



HITACHI

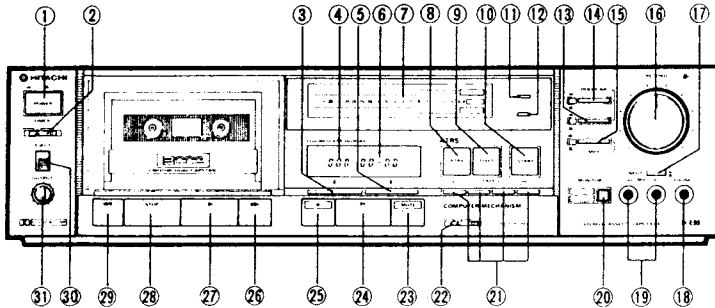
SERVICE MANUAL

TK

No. 1659E

D-E99

(U, C, FS, BS, AU, W)



CONTENTS

Specifications	2
Disassembly	2
Adjustment.....	4
Inspection of mechanism.....	6
Lubrications	7
Block diagram	8
Schematic diagram	10
Circuit board diagram	13
Wiring diagram.....	16
Schematic diagram (Counter PC board section)	19
IC pin function table.....	20
Microprocessor test program.....	26
Replacement parts list.....	27, 31
Exploded view (Mechanism-FL-32A).....	29
Exploded view (Cabinet).....	33

KEY TO ILLUSTRATIONS

- | | |
|-----------------------------------|------------------------------|
| ① POWER (MAINS) SWITCH | ①⑦ INPUT SELECT SWITCH |
| ② TIMER SWITCH | ①⑧ HEADPHONE SOCKET |
| ③ COUNTER RESET SWITCH | ①⑨ MICROPHONE SOCKETS |
| ④ TAPE COUNTER | ①⑩ MONITOR SWITCH |
| ⑤ ELAPSED TIME RESET SWITCH | ①⑪ TAPE SELECT SWITCHES |
| ⑥ ELAPSED TIMER | ①⑫ AUTO/MEMORY REWIND SWITCH |
| ⑦ DIGITAL PEAK METER | ①⑬ REC. MUTE BUTTON |
| ⑧ ATRS BUTTON | ①⑭ PAUSE BUTTON |
| ⑨ FIXED BUTTON | ①⑮ RECORD BUTTON |
| ⑩ ATRS START BUTTON | ①⑯ FAST FORWARD BUTTON |
| ⑪ BATTERY INDICATOR | ①⑰ PLAYBACK BUTTON |
| ⑫ TEST INDICATOR | ①⑱ STOP BUTTON |
| ⑬ DOLBY B/C NR CHANGE OVER SWITCH | ①⑲ REWIND BUTTON |
| ⑭ DOLBY NR SWITCH | ①⑳ EJECT BUTTON |
| ⑮ MPX SWITCH | ①㉑ OUTPUT LEVEL CONTROL |
| ⑯ RECORDING LEVEL CONTROLS | |

SAFETY PRECAUTION

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety related characteristics, always use genuine Hitachi's replacement parts. Especially critical parts in the power circuit block should not be replaced with other makes.
Critical parts are marked with Δ in the schematic diagram and circuit board diagram.
2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to ascertain that it is completely safe to operate without danger of electrical shock.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

STEREO CASSETTE TAPE DECK

December 1981

TOKAI WORKS

SPECIFICATIONS

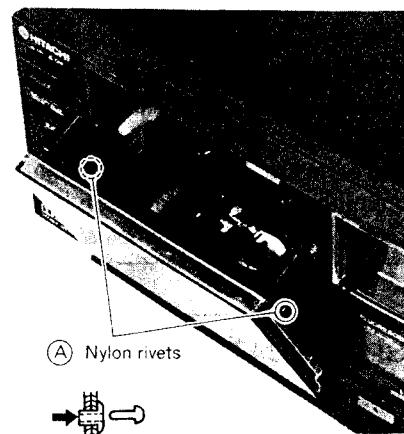
Semiconductors :		Dolby C NR ON :	75 dB (Weighted A, Reference 3% THD, Metal tape)
Modules :	5		75 dB*
ICs :	11	Wow and Flutter :	0.032% (WRMS)
Transistors :	58		0.10%*
FETs :	2	Input Sensitivity and Impedance :	
Diodes :	58	Microphone :	0.4mV, 300 ohms-5 kohms
LEDs :	14	Line in :	100mV, 50 kohms or more
Track System :	4 track 2 channel stereo	Output Level :	500mV
Tape :	Cassette tape (C-30, 60, 90)	Output Load Impedance :	
Tape Speed :	4.75cm/s	Line out :	50 kohms or more
Recording System and		Headphone :	8 ohms-2 kohms
Bias Frequency :	AC bias, 105 kHz	Distortion :	0.8% (1 kHz, 160 nwb/m)
Erasing System :	AC erase	Channel Separation :	30 dB or more (at 1 kHz)
Erase Ratio :	65 dB or more (at 1 kHz)	Cross Talk :	60 dB or more (at 1 kHz)
Frequency Response :		Power Supply :	AC 120V, 60 Hz (U, C)
NOR-I :	20 Hz-19 kHz		AC 100-110V/115-127V/
	30 Hz-17 kHz \pm 3 dB		200-220V/230-250V,
	25 Hz-18 kHz*		50/60 Hz (W)
CrO ₂ -II :	20 Hz-21 kHz		AC 220V, 50 Hz (FS)
	30 Hz-18 kHz \pm 3 dB		AC 240V, 50 Hz (BS, AU)
	25 Hz-19 kHz*	Power Consumption :	29W
FeCr-III :	20 Hz-19 kHz	Dimensions :	110(H) \times 435(W) \times 282(D)mm
	30 Hz-17 kHz \pm 3 dB	Weight :	6.3 kg
	25 Hz-18 kHz*	Motor :	FG Servomotor \times 1
METAL-IV :	20 Hz-21 kHz		DC motor \times 1
	30 Hz-19 kHz \pm 3 dB	Heads :	1.4mm gap Metal R & P head
	25 Hz-20 kHz*		(ferrite)
S/N (Signal to Noise Ratio) :			Ferrite guard Metal erase head
Dolby NR OFF :	61 dB (Weighted A, Reference 3% THD, Metal tape)		(Permalloy)
	61 dB*		
Dolby B NR ON :	69 dB (Weighted A, Reference 3% THD, Metal tape)		
	69 dB*		

* According to DIN 45 500

DISASSEMBLY

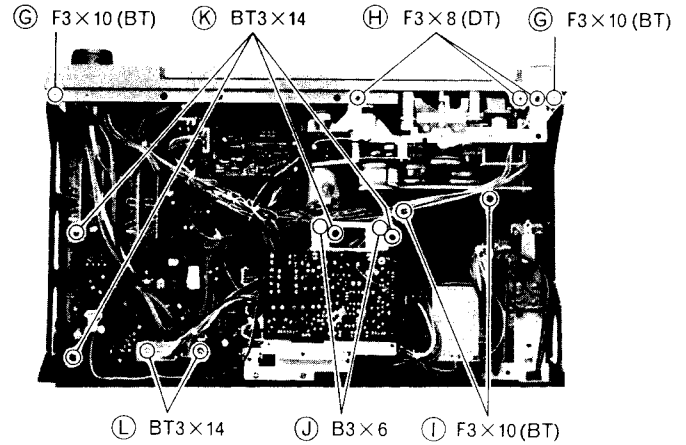
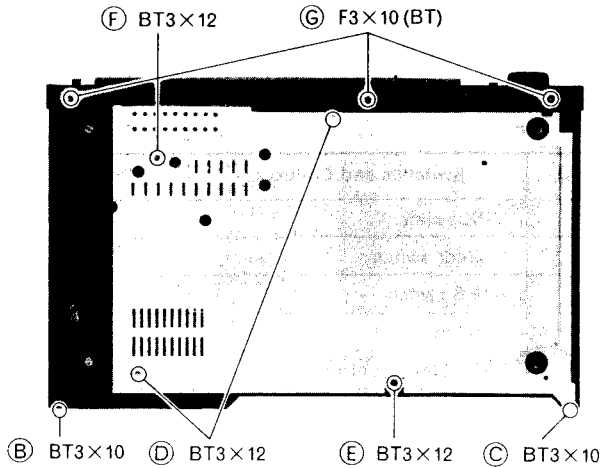
1. Cassette door

Depress the eject button to open the cassette door.
Remove (A) (two) nylon rivets and remove the cassette door.



Note :

The photos used here show the [W] model unit.



2. Upper cover

Remove (B) and (C) (two) screws.

3. Bottom cover

Remove (C), (D), (E) and (F) (five) screws.

4. Front panel

Remove (G) and (H) (eight) screws.

5. Cassette chassis

After removing the front panel, remove (F) and (I) (three) screws.

6. Power PC board

Remove (J) (two) screws and open the PC board.

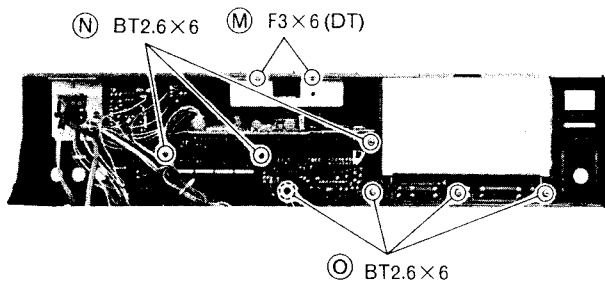
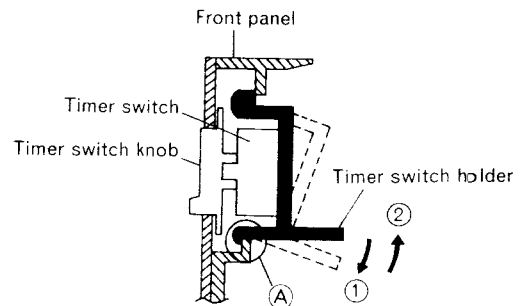
7. Main PC board

After removing the front panel, remove (E), (K) and (L) (seven) screws.

8. Timer switch

Press the projection of the timer switch holder in the direction of the arrow (1) to remove the timer switch.

Engage section (A) and then press the switch holder in the direction of the arrow (2) to install the timer switch.



9. Meter PC board assembly

Remove (M) (two) screws.

10. Counter PC board

Remove (N) (three) screws.

11. Function switch PC board

Remove (O) (four) screws.

ADJUSTMENT

Perform the following adjustments in the sequence stated after cleaning the heads, pressure rollers, and capstans with a head cleaning stick moisted in alcohol. Also, unless otherwise specified, set the switches and controls to the positions indicated in the table.

Symbol No.	Switches and Controls	Position	Symbol No.	Switches and Controls	Position
S1	Input select switch	LINE	S7	MPX switch	OFF
S2	Tape select switch	NOR-I	S8	Monitor switch	TAPE
S3	Auto/memory REW switch	OFF	S109	ATRS switch	OFF
S4	Timer switch	OFF	S111	Fixed switch	ON
S5	Dolby NR switch	OFF	RV1L, R	Record level controls	MAX.
S6	Dolby NR B/C switch	B	RV2L, R	Output level control	MAX.

* According to DIN 45 500

Item	Adjustments	Measuring Instrument and Connection			Check Tape	Mode	Adjusted Position	Adjusted Value	Remarks
		Measuring Instrument	Input Terminal	Output Terminal					
1	Tape speed	· Frequency counter	—	LINE OUT	MTT-111, 3000 Hz (3150 Hz*)	Playback	Semi-variable resistor in the motor	3000 Hz +20 Hz - 5 Hz (3150 Hz*)	See Note 1
2	(1) Tilt and height of the head	· Head adjusting jig	—	—	—	Playback	Screw (A), (B), (C)	—	See Note 2
	(2) Head azimuth	· VTVM	—	LINE OUT	MTT-114 (10 kHz)	Playback	Screw (C)	Output Max.	See Note 3
3	Digital peak meter	· Audio oscillator (400 Hz) · Attenuator · VTVM	LINE IN	TP1L, R	—	—	RT303L, R	0 dB indicators flash	See Note 4
4	Playback gain	· VTVM	—	TP2L, R	MTT-150, 400 Hz, 20m Maxwell	Playback	RT301L, R	580mV	See Note 5

Note :

- Adjust within 30 sec. after heat-running for more than 20 minutes.
- Use the Hitachi head adjusting jig and instructions (consult nearest Hitachi office) to obtain the correct head height, tilt and azimuth. This adjustment has to be done alternately.
- When the maximum values of both channels are different, adjust to the maximum value of the L channel. In this case, the difference between the maximum values of both channels should be within 2 dB.
- 1) Set the monitor switch to the SOURCE position.
2) Feed a 400 Hz signal to the LINE IN jacks and adjust the audio oscillator output so that the level of TP1L, R becomes 580mV.
3) Then, adjust the attenuator to lower the output level by 0.5 dB and adjust RT303L, R so that 0 dB indicators of the digital peak meter flash.
4) Adjust the attenuator to increase the output level by 0.5 dB and confirm 0 dB indicators of the digital peak meter light up.
- Playback a test tape (MTT-150, 400 Hz 20m Maxwell) and adjust RT301L, R so that the level of TP2L, R becomes 580mV.

