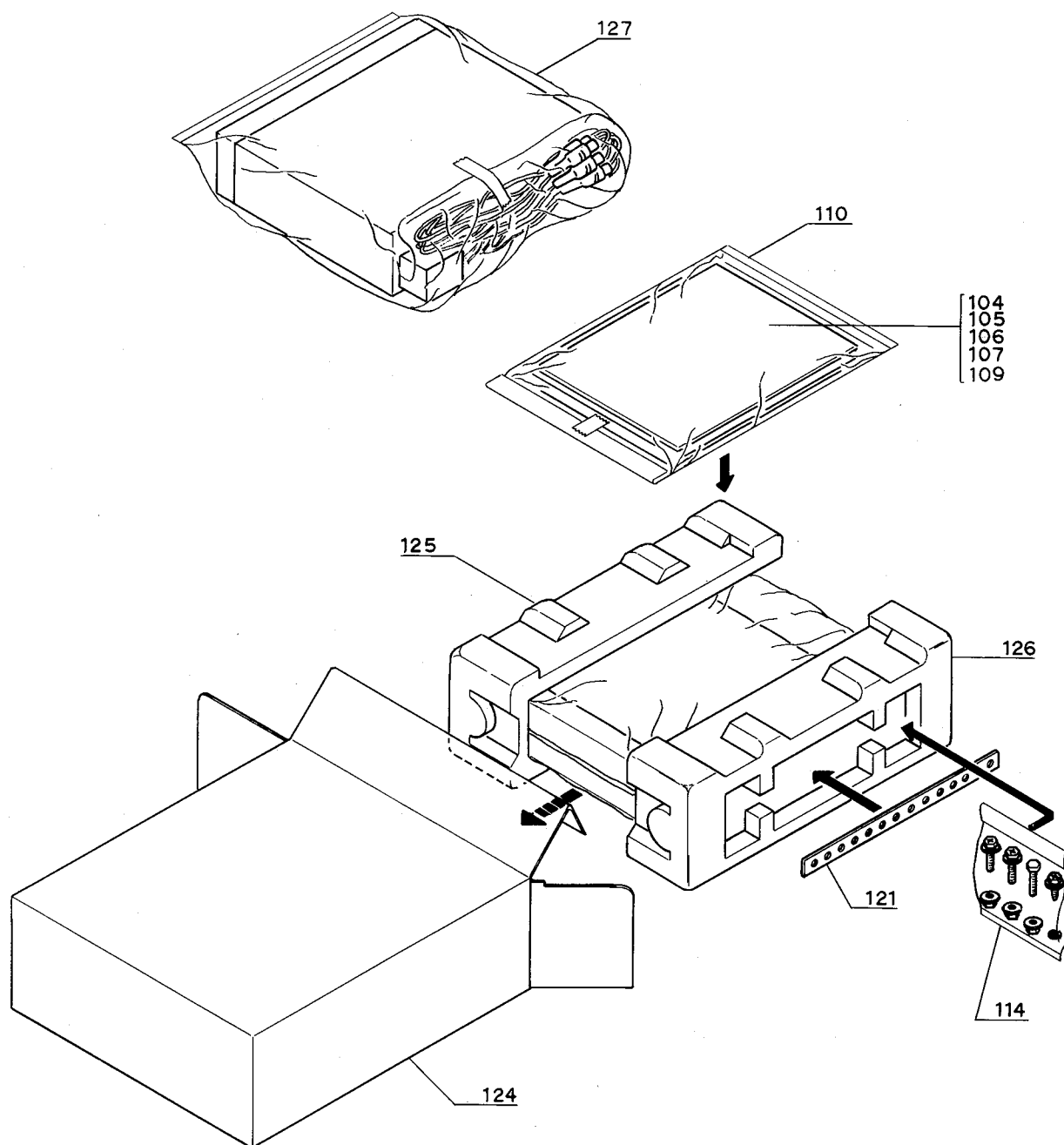
827	LCN201	4163-02501003	CONNECTOR W/W
835	LCN202	4163-02703005	CONNECTOR W/W

NOTE



SAFETY RELATED COMPONENT. USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.

