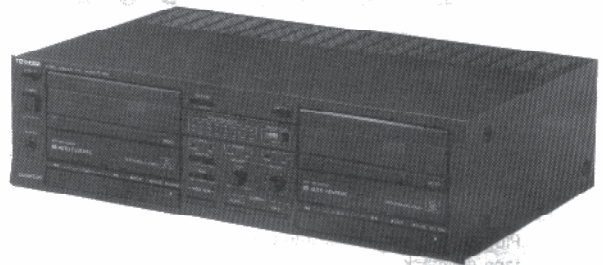


# TOSHIBA

## STEREO CASSETTE DECK

# PC-5858



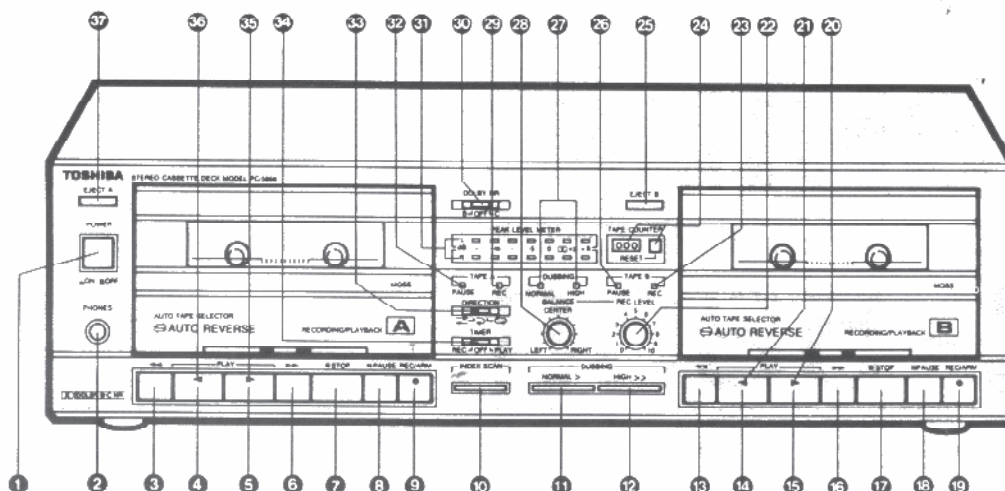
### SPECIFICATIONS

<b>Type:</b>	Stereo Double Auto Reverse, Double Recording Full Logic Cassette Deck with Dolby B, C NR system	<b>SN ratio:</b>	57 dB (Dolby NR OFF, Normal tape) 65 dB (Dolby B type NR ON, Normal tape) 72 dB (Dolby C type NR ON, Normal tape)
<b>Track system:</b>	4-track, 2-channel stereo/mono, recording/playback	<b>Wow &amp; flutter:</b>	0.08% WRMS
<b>Recording system:</b>	AC bias system	<b>Harmonic distortion:</b>	Less than 0.6% (at 1 kHz, 0 VU with normal tape)
<b>Erasing system:</b>	AC system	<b>Bias frequency:</b>	105 kHz
<b>Tape speed:</b>	4.76 cm/sec.	<b>Input sensitivity/Impedance:</b>	LINE: 77.5 mV/50 kohm
<b>Heads:</b>	Hard permalloy recording/playback head x 2 Double gap ferrite erasing head x 2	<b>Output level/Load impedance:</b>	LINE: 270 mV/3.9 kohm
<b>Motor:</b>	Electronically-controlled DC motor x 2	<b>Power supply:</b>	AC 120V ~, 60 Hz (U.S.A) AC 220V ~, 50 Hz (EUROPE)
<b>Fast forward and rewind time:</b>	Approx. 110 sec. (C-60 tape)	<b>Power consumption:</b>	30 W
<b>Frequency response:</b>	Normal tape: 20 Hz to 15,000 Hz (30 Hz to 14,000 Hz, $\pm 3$ dB) CrO <sub>2</sub> tape: 20 Hz to 16,000 Hz (30 Hz to 15,000 Hz, $\pm 3$ dB) Metal tape: 20 Hz to 16,000 Hz (30 Hz to 16,000 Hz, $\pm 3$ dB)	<b>Major dimensions:</b>	420(W) x 119(H) x 266(D) mm
		<b>Weight:</b>	5.4 kg

Specifications are subject to change without notice.

TA, TE

# OPERATING CONTROLS



## 1 POWER switch

Use this switch to turn the power on and off.

### Note:

OFF position: This unit remains connected to main supply in the OFF position. Disconnect the power cord when the unit is not going to be used for a long time.

## 2 PHONES jack

Plug stereo headphones into this jack to monitor recordings or tape playback.

## 3 13 Rewind button (◀◀)

Press to rewind the tape. Tape will move from the right reel to the left reel at high speed. When this button is pressed during playback, tunes are skipped in the reverse direction each time the button is pressed. When this button is pressed together with the forward PLAY button (▶), the tape is re-wound and the tape is played back from the first tune of side A.

## 4 14 Reverse PLAY button (◀)

Press to play the tape in the reverse direction (side B). When this button is pressed more than twice, the current tune is played back repeatedly (16 times). To release the current tune being played back repeatedly, press the STOP button (■). When the reverse PLAY button (◀) is pressed with tapes loaded in both A and B decks, the unit enters relay playback mode.

## 5 15 Forward PLAY button (▶)

Press to play the tape in the forward direction (side A). When this button is pressed more than twice, the current tune is played back repeatedly (16 times). To release the current tune being played back repeatedly, press the STOP button (■).

## 6 16 Fast forward button (▶▶)

Press to rapidly advance the tape. Tape will move from the left reel to the right reel at high speed. When this button is pressed during playback, tunes are skipped in the forward direction each time the button is pressed. When this button is pressed together with the reverse PLAY button (◀), the tape is re-wound and the tape is played back from the first tune of side B.

## 7 17 STOP button (■)

Press to stop tape travel. This will also release the previous mode of operation.

## 8 18 PAUSE button (■)

When this button is pressed during playback, recording, normal-speed or high-speed dubbing, the unit temporarily stops.

To release playback pause mode, press the forward PLAY button (▶) or reverse PLAY button (◀).

To release rec pause mode, press the REC/ARM button (●) or NORMAL-speed DUBBING button (>) or HIGH-speed DUBBING button (>>).

## 9 19 REC/ARM button (●)

Press this button to start recording. The REC indicator lights. The recording mode can only be entered from the stop mode. Recording is not possible while either deck is in the playback mode.

## 10 INDEX SCAN button

This button is for deck A only.

Press this button to select the desired tune. When this button is pressed, the beginning of each tune is played back for about 10 seconds. When the desired tune is reached, press the forward PLAY button (▶) or reverse PLAY button (◀).

## 11 NORMAL-speed DUBBING button (>)

When this button is pressed, the NORMAL-speed DUBBING indicator lights and dubbing from deck A to deck B starts. Dubbing is not possible unless both A and B decks are in the stop mode.

## 12 HIGH-speed DUBBING button (>>)

When this button is pressed, the HIGH-speed DUBBING indicator lights and high-speed dubbing from deck A to deck B starts.

Dubbing is not possible unless both A and B decks are in the stop mode.

## 20 35 Forward indicator

Shows the direction of tape travel.

## 21 36 Reverse indicator

## 22 REC LEVEL control knob

Adjust both right and left channels recording levels.

## 23 28 REC indicator

This indicator lights during recording, or dubbing (only deck B).

## 24 TAPE COUNTER and RESET button

The TAPE COUNTER provides a means of locating passage on the tape for deck B. When starting a recording, set the counter "000" by depressing the RESET button.

## 25 Deck B EJECT button

Pressing this button opens the deck B cassette door.

## 26 32 PAUSE indicator

During playback or recording, this indicator lights when the PAUSE button (■) is pressed.

## 27 DUBBING indicators

**NORMAL** : Lights when the NORMAL-speed DUBBING button is pressed.

**HIGH** : Lights when the HIGH-speed DUBBING button is pressed.

## 28 29 BALANCE control knob

Adjust the balance of the left and right channel recording levels. Normally fixed at the CENTER position.

**30 DOLBY NR switch**

Set to "B" or "C" when playing a tape recorded using Dolby NR or recording a tape using Dolby NR. However, avoid changing this switch during record or playback.

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

**31 PEAK LEVEL METER**

Indicate the peak values of the input levels for recording or the output levels for playback.

**32 DIRECTION switch**

**Normal mode (  ):**

In this position, one side playback or recording is possible. When the end of tape is reached, the operation mode is released and the tape stops.


When the tape reaches its end in playback mode, the tape loaded on the other deck is played back.

**Reverse mode (  ):**

In this position, both sides can be played back or recorded. In this mode, recording and playback do not automatically change from side B to side A.

When the tape reaches its end in playback mode, the tape loaded on the other deck is played back.

**Endless mode (  ):**

In this position, tape is played back repeatedly. MOSS, index scan are carried out 2 sides. In the endless mode (  ), relay playback is not possible.

**33 TIMER stand-by switch**

This switch is used along with an audio timer when an unattended recording or timer-playback is performed. Set this switch to the REC position for unattended recording, to the PLAY position for timer-playback and to the OFF position when the timer is not used. For timer operation, Deck B has the priority.

**37 Deck A EJECT button**

Pressing this button opens the deck A cassette door.

**Auto Tape Selector**

This function detects tape types (normal, chrome, metal) automatically.

**System Connections**

**■ Connection by audio cords**

Two pairs of red and white audio cords with standard phono plugs attached (i.e. LINE OUT cords and LINE IN cords) are provided with your PC-5858.

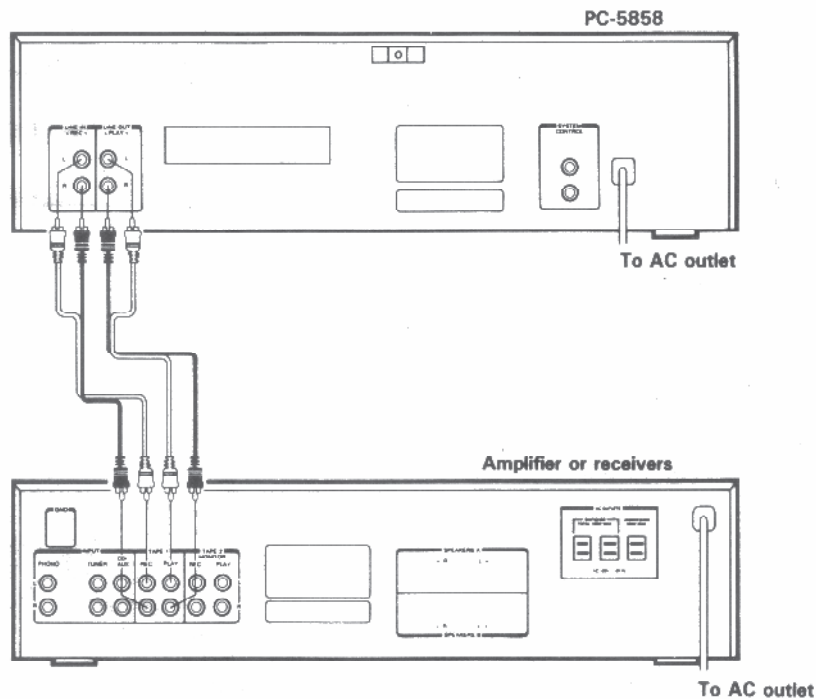
The colors are to identify the right and left stereo channels, red indicates the right channel and white the left channel.

Use of these cords is recommended for optimum performance in terms of noise and frequency response.

To protect your speakers, turn off all power before making any system connections.

Make connections as follows:

1. Connect the left and right LINE OUT <PLAY> plugs to the TAPE PLAY jacks on your amplifier.
2. Connect the LINE IN <REC> plugs to the TAPE REC (record) jacks on your amplifier.



**■ SYSTEM CONTROL jacks**

These jacks are dedicated terminals for connecting this set to the TOSHIBA Amplifier XB-1000/1500 to provide operation as a system component along with the TOSHIBA Turntable SR-5638 and/or Tuner ST-5528. Connect this set to the SYSTEM

(U.S.A.)

CONTROL jacks on the ST-5528 and/or XB-1000/1500 using the supplied cords with mini-plugs. Refer to the XB-1000/1500 owner's manual for the system up procedures.

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(EUROPE)

CONTROL jacks on the ST-5528/5538 and/or XB-1000/1500 using the supplied cords with mini-plugs. Refer to the XB-1000/1500 owner's manual for the system up procedures.

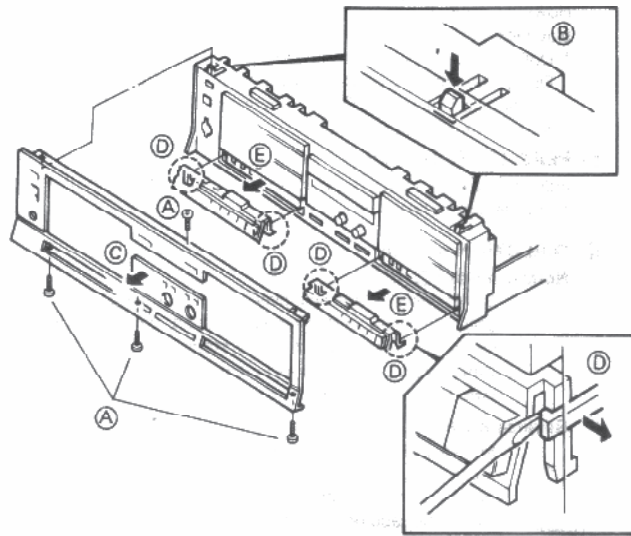


# DISASSEMBLY FOR REPAIR

Operations in steps 2. and 3. are not required when only the mechanisms are to be removed.

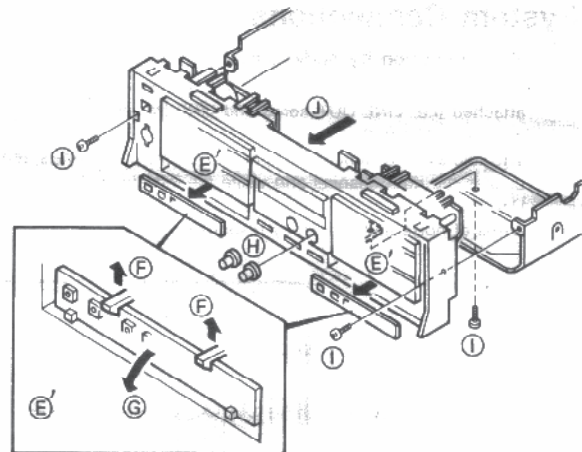
1. Remove the 4 screws (A) fixing the front panel, disengage the 2 claws (B) on the sub-panel, and take out the front panel (C).
2. Disengage the 4 claws (D) retaining the switches and knobs, and pull out the knobs (E).

Ⓐ 3 x 8MM, K



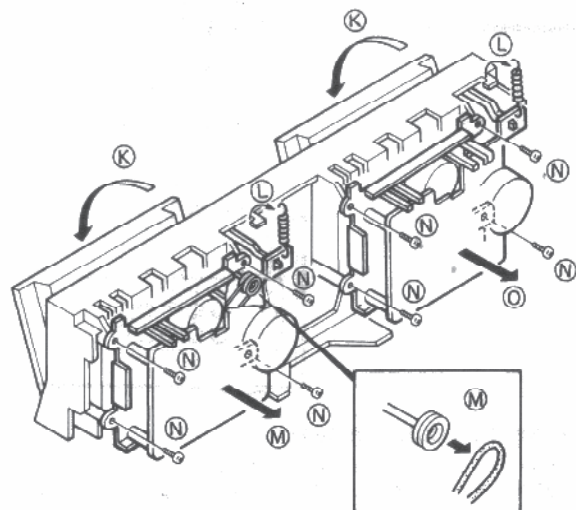
3. Disengage the claws retaining the Switch unit (F), and take out the Switch unit in the direction of the arrow (G) (E).
4. Remove the 2 volume controls (H) and the 3 screws (I) connecting the sub-panel and chassis, and take out the sub-panel in the direction of the arrow (J).

Ⓛ 3 x 8MM, K



5. Press the Eject buttons to open the cassette holders (K).
6. Disengage the respective springs (L) from the A and B mechanisms.
7. Remove the rubber belts of the tape counters (M).
8. Remove the 8 screws (N) fixing the mechanisms, and take them out in the direction of the arrow (O).

Ⓝ 3 x 8MM, K

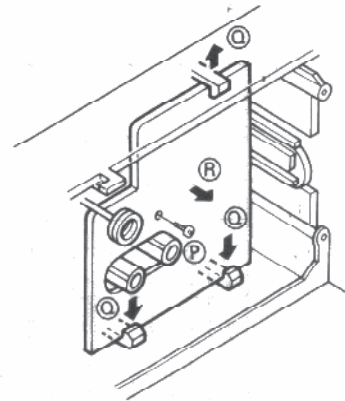




## DISASSEMBLY FOR REPAIR

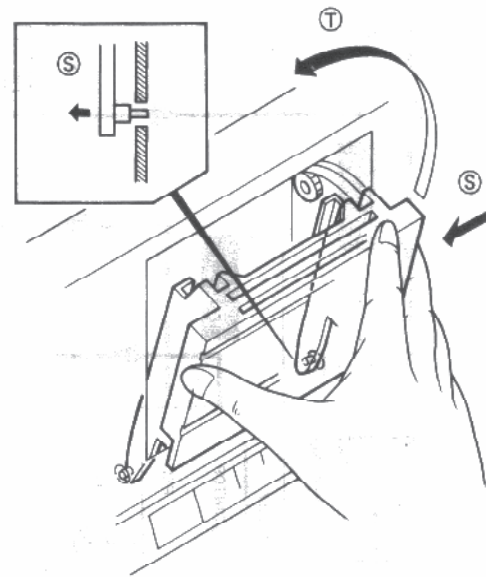
9. Remove 1 screw (P) and disengage 3 claws (Q) which fix, together with the screw, the Switch unit on the center of the sub-panel, and take out the Switch unit in the direction of the arrow (R).

P 3 x 8MM, K



### REMOVING THE CASSETTE HOLDER

After ejecting each cassette holder out, press the cassette holder in the direction of the arrow (S) as shown in the illustration until the projection on one side of the holder is disengaged. Then, take out the cassette holder in the direction of the arrow (T).





# CIRCUIT DESCRIPTION

## DESCRIPTION OF COMPONENTS

### Power Supply Unit (X27-1560)

Components	Application/Functions	Operation/Conditions/Interchangeability
Q1, 2	Phones amp.	
Q3, 4	Power supply	+12V, Mechanism, meter.
Q5	Power supply	+5V $\mu$ com. DPSS.
IC1	Power supply	+18V BIAS. REC EQ.

