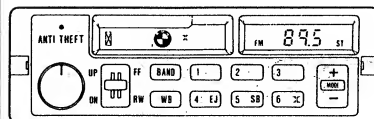


Service Manual



**ORDER NO.
CRT 1153**

BMW ANTI-THEFT CD-READY RADIO

KE-83ZBM US

Note :

- See the separate manual CX-156 (CRT-468) for the cassette mechanism description.
- Dolby and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.
- Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.
BMW No. 88 88 1 600 183

SPECIFICATIONS

TUNER

FM Receiver

Usable Sensitivity (Load) [30 dB (N + D)/(S + N + D)]	1 μ V
Signal/Noise Ratio (1 mV)	65 dB
Overload Signal	1 V
AM Rejection	40 dB
IF Rejection	100 dB
Image Rejection	50 dB
Spurious Rejection	70 dB
Alternate Channel Selectivity	60 dB
Capture Ratio	2 dB
Stereo Separation (1 kHz)	40 dB
Stereo Distortion (1 mV)	0.5%
Frequency Range	87.9 to 107.9 MHz
Intermediate Frequency	10.7 MHz

AM Receiver

Usable Sensitivity [20 dB N/(S + N)]	10 μ V
Signal/Noise Ratio (5 mV)	50 dB
Selectivity (\pm 10 kHz)	100 dB
IF Rejection	100 dB
Image Rejection	60 dB
Distortion (5 mV RF)	0.5%
Frequency Range	530 to 1620 kHz
Intermediate Frequency	450 kHz

WB Receiver

Usable Sensitivity (Load) [20 dB (S + N)/(S + N + D)]	0.3 μ V
--	-------------

Signal/Noise Ratio (1 mV)	55 dB
Distortion	1.5%
Frequency Range	162.400 to 162.550 MHz (25 kHz Step)

Intermediate Frequency	
1st I.F.	10.7 MHz
2nd I.F.	450 kHz

Cassette Deck

Wow and Flutter WRMS — JIS	0.07%
Signal/Noise Ratio	50 dB
Dolby NR Effect	10 dB
Separation	50 dB
Cross Talk	55 dB
Distortion	1%
Frequency Response (-3 dB)	
Normal	40 Hz to 15 kHz
Metal	40 Hz to 18 kHz

Audio Control

Tone Control Response	
Treble Boost/Cut	10 kHz \pm 10 dB
Bass Boost/Cut	100 Hz \pm 10 dB

Power Amplifier

Power Output ($R_L = 4 \Omega$, $V_{CC} = 14.4$ V)	
10% THD	5.5 W/Ch
1% THD	4.5 W/Ch
THD ($R_L = 4 \Omega$, $V_{CC} = 14.4$ V)	
$P_o = 1$ W	0.7%
Frequency Response (± 3 dB)	20 Hz to 40 kHz
Signal/Noise Ratio	65 dB

NOTE: Specifications are subject to change without notice.

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
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PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

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1. PROTECT YOUR RADIO FROM THEFT

Your BMW radio will not operate once it is removed from the console, making it virtually useless to a thief. The only way to restore power to the radio once it is removed is to enter a five-digit security code unique to your radio. The anti-theft features of your radio operate as follows:

1. When the ignition key is removed, the red anti-theft LED indicator will flash continuously.
2. If any buttons on the radio are touched after the key is removed, a warning tone will sound for five minutes or until the ignition is turned on. The anti-theft indicator will also flash.
3. A dead battery, electrical repairs, radio removal or reduction of voltage supply to less than a preset value will render the radio inoperable until voltage is restored and the security code is entered. The radio must be turned on before the code is entered. The word "code" will show on the display.
4. To enter your security code, which can be found on the two cards supplied to you by BMW, turn the radio on and use the appropriately numbered radio push-button selectors.

If the correct code is not entered in three successive tries, the radio will not accept another entry until it has been left on for one hour.

5. Do not leave the code cards in your car. Place them in your wallet or with your vehicle title papers for security. If you lose the code cards, contact the nearest BMW dealer. He will get your code from BMW. There may be a charge for removing the radio to ascertain its chassis number.
6. If radio or electrical repairs become necessary, please give the repair facility your radio code number. If you do not, only authorized BMW personnel can obtain the code from BMW.

Important: If you make a mistake in entering your code, complete the entire sequence before entering the correct code. For example, if your code is 12345, and you mistakenly enter 125, finish the five-digit sequence (45) to complete that entry. The radio will not operate, and the word "code" will again appear on the display. Enter the correct code at this time.

Exception: If you hear a beep when entering your code, stop immediately! Begin entering the code again, starting with the first digit.

WARNING: FOR YOUR PROTECTION, CODES WILL **NOT** BE GIVEN OUT TO ANYONE—UNDER ANY CIRCUMSTANCES—EXCEPT AUTHORIZED BMW DEALER PERSONNEL AFTER PROOF OF VEHICLE OWNERSHIP AND PROPER IDENTIFICATION IS ESTABLISHED.

2. USING THE RADIO

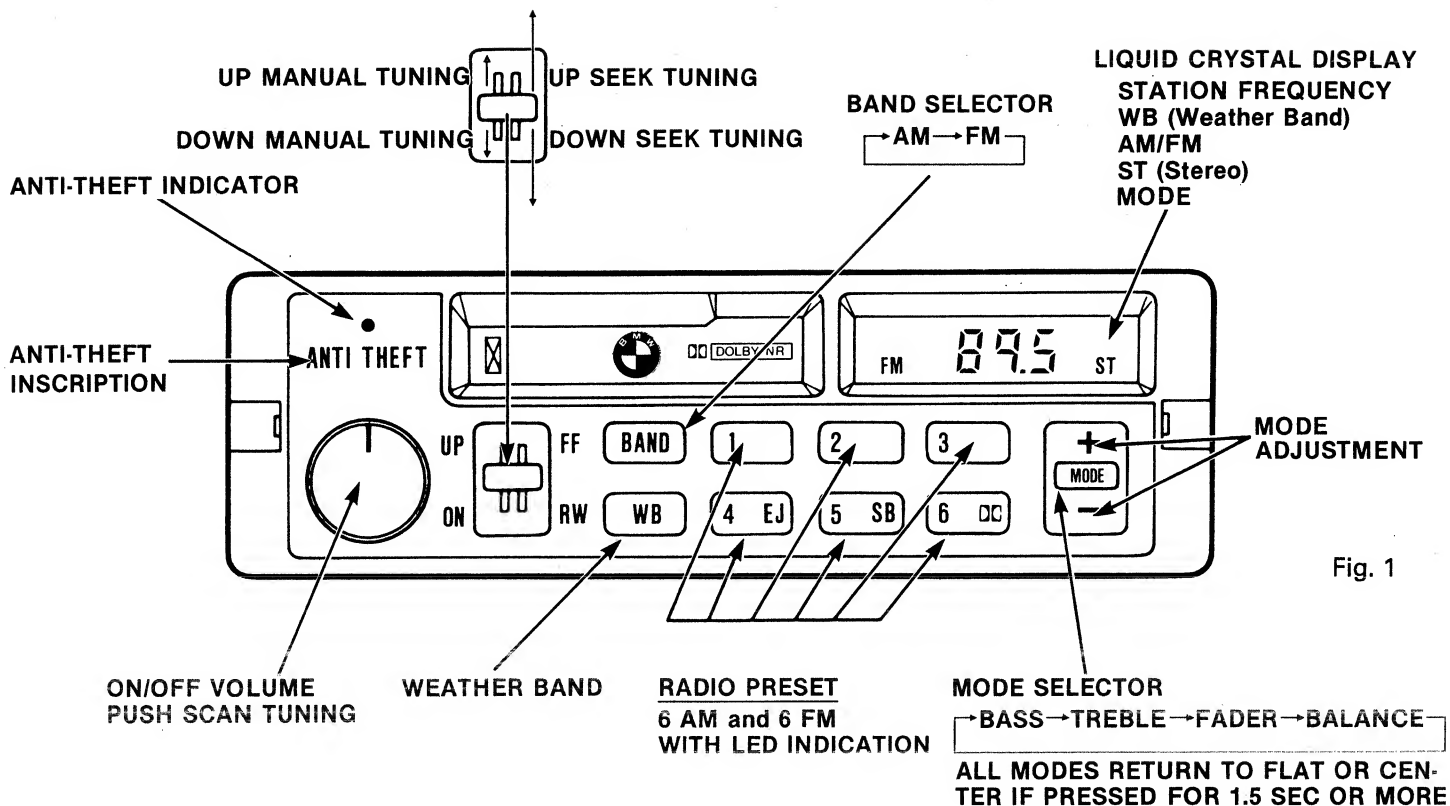


Fig. 1

AM/FM

Press the BAND button and AM or FM will appear on the display indicating which band is being received. When AM or FM is chosen, the currently tuned frequency is also displayed. Press the button to change from band to band.

WEATHER BAND (WB) AUTOMATIC FREQUENCY SELECTION

When the WB button is pressed, regardless of what source you are currently listening to, weather band seek tuning begins automatically and finds the strongest broadcast frequency. If the broadcast frequency in your area is too weak, or nonexistent, a beep will sound after the WB frequencies have been run through three times. If you press the WB button again, the radio returns to the previous source.

AUTOMATIC LOCAL/DISTANCE SWITCHING

New electronic circuitry automatically selects the local/distance mode for best reception, eliminating the need for manual switching.

MANUAL/SEEK TUNING

The TUNING LEVER is used for both manual and seek tuning. For manual tuning, raise or lower the lever one step—up for higher frequencies, down for lower frequencies. For seek tuning, raise or lower the lever as far as it will go. The unit will automatically tune and lock onto the next higher or lower receivable broadcast frequency.

STEREO

The ST indicator will light up on the display whenever a stereo station is received. The indicator will flash when signal strength diminishes.

PRESET STATION INDICATORS WITH LED

Each PRESET button has a built-in LED. When a PRESET button is pushed, the LED will change from orange to green, indicating selection of that preset frequency.

SCAN TUNING

Signal scan tuning allows you to tune into each medium-to-strong frequency pausing seven seconds at each. Push the ON/OFF button once to begin tuning up scale, and press it again during a pause to stop the scanning.

FM RECEPTION

Signal reflections or blockages caused by hills or tall buildings may cause hissing and fluttering noises in FM reception. FM signal strength diminishes beyond 25 miles from the transmitter.

BASS, TREBLE, FADER AND BALANCE CONTROL

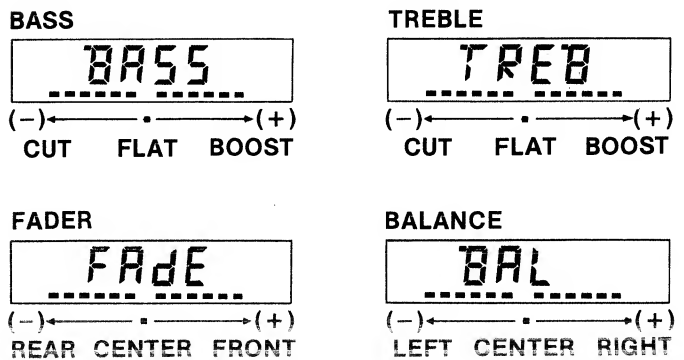
Each time the MODE button is pressed, control of bass, treble, fader, or balance is selected in turn. The selected mode is shown on the display and can be adjusted by the + and - buttons. About five seconds after adjustment, the display returns to its previous state.

When the MODE button is pressed continuously for more than 1.5 seconds, the level of each mode returns to flat or center. At this time a beep is sounded and "FLAT" is displayed on the display.

PROGRAMMING/REPROGRAMMING PRESET STATIONS

Tune in the desired radio station. Then push a PRESET selection button for 1.5 seconds. When you hear a beep, the frequency has been memorized. Repeat this procedure for the remaining preset station selectors on the AM and FM bands.

NOTE: The radio programming controls have dual functions. Each button can be set to one AM and one FM station.



3. USING THE TAPE DECK

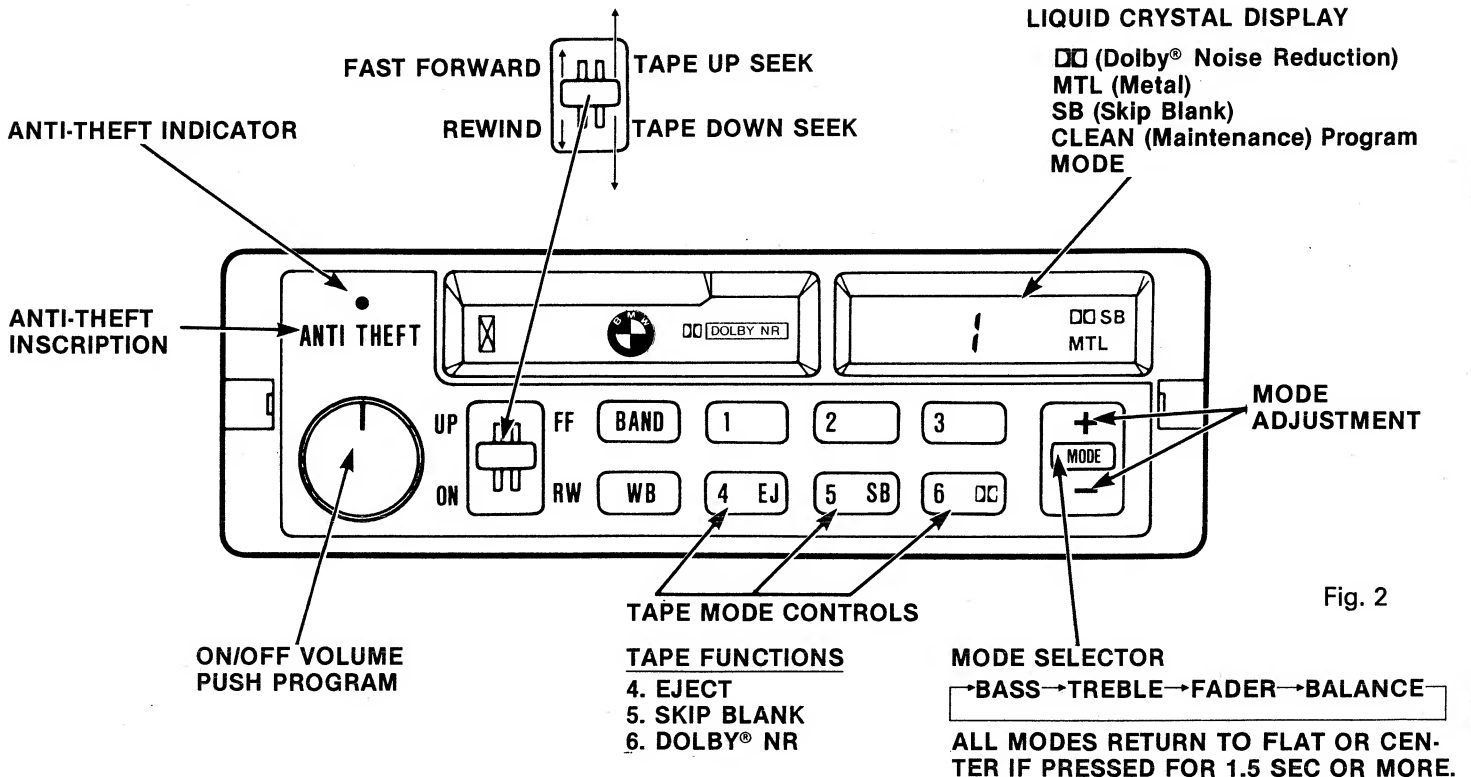


Fig. 2

CASSETTE OPERATION

To use the cassette player, turn the radio on. When a cassette is inserted, the unit will switch automatically from radio to tape mode.

FAST FORWARD/REWIND

The FF/RW lever has a two-step operation. Raise the lever one step to fast forward; lower it one step to rewind. Repeat the same action to stop the appropriate function. The logic circuitry in your radio will automatically determine the right direction for fast forward or rewind.

A standard cassette has two sides and can be played in either direction. When in play, the top side of a cassette will be indicated as "1" on the display. The bottom side will appear as "2".

TAPE SEEK

Raising or lowering the fast forward/rewind (FF/RW) lever two steps (as far as it can go) activates the seek mode. SEEK will appear on the display. To move to the next selection on your tape, raise the lever as far as it can go. The tape will move rapidly to the next selection. To restart the current selection, lower the lever in the same fashion.

TAPE EJECT (4 EJ)

Press the EJECT button—4 EJ to eject tape cassette and return to the radio mode.

SKIP BLANK (5 SB)

The SKIP BLANK button—5 SB—automatically advances the tape to the next recorded portion when a blank section of tape exceeds approximately 12 seconds. When there is a long, unrecorded portion at the end of the tape, the unit advances the tape to the end and then starts to play the other side. When the SKIP BLANK button is pushed, SB will appear on the display. Additionally, SEEK will be displayed while the tape is advancing.

DOLBY® NOISE REDUCTION (6 DD)

Use the Dolby® * Noise Reduction function—button 6 DD—to reduce the level of hiss on Dolby® encoded cassettes. If you do not use the Dolby® noise-reduction function with Dolby® encoded tapes, the high-frequency response will be intensified. If you do use this function with non-Dolby® tapes, high-frequency response will be diminished.

*The word "Dolby" and the double-D symbol are registered trademarks of Dolby Laboratories, Inc.

Tape Seek will only function correctly if there are four seconds of silence between the selections on your tape. Excessive noise between selections on home-recorded tapes may interfere with these functions.

The cassette automatically ejects from the unit if tape setting operations cannot be completed within a few seconds. This may be caused by a faulty or damaged cassette. Determine the cause of the problem or use a different cassette.

REVERSING TAPE DIRECTION

To reverse tape direction, push the ON/OFF button. The tape will reverse automatically when a side is complete.

AUTOMATIC EQUALIZATION

The playback equalization of normal tapes differs from that of chrome and metal tapes. When a high-bias tape, including metal, is inserted, the unit will automatically change to the correct equalization level, and MTL will be indicated on the display.

IGNITION-KEY-OFF PAUSE MODE

If the ignition is turned off while a tape is playing, the unit automatically enters the pause mode. The unit will return to normal play mode when the ignition is turned on. The unit will not accept another cassette when it is in the pause mode.

AUTOMATIC TAPE SLACK CANCELLER (ATSC)

The automatic tape slack canceller removes any slack in the tape before play to protect the tape and extend its life.

ROTATING TAPE HEAD

The rotating tape head in your tape cassette player ensures accurate horizontal tape alignment in both directions for optimum sound level reproduction and frequency response.

NOTE: The BMW Anti-Theft Radio contains a full-logic computer-controlled 3-motor drive which controls the automatic tape slack canceller (ATSC) and rotating tape head mechanism. During cassette tape loading/unloading or tape transport directional changes, the motor drive emits a precision mechanical sound which indicates normal tape cassette player operation.

4. DISASSEMBLY

● **Removing the Case**

- 1. Remove the screw (A).
- 2. Insert and turn a flat screwdriver to remove case.
- 3. Raise case to remove.

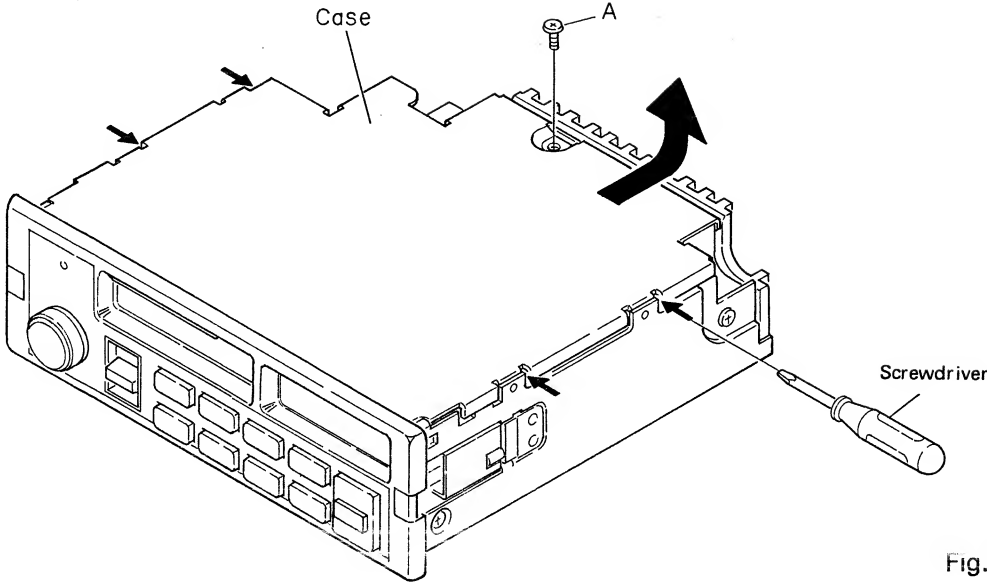


Fig. 3

● **Removing the Cassette Mechanism Assy**

- 1. Remove the four screws (B)
- 2. Pull the connector (20P) out while Lifting the Cassette Mechanism Assy straight up.

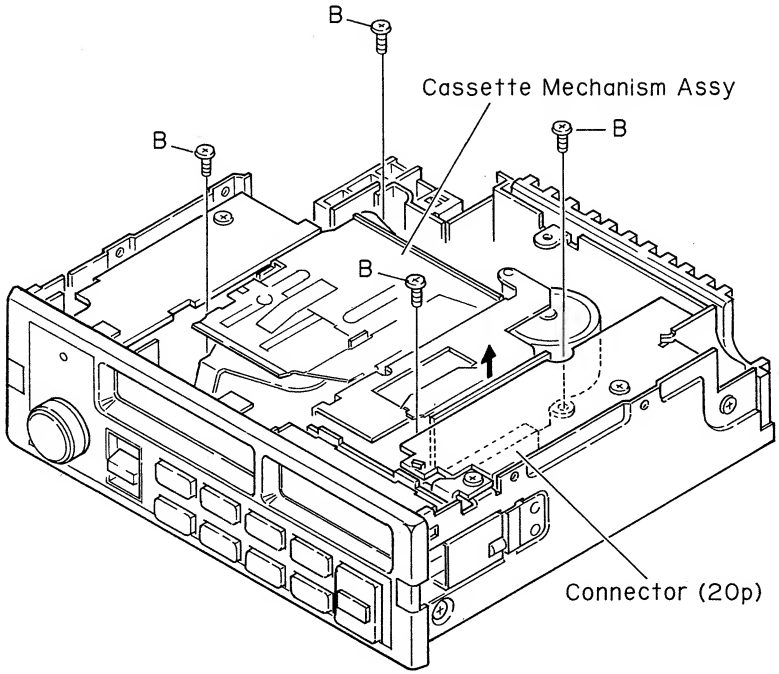


Fig. 4

● **Removing the Grille Assy**

1. Remove the two knobs, and remove the two screws (c).
2. Insert a screwdriver and turn it in the arrow direction, then two connector catches come off and the flexible circuit board can be removed.
3. Remove the two tabs.

● **Removing the Tuner Amp Unit (4/6)**

1. Remove the screw (E).
2. Remove the solder, and stretch the tab.
3. Pull the connector (10P) out while Lifting the Tuner Amp Unit (4/6) straight up.

● **Removing the Tuner Amp Unit (1/6)**

1. Remove the screw (D).
2. Remove the solder, and stretch the two tabs.
3. Pull the connectors (4P, 5P) out while Lifting the Tuner Amp Unit (1/6) straight up.