PACKAGE



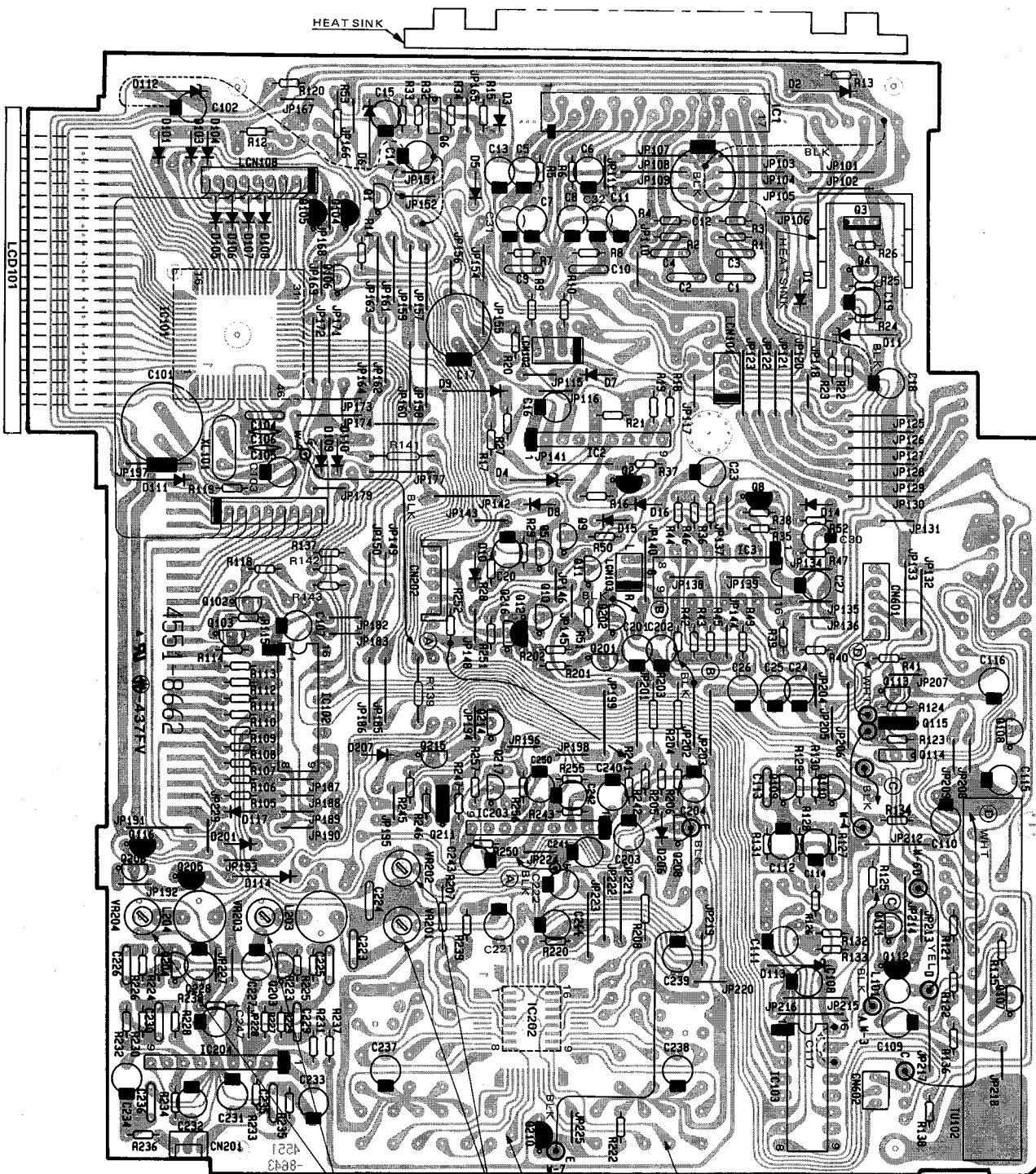
Ref. No.	Part No.	Description
104	1111-J30291	OWNER GUIDE
105	1113-717004	OWNER CARD
106	1113-727004	OWNER CARD
107	1119-0138	ATTACH SHEET
109	5732-102037	FUSE
110	1241-C12742	POLYETHY BAG