### Record/Playback Unit (X28-1880)

Components	Application/Functions	Operation/Conditions/Interchangeability
IC1, 2	R/P Head selection.	
IC3, 4	Recording EQ device selection.	
IC5	Recording input buffer.	
IC6	$\mu$ COM.	
IC7	Level meter.	
IC8	Reset	
Q1, 2	Frequency response.	
Q3, 4	Dolby REC/PLAY switch.	
Q5, 6	Line mute.	
Q7	Bias OSC (A).	
Q8	Bias control (A)	ON when metal or CrO <sub>2</sub> tape is loaded in deck (A).
Q9	Bias control (A)	ON when metal tape is loaded in deck (A).
Q10	Bias ON/OFF switch (A)	ON during (A) recording.
Q11	EQ select (A)	ON when play (A) or dubbing.
Q12	A/B select (B)	ON when play (B).
Q13	A/B select (B)	ON when play (B).
Q14	EQ select (A)	ON when play (A) or dubbing.
Q15	Bias OSC (B).	
Q16	Bias control (B)	ON when metal tape is loaded in deck (B).
Q17	Bias control (B)	ON when metal or CrO <sub>2</sub> tape is loaded in deck (B).
Q18	Bias ON/OFF switch (B)	ON during deck (B) recording.
Q19	Auto tape select (B)	ON when metal tape is loaded in deck (B).
Q20	Auto tape select (A)	ON when metal tape is loaded in deck (A).
Q21	Rec mute (A)	Normally ON, OFF during deck (A) recording.
Q22	Speed switch	Normally ON OFF during hi-dubbing.
Q23	Rec mute (B)	Normally ON, OFF during deck (B) recording.



# CIRCUIT DESCRIPTION

Components	Application/Functions	Operation/Conditions/Interchangeability
Q24	Power supply	+14V for Dolby & PB (EQ).
Q25	DPSS sens select	CUE & REVIEW: ON Others: OFF.
Q26	Line mute	PB, REC, REC PAUSE, DUBB: OFF Others: ON.
Q27	Speed switch	Normally: OFF ON during hi-dubbing.
Q28	Dolby ON/OFF switch	REC: OFF Others: ON.
Q29	Dolby MODE switch	Dubbing: ON Others: OFF.
Q30, 31	DPSS amp.	
Q32	DPSS detector switch	ON when signal of approx -20dBs or more at line out.
Q33	Quick RVS detector (B)	Normally OFF. (Europe only)
Q34	Quick RVS detector (B)	ON when deck (B) tape attains leader tape. (Europe only)
Q35	Quick RVS detector (A)	Normally OFF. (Europe only)
Q36	Quick RVS detector (A)	ON when deck (A) tape attains leader tape. (Europe only)

## Control Circuit Unit (X29-1900-00)

Components	Application/Functions	Operation/Conditions/Interchangeability
IC1	Reel motor drive.	
Q1	Solenoid drive	Always ON. at solenoid ON.
Q2	Solenoid switch	Immediately, ON at solenoid kick.
Q3	Reel motor speed switch	ON in PLAY or REC mode.
Q4	Capstan motor speed switch	ON in normal speed.
Q5	Capstan motor speed switch	OFF in normal speed.

## Record Amplifier Unit (X87-1040)

Components	Application/Functions	Operation/Conditions/Interchangeability
Q1, 2	Rec amplifier	
Q3, 4	Rec Mute switch	Controlled by A REC mute port (PIN 34). During REC and REC PAUSE modes, shorted to GND by A REC mute port (PIN 34), becomes "L", turning Q3 and Q4 OFF.

# CIRCUIT DESCRIPTION

## Record/Playback Unit (X87-1140)

Components	Application/Functions	Operation/Conditions/Interchangeability
Q1, 2	Signal muting	When pin 5 of CN2 becomes "H", Q1 and Q2 turn ON so that muting is applied to the input signals from pin 1 of CN1 and pin 9 of CN2.
IC1, 2	Equalizer selection	Those pins 1-7 of IC1 (IC2) to which pins 6 and 7 of CN1 and pins 1-4 of CN2 are connected are controlled to turn ON/OFF each equalizer device. When each input pin becomes "H", the output side (pin 10-16 of each IC) conducts with GND (pin 8) to determine the NF constant of IC3.
IC3	Recording equalizer amplifier	It operates on single power supply and is used with the input voltage pulled up to 1/2 V <sub>b</sub> . Its NF constant is determined by IC1:IC2, thus providing the recording equalizer characteristics.

## Playback Amplifier Unit (X87-1210)

Components	Application/Functions	Operation/Conditions/Interchangeability
IC1	Playback equalizer amplifier	
Q1, 2	B deck PB LEVEL adjustment switch	Operates according to A/B selection control (X28-1880 Q13). ON in B deck PLAY mode, OFF in other modes.
Q3, 4	A deck PB LEVEL adjustment switch	Operates according to A/B selection control (X28-1880 Q13). OFF in B deck PLAY mode, ON in other modes.

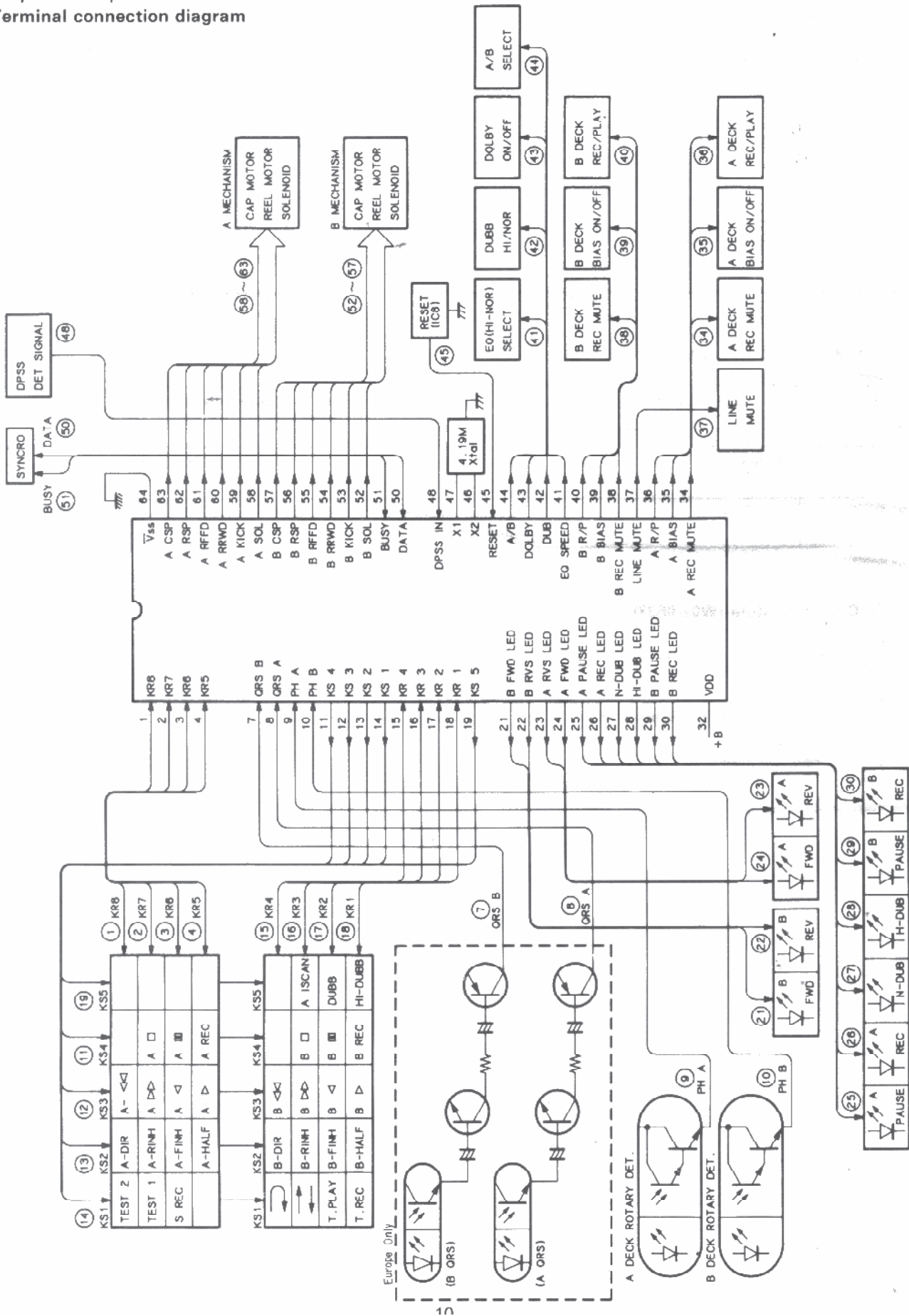
## Electric Circuit Module (W02-0693)

Components	Use/Functions	Operation/Conditions/Interchangeability
IC1	Dolby B/C IC	

# CIRCUIT DESCRIPTION

Microprocessor  $\mu$ PD75104CW-097

● Terminal connection diagram





# CIRCUIT DESCRIPTION

μPD75104CW-097

## ● Explanation of terminals

Pin No.	Pin Name	Port Name	I/O	Function Description
1 ~ 4	P13 ~ P10	KR8 ~ KR5	I	Key return input H: Input signal is present L: Input signal is not present
5, 6	PTH03 ~ 02	—	I	GND, (Not used).
7	PTH01	QUICK B	I	B deck quick RVS signal input terminal.
8	PTH00	QUICK A	I	A deck quick RVS signal input terminal.
9	TI0	PH A	I	A deck mechanism rotation detection signal input terminal.
10	TI1	PH B	I	B deck mechanism rotation detection signal input terminal.
11 ~ 14	P23 ~ P20	KS4 ~ KS1	O	Key matrix scan signal output terminals (Active: L).
15 ~ 18	P03 ~ P00	KR4 ~ KR1	I	Key return signal input terminals (Active: L).
19	P123	KS5	O	Same as terminals 1 ~ 4.
20	P122	—	O	GND (Not used)
21	P121	B FWD LED	O	B deck forward LED drive. L: ON.
22	P120	B RVS LED	O	B deck reverse LED drive. L: ON.
23	P133	A RVS LED	O	A deck reverse LED drive. L: ON.
24	P132	A FWD LED	O	A deck forward LED drive. L: ON.
25	P131	A PAUSE LED	O	A deck pause LED drive. L: ON.
26	P130	A REC LED	O	A deck REC LED drive. L: ON.
27	P143	N-DUBB LED	O	Nor-dubbing LED drive. L: ON
28	P142	HI-DUBB LED	O	Hi-dubbing LED drive. L: ON
29	P141	B PAUSE LED	O	B deck pause LED drive. L: ON
30	P140	B REC LED	O	B deck REC LED drive. L: ON
31	NC	—	—	Open
32	V <sub>DD</sub>	V <sub>DD</sub>	I	+5V.
33	P33	—	O	Not used
34	P32	A REC MUTE	O	A deck REC muting signal output L: REC mute ON.
35	P31	A BIAS	O	A deck biasing signal output terminal H: Bias ON.
36	P30	A R/P	O	A deck REC/PLAY switching signal output terminal H: REC mode
37	P43	LINE MUTE	O	Line mute signal output. L: Line mute ON.
38	P42	B REC MUTE	O	B deck REC muting signal output. L: REC mute ON.
39	P41	B BIAS	O	B deck biasing signal output H: Bias ON.
40	P40	B R/P	O	B deck REC/PLAY switching signal output H: REC mode.

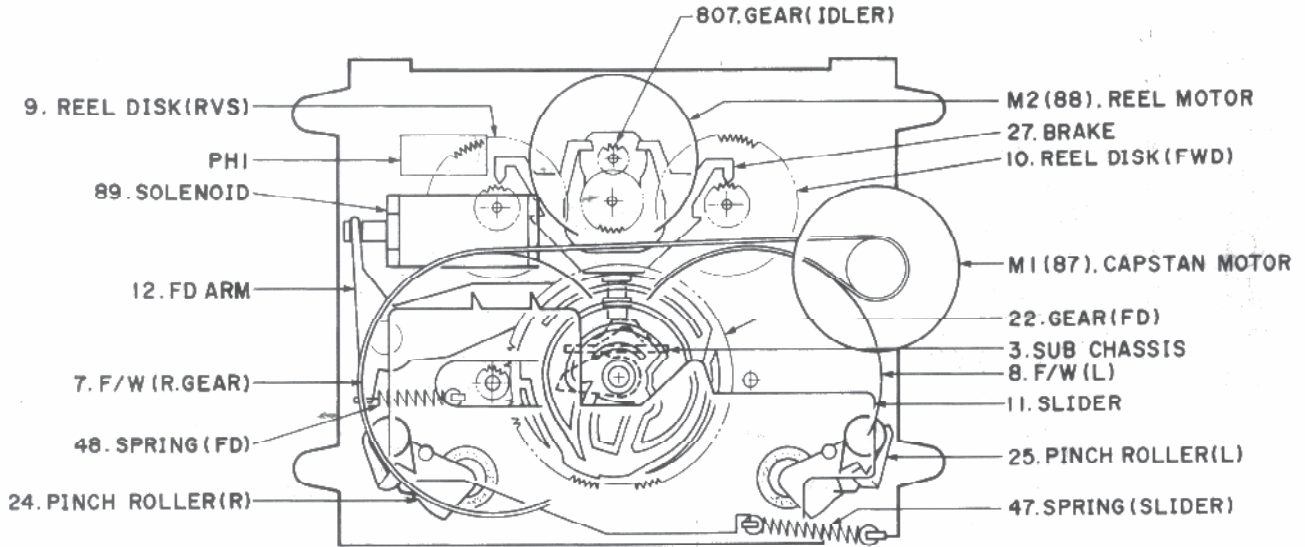
# CIRCUIT DESCRIPTION

Pin No.	Pin Name	Port Name	I/O	Function Description																		
41	P53	EQ SPEED	O	PB EQ switching signal output terminal. H: Hi-dubbing. L: Others.																		
42	P52	DUBB	O	Dubbing signal output H: During Nor and Hi-dubbing.																		
43	P51	DOLBY	O	Dolby mode control output H: Dubbing, PLAY & STOP L: REC																		
44	P50	A/B	O	A/B switch. H: B deck. L: A deck.																		
45	RESET	RESET	↓	Reset signal input. H: Normal L: Reset.																		
46, 47	X1, X2	—	—	(4.19MHz) Interval-between-tunes detection signal input																		
48	P63	DPSS IN	I	H: With sound L: Without sound.																		
49	P62	—	O	Not used.																		
50	P61	DATA	I/O	Serial data Input/Output for system control.																		
51	P60	BUSY	I/O	Busy signal input/output for system control.																		
52	P73	B SOL	O	B deck solenoid control H: ON L: OFF																		
53	P72	B KICK	O	B deck solenoid control H: KICK L: OFF.																		
54	P71	B RRWD	O	B deck reel motor control.																		
55	P70	B RFFD	O	<table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Pin No.</th> <th style="text-align: center;">55</th> <th style="text-align: center;">54</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Mode</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">FF, CUE, FWD.</td> <td style="text-align: center;">L</td> <td style="text-align: center;">H</td> </tr> <tr> <td style="text-align: center;">REW, REV, RVS.</td> <td style="text-align: center;">H</td> <td style="text-align: center;">L</td> </tr> <tr> <td style="text-align: center;">STOP, PAUSE</td> <td style="text-align: center;">—</td> <td style="text-align: center;">L</td> </tr> <tr> <td style="text-align: center;">BREAK.</td> <td style="text-align: center;">H</td> <td style="text-align: center;">H</td> </tr> </tbody> </table>	Pin No.	55	54	Mode			FF, CUE, FWD.	L	H	REW, REV, RVS.	H	L	STOP, PAUSE	—	L	BREAK.	H	H
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56	P83	B RSP	O	B deck reel motor control. H: PLAY, REC L: Others.																		
57	P82	B CSP	O	B deck capstan motor control. H: Normal L: Hi-dubbing.																		
58	P81	A SOL	O	A deck solenoid control H: ON L: OFF																		
59	P80	A KICK	O	A deck solenoid control H: KICK L: OFF																		
60	P93	A RFFD	O	<table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Pin No.</th> <th style="text-align: center;">60</th> <th style="text-align: center;">61</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Mode</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">FF, CUE, FWD.</td> <td style="text-align: center;">H</td> <td style="text-align: center;">L</td> </tr> <tr> <td style="text-align: center;">REW, REV, RVS.</td> <td style="text-align: center;">L</td> <td style="text-align: center;">H</td> </tr> <tr> <td style="text-align: center;">STOP, PAUSE</td> <td style="text-align: center;">L</td> <td style="text-align: center;">—</td> </tr> <tr> <td style="text-align: center;">BREAK.</td> <td style="text-align: center;">H</td> <td style="text-align: center;">H</td> </tr> </tbody> </table>	Pin No.	60	61	Mode			FF, CUE, FWD.	H	L	REW, REV, RVS.	L	H	STOP, PAUSE	L	—	BREAK.	H	H
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REW, REV, RVS.	L	H																				
STOP, PAUSE	L	—																				
BREAK.	H	H																				
61	P92	A RRWD	O																			
62	P91	A RSP	O	A deck reel motor control H: PLAY, REC L: Others.																		
63	P90	A CSP	O	A deck reel motor control H: Normal L: Hi-dubbing.																		
64	V <sub>SS</sub>	—	I	GND																		

# MECHANISM DESCRIPTION

A figure ( ) in a following drawing denotes a reference number in the parts list.

Drawings are rear perspective view, unless otherwise specified.



Parts layout (Perspective view from the rear)

Driving Power	: More than 100g·cm
Take up Torque	: 35 ~ 60g·cm (3.3V)
FF.REW Torque	: 110 ~ 170 g·cm (8.0V)
Back Tension Torqu	: 2 ~ 6g·cm

## I. STOP to FWD (forward) PLAY/REC Operation

- 1-1) The PLAY/REC key is pressed.
- 1-2) By a signal from the microcomputer, the SOLENOID (89) turns ON.
- 1-3) The FD ARM (12) swings in the direction of the arrow (A).
- 1-4) The pin (B) of the FD ARM (12) is released from the stopper (C) of the FD GEAR (22).
- 1-5) The FD GEAR (22) rotates slightly by pressure from the FD ARM pin (B), and meshes with the gear of the FLYWHEEL (7).

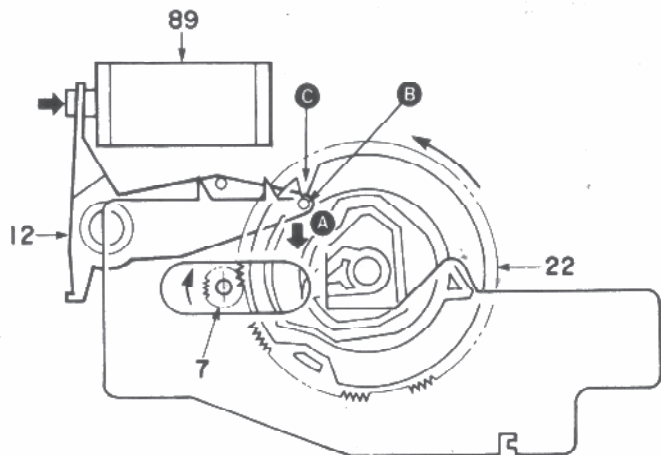


Fig.1



# MECHANISM DESCRIPTION

- 1-6) After a short time, the SOLENOID (89) turns OFF. Since the FD ARM is pulled by the FD SPRING (48), the pin (D) is disengaged from the protrusions (E1 or E2) of the SLIDER.
- 1-7) Since the SLIDER (11) is pulled by the SPRING (47), the protrusion (F) swings along the FD GEAR orbit (G) until it reaches the FWD PLAY/REC position.