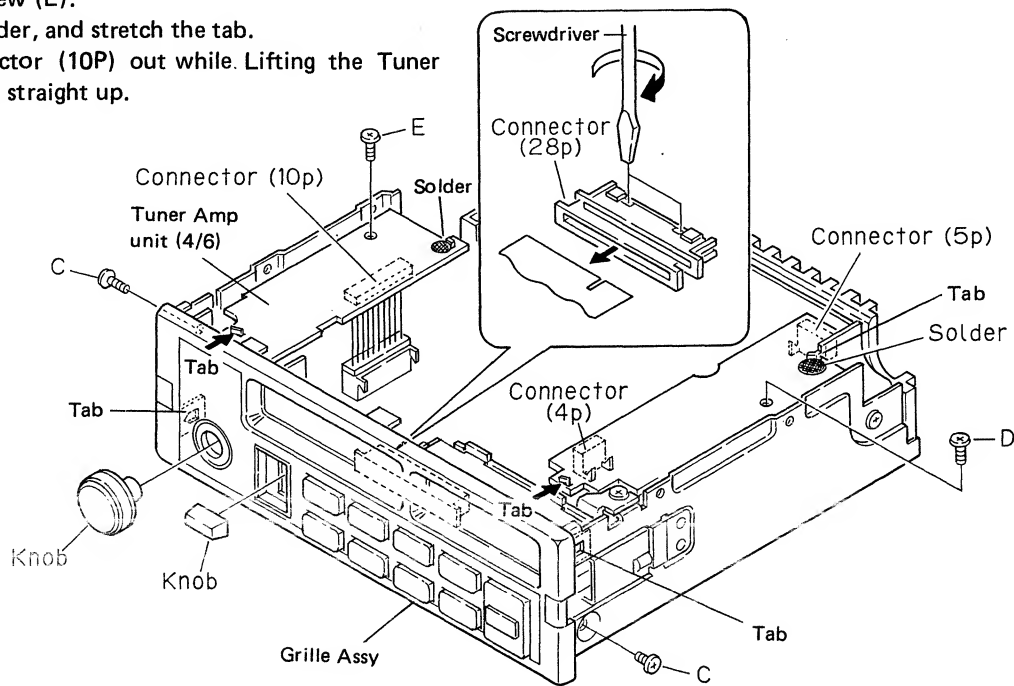


Fig. 5

● **Removing the LCD Unit**

1. Remove the screw (F).
2. Pull the connector (16P) out while Lifting the LCD Unit straight up.

● **Removing the chassis**

1. Remove the four screws (G).

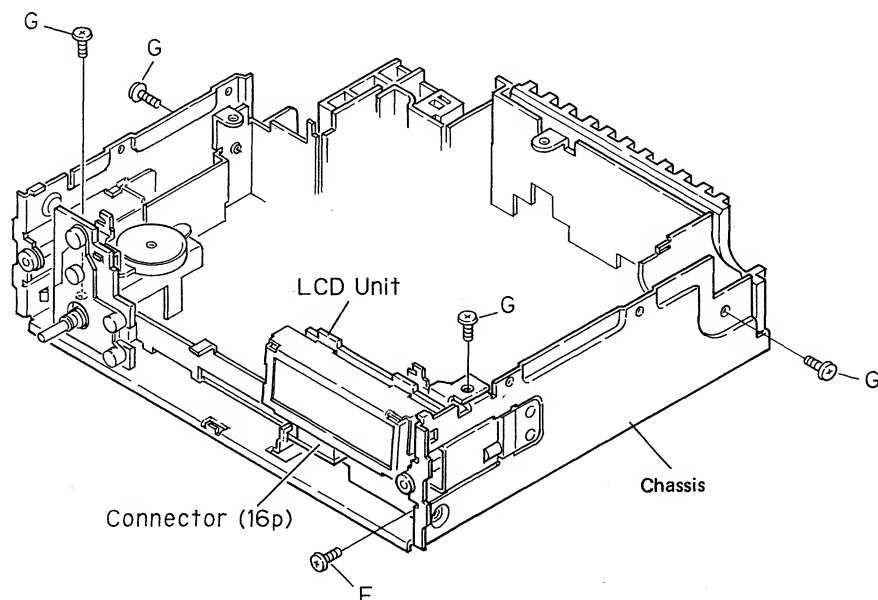


Fig. 6

5. CONNECTOR TERMINAL FUNCTIONS

● Connection Diagram

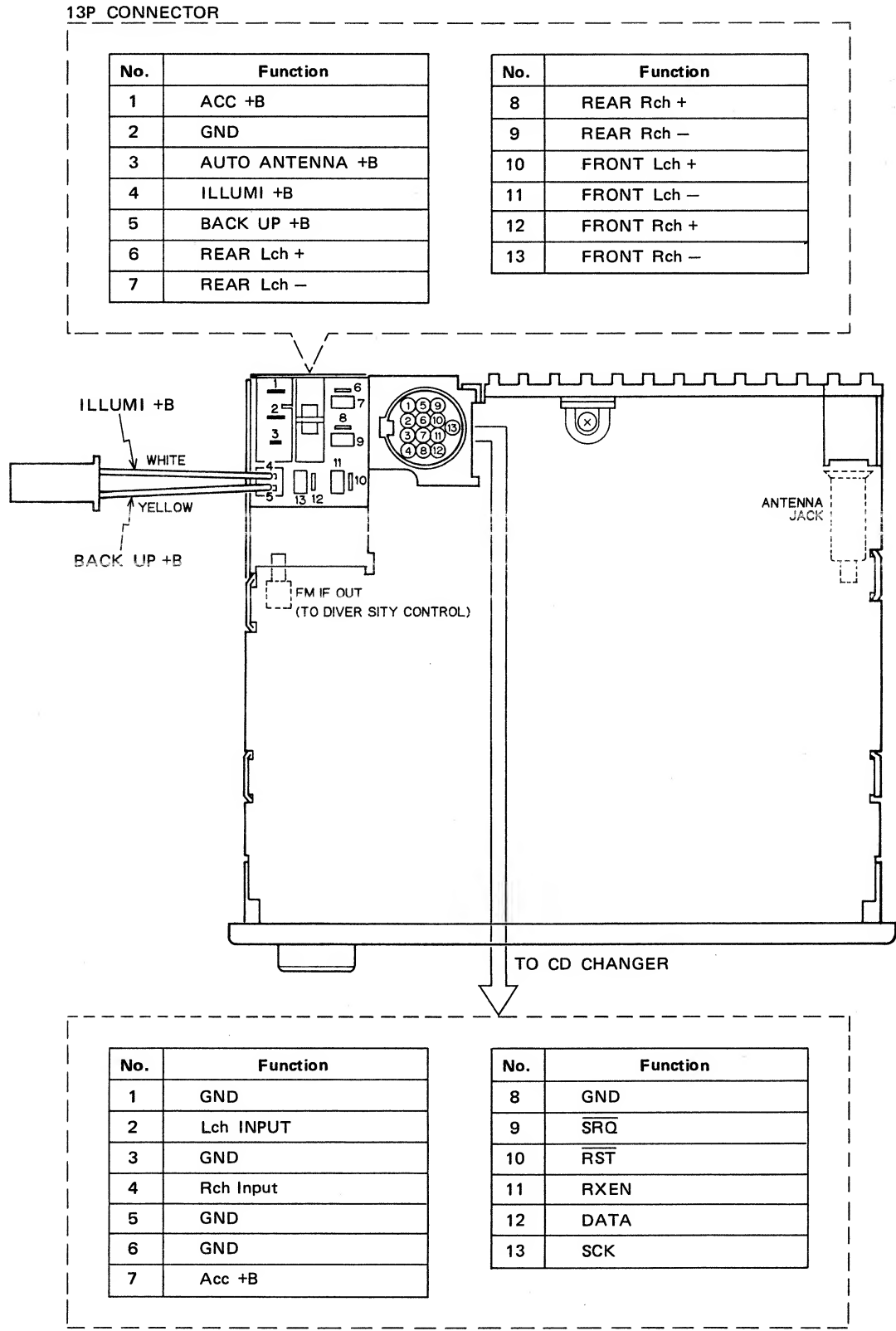


Fig. 7

6. BLOCK DIAGRAM

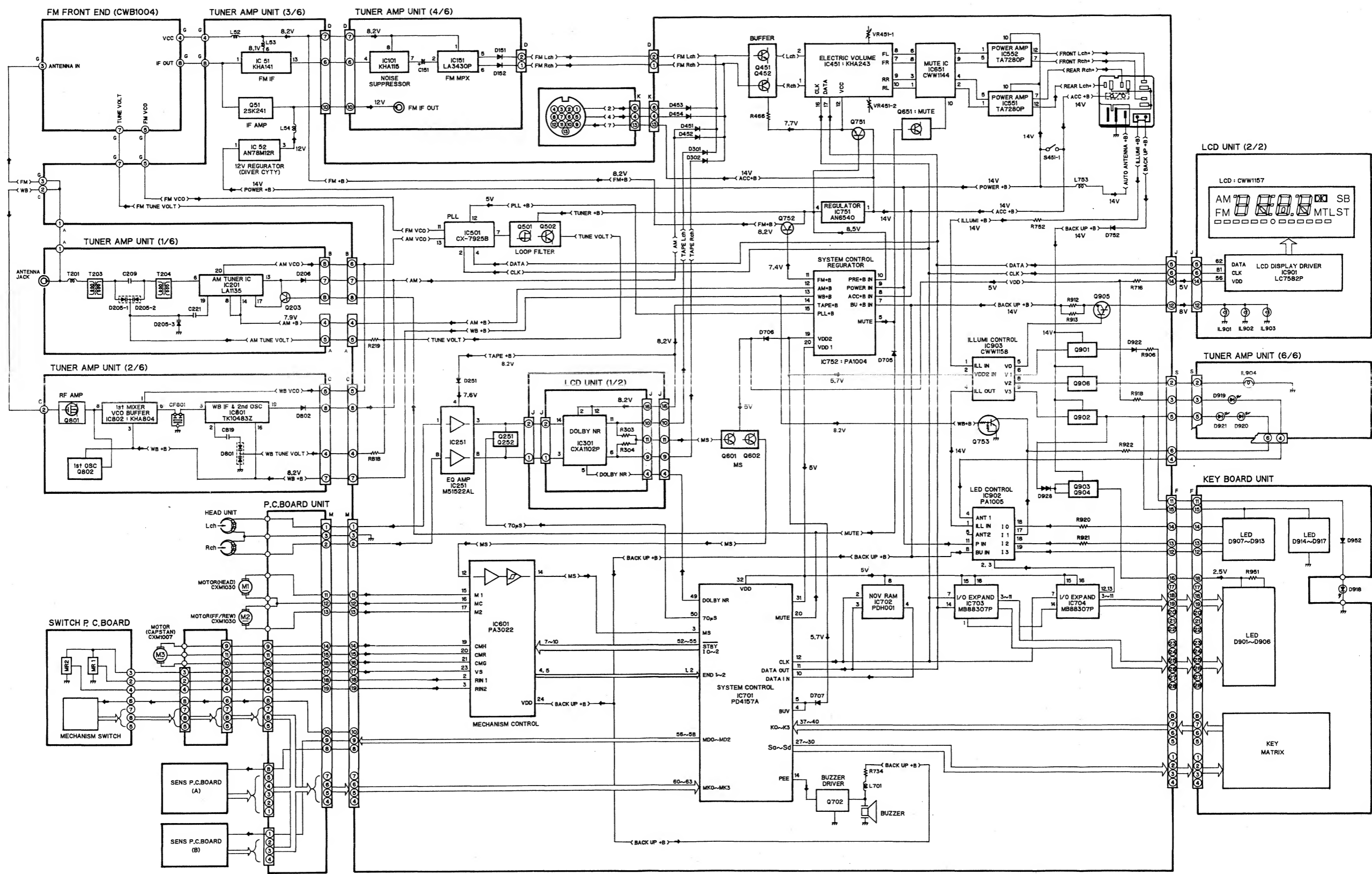


Fig. 8

7. ADJUSTMENT

● Connection Diagram

NOTICE:

Select C1 so that total capacity of 80pF attained from the direction of the receiver jack.
Z: Output impedance of SSG.

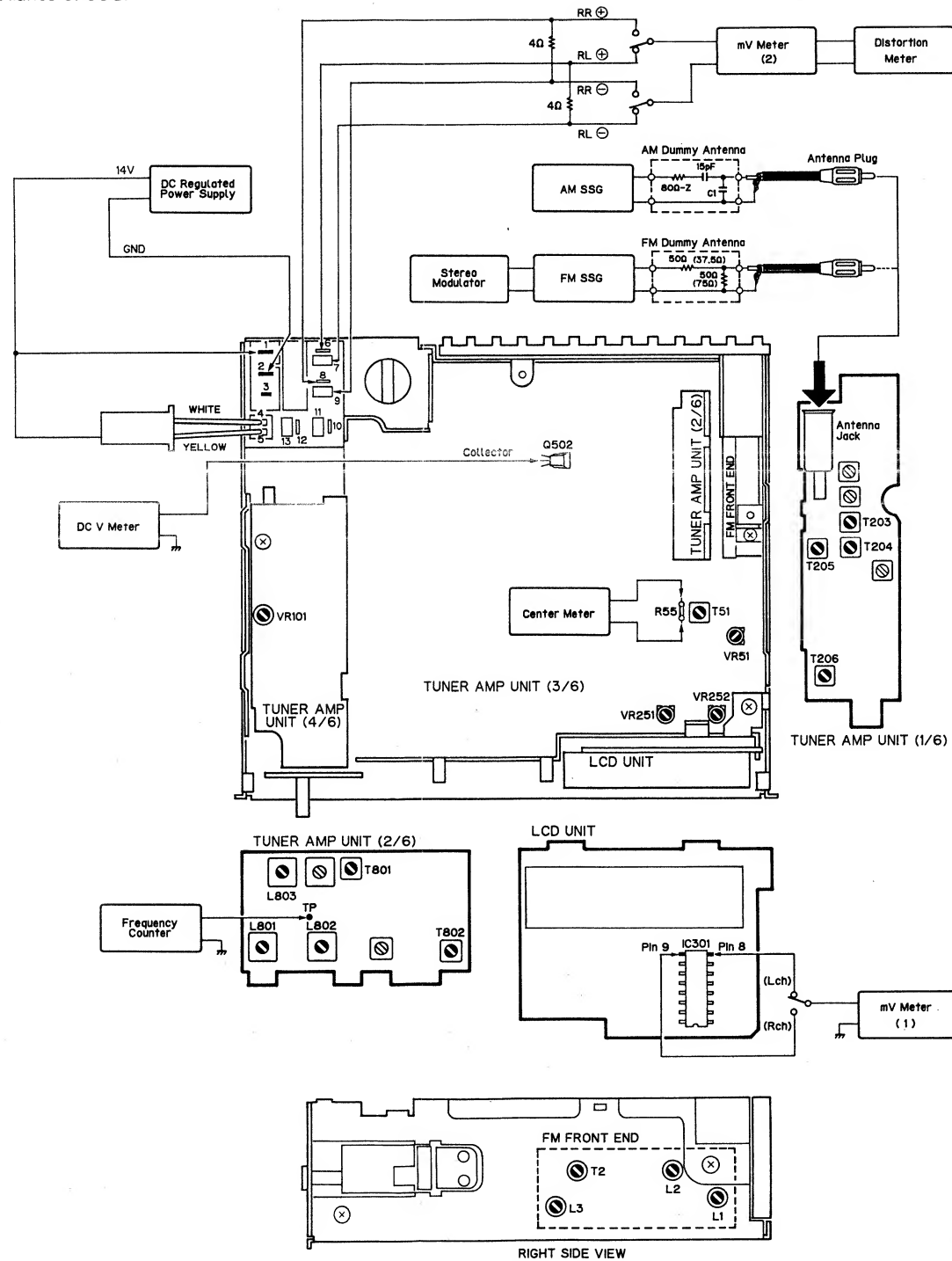


Fig. 9

7. 1 DOLBY NR LEVEL ADJUSTMENT

No.	Cassette Tape	Adjusting Point	Adjustment Method (Switch Position)
1	NCT-150 (400Hz, 200nwb/m)	VR251 (Lch), VR252 (Rch)	mV Meter (1): $245\text{mV} \pm 1\text{dB}$ ($245\text{mV} = -10\text{dBs}$) (DOLBY NR Switch: OFF)

7. 2 AM ADJUSTMENT

	No.	AM SSG (400Hz, 30%)		Displayed Frequency (kHz)	Adjusting Point	Adjustment Method (Switch Position)
		Frequency (kHz)	Level (dB)			
Tuning Volt	1			1,620	—	DC V Meter: Less than 8.0V
	2			530	—	DC V Meter: More than 0.8V
Tracking	1	600	20	600	T203, T204, T205, T206	mV Meter (2): Maximum
	2	600 1,000 1,400	35	600 1,000 1,400	—	The difference between the maximum and minimum output levels at 600kHz, 1,000kHz and 1,400kHz must be 6dB or less.

7. 3 FM ADJUSTMENT * Stereo MOD.: 1kHz, L+R = 90%, Pilot = 10%

	No.	FM SSG (400Hz, 100%)		Displayed Frequency (MHz)	Adjusting Point	Adjustment Method (Switch Position)
		Frequency (MHz)	Level (dB)			
IF	1	98.1 Unmodulated	60	98.1	T51	Center Meter: 0
Tracking	1	107.9	10	107.9	L3	DC V Meter: $7.0\text{V} \pm 0.1\text{V}$
	2	87.9	10	87.9	—	DC V Meter: More than 1.5V
	3	90.1	10	90.1	L1, L2	mV Meter (2): Maximum
	4	98.1	10	98.1	T2	mV Meter (2): Maximum
MPX	1	98.1*	60	98.1	VR101	mV Meter (2): Best separation
ARC	1	98.1*	35	98.1	VR51	mV Meter (2): Separation 5dB

7. 4 WB ADJUSTMENT

	No.	FM SSG(400Hz,100%)		Displayed Frequency (MHz)	Adjusting Point	Adjustment Method (Switch Position)
		Frequency (MHz)	Level (dB)			
WB	1			CH-3/WB	L803	Frequency Counter: 151.775MHz NOTE:After adjusting L803, disconnect frequency counter
	2	162.400	60	CH-2/WB	Volume control knob	mV Meter (2) :10dBs
	3	162.400	60	CH-2/WB	T802	Distortion Meter:Minimum
	4	162.475	10-15	CH-3/WB	L801,L802	mV Meter (2) :Maximum
	5	162.475	10-15	CH-3/WB	T801	mV Meter (2) :Maximum

8. INNER CONNECTIONS OF LCD (CWW 1157)

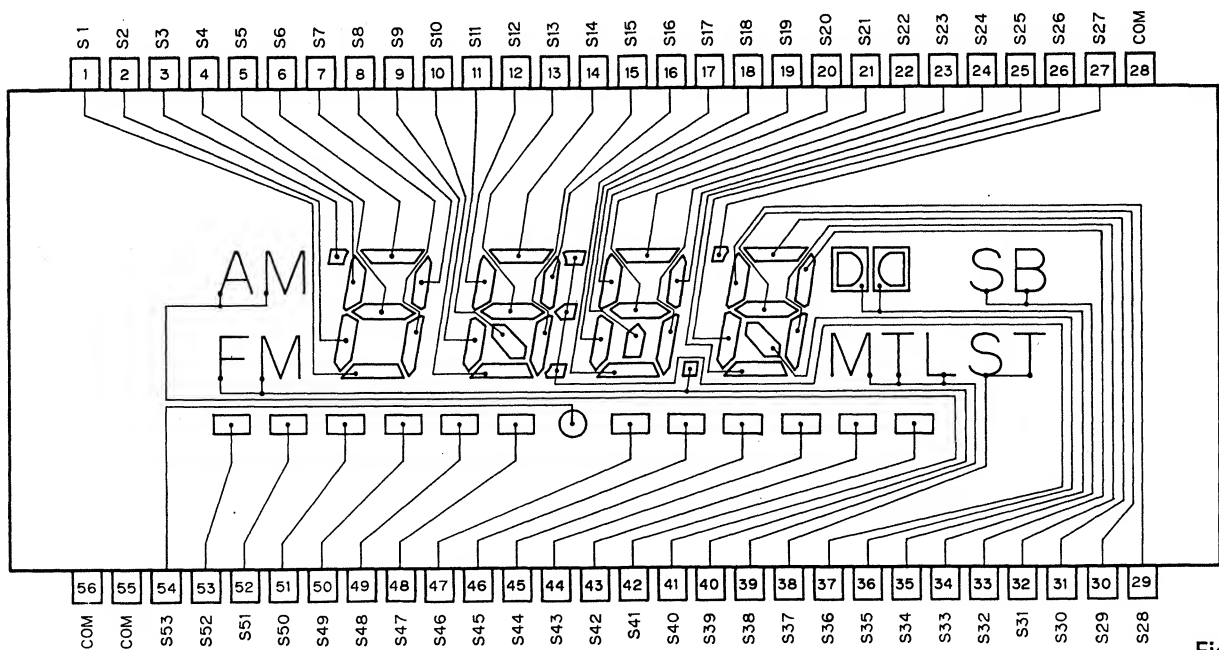
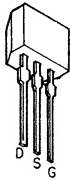


Fig. 10

● ICs and Transistors

2SK241



2SD1276



2SC2753
2SC2570



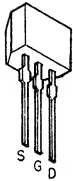
2SK435



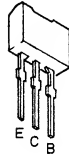
2SC2458
2SC1740S
2SB808



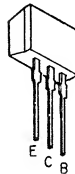
2SK330



2SC3665



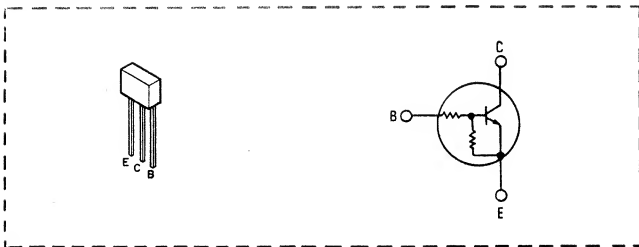
2SC2786



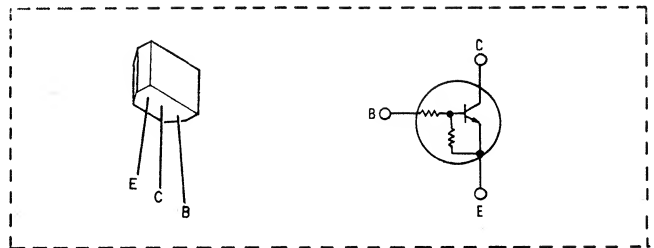
2SD1930



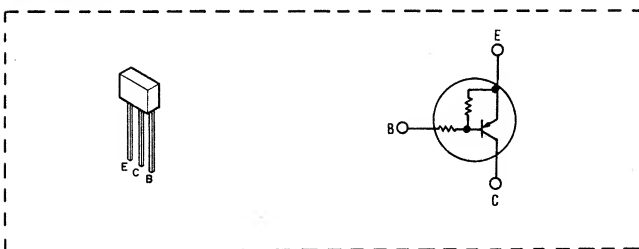
UN4212



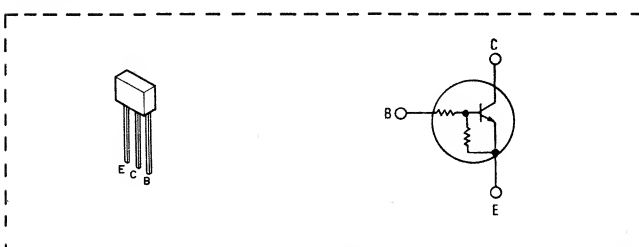
DTC124ES



DTA144ES

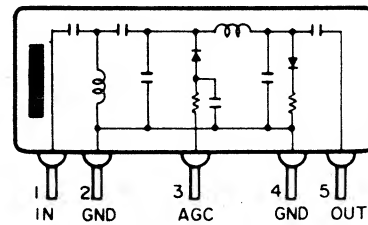


UN4113



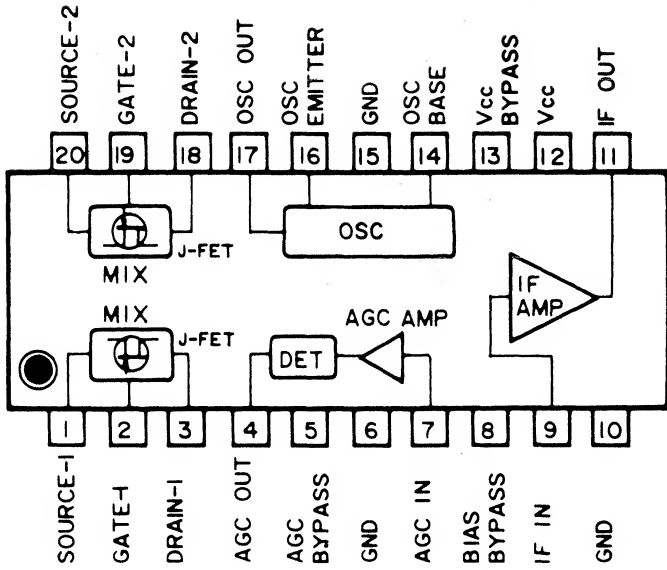
● FM Front End

IC1: CWW1015
(CWW-173)