Ref. No.	Part No.	Description
114	2310-7037	SCREW, SPE
121	2219-8053	METAL FITTG
124	1221-747179	CARTON BOX
125	1222-7335	CUSHION
126	1222-7336	CUSHION
127	1241-C1266	POLYETHY BAG

P.C. BOARDS (1)

PCB-1

MAIN P.C. BOARD

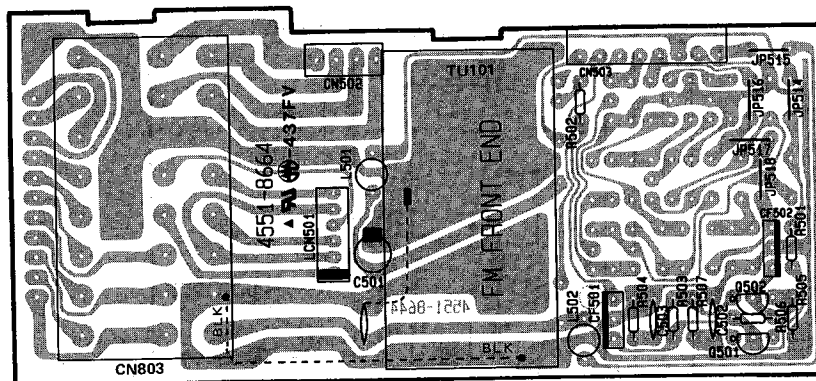
PLAYBACK
FREQUENCY
CHARACTERISTIC
ADJ.DOLBY NR
LEVEL ADJ.