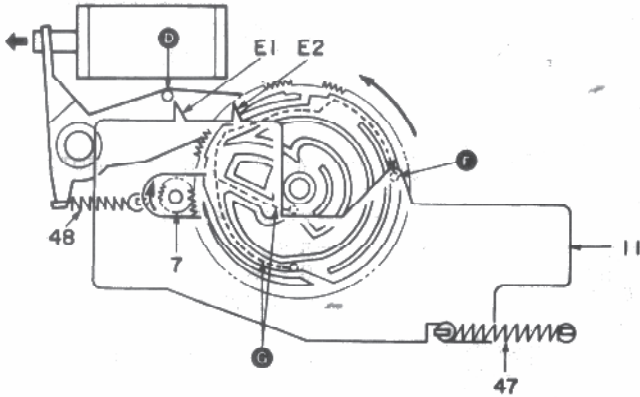


Fig. 2

- 1-8) The bent section (H) of the SUB-CHASSIS (3) is lifted by the cam (J) of the FD GEAR.

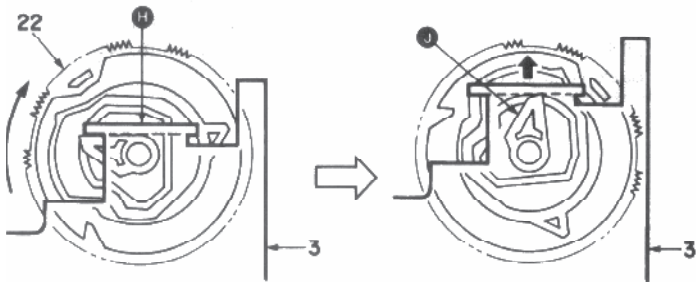


Fig. 3 (Perspective view from the front)

- 1-9) The pin (K) of the BRAKE (27) moves up along the FD GEAR orbit (L), and the BRAKE of the REEL ASS'Y (9) (10) is released.

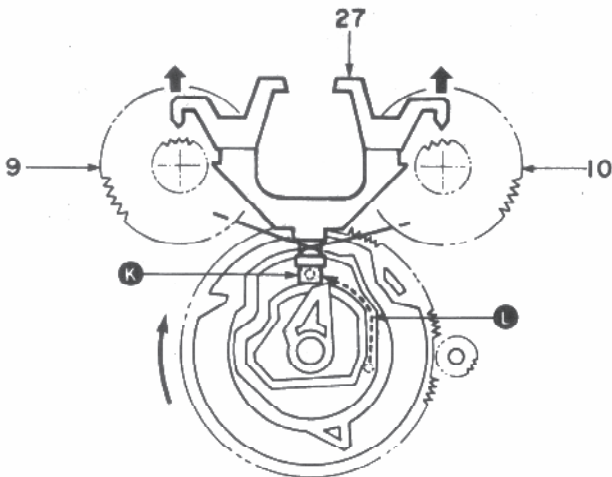


Fig. 4 (Perspective view from the front)

- 1-10) When the FD GEAR has rotated by approximately half, the SOLENOID turns ON and the FD ARM swings in direction (A), and the protrusion (E1) of the SLIDER is held by the pin (D) of the FD ARM.
- 1-11) When the FD GEAR has rotated by 3/4 of a turn, the FD GEAR rotation stops because the non-toothed section of the flywheel gear has been reached.

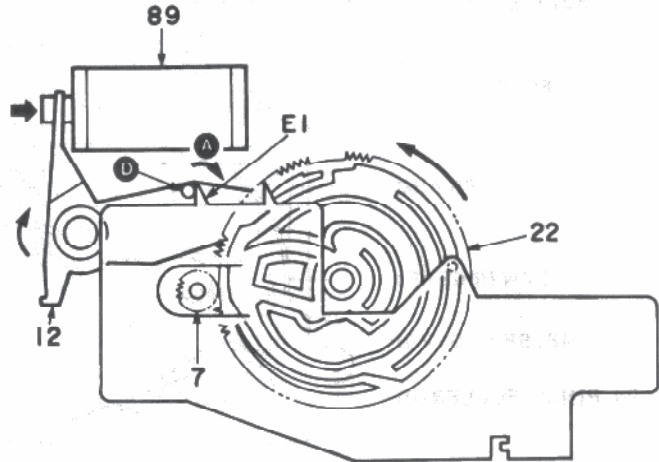


Fig. 5

- 1-12) The FD GEAR is locked in position of Fig. 6 by the pin (B) of the FD ARM, and the P/R and E heads fixed on the SUB-CHASSIS are held in the PLAY/REC position.

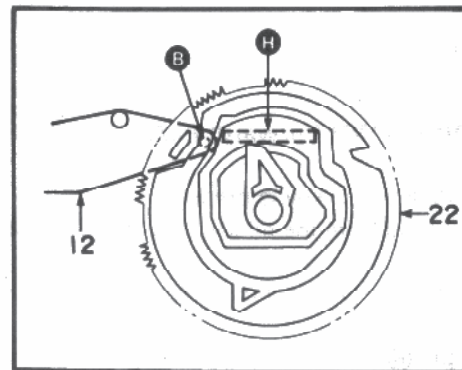


Fig. 6

# MECHANISM DESCRIPTION

- 1-13) When the SUB-CHASSIS comes to the top, the spring (N) of the pinch roller (L) does not contact the SUB-CHASSIS edge (H) because the SLIDER is fixed in position of Fig. 7 by the pin (O) of the FD ARM, and the pinch roller is not pressed against the capstan because the boss (M) is held by the groove of the SLIDER.
- 1-14) Since the spring (Q) of the pinch roller (R) is pushed up by the SUB-CHASSIS edge (S) and the boss (P) is in the free section of the SLIDER groove, the pinch roller is pressed against the capstan and the FWD P/R operation starts.

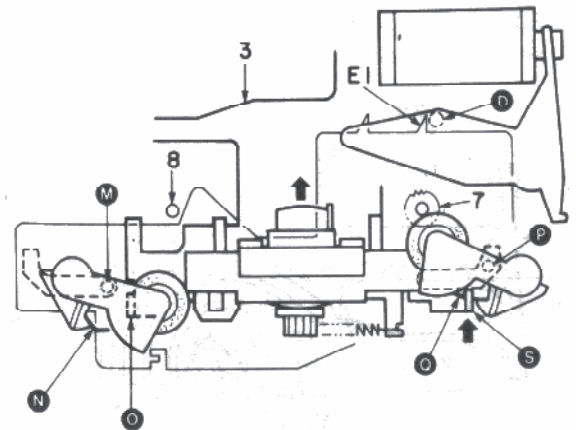


Fig. 7 (Perspective view from the front)

## 2. STOP to RVS (reverse) PLAY/REC Operation

- 2-1) The PLAY/REC key is pressed.
- 2-2) By a signal from the microcomputer, the SOLENOID (89) turns ON.
- 2-3) The FD ARM (12) swings in the direction of the arrow (A).
- 2-4) The pin (B) of the FD ARM (12) is released from the stopper (C) of the FD GEAR (22).
- 2-5) The FD GEAR (22) rotates slightly by pressure from the FD ARM pin (B) and meshes with the gear of the FLYWHEEL (7).

- 2-8) The bent section (H) of the SUB-CHASSIS (3) is lifted in the direction of the arrow by the cam (J) of the FD GEAR.

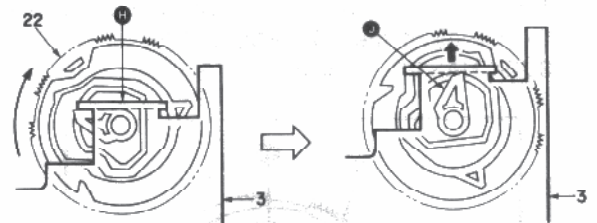


Fig. 10 (Perspective view from the front)

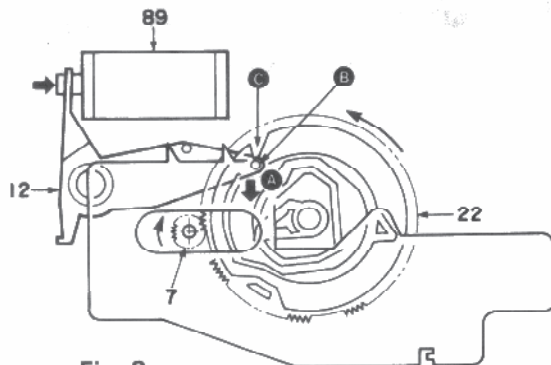


Fig. 8

- 2-9) The pin (K) of the BRAKE (27) moves up along the FD GEAR orbit (L), and the BRAKE of the REEL ASS'Y (9) (10) is released.

- 2-6) The FD GEAR continues to rotate while the SOLENOID remains ON.
- 2-7) The SLIDER is held in position (E1 or E2) by the FD ARM pin (D), while the pin (F) moves to the RVS P/R position along the orbit (T). At this time, the SOLENOID turns OFF to avoid the protrusion (E2) of the SLIDER, and turns ON again immediately after passing it.)

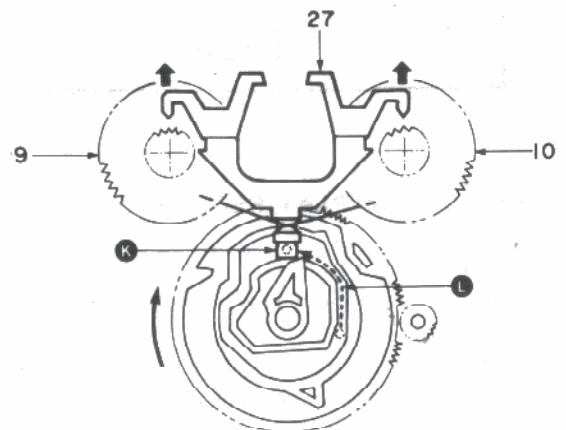


Fig. 11 (Perspective view from the front)

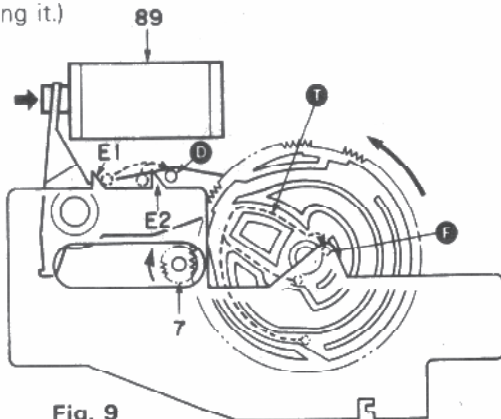


Fig. 9

# MECHANISM DESCRIPTION

1-10) When the FD GEAR has rotated by 3/4 of a turn, the FD GEAR rotation stops, because the non-toothed section of the flywheel gear has been reached.

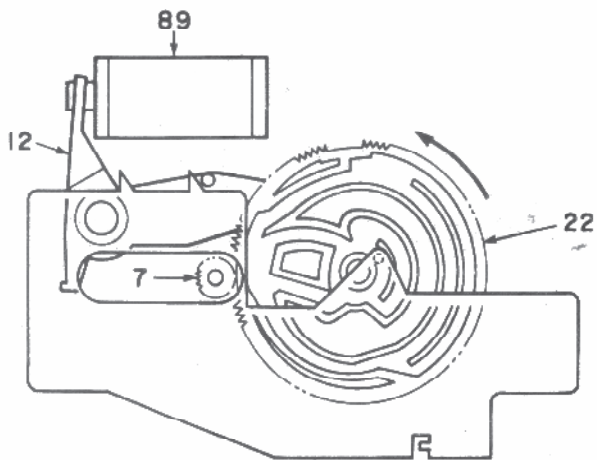


Fig. 12

1-11) The FD GEAR (22) is held in position of Fig. 13 by the pin (B) of the FD ARM, and the heads on the SUB-CHASSIS are held in the PLAY/REC position.

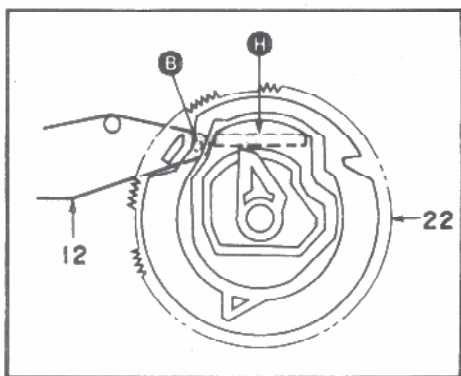


Fig. 13

## 1. FWD (forward) PLAY/REC to STOP Operation

- 1-1) The STOP key is pressed.
- 1-2) By a signal from the microcomputer, the SOLENOID (89) turns OFF.
- 1-3) The FD ARM (12) is swung by the SPRING (48), and the FD GEAR (22) is pushed by the SUB CHASSIS and rotated in direction (A).
- 1-4) The FD GEAR meshes with the GEAR (7) of the FLYWHEEL, and starts to rotate. The pin (E) of the SLIDER (11) passes through the orbit (V) and stops at position of Fig. 15.

2-12) When the SUB-CHASSIS comes to the top, the spring (Q) of the pinch roller (R) does not contact the SUB-CHASSIS edge (S) because the SLIDER is fixed in position of Fig. 14 by the pin (D) of the FD ARM, and the pinch roller (R) is not pressed against the capstan because the boss (P) is held by the groove of the SLIDER.

2-13) Since the spring (N) of the pinch roller (L) is pushed up by the SUB-CHASSIS edge (H) and the boss (M) is in the free section of the SLIDER groove, the pinch roller is pressed against the capstan and the RVS P/R operation starts.

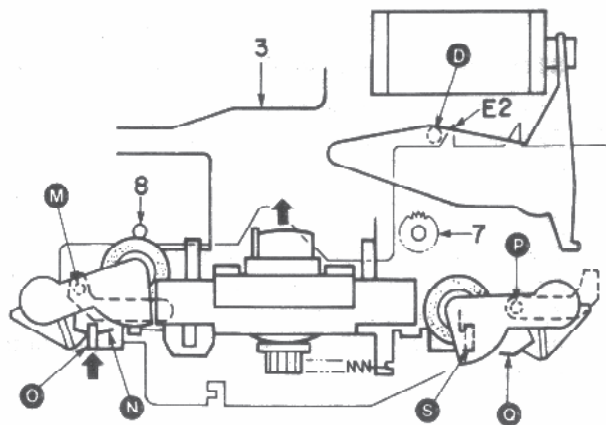


Fig. 14 Perspective view from the front

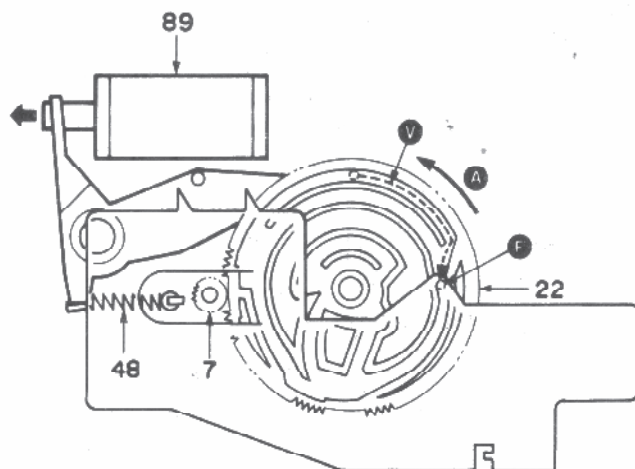


Fig. 15

# MECHANISM DESCRIPTION

- 3-5) The FD ARM pin (B) passes through the FD GEAR orbit (U) and comes in contact with the stopper (C). As this position corresponds to the non-tooth section of the FD GEAR, the FD GEAR stops rotating.

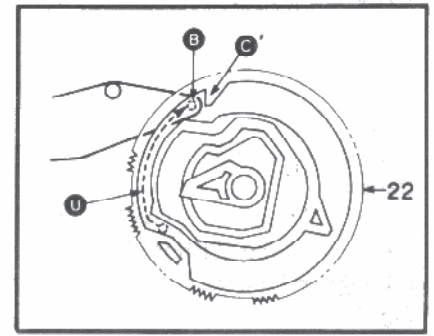


Fig. 16

## 4. RVS (reverse) PLAY/REC to STOP Operation

- 4-1) The STOP key is pressed.  
 4-2) By a signal from the microcomputer, the SOLENOID (89) turns OFF.  
 4-3) The FD ARM (12) is swung by the SPRING (48), and the FD GEAR (22) is pushed by the SUB-CHASSIS and rotated in direction (A).  
 4-4) The FD GEAR meshes with the GEAR (7) of the FI YWHFFI, and starts to rotate. The pin (F) of the SLIDER (11) passes through the orbit (W) and stops at position of Fig. 17.

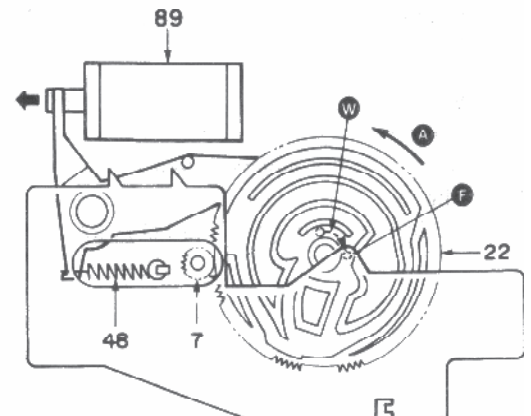


Fig. 17

- 4-5) The FD ARM pin (B) passes through the FD GEAR orbit (X) and comes in contact with the stopper (C). As this position corresponds to the non-tooth section of the FD GEAR, the FD GEAR stops rotating.

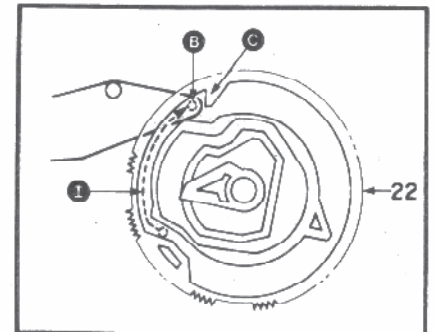


Fig. 18

## 5. STOP to FF/REW Operation

- 5-1) The FF/REW key is pressed.  
 5-2) By a signal from the microcomputer, the REEL MOTOR (M2) starts to rotate in the appropriate direction.  
 5-3) According to the rotating direction of the REEL MOTOR, the IDLER ASS'Y (23) rotates in the appropriate direction.  
 5-4) In the CUE/REVIEW position, the brake of the REEL ASS'Y (9) (10) has already been released, so the REEL ASS'Y gear meshes with the IDLER ASS'Y gear, and the REEL ASS'Y starts to rotate in the appropriate direction.