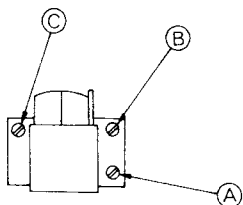


Fig. 1

ATR\$ circuit adjustment

Item	Adjustments	Measuring Instrument and Connection			Check Tape	Mode	Adjusted Position	Adjusted Value	Remarks
		Measuring Instrument	Input Terminal	Output Terminal					
1	Bias current	· Audio oscillator (1.5kHz/15kHz, 0dB-23dB) · Attenuator · VTVM	LINE IN	LINE OUT	Hitachi UD C-90 tape	Record	RT103L, R	Output difference within ± 0.5 dB	See Note 1
2	Bias trap	Set RV1L, R (Record level control) to Minimum.							
		· VTVM	—	TP3L, R	—	Record	L108L, R	Min.	See Note 2
3	Record level	· Audio oscillator (1kHz, 0dB-23dB) · Attenuator · VTVM	LINE IN	LINE OUT	Hitachi UD C-90 tape	Record	RT102L, R	Output difference within ± 0.2 dB	See Note 3
4	AF oscillator	Set the AUTO/MEMORY REW switch (S3) to PLAY position and connect a diode (1S2473 or 1S2076) as shown in Fig. 2. Then, set the power switch to ON. (Microprocessor test program is performed)							
		· VTVM	—	TP4	—	—	RT101	Output difference within ± 0.3 dB	See Note 4
5	A/D conversion	· Audio oscillator (1kHz, 0dB-23dB) · Attenuator · VTVM	LINE IN	LINE OUT	Hitachi UD C-90 tape	Record	RT302L, R	0dB ± 0.3 dB	See Note 5

Note :

- 1) Set the monitor switch to the SOURCE position and feed a 1.5kHz signal to the LINE IN jacks in the recording mode.
 - 2) Adjust the audio oscillator output so that the digital peak meter indicates 0 dB. Then, adjust the attenuator to lower the output level by 23 dB.
 - 3) Set the monitor switch to the TAPE position and read the playback output level of LINE OUT jacks.
 - 4) Then, set the audio oscillator frequency to 15kHz and read the playback output level of LINE OUT jacks.
 - 5) Adjust RT103L, R so that the output level difference between two frequencies is within ± 0.5 dB.
2. With the condition shown in item 1, set RV1L, R (Record level control) to Minimum. Then, adjust L108L, R so that the level of TP3L, R becomes minimum.
3. 1) Set the monitor switch to the SOURCE position and feed a 1kHz signal to the LINE IN jacks in the recording mode.
 - 2) Adjust the audio oscillator output so that the digital peak meter indicates 0 dB. Then, adjust the attenuator to lower the output level by 23 dB.
 - 3) Set the monitor switch to the TAPE position and adjust RT102L, R so that the output level difference between SOURCE and TAPE is within ± 0.2 dB at LINE OUT jacks.
4. 1) Connect the VTVM to TP4, press the PLAY button and read the output of the 1 kHz signal.
 - 2) Next, press the REC button, read the output of the 12kHz signal and adjust RT101 so that the output difference between 1kHz signal and 12kHz signal is within ± 0.3 dB.
 - 3) After adjustment, remove a diode as shown in Fig. 2.

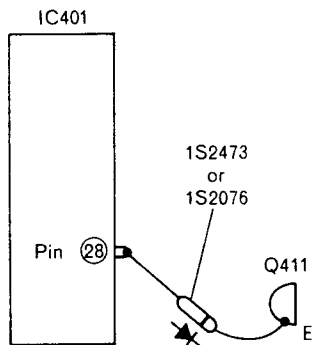


Fig. 2

5. 1) Perform the ATRS test using Hitachi UD(C-90) tape.
- 2) Set the monitor switch to the SOURCE position and feed a 1kHz signal to the LINE IN jacks in the recording mode.
- 3) Adjust the audio oscillator output so that the digital peak meter indicates 0 dB. Then, adjust the attenuator to lower the output level by 23 dB.
- 4) Read the output of LINE OUT jacks when the monitor switch is changed over, and adjust RT302L, R so that the output when the MONITOR switch is set to TAPE is within ± 0.3 dB with respect to the output when the monitor switch is set to SOURCE.

INSPECTION OF MECHANISM

Check Item		Reference Value	Remarks	
1	Pressure roller (Take-up side)	Pressure	Measure in playback mode (Fig. 3)	
		Driving force		420—500g
2	Pressure of pressure roller (Supply side)	120g or more	Measure in playback mode (Fig. 4)	
3	Pressure of take-up idler	130—180g	Measure in playback mode (Fig. 5)	
4	Torque	60g or more		
		Take-up	35—65g·cm	Measure in fast forward mode
		Fast forward	75—110g·cm	
Rewind	Measure in rewind mode			
5	Back tension	9—12g·cm (See Note 1)	Measure in playback mode (Fig. 6)	
		Supply side		
6	Brake torque	1.7—5g·cm	Measure in stop mode (Fig. 7)	
		Take-up side		
7	Head plate return strength	50—100g·cm	Measure in stop mode (Fig. 8)	
8	Head plate play lock allowance	200g or more	Measure in playback mode (Fig. 9)	
9	Head plate pressing strength	300g or more	Measure in playback mode (Fig. 10)	

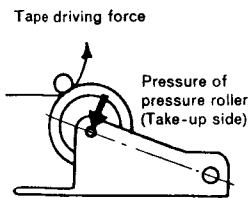


Fig. 3

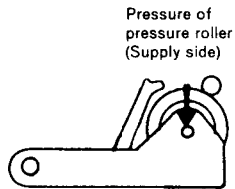


Fig. 4

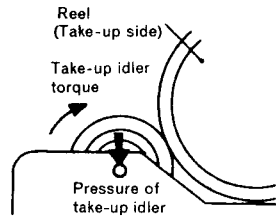


Fig. 5

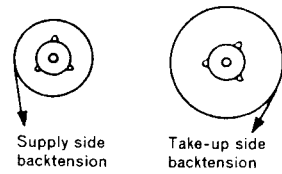


Fig. 6

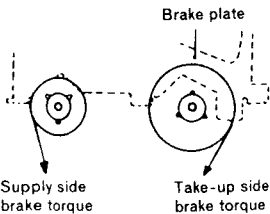


Fig. 7

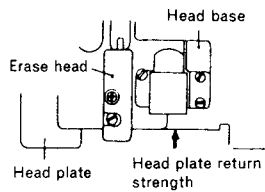


Fig. 8

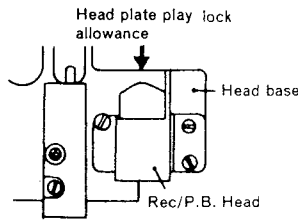


Fig. 9

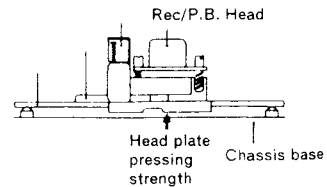
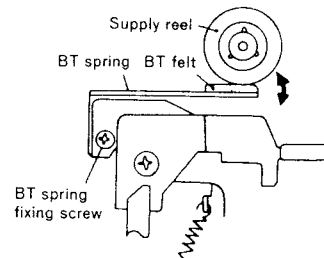


Fig. 10

Note 1. Back tension adjustment

When the supply back tension is out of the reference value, loosen the BT spring fixing screw and move the BT spring up and down to adjust so that the back tension is within the reference value.



LUBRICATIONS

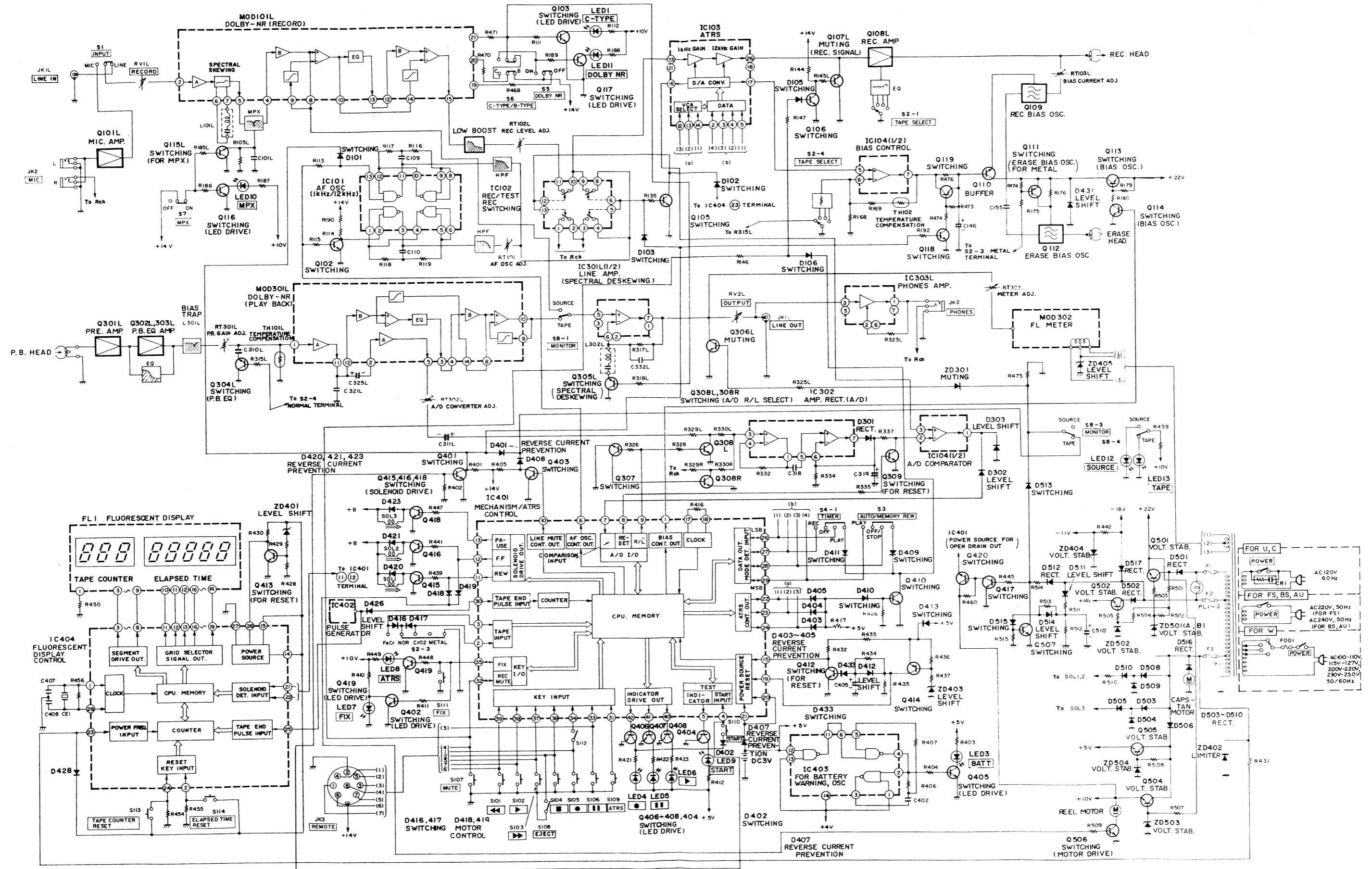
Lubricate one or two drops of oil to rotating point or lubricate grease to sliding point.

Lubricate the respective parts listed once every 1000 hours or once a year under normal conditions of use.

Avoid oiling them excessively, or rotation may become irregular because of oil splashes.

Lubrication		Oil or Grease
Rotary section	Metal and metal	Pan motor oil (10W-40)
	Mold and metal	Sonic slider oil (#1600)
Sliding section	Metal and metal	Hitasol (MO-138)
	Mold and mold Mold and metal	White grease (FL-LUBE-A)
Spring resonance prevention		Froil (GB-TS-1)