TP3

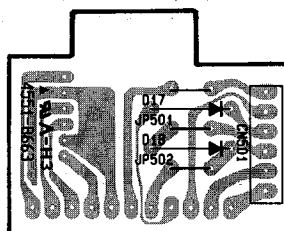
TP4

1
2
3
4
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6
7

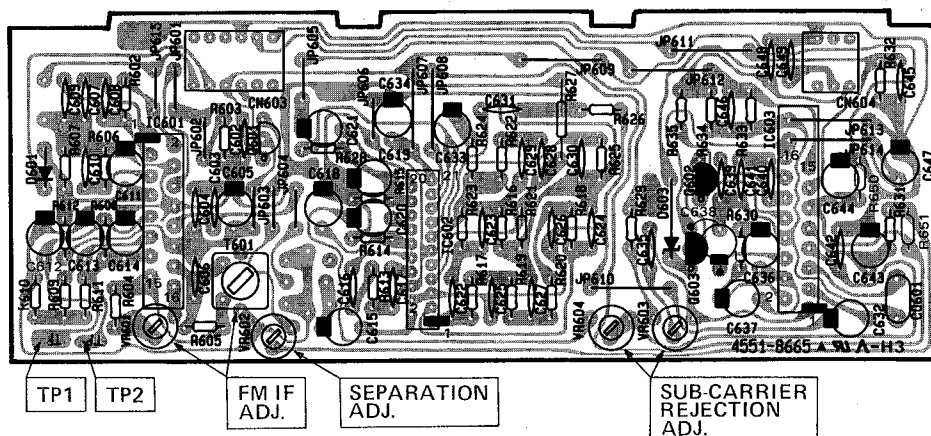
PCB-2



PCB-3



PCB-4



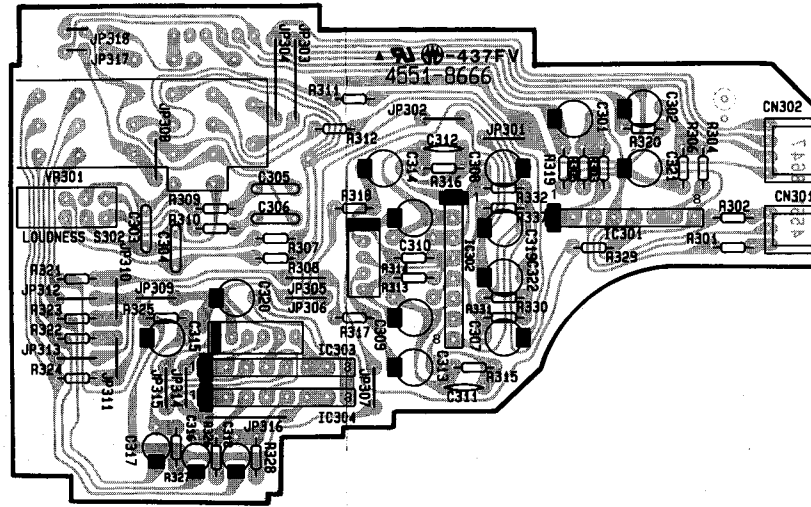