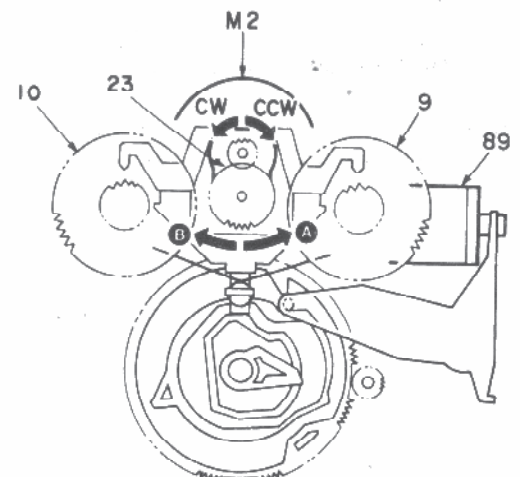


Fig. 19 (Perspective view from the front)



# MECHANISM DESCRIPTION

## 6. FWD (forward)/RVS (reverse) PLAY to CUE/REVIEW Operation

- 6-1) The FF/REW key is pressed during playback.
- 6-2) The SOLENOID turns OFF, and the deck enters STOP mode.
- 6-3) The same operation as in the "STOP to PLAY" transition occurs.
- 6-4) In the transition from FWD PLAY to CUE/REVIEW, the pin (F) of the SLIDER passes through the FD GEAR orbit (Z) and moves to the CUE/REVIEW position of Fig. 20.

In the transition from RVS PLAY to CUE/REVIEW, the pin (F) of the SLIDER passes through the FD GEAR orbit (Y) and moves to the CUE/REVIEW position of Fig. 20.

- 6-5) When the FD GEAR has rotated by 3/4 of a turn, the FD GEAR rotation stops, because the non-toothed section of the flywheel gear has been reached.
- 6-6) The SLIDER is held by the protrusion (E1) of the SLIDER and pin (D) of the FD ARM.

- 6-7) When the SUB-CHASSIS comes to the top, the SLIDER is in one of the positions of Fig. 22 shown in the diagram. In either case, the spring (N) (Q) of the pinch roller (L, R) is not lifted by the SUB-CHASSIS edge (C) (S), so the pinch roller is not pressed against the capstan.

- 6-8) By a signal from the microcomputer, the REEL MOTOR starts to rotate and the CUE or REVIEW operation starts.

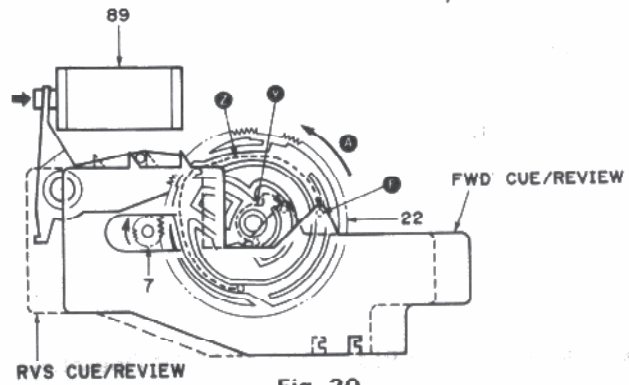


Fig. 20

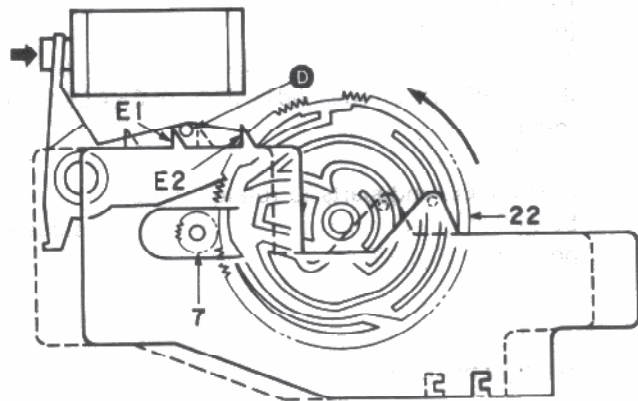


Fig. 21

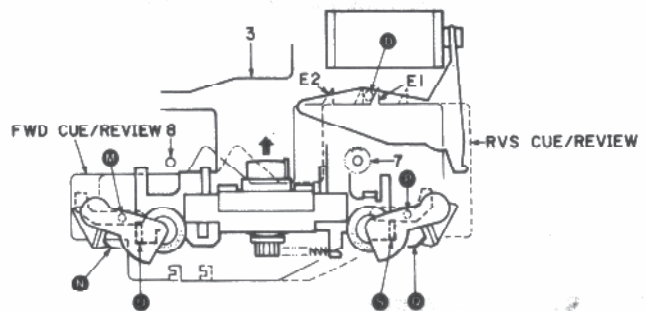


Fig. 22 (Perspective view from the front)

## 7. Head Switching Operation

The HEAD is rotated by movement of the SLIDER, and the FWD and RVS position are switched over.

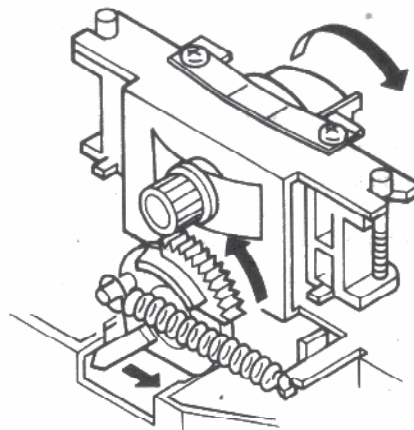
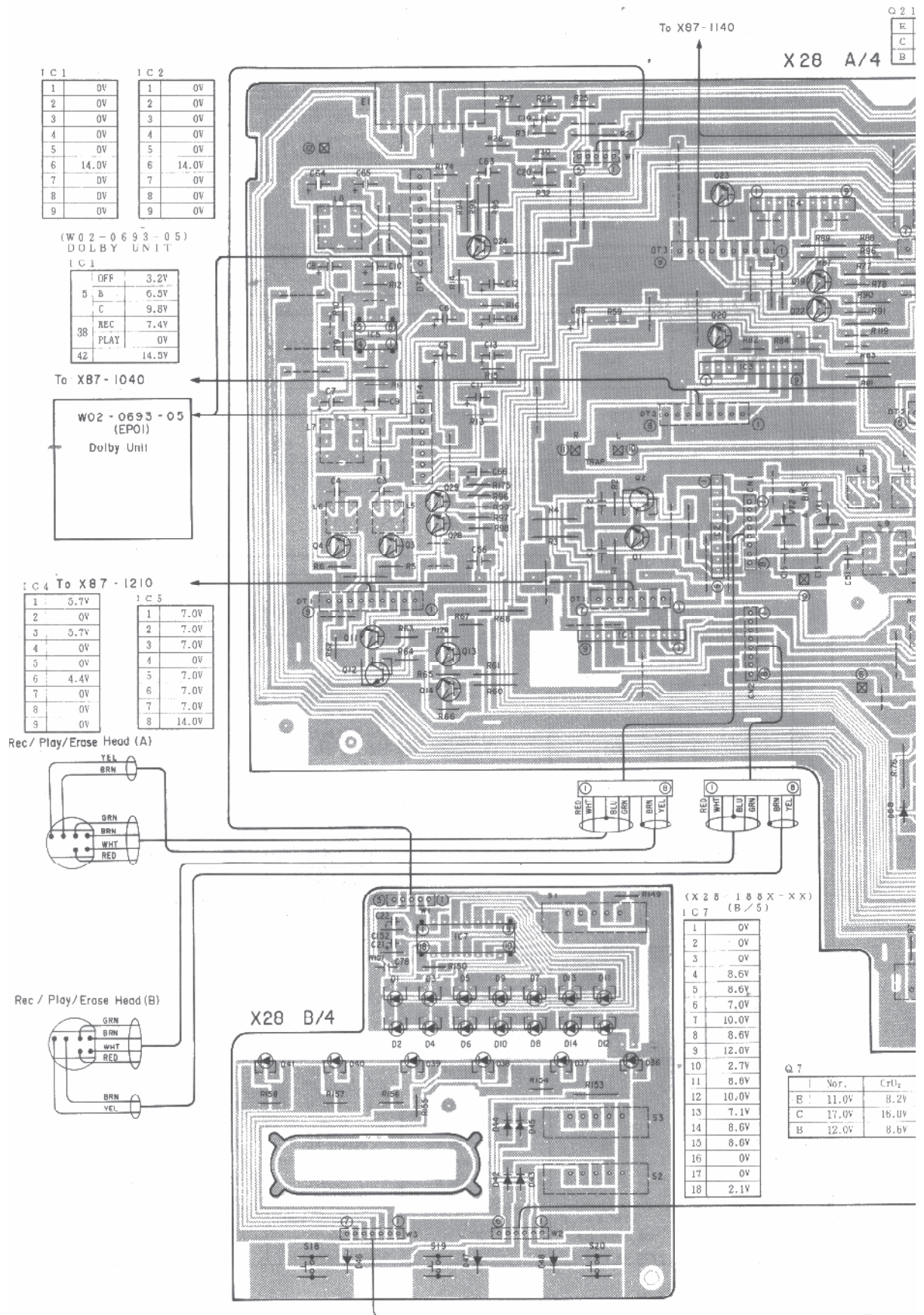


Fig. 23 Head Switching (FWD → RVS)

# ELECTRICAL PAI

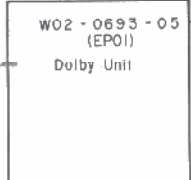


IC 1		IC 2	
1	0V	1	0V
2	0V	2	0V
3	0V	3	0V
4	0V	4	0V
5	0V	5	0V
6	14.0V	6	14.0V
7	0V	7	0V
8	0V	8	0V
9	0V	9	0V

(W02-0693-05)  
DOLBY UNIT

IC 1	
OFF	3.2V
5 B	6.5V
C	9.8V
38 REC	7.4V
PLAY	0V
42	14.5V

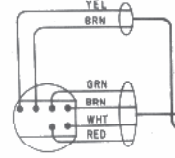
To X87-1040



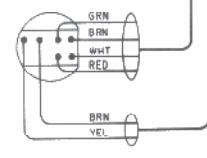
To X87-1210

IC 4		IC 5	
1	5.7V	1	7.0V
2	0V	2	7.0V
3	5.7V	3	7.0V
4	0V	4	0V
5	0V	5	7.0V
6	4.4V	6	7.0V
7	0V	7	7.0V
8	0V	8	7.0V
9	0V	8	14.0V

Rec / Play/Erase Head (A)



Rec / Play/Erase Head (B)



X28 B/4

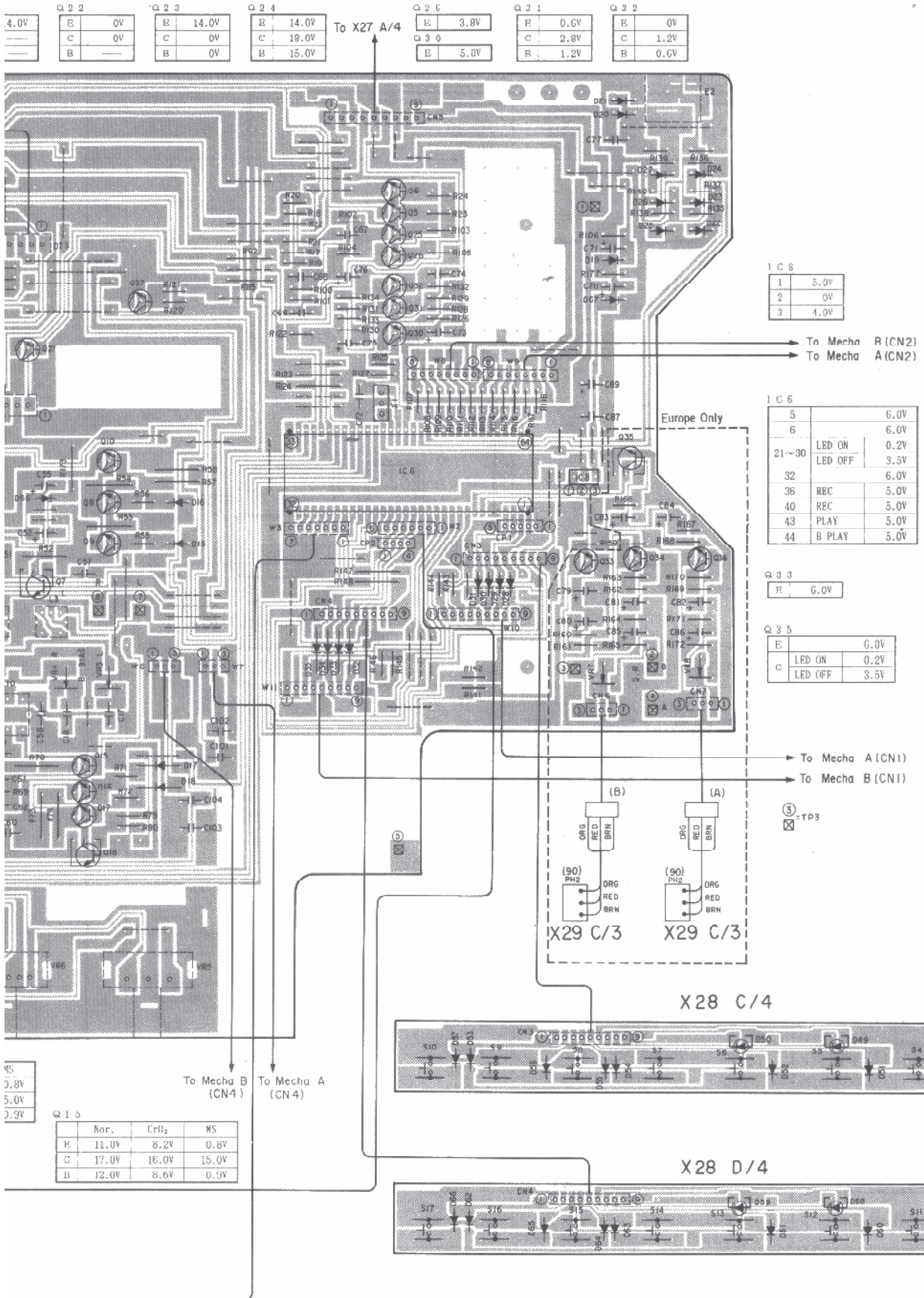
(X28-188X-XX)  
IC 7 (B/5)

1	0V
2	0V
3	0V
4	8.6V
5	8.6V
6	7.0V
7	10.0V
8	8.6V
9	12.0V
10	2.7V
11	8.6V
12	10.0V
13	7.1V
14	8.6V
15	8.6V
16	0V
17	0V
18	2.1V