BLOCK DIAGRAM



SCHMATIC DIAGRAM

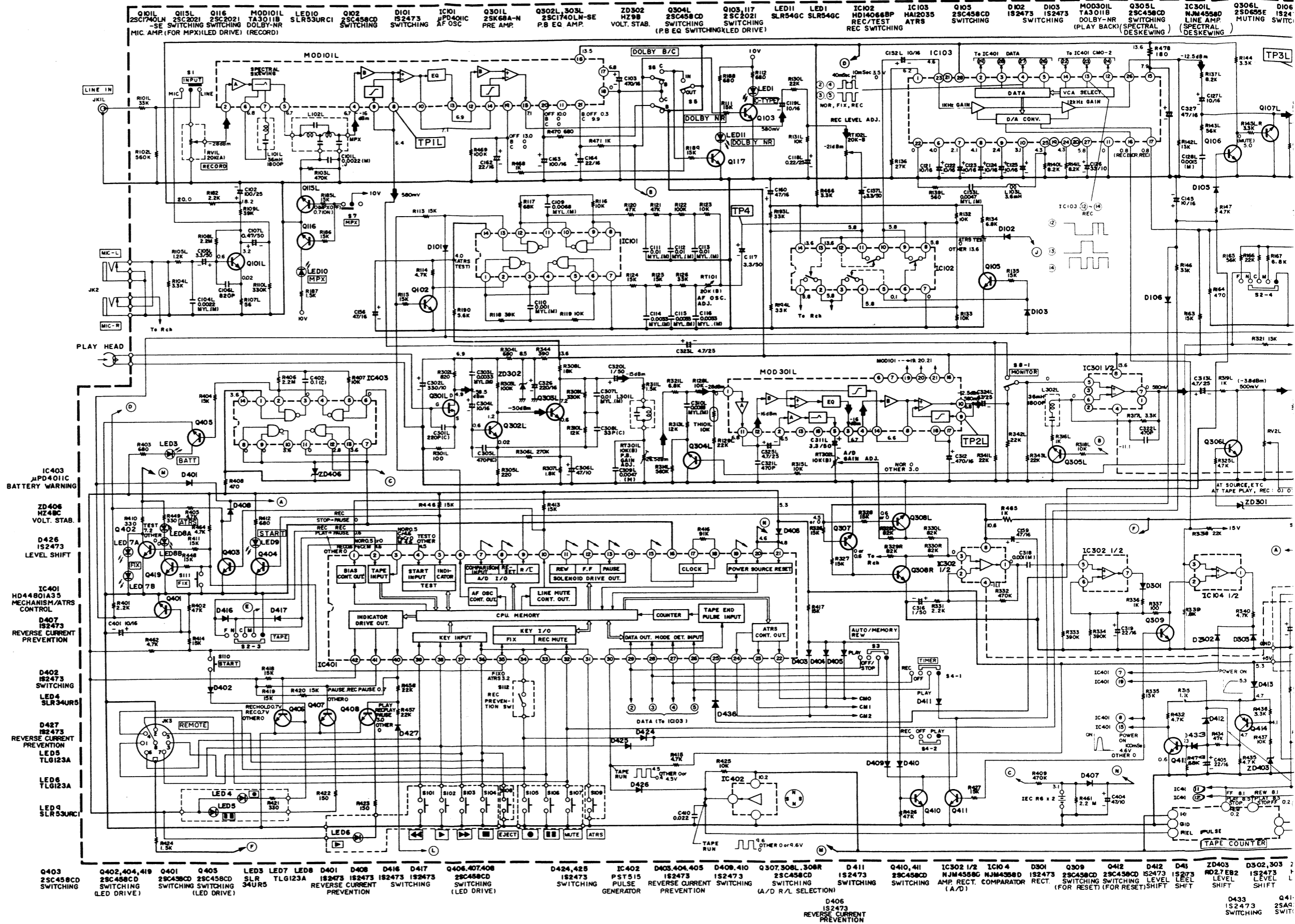
Note

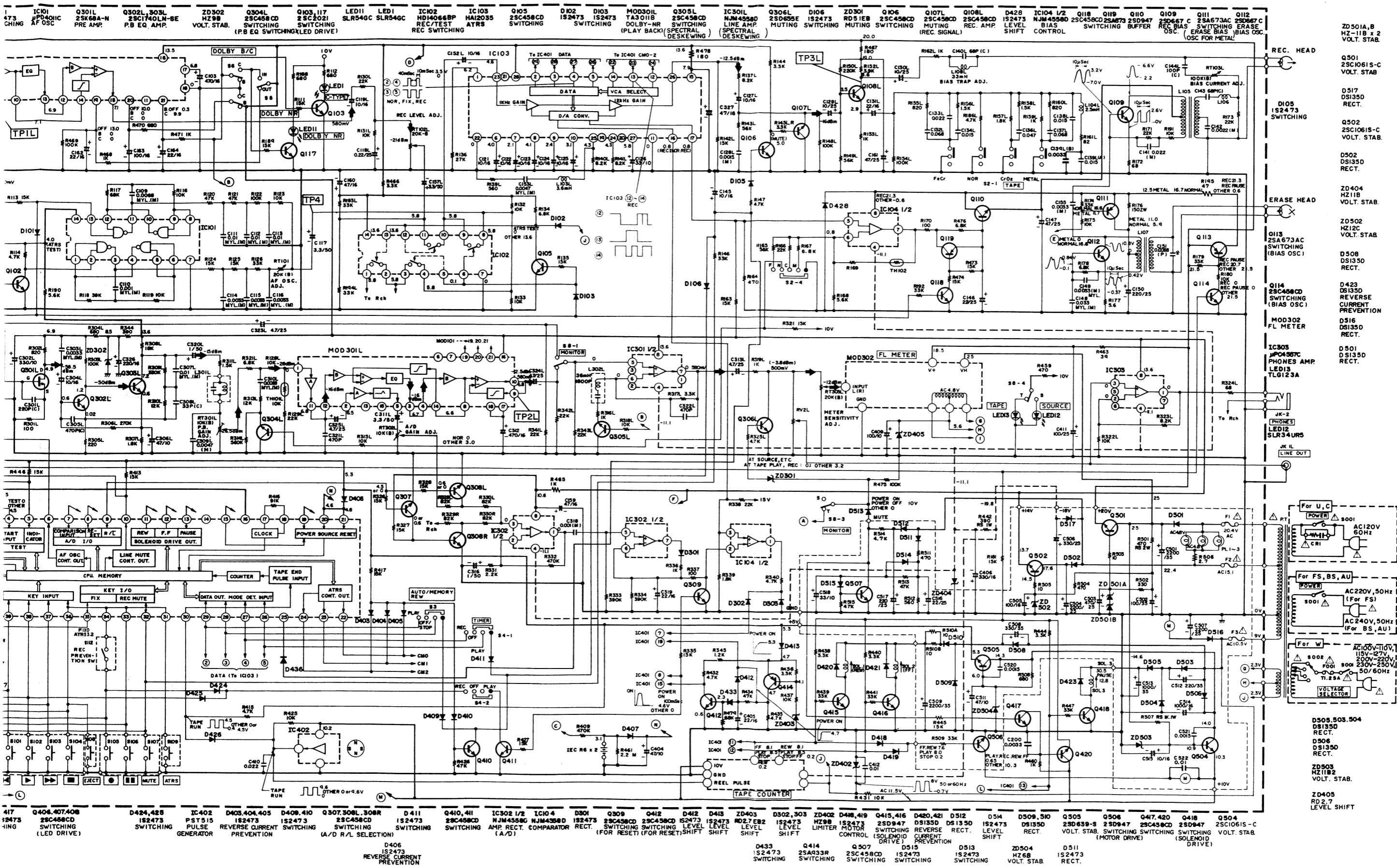
1. Voltage measured at base of chassis with minimum volume control and no signal.
2. Nomenclature of Resistors and Capacitors.

Circuit No.	
Value	No indicated Ω(Ohm) M : 1000 kΩ
Tolerance	No indicated ±5% K : ±10% M : ±20%
Wattage	No indicated ¼W
Sort	No indicated Carbon film RC : Composition RW : Wire wound RS : Oxide metal film RN : Fixed metal film

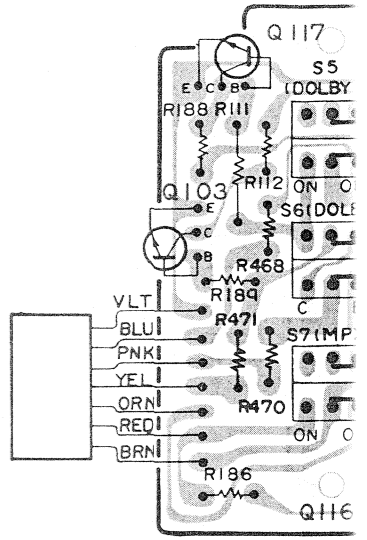
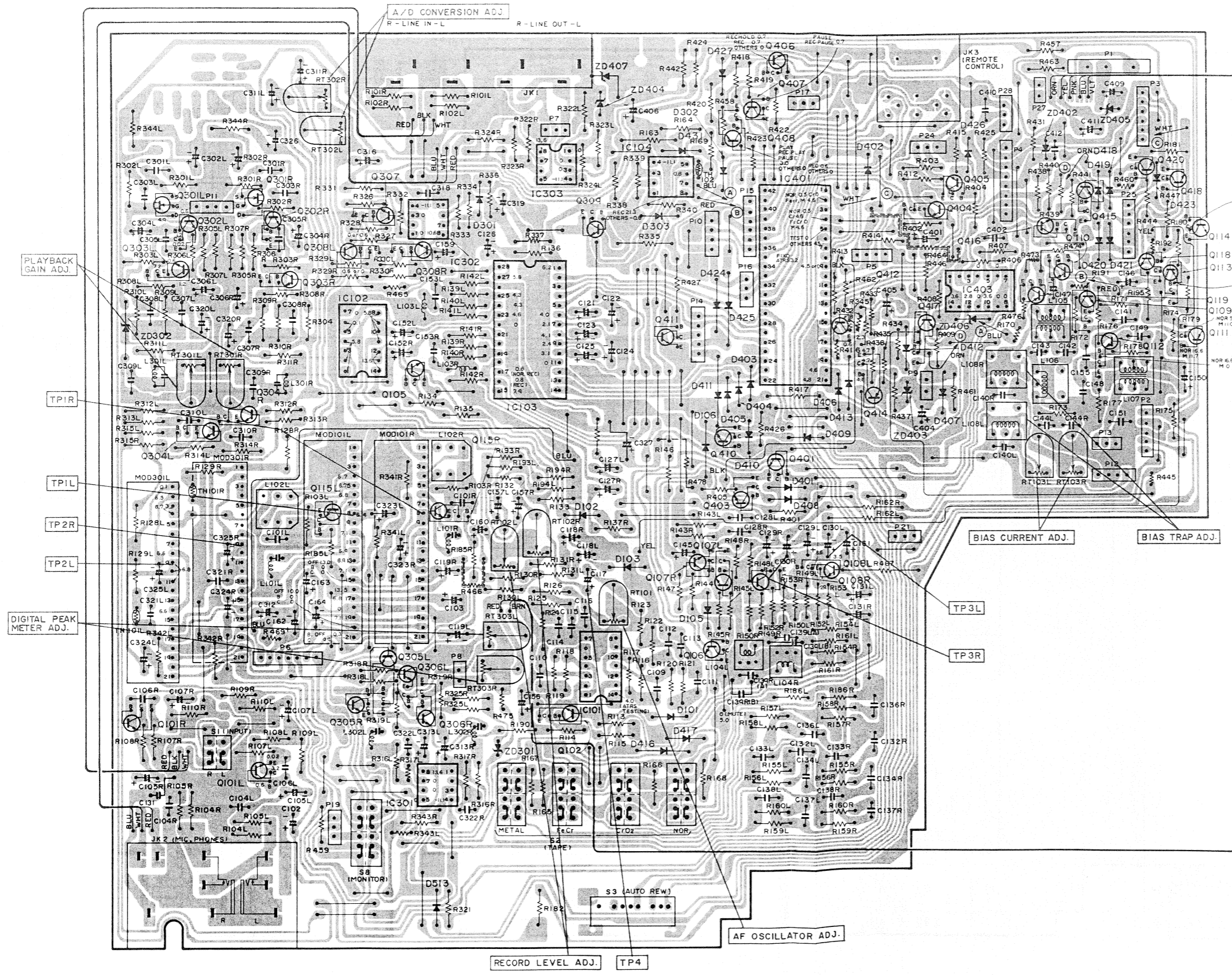
Circuit No.	
Value	No indicated μF P : PF
Tolerance	No indicated ±10% J : ±5% M : ±20% Z : +80% -20% D : ±0.5pF C : ±0.25pF
Sort	Ceramic
	Electrolytic
	Mylar
	Polyester
	Styrol
Voltage	No indicated 50WV

3. Be sure to make your orders of resistors and capacitors with value, voltage, tolerance and sort.
4. When replacing capacitors marked with *, use specified ones stated on parts list since required temperature characteristics.

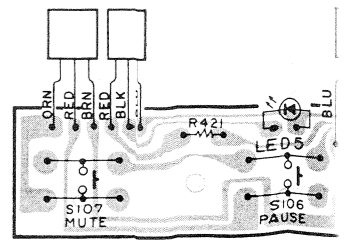
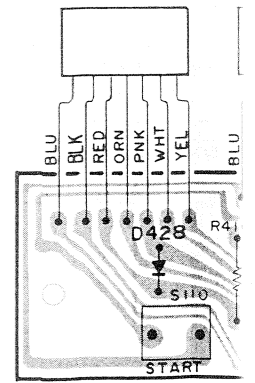


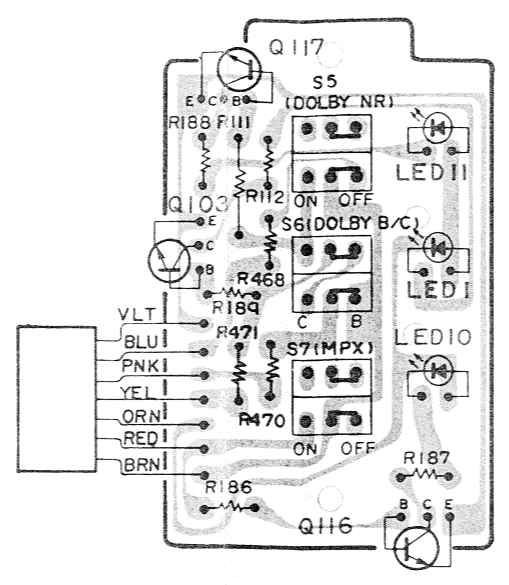
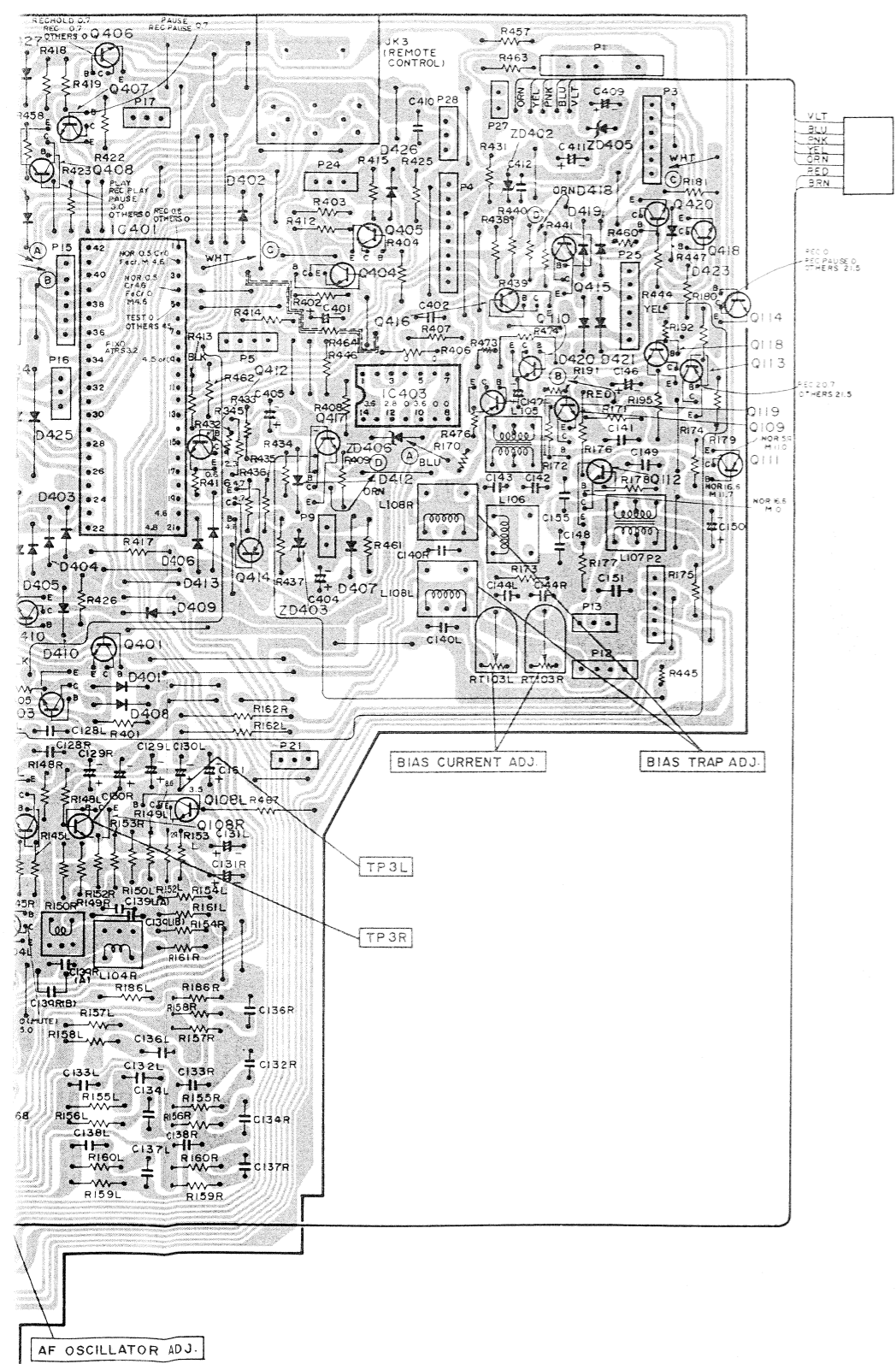