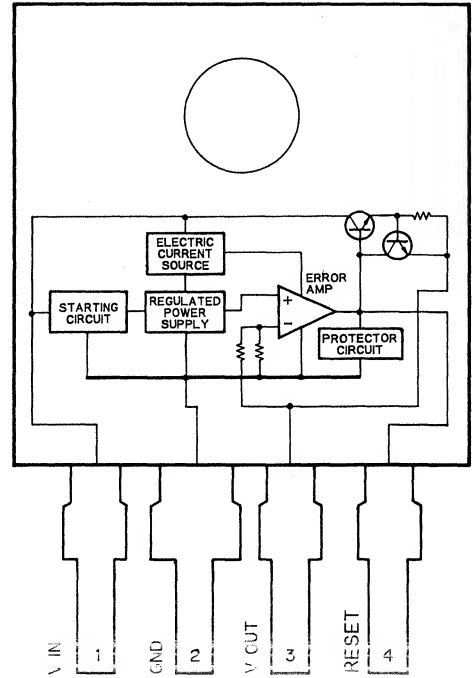


IC2: PA4009

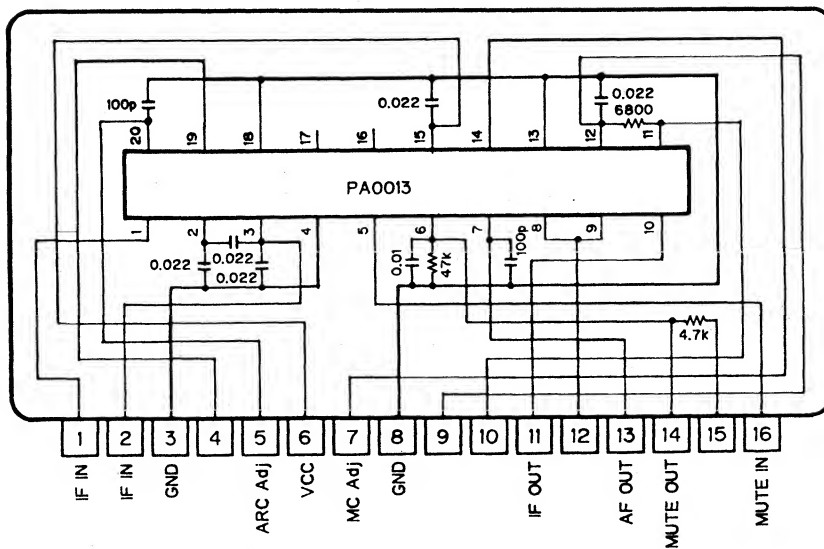
● Tuner Amp Unit



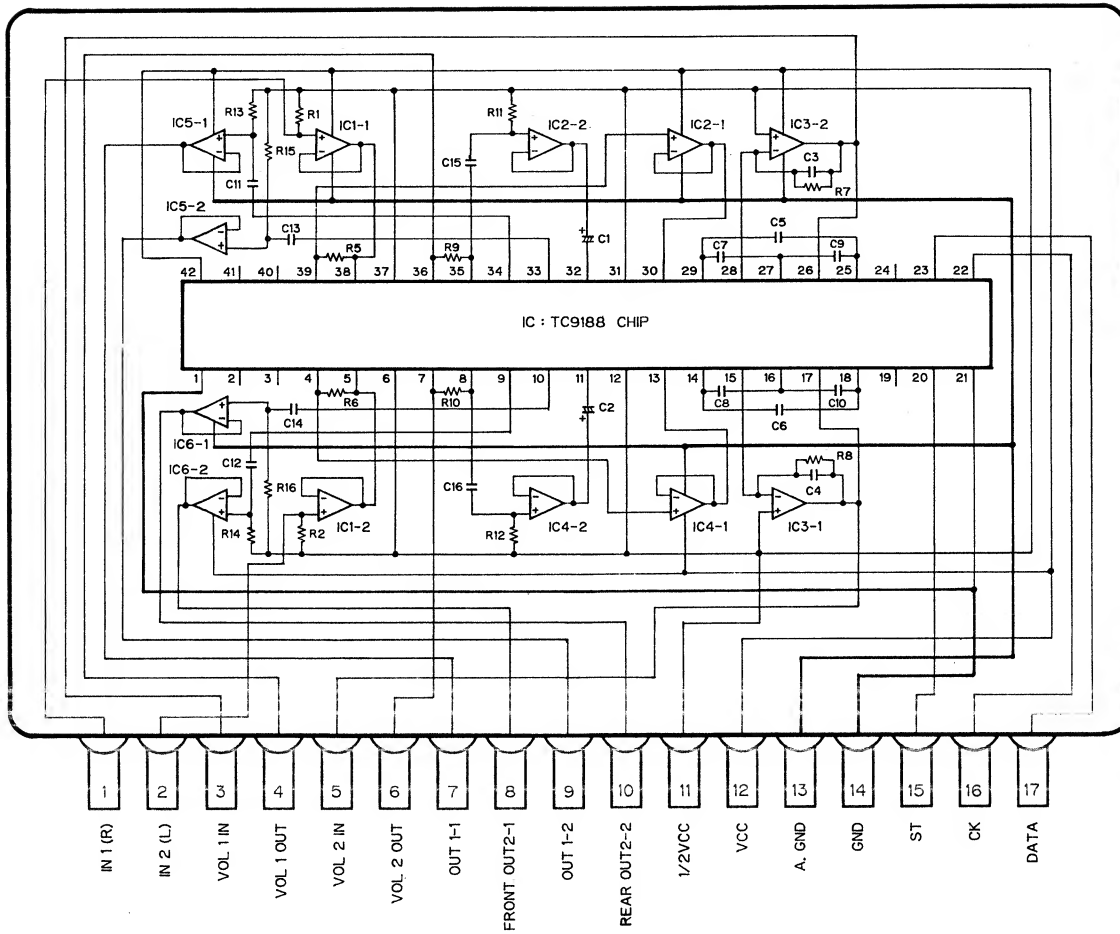
IC52: AN78M12R



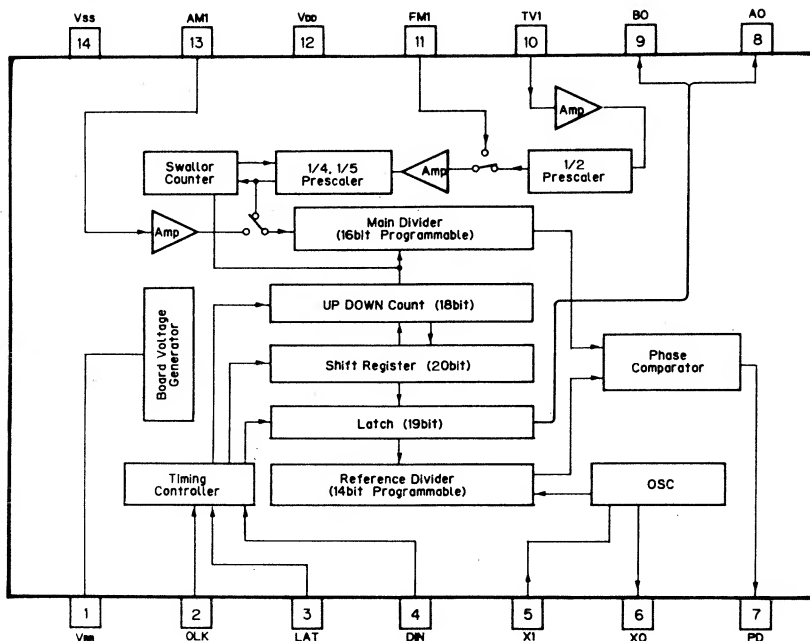
IC51: KHA141



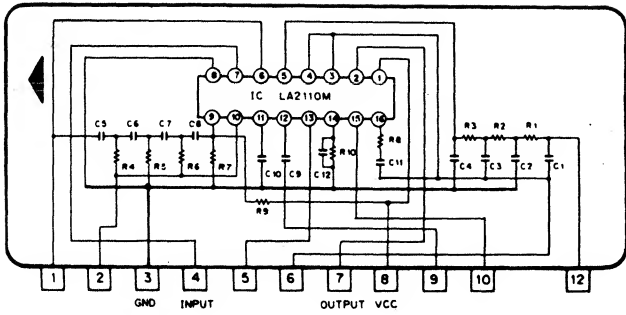
IC451: KHA243



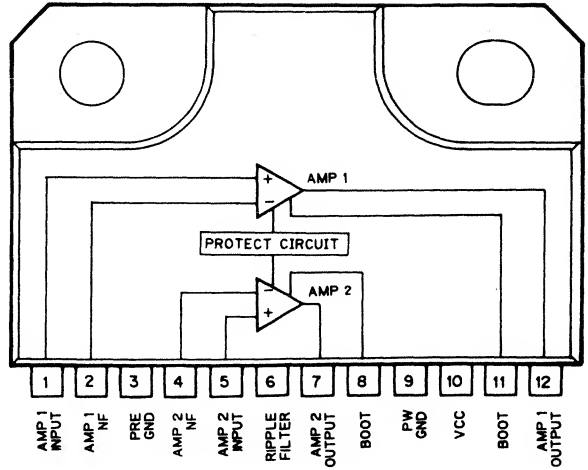
IC501: CX-7925B



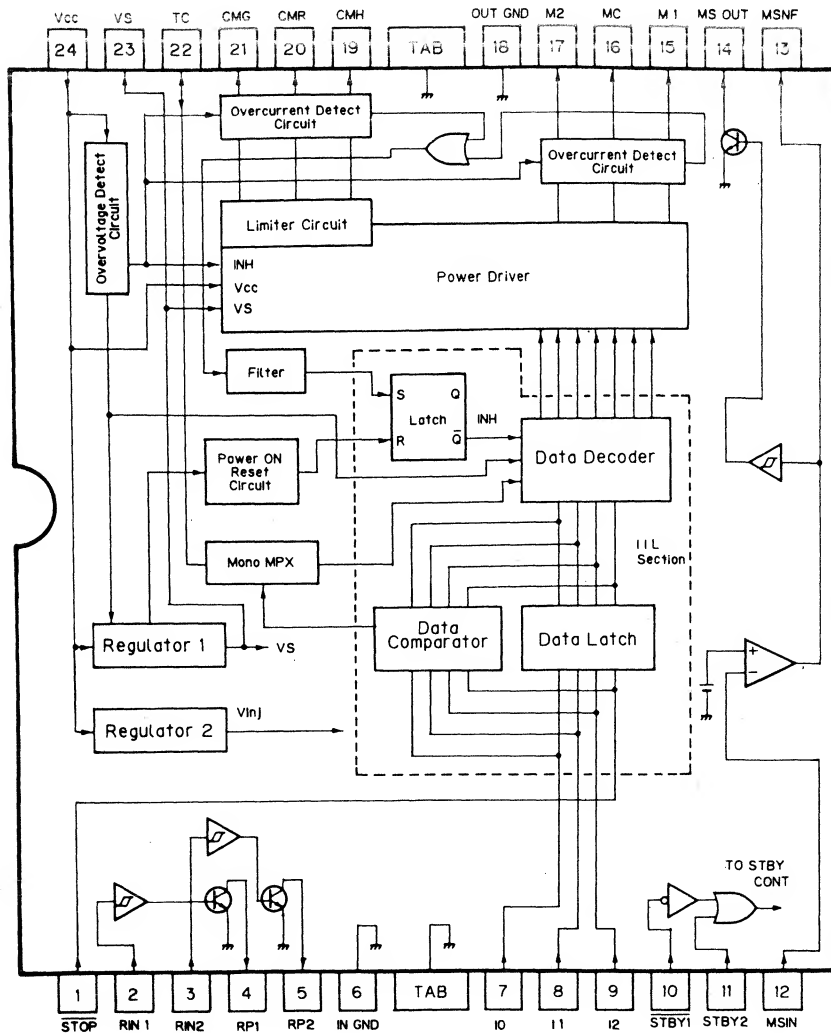
IC101: KHA115



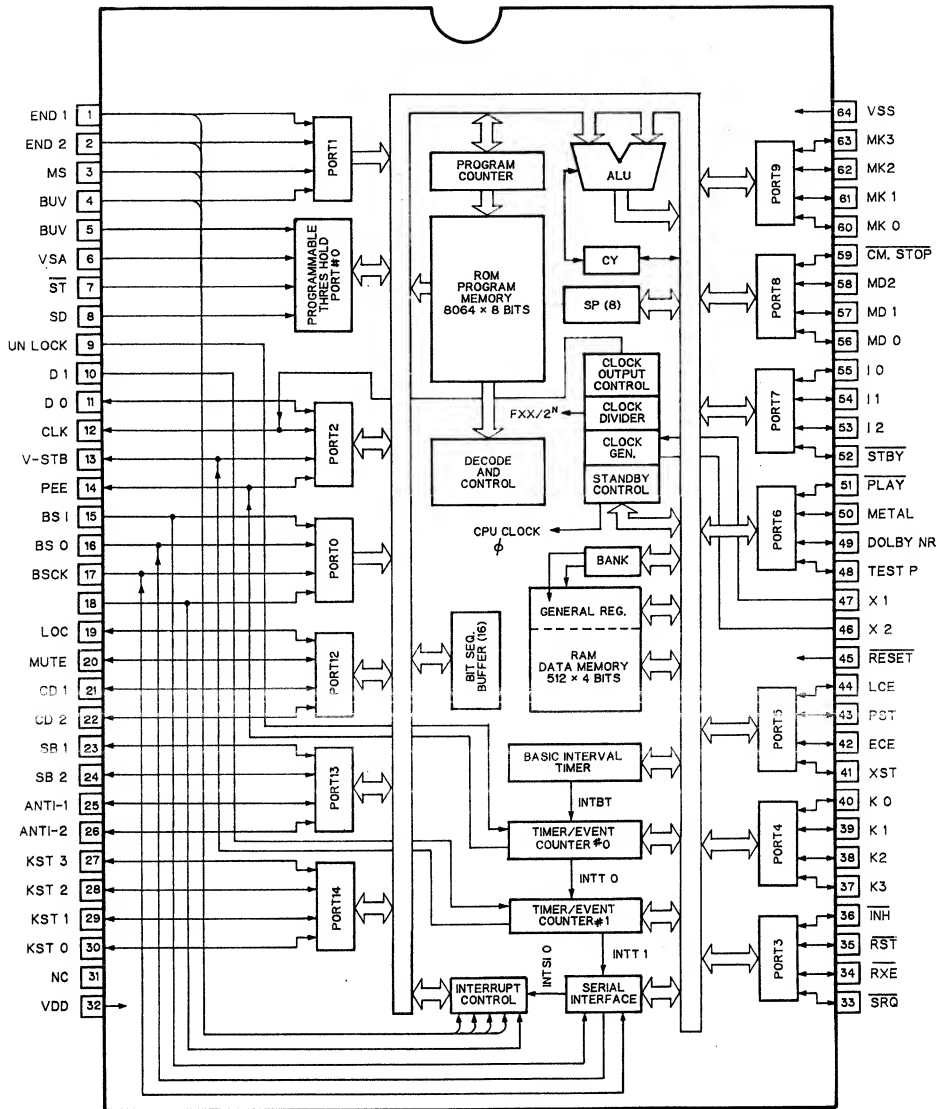
IC551, 552: TA7280P



IC601: PA3022A



IC701: PD4157A

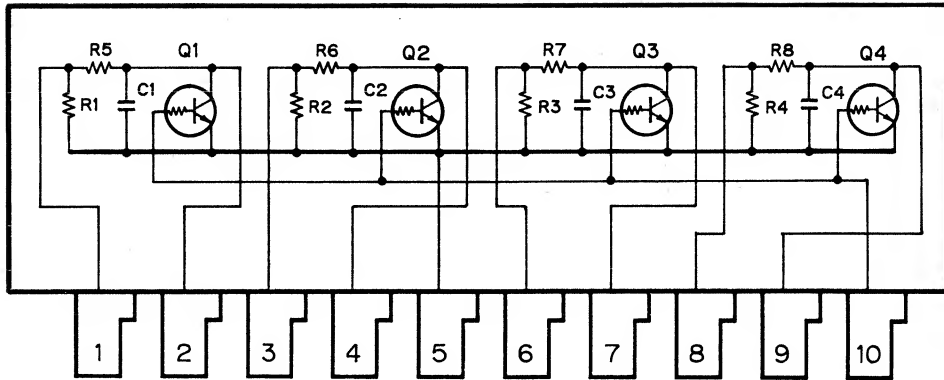


● Pin Function (PD4157A)

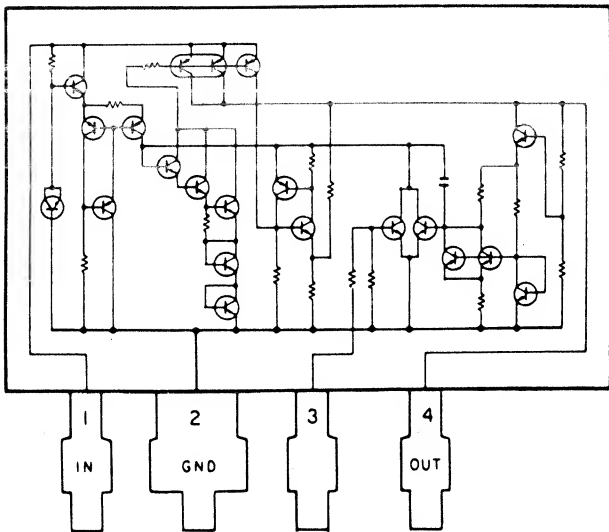
Pin No.	Pin Name	I/O	Function and Operation
1	END1	Input	Reel rotation detection terminal.
2	END2	Input	Detects IC601 (PA3022) pulse output.
3	MS	Input	Tape interim music detection terminal.
4	BUV	Input	Back up +B detector terminal. (0 - 1 - 5V)
5	BUV	Input	
6	VSA	Input	Power SW sense.
7	ST	Input	"L" during stereo.
8	SD	Input	Stop input terminal during seek and scan operation. Seek and scan stops during "H".
9	UN LOCK	Input	PLL lock detector.
10	D1	Input	Data input.

Pin No.	Pin Name	I/O	Function and Operation
11	D0	Output	Data output.
12	CLK	Output	Clock signal.
13	V-STB	Output	Strobe signal.
14	PEE	Output	4 kHz signal.
15	BS1	Input	Communication data line. (CD CHANGER)
16	BS0	Output	
17	BSCK	I/O	Communication clock line.
18			No connection.
19	LOC	Output	"H" during local search.
20	MUTE	Output	Mute output.
21	CD1	Output	"L" during CD play.
22	CD2	Output	
23	SB1	Output	Source selector control (IC751).
24	SB2	Output	
25	ANT1-1	Output	Causes LED (D919) to flash when Anti-Theft is operating.
26	ANT1-2	Output	Shifts to "L" when ACC is OFF and the key matrix switch is pressed.
27 30	KST3 KST0	Output Output	Key strobe output.
31	NC		
32	VDD		Power supply terminal.
33	$\overline{\text{SRQ}}$	Output	Communication line. (CD CHANGER)
34	$\overline{\text{RXE}}$	I/O	
35	$\overline{\text{RST}}$	Output	
36	$\overline{\text{INH}}$	Output	Turns LCD display on and off. "L" when LCD display.
37 40	K3 K0	Input Input	Key return input.
41	XST	Output	
42	ECE	Output	Chip enable line. (IC702)
43	PST	Output	Strobe signal.
44	LCE	Output	Chip enable line. (IC901)
45	$\overline{\text{RESET}}$	Input	Reset input terminal. Active "L".
46	X2		Crystal oscillator (194 MHz) connection terminal.
47	X1		
48	TEST P	Input	Test program.
49	DOLBY NR	Output	"H" during dolby NR ON.
50	METAL	Output	"H" during TAPE mode and metal tape detection.
51	$\overline{\text{PLAY}}$	Output	"L" during PLAY operation.
52 53 55	$\overline{\text{STBY}}$ I_2 I_0	Output Output Output	Input data to IC601 (PA3022). $I_2 - I_0$ are motor control logic output terminals.
56 58	MD0 MD2	Output Output	
59	$\overline{\text{CM. STOP}}$	Output	Capstan motor stops with "L".
60 63	MK0 MK3	Input Input	Cassette mechanism status detection key input terminal.
64	VSS		
			GND

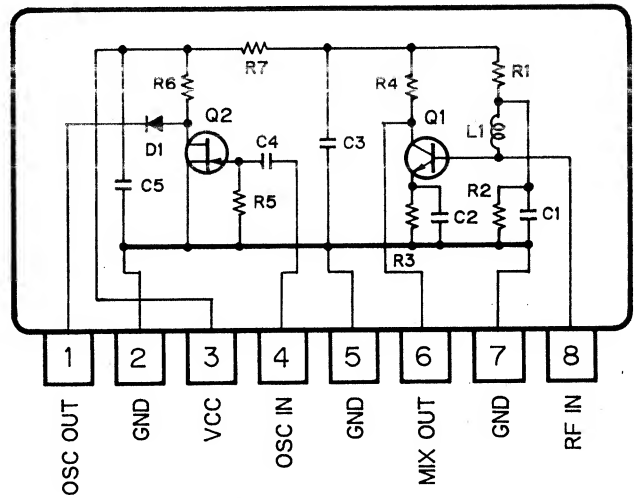
IC651: CWW1144



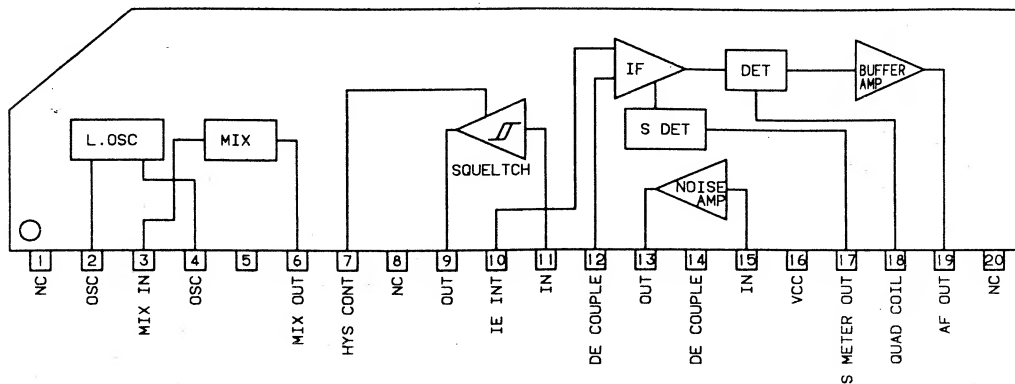
IC751: AN6540



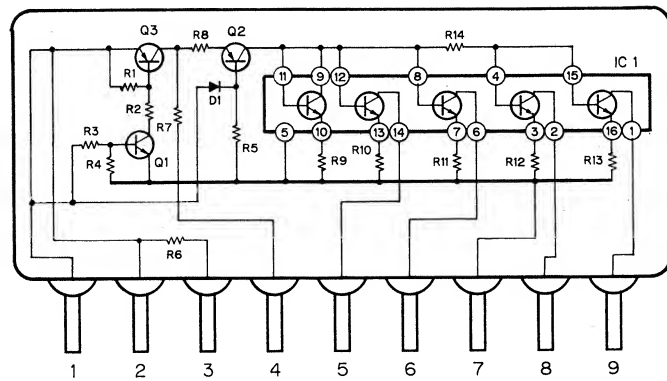
IC802: KHA804



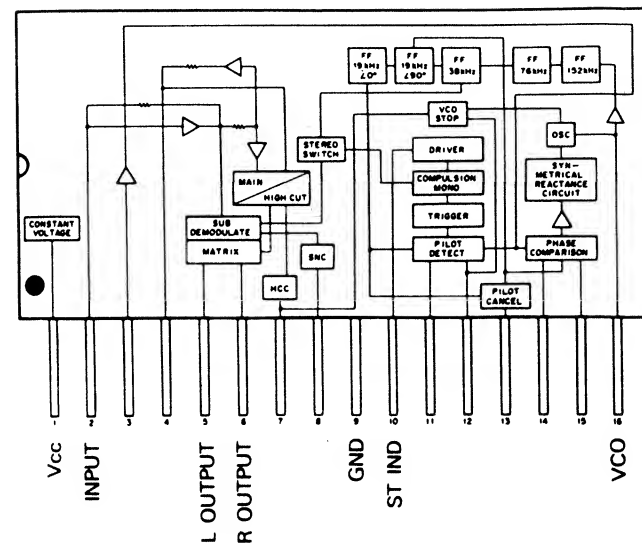
IC801: TK10483Z



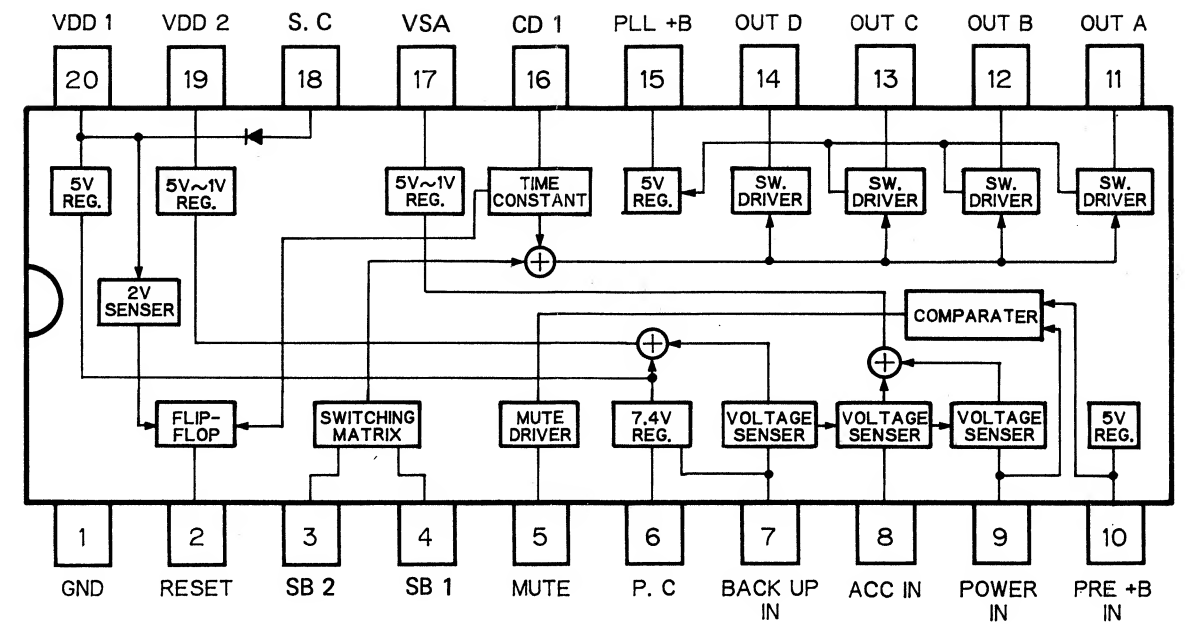
IC903: CWW1158



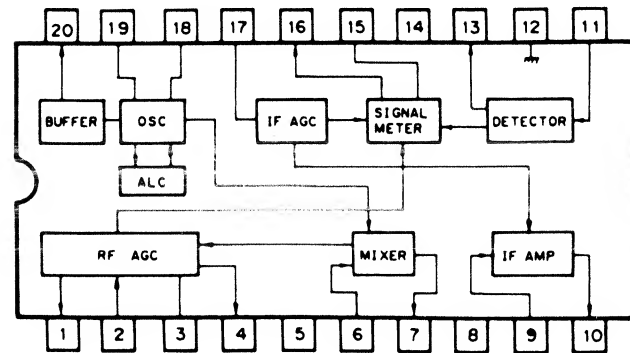
IC151: LA3430P



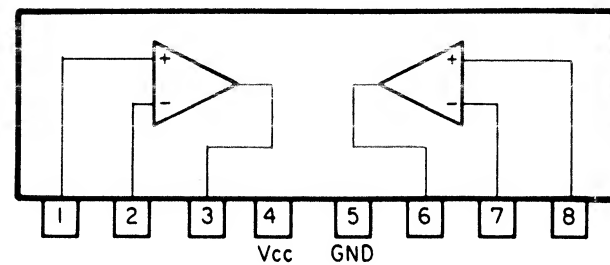
IC752: PA1004



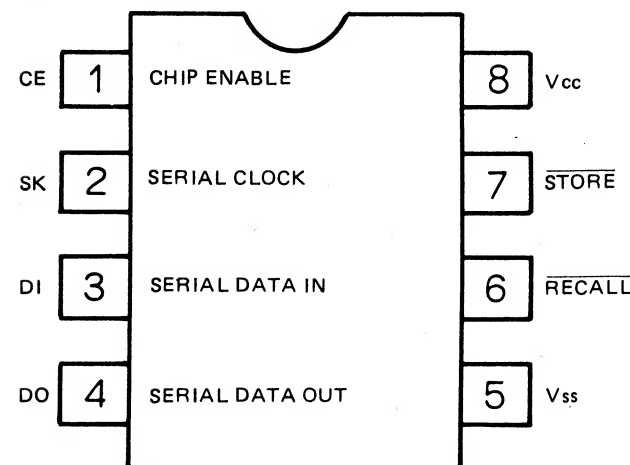
IC201: LA1135



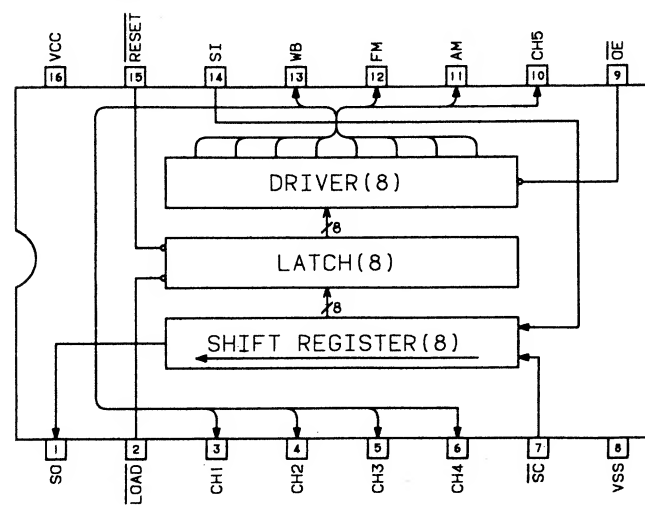
IC251: M51522AL



IC702: PDH001



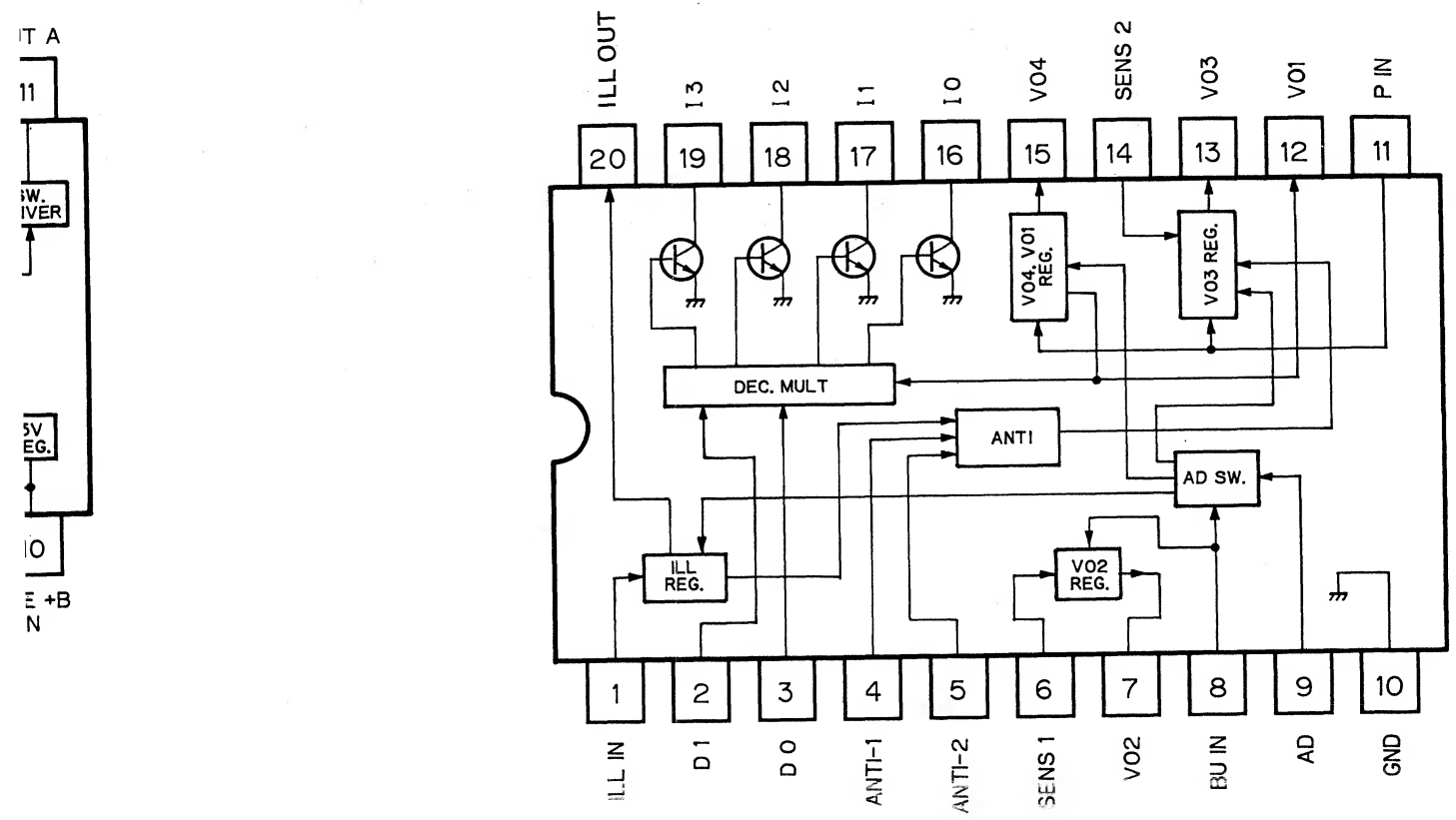
IC703, 704: MB88307P



● Pin Function (PA1004)