Q 7		
	Vol.	Crt1 <sub>2</sub>
B	11.0V	8.2V
C	17.0V	16.0V
B	12.0V	8.6V

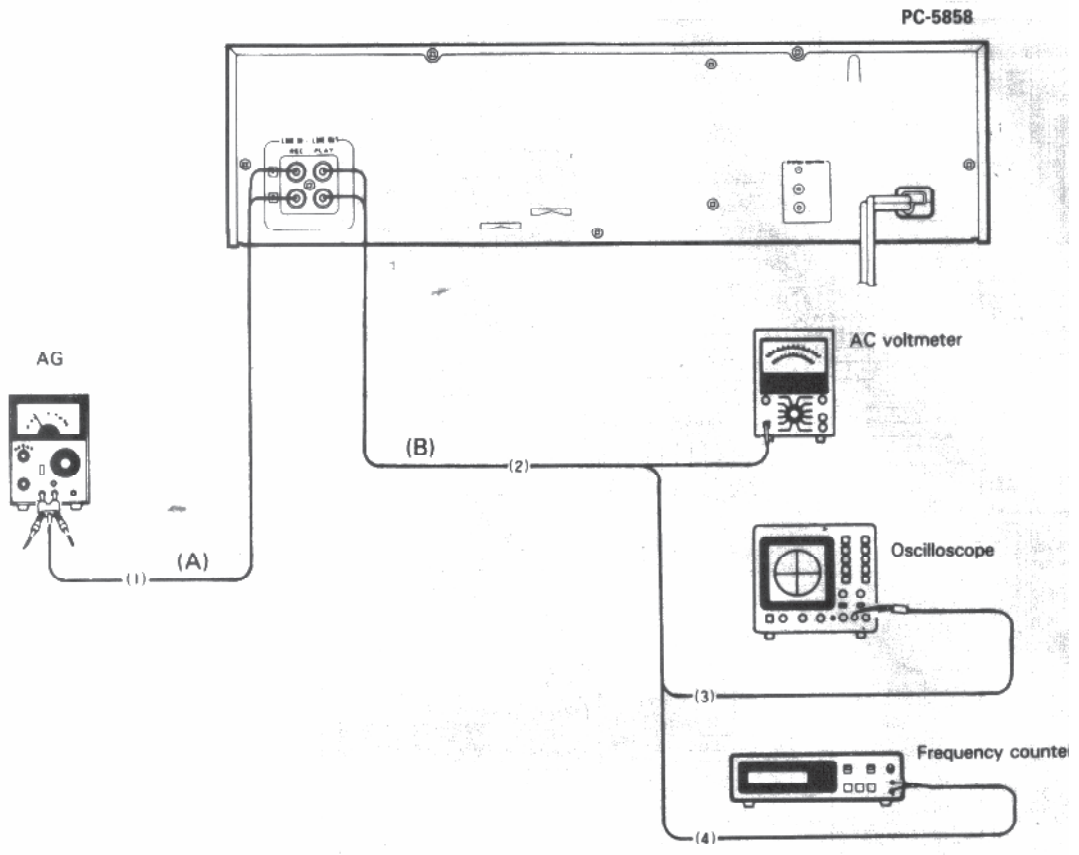


# TS LOCATIONS

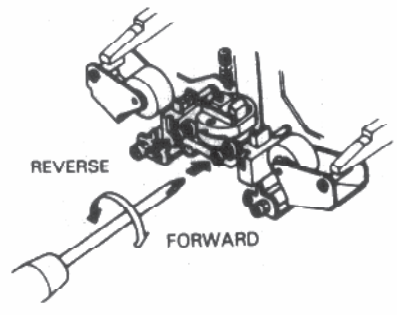


# ADJUSTMENT

## SYSTEM CONNECTIONS



(a) AZIMUTH ADJUSTMENT SCREW



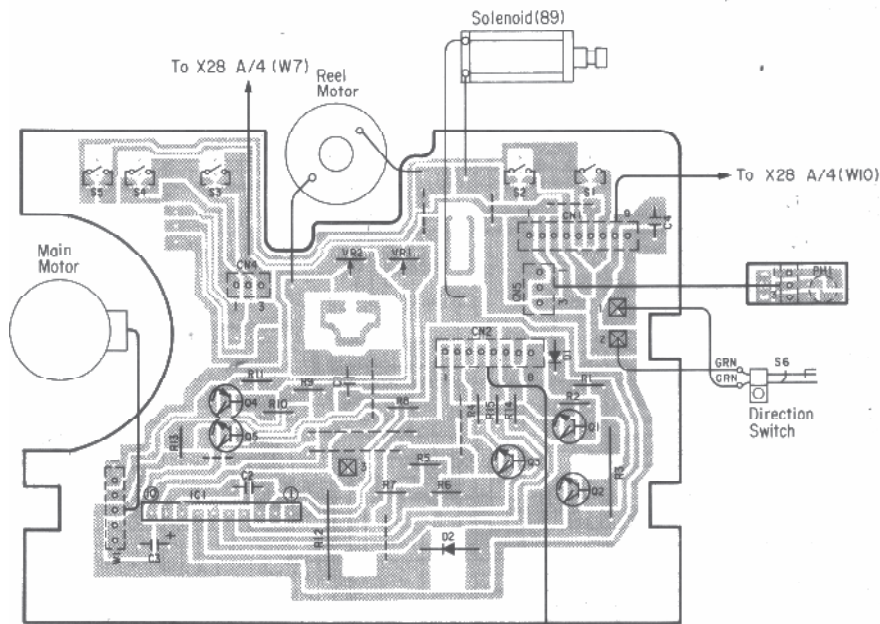


# ADJUSTMENT

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	CASSETTE TAPE DECK SETTINGS	ALIGNMENT POINTS	ALIGN FOR
<b>CASSETTE DECK SECTION</b> TAPE: NORMAL, DOLBY: OFF, INPUT: LINE <span style="float: right;">0dBs = 0.775V</span>						
<b>I REC/PLAY HEAD</b>						
[1]	DEMAGNETIZATION	-	-	POWER: OFF Remove the cassette door.	REC/PLAY head	Demagnetize the REC/PLAY head with a head demagnetizer.
[2]	CLEANING	-	-	PLAY	REC/PLAY head erase head, capstan, pinch roller.	Clean the REC/PLAY head erase head, capstan and pinch roller using a cotton swab slightly dampened with alcohol.
[3]	AZIMUTH	ATT-114 10kHz, -10dB	(B)	PLAY	Azimuth adjustment screw	Maximum output.
<b>II PC BOARD (X29-1900, X28-188X-XX)</b>						
(1)	TAPE SPEED (HI SPEED)	ATT-111 3kHz	(B)	Connect jumper between GND and TP3 PLAY	DECK A: VR2 DECK B: VR2 (X29-1900)	Adjust the tape speed so that a 6kHz signal is produced at the center of the tape.
(2)	TAPE SPEED (NORMAL)	ATT-111 3kHz	(B)	PLAY	DECK A: VR1 DECK B: VR1 (X29-1900)	Adjust the tape speed so that a 3kHz signal is produced at the center of the tape.
(3)	QUICK REVERSE SENSITIVITY	Use the leader section of the test tape.	Connect a DC voltmeter to TP2 and TP4.	PLAY	DECK A: VR8 DECK B: VR7 (X28-188X-XX)	Adjust the semi-fixed resistances that 0.75V (±0.15V) voltage is obtained.
<b>III PC BOARD (X28-188X-XX, X87-1210-00, X87-1040, X87-1140)</b>						
<1>	PLAYBACK LEVEL	ATT-150 400Hz(200nWb)	(B)	PLAY	DECK A: VR1(L) VR2(R) DECK B: VR3(L) VR4(R) (X87-1210-00)	Output level: -6.0dBs
		MTT-256 315Hz(160nWb)				Output level: -9.0dBs
		MTT-256U 315Hz(220nWb)				Output level: -5.0dBs
<2>	BIAS CURRENT	(A) 1kHz, -30dBs 10kHz, -30dBs	(B)	Adjust REC level volume so that the REC monitor output becomes -29dBs at 1kHz, then record and reproduce signal of 1kHz and 10kHz in alternation.	DECK A: VR1(L) VR2(R) DECK B: VR3(L) VR4(R) (X28-188X-XX)	Record 1kHz and 10kHz in alternation and adjust the variable resistors which control the bias current so that the same playback level is obtained.
<3>	RECORD LEVEL	(A) 1kHz, -10dBs	(B)	Record and reproduce a 1kHz signal under the conditions set in <2>	DECK A: VR1(L) VR2(R) DECK B: VR1(L) VR2(R) (X87-1040/X87-1140)	Adjust the variable resistors so that a playback level of -9dBs is obtained
<4>	BIAS OSCILLATING FREQUENCY	Load the non recorded tapes on Deck A and B.	Connect the frequency counter between TP9 and GND on Deck A, between TP6 and GND on Deck B.	REC	DECK A: L 9 DECK B: L10 (X28-188X-XX)	Adjust so that the frequency counter shows 105kHz.
<5>	BIAS TRAP	-	DECK A: TP10(L) TP11(R) DECK B: TP 7(L) TP 8(R) Connect the AC voltmeter to Deck A and B as above.	METAL, REC	DECK A: L1(L) L2(R) DECK B: L3(L) L4(R) (X28-188X-XX)	Minimum (point)
<6>	BIAS LEAK	Load a non recorded tape on Deck A	(B)	Load a metal tape, and dub in a high speed mode.	L5(L) L6(R) (X28-188X-XX)	Minimum (Point)

TP2-11:PIN②-⑪

# ELECTRICAL PA

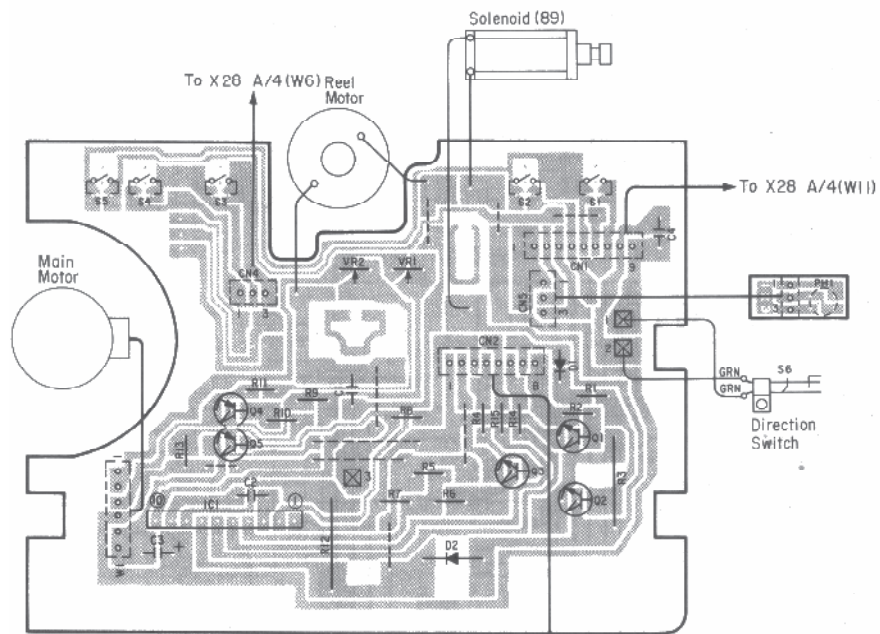
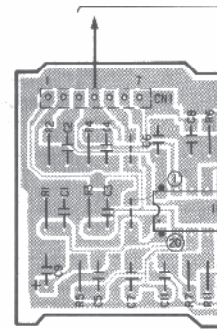


**A MECHA ASSY**  
IC1

1		0V
4	PLAY	3.7V
5	FF/REW	9.2V
6	FWD	0V
7	RVS	0V
		12.5V

**X29 A/3**  
**(A Mechanism)**

To X28 A/4 (W9)

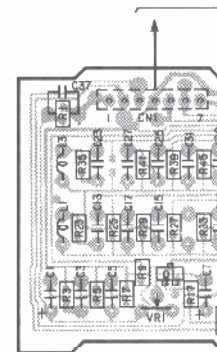
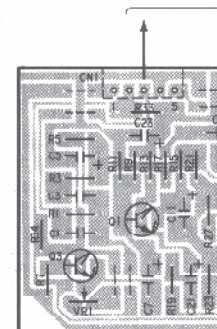


**B MECHA ASSY**  
IC1

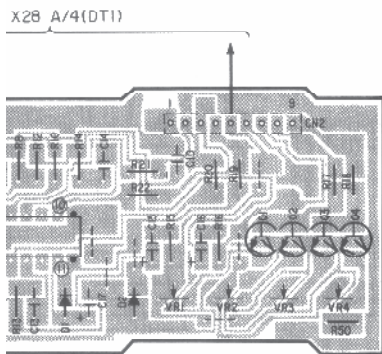
1		0V
4	PLAY	3.7V
5	FF/REW	9.2V
6	FWD	0V
7	RVS	0V
		12.5V

**X29 A/3**  
**(B Mechanism)**

To X28 A/4 (W8)

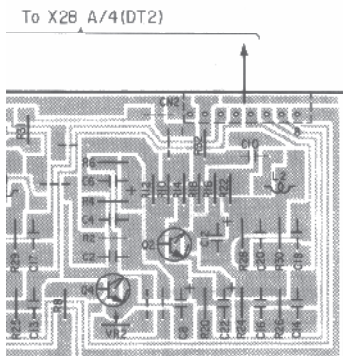


# RTS LOCATIONS

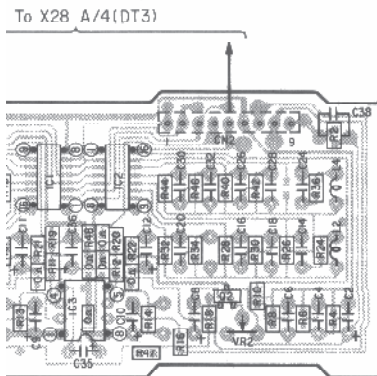


37-1210

X 8 7 - 1 2 1 0	I C 1
1	0V
2	0V
3	0.6V
4	3.2V
5	3.2V
6	0.1V
7	0V
8	3.2V
9	4.7V
10	0V
11	8.0V
12	8.0V
13	7.2V
14	0V
15	0.1V
16	3.2V
17	3.2V
18	0.6V
19	0V
20	0V



37-1040

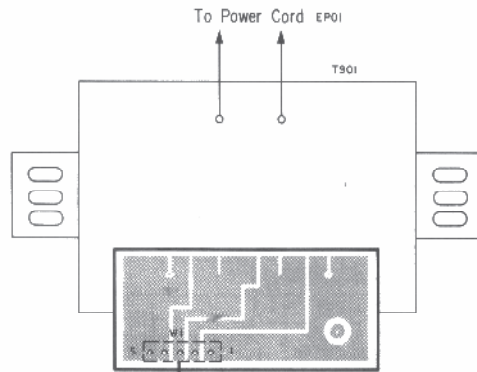


37-1140

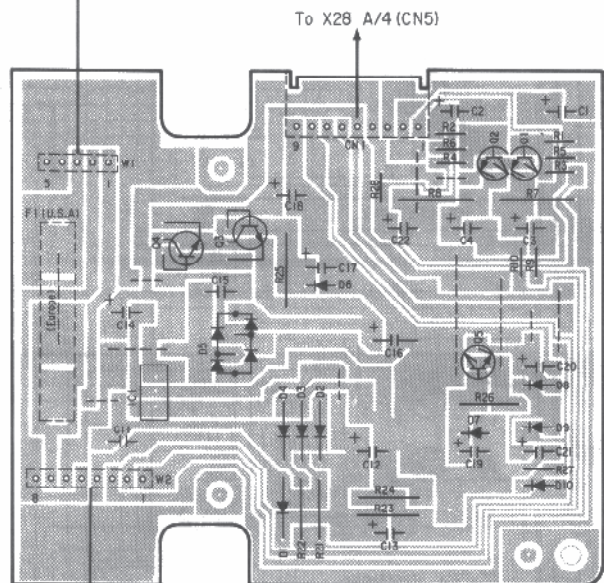
X 8 7 - 1 1 4 0	Q 1
E	0V
C	0V

Q 2	
E	0V
C	0V



X27 C/4



X27 A/4 (X27-156X-XX) (A/4)

I C 1	Q 4
1	29.8V
2	0V
3	18.0V

Q 1	Q 5
E	11.85V
C	18.0V
B	12.45V

Q 2	Q 4
C	18.0V

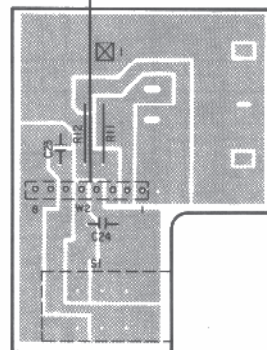
Q 5	Q 4
C	19.5V
B	16.1V

Q 4	
E	14.76V
C	19.5V

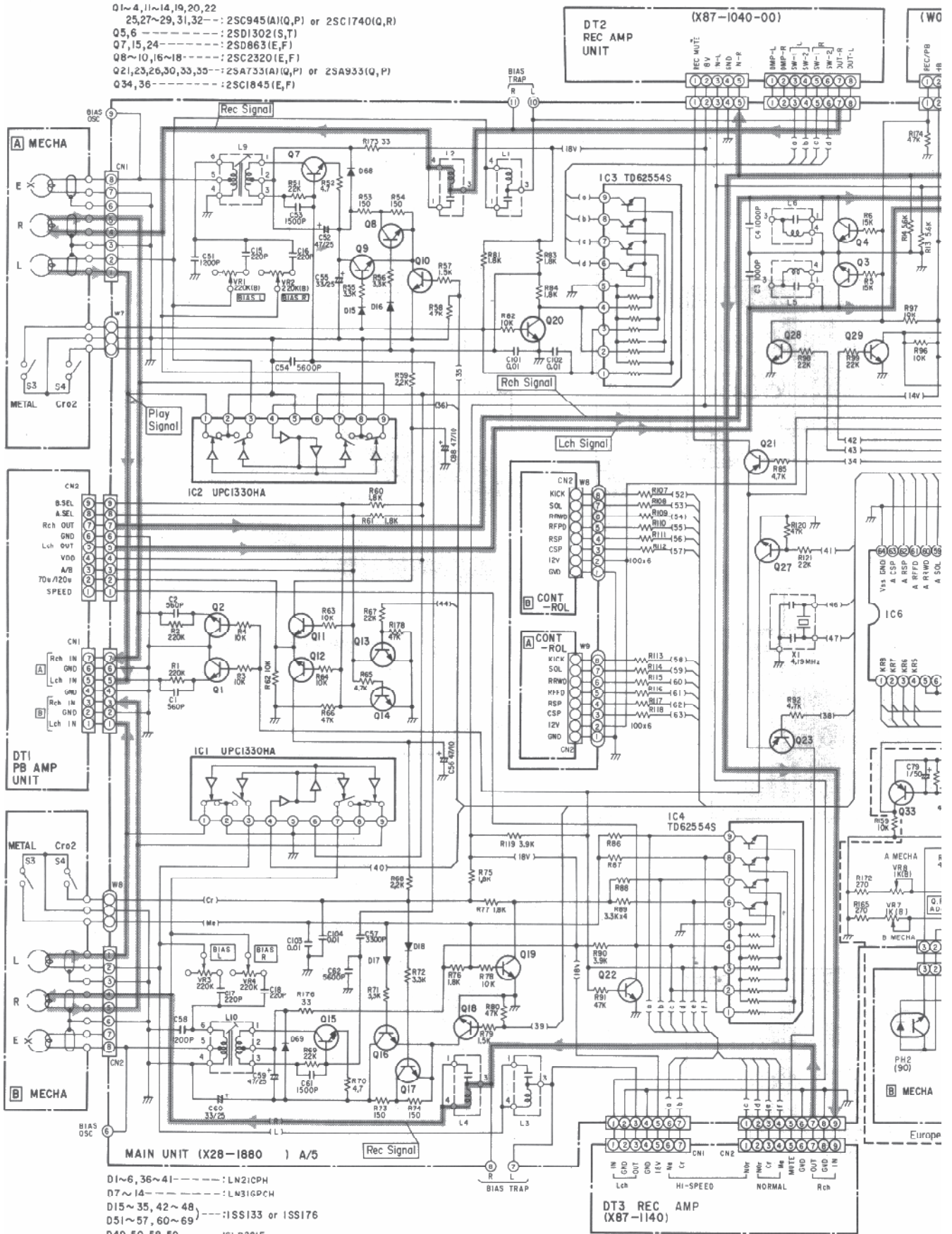
Q 5	
E	6.05V
C	14.76V
B	6.63V



X27 B/4



# SCHEMATIC

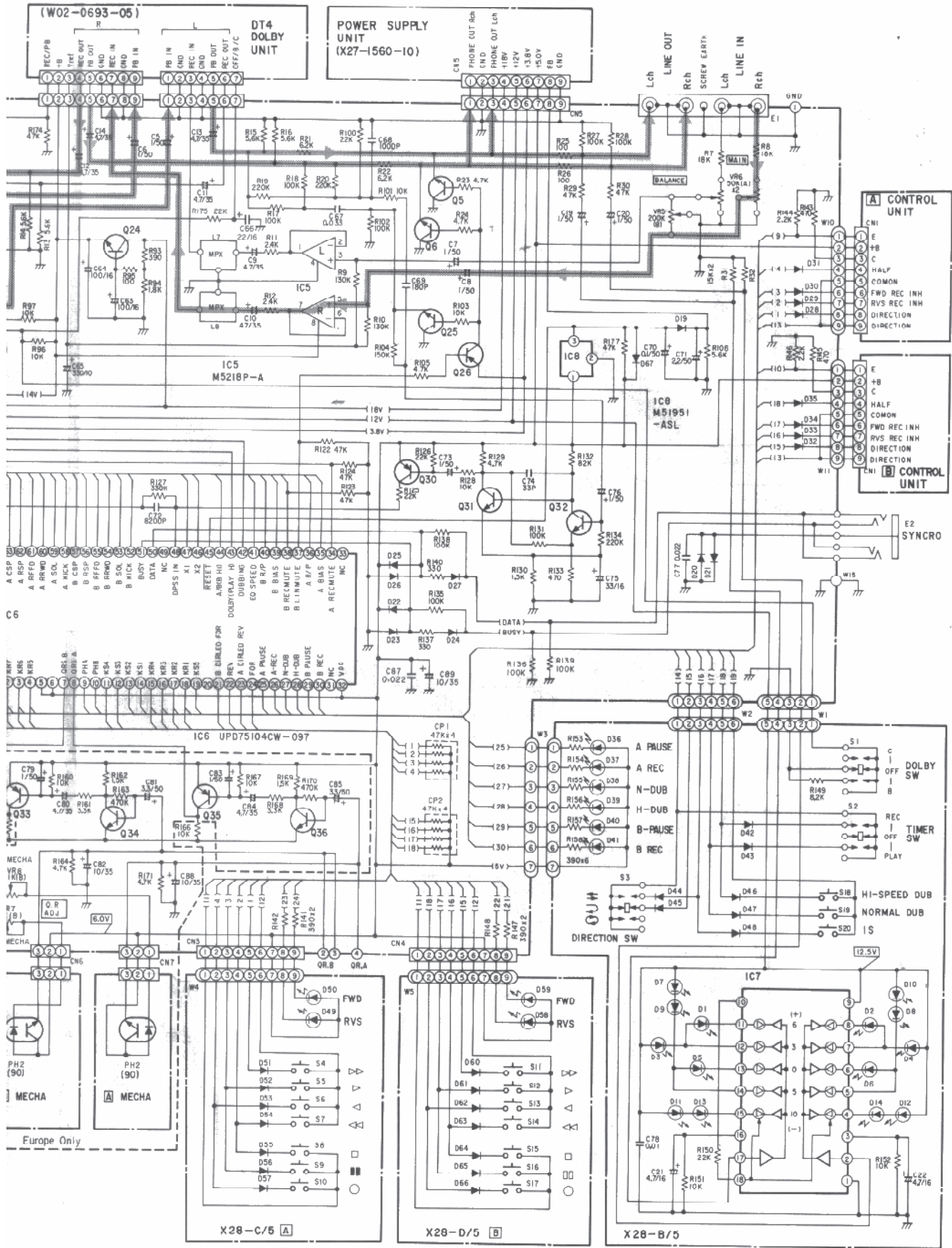


Q1~4, 11~14, 19, 20, 22  
 25, 27~29, 31, 32 --- : 2SC945(A)(Q,P) or 2SC1740(Q,R)  
 Q5, 6 --- : 2SD1302(S,T)  
 Q7, 15, 24 --- : 2SD863(E,F)  
 Q8~10, 16~18 --- : 2SC2320(E,F)  
 Q21, 23, 26, 30, 33, 35 --- : 2SA733(A)(Q,P) or 2SA933(Q,P)  
 Q34, 36 --- : 2SC1845(E,F)