CIRCUIT BOARD DIAGRAM

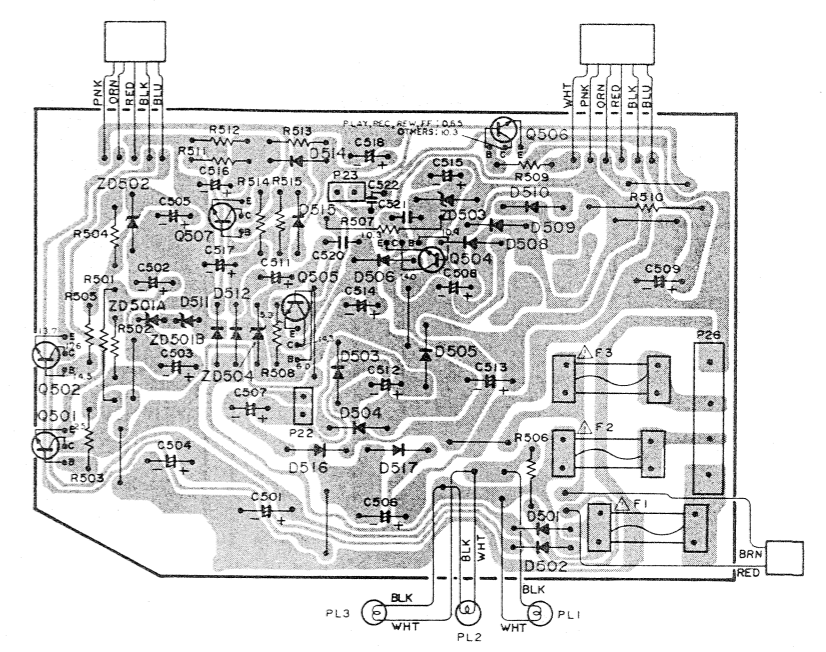


DOLBY SWITCH

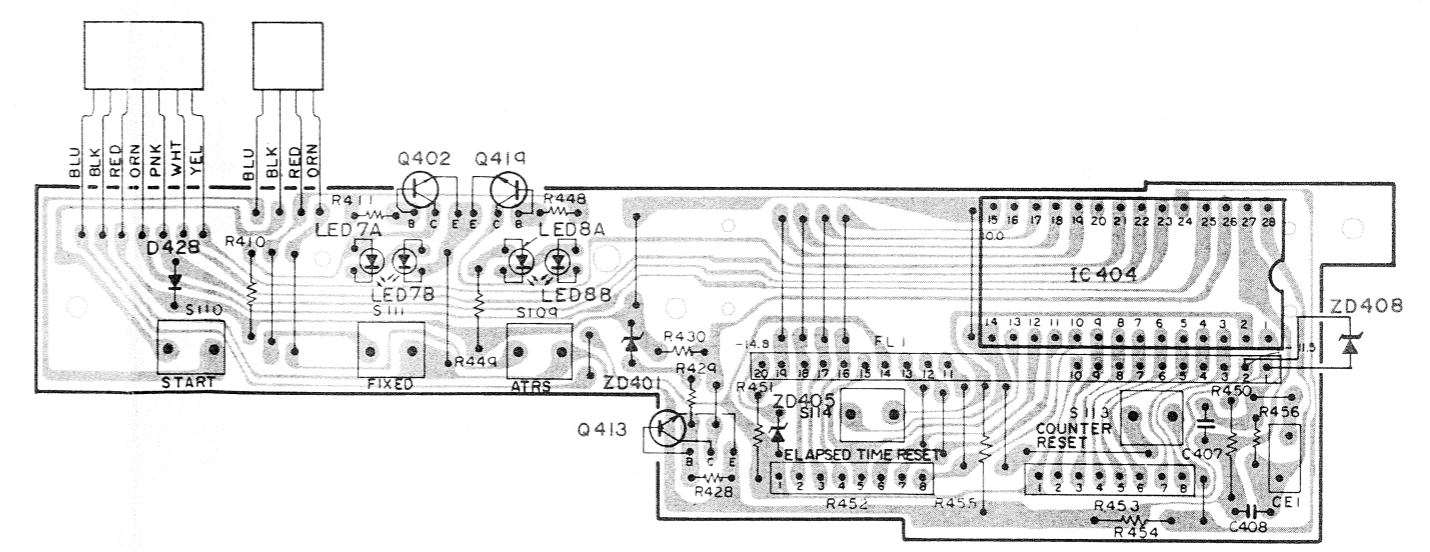




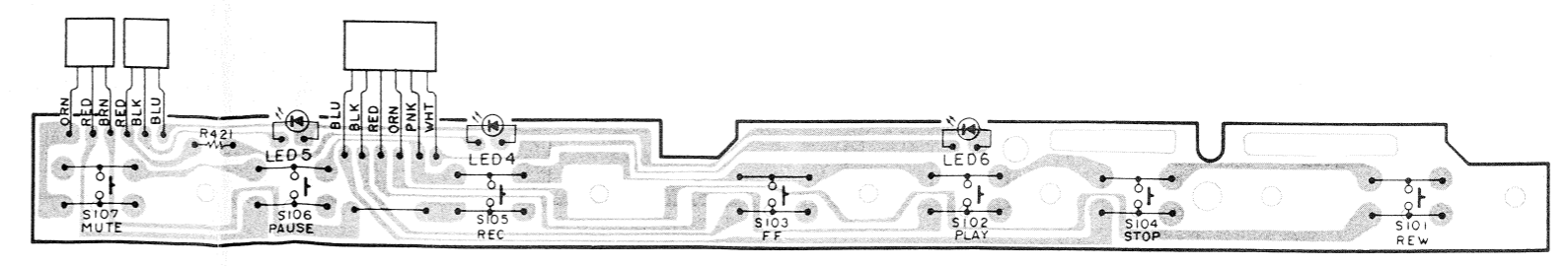
DOLBY SWITCH



POWER

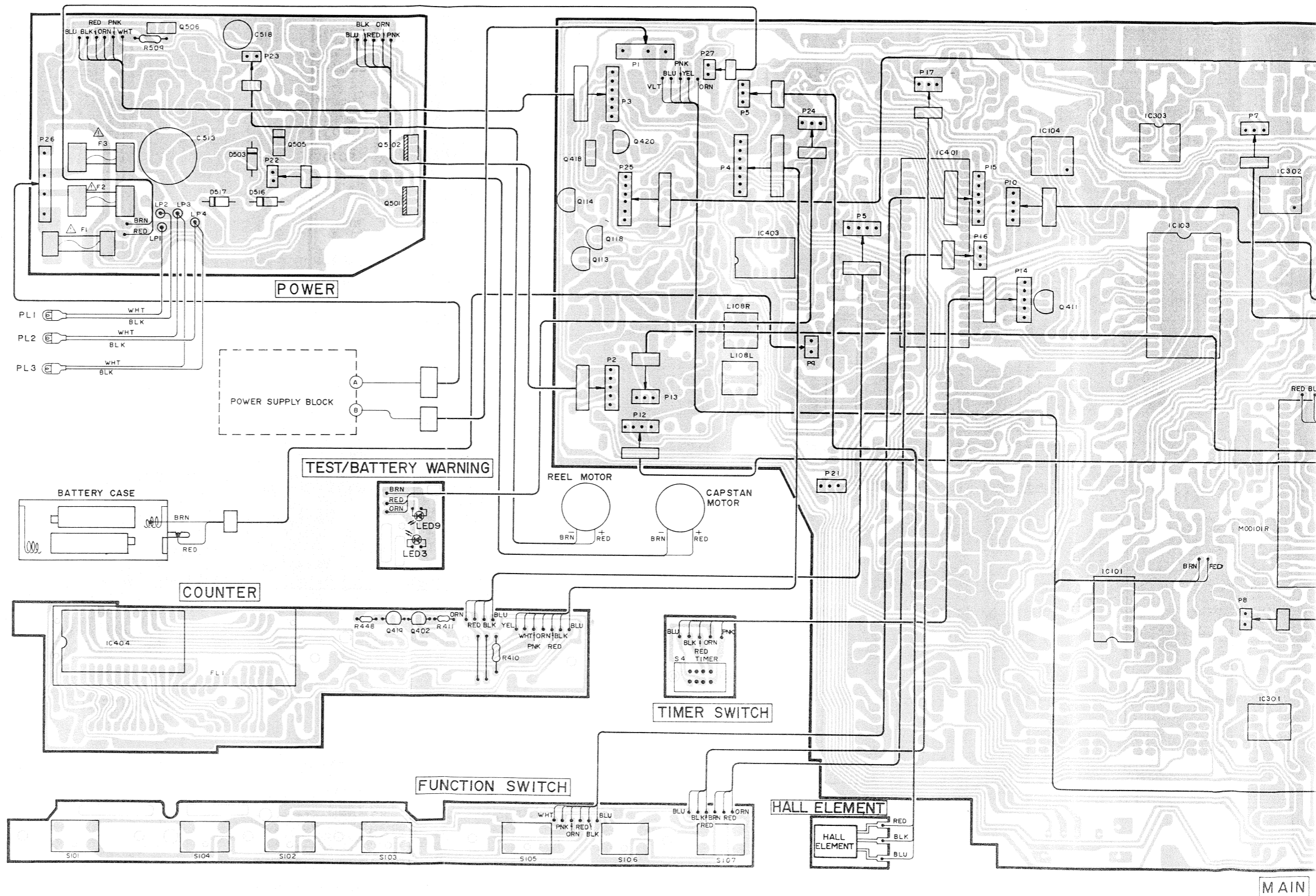
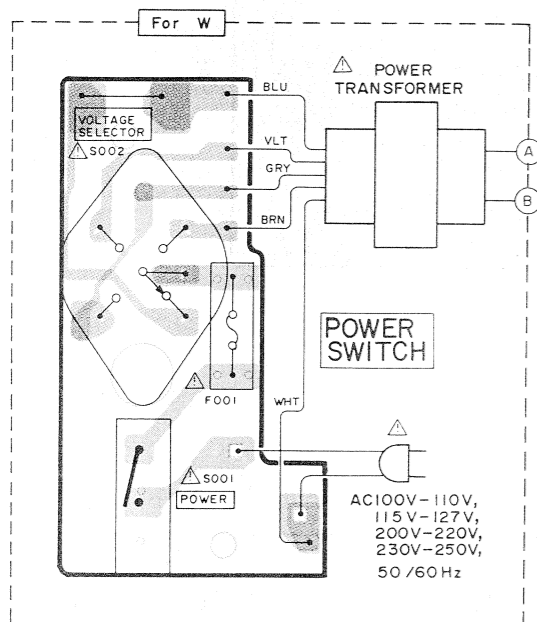
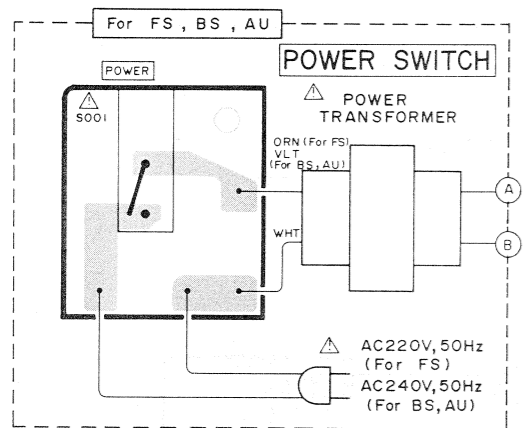
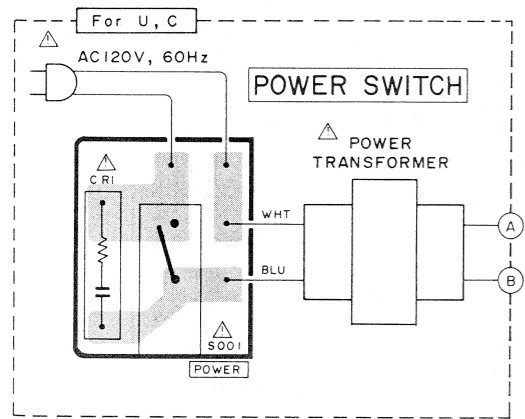