Pin No.	Pin Name	Function and Operation
1	GND	GND
2	RESET	Reset puls output.
3	SB2	Switch matrix input.
4	SB1	
5	MUTE	Mute signal output.
6	P.C	Power control.
7	BACK UP IN	Back UP + B input.
8	ACC IN	ACC + B input.
9	POWER IN	Power + B input.
10	PRE + B IN	PRE + B input.
11	OUT A	FM + B output.
12	OUT B	AM + B output.
13	OUT C	WB + B output.
14	OUT D	TAPE + B output.
15	PLL + B	PLL + B output.
16	CD1	Timing capacitor terminal.
17	VSA	Power + B/ACC + B detector output. 0 - 1 - 5V three state output.
18	S.C	VDD maintain capacitor terminal.
19	VDD2	5V output.
20	VDD1	

IC902: PA1005

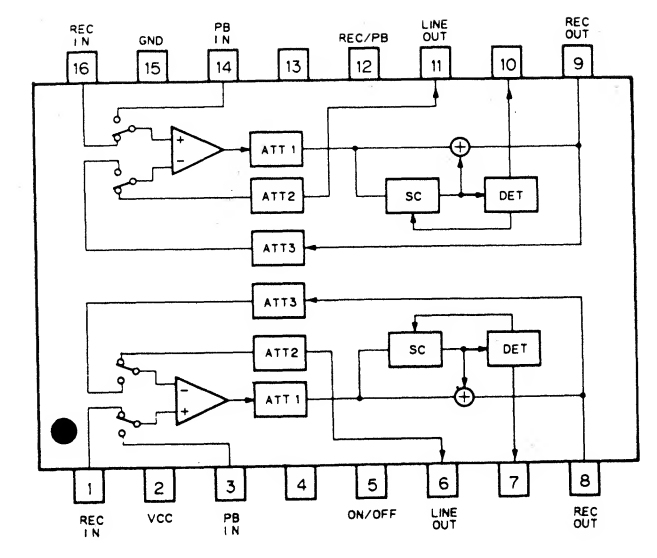


● Pin Function (PA1005)

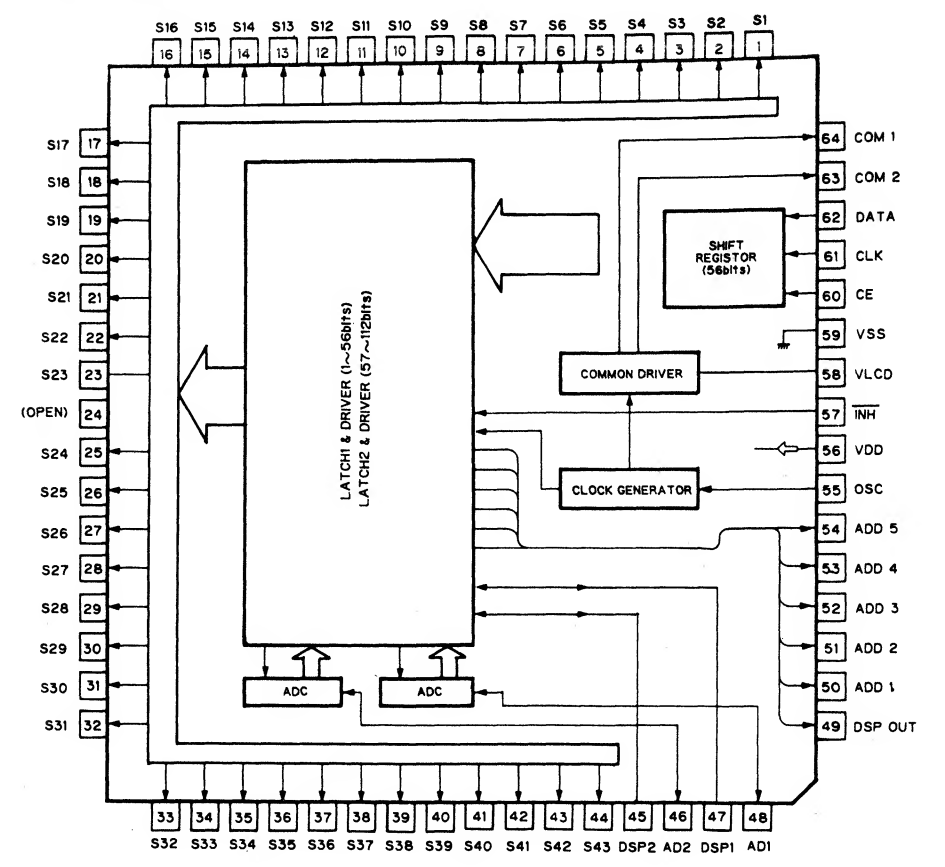
Pin No.	Pin Name	Function and Operation
1	ILL IN	ILLUMI + B input.
2	D1	Data input ($I_0 - I_3$ control).
3	D0	
4	ANTI-1	Signal input.
5	ANTI-2	Signal input (V02 control).
6	SENS1	No connection.
7	V02	9.6V output. (VOL, LAMP)
8	BU IN	UN SWD + B input.
9	AD	Standby input.
10	GND	GND
11	P IN	SWD + B input.
12	V01	5.7V output. (ch. IND)
13	V03	9.4V/8V output (DIMER/LCD LAMP)
14	SENS2	No connection.
15	V04	12.7V output. (MODE IND)
16	I_0	Switch output (BAND LED)
17	I_1	Switch output. (UP, DOWN LED)
18	I_2	Switch output. (FF, REW LED)
19	I_3	Switch output. (EJ, SB, DOLBYNR LED)
20	ILL OUT	10.5V output. (Door LED)

● LCD Unit

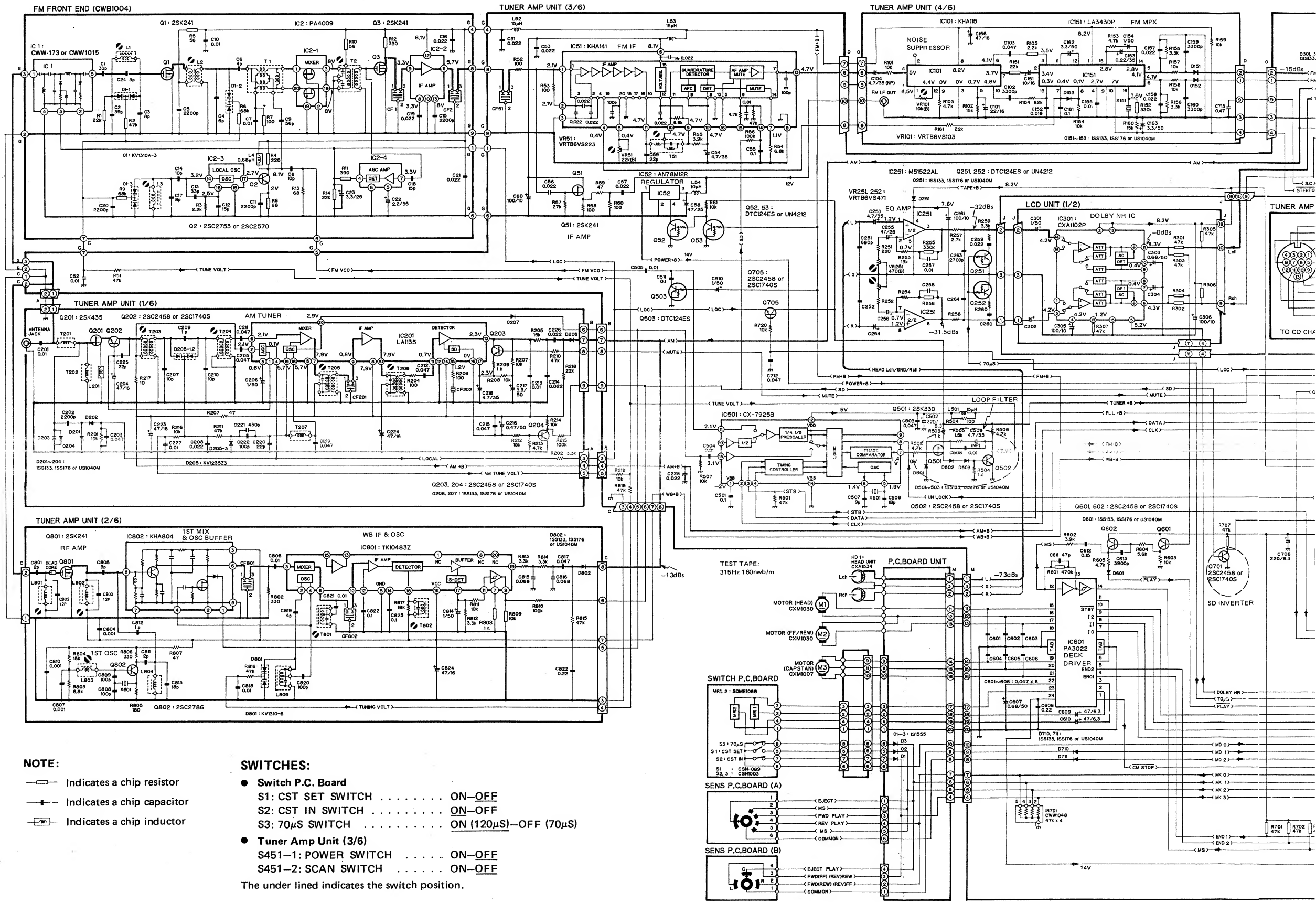
IC301: CXA1102P



IC901: LC7582P



9. SCHEMATIC CIRCUIT DIAGRAM



NOTE:
 —○— Indicates a chip resistor
 —■— Indicates a chip capacitor
 —□— Indicates a chip inductor

SWITCHES:

- **Switch P.C. Board**
 S1: CST SET SWITCH ON-OFF
 S2: CST IN SWITCH ON-OFF
 S3: 70μS SWITCH ON (120μS)—OFF (70μS)
- **Tuner Amp Unit (3/6)**
 S451-1: POWER SWITCH ON-OFF
 S451-2: SCAN SWITCH ON-OFF

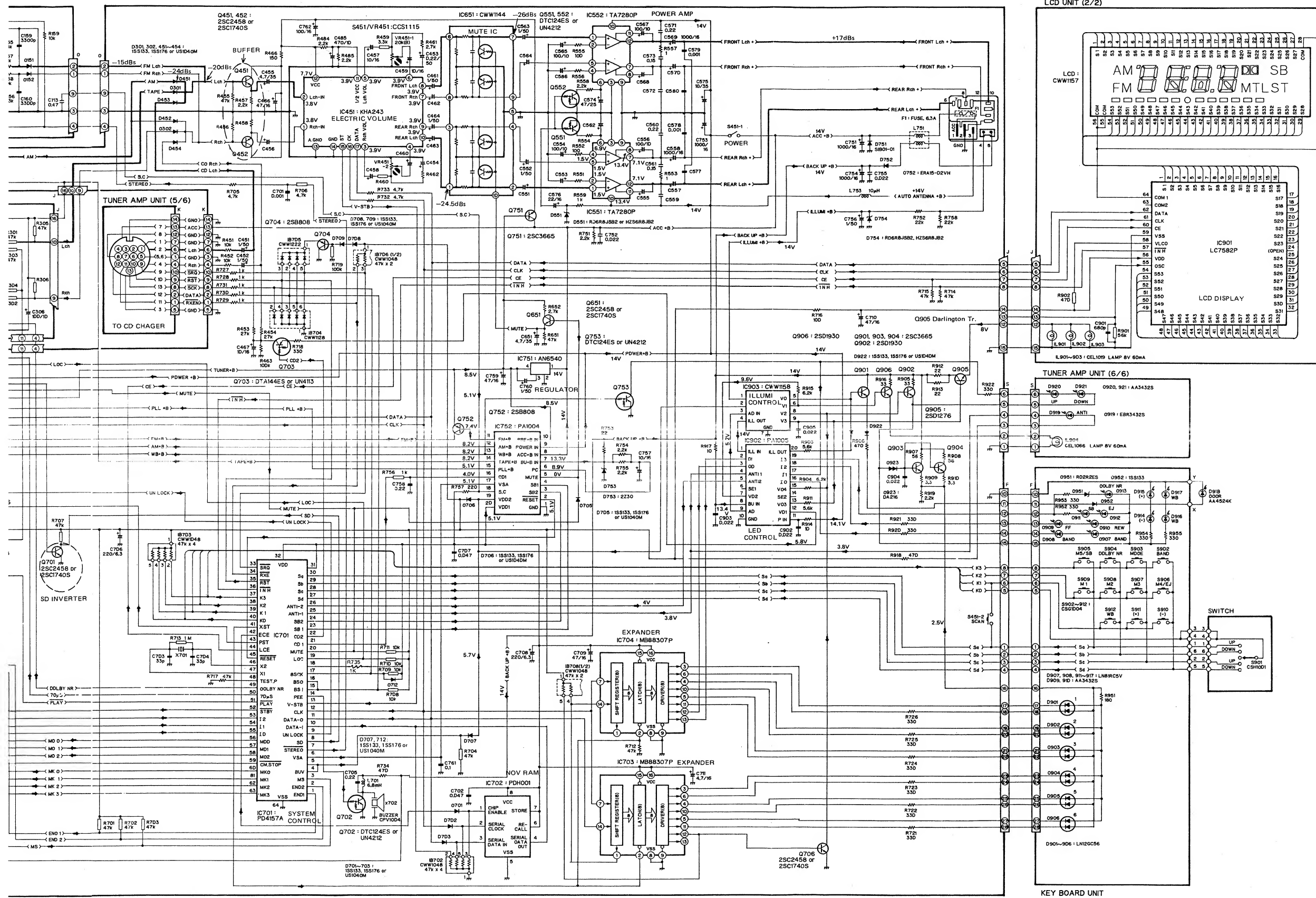
The under lined indicates the switch position.

A

B

C

D



A

B

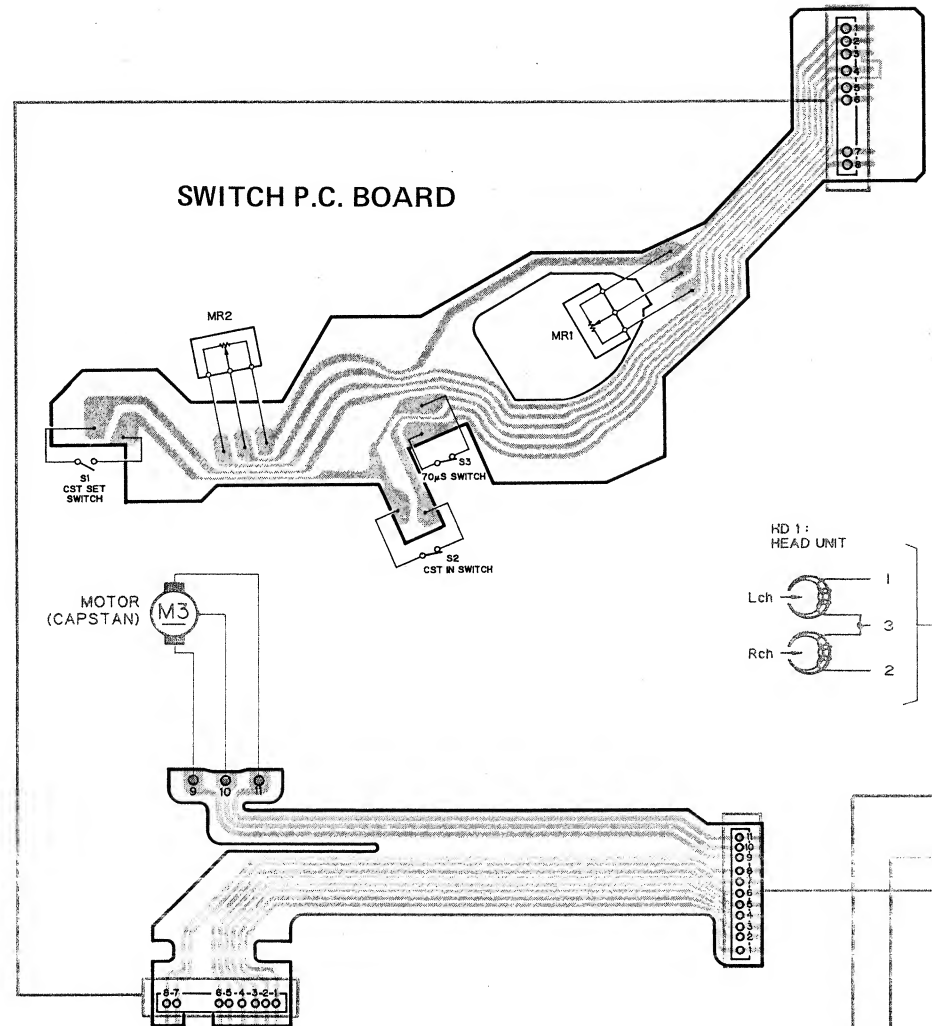
C

D

Fig. 11

10. CONNECTION DIAGRAM

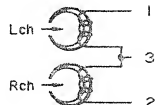
A



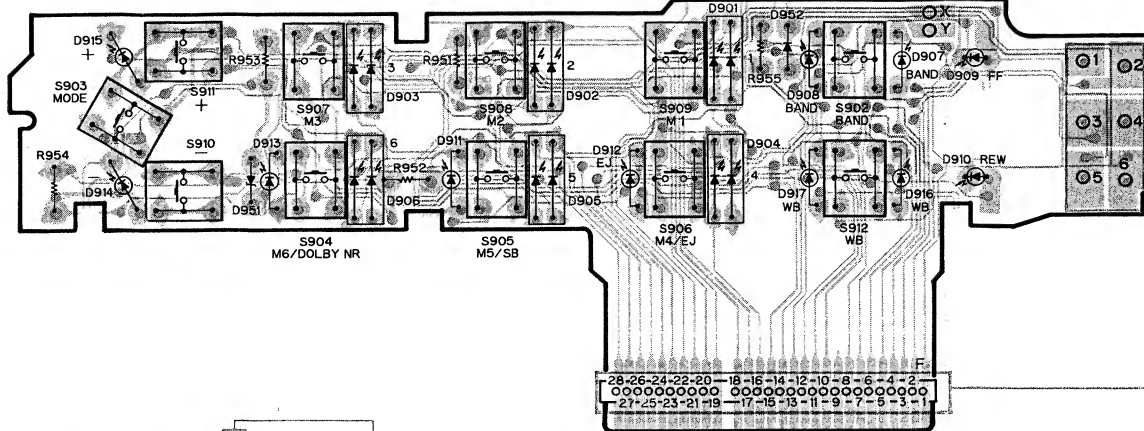
B

MOTOR (CAPSTAN) M3

HD 1: HEAD UNIT



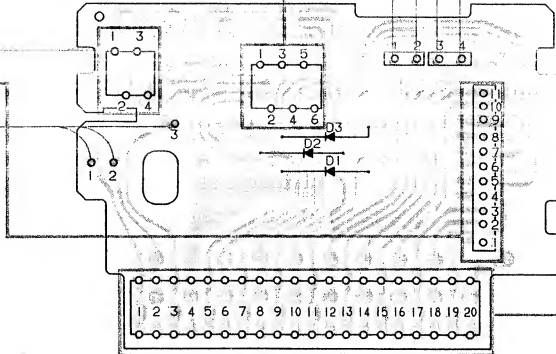
KEY BOARD UNIT



MOTOR (FF/REW) M2

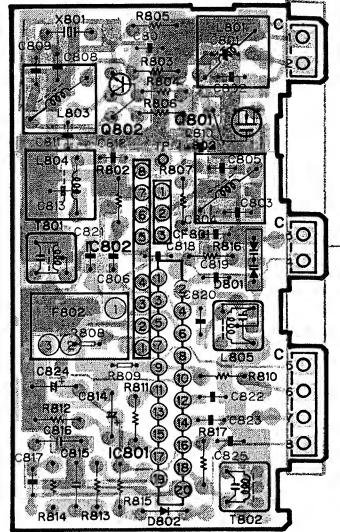
MOTOR (HEAD) M1

P.C. BOARD UNIT



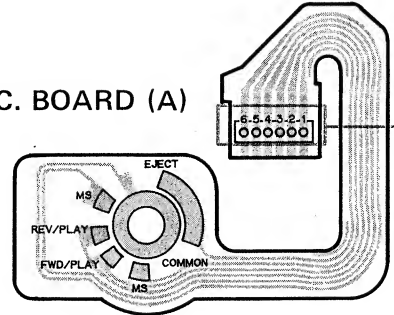
TUNER AMP UNIT (2/6)

IC, Q Q802 IC802 IC801 Q801
ADJ L803 T801 L801 L802 T802



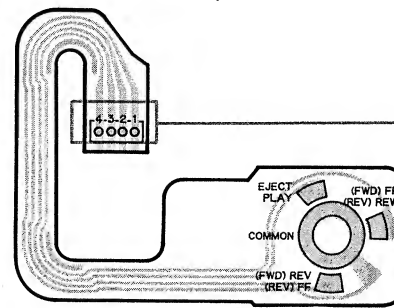
C

SENS P.C. BOARD (A)

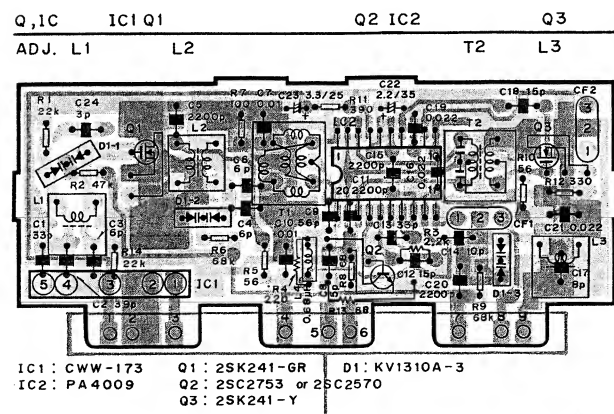


D

SENS P.C. BOARD (B)



FM FRONT END (CWBI004)



IC1: CWW-173 Q1: 2SK241-GR D1: KV1310A-3
IC2: PA4009 Q2: 2SC2753 or 2SC2570
Q3: 2SK241-Y

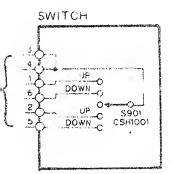
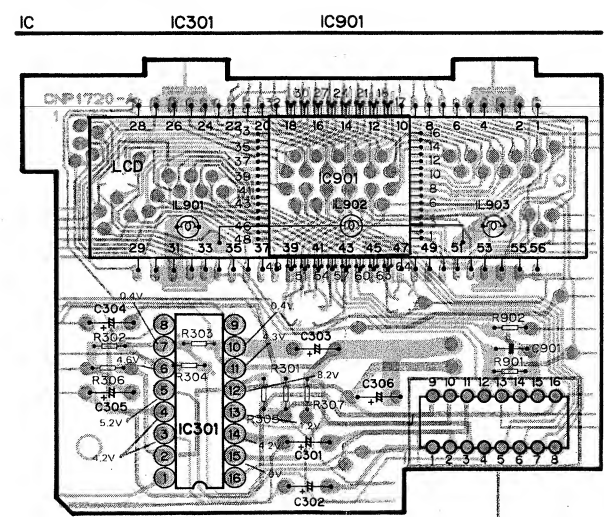
TUNER AMP UNIT (1/6): IC201

1	2	3	4	5	6	7	8	9	10
	2.1V	0.6V	5.2V	0V	2.1V	7.9V	7.9V	0.8V	7.9V
11	12	13	14	15	16	17	18	19	20
0.7V	0V	2.3V	1.9V	1.2V	0V	2.3V	1.7V	5.7V	2.9V