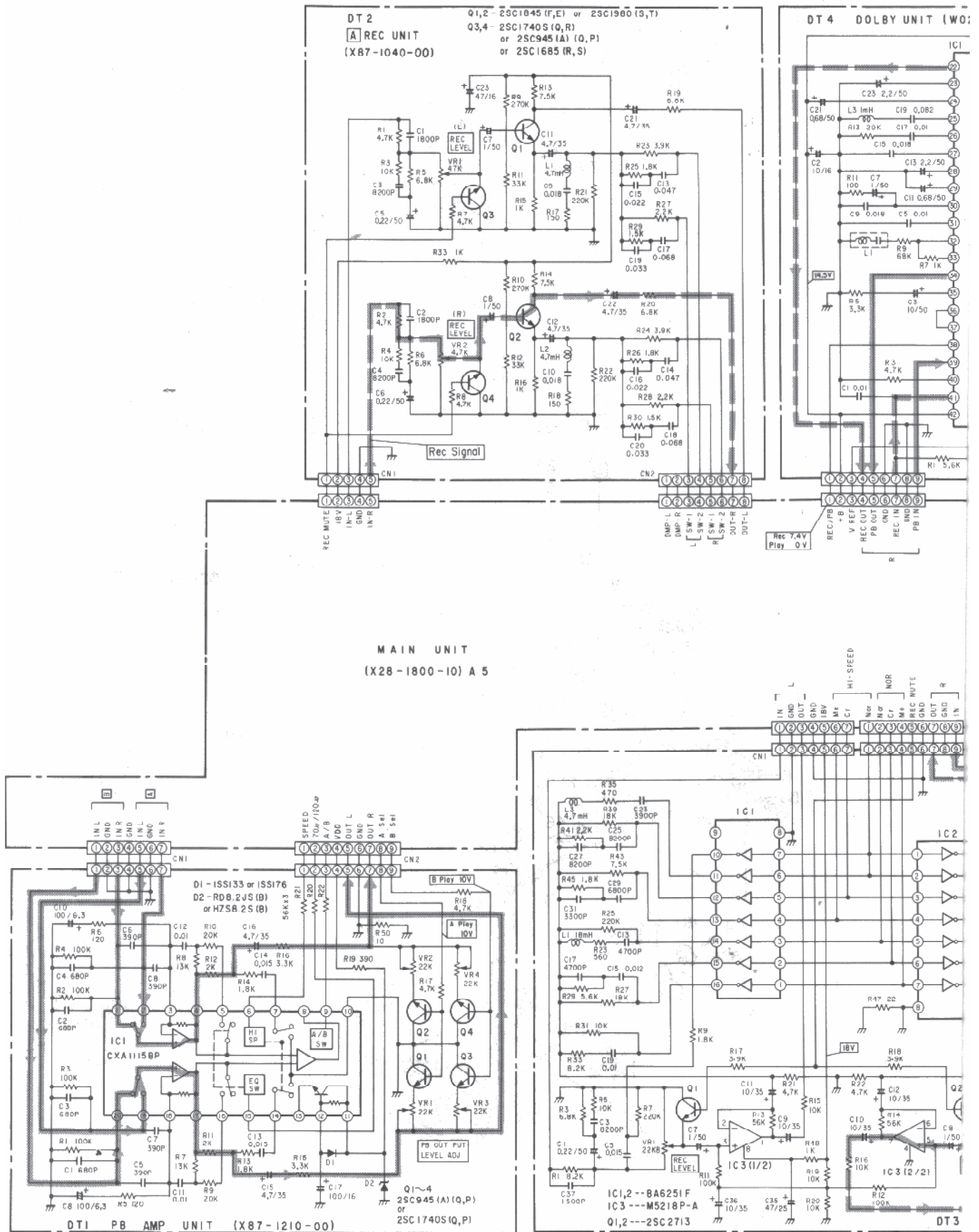
D1~6, 36~41 --- : LN21CPH  
 D7~14 --- : LN31GDCB  
 D15~35, 42~48 --- : ISS133 or ISS176  
 D51~57, 60~69 --- :  
 D49, 50, 58, 59 --- : SLP281F



# ATIC DIAGRAM

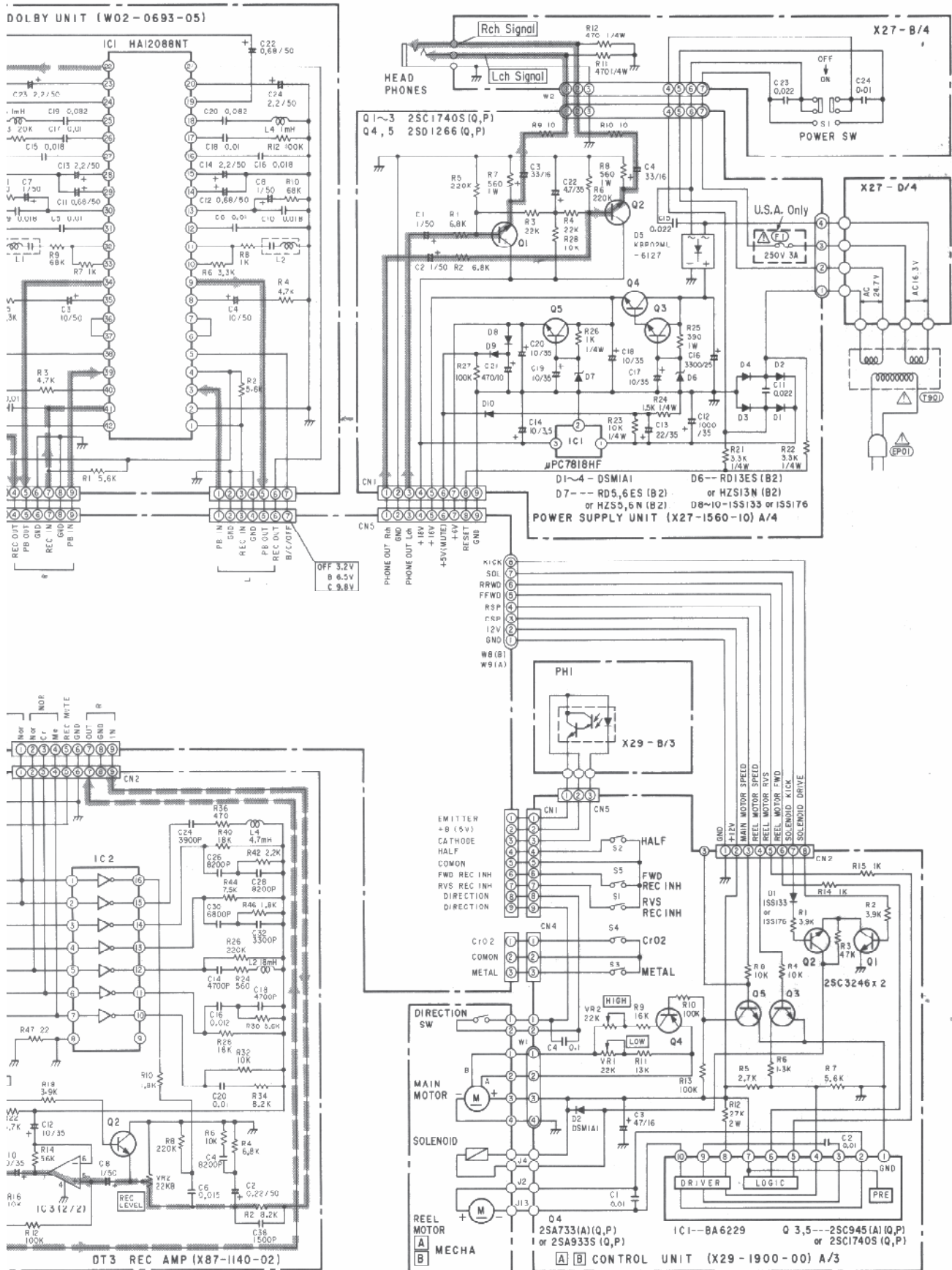


# SCHEMATIC DI





# ATIC DIAGRAM



# MECHANISM PARTS LIST

Location No.	Part No.	Description	Location No.	Part No.	Description
1	25792483	CHASSIS ASSY EUROPE	45	25778703	SPRING RETURN
1	25792484	CHASSIS ASSY (USA)	46	25778705	SPRING
3	25734567	CHASSIS, SUB	47	25778709	SPRING SLIDER
7	25797296	FLYWHEEL ASSY RIGHT(WITH GEAR)	48	25778708	SPRING FD
8	25797297	FLYWHEEL ASSY LEFT	49	25778704	SPRING BRAKE
9	25712488	REEL ASSY, BASE, TAKE-UP	50	25778712	SPRING PINCH ARM RIGHT
10	25712489	REEL BASE, SUPPLY	51	25778713	SPRING PINCH ARM LEFT
11	25784740	SLIDER	52	25778710	SPRING RIGHT(WITH GEAR)
12	25784739	ARM FD	53	25778711	SPRING LEFT
13	25784741	LEVER METAL DETECTOR	54	25778714	SPRING EJECT
14	25784742	LEVER HALF DETECTOR	56	25779795	SPRING AZIMUTH
15	25784743	LEVER REC DETECTOR	57	25779796	SPRING HEAD
16	25784738	ARM LOCK	58	25779793	SPRING
17	25784744	LEVER CHROME DETECTOR	59	25779794	SPRING HALF
18	25784745	LEVER EJECT	60	25762463	SHEET BLACK
19	25784746	LEVER SWITCH RELEASE	61	25762462	SHEET EUROPE
20	25757342	GEAR HEAD	67	25753429	COLLAR EJECT
21	25757343	GEAR DIRECTION	68	25783478	GUIDE EUROPE 1 (RIGHT)
22	25757341	GEAR FD	76	25766184	WASHER, 2.6MM
23	25797295	IDLER ASSY (REEL MOTOR)	77	25766573	WASHER
24	25797299	PRESSURE ROLLER RIGHT	78	25766576	WASHER, 3.7MM
25	25797300	PRESSURE ROLLER LEFT	79	25766574	WASHER
26	25759185	BELT	84	22709339	SCREW, 2.6X6MM, Z, DTBID
27	25784737	BRAKE ASSY	85	22709335	SCREW, 2.6X10MM, Z, DTBID
31	22170701	WIRE ASSY, HEAD HEAD A	86	22217557	HEAD, REC/PLAY/ERASE
31	22170702	WIRE ASSY, HEAD HEAD B	87	25792482	MOTOR ASSY
40	25778715	SPRING DIRECTION	89	22147319	SOLENOID ASSY
41	25778716	SPRING TAPE GUIDE LEFT	90	22119538	PHOTO INTERRUPTER, SPI-314 TAPE GUIDE LEFT (EUROPE)
42	25778717	SPRING TAPE GUIDE RIGHT	91	22709332	SCREW, SPECIAL
43	25778706	SPRING BACK TENSION R	92	22709333	SCREW, SPECIAL
44	25778707	SPRING BACK TENSION L	93	22709334	SCREW, SPECIAL
			94	22709337	SCREW, 1.4X6MM, Z, PAN
			95	22701361	SCREW, 2.6X5MM, Z, FLT
			96	22708382	SCREW, 2.6X3MM, Z, PAN
			97	22709338	SCREW, 2X7MM, DTPAN
			98	22709336	SCREW, SPACIAL
			99	22707366	SCREW, 2.6X6MM, Z, DTBID



# CABINET PARTS LIST

Location No.	Part No.	Description	Location No.	Part No.	Description
601	25864572	TOP COVER	614	22766465	CUSHION
602	22829132	PANEL, FRONT	615	25779788	SPRING
603	22829133	PANEL, SUB			CASSETTE HOLDER
604	22801163	PANEL, REAR	616	22874092	FOOT
		EUROPE			FRONT
604	22801174	PANEL, REAR	617	22828113	FOOT
		USA			REAR
605	25877206	HOLDER ASSY, CASSETTE	618	25848041	BUSHING
		A	619	25816779	BUTTON ASSY, POWER
606	25877207	HOLDER ASSY, CASSETTE			POWER
		B	620	25888202	KNOB
607	25877208	DECORATION			EJECT
608	25877209	ESCUTCHEON	621	25888803	KNOB
609	25877210	PLATE, FILTER			BALANCE/REC LEVE
610	25873319	TAPE COUNTER	622	25888804	KNOB ASSY
611	25759183	BELT			PLAY
		TAPE COUNTER	623	22707590	SCREW, 3.0X8MM, B, PANW
612	25885503	DAMPER	624	22705023	PLASTIC RIVET, 3.5X5.5MM
613	25779787	SPRING	625	22707911	SCREW, 3.0X8MM, B, 2DTBID
		EJECT	626	22709258	SCREW, 4.0X6MM, Z, 12BID

# PARTS LIST

## CAUTION:

The  $\Delta$  mark, the Location No. circled with oval in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list.

## ABBREVIATIONS

1. **CAPACITOR:** CD = Ceramic Disk, PF = Plastic Film, BL = Barrier Layer, EL = Electrolytic, MY = Mylar, PP = Polypropylene, PS = Polystyrene, TT = Tantalum, PE = Polyethylene  
 MFD = Microfarad, PF = Picofarad, V = Voltage, NP = Non Polarity
2. **RESISTOR:** CF = Carbon Film, CC = Carbon Composition, OMF = Oxide Metal Film, MF = Metal Film  
 K = Kilo (1000), M = Mega (1000000)
3. **TOLERANCE**

Symbol	F	G	J	K	M	N	Z	P
%	±1	±2	±5	±10	±20	±30	-20+80	0+100

Symbol	C	D
pF	±0.25	±0.5

Location No.	Part No.	Description	Location No.	Part No.	Description
<b>IC/TRANSISTORS (X28)</b>			Q21	22117555	TRANSISTOR, 2SA933S(Q/R) OR 2SA733(A)(Q,P)
IC1	22128723	IC, UPC1330HA	Q22	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)
IC2	22128723	IC, JPC1330HA	Q23	22117555	TRANSISTOR, 2SA933S(Q/R) OR 2SA733(A)(Q,P)
IC3	B0275090	IC, TD62554S	Q24	22117270	TRANSISTOR, 2SD863-E/F
IC4	B0275090	IC, TD62554S	Q25	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)
IC5	22117971	IC, M5218P-A OR NJM4560D-A	Q26	22117555	TRANSISTOR, 2SA933S(Q/R) OR 2SA733(A)(Q,P)
IC6	22128722	IC, UPD75104CW-097	Q27	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)
IC7	22128724	IC, AN6888	Q28	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)
IC8	22128477	IC, M51951ASL	Q29	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)
Q01	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)	Q30	22117555	TRANSISTOR, 2SA933S(Q/R) OR 2SA733(A)(Q,P)
Q02	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)	Q31	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)
Q03	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)	Q32	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)
Q04	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)	Q33	22117555	TRANSISTOR, 2SA933S(Q/R) EUROPE
Q05	22117718	TRANSISTOR, 2SD1302S	Q34	22117262	TRANSISTOR, 2SC1845-F/E EUROPE
Q06	22117718	TRANSISTOR, 2SD1302S	Q35	22117555	TRANSISTOR, 2SA933S(Q/R) EUROPE
Q07	22117270	TRANSISTOR, 2SD863-E/F	Q36	22117262	TRANSISTOR, 2SC1845-F/E EUROPE
Q08	22117264	TRANSISTOR, 2SC2320-E/F	<b>DIODE (X28)</b>		
Q09	22117264	TRANSISTOR, 2SC2320-E/F	D01	22119530	DIODE, LN21CPH(V)-(C), LED METER
Q10	22117264	TRANSISTOR, 2SC2320-E/F	D02	22119530	DIODE, LN21CPH(V)-(C), LED METER
Q11	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)	D03	22119530	DIODE, LN21CPH(V)-(C), LED METER
Q12	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)			
Q13	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)			
Q14	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)			
Q15	22117270	TRANSISTOR, 2SD863-E/F			
Q16	22117264	TRANSISTOR, 2SC2320-E/F			
Q17	22117264	TRANSISTOR, 2SC2320-E/F			
Q18	22117264	TRANSISTOR, 2SC2320-E/F			
Q19	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)			
Q20	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)			