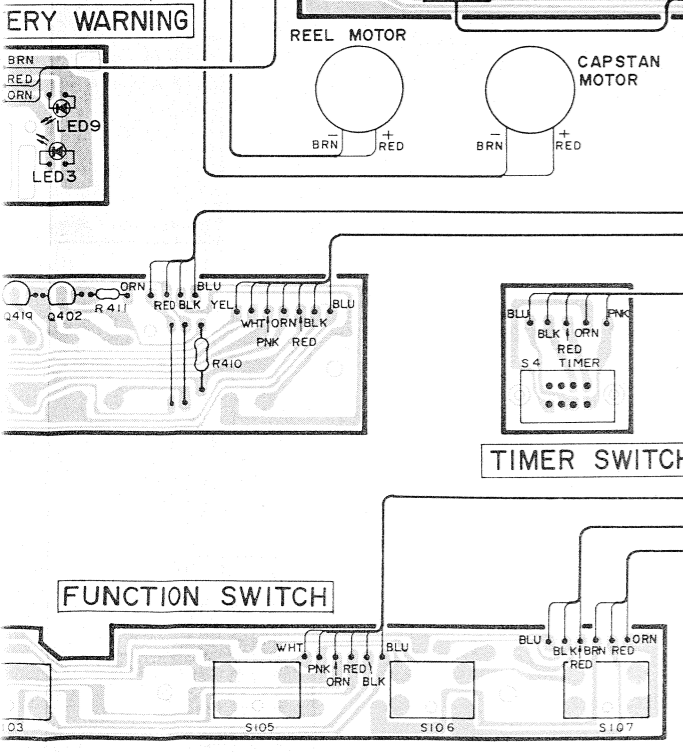
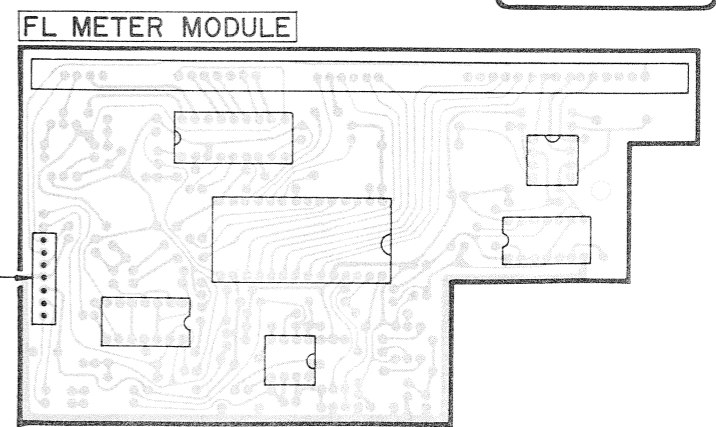
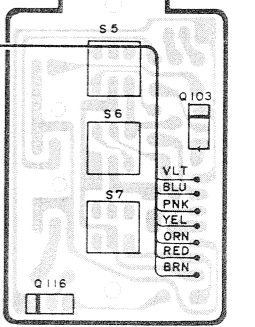
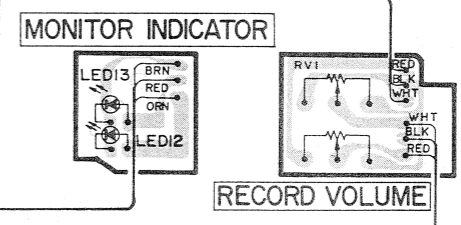
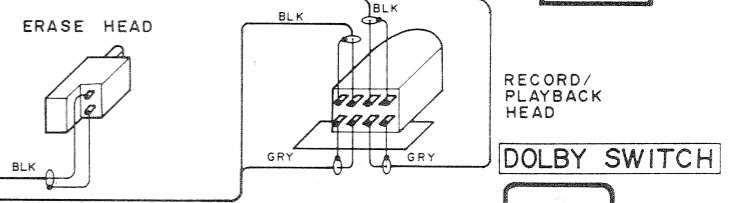
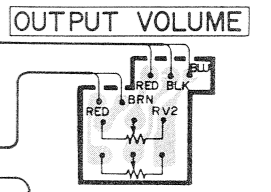
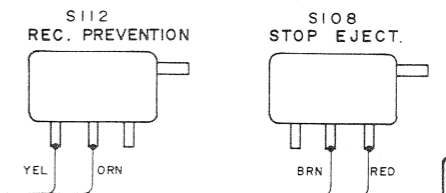
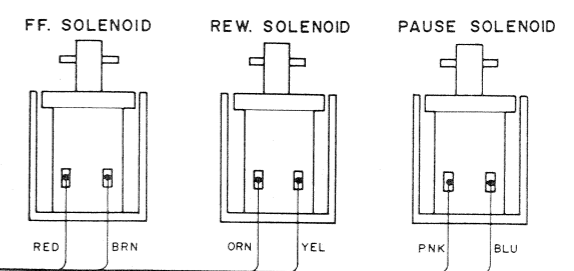
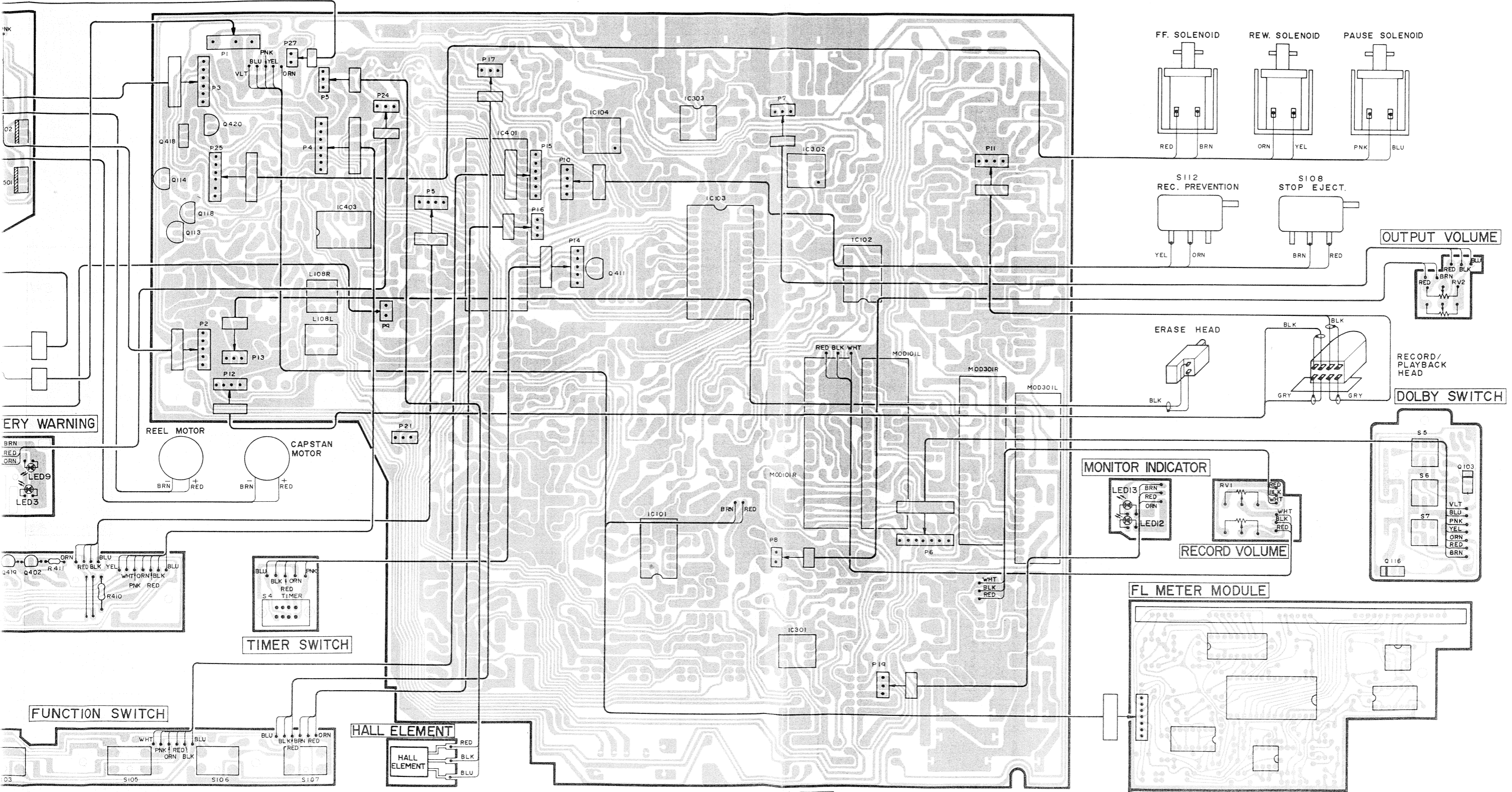
COUNTER



FUNCTION SWITCH

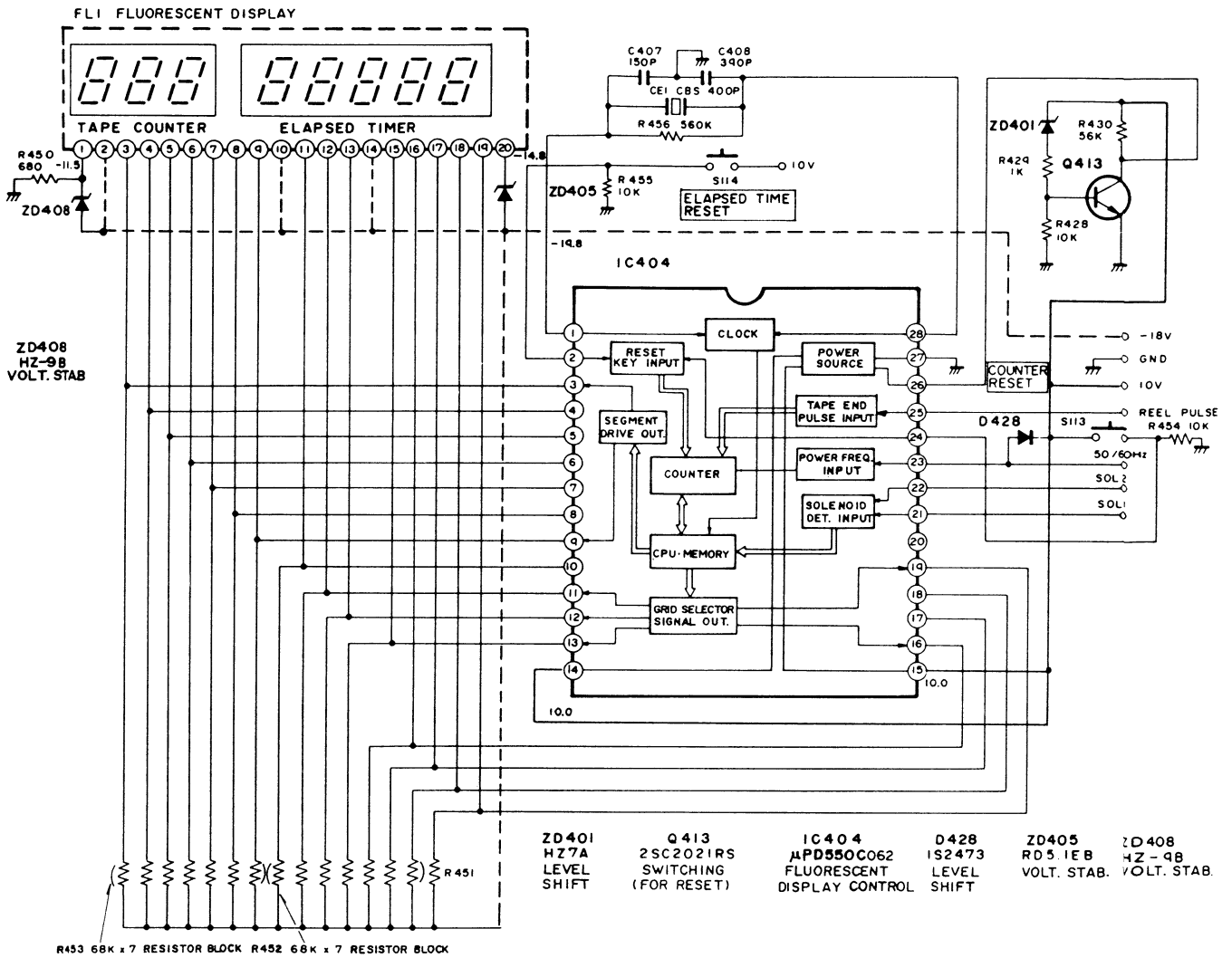
WIRING DIAGRAM





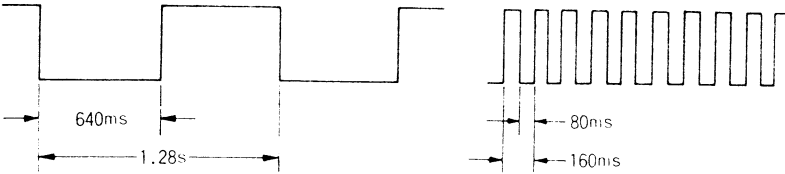
MAIN

SCHEMATIC DIAGRAM (Counter PC Board Section)



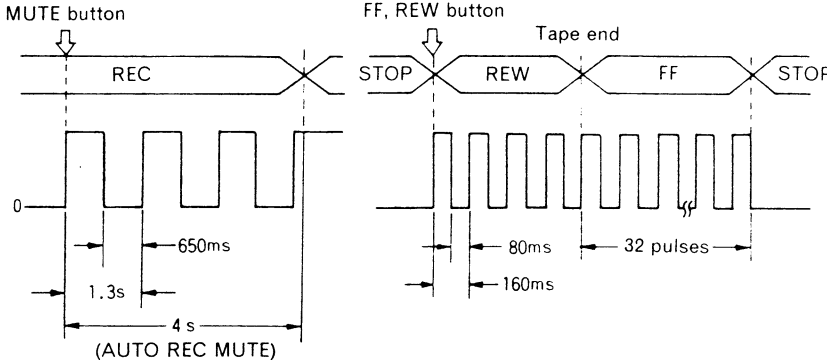
IC PIN FUNCTION TABLE

1. IC401 (HD44801A35 for mechanism/ATRS control)

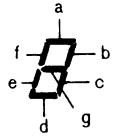
Pin No.	Pin Symbol	Function															
1	BIAS	<ul style="list-style-type: none"> Control output pin to operate the bias oscillation circuit. Outputs Lo potential normally and Hi potential in the REC mode and the REC-PAUSE mode after recording. Outputs after elapse of the inhibit time of 120 ms when the mode is changed from STOP, PLAY or PAUSE, and outputs after elapse of the inhibit time of 820 ms when the mode is changed from FF or REW. 															
2 3	TAPE SELECT 1 TAPE SELECT 2	<ul style="list-style-type: none"> Tape select switch (S2) position detection input pin. Detects the tape select switch position according to the truth table shown below and changes over the output data. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Switch position Input pins</th> <th>NORMAL</th> <th>FeCr</th> <th>CrO₂</th> <th>METAL</th> </tr> </thead> <tbody> <tr> <td>Pin ②</td> <td>0</td> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>Pin ③</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> </tr> </tbody> </table>	Switch position Input pins	NORMAL	FeCr	CrO ₂	METAL	Pin ②	0	1	0	1	Pin ③	0	0	1	1
Switch position Input pins	NORMAL	FeCr	CrO ₂	METAL													
Pin ②	0	1	0	1													
Pin ③	0	0	1	1													
4	TEST START	<ul style="list-style-type: none"> ATRS test start detection input pin. Inputs Hi potential normally and inputs Lo potential by the button operation in the REC, REC-PAUSE or REC-HOLD mode, to detect the ATRS test start. The ATRS test starts actually when the input is detected during the REC or REC-PAUSE mode. Outputs Lo potential when executing the ATRS test and outputs Hi potential normally. 															
5	TEST INDI.	<ul style="list-style-type: none"> Test indicator drive output pin. Outputs Lo potential normally and outputs the flashing pulse with 1.28 sec. period when executing the ATRS test. When error occurs during the ATRS test, the flashing pulse with 160 ms period is output as error indication. This error indication continues until the play button or pause button key input is given. 															
6	AF OSC (1 kHz/12 kHz)	<ul style="list-style-type: none"> AF signal oscillator control output pin. Outputs Hi potential until ATRS test starts when power is ON, and outputs Lo potential when recording the 12 kHz signal during execution of the ATRS test. It is set to the Lo potential output mode after ATRS test is completed. 															
7	A/D COMP.	<ul style="list-style-type: none"> A/D comparator output input pin. Detects the inversion output (fall signal from Hi to Lo potential) of the A/D comparator during execution of the ATRS test. 															
8	A/D RESET	<ul style="list-style-type: none"> A/D comparator circuit reset control output pin. Outputs Lo potential in other modes than the ATRS operation, and outputs Hi potential with 80 ms width for approx. 3 sec. after power is supplied or just after scanning the A/D comparison reference voltage during execution of the ATRS test to reset the test sample hold. 															
9	A/D SELECT	<ul style="list-style-type: none"> A/D comparison circuit input (play output signal) channel select control output pin. <ul style="list-style-type: none"> When Hi potential is output : R channel When Lo potential is output : L channel 															