FM FRONT END: IC2

1	2	3	4	5	6	7	8	9	10
	0V	8V			0V	3.3V	3.3V	3.3V	0V
11	12	13	14	15	16	17	18	19	20
5.7V	8.1V	8V	3.2V	0V	2.5V	2.7V	8V	0V	

LCD UNIT



TUNE

1
2.1V
9
4.7V

7

8

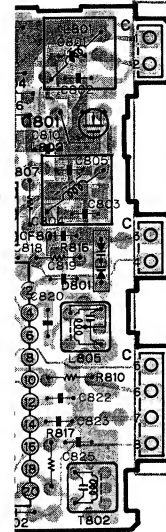
9

10

11

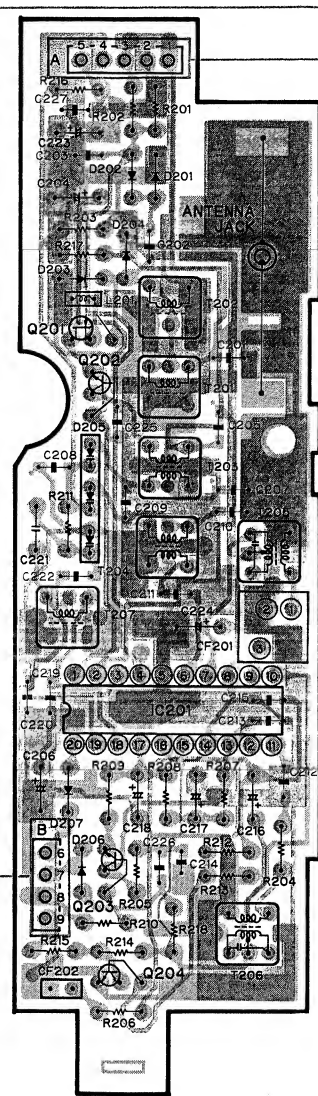
UNIT (2/6)

IC801 Q801
301 L802 T802

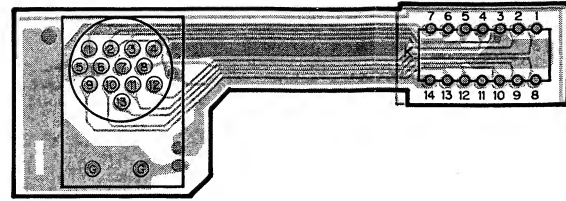


TUNER AMP UNIT (1/6)

Q202 Q203
IC, Q Q201 Q204 IC201
ADJ T203 T204 T206
T205



TUNER AMP UNIT (5/6)

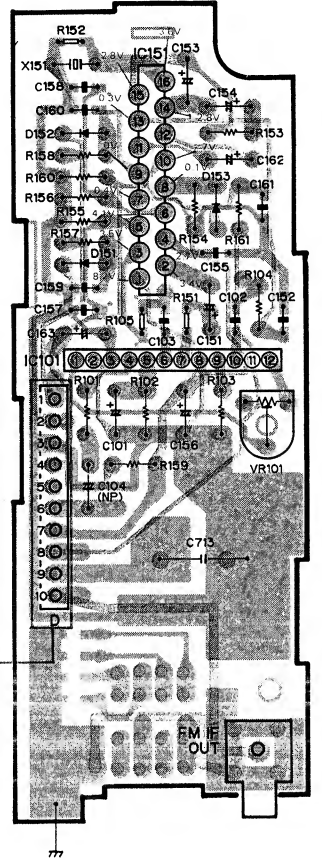


TUNER AMP UNIT (3/6): IC752

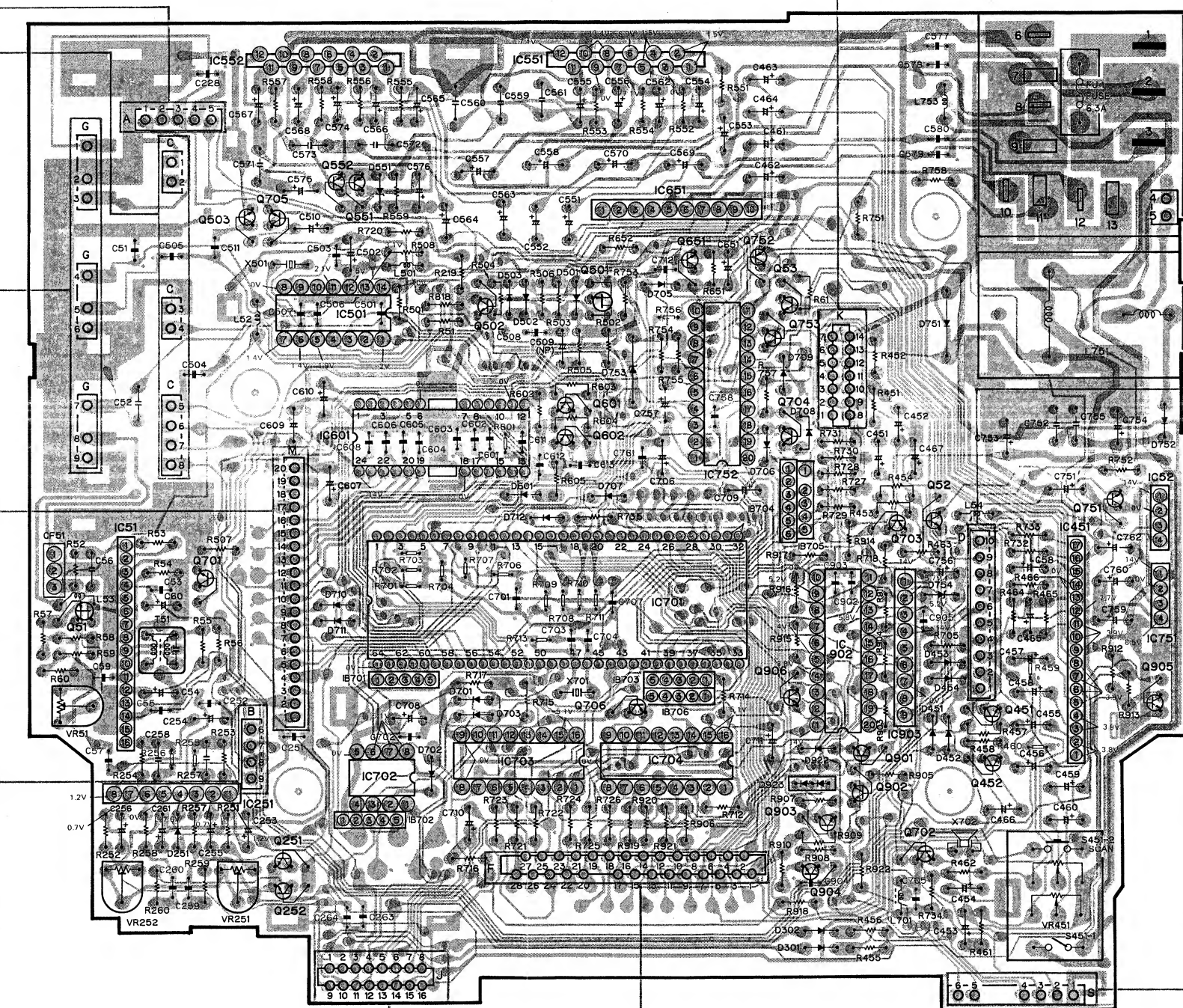
1	2	3	4	5	6	7	8	9	10
0V	5.1V			0V	8.9V	13.3V	14V	14V	8.5V
11	12	13	14	15	16	17	18	19	20
7.4V	8.2V	8.2V	8.2V	5.1V	4.0V	5.1V	5.1V	5.7V	5.1V

TUNER AMP UNIT (4/6)

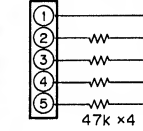
IC, Q IC151 IC101
ADJ VR101



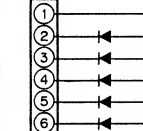
Q503 IC251 IC552 Q252 Q552 Q551 IC701 Q601 IC551 Q706 IC651 Q906 Q902 IC52
IC, Q Q51 IC51 Q701 Q705 Q251 IC501 IC702 IC601 Q502 IC703 Q602 Q501 IC704 Q651 IC752 Q753 Q53 Q903 IC902 IC903 Q702 Q452 IC451 Q751 Q905
ADJ VR51 VR252 T51 VR251



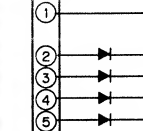
IB701, IB702, IB703, IB706



IB704



IB705



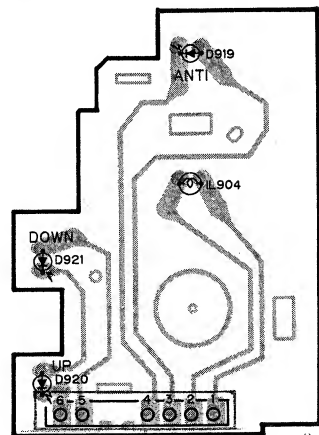
TUNER AMP UNIT (3/6): IC51

1	2	3	4	5	6	7	8
2.1V	2.1V	0V	0.4V	0.4V	8.1V	1.1V	0V
9	10	11	12	13	14	15	16
4.7V	4.7V	4.7V	4.7V	4.7V			

TUNER AMP UNIT (4/6): IC101

1	2	3	4	5
4.5V		0V	5V	0.7V
6	7	8	9	10
4.1V	3.7V	8.2V	0V	4.8V

TUNER AMP UNIT (6/6)



TUNER AMP UNIT (3/6)

7

8

9

10

11

12

Fig. 12

11. CASSETTE MECHANISM EXPLODED VIEW

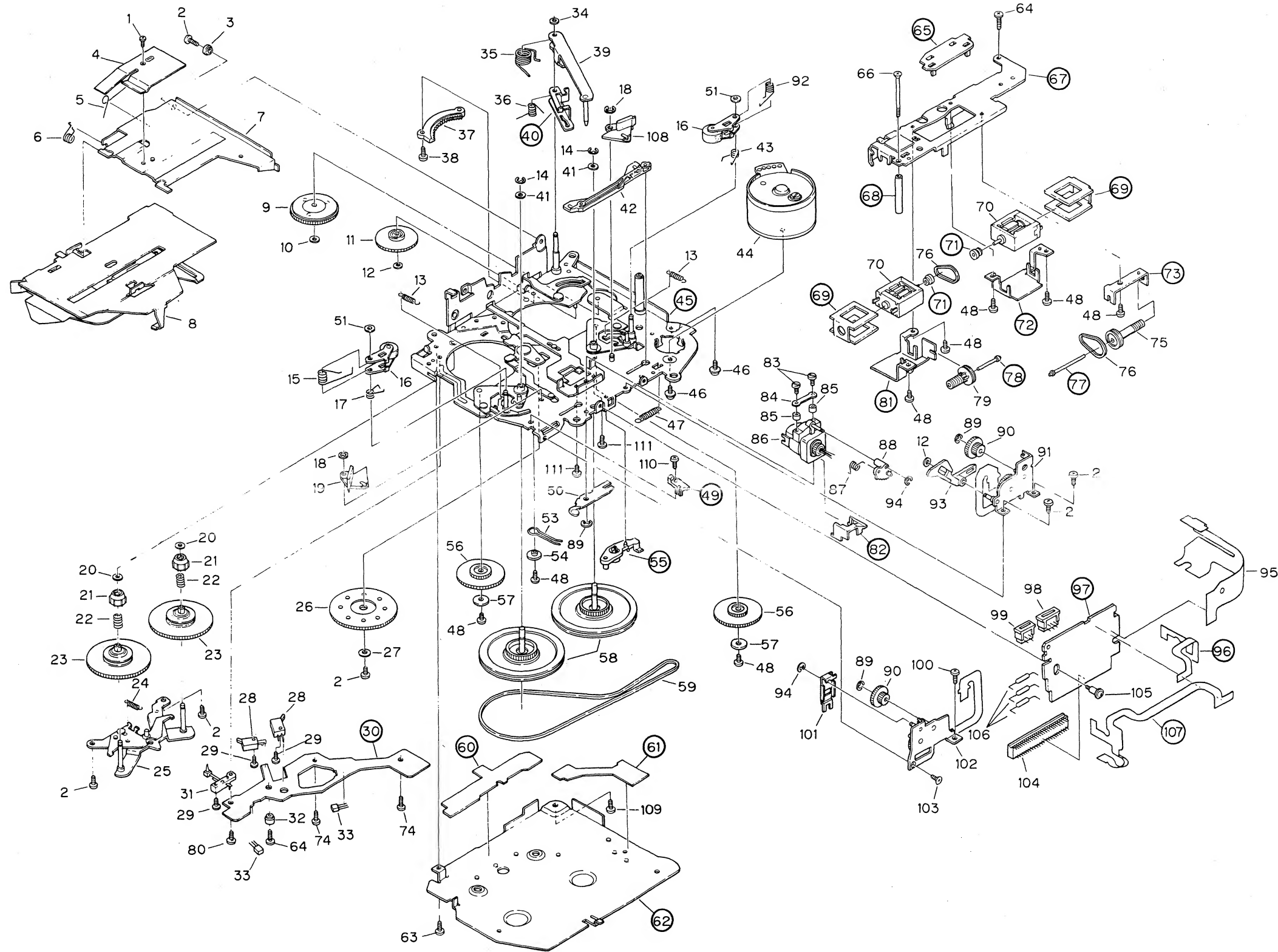


Fig. 13

● Parts Li
 NOTE:
 ● For your
 marks ★
 ★★: GEA
 This clas
 model n
 ● Parts wh
 ● Parts ma
 longer th

Mark No

★★

★★

★★

★★

★

34

● Parts List

NOTE:

- For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.
- ★★: GENERALLY MOVES FASTER THAN ★.
- This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- Parts whose parts numbers are omitted are subject to being not supplied.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

A

—

B

—

C

—

D

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1	HBA-147	Screw M1.4×1.4		35	CBH-887	Spring
	2	BMZ20P040FMC	Screw		36	CBH-886	Spring
	3	CLB-663	Bush		37	CNV1075	Gear
	4	CBL1043	Spring		38	CBA1004	Screw M2×6
	5	CBH-867	Spring		39	CXD-389	Arm Unit
	6	CBH-837	Spring		40		Arm
	7	CNC1597	Arm		41	HBF-179	Washer
	8	CXA2164	Holder Unit		42	CNV1257	Lever
	9	CXA2088	Gear Unit		43	CBH-833	Spring
	10	CBF1024	Washer	★★	44	CXM1007	Motor (Capstan)
	11	CNY-271	Gear		45		Chassis Unit
	12	CBF-126	Washer		46	PMS26P025FMC	Screw
	13	CBH-835	Spring		47	CBH-830	Spring
	14	CBG1003	E Type Washer		48	HBA-175	Screw M2×2.5
	15	CBH-832	Spring		49		Spacer
★★	16	CXA1445	Pinch Roller Unit		50	CBL1050	Spring
	17	CBH-834	Spring		51	CBF1025	Washer
	18	YE25FUC	E Type Washer		52	
	19	CNV1254	Arm		53	CBH-893	Spring
	20	CBF1022	Washer		54	CLA1110	Collar
	21	CNW-932	Collar		55		Clamper
★★	22	CBH-827	Spring		56	CNV1616	Gear
	23	CXA2089	Reel Unit		57	CLA1238	Collar
	24	CBH-868	Spring		58	CNV1572	Flywheel
	25	CXA1481	Bracket Unit	★★	59	CNT-111	Belt
	26	CNW-944	Gear		60		Insulator
	27	CLA1109	Collar		61		Insulator
★★	28	CSN1003	Switch (70 μS, CST IN)		62		Cover
	29	CBA1025	Screw M1.7×5.5		63	BMZ20P030FMC	Screw
	30		P.C. Board		64	CBA-172	Screw M1.7×5.5
★★	31	CSN-089	Switch (CST SET)		65		Holder
	32	CLA1170	Collar		66	CBA-165	Screw M2×25
★	33	SDME106B	Magnetic Resistive Device		67		Guide
	34	CBF-046	Washer		68		Spacer
					69		Insulator

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
★★	70	CXM1030	Motor (RF/REW, Head Position)		93	CNV1495	Arm
	71		Pulley		94	YE15FUC	E Type Washer
	72		Bracket		95	CNP1227	P.C. Board
	73		Bracket		96		P.C. Board
	74	CBA1037	Screw M2×2.5		97		P.C. Board
	75	CNV1255	Pulley		98	CKS1075	Connector (6P)
★★	76	CNT1010	Belt		99	CKS1073	Connector (4P)
	77		Shaft		100	BMZ20P060FMC	Screw
	78		Shaft		101	CNH-004	Arm
	79	CNV1256	Pulley		102	CXA1548	Holder Assy
	80	CBA1054	Screw M2×5		103	HBA-209	Screw M2×2
	81		Bracket		104	CKS-678	Connector (20P)
	82		Cover	★	105	CBA1022	Screw M2×2×3
	83	CBA1055	Screw M1.4×8		106	1S1555	Diode
	84	CBE-114	Spring		107		P.C. Board
	85	CNY-134	Azimuth Rubber		108	CNV1253	Arm
★★	86	CXA1534	Head Unit		109	CBA1060	Screw M2×7
	87	CBH-829	Spring		110	CBA1015	Screw M2×4
	88	CNW-939	Gear		111	CBA1041	Screw M2×2.5
	89	YE12FUC	E Type Washer				
	90	CNV1262	Gear				
	91	CXA1546	Holder Assy				
	92	CBH-831	Spring				

12. CHASSIS EXPLODED VIEW

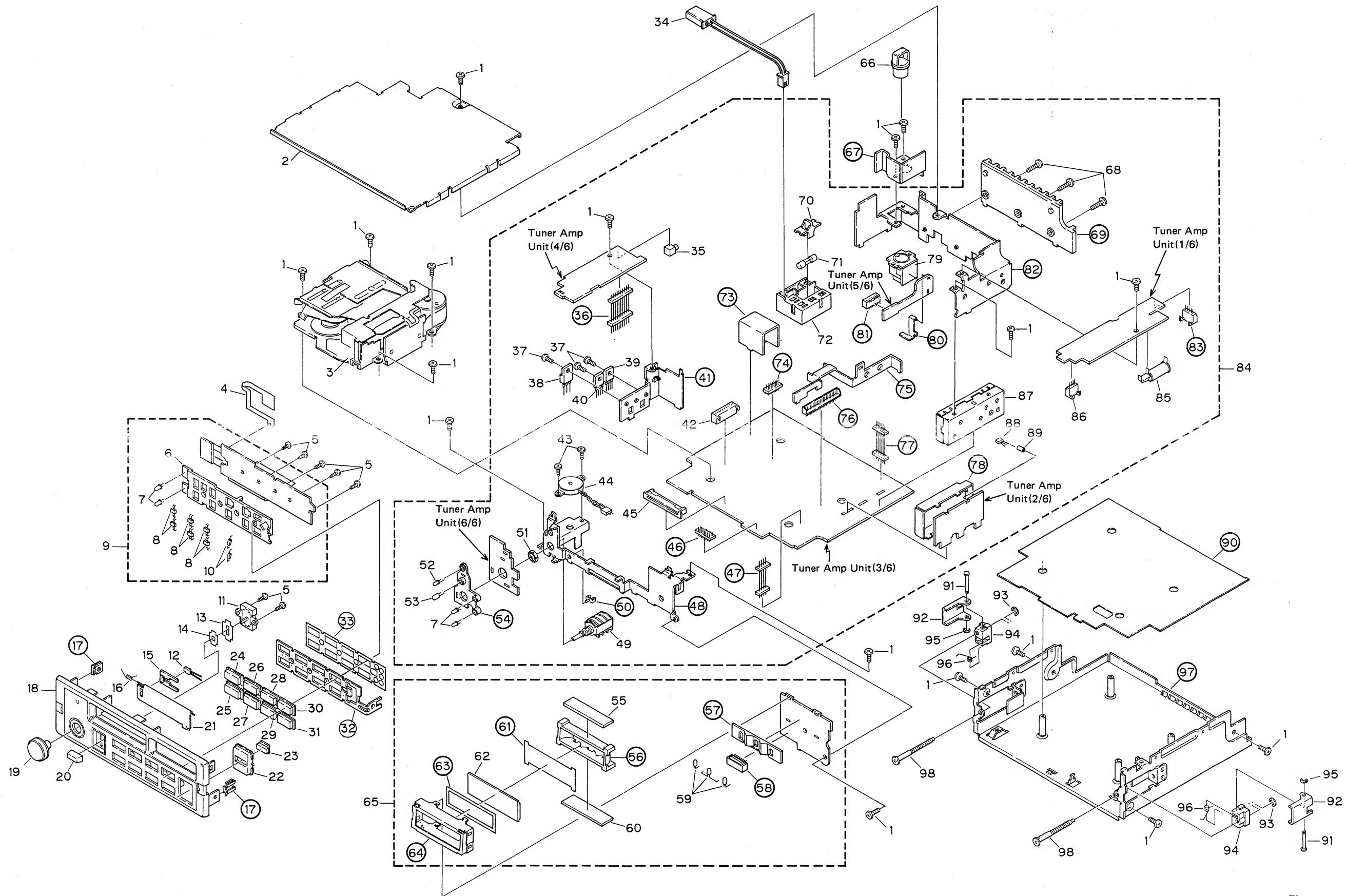


Fig. 14

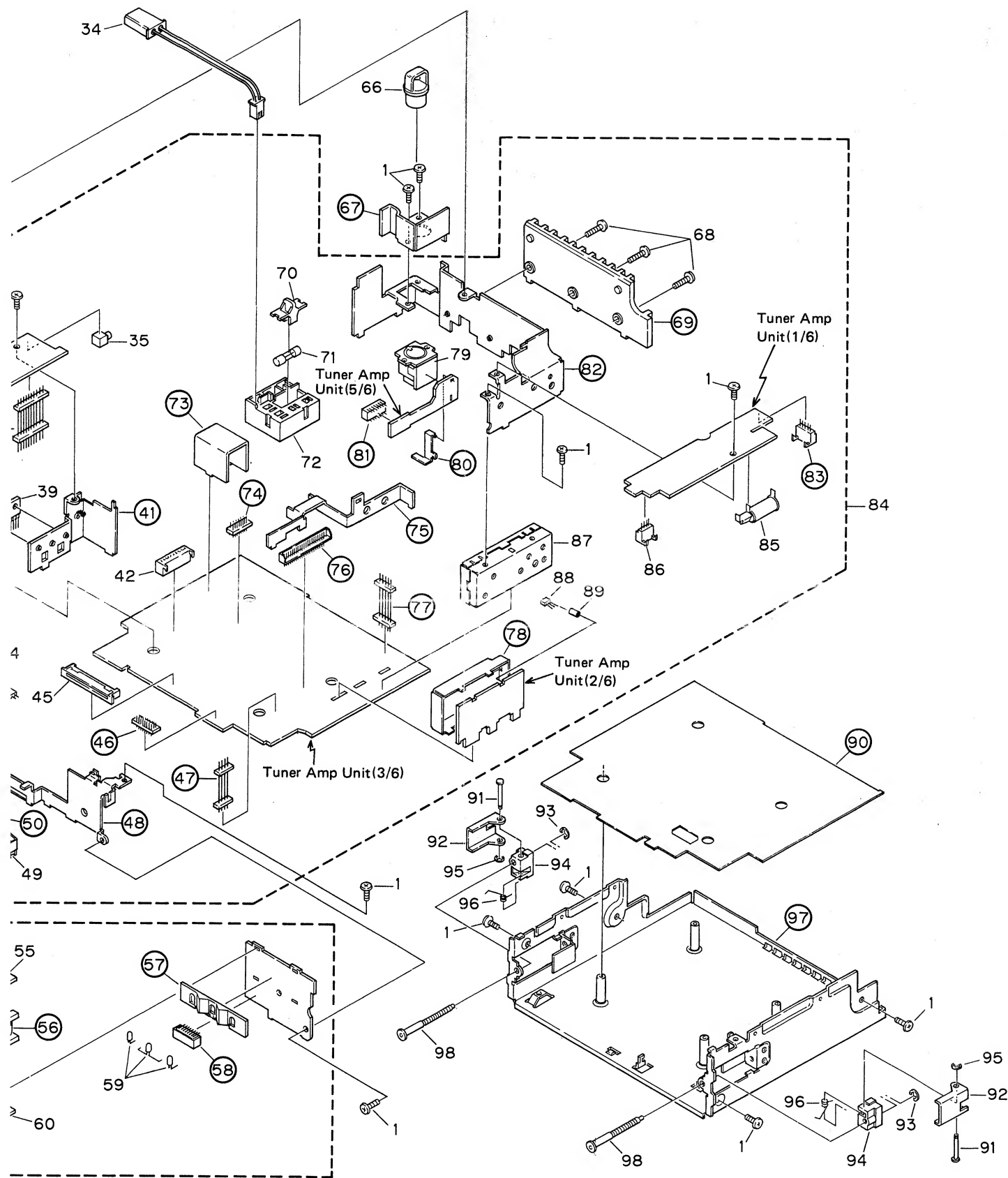


Fig. 14

● Parts List

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	BMZ26P050FMC	Screw		51.	CBN-003	Nut
	2.	CXA2136	Case Unit	*	52.	EBR3432S	LED (D919)
●	3.	CXK1652	Cassette Mechanism Assy	**	53.	CEL1066	Lamp 8V, 60mA
	4.	CNP1278	P.C. Board		54.		Holder
	5.	CBA1100	Screw		55.	CNV1680	Connector
	6.	CNV1623	Housing		56.		Holder
*	7.	AA3432S	LED		57.		Holder
*	8.	LN12GC56	LED		58.		Connector (16P)
●	9.	CWM1507	Key Board Unit		59.	CEL1019	Lamp 8V, 60mA
*	10.	LN81RC5V	LED		60.	CNV1681	Connector
**	11.	CSH1001	Switch (S901)		61.		Sheet
*	12.	AA4524K	LED (Door)		62.	CWW1157	LCD
	13.	CNM1345	Cover		63.		Spacer
	14.	CNM1918	Cover		64.		Case
	15.	CNS1181	Lens	●	65.	CWM1506	LCD Unit
	16.	CBH1081	Spring		66.	CNV1468	Cap
	17.		Holder		67.		Cover
	18.	CXA2137	Grille Unit		68.	BMZ30P080FMC	Screw
	19.	CAA1014	Knob		69.		Heat Sink
	20.	CAC1678	Knob		70.	CNV1211	Fuse Holder
	21.	CAT1012	Door	**	71.	CEK1007	Fuse, 6.3A
*	22.	CAC1658	Button		72.	CKS1518	Connector
*	23.	CAC1659	Button (MODE)		73.		Case
*	24.	CAC1650	Button (BAND)		74.		Plug
*	25.	CAC1657	Button (WB)		75.		Bracket
*	26.	CAC1651	Button (1)		76.		Plug
*	27.	CAC1654	Button (4/EJ)		77.		Plug
*	28.	CAC1652	Button (2)		78.		Case
*	29.	CAC1655	Button (5/SB)		79.	CKS1144	Connector
*	30.	CAC1653	Button (3)		80.		Contact Peace
*	31.	CAC1656	Button (6/DOLBY NR)		81.		Connector
	32.		Spacer		82.		Frame
	33.		Insulator		83.		Connector
	34.	CDE1823	Connector (2P)	●	84.	CWM1505	Tuner Amp Unit
	35.	CKX1007	Connector		85.	CKX1006	Antenna Plug
	36.		Plug		86.	HKS-174	Connector
	37.	BMZ30P060FMC	Screw		87.	CWB1004	FM Front End
**	38.	2SD1276	Transistor (Q905)	**	88.	2SK241	Transistor (Q801)
**	39.	AN78M12R	IC (IC5)		89.	CTX-022	Bead Core
**	40.	AN6540	IC (IC751)		90.		Insulator
	41.		Frame		91.	CLA1071	Shaft
	42.	HKS-180	Connector		92.	CNC1103	Clamper
	43.	CBA1015	Screw		93.	YE20FUC	E Type Washer
	44.	CPV1004	Buzzer		94.	CNR1016	Slider
	45.	CKS1130	Connector		95.	YE15FUC	E Type Washer
	46.		Plug		96.	CBH1019	Spring
	47.		Plug		97.		CHassis
	48.		Frame		98.	CLA1279	Bolt
**	49.	CCS1115	Volume (VR451/S451)				
	50.		Clamper				

A

B

C

D

4

5

6

13. ELECTRICAL PARTS LIST

NOTE:

- For your parts Stock Control, the fast moving items are indicated with the marks ** and *.
** : GENERALLY MOVES FASTER THAN *.
This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- Parts whose parts numbers are omitted are subject to being not supplied.
- The part numbers shown below indicate chip components.
Chip Resistor
RS1/8S□□□J, RS1/10S□□□J
Chip Capacitor (except for CQS.....)
CKS....., CCS....., CSZS.....