Location No.	Part No.	Description	Location No.	Part No.	Description
D04	22119530	DIODE, LN21CPH(V)-(C), LED METER	D32	A7160570	DIODE, 1SS176 OR 1SS133
D05	22119530	DIODE, LN21CPH(V)-(C), LED METER	D33	A7160570	DIODE, 1SS176 OR 1SS133
D06	22119530	DIODE, LN21CPH(V)-(C), LED METER	D34	A7160570	DIODE, 1SS176 OR 1SS133
D07	22115972	DIODE, LN31GCPH-U, LED METER	D35	A7160570	DIODE, 1SS176 OR 1SS133
D08	22115972	DIODE, LN31GCPH-U, LED METER	D36	22119530	DIODE, LN21CPH(V)-(C), LED METER
D09	22115972	DIODE, LN31GCPH-U, LED METER	D37	22119530	DIODE, LN21CPH(V)-(C), LED METER
D10	22115972	DIODE, LN31GCPH-U, LED METER	D38	22119530	DIODE, LN21CPH(V)-(C), LED METER
D11	22115972	DIODE, LN31GCPH-U, LED METER	D39	22119530	DIODE, LN21CPH(V)-(C), LED METER
D12	22115972	DIODE, LN31GCPH-U, LED METER	D40	22119530	DIODE, LN21CPH(V)-(C), LED METER
D13	22115972	DIODE, LN31GCPH-U, LED METER	D41	22119530	DIODE, LN21CPH(V)-(C), LED METER
D14	22115972	DIODE, LN31GCPH-U, LED METER	D42	A7160570	DIODE, 1SS176 OR 1SS133
D15	A7160570	DIODE, 1SS176 OR 1SS133	D43	A7160570	DIODE, 1SS176 OR 1SS133
D16	A7160570	DIODE, 1SS176 OR 1SS133	D44	A7160570	DIODE, 1SS176 OR 1SS133
D17	A7160570	DIODE, 1SS176 OR 1SS133	D45	A7160570	DIODE, 1SS176 OR 1SS133
D18	A7160570	DIODE, 1SS176 OR 1SS133	D46	A7160570	DIODE, 1SS176 OR 1SS133
D19	A7160570	DIODE, 1SS176 OR 1SS133	D47	A7160570	DIODE, 1SS176 OR 1SS133
D20	A7160570	DIODE, 1SS176 OR 1SS133	D48	A7160570	DIODE, 1SS176 OR 1SS133
D21	A7160570	DIODE, 1SS176 OR 1SS133	D49	22119015	DIODE, SLP-281F-50U, LED REVERSE
D22	A7160570	DIODE, 1SS176 OR 1SS133	D50	22119015	DIODE, SLP-281F-50U, LED FOWARD
D23	A7160570	DIODE, 1SS176 OR 1SS133	D51	A7160570	DIODE, 1SS176 OR 1SS133
D24	A7160570	DIODE, 1SS176 OR 1SS133	D52	A7160570	DIODE, 1SS176 OR 1SS133
D25	A7160570	DIODE, 1SS176 OR 1SS133	D53	A7160570	DIODE, 1SS176 OR 1SS133
D26	A7160570	DIODE, 1SS176 OR 1SS133	D54	A7160570	DIODE, 1SS176 OR 1SS133
D27	A7160570	DIODE, 1SS176 OR 1SS133	D55	A7160570	DIODE, 1SS176 OR 1SS133
D28	A7160570	DIODE, 1SS176 OR 1SS133	D56	A7160570	DIODE, 1SS176 OR 1SS133
D29	A7160570	DIODE, 1SS176 OR 1SS133	D57	A7160570	DIODE, 1SS176 OR 1SS133
D30	A7160570	DIODE, 1SS176 OR 1SS133	D58	22119015	DIODE, SLP-281F-50U, LED REVERSE
D31	A7160570	DIODE, 1SS176 OR 1SS133	D59	22119015	DIODE, SLP-281F-50U, LED FOWARD



Location No.	Part No.	Description
D60	A7160570	DIODE, 1SS176 OR 1SS133
D61	A7160570	DIODE, 1SS176 OR 1SS133
D62	A7160570	DIODE, 1SS176 OR 1SS133
D63	A7160570	DIODE, 1SS176 OR 1SS133
D64	A7160570	DIODE, 1SS176 OR 1SS133
D65	A7160570	DIODE, 1SS176 OR 1SS133
D66	A7160570	DIODE, 1SS176 OR 1SS133
D67	A7160570	DIODE, 1SS176 OR 1SS133
D68	A7160570	DIODE, 1SS176 OR 1SS133
D69	A7160570	DIODE, 1SS176 OR 1SS133

#### TRANSISTOR (X87-1210-00)

Q01	22117262	TRANSISTOR, 2SC1845-F/E OR 2SC1980(S,T)
Q02	22117262	TRANSISTOR, 2SC1845-F/E OR 2SC1980(S,T)
Q03	22117554	TRANSISTOR, 2SC1740S(Q,R) OR 2SC945(A)(Q,P)
Q04	22117554	TRANSISTOR, 2SC1740S(Q,R) OR 2SC945(A)(Q,P)

#### IC/TRANSISTOR (X87-1210-00)

IC1	22128726	IC, CXA1115BP
Q1	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)
Q2	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)
Q3	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)
Q4	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)

#### DIODE

D1	A7160570	DIODE, 1SS176 OR 1SS133
D2	22119532	DIODE, RD8.2JS(B), ZENER OR HZS8.2S(B)

Location No.	Part No.	Description
<b>IC/TRANSISTOR (X87-1140-02)</b>		
IC1	22128500	IC, BA6251F
IC2	22128500	IC, BA6251F
IC3	22117971	IC, M5218P-A
Q1	A6335530	TRANSISTOR, 2SC2713-GR
Q2	A6335530	TRANSISTOR, 2SC2713-GR

#### IC/TRANSISTOR (X29-1900-00)

IC1	22117524	IC, BA6229
Q1	22117946	TRANSISTOR, 2SC3246-H
Q2	22117946	TRANSISTOR, 2SC3246-H
Q3	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)
Q4	22117555	TRANSISTOR, 2SA933S(Q,R) OR 2SA733(A)(Q,P)
Q5	22114768	TRANSISTOR, 2SC945A-Q OR 2SC1740S(Q,R)

#### DIODE

D1	A7160570	DIODE, 1SS176 OR 1SS133
D2	22119029	DIODE, DSM1A1
PH1	22119533	PHOTO INTERRUPTER, NJL5164KF1

#### IC/TRANSISTOR (X27)

IC1	22128728	IC, UPC7818HF
Q01	22117554	TRANSISTOR, 2SC1740S(Q,R)
Q02	22117554	TRANSISTOR, 2SC1740S(Q,R)
Q03	22117554	TRANSISTOR, 2SC1740S(Q,R)
Q04	22117655	TRANSISTOR, 2SD1266-Q/P
Q05	22117655	TRANSISTOR, 2SD1266-Q/P

#### DIODE

D01	22119029	DIODE, DSM1A1
D02	22119029	DIODE, DSM1A1
D03	22119029	DIODE, DSM1A1
D04	22119029	DIODE, DSM1A1
D05	22119534	DIODE, KBP02ML-6127
D06	22119256	DIODE, RD13ES-B2, ZENER OR HZS13ES(B2)
D07	22119263	DIODE, RD5.6ES-B2, ZENER OR HZS5.6N(B2)

Location No.	Part No.	Description
D08	A7160570	DIODE, 1SS176 OR 1SS133
D09	A7160570	DIODE, 1SS176 OR 1SS133
D10	A7160570	DIODE, 1SS176 OR 1SS133

### ELECTRICAL PARTS (X28)

E1	22198364	JACK, US-4P IN-OUT
E2	22198297	JACK USA
E2	22198414	JACK EUROPE
EP01	22131391	PC BOARD ASSY, DOLBY W02-0693-05
L01	22235309	COIL, OSCILLATOR, LW
L02	22235309	COIL, OSCILLATOR, LW
L03	22235309	COIL, OSCILLATOR, LW
L04	22235309	COIL, OSCILLATOR, LW
L05	22235309	COIL, OSCILLATOR, LW
L06	22235309	COIL, OSCILLATOR, LW
L07	22135091	FILTER, LC
L08	22135091	FILTER, LC
L09	22235293	COIL, BIAS OSCILLATOR
L10	22235293	COIL, BIAS OSCILLATOR
S01	22108118	SLIDE SWITCH DOLBY
S02	22108118	SLIDE SWITCH TIMFR
S03	22108118	SLIDE SWITCH DIRECTION, A
S04	22196416	PUSH SWITCH FF/REW, A MECHA
S05	22196416	PUSH SWITCH PLAY, A MECHA
S06	22196416	PUSH SWITCH PLAY, A MECHA
S07	22196416	PUSH SWITCH FF/REW, A MECHA
S08	22196416	PUSH SWITCH STOP, A MECHA
S09	22196416	PUSH SWITCH PAUSE, A MECHA
S10	22196416	PUSH SWITCH REC MUTE, A
S11	22196416	PUSH SWITCH FF/REW, B MECHA
S12	22196416	PUSH SWITCH PLAY, B MECHA
S13	22196416	PUSH SWITCH PLAY, B MECHA
S14	22196416	PUSH SWITCH FF/REW, B MECHA

Location No.	Part No.	Description
S15	22196416	PUSH SWITCH STOP, B MECHA
S16	22196416	PUSH SWITCH PAUSE, B MECHA
S17	22196416	PUSH SWITCH REC MUTE, B MECH
S18	22196416	PUSH SWITCH HI SPEED DUBBING
S19	22196416	PUSH SWITCH NORMAL DUBBING
S20	22196416	PUSH SWITCH LOW SPEED
X01	22153387	OSCILLATOR, 4.194MHZ

### ELECTRICAL PARTS (X87-1040-04)

L1	22232301	CHOKE COIL, 4.7MH
L2	22232301	CHOKE COIL, 4.7MH

### ELECTRICAL PARTS (X87-1140-02)

L1	22232334	CHOKE COIL, 18MH
L2	22232334	CHOKE COIL, 18MH
L3	22232301	CHOKE COIL, 4.7MH
L4	22232301	CHOKE COIL, 4.7MH

### ELECTRICAL PARTS (X29)

S1	22108198	PUSH SWITCH REVERSE REC INH
S2	22108198	PUSH SWITCH HALF
S3	22108198	PUSH SWITCH METAL
S4	22108198	PUSH SWITCH CrO2
S5	22108198	PUSH SWITCH FOWARD REC INH

### ELECTRICAL PARTS (X27)

E1	22198347	JACK HEADPHONE
△ EP01	22176286	POWER CORD EUROPE
△ EP01	22176759	POWER CORD USA
△ F1	22144529	FUSE, 250V, 3A USA
EP03	22165093	HOLDER, FUSE USA

Location No.	Part No.	Description	Location No.	Part No.	Description
S1	22108199	PUSH SWITCH POWER	C072	22321279	PF, 8200PF, 50V, J
S6	22108201	LEAF SWITCH DIRECTION	C073	20418109	EL, 1MFD, 50V
T901	22225147	POWER TRANSFORMER USA	C074	20311330	CD, 33PF, 50V, J
T901	22225149	POWER TRANSFORMER EUROPE	C075	20415330	EL, 33MFD, 16V
			C076	20418109	EL, 1MFD, 50V
			C077	20341223	CD, 0.022MFD, 50V, Z
			C078	20341103	CD, 0.01MFD, 50V, Z
			C079	20418109	EL, 1MFD, 50V EUROPE
			C080	20417479	EL, 4.7MFD, 35V EUROPE
			C081	20418339	EL, 3.3MFD, 50V EUROPE
			C082	20417100	EL, 10MFD, 35V EUROPE
			C083	20418109	EL, 1MFD, 50V EUROPE
			C084	20417479	EL, 4.7MFD, 35V EUROPE
			C085	20418339	EL, 3.3MFD, 50V EUROPE
			C086	20417100	EL, 10MFD, 35V EUROPE
			C087	20341223	CD, 0.022MFD, 50V, Z
			C088	20414470	EL, 47MFD, 10V
			C089	20417100	EL, 10MFD, 35V
			C101	20341103	CD, 0.01MFD, 50V, Z
			C102	20341103	CD, 0.01MFD, 50V, Z
			C103	20341103	CD, 0.01MFD, 50V, Z
			C104	20341103	CD, 0.01MFD, 50V, Z
<b>CAPACITORS (X28)</b>			<b>CAPACITORS (X87-1040)</b>		
C001	20343561	CD, 560PF, 50V, K	C01	20310027	CD, 1800PF, 25V, K
C002	20343561	CD, 560PF, 50V, K	C02	20310027	CD, 1800PF, 25V, K
C003	20343102	CD, 1000PF, 50V, K	C03	20310026	CD, 8200PF, 25V, K
C004	20343102	CD, 1000PF, 50V, K	C04	20310026	CD, 8200PF, 25V, K
C005	20418109	EL, 1MFD, 50V	C05	20418228	EL, 0.22MFD, 50V
C006	20418109	EL, 1MFD, 50V	C06	20418228	EL, 0.22MFD, 50V
C007	20418109	EL, 1MFD, 50V	C07	22488109	EL, 1MFD, 50V
C008	20418109	EL, 1MFD, 50V	C08	22488109	EL, 1MFD, 50V
C009	20417479	EL, 4.7MFD, 35V	C09	22321277	PF, 0.018MFD, 50V, J
C010	20417479	EL, 4.7MFD, 35V	C10	22321277	PF, 0.018MFD, 50V, J
C011	20417479	EL, 4.7MFD, 35V	C11	20417479	EL, 4.7MFD, 35V
C012	20417479	EL, 4.7MFD, 35V	C12	20417479	EL, 4.7MFD, 35V
C013	20417479	EL, 4.7MFD, 35V	C13	22321233	PF, 0.047MFD, 50V, J
C014	20417479	EL, 4.7MFD, 35V	C14	22321233	PF, 0.047MFD, 50V, J
C015	20311221	CD, 220PF, 50V, J	C15	20310029	CD, 0.022MFD, 25V, K
C016	20311221	CD, 220PF, 50V, J	C16	20310029	CD, 0.022MFD, 25V, K
C017	20311221	CD, 220PF, 50V, J	C17	22321268	PF, 0.068MFD, 50V, J
C018	20311221	CD, 220PF, 50V, J	C18	22321268	PF, 0.068MFD, 50V, J
C019	20418108	EL, 0.1MFD, 50V	C19	20310028	CD, 0.033MFD, 25V, K
C020	20418108	EL, 0.1MFD, 50V	C20	20310028	CD, 0.033MFD, 25V, K
C051	20340011	PP, 1200PF, 630V	C21	20417479	EL, 4.7MFD, 35V
C052	20416470	EL, 47MFD, 25V			
C053	20370031	PF, 1500PF, 50V, J			
C054	20370007	PF, 5600PF, 50V, J			
C055	20416330	EL, 33MFD, 25V			
C056	20414470	EL, 47MFD, 10V			
C057	22321330	PF, 3300PF, 50V, J			
C058	20340011	PP, 1200PF, 630V			
C059	20416470	EL, 47MFD, 25V			
C060	20416330	EL, 33MFD, 25V			
C061	20370031	PF, 1500PF, 50V, J			
C062	20370007	PF, 5600PF, 50V, J			
C063	20415330	EL, 33MFD, 16V			
C064	20415101	EL, 100MFD, 16V			
C065	20414331	EL, 330MFD, 10V			
C066	20414331	EL, 330MFD, 10V			
C067	22321273	PF, 0.033MFD, 50V, J			
C068	20343103	CD, 0.01MFD, 50V, K			
C069	20311181	CD, 180PF, 50V, J			
C070	20418108	EL, 0.1MFD, 50V			
C071	20418229	EL, 2.2MFD, 50V			



Location No.	Part No.	Description
C22	20417479	EL, 4.7MFD, 35V
C23	20415101	EL, 100MFD, 16V

### CAPACITORS (X87-1210)

C01	20343681	CD, 680PF, 50V, K
C02	20343681	CD, 680PF, 50V, K
C03	20311121	CD, 120PF, 50V, J
C04	20311121	CD, 120PF, 50V, J
C05	20343391	CD, 390PF, 50V, K
C06	20343391	CD, 390PF, 50V, K
C07	20343391	CD, 390PF, 50V, K
C08	20343391	CD, 390PF, 50V, K
C11	22321256	PF, 0.01MFD, 50V, J
C12	22321256	PF, 0.01MFD, 50V, J
C13	22321237	PF, 0.015MFD, 50V, J
C14	22321237	PF, 0.015MFD, 50V, J
C15	20417479	EL, 4.7MFD, 35V
C16	20417479	EL, 4.7MFD, 35V

### CAPACITORS (X87-1140)

C01	20418228	EL, 0.22MFD, 50V
C02	20418228	EL, 0.22MFD, 50V
C03	22321279	PF, 8200PF, 50V, J
C04	22321279	PF, 8200PF, 50V, J
C07	20418109	EL, 1MFD, 50V
C08	20418109	EL, 1MFD, 50V
C09	20417100	EL, 10MFD, 35V
C10	20417100	EL, 10MFD, 35V
C11	20417100	EL, 10MFD, 35V
C12	20417100	EL, 10MFD, 35V
C13	22321236	PF, 4700PF, 50V, J
C14	22321236	PF, 4700PF, 50V, J
C15	22321262	PF, 0.012MFD, 50V, J
C16	22321262	PF, 0.012MFD, 50V, J
C17	22321236	PF, 4700PF, 50V, J
C18	22321236	PF, 4700PF, 50V, J
C19	22321256	PF, 0.01MFD, 50V, J
C20	22321256	PF, 0.01MFD, 50V, J
C23	22321278	PF, 3900PF, 50V, J
C24	22321278	PF, 3900PF, 50V, J
C25	22321279	PF, 8200PF, 50V, J
C26	22321279	PF, 8200PF, 50V, J
C27	22321279	PF, 8200PF, 50V, J
C28	22321279	PF, 8200PF, 50V, J
C29	22321269	PF, 6800PF, 50V, J
C30	22321269	PF, 6800PF, 50V, J
C31	22321330	PF, 3300PF, 50V, J
C32	22321330	PF, 3300PF, 50V, J
C35	20416470	EL, 47MFD, 25V
C36	20417100	EL, 10MFD, 35V
C37	20370031	PF, 1500PF, 50V, J
C38	20370031	PF, 1500PF, 50V, J

Location No.	Part No.	Description
<b>CAPACITORS (X29)</b>		
C01	20341103	CD, 0.01MFD, 50V, Z
C02	20341103	CD, 0.01MFD, 50V, Z
C03	20415470	EL, 47MFD, 16V

### CAPACITORS (X27)

C01	22488109	EL, 1MFD, 50V
C02	22488109	EL, 1MFD, 50V
C03	20415330	EL, 33MFD, 16V
C04	20415330	EL, 33MFD, 16V
C11	20341223	CD, 0.022MFD, 50V, Z
C12	20487102	EL, 1000MFD, 35V
C13	20417479	EL, 4.7MFD, 35V
C14	20417100	EL, 10MFD, 35V
C15	20341223	CD, 0.022MFD, 50V, Z
C16	22440637	EL, 3300MFD, 25V
C17	20417100	EL, 10MFD, 35V
C18	20417100	EL, 10MFD, 35V
C19	20417100	EL, 10MFD, 35V
C20	20417100	EL, 10MFD, 35V
C21	20414471	EL, 470MFD, 10V
C22	20417479	EL, 4.7MFD, 35V
C23	20341223	CD, 0.022MFD, 50V, Z
C24	20341103	CD, 0.01MFD, 50V, Z