Pin No.	Pin Symbol	Function																																							
10	LINE MUTE	<ul style="list-style-type: none"> LINE amp final stage muting control output pin. Outputs Hi potential during REC, PLAY and REC-PAUSE after recording to mute the play signal of the LINE amp output. Hi potential is output after elapse of the inhibit time of 120 ms during play, after elapse of the inhibit time of 400 ms during record and after elapse of the inhibit time of 1100 ms when changing the mode from FF or REW. 																																							
11	REW SOL.	<ul style="list-style-type: none"> REW solenoid drive output pin. Outputs Lo potential normally and Hi potential during REC, PLAY and REW. 																																							
12	FF SOL.	<ul style="list-style-type: none"> FF solenoid drive output pin. Outputs Lo potential normally and outputs Hi potential during REC, PLAY and FF. 																																							
13	PAUSE SOL.	<ul style="list-style-type: none"> PAUSE solenoid drive output pin. Outputs Lo potential normally and outputs Hi potential during REC-PAUSE mode and PLAY-PAUSE mode. 																																							
14	NC	<ul style="list-style-type: none"> Blank pin. 																																							
15	RESET	<ul style="list-style-type: none"> Initial reset input pin. This pin input is set to Hi potential when power is supplied to perform initial resetting. 																																							
16	GND	<ul style="list-style-type: none"> Connected to GND 																																							
17 18	OSC 1 OSC 2	<ul style="list-style-type: none"> The external resonance circuit is coupled with these pins to operate the built-in clock oscillation circuit which is the reference of microprocessor operation. The oscillation frequency is set to 400 kHz. 																																							
19	HALT	<ul style="list-style-type: none"> HALT pin. This pin changes from Lo potential to Hi potential when power is supplied and the program of the microprocessor is executed. It is set to Lo potential when power is set to OFF and the execution of the program stops and is held. 																																							
20	TEST	<ul style="list-style-type: none"> Microprocessor test pin. Connected to Vcc pin 21 because this is not used. 																																							
21	Vcc	<ul style="list-style-type: none"> Power pin. Applies +5V. 																																							
22 23 24	VCA SELECT 0 VCA SELECT 1 VCA SELECT 2	<ul style="list-style-type: none"> ATRS IC (HA12035) control output pins. Output during REC, REC-PAUSE and REC-HOLD, and designate the object of the ATRS IC internal circuit to be controlled by the control data output from the data output pins 26 ~ 29. These outputs are composed of the 3-bit signal. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="3">Output pins</th> <th rowspan="2">Designation function</th> </tr> <tr> <th>24</th> <th>23</th> <th>22</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> <td>Designates that data has no meaning.</td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> <td>Designates that it is 1 kHz, Lch data.</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> <td>Designates that it is 14 kHz, Lch data.</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> <td>Designates that it is bias data.</td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> <td>Designates that 14 kHz, R ch data.</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> <td>Designates that it is 1 kHz, R ch data.</td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> <td>Designates that it is A/D comparison reference voltage.</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> <td>Designates to clear all data.</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Auto/memory rewind switch and timer switch position detection output pin. Outputs Hi when detecting switch position. 	Output pins			Designation function	24	23	22	0	0	0	Designates that data has no meaning.	0	0	1	Designates that it is 1 kHz, Lch data.	0	1	0	Designates that it is 14 kHz, Lch data.	0	1	1	Designates that it is bias data.	1	0	0	Designates that 14 kHz, R ch data.	1	0	1	Designates that it is 1 kHz, R ch data.	1	1	0	Designates that it is A/D comparison reference voltage.	1	1	1	Designates to clear all data.
Output pins			Designation function																																						
24	23	22																																							
0	0	0	Designates that data has no meaning.																																						
0	0	1	Designates that it is 1 kHz, Lch data.																																						
0	1	0	Designates that it is 14 kHz, Lch data.																																						
0	1	1	Designates that it is bias data.																																						
1	0	0	Designates that 14 kHz, R ch data.																																						
1	0	1	Designates that it is 1 kHz, R ch data.																																						
1	1	0	Designates that it is A/D comparison reference voltage.																																						
1	1	1	Designates to clear all data.																																						

Pin No.	Pin Symbol	Function																														
25	IC MUTE	<ul style="list-style-type: none"> IC muting control output pin. 																														
26 } } 29	DATA 0(LSB) DATA 3(MSB)	<ul style="list-style-type: none"> ATRS IC (HA12035) control output pins. The control data is composed of 4-bit signal and output during REC, REC-PAUSE and REC-HOLD. Auto/memory rewind switch and timer switch position detection input pins. Input the timer switch position detection signal for 3 sec. after power is supplied, to judge the mode. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="4">Input pins</th> <th rowspan="2">Criterion mode</th> </tr> <tr> <th>29</th> <th>28</th> <th>27</th> <th>26</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>×</td> <td>×</td> <td>Test program execution</td> </tr> <tr> <td rowspan="4">DATA2 + DATA3 = 1</td> <td></td> <td>0</td> <td>0</td> <td rowspan="2">Timer recording</td> </tr> <tr> <td></td> <td>0</td> <td>1</td> </tr> <tr> <td></td> <td>1</td> <td>0</td> <td>Timer play</td> </tr> <tr> <td></td> <td>1</td> <td>1</td> <td></td> </tr> </tbody> </table>	Input pins				Criterion mode	29	28	27	26	0	0	×	×	Test program execution	DATA2 + DATA3 = 1		0	0	Timer recording		0	1		1	0	Timer play		1	1	
Input pins				Criterion mode																												
29	28	27	26																													
0	0	×	×	Test program execution																												
DATA2 + DATA3 = 1		0	0	Timer recording																												
		0	1																													
		1	0	Timer play																												
		1	1																													
30	REEL PULSE	<ul style="list-style-type: none"> Input pin of tape end detection Hall element pulse output. When the take-up reel disk stops rotating, pulse input disappears and tape end is detected with pulse not input for 3 sec. or more during REC and PLAY, and for 1 sec. or more during REW and FF. Tape count during the memory rewind function operation is done counting the input pulses. 																														
31	$\overline{\text{ATRS}}$	<ul style="list-style-type: none"> ATRS mode input pin. Judged as ATRS mode with Lo potential input. 																														
32	$\overline{\text{REC MUTE}}$	<ul style="list-style-type: none"> Auto REC MUTE detection input/output pin. When Lo potential is input by the REC-MUTE button operation during outputting Hi potential (during REC or REC-PAUSE mode), it is judged as auto REC MUTE mode and Lo potential is output for approx. 4 sec. 																														
33	$\overline{\text{PAUSE}}$	<ul style="list-style-type: none"> PAUSE mode input pin. Judged as PAUSE mode with Lo potential input. 																														
34	$\overline{\text{REC}}$	<ul style="list-style-type: none"> REC mode input pin. Judged as REC mode with Lo potential input. 																														
35	$\overline{\text{FIXED}}$	<ul style="list-style-type: none"> ATRS FIXED mode input pin. When Lo potential is input, it is judged as FIXED mode and the REC control data output is changed over from the ATRS data to FIXED data. When the Lo potential is input and it is judged as FIXED mode, Lo potential is output to light the FIXED indicator and makes ATRS indicator go off. 																														
36	$\overline{\text{STOP}}$	<ul style="list-style-type: none"> STOP mode input pin. When Lo potential is input, it is judged as STOP mode. 																														
37	$\overline{\text{FF}}$	<ul style="list-style-type: none"> FF mode input pin. When Lo potential is input, it is judged as FF mode. 																														
38	$\overline{\text{PLAY}}$	<ul style="list-style-type: none"> PLAY mode input pin. When Lo potential is input, it is judged as PLAY mode. When the timer record or play is set within 3 sec. after power is supplied, Lo potential is output after approx. 3 sec. Outputs Lo potential with approx. 80 ms width simultaneously with the play operation start in the auto rewind play mode. This Lo potential is the one action control signal when the unit is combined with the system component stereo. 																														
39	$\overline{\text{REW}}$	<ul style="list-style-type: none"> REW mode input pin. When Lo potential is input, it is judged as REW mode. 																														

Pin No.	Pin Symbol	Function
40	PLAY INDI.	<ul style="list-style-type: none"> PLAY indicator drive output pin. Flashing pulse is output synchronizing with the reel pulse input during REC and PLAY. When the time of light gone off becomes 500 ms, Hi potential is output regardless of presence/absence of the reel pulse input. Outputs Hi potential during REC-PAUSE and PLAY-PAUSE. When the REC and PLAY buttons are pressed simultaneously within 3 sec after power is supplied and reset is completed, or during the timer recording or play, flashing pulse is output with 180 ms period for 3 sec. after resetting, and Hi potential is output after elapse of 3 sec.
41	PAUSE INDI.	<ul style="list-style-type: none"> PAUSE indicator drive output pin. Outputs Hi potential during REC-PAUSE and PLAY-PAUSE. Flashing pulse is output with 1.3 sec. period during the AUTO REC MUTE, and Hi potential is output after AUTO REC MUTE is completed. Flashing pulse is output with 160 ms period during the timer stand-by mode and the Lo potential is output after the mode is complete. 
42	REC INDI.	<ul style="list-style-type: none"> REC indicator drive output pin. Outputs Hi potential during REC, REC-PAUSE and REC-HOLD. When the REC and PLAY buttons are pressed simultaneously within 3 sec. after power is supplied and resetting is complete or during the timer recording, flashing pulse is output with 180 ms period for 3 sec. after resetting is completed, and Hi potential is output after 3 sec.