Unit Number : CWB1004
Unit Name : FM Front End

MISCELLANEOUS

Mark	Symbol	Circuit Symbol & No.	Part Name	Part No.
** IC	1		CW1015 (CW-173)	
** IC	2		PA4009	
** Q	1		2SK241	
** Q	2		2SC2753	
** Q	3		(2SC2570)	
*	D 1		2SK241	
	I 1	Coil	KV1310A-3	
	L 2	Coil	CTC1001	
			CTC1002	
	L 3	Coil	CTC1003	
	L 4	Inductor	CTF-185	
	T 1	Coil	CTC1005	
	T 2	Coil	CTC1004	
	CF 1 2	Ceramic Filter	CTF-182	

RESISTORS

Mark	Symbol	Circuit Symbol & No.	Part Name	Part No.
R	1 14		RS1/8S223J	
R	2		RS1/8S473J	
R	3		RD1/4PS222JL	
R	4		RD1/4PS221JL	
R	5 10		RS1/8S560J	
R	6 9		RS1/8S683J	
R	7		RS1/8S101J	
R	8		RS1/8S680J	
R	11		RS1/8S391J	
R	12		RS1/8S331J	
R	13		RD1/4PS680JL (RD1/6PS680J)	

CAPACITORS

Mark	Symbol	Circuit Symbol & No.	Part Name	Part No.
C	1		CCSSH330J50	
C	2		CCSSH390J50	
C	3		CCSCH060D50 (CCSCH060C50)	
C	4		CCSTH060C50	

Mark	Symbol	Circuit Symbol & No.	Part Name	Part No.
			(CCSTH060D50)	
			CKSYB222K50	
			CCSCH040C50	
			CKSYB103K50	
			CCSCH100D50	
			CCSSH560J50	
			CCSTH150J50	
			CCSTH330J50	
			CCSTH100D50	
			CKSYB223K50	
			CCSUJ080D50	
			CFA2R2M35LS	
			CFA3R3M25LS	
			CCSSH030C50	

Unit Number : CW1505
Unit Name : Tuner Amp Unit

Mark	Symbol	Circuit Symbol & No.	Part Name	Part No.
** IC	51		KHA141	
** IC	52		AN78M12R	
** IC	101		KHA115	
** IC	151		LA3430P	
** IC	201		LA1135	
** IC	251		M51522AL	
** IC	451		KHA243	
** IC	501		CX-7925B	
** IC	551 552		TAT280P	
** IC	601		PA3022	
** IC	651		CW1144	
** IC	701		PD4157A	
** IC	702		PDH001	
** IC	703 704		MB88307P	
** IC	751		AN6540	
** IC	752		PA1004	
** IC	801		TK10483Z	
** IC	802		KHA804	
** IC	902		PA1005	
** IC	903		CW1158	
** Q	51		2SK241	
** Q	52 53 251 252 503 551 552 702 753		DTC124ES (UN4212)	

Mark	Symbol	Circuit Symbol & No.	Part Name	Part No.	Mark	Symbol	Circuit Symbol & No.	Part Name	Part No.	Mark	Symbol	Circuit Symbol & No.	Part Name	Part No.
** Q	201		2SK435		CF	801		FM Ceramic Filter	CTF-101	R	7			
** Q	202 203 204 451 452 502 601 602 651 701		2SC2458		CF	802		Filter	CTF1004	R	7			
			(2SC1740S)		IB	701 702 703 706			CW1048	R	7			
** Q	501		2SK330		IB	704			CW1128	R	7			
** Q	703		DTA144ES (UN4113)		IB	705			CW1222	R	7			
** Q	704 752		2SB808		X	151		Ceramic Resonator	CSS1028	R	7			
** Q	705 706		2SC2458 (2SC1740S)		X	501		Xtal Resonator 4.5MHz	CSS1011	R	8			
** Q	751 901 903 904		2SC3665		X	701		Xtal Resonator 194MHz	CSS1029	R	8			
** Q	801		2SK241		X	702		Buzzer	CPV1004	R	8			
** Q	802		2SC2786		X	801		Xtal Resonator 50.59166MHz	CSS1001	R	8			
** Q	902 906		2SD1930		** VR	51		Semi-fixed 22kΩ(B)	VRTB6VS223	R	9			
** Q	905 (Darlington Tr)		2SD1276		** VR	101		Semi-fixed 10KΩ(B)	VRTB6VS103	R	9			
*	D 151 152 153 201 202 203 204 206 207 251		1SS133 (1SS176) (US1040M)		** VR	251 252		Semi-fixed 470Ω(B)	VRTB6VS471	R	9			
			KV1235Z3		** VR	451/S 451		Volume	CCS1115	R	9			
*	D 205		1SS133 (1SS176) (US1040M)		** IL	904		FM Front End Fuse 125V 6.3A Lamp 8V 60mA	CWB1004 CEK1007 CEL1066	R	9			
*	D 301 302 451 452 453 454 501 502 503 601		1SS133 (1SS176) (US1040M) RD6R8JSB2											
*	D 551 754		(HZS6R8JB2)		RESISTORS									
*	D 701 702 703 705 706 707 708 709 710		1SS133 (1SS176) (US1040M)		R	51 815 816 818			RD1/4PS473JL					
*	D 711 712 802 922		1SS133 (1SS176) (US1040M) S1B01-01 ERA15-02VH		R	52 53 58 60 204 206 551 552 555 556			RD1/4PS101JL					
*	D 751		2Z30		R	54 803			RD1/4PS682JL					
*	D 752		KV1310-6 EBR3432S		R	55 602			RD1/4PS392JL					
*	D 753		AA3432S DA216		R	56 215 463 810			RD1/4PS104JL					
L	52 53 501	Ferri-Inductor 15μH	LAU150K		R	57 453 454			RD1/4PS273JL					
L	54 753	Inductor 10μH	CTF1053		R	59 203 807			RD1/4PS470JL					
L	201	Inductor	CTF1056		R	61 154 157 158 159 201 207 208 214			RD1/4PS103JL					
L	701	Inductor 6.8mH	CTF1051		R	101 811			RD1/4PS103JL					
L	751	Coil	CTH1039		R	102 160 205 212 804			RD1/4PS153JL					
L	801 802 804	Coil	CTC1006		R	103 153 213 502 506 605 705 732 733			RD1/4PS472JL					
L	803	Coil	CTC1030		R	104			RD1/4PS823JL					
L	805	Coil	CTE1001		R	105			RS1/8S222J					
T	51	Coil	CTC1029		R	151			RS1/8S223J					
T	201	Coil	CTB1011		R	152 255 256			RS1/8S334J					
T	202	Coil	CTB1012		R	155 156 202 259 260 812 813			RD1/4PS332JL					
T	203 204	Coil	CTB1013		R	161 218 752 758			RD1/4PS223JL					
T	205	Coil	CTE1011		R	209 503 504 559 727 728 729 730 731 735			RD1/4PS102JL					
T	206	Coil	CTB1012		R	210 211 455 456 501 651 712 714 715 717			RD1/4PS473JL					
T	207	Coil	CTB1014		R	216 219 451 452 507 603 720			RD1/4PS103JL					
T	801	Coil	CTE1002		R	217 914 917			RD1/4PS100JL					
T	802	Coil	CTE1003		R	251 252 757			RD1/4PS221JL					
CF	51	Ceramic Filter	CTF-182		R	253 254			RD1/4PS133JL					
CF	201	Filter	CTF-100		R	257 258 461 462 652			RD1/4PS272JL					
CF	202	Ceramic Resonator	CTF1039		R	457 458 464 465 554 558 751 754 755 919			RD1/4PS222JL					
					R	459 460			RS1/8S332J					
					R	466			RD1/4PS151JL					
					R	505			RD1/4PS152JL					
					R	508 716			RD1/4PS101JL					
					R	553 557			RD1/4PS010JL					
					R	601			RS1/8S474J					
					R	604 903 911			RD1/4PS562JL					
					R	701 702 703 704 707			RS1/8S473J					
					R	706			RS1/8S472J					
					R	708 709 710 711 809 819			RS1/8S103J					

Mark	Circuit Symbol & No.	Part Name	Part No.	Mark	Circuit Symbol & No.	Part Name	Part No.	Mark	Circuit Symbol & No.	Part Name	Part No.	Mark	Circuit Symbol & No.	Part Name	Part No.
** Q	201		2SK435	CF	801	FM Ceramic Filter	CTF-101	R	713	RS1/8S105J	C 577 578 579 580 701 804 807 810	C	577 578 579 580 701 804 807 810	CKSYB102K50	
** Q	202 203 204 451 452 502 601 602 651 701		2SC2458	CF	802	Filter	CTF1004	R	718 721 722 723 724 725 726 802 806 920	RD1/4PS331JL	C 602 603 604 605 606 702 707 712	C	602 603 604 605 606 702 707 712	CKSYF473Z50	
			(2SC1740S)	IB	701 702 703 706		CW1048	R	719	RS1/8S104J	C 607	C	607	CEAR68M50LS2	
** Q	501		2SK330	IB	704		CW1128	R	734 906 918	RD1/4PS471JL	C 608 705 758 825	C	608 705 758 825	CKSYF224Z25	
** Q	703		DTA144ES	IB	705		CW1222	R	753 912 913	RD1/4PS220JL	C 609 610	C	609 610	CEA470M6R3LS	
** Q	704 752		(UN4113)	X	151	Ceramic Resonator	CSS1028	R	756	RS1/8S102J	C 611	C	611	CCSCH470J50	
** Q	705 706		2SB808	X	501	Xtal Resonator 4.5MHz	CSS1011	R	805	RD1/4PS181JL	C 612	C	612	CKSYF154Z25	
** Q	705 706		2SC2458	X	701	Xtal Resonator 194MHz	CSS1029	R	808	RS1/8S102J	C 613	C	613	CKSYB392K50	
** Q	751 901 903 904		(2SC1740S)	X	702	Buzzer	CPV1004	R	814	RD1/4PS332JL	C 703 704	C	703 704	CCSCH330J50	
** Q	801		2SC3665	X	801	Xtal Resonator 50.59166MHz	CSS1001	R	817	RD1/4PS183JL	C 706 708	C	706 708	CEA221M6R3LL	
** Q	801		2SK241	** VR	51	Semi-fixed 22kΩ(B)	VRTB6VS223	R	904 915	RD1/4PS622JL	C 709 711	C	709 711	CSVA4R7M160S	
** Q	802		2SC2786	** VR	101	Semi-fixed 10kΩ(B)	VRTB6VS103	R	905 916	RD1/4PS330JL	C 713	C	713	CCL1014	
** Q	902 906		2SD1930	** VR	251 252	Semi-fixed 470Ω(B)	VRTB6VS471	R	907 908	RD1/4PS560JL	C 801 811	C	801 811	CCSCH020C50	
** Q	905 (Darlington Tr)		2SD1276	** VR	451/S 451	Volume	CCS1115	R	909 910	RD1/4PS3R3JL	C 802 803	C	802 803	CCSCH120J50	
* D	151 152 153 201 202 203 204 206 207 251		ISS133	** IL	904	FM Front End	CWB1004	R	921 922	RD1/4PS331JL	C 805	C	805	CCSCH030C50	
			(1SS176)			Fuse 125V 6.3A	CEK1007					C	808 809	CCSUJ101J50	
			(US1040M)			Lamp 8V 80mA	CEL1066					C	815 816	CQEA683J50	
* D	205		KV1235Z3									C	817	CKSYB473K50	
* D	301 302 451 452 453 454 501 502 503 601		ISS133									C	819	CCSCH040C50	
			(1SS176)									C	819	CCSCH101J50	
			(US1040M)												
* D	551 754		RD6R8JSB2												
			(HZS6R8JB2)												
* D	701 702 703 705 706 707 708 709 710		ISS133												
			(1SS176)												
			(US1040M)												
* D	711 712 802 922		ISS133												
			(1SS176)												
			(US1040M)												
* D	751		S1B01-01												
* D	752		EKA15-02VH												
* D	753		2Z30												
* D	801		KV1310-6												
* D	919	LED	EBR3432S												
* D	920 921	LED	AA3432S												
* D	923		DA216												
L	52 53 501	Ferri-Inductor 15μH	LAU150K	R	51 815 816 818		RD1/4PS473JL	C	51 53 57 157 158 208 214 226 902	CKSYB223K50					
L	54 753	Inductor 10μH	CTF1053	R	52 53 58 60 204 206 551 552 555 556		RD1/4PS101JL	C	52	CKPY103M16L					
L	201	Inductor	CTF1056	R	54 803		RD1/4PS682JL	C	54 218 651	CEA4R7M35LS	Unit Number : CWM1506				
L	701	Inductor 6.8mH	CTF1051	R	55 802		RD1/4PS392JL	C	55 161 501 511 761 822 823	CKSYF104Z25	Unit Name : LCD Unit				
L	751	Coil	CTH1039	R	56 215 463 810		RD1/4PS104JL	C	56 752 755	CKCYF223Z750					
L	801 802 804	Coil	CTC1006	R	57 453 454		RD1/4PS273JL	C	58 255 256 562 574	CEA470M25L2					
L	803	Coil	CTC1030	R	59 203 807		RD1/4PS470JL	C	59 220 225	CCSUJ220J50	Mark				
L	805	Coil	CTE1001	R	61 154 157 158 159 201 207 208 214		RD1/4PS103JL	C	60 158 204 223 224 466 710 759 824	CEA470M16LS					
T	51	Coil	CTC1029	R	61 154 157 158 159 201 207 208 214		RD1/4PS103JL	C	101 576	CEA220M16L2	** IC	301		CXA1102P	
T	201	Coil	CTB1011	R	101 811		RD1/4PS103JL	C	102 159 160	CKSYB332K50	** IC	901		LC7582P	
T	202	Coil	CTB1012	R	102 160 205 212 804		RD1/4PS153JL	C	103 203 205 211 212 215 219 503 601	CKSYF473Z50	** IL	901 902 903	Lamp 8V 80mA	CEL1019	
T	203 204	Coil	CTB1013	R	103 153 213 502 506 605 705 732 733		RD1/4PS472JL	C	104 455 456	CEA4R7M35NPLL	LCD			CW1157	
T	205	Coil	CTE1011	R	104		RD1/4PS823JL	C	104 455 456	CEA100M16LS2					
T	206	Coil	CTE1012	R	105		RS1/8S222J	C	151 457 458 459 460 467 757	CKSYB183K50					
T	207	Coil	CTB1014	R	151		RS1/8S223J	C	152	CSZAR22K35					
T	801	Coil	CTE1002	R	152 255 256		RS1/8S334J	C	153						
T	802	Coil	CTE1003	R	152 255 256		RS1/8S334J	C	154 206 451 452 461 462 463 464 551 814	CEA010M50LS2	Mark				
CF	51	Ceramic Filter	CTF-182	R	155 156 202 259 260 812 813		RD1/4PS332JL	C	155 201 213 227 504 505 508 806 818 821	CKSYB103K50	R	301 302 303 304 305 306 307		RS1/8S473J	
CF	201	Filter	CTF-100	R	161 218 752 758		RD1/4PS223JL	C	162 163 217	CKSYB103K50	R	901		RS1/8S563J	
CF	202	Ceramic Resonator	CTF1039	R	161 218 752 758		RD1/4PS223JL	C	202	CEA3R3M50LS	R	902		RS1/8S471J	
				R	209 503 504 559 727 728 729 730 731 735		RD1/4PS102JL	C	207 210	CKSYB222K50					
				R	210 211 455 456 501 651 712 714 715 717		RD1/4PS473JL	C	209 812	CCSSH100D50					
				R	216 219 451 452 507 603 720		RD1/4PS103JL	C	209 812	CCSCH010C50	Mark				
				R	217 914 917		RD1/4PS100JL	C	216	CEAR47M50L2					
				R	251 252 757		RD1/4PS221JL	C	221	CQPA431G2A	C	301 302		CEA010M50LS2	
				R	253 254		RD1/4PS133JL	C	222	CCSRH101J50	C	303 304		CEAR68M50LS2	
				R	257 258 461 462 652		RD1/4PS272JL	C	228 259 260 903 904 905	CKSYB223K50	C	305 306		CEA101M10LS	
				R	457 458 464 465 554 558 751 754 755 919		RD1/4PS222JL	C	251 252	CCSSL681J50	C	901		CCSSL681J50	
				R	459 460		RS1/8S332J	C	253 254	CEANL4R7M35LL	Unit Number : CWM1507				
				R	466		RD1/4PS151JL	C	257 258	CQMA103J50L1	Unit Name : Key Board Unit				
				R	505		RD1/4PS152JL	C	261 553 554 555 556 565 566 567 672	CEA101M10I.2					
				R	508 716		RD1/4PS101JL	C	263 264	CKSYB272K50					
				R	553 557		RD1/4PS010JL	C	453 454						
				R	601		RS1/8S474J	C	465	CEAR22M50L2	Mark				
				R	604 903 911		RD1/4PS562JL	C	502	CEA471M10L2					
				R	701 702 703 704 707		RS1/8S473J	C	506 813	CEA221M6R3LL	* D	901 902 903 904 905 906	LED	LN12GC56	
				R	706		RS1/8S472J	C	507	CCSCH180J50	* D	907 908 911 912 913 914 915 916 917	LED	LN81RC5V	
				R	708 709 710 711 809 819		RS1/8S103J	C	509	CCSCH090D50	* D	909 910	LED	AA3432S	
				R				C	509	CCH1005	* D	951		RD2R2ES	
				R				C	510 552 563 564 756 760	CEA010M50LS2	* D	952		ISS133	
				R				C	557 558 569 570 751 753 754	CEA102M16L2	** S	902 903 904 905 906 907 908	Switch	CSG1004	
				R				C	559 560 571 572	CQMA224J50	** S	909 910 911 912	Switch	CSG1004	
				R				C	561 573	CQMA154J50					
				R				C	575	CEA100M35LS					

RESISTORS

Unit Number :
Unit Name : Switch P.C.Board

Mark	Circuit Symbol & No.	Part Name	Part No.
R	951		RD1/4PS181JL
R	952 953 954 955		RD1/4PS331JL

Mark	Circuit Symbol & No.	Part Name	Part No.
**	S 1	Switch(CST SET)	CSN-089
**	S 2 3	Switch(CST IN 70μS)	CSN1003
*	MR 1 2	Magnetic Resistive Device	SDME106B

Unit Number :
Unit Name : P.C.Board

Mark	Circuit Symbol & No.	Part Name	Part No.
*	D 1 2 3		1S1555

Miscellaneous Parts List

Mark	Circuit Symbol & No.	Part Name	Part No.
**	S 901	Switch	CSH1001
*	D 918	LED(DOOR)	AA4524K
**	HD 1	Head Unit	CXA1534
**	M 1 2	Motor(Head Gear)	CXM1030
**	M 3	Motor(Capstan)	CXM1007

14. PACKING METHOD

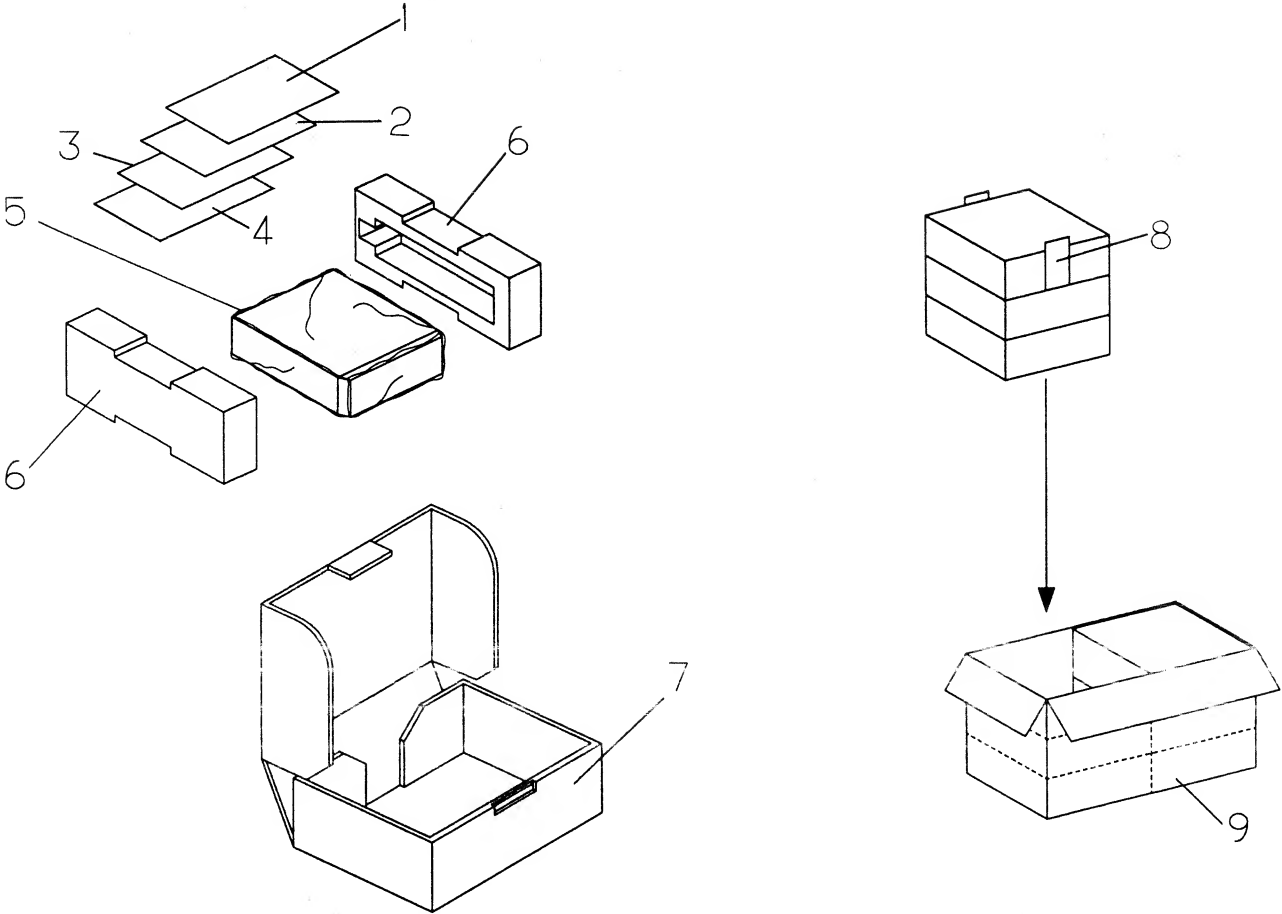


Fig. 15

● Parts List

Mark	No.	Part No.	Description
	1.	CRB1112	Owner's Manual
	2.	CRB1113	Installation Manual
	3.	CRB1105	WB Manual
	4-1.	CRY1005	Envelope
	4-2.		Label
	4-3.		Film (x2)
	4-4.	CRY1003	Card (x2)
	4-5.	CRW1014	Label
	4-6.	CRW1009	Tag
	5.	CEG-162	Polyethylene Bag
	6.	CHP1030	Styrofoam
	7.	CHG1483	Carton
	8.	CWH1009	Paper Sheet
	9.	CHL1461	Contain Box

15. CD MODE CONTROL LOCATION AND OPERATION (WITH CD CHANGER OPTION)

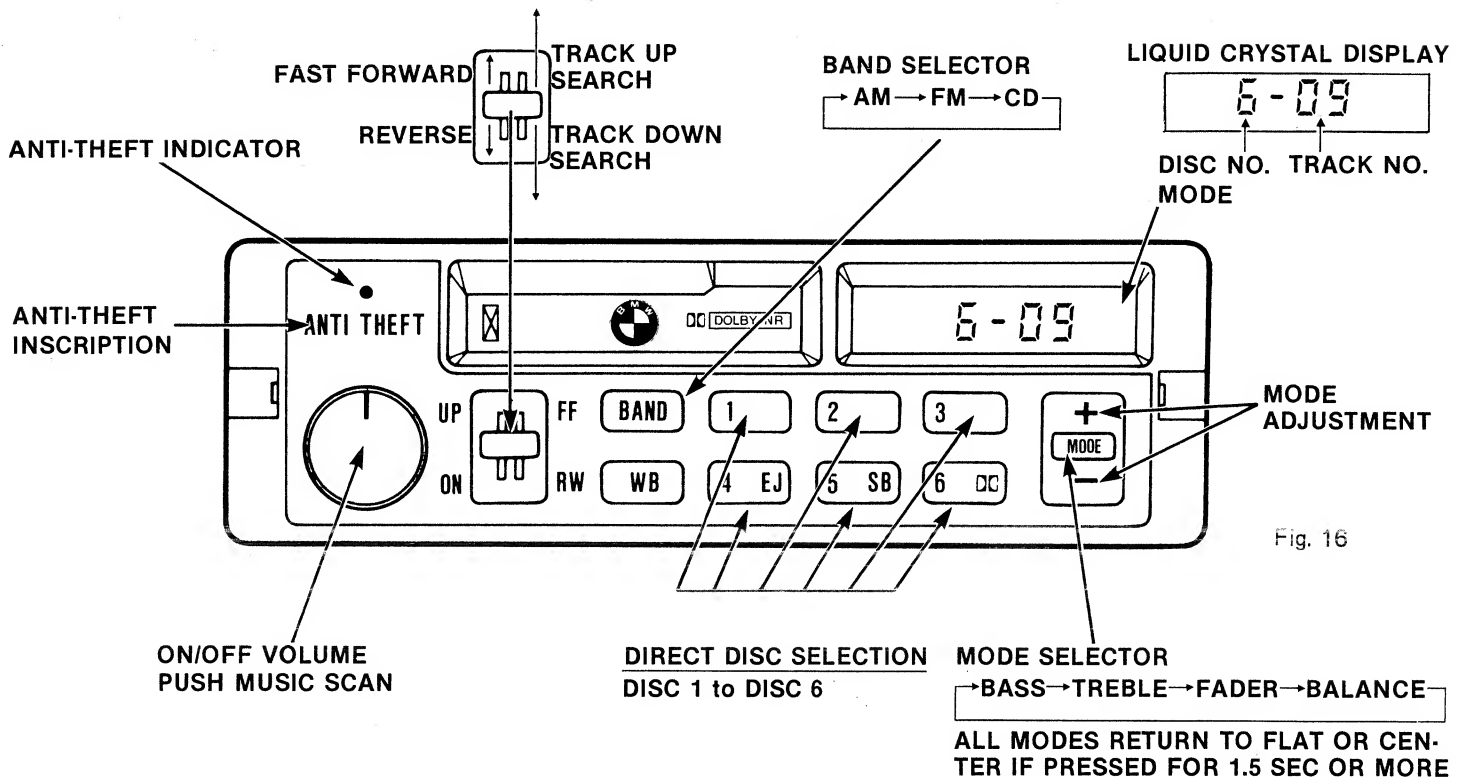


Fig. 16

CD OPERATION

To use the CD player, turn the radio on and press the BAND button. The display indicates AM, FM, or CD. Select CD to switch from radio mode to CD mode.