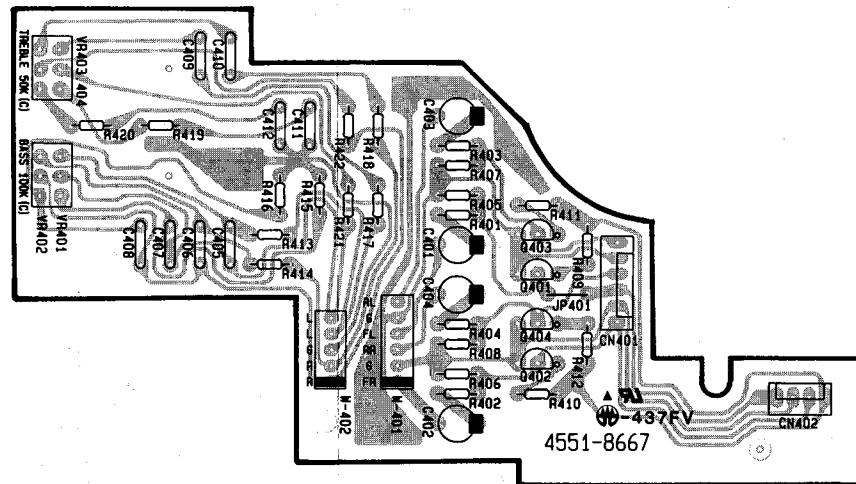
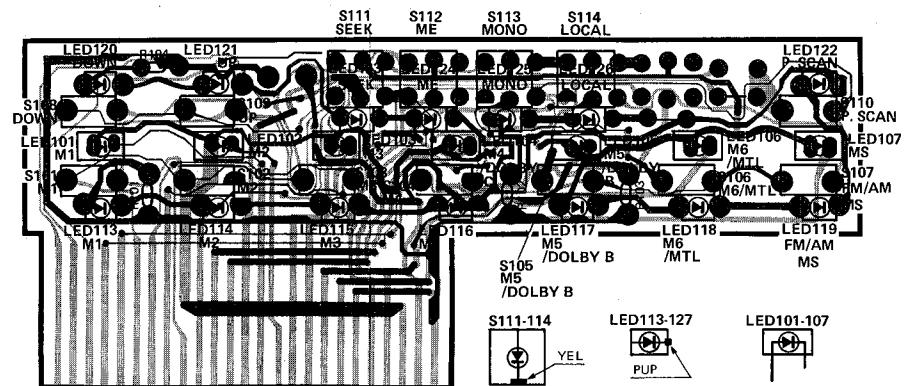
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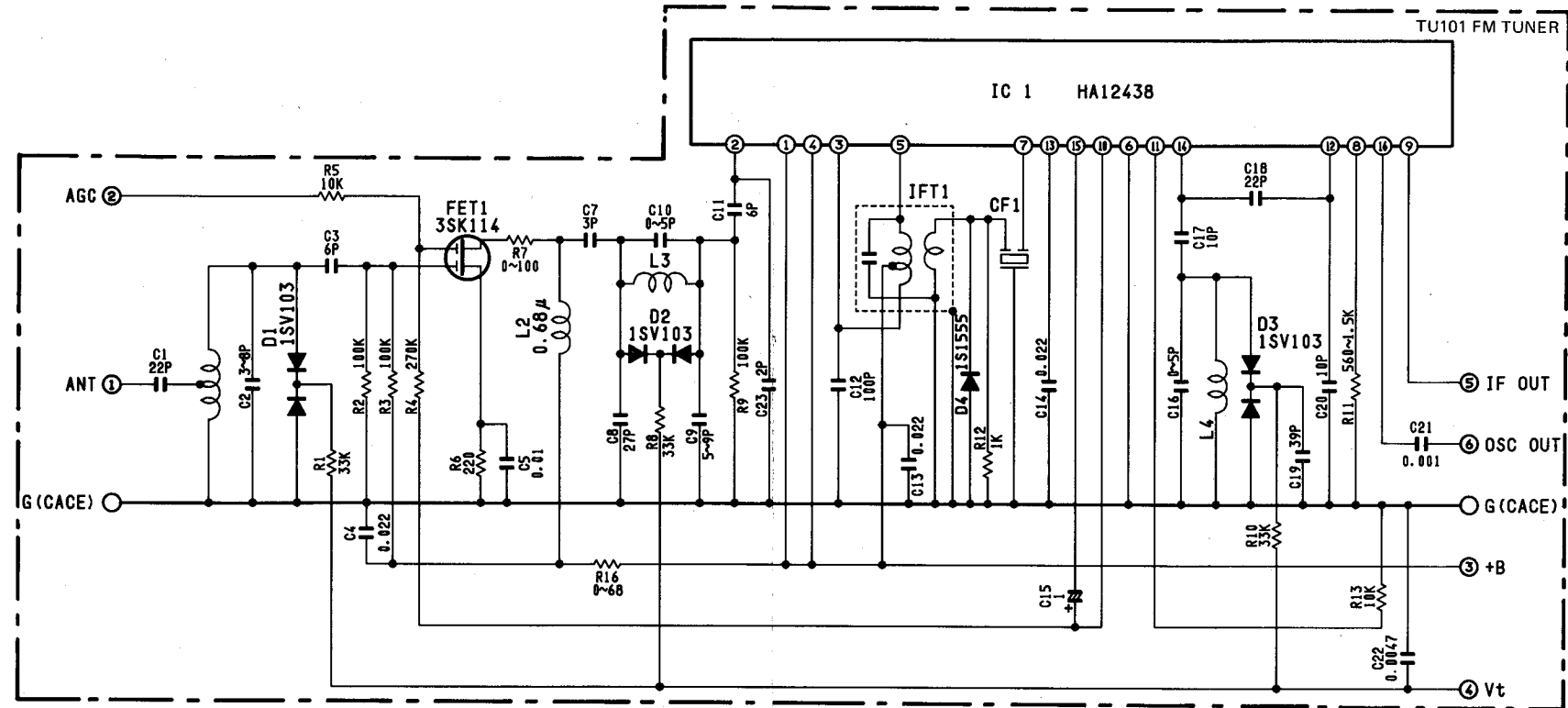
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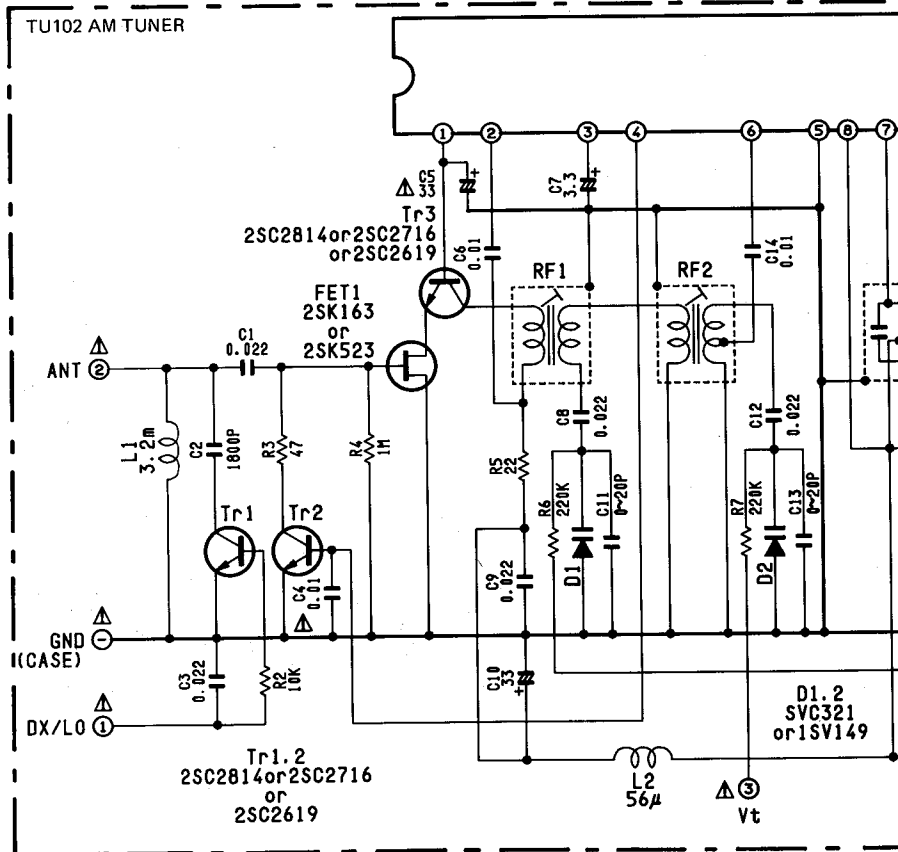