2. IC404 (μ PD550C 062, for counter with stopwatch)

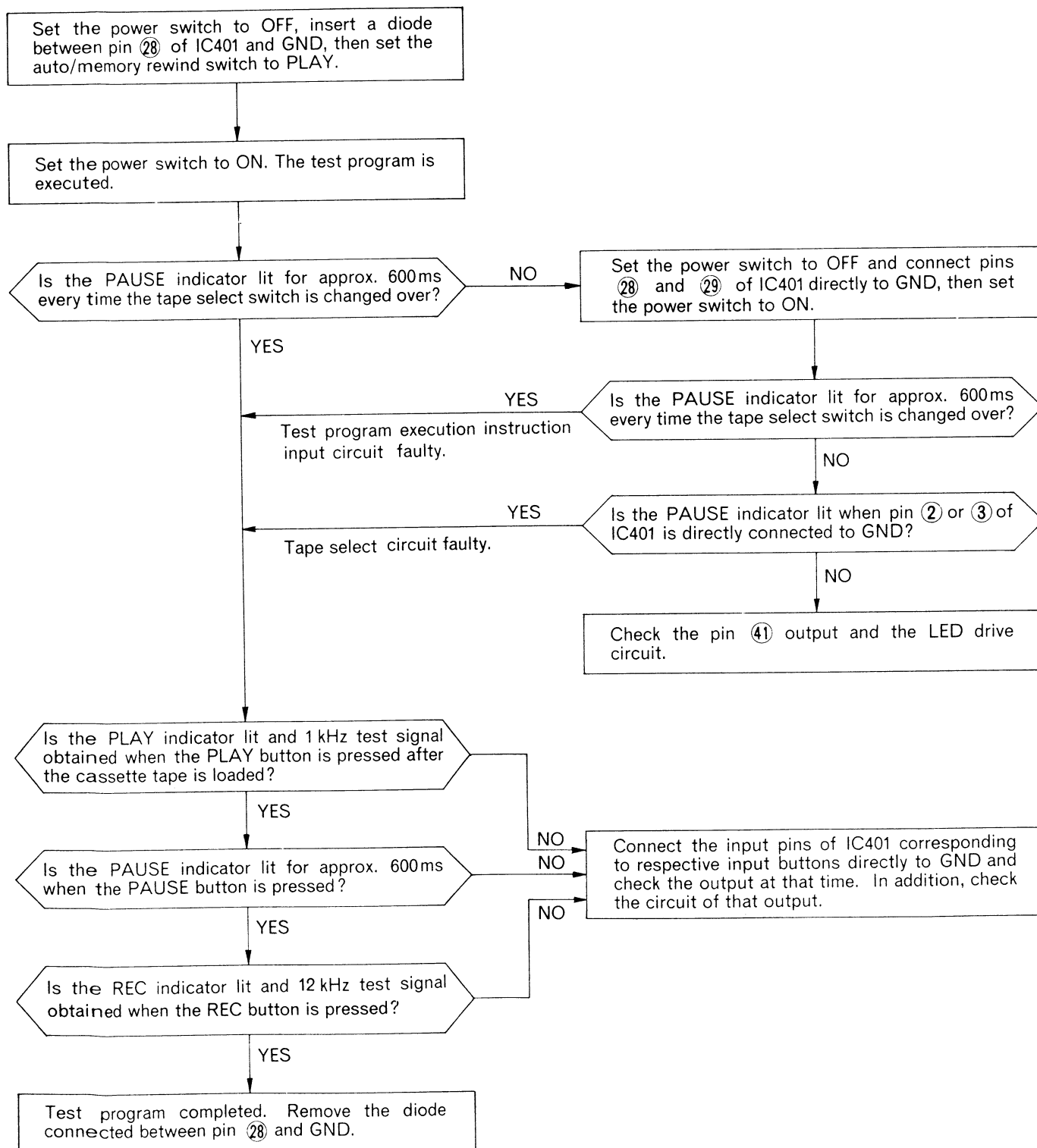
Pin No.	Pin Symbol	Function																																																																																																
1	CLOCK 1	<ul style="list-style-type: none"> The external resonance circuit is coupled with these pins to operate the built-in clock oscillation circuit which is the reference of the microprocessor operation, and the oscillation frequency is set to 400 kHz. 																																																																																																
28	CLOCK 0																																																																																																	
2	TIMER CLEAR	<ul style="list-style-type: none"> Elapsed time indication timer (stopwatch indication) zero clear input pin. Inputs Lo potential normally and outputs Hi potential during button operation. 																																																																																																
3 7 9	a f g	<ul style="list-style-type: none"> Fluorescent display tube plate segment drive output pins. The Hi potential output segment is lit synchronized with the grid select signal. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Segment Indication</th> <th>a</th> <th>b</th> <th>c</th> <th>d</th> <th>e</th> <th>f</th> <th>g</th> </tr> </thead> <tbody> <tr><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td></tr> <tr><td>1</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>2</td><td>1</td><td>1</td><td>0</td><td>1</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>3</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>4</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td></tr> <tr><td>5</td><td>1</td><td>0</td><td>1</td><td>1</td><td>0</td><td>1</td><td>1</td></tr> <tr><td>6</td><td>1</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr> <tr><td>7</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>8</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr> <tr><td>9</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>1</td><td>1</td></tr> <tr><td>—</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> </tbody> </table> 	Segment Indication	a	b	c	d	e	f	g	0	1	1	1	1	1	1	0	1	0	1	1	0	0	0	0	2	1	1	0	1	1	0	1	3	1	1	1	1	0	0	1	4	0	1	1	0	0	1	1	5	1	0	1	1	0	1	1	6	1	0	1	1	1	1	1	7	1	1	1	0	0	0	0	8	1	1	1	1	1	1	1	9	1	1	1	1	0	1	1	—	0	0	0	0	0	0	1
Segment Indication	a	b	c	d	e	f	g																																																																																											
0	1	1	1	1	1	1	0																																																																																											
1	0	1	1	0	0	0	0																																																																																											
2	1	1	0	1	1	0	1																																																																																											
3	1	1	1	1	0	0	1																																																																																											
4	0	1	1	0	0	1	1																																																																																											
5	1	0	1	1	0	1	1																																																																																											
6	1	0	1	1	1	1	1																																																																																											
7	1	1	1	0	0	0	0																																																																																											
8	1	1	1	1	1	1	1																																																																																											
9	1	1	1	1	0	1	1																																																																																											
—	0	0	0	0	0	0	1																																																																																											
10 7 13 16 7 19	9 7 5 4 7 1	<ul style="list-style-type: none"> Fluorescent display tube dynamic drive grid select (for display digit scanning) data output pins, and the display of the Hi potential output digit is lit. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th rowspan="2">Display digit Output pin</th> <th colspan="3">Tape counter</th> <th colspan="5">Elapsed time</th> </tr> <tr> <th>3 rd digit</th> <th>2 nd digit</th> <th>1 st digit</th> <th>10 minute</th> <th>1 minute</th> <th>—</th> <th>10 sec</th> <th>1 sec</th> </tr> </thead> <tbody> <tr><td>1 (pin 19)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>2 (pin 18)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td></tr> <tr><td>3 (pin 17)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>4 (pin 16)</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>5 (pin 13)</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>7 (pin 12)</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>8 (pin 11)</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>9 (pin 10)</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> </tbody> </table>	Display digit Output pin	Tape counter			Elapsed time					3 rd digit	2 nd digit	1 st digit	10 minute	1 minute	—	10 sec	1 sec	1 (pin 19)	0	0	0	0	0	0	0	1	2 (pin 18)	0	0	0	0	0	0	1	0	3 (pin 17)	0	0	0	0	0	1	0	0	4 (pin 16)	0	0	0	0	1	0	0	0	5 (pin 13)	0	0	0	1	0	0	0	0	7 (pin 12)	0	0	1	0	0	0	0	0	8 (pin 11)	0	1	0	0	0	0	0	0	9 (pin 10)	1	0	0	0	0	0	0	0							
Display digit Output pin	Tape counter			Elapsed time																																																																																														
	3 rd digit	2 nd digit	1 st digit	10 minute	1 minute	—	10 sec	1 sec																																																																																										
1 (pin 19)	0	0	0	0	0	0	0	1																																																																																										
2 (pin 18)	0	0	0	0	0	0	1	0																																																																																										
3 (pin 17)	0	0	0	0	0	1	0	0																																																																																										
4 (pin 16)	0	0	0	0	1	0	0	0																																																																																										
5 (pin 13)	0	0	0	1	0	0	0	0																																																																																										
7 (pin 12)	0	0	1	0	0	0	0	0																																																																																										
8 (pin 11)	0	1	0	0	0	0	0	0																																																																																										
9 (pin 10)	1	0	0	0	0	0	0	0																																																																																										
14	V _{SS}	<ul style="list-style-type: none"> Hi side power pin. Applies +10V. 																																																																																																
15	TEST	<ul style="list-style-type: none"> Microprocessor test pin. Connected to V_{SS} pin because this is not used. 																																																																																																
20	NC	<ul style="list-style-type: none"> Blank pin. 																																																																																																
21 22	FF SOL. REWIND SOL.	<ul style="list-style-type: none"> Mechanism operation (solenoid operation) detection input pin. Addition/subtraction to/from the tape counter or addition of the elapsed timer is executed by inputting, and displayed to the fluorescent display tube. 																																																																																																

Pin No.	Pin Symbol	Function																				
21 22	FF SOL. REWIND SOL.	<table border="1"> <thead> <tr> <th>Pin (21) Potential</th> <th>Pin (22) Potential</th> <th>Tape counter</th> <th>Elapsed timer</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>—</td> <td>—</td> </tr> <tr> <td>0</td> <td>1</td> <td>Count subtracted</td> <td>—</td> </tr> <tr> <td>1</td> <td>0</td> <td>Count added</td> <td>—</td> </tr> <tr> <td>1</td> <td>1</td> <td>Count added</td> <td>Count added</td> </tr> </tbody> </table> <ul style="list-style-type: none"> • Test program execution instruction input pin. Test program is executed when pin 22 is set to Hi potential input with power ON reset. 	Pin (21) Potential	Pin (22) Potential	Tape counter	Elapsed timer	0	0	—	—	0	1	Count subtracted	—	1	0	Count added	—	1	1	Count added	Count added
Pin (21) Potential	Pin (22) Potential	Tape counter	Elapsed timer																			
0	0	—	—																			
0	1	Count subtracted	—																			
1	0	Count added	—																			
1	1	Count added	Count added																			
23	50/60	<ul style="list-style-type: none"> • Elapsed time indication timer drive power frequency pulse input pin. Inputs power frequency pulse within 2 sec. after power is ON and resetting is complete and executes the 50/60 Hz frequency automatic discrimination. 																				
24	COUNTER CLEAR	<ul style="list-style-type: none"> • Tape counter indication reset (zero clear) input pin. Inputs Lo potential normally and inputs Hi potential during button operation. 																				
25	REEL PULSE	<ul style="list-style-type: none"> • Input pin of tape end detection Hall element pulse output signal. Becomes the reference signal of the addition/subtraction count of the tape counter. 																				
26	RESET	<ul style="list-style-type: none"> • Reset pin. This pin is set to Lo potential when power is supplied and initial resetting is performed at the retrailing edge of the pulse. 																				
27	V _{GG}	<ul style="list-style-type: none"> • Power pin. Connected to GND. 																				

MICROPROCESSOR TEST PROGRAM

The test programming is stored in the microprocessor of this unit. Judge troubles according to the following procedure when the microprocessor and peripheral circuits are malfunctioning.