DIRECT DISC SELECTION

DIRECT DISC SELECT buttons 1 through 6 correspond to the magazine tray numbers. When there is a disc in a tray, the number lights on the corresponding button. To play a disc in the magazine, press one of the buttons whose indicator is lit.

NOTE: Nothing will happen if you press a button whose indicator is not lit.

FAST FORWARD/REVERSE

The UP/DN lever has a two-step operation. Raise the lever one step to fast forward; lower it one step to reverse.

TRACK SEARCH

Raising or lowering the UP/DN lever two steps (as far as it can go) activates the track search mode. To advance to the next track, push the lever fully up. To return to the previous track, push the lever fully down. If you hold the lever in the fully up or fully down position, the player moves forward or backward through the tracks continuously.

MUSIC SCAN

When the ON/OFF button is pressed, the word "SCAN" appears on the display and the player begins playing the first part (approximately 10 seconds) of each track on the current disc. Press the button again when you find a track you want to listen to: the player will return to normal playback and continue with the current track.

Service Manual

**ORDER NO.
CRT-468-0**

CASSETTE MECHANISM ASSEMBLY

CX-156/A, CX-156/B

- This service manual is for cassette mechanism assembly used in car stereo components.
- Refer to the service manual for individual models for details on sections other than the cassette mechanism assembly.

Model	Service Manual	Cassette Mechanism Assembly
FX-K5/EW	CRT-469	CX-156/A
FX-K5B/EW		CX-156/A
FX-K5SDK/WG		CX-156/A
FEX-55/US, CA, CS	CRT-471	CX-156/A
FEX-50/ES	CRT-470	CX-156/A
KX-E60/EW	CRT-476	CX-156/B

Model	Service Manual	Cassette Mechanism Assembly

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1. REPLACEMENT OF PARTS IN CASSETTE MECHANISM

• Belt and capstan motor (M3) replacement

1. Remove the four screws and the cover. (Fig. 1)
2. The belt in Fig. 2 can be replaced. (Be sure that the belt is not greased and not twisted.)
3. To replace the capstan motor, remove the two screws shown in Fig. 2.

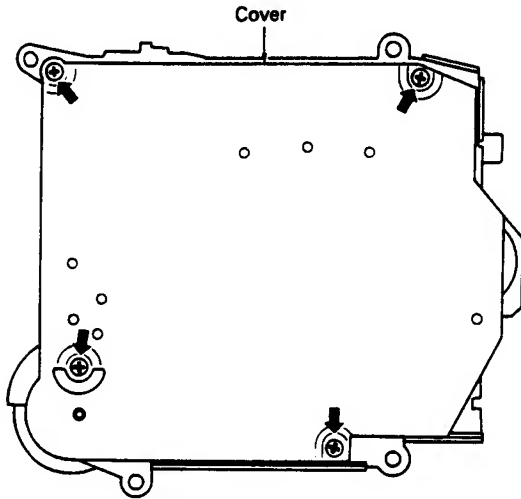


Fig. 1

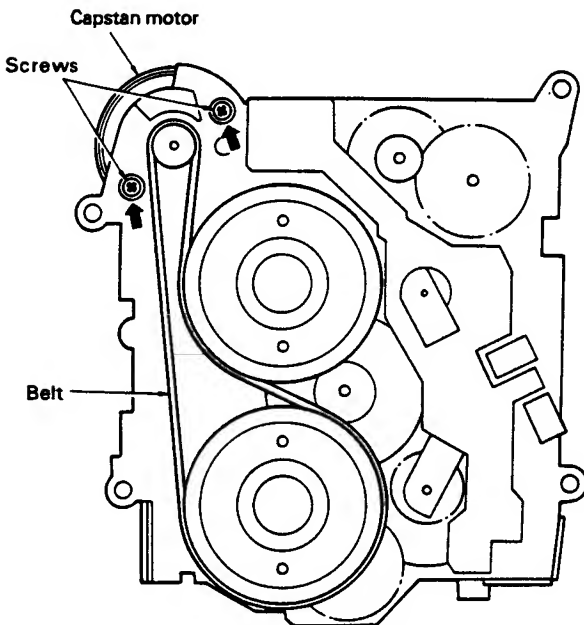


Fig. 2

• Cassette holder removal

1. Turn the capstan motor until the cassette holder drops down. (Do not turn the flywheel directly by hand.)
2. Remove the screw labeled "B", the collar and the spring.
3. Remove unit "A" and the cassette holder "D" and "E".

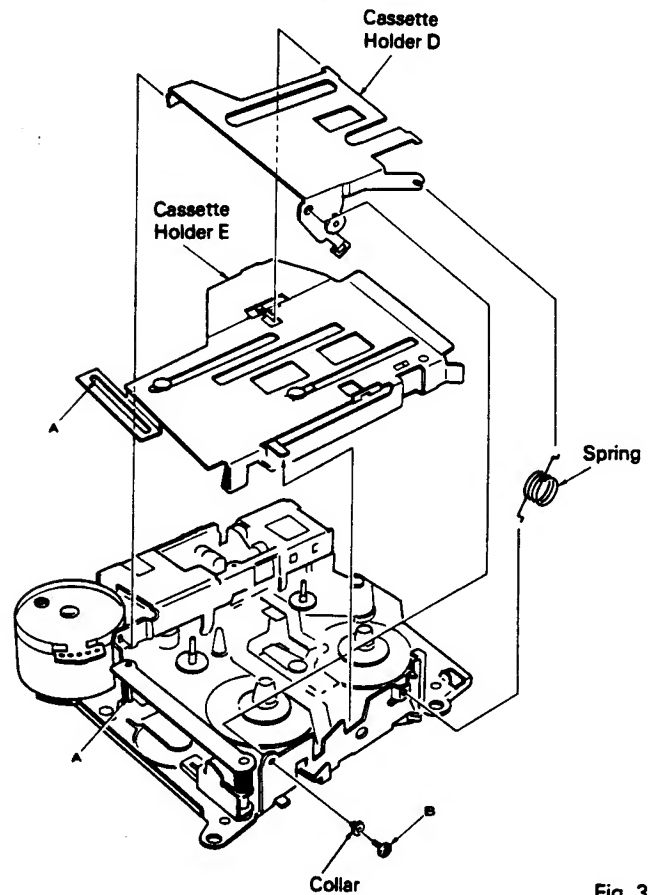


Fig. 3

• **Head unit replacement**

1. Remove the washer and spring.
2. Remove the screw labeled "F", and the head unit can be removed in the opposite direction.
3. Be careful of the following point during reassembly.
 - Put the head unit pins through the lever holes. (One in front and one in back.)

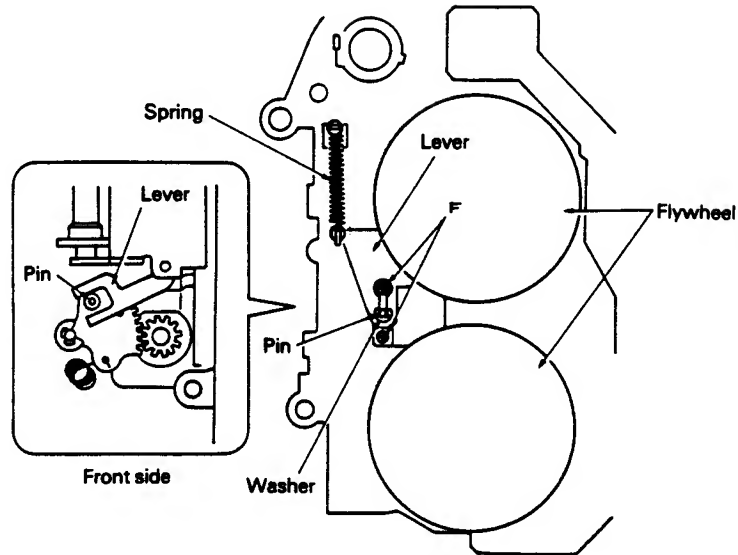


Fig. 4

• **Sub-motor replacement (M1 and M2)**

1. Remove the two screws labeled "G" and remove the P.C. board unit.
2. The sub-motor can be removed by removing the three screws indicated by the arrows.
3. Sub-motor 2 (for switching the FF/REW gear) can be replaced when the spacer has been removed. (The motor fits very snugly, so some force must be used to remove it.)
4. Sub-motor 1 (for turning and positioning the head) can be replaced by removing the belt, lock washer, pulley and two screws labeled "J".

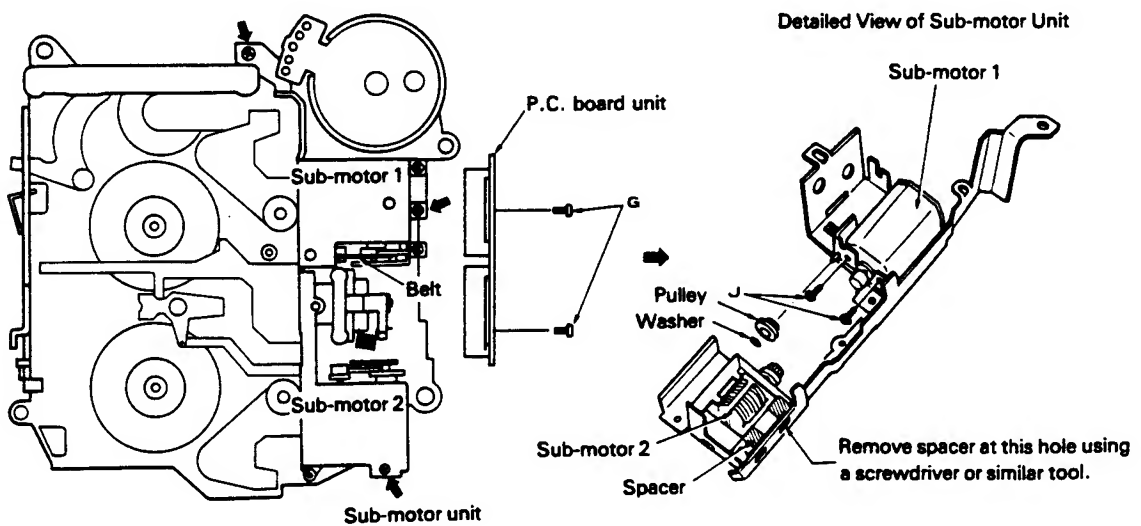


Fig. 5

• Reel unit replacement

1. Remove the six screws and the switch P.C. board.
2. Remove the screw labeled "K" and the collar and free the FF/REW idler gear.
3. The reel assy can be replaced by removing the two screws labeled "L" and removing the reel unit.

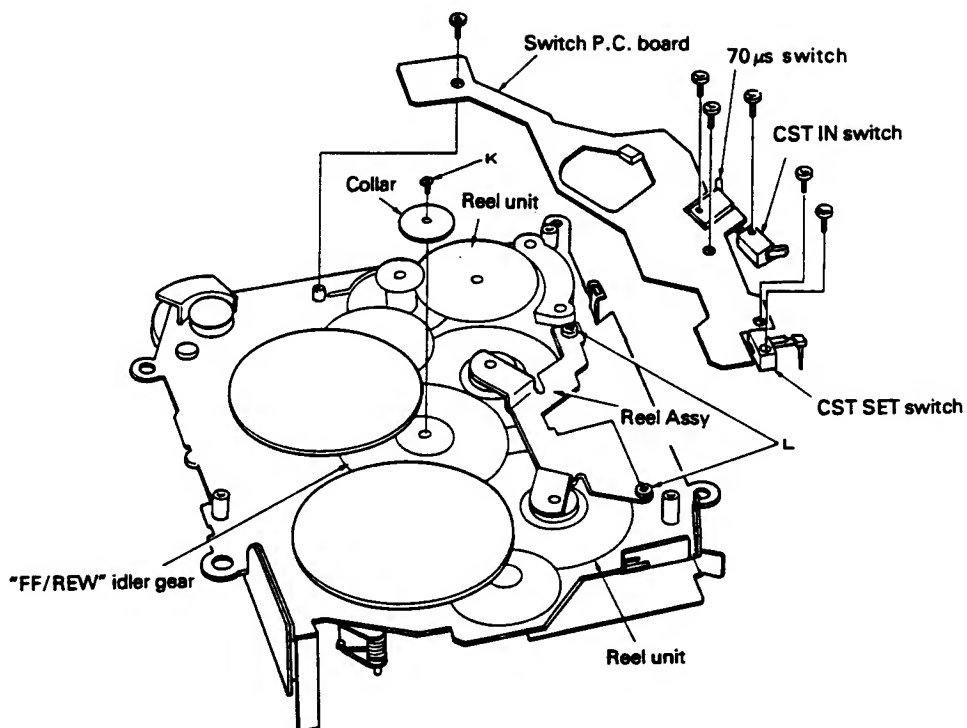


Fig. 6

2. MECHANISM DESCRIPTION

Cassette mechanism assy for CX-156/A is used in this mechanism description.

1. Outline of Mechanism

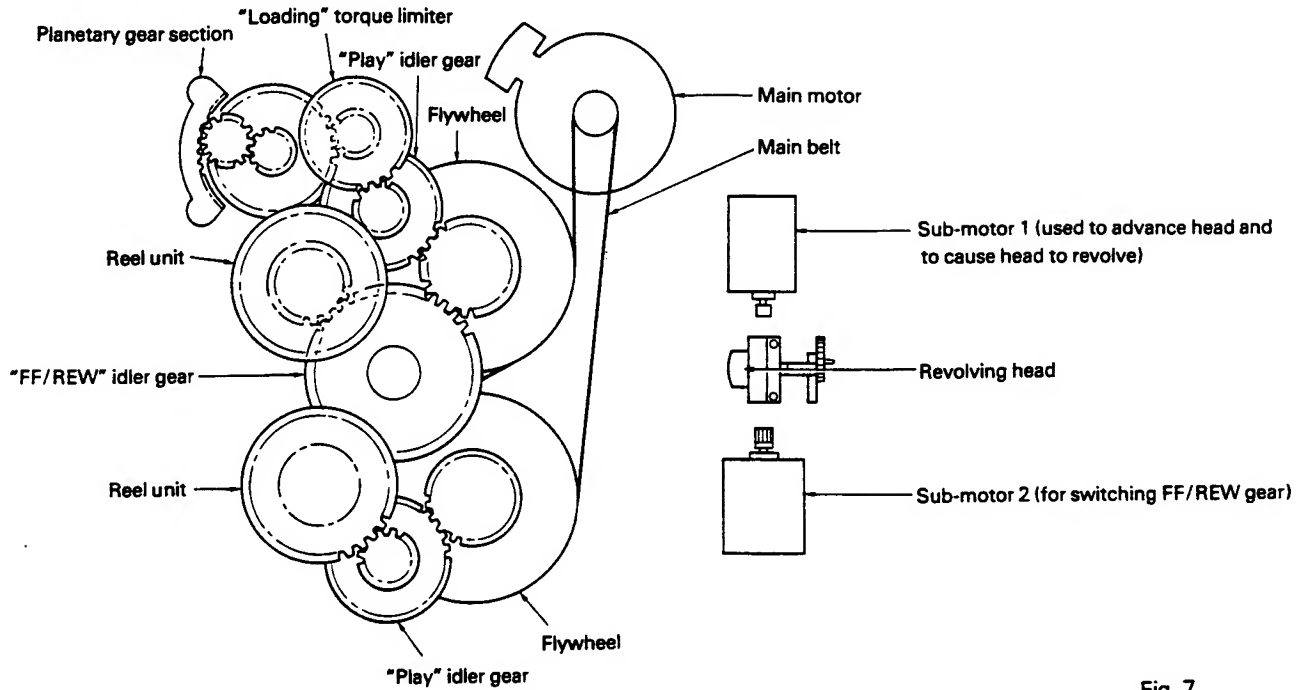


Fig. 7

2. Loading/Eject Function

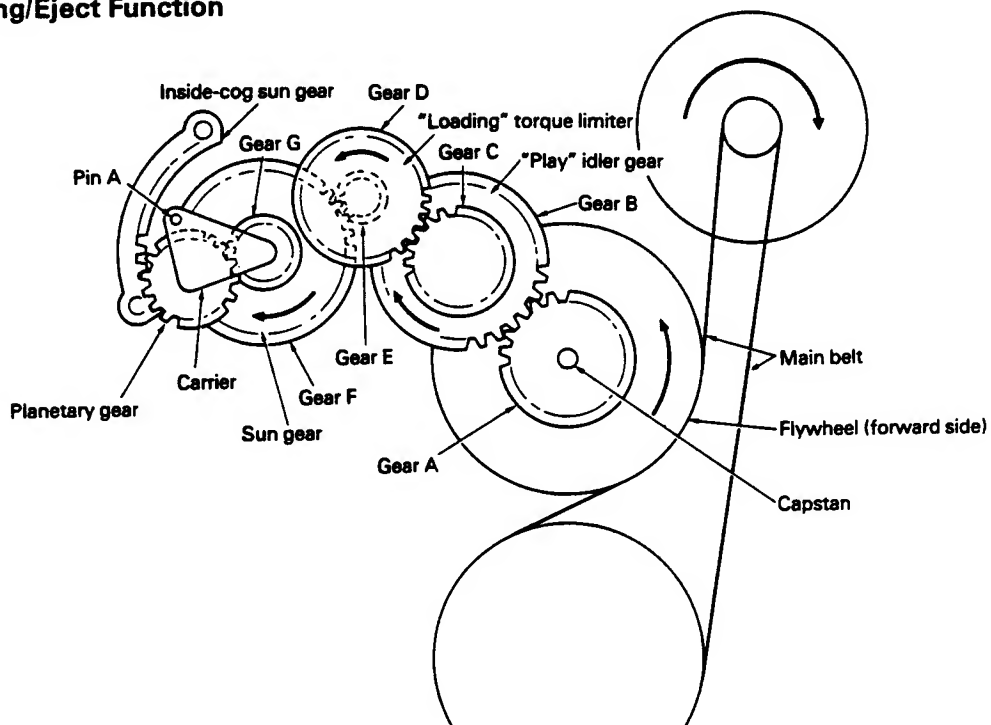


Fig. 8

3. Cassette Tape Load and Eject Mechanism

• Cassette tape loading operation

1. Push the cassette tape lightly in the direction indicated by the arrow. (As shown in Fig. 10, arm "A" and arm "B" connect to spring "A". These are also connected to common axis shaft "A", which is attached to the chassis surface and acts as a swivel. Pin "A", which is caulked to the planetary gear unit carrier, goes through the chassis and fits into the oblong hole of arm "B". Because pin "A" won't move as long as the capstan motor isn't moving, arm "B" won't move either.)
2. When a cassette tape is loaded, arm "A" moves in the direction indicated by the arrow and spring "A" loosens. Lever "A" also moves in the direction indicated by the arrow, and the catch at left of the lever releases arm "C". Arm "C" then turns counterclockwise and opens the CST IN switch. The capstan motor then begins turning forward.
3. The carrier then moves clockwise because the planetary gear moves along the inside-cog sun gear. Pin "A" which is caulked to the carrier also moves in the same direction. (Fig. 11) The movement of pin "A" is causing arm "B" to move counterclockwise. Arm "A" turns in the same fashion and the "A" unit of lever "A" draws the cassette tape in. (Fig. 9)

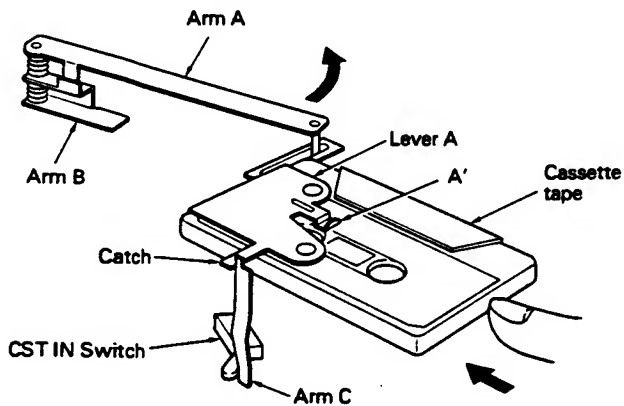


Fig. 9

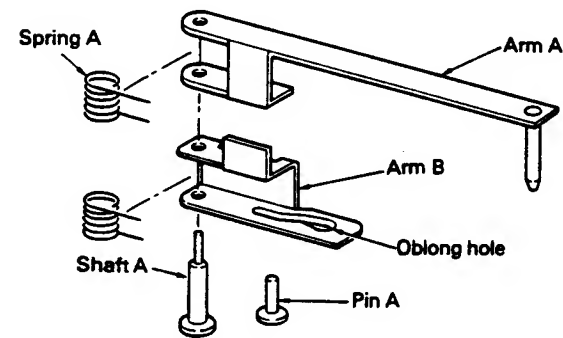


Fig. 10

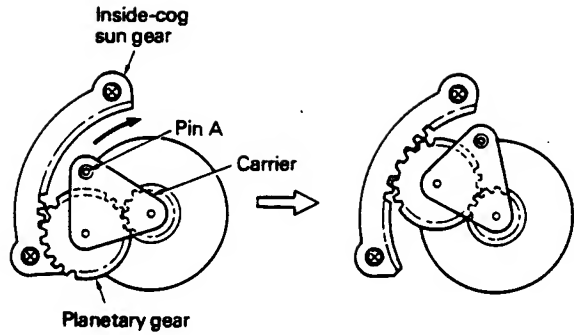


Fig. 11

4. The oblong hole of arm "B" is as shown in Fig. 12. The cassette tape draw-in process will be complete when the pin "A" degree of rotation is θ . Arm "B" will not move while the degree of rotation is θ' .

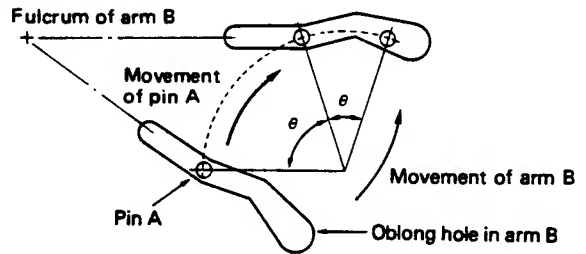


Fig. 12

5. As shown in Fig. 13, arm "C" (caulked to the chassis swivel) is fixed to pin "A" and when the degree of rotation is θ arm "C" is stationary, and when it is θ' arm "C" turns clockwise.

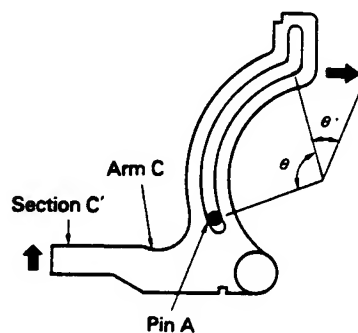


Fig. 13

- As shown in Fig. 14, the "C" unit of arm "C" connects to the cassette arm (which suspends the cassette tape) through spring "C". The arm "C" movement described above in paragraph five makes the "C" unit move in the direction indicated by the arrow in Fig. 14. The cassette arm pushes down holder "A" by means of spring "B". The "C" unit is released when holder "A" drops down.
- In order for the capstan motor to keep turning forward, the planetary gear disengages from the inside-cog sun gear and becomes free.

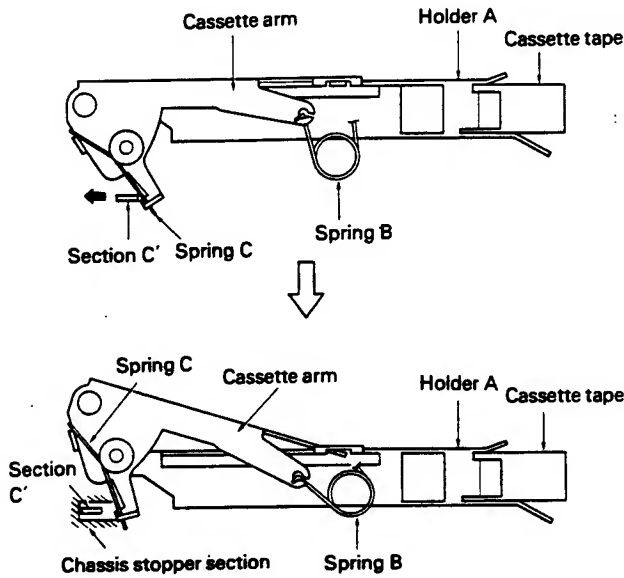


Fig. 14

• Eject operation

- Turning on the eject switch reverses the capstan motor. As shown in Fig. 15, spring "D" places slight friction on the planetary gear which causes it to engage with the inside-cog sun gear. The cassette tape is ejected following an operation opposite to the loading operation.