### RESISTORS (X28)

CP1	20540105	COMPOSITE PARTS, 47K OHM X4
CP2	20540105	COMPOSITE PARTS, 47K OHM X4
R001	20512224	CF, 220K OHM, 1/6W, J
R002	20512224	CF, 220K OHM, 1/6W, J
R003	20512103	CF, 10K OHM, 1/6W, J
R004	20512103	CF, 10K OHM, 1/6W, J
R005	20512153	CF, 15K OHM, 1/6W, J
R006	20512153	CF, 15K OHM, 1/6W, J
R007	20512183	CF, 18K OHM, 1/6W, J
R008	20512183	CF, 18K OHM, 1/6W, J
R013	20512562	CF, 5.6K OHM, 1/6W, J
R014	20512562	CF, 5.6K OHM, 1/6W, J
R015	20512562	CF, 5.6K OHM, 1/6W, J
R016	20512562	CF, 5.6K OHM, 1/6W, J
R017	20512104	CF, 100K OHM, 1/6W, J
R018	20512104	CF, 100K OHM, 1/6W, J
R019	20512224	CF, 220K OHM, 1/6W, J
R020	20512224	CF, 220K OHM, 1/6W, J
R021	20512622	CF, 6.2K OHM, 1/6W, J
R022	20512622	CF, 6.2K OHM, 1/6W, J
R023	20512472	CF, 4.7K OHM, 1/6W, J
R024	20512472	CF, 4.7K OHM, 1/6W, J
R025	20512101	CF, 100 OHM, 1/6W, J
H026	20512101	CF, 100 OHM, 1/6W, J

Location No.	Part No.	Description	Location No.	Part No.	Description
R027	20512104	CF, 100K OHM, 1/6W, J	R115	20512101	CF, 100 OHM, 1/6W, J
R028	20512104	CF, 100K OHM, 1/6W, J	R116	20512101	CF, 100 OHM, 1/6W, J
R029	20512472	CF, 4.7K OHM, 1/6W, J	R117	20512101	CF, 100 OHM, 1/6W, J
R030	20512473	CF, 47K OHM, 1/6W, J	R118	20512101	CF, 100 OHM, 1/6W, J
R031	20512153	CF, 15K OHM, 1/6W, J	R120	20512473	CF, 47K OHM, 1/6W, J
R032	20512153	CF, 15K OHM, 1/6W, J	R121	20512223	CF, 22K OHM, 1/6W, J
R051	20512223	CF, 22K OHM, 1/6W, J	R122	20512473	CF, 47K OHM, 1/6W, J
R052	20513479	CF, 4.7 OHM, 1/4W, J	R123	20512473	CF, 47K OHM, 1/6W, J
R055	20512332	CF, 3.3K OHM, 1/6W, J	R124	20512473	CF, 47K OHM, 1/6W, J
R056	20512332	CF, 3.3K OHM, 1/6W, J	R125	20512223	CF, 22K OHM, 1/6W, J
R057	20512152	CF, 1.5K OHM, 1/6W, J	R126	20512223	CF, 22K OHM, 1/6W, J
R058	20512473	CF, 47K OHM, 1/6W, J	R127	20512334	CF, 330K OHM, 1/6W, J
R059	20512222	CF, 2.2K OHM, 1/6W, J	R128	20512103	CF, 10K OHM, 1/6W, J
R062	20512103	CF, 10K OHM, 1/6W, J	R129	20512472	CF, 4.7K OHM, 1/6W, J
R063	20512103	CF, 10K OHM, 1/6W, J	R130	20512152	CF, 1.5K OHM, 1/6W, J
R064	20512103	CF, 10K OHM, 1/6W, J	R131	20512104	CF, 100K OHM, 1/6W, J
R065	20512473	CF, 47K OHM, 1/6W, J	R132	20512823	CF, 82K OHM, 1/6W, J
R066	20512473	CF, 47K OHM, 1/6W, J	R133	20512470	CF, 47 OHM, 1/6W, J
R067	20512223	CF, 22K OHM, 1/6W, J	R134	20512224	CF, 220K OHM, 1/6W, J
R068	20512222	CF, 2.2K OHM, 1/6W, J	R135	20512104	CF, 100K OHM, 1/6W, J
R069	20512223	CF, 22K OHM, 1/6W, J	R136	20512104	CF, 100K OHM, 1/6W, J
R070	20513479	CF, 4.7 OHM, 1/4W, J	R137	20512330	CF, 33 OHM, 1/6W, J
R071	20512332	CF, 3.3K OHM, 1/6W, J	R138	20512104	CF, 100K OHM, 1/6W, J
R072	20512332	CF, 3.3K OHM, 1/6W, J	R139	20512104	CF, 100K OHM, 1/6W, J
R078	20512103	CF, 10K OHM, 1/6W, J	R140	20512330	CF, 33 OHM, 1/6W, J
R079	20512152	CF, 1.5K OHM, 1/6W, J	R141	20512390	CF, 39 OHM, 1/6W, J
R080	20512473	CF, 47K OHM, 1/6W, J	R142	20512390	CF, 39 OHM, 1/6W, J
R082	20512103	CF, 10K OHM, 1/6W, J	R143	20512470	CF, 47 OHM, 1/6W, J
R086	20512332	CF, 3.3K OHM, 1/6W, J	R144	20512222	CF, 2.2K OHM, 1/6W, J
R087	20512332	CF, 3.3K OHM, 1/6W, J	R145	20512470	CF, 47 OHM, 1/6W, J
R088	20512332	CF, 3.3K OHM, 1/6W, J	R146	20512222	CF, 2.2K OHM, 1/6W, J
R089	20512332	CF, 3.3K OHM, 1/6W, J	R147	20512390	CF, 39 OHM, 1/6W, J
R091	20512473	CF, 47K OHM, 1/6W, J	R148	20512390	CF, 39 OHM, 1/6W, J
R092	20512472	CF, 4.7K OHM, 1/6W, J	R149	20512822	CF, 8.2K OHM, 1/6W, J
R094	20512182	CF, 1.8K OHM, 1/6W, J	R150	20512223	CF, 22K OHM, 1/6W, J
R095	20512101	CF, 100 OHM, 1/6W, J	R151	20512103	CF, 10K OHM, 1/6W, J
R096	20512103	CF, 10K OHM, 1/6W, J	R152	20512103	CF, 10K OHM, 1/6W, J
R097	20512103	CF, 10K OHM, 1/6W, J	R154	20512390	CF, 39 OHM, 1/6W, J
R098	20512223	CF, 22K OHM, 1/6W, J	R155	20512390	CF, 39 OHM, 1/6W, J
R099	20512223	CF, 22K OHM, 1/6W, J	R156	20512390	CF, 39 OHM, 1/6W, J
R100	20512223	CF, 22K OHM, 1/6W, J	R157	20512390	CF, 39 OHM, 1/6W, J
R101	20512103	CF, 10K OHM, 1/6W, J	R158	20512390	CF, 39 OHM, 1/6W, J
R102	20512104	CF, 100K OHM, 1/6W, J	R159	20512103	CF, 10K OHM, 1/6W, J
R103	20512103	CF, 10K OHM, 1/6W, J	R160	20512103	CF, 10K OHM, 1/6W, J
R104	20512154	CF, 150K OHM, 1/6W, J			EUROPE
R105	20512472	CF, 4.7K OHM, 1/6W, J	R161	20512332	CF, 3.3K OHM, 1/6W, J
R106	20512562	CF, 5.6K OHM, 1/6W, J			EUROPE
R107	20512101	CF, 100 OHM, 1/6W, J	R162	20512152	CF, 1.5K OHM, 1/6W, J
R108	20512101	CF, 100 OHM, 1/6W, J			EUROPE
R109	20512101	CF, 100 OHM, 1/6W, J	R163	20512474	CF, 470K OHM, 1/6W, J
R110	20512101	CF, 100 OHM, 1/6W, J			EUROPE
R111	20512101	CF, 100 OHM, 1/6W, J	R164	20512472	CF, 4.7K OHM, 1/6W, J
R112	20512101	CF, 100 OHM, 1/6W, J			EUROPE
R113	20512101	CF, 100 OHM, 1/6W, J	R165	20512270	CF, 27 OHM, 1/6W, J
R114	20512101	CF, 100 OHM, 1/6W, J			EUROPE
			R166	20512103	CF, 10K OHM, 1/6W, J

Location No.	Part No.	Description
R167	20512103	CF, 10K OHM, 1/6W, J EUROPE
R168	20512332	CF, 3.3K OHM, 1/6W, J EUROPE
R169	20512152	CF, 1.5K OHM, 1/6W, J EUROPE
R170	20512474	CF, 47K OHM, 1/6W, J EUROPE
R171	20512472	CF, 4.7K OHM, 1/6W, J EUROPE
R172	20512270	CF, 27 OHM, 1/6W, J EUROPE
R174	20512473	CF, 47K OHM, 1/6W, J
R175	20512223	CF, 22K OHM, 1/6W, J
R177	20512473	CF, 47K OHM, 1/6W, J
R178	20512473	CF, 47K OHM, 1/6W, J
VR1	22659103	VARIABLE, SEMI FIXED, 220K BIAS LEFT
VR2	22659103	VARIABLE, SEMI FIXED, 220K BIAS RIGHT
VR3	22659103	VARIABLE, SEMI FIXED, 220K BIAS LEFT
VR4	22659103	VARIABLE, SEMI FIXED, 220K BIAS RIGHT
VR5	22657539	VARIABLE, 200K OHM, B BALANCE
VR6	22657538	VARIABLE, 50KX2 OHM, A REC LEVEL
VR7	22659104	VARIABLE, SEMI FIXED, 1K-B Q,R ADJ B EUROPE
VR8	22659104	VARIABLE, SEMI FIXED, 1K-B Q,R ADJ A EUROPE

### RESISTORS

R001	20512472	CF, 4.7K OHM, 1/6W, J
R002	20512472	CF, 4.7K OHM, 1/6W, J
R003	20512103	CF, 10K OHM, 1/6W, J
R004	20512103	CF, 10K OHM, 1/6W, J
R005	20512682	CF, 6.8K OHM, 1/6W, J
R006	20512682	CF, 6.8K OHM, 1/6W, J
R007	20512472	CF, 4.7K OHM, 1/6W, J
R008	20512472	CF, 4.7K OHM, 1/6W, J
R009	20512274	CF, 270K OHM, 1/6W, J
R010	20512274	CF, 270K OHM, 1/6W, J
R011	20512333	CF, 33K OHM, 1/6W, J
R012	20512333	CF, 33K OHM, 1/6W, J
R015	20512102	CF, 1K OHM, 1/6W, J
R016	20512102	CF, 1K OHM, 1/6W, J
R019	20512682	CF, 6.8K OHM, 1/6W, J
R020	20512682	CF, 6.8K OHM, 1/6W, J
R021	20512224	CF, 220K OHM, 1/6W, J
R022	20512224	CF, 220K OHM, 1/6W, J
R023	20512392	CF, 3.9K OHM, 1/6W, J

Location No.	Part No.	Description
R024	20512392	CF, 3.9K OHM, 1/6W, J
R025	20512182	CF, 1.8K OHM, 1/6W, J
R026	20512182	CF, 1.8K OHM, 1/6W, J
R027	20512222	CF, 2.2K OHM, 1/6W, J
R028	20512222	CF, 2.2K OHM, 1/6W, J
R029	20512152	CF, 1.5K OHM, 1/6W, J
R030	20512152	CF, 1.5K OHM, 1/6W, J
R033	20512102	CF, 1K OHM, 1/6W, J
R034	20512470	CF, 47 OHM, 1/6W, J
VR1	22658984	VARIABLE, SEMI FIXED, 47K REC LEVEL
VR2	22658984	VARIABLE, SEMI FIXED, 47K REC LEVEL

### RESISTORS (X87-1210)

R01	20512104	CF, 100K OHM, 1/6W, J
R02	20512104	CF, 100K OHM, 1/6W, J
R03	20512334	CF, 330K OHM, 1/6W, J
R04	20512334	CF, 330K OHM, 1/6W, J
R05	20512122	CF, 1.2K OHM, 1/6W, J
R06	20512122	CF, 1.2K OHM, 1/6W, J
R09	20512183	CF, 18K OHM, 1/6W, J
R10	20512183	CF, 18K OHM, 1/6W, J
R13	20512182	CF, 1.8K OHM, 1/6W, J
R14	20512182	CF, 1.8K OHM, 1/6W, J
R15	20512332	CF, 3.3K OHM, 1/6W, J
R16	20512332	CF, 3.3K OHM, 1/6W, J
R17	20512472	CF, 4.7K OHM, 1/6W, J
R18	20512472	CF, 4.7K OHM, 1/6W, J
R19	20512390	CF, 39 OHM, 1/6W, J
R20	20512563	CF, 56K OHM, 1/6W, J
R21	20512563	CF, 56K OHM, 1/6W, J
R22	20512563	CF, 56K OHM, 1/6W, J
VR1	22657374	VARIABLE, SEMI FIXED, 22K PB OUTPUT LEVEL
VR2	22657374	VARIABLE, SEMI FIXED, 22K PB OUTPUT LEVEL
VR3	22657374	VARIABLE, SEMI FIXED, 22K PB OUTPUT LEVEL
VR4	22657374	VARIABLE, SEMI FIXED, 22K PB OUTPUT LEVEL

### RESISTORS

J7	20540102	OMF, 1K OHM, 1/8W, J, CHIP
R01	20540259	OMF, 8.2K OHM, 1/8W, J, CHIP
R02	20540259	OMF, 8.2K OHM, 1/8W, J, CHIP
R03	20540257	OMF, 6.8K OHM, 1/8W, J, CHIP
R04	20540257	OMF, 6.8K OHM, 1/8W, J, CHIP
R05	20540063	OMF, 10K OHM, 1/8W, J, CHIP
R06	20540063	OMF, 10K OHM, 1/8W, J, CHIP
R11	20540064	OMF, 100K OHM, 1/8W, J, CHI



Location No.	Part No.	Description
R12	20540064	OMF, 100K OHM, 1/8W, J, CHIP
R13	20540261	OMF, 56K OHM, 1/8W, J, CHIP
R14	20540261	OMF, 56K OHM, 1/8W, J, CHIP
R15	20540063	OMF, 10K OHM, 1/8W, J, CHIP
R16	20540063	OMF, 10K OHM, 1/8W, J, CHIP
R17	20540256	OMF, 3.9K OHM, 1/8W, J, CHIP
R18	20540256	OMF, 3.9K OHM, 1/8W, J, CHIP
R19	20540063	OMF, 10K OHM, 1/8W, J, CHIP
R20	20540063	OMF, 10K OHM, 1/8W, J, CHIP
R21	20540472	OMF, 4.7K OHM, 1/8W, J, CHIP
R22	20540472	OMF, 4.7K OHM, 1/8W, J, CHIP
R23	20540255	OMF, 560 OHM, 1/8W, J, CHIP
R24	20540255	OMF, 560 OHM, 1/8W, J, CHIP
R25	20540065	OMF, 220K OHM, 1/8W, J, CHIP
R26	20540065	OMF, 220K OHM, 1/8W, J, CHIP
R27	20540260	OMF, 18K OHM, 1/8W, J, CHIP
R28	20540260	OMF, 18K OHM, 1/8W, J, CHIP
R29	20540062	OMF, 5.6K OHM, 1/8W, J, CHIP
R30	20540062	OMF, 5.6K OHM, 1/8W, J, CHIP
R31	20540063	OMF, 10K OHM, 1/8W, J, CHIP
R32	20540063	OMF, 10K OHM, 1/8W, J, CHIP
R33	20540259	OMF, 8.2K OHM, 1/8W, J, CHIP
R34	20540259	OMF, 8.2K OHM, 1/8W, J, CHIP
R35	20540254	OMF, 470 OHM, 1/8W, J, CHIP
R36	20540254	OMF, 470 OHM, 1/8W, J, CHIP
R39	20540260	OMF, 18K OHM, 1/8W, J, CHIP
R40	20540260	OMF, 18K OHM, 1/8W, J, CHIP
R41	20540222	OMF, 2.2K OHM, 1/8W, J, CHIP
R42	20540222	OMF, 2.2K OHM, 1/8W, J, CHIP
R43	20540258	OMF, 7.5K OHM, 1/8W, J, CHIP
R44	20540258	OMF, 7.5K OHM, 1/8W, J, CHIP
R45	20540182	OMF, 47K OHM, 1/8W, J, CHIP
R46	20540182	OMF, 47K OHM, 1/8W, J, CHIP
R47	20540253	OMF, 22 OHM, 1/8W, J, CHIP

**RESISTORS (X29)**

R01	20512392	CF, 3.9K OHM, 1/6W, J
R02	20512392	CF, 3.9K OHM, 1/6W, J
R04	20512103	CF, 10K OHM, 1/6W, J
R05	20512273	CF, 27K OHM, 1/6W, J
R07	20512562	CF, 5.6K OHM, 1/6W, J
R08	20512103	CF, 10K OHM, 1/6W, J
R10	20512104	CF, 100K OHM, 1/6W, J
R13	20512104	CF, 100K OHM, 1/6W, J
VR1	22659054	VARIABLE, SEMI FIXED, 22K LOW
VR2	22659054	VARIABLE, SEMI FIXED, 22K HIGH

Location No.	Part No.	Description
<b>RESISTORS</b>		
R01	20512682	CF, 6.8K OHM, 1/6W, J
R02	20512682	CF, 6.8K OHM, 1/6W, J
R03	20512223	CF, 22K OHM, 1/6W, J
R04	20512223	CF, 22K OHM, 1/6W, J
R05	20512224	CF, 220K OHM, 1/6W, J
R06	20512224	CF, 220K OHM, 1/6W, J
R07	22570271	OMF, 560 OHM, 1W, J
R08	22570271	OMF, 560 OHM, 1W, J
R09	22555100	CF, 10 OHM, 1/4W, J
R10	22555100	CF, 10 OHM, 1/4W, J
R11	22555470	CF, 47 OHM, 1/4W, J
R12	22555470	CF, 47 OHM, 1/4W, J
R21	20514332	CF, 3.3K OHM, 1/4W, J
R22	20514332	CF, 3.3K OHM, 1/4W, J
R23	20514103	CF, 10K OHM, 1/4W, J
R25	20523391	OMF, 390 OHM, 1W, J
R26	20514102	CF, 1K OHM, 1/4W, J
R27	20512104	CF, 100K OHM, 1/6W, J
R28	20512103	CF, 10K OHM, 1/6W, J

**RESISTORS (X27)**

AC01	22908728	OWNER'S MANUAL USA
AC01	22908730	OWNER'S MANUAL EUROPE
AC02	22170518	CORD, WITH PIN PLUG