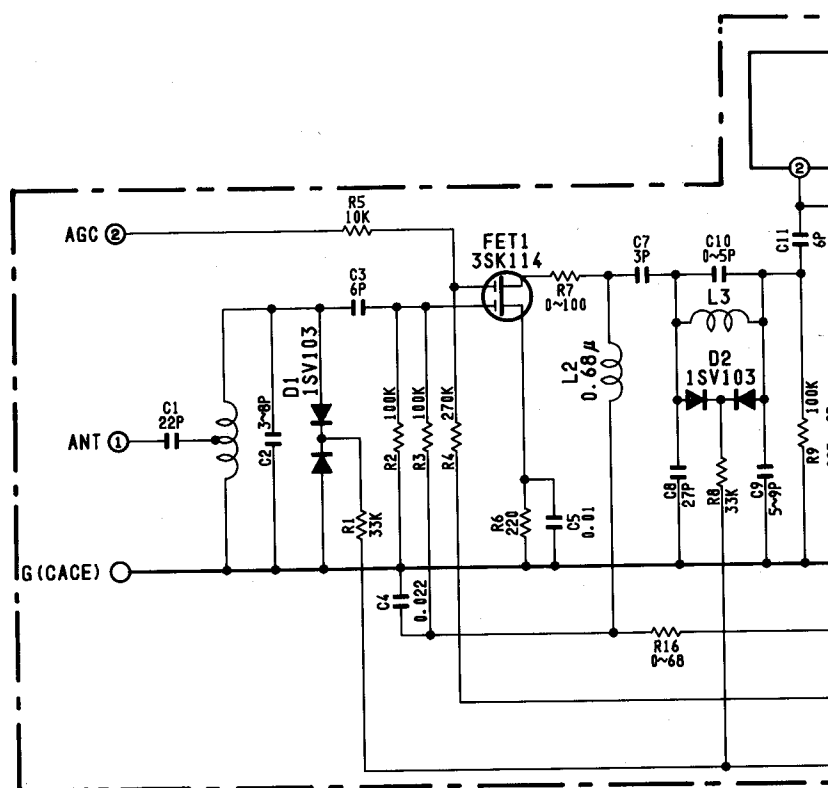
J

PCB-5 PRE AMP P.C. BOARD**PCB-6 TONE AND BUFFER P.C. BOARD****PCB-7 FRONT P.C. BOARD**

SCHEMATIC DIAGRAM (1)



SCHEMATIC DIAGRAM (1)



F

G

H

I

J