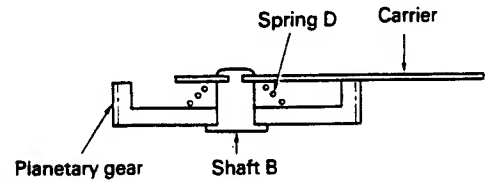


Fig. 15

4. Head Turning and Head Positioning Operations (during forward play)

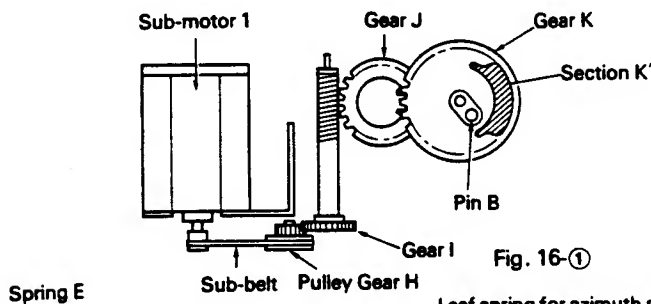


Fig. 16-①

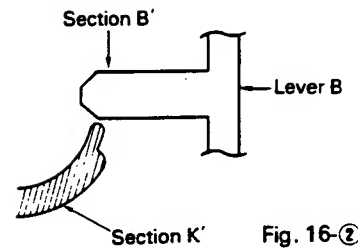


Fig. 16-②

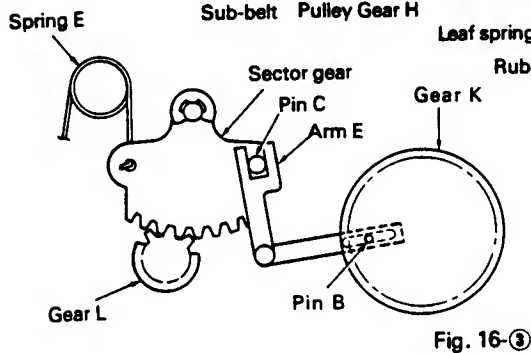


Fig. 16-③

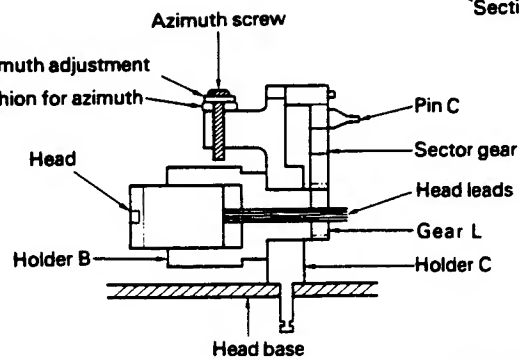


Fig. 16-④

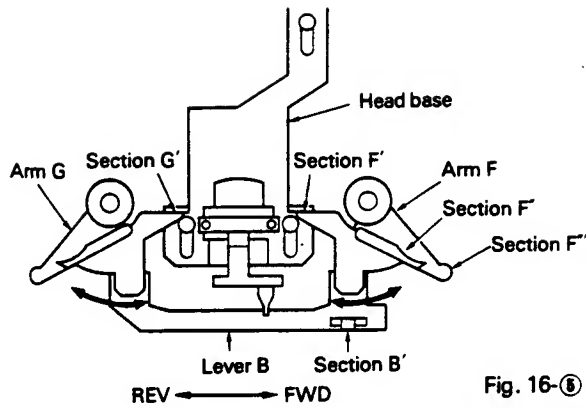


Fig. 16-8

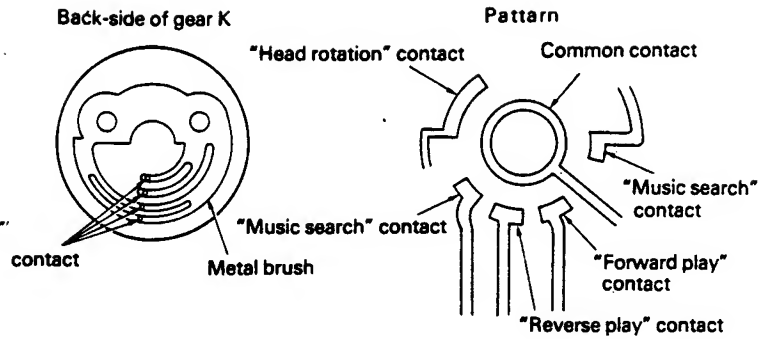


Fig. 16-9

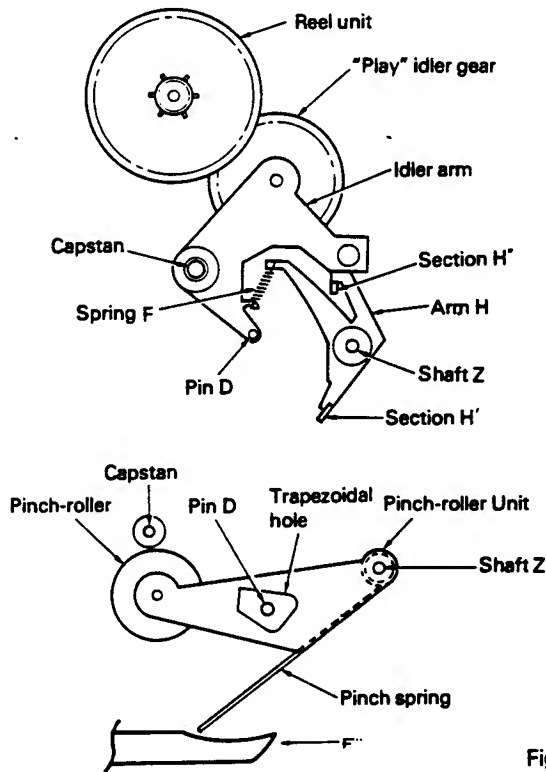


Fig. 17

1. The sub-belt from sub-motor 1 goes through pulley gear "H", gear "I", gear "J" and turns gear "K". Head turning and head base positioning take place using the "K" unit (the projecting unit) of gear "K" and pin "B". There is a metal brush attached to the back of gear "K" which detects the passing through of all patterns and common patterns and stops sub-motor 1. This controls the head positioning, the head turning, the contact pressure of the play idler gear and the contact pressure of the pinch roller.
2. Head turning at pin "B" takes place until gear "K" starts turning which brings the "K" part into contact with the lever "B", "B" part. (Fig. 16-3)
3. Pin "B" engages with the arm "E" oval opening and rotates arm "E". The arm "E" sector gear is engaged with pin "C" and this turns the head. The head rotation pattern (Fig. 16-9) performs this operation inside a certain angle.
4. When gear "K" turns it also pushes the lever "B", "B" part. The "B" part turns arm "F" and arm "G" counter-clockwise and advances head base with the arm "G", "G" part. (Fig. 16-2, 8)
5. After the head base goes beyond the MS pattern (Fig. 16-6) position, the arm "F", "F" part pushes the pinch roller unit pinch spring and presses the pinch roller down onto the capstan. (Fig. 17)
6. Simultaneously, the arm "F", "F" unit pushes the arm "H", "H" part. The "H" part lock releases when pushed, and the play idler gear comes into contact with the reel unit. Play operation begins because of this. (Fig. 16-5, Fig. 17)
7. When going from play to eject, first, the pinch roller disengages from the capstan, and then using the pinch roller unit trapezoidal hole, releases the idler arm from the reel unit by means of pin "D". After that, the "H" unit again meshes with the idler arm and the "play" idler gear stops after completely disengaging from the reel unit.

5. FF/REW Operation

1. As with the head operations a brush is attached to the back of gear "P" and using patterns and the brush, position sensing takes place and this controls the FF/REW operation.
2. Sub-motor 2 goes through gears "L", "M" and "N" and turns gear "P". When gear "P" turns, arm "J" rotates by means of arm "J". Arm "I" rotates the FF/REW idler gear and engages it with the reel unit.

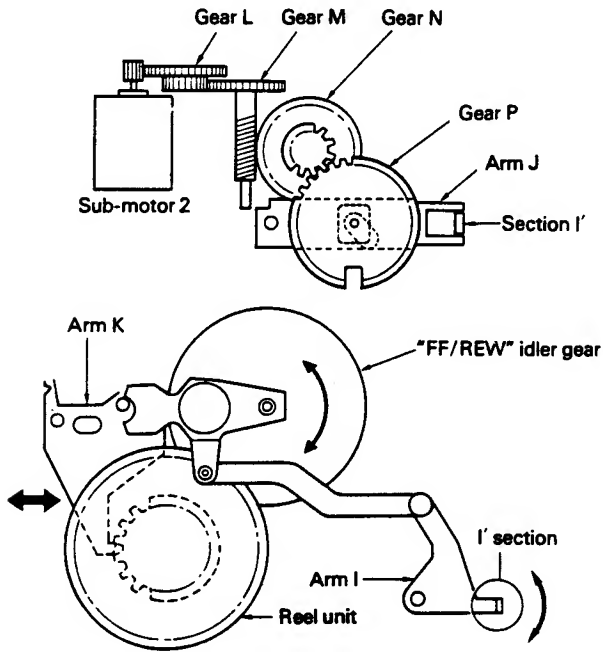


Fig. 18

3. ADJUSTMENT

3.1 AZIMUTH ADJUSTMENT

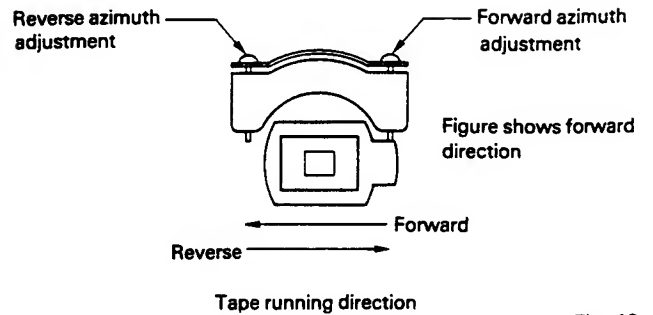


Fig. 19

• To Adjust

1. Play "A" side of STD-341A (10kHz, -20dB). Adjust each screw for maximum output in forward and reverse directions.
2. Play "B" side in forward and reverse directions to confirm adjustment.

3.2 TAPE SPEED ADJUSTMENT

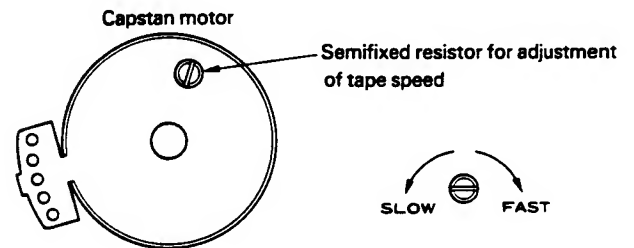

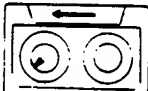
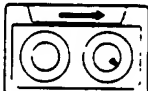



Fig. 20

• To Adjust

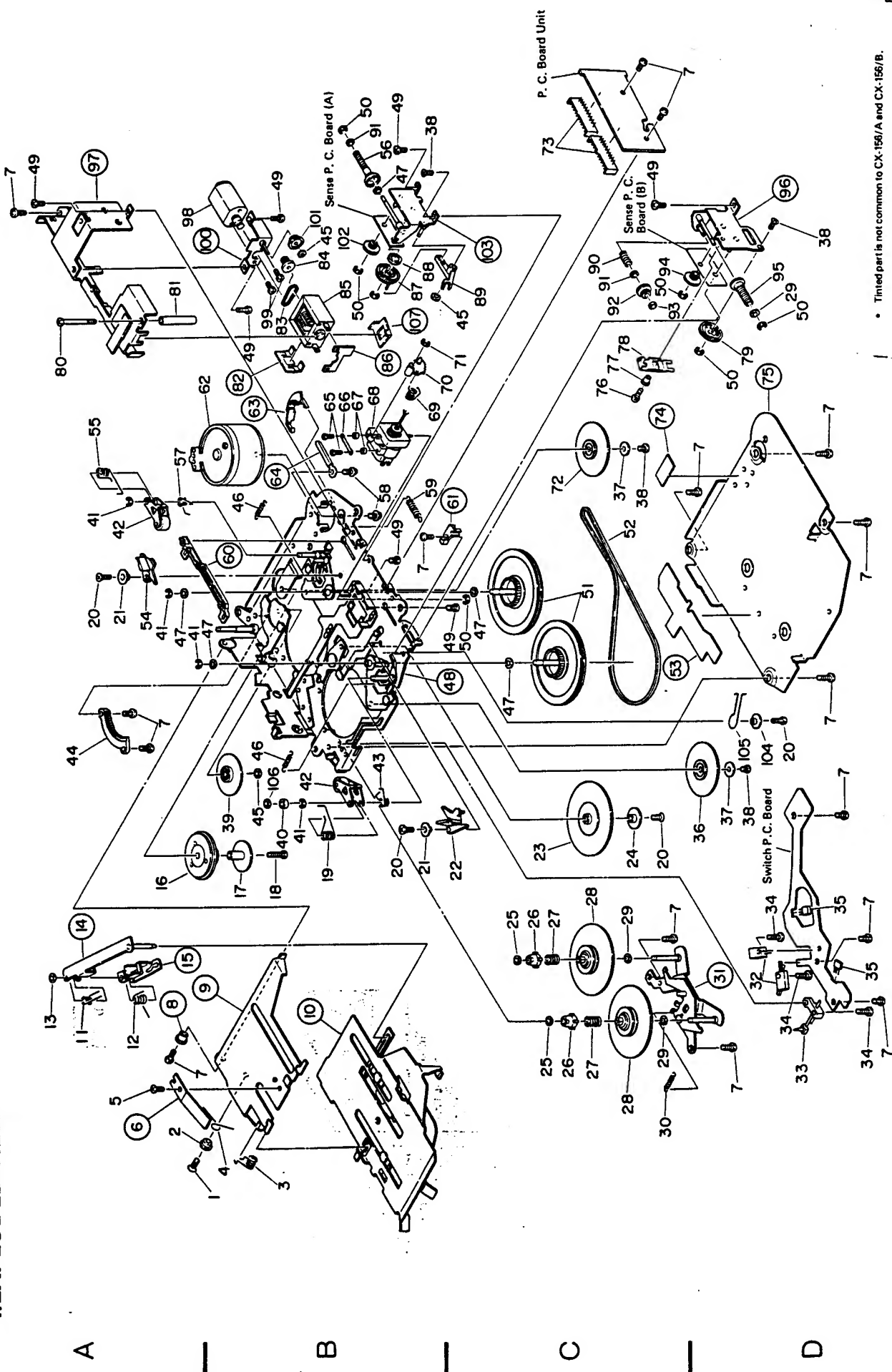
1. Reproduce STD-301 (3kHz, -10dB). Adjust the semifixed resistor so that the frequency counter shows 3,010Hz (+30Hz, -30Hz).

3.3 CHECK POINTS OF CASSETTE MECHANISM

<p>Confirm the following items when replacing parts of the cassette mechanism.</p>	<p>■ Tape speed deviation:</p> <p>$3,000 \pm \frac{90}{30}$ Hz $(4.76 \text{ cm/s} \pm \frac{3}{1}\%)$</p> <p>Using an STD-301, measure the speed at the start and end of winding and see that a deviation remains within the limits each time. If values indicated by the pointer vary considerably, adjust to 70% of the minimum and maximum values. Measuring time shall be 5~6 seconds.</p>	<p>■ Wow and flutter: Less than 0.15% (WMS)</p> <p>Using an STD-301, measure the wow and flutter at the start and end of winding and take the maximum value. If values indicated by the pointer vary considerably, adjust to 70% of the minimum and maximum values. Measuring time shall be 5~6 seconds.</p>
<p>■ Fast forward and rewinding time:</p> <p>95 ~ 115 seconds</p> <p>Using a C-60, set to fast forward and rewind, and measure the time with a stop watch.</p>	<p>■ Winding torque:</p> <p>40 ~ 60g · cm</p>  <p>Using a cassette type torque meter (100 g · cm), measure the minimum value while in the play mode. Measuring time shall be 5 ~ 6 seconds.</p>	<p>■ F.F. torque:</p> <p>70 ~ 110g · cm</p>  <p>Using a cassette type torque meter (120 g · cm), measure the value when the tape stops in the F.F. mode.</p>
<p>■ REW torque:</p> <p>70 ~ 110g · cm</p>  <p>Using a cassette type torque meter (120 g · cm), measure the value when the tape stops in the REW mode.</p>	<p>■ Back tension torque:</p> <p>2.0 ~ 3.5g · cm</p>  <p>After setting in the REW mode without loading a cassette tape for 5 minutes, measure the back tension torque in the play mode, using a cassette type torque meter.</p>	<p>■ Cassette loading force:</p> <p>450 ~ 550 g</p> <p>Push the center of the cassette and measure the force with a tension meter (1 kg).</p>

CX-156/A, CX-156/B

4. EXPLODED VIEW



• Tined part is not common to CX-156/A and CX-156/B.

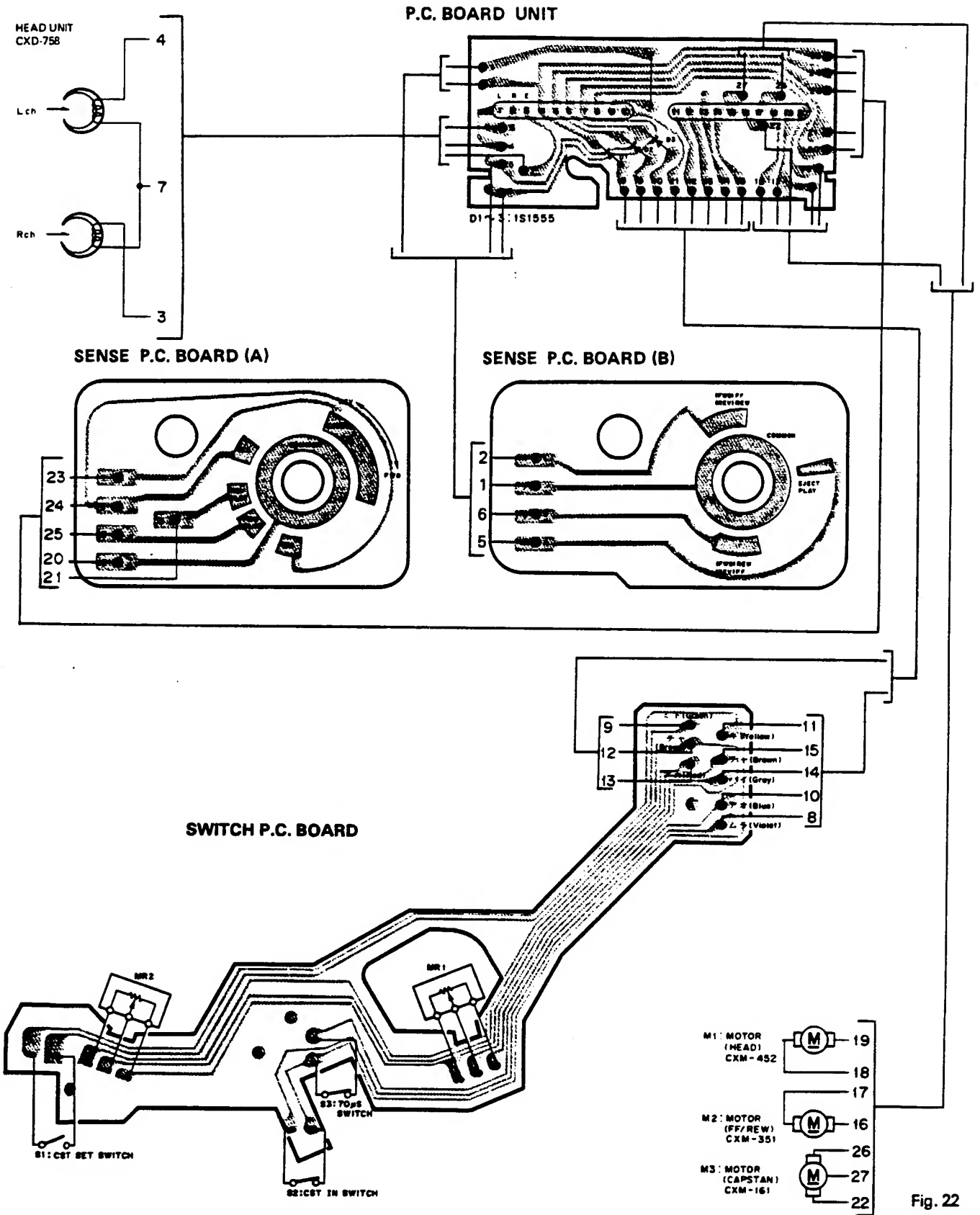
Fig. 21

NOTE:

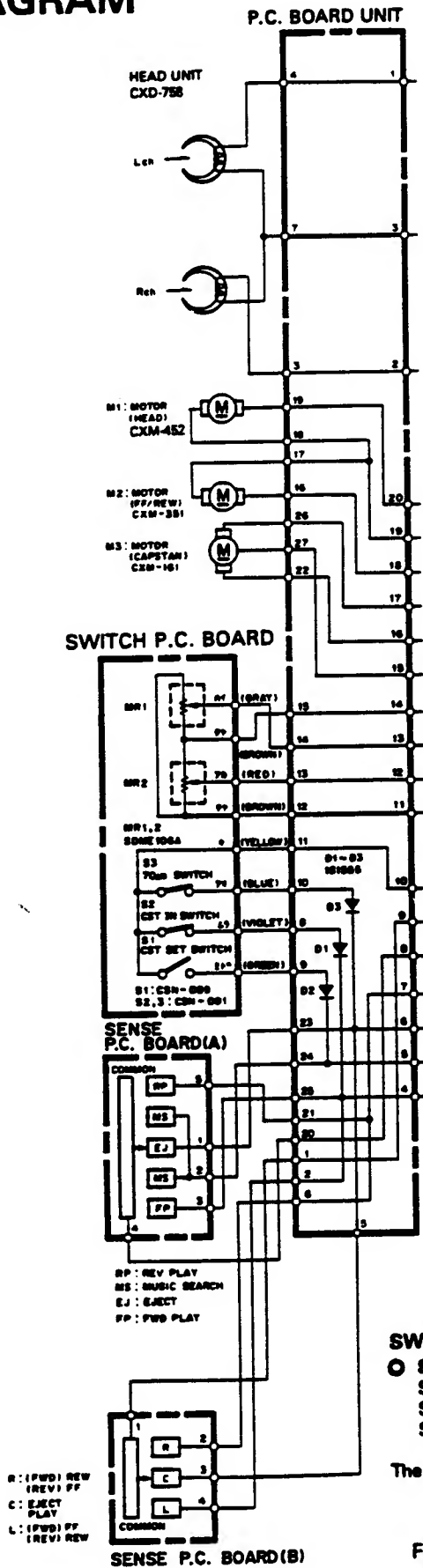
- For your Parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.
- ★ ★: **GENERALLY MOVES FASTER THAN ★.**
- This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.*
- Parts whose parts numbers are omitted are subject to being not supplied.

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	HBA-193	Screw M1.4×3.5		53.		Insulator
	2.	CLB-691	Collar		54.	CNW-931	Arm
	3.	CBH-837	Spring		55.	CBH-831	Spring
	4.	CBH-867	Spring		56.	CNW-956	Gear
	5.	HBA-147	Screw M1.4×1.4		57.	CBH-833	Spring
	6.		Spring		58.	PMS26P030FMC	Screw
	7.	BMZ20P040FMC	Screw		59.	CBH-830	Spring
	8.		Bush		60.		Lever
	9.		Arm		61.		Spacer
	10.		Holder Unit (CX-156/A)	★ ★	62.	CXM-161	Motor (Capstan)
			Holder Unit (CX-156/B)		63.		Clamper
	11.	CBH-836	Spring (CX-156/A)		64.		Clamper
		CBH-887	Spring (CX-156/B)		65.	CBA-173	Screw M1.4×8
	12.	CBH-886	Spring		66.	CBE-114	Spring
	13.	CBF-046	Washer		67.	CNY-134	Azimuth Rubber
	14.		Arm Unit	★ ★	68.	CXD-758	Head Unit
	15.		Arm		69.	CBH-829	Spring
	16.	CXD-388	Gear Unit		70.	CNW-939	Gear
	17.	CLB-617	Collar		71.	YE15FUC	Washer
	18.	CBA-166	Screw M1.7×8		72.	CNW-943	Gear
	19.	CBH-832	Spring		73.	CKS-534	Plug
	20.	HBA-310	Screw M2×3.5		74.		Insulator
	21.	CLB-612	Collar		75.		Cover
	22.	CNW-930	Arm		76.	HBA-158	Screw M1.4×5
	23.	CNW-944	Gear		77.	CLB-750	Collar
	24.	CLB-616	Collar		78.	CNH-004	Arm
	25.	CBF-135	Washer		79.	CNW-953	Gear
	26.	CNW-932	Collar		80.	CBA-165	Screw M2
	27.	CBH-827	Spring		81.	CLB-749	Spacer
★ ★	28.	CXD-384	Reel Unit		82.		Spacer
	29.	CBF-088	Washer	★ ★	83.	CNT-114	Belt
	30.	CBH-868	Spring		84.	CNW-941	Gear
	31.		Bracket Unit	★ ★	85.	CXM-351	Motor (Gear Position)
★ ★	32.	CSN-091	Switch (70μs, CST IN)		86.		P.C. Board
★ ★	33.	CSN-089	Switch (CST SET)		87.	CNW-952	Gear
	34.	CBA-172	Screw M1.7×5.5		88.	CNN-481	Spacer
★	35.	SDME106A	Magnetic Resistive Device		89.	CNW-958	Arm
	36.	CNW-943	Gear		90.	CBH-866	Spring
	37.	CLB-615	Collar		91.	HBF-116	Washer
	38.	HBA-209	Screw M2×2		92.	CNW-954	Gear
	39.	CNW-950	Gear		93.	CBF-135	Washer
	40.	CLB-690	Roller		94.	CNY-077	Gear
	41.	EBG-001	Washer		95.	CNY-148	Gear
★ ★	42.	CXD-387	Pinch Roller Unit		96.		Holder Unit
	43.	CBH-834	Spring		97.		Guide
	44.	CNW-951	Gear	★ ★	98.	CXM-452	Motor (Head Position)
	45.	CBF-126	Washer		99.	HBA-244	Screw M1.4×1.6
	46.	CBH-835	Spring		100.		Bracket Unit
	47.	HBF-179	Washer		101.	CNY-075	Pulley
	48.		Chassis Unit (CX-156/A)		102.	CNW-955	Gear
			Chassis Unit (CX-156/B)		103.		Holder Unit
	49.	HBA-175	Screw M2×2.5		104.	CLB-760	Collar
	50.	YE12FUC	Washer		105.	CBH-893	Spring
	51.	CNW-942	Flywheel		106.	HBF-180	Washer
★ ★	52.	CNT-111	Belt		107.		Cover

5. CONNECTION DIAGRAM



6. SCHEMATIC CIRCUIT DIAGRAM



7. ELECTRICAL PARTS LIST

Switch P.C. Board

Mark	Symbol & Description	Part No.
★★	S1 Switch (CST SET)	CSN-089
★★	S2, S3 Switch (CST IN, 70 μs)	CSN-091
★	MR1, MR2 Magnetic Resistive Device	SDME108A

P.C. Board Unit

Mark	Symbol & Description	Part No.
★	D1 - D3	1S1555

Miscellaneous Parts List

Mark	Symbol & Description	Part No.
★★	Head Unit	CXD-758
★★	M1 Motor (Head)	CXM-452
★★	M2 Motor (Gear)	CXM-351
★★	M3 Motor (Capstan)	CXM-161

SWITCHES

- SWITCH P.C. BOARD
- S1: CST SET SWITCH..... ON-OFF
- S2: CST IN SWITCH..... ON-OFF
- S3: 70μs SWITCH..... ON (120μs)-OFF (70μs)

The underlined indicates the switch position.

Fig. 23