IC401

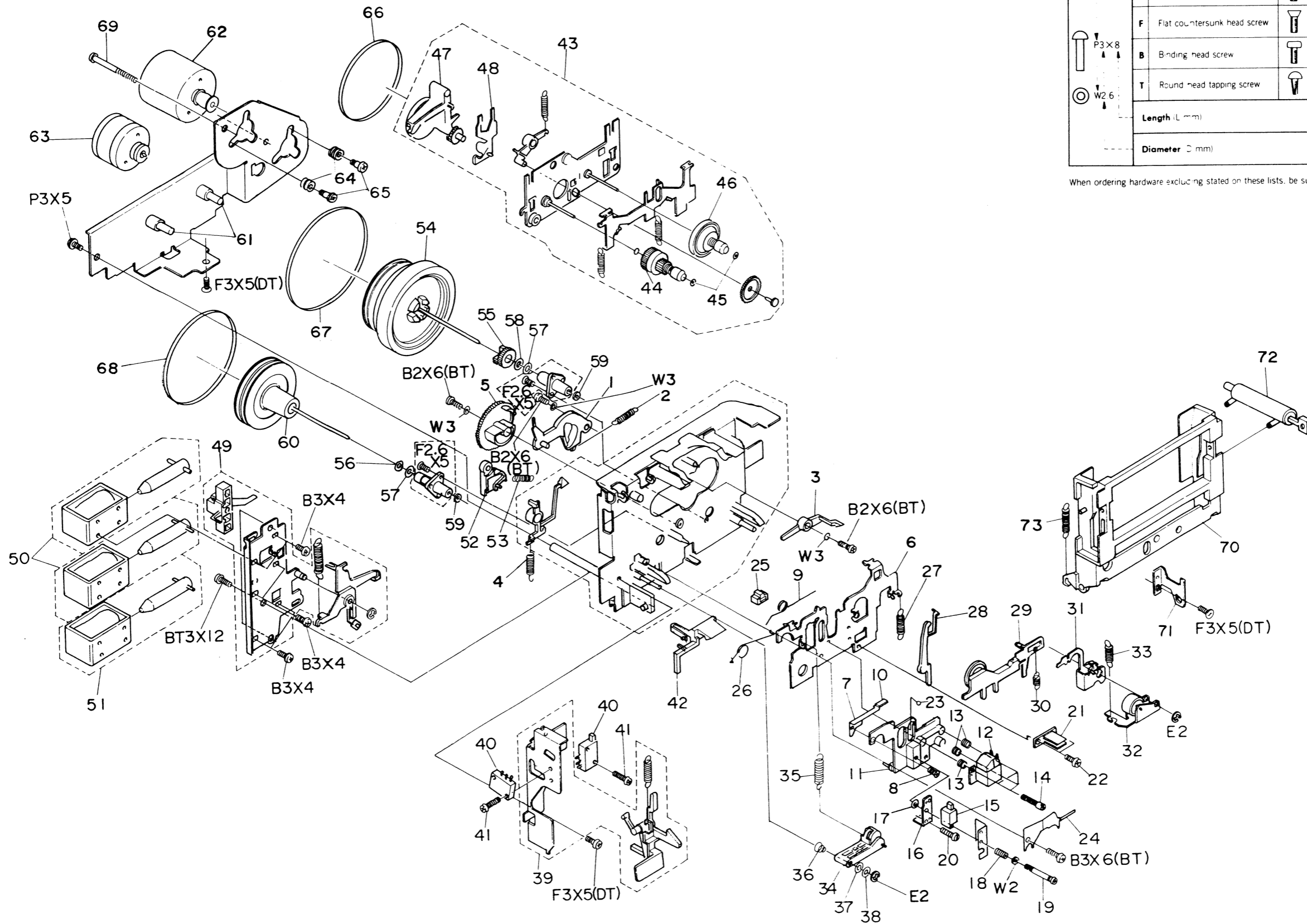


REPLACEMENT PARTS LIST

SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
CAPACITORS					
△ CR1	0219902	CR PACK 120 OHM 0.0033MF 450V (U)	LED 5	5380711	LED TLG123A
△ CR1	0219907	CR PACK (C)	LED 6	5380711	LED TLG123A
RESISTORS					
RT101	5007478	SEMI VARIABLE 20K OHM	LED 7AB	5380711	LED TLG123A
RT102LR	5007478	SEMI VARIABLE 20K OHM	LED 8AB	5380711	LED TLG123A
RT103LR	5007481	SEMI VARIABLE 100K OHM	LED 9	5380482	LED SLR53URC1
RT301LR	5007477	SEMI VARIABLE 10K OHM	LED 10	5380482	LED SLR53URC1
RT302LR	5007477	SEMI VARIABLE 10K OHM	LED 11	5380481	LED SLR-53GC1
RT303LR	5007478	SEMI VARIABLE 20K OHM	LED 12	5380691	LED SLR34UR
RV 1	5000845	VARIABLE RESISTOR 20K OHM(A)	LED 13	5380711	LED TLG123A
RV 2	5000872	VARIABLE RESISTOR 10K OHM (B)	LED515	5380101	LED SLP-24B
R452	5068301	RESISTOR BLOCK R0718	MOD101LR	5378063	MODULE TA3011A
R453	5068301	RESISTOR BLOCK R0718	MOD301LR	5378063	MODULE TA3011A
R510AB	0170407	FUSE RESISTOR 10 OHM+-5% 1/2W	Q101LR	5321298	TRANSISTOR 2SC1740LN-SE
SEMI-CONDUCTORS					
D101-103	5330573	DIODE 1S2473	Q102	5320069	TRANSISTOR 2SC458CD
D105	5330573	DIODE 1S2473	Q103	5321663	TRANSISTOR 2SC2021R/S
D106	5330573	DIODE 1S2473	Q105	5320069	TRANSISTOR 2SC458CD
D301-303	5330573	DIODE 1S2473	Q106	5320069	TRANSISTOR 2SC458CD
D401-413	5330573	DIODE 1S2473	Q107LR	5320069	TRANSISTOR 2SC458CD
D416-419	5330573	DIODE 1S2473	Q108LR	5320069	TRANSISTOR 2SC458CD
D420-423	5331671	DIODE DS135D-FA3	Q109	5322651	TRANSISTOR 2SD667C
D424-427	5330573	DIODE 1S2473	Q110	5323071	TRANSISTOR 2SD947
D428	5330573	DIODE 1S2473	Q111	5320603	TRANSISTOR SILICON 2SA673A-C
D431	5330573	DIODE 1S2473	Q112	5322651	TRANSISTOR 2SD667C
D433	5330574	DIODE 1S2473	Q113	5320603	TRANSISTOR SILICON 2SA673A-C
D436	5330573	DIODE 1S2473	Q114	5320069	TRANSISTOR 2SC458CD
D501-506	5331671	DIODE DS135D-FA3	Q115LR	5321663	TRANSISTOR 2SC2021R/S
D508-510	5331671	DIODE DS135D-FA3	Q116	5321663	TRANSISTOR 2SC2021R/S
D511	5330573	DIODE 1S2473	Q117	5321663	TRANSISTOR 2SC2021R/S
D512	5331671	DIODE DS135D-FA3	Q118	5320069	TRANSISTOR 2SC458CD
D513	5330573	DIODE 1S2473	Q119	5320603	TRANSISTOR SILICON 2SA673A-C
D514	5330573	DIODE 1S2473	Q301LR	5321506	TRANSISTOR 2SK68A-N
D516	5331671	DIODE DS135D-FA3	Q302LR	5321298	TRANSISTOR 2SC1740LN-SE
D517	5331671	DIODE DS135D-FA3	Q303LR	5321298	TRANSISTOR 2SC1740LN-SE
IC101	5359501	IC MPD4011C	Q304LR	5320069	TRANSISTOR 2SC458CD
IC102	5365491	IC HD14066BP	Q305LR	5320069	TRANSISTOR 2SC458CD
IC103	5355041	IC HA12035	Q306LR	5322381	TRANSISTOR 2SD655
IC104	5350601	IC NJM4558D	Q307	5320069	TRANSISTOR 2SC458CD
IC301	5350601	IC NJM4558D	Q308LR	5320069	TRANSISTOR 2SC458CD
IC302	5350601	IC NJM4558D	Q309	5320069	TRANSISTOR 2SC458CD
IC303	5352831	IC MPC4557C	Q401	5320069	TRANSISTOR 2SC458CD
IC401	5365558	IC HD44801A35	Q402	5320069	TRANSISTOR 2SC458CD
IC402	5352911	HALL IC PST515	Q403-408	5320069	TRANSISTOR 2SC458CD
IC403	5359501	IC MPD4011C	Q410-412	5320069	TRANSISTOR 2SC458CD
IC404	5359729	IC MPD550C	Q413	5321663	TRANSISTOR 2SC2021R/S
LED 1	5380481	LED SLR-53GC1	Q415	5323071	TRANSISTOR 2SD947
LED 3	5380482	LED SLR53URC1	Q416	5323071	TRANSISTOR 2SD947
LED 4	5380691	LED SLR34UR	Q417	5320069	TRANSISTOR 2SC458CD
			Q418	5323071	TRANSISTOR 2SD947
			Q419	5320069	TRANSISTOR 2SC458CD
			Q420	5320069	TRANSISTOR 2SC458CD
			Q501	5321301	TRANSISTOR 2SC1061

SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
SEMI-CONDUCTORS			MISCELLANEOUS		
Q502	5321301	TRANSISTOR 2SC1061	CE1	5780631	CERAMIC OSCILLATOR 400KHZ
Q504	5320643	TRANSISTOR 2SC1162WT-C	△ F 1	5721161	FUSE 1.6A(U, C)
Q505	5322442	TRANSISTOR 2SD639S	△ F 1	5721063	FUSE 1.25AT (FS, BS, AU, W)
Q506	5323071	TRANSISTOR 2SD947	△ F 2	5721161	FUSE 1.6A(U, C)
Q507	5320069	TRANSISTOR 2SC458CD	△ F 2	5721063	FUSE 1.25AT (FS, BS, AU, W)
TH101LR	5340232	THERMISTOR 112103-2	△ F 3	5721161	FUSE 1.6A(U, C)
TH102	5340231	THERMISTOR 112302-2	△ F 3	5721061	FUSE 1.6A(FS, BS, AU, W)
ZD301	5330841	ZENER DIODE RD5.1E-B	△ FU01	5721063	FUSE 1.25AT (W)
ZD302	5330322	ZENER DIODE SILICON TR-9S	FL1	5310641	FLUORESCENT DISPLAY
ZD401	5330311	ZENER DIODE SILICON HZ7A	JK 1	5676261	PIN JACK ASSEMBLY (LINE IN, LINE OUT)
ZD402	5330322	ZENER DIODE SILICON TR-9S	JK 2	5679823	JACK (MIC, PHONES) (U, C, FS, BS, AU)
ZD403	5331588	ZENER DIODE RD2.7EB2	JK 2	5679825	JACK (MIC, PHONES) (W)
ZD404	5330552	ZENER DIODE HZ11B	JK 3	5677131	8P DIN SOCKET (REMOTE)
ZD405	5330841	ZENER DIODE RD5.1E-B	PL 1-3	5762036	PILOT LAMP
ZD405	5331588	ZENER DIODE RD2.7EB2	S 1	5634363	PUSH SWITCH (INPUT)
ZD406	5330711	ZENER DIODE HZ4BC	S 2	5634433	PUSH SWITCH (TAPE)
ZD407	5330392	ZENER DIODE SILICON HZ6B	S 3	5624281	SLIDE SWITCH (AUTO REW)
ZD408	5330324	ZENER DIODE HZ9B1	S 4	5624131	SLIDE SWITCH (TIMER)
ZD5U1AB	5330554	ZENER DIODE HZ11AS	S 5-7	5633792	PUSH SWITCH (DOLBY NR, DOLBY B/C, MPX)
ZD502	5330533	ZENER DIODE SILICON HZ-12C	S 6	5634367	PUSH SWITCH (MONITOR)
ZD503	5330555	ZENER DIODE HZ11H2	△ S001	5633842	PUSH SWITCH (POWER) (U, C)
ZD504	5330392	ZENER DIODE SILICON HZ6B	△ SU01	5633843	PUSH SWITCH (POWER) (FS, BS, AU, W)
COILS			△ SU02	5605083	ROTARY SWITCH (VOLTAGE SELECTOR) (W)
L101LR	5120564	TRAP COIL	S101-107	5633851	PUSH SWITCH (REW, PLAY, FF, STOP, REC, PAUSE, MUTE)
L102LR	5161668	DOLBY FILTER	S109-111	5633671	PUSH SWITCH (ATRS, TEST, FIXED)
L103LR	0333151	PEAKING COIL 36MH	S113	5633671	PUSH SWITCH (COUNTER RESET)
L104LR	5120274	CHOKE COIL	S114	5633671	PUSH SWITCH (ELAPSED TIME RESET)
L105	5260368	OSCILLATOR TRANSFORMER	FOR ACCESSORIES		
L106	5260215	TRAP COIL 33HH		7740321	HEAD CLEANING STICK
L107	5260368	OSCILLATOR TRANSFORMER		5894163	PATCH CORD
L108LR	5260215	TRAP COIL 33HH	△	5652291	SOCKET ADAPTER (W)
L301LR	5120561	BIAS TRAP COIL			
L302LR	5120564	TRAP COIL			

EXPLODED VIEW (Mechanism-FL-32A)



Type of head					
	P	Pan head screw		BT	Binding head tapping screw
	F	Flat countersunk head screw		BL	Bolt
	B	Binding head screw		W	Washer
	T	Round head tapping screw		E	"E" ring
Length (L mm)					
Diameter (D mm)					

When ordering hardware excluding stated on these lists, be sure to make your orders with type and size

SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
FOR CASSETTE DECK ASSEMBLY (FL-32A)					
1	6766551	PLAY ARM	37	7786215	POLYSLIDER WASHER
2	6323761	SPRING	38	7786216	POLYSLIDER WASHER
3	6761821	PICK UP ARM	39	7330666	EJECT HOLDER ASSEMBLY
4	6300981	SPRING	40	5633361	PUSH SWITCH
5	6430887	PLAY GEAR	41	0671310	DT SCREW-2.6MMDX10MM
6	7338843	HEAD PLATE	42	6761815	RECORD PREVENTION ARM
7	6534811	LEAF SPRING	43	6766586	REEL BASE ASSEMBLY
8	8721104	FLAT SCREW-2MMDX4MM	44	6414431	TURNTABLE ASSEMBLY (SUPPLY)
9	6546964	SPRING	45	7786745	POLYESTER WASHER
10	7740394	FELT	46	6414213	TURNTABLE ASSEMBLY (TAKE UP)
11	6973791	HEAD PLATE	47	6761673	FF/REWIND ARM ASSEMBLY
12	5449141	RECORD PLAYBACK HEAD	48	6761733	SELECT SLIDER ASSEMBLY
13	6321246	HEAD SPRING	49	7338993	SOLENOID PLATE ASSEMBLY
14	7781751	SPECIAL SCREW	50	5642961	DC SOLENOID
15	5445313	ERASE HEAD	51	5642962	DC SOLENOID
16	7321221	ERASE HEAD BASE	52	6766562	SEARCH ARM
17	7786215	POLYSLIDER WASHER	53	6300596	SPRING
18	6321736	HEAD SPRING	54	6373974	FLYWHEEL ASSEMBLY(R)
19	7781921	PAN HEAD SCREW-2MMDX25MM	55	6430932	FLYWHEEL GEAR
20	7780554	SCREW	56	7778848	POLYSLIDER WASHER
21	6766501	LEAD WIRE GUIDE	57	7778847	POLY SLIDER WASHER
22	0671306	DT SCREW-2.6MMDX6MM	58	7772623	SPRING
23	0948492	BALL - 2MMD	59	7787566	POLYSLIDER WASHER
24	6534801	LEAF SPRING	60	6373952	FLYWHEEL ASSEMBLY(L)
25	6581042	RUBBER FOR RECORD PREVENTION	61	7768682	THRUST SUPPORT
26	6547242	SPRING	62	6428154	DC MOTOR ASSEMBLY(PLAY)
27	6301002	SPRING	63	6428141	DC MOTOR ASSEMBLY(F,F/REWIND)
28	6768014	REWIND ARM	64	6576322	RUBBER PLATE
29	6382164	TAKE UP IDLER ASSEMBLY	65	7539002	SCREW FOR MOTOR MOUNTING
30	6320577	SPRING	66	6355193	BELT
31	7340621	PAUSE ARM ASSEMBLY	67	6357403	FLYWHEEL BELT
32	7346901	PRESSURE ROLLER ARM ASSEMBLY (R)	68	6357301	FLYWHEEL BELT
33	6321256	SPRING	69	7781149	TAPPING SCREW-3MMDX55MM
34	6770496	PRESSURE ROLLER ARM ASSEMBLY(L)	70	6768333	CASSETTE HOLDER
35	6301004	SPRING	71	7339072	CASSETTE HOLDER SUPPORT
36	6303731	SPRING	72	6763431	DAMPER ASSEMBLY
			73	6300552	SPRING

SYMBOL-NO	P-NO	DESCRIPTION	SYMBOL-NO	P-NO	DESCRIPTION
FOR CASSETTE DECK ASSEMBLY (B)			114	6204311	METER COVER ASSEMBLY
74	7740603	FELT LEG	115(MOD302)	5310681	FLUORESCENT METER ASSEMBLY
△ 75	6794401	BUSHING (U,C,FS,AU,W)	116	6054861	EJECT BUTTON ASSEMBLY (U,C,FS,BS,AU)
△ 76	6794411	BUSHING (BS)	117	6054862	EJECT BUTTON ASSEMBLY (W)
△ 77	5746443	POWER CORD (U,C)	118	6303115	SPRING FOR EJECT BUTTON
△ 78	5746661	POWER CORD (FS,W)	119	6291713	SLIDE KNOB (U,C,FS,BS,AU)
△ 79	5746342	POWER CORD (BS)	120	6291712	SLIDE KNOB (W)
△ 80	5746571	POWER CORD (AU)	121	6792441	MONITOR INDICATOR ASSEMBLY
△ 81	5213072	POWER TRANSFORMER (U,C)	122	6769021	LED SPACER
△ 82	5213075	POWER TRANSFORMER (W)	123	6769651	LED SPACER (FOR PLAY,REC,PAUSE INDICATOR)
△ 83	5213073	POWER TRANSFORMER (FS)	124	0626577	SPECIAL WASHER
△ 84	5213074	POWER TRANSFORMER (BS,AU)	125	0678312	DT SCREW-2.6MMDX12MM (BLACK)
85	6174253	BATTERY LID	126	8699308	BT BIND SCREW-2.6MMDX8MM (BLACK)
86	6488342	BATTERY BOX	127	7781581	BT FLAT SCREW-3MMDX10MM
87	7756282	TERMINAL COVER (U,C)	128	7781582	FLAT SCREW-3MMDX10MM (BLACK)
88	7758241	SWITCH COVER (FS,BS,AU)	129	8699414	BT BIND HEAD SCREW-3MMDX14MM
89	7341143	PULLEY BRACKET	130	8602408	DT FLAT SCREW-3MMDX8MM
90	6422541	COUNTER PULLEY ASSEMBLY	131	6714215	NYLON RIVET
91	7778356	POLYESTER WASHER	132	6768381	LED SPACER (FOR SOURCE/MONITOR INDICATOR)
92	7786115	POLYESTER WASHER	133	6768731	COUNTER HOLDER
93	6354471	COUNTER BELT	134	6768721	LED SPACER
94	7341183	CASSETTE METAL ASSEMBLY	135	6768671	LED SPACER
95	6761962	LAMP HOLDER	MISCELLANEOUS		
96	6768021	PUSH BUTTON ASSEMBLY (POWER) (U,C,FS,BS,AU)	136	6044693	BOTTOM COVER
97	6056243	POWER BUTTON ASSEMBLY (W)	137	6045501	UPPER COVER (U,C)
98	6055471	PUSH BUTTON ASSEMBLY (INPUT) (U,C,FS,BS,AU)	138	6044707	UPPER COVER (FS,BS,AU)
99	6055472	PUSH BUTTON ASSEMBLY (INPUT) (W)	139	6044706	UPPER COVER (W)
100	6055521	PUSH BUTTON (MONITOR) (U,C,FS,BS,AU)	140	6288673	KNOB (OUTPUT) (U,C,FS,BS,AU)
101	6055522	PUSH BUTTON (MONITOR) (W)	141	6288672	KNOB (OUTPUT) (W)
102	6055492	PUSH BUTTON ASSEMBLY (TAPE SELECTOR)	142	6289371	KNOB ASSEMBLY (RECORD R) (U,C,FS,BS,AU)
103	6768702	LAMP HOLDER	143	6289372	KNOB (RECORD R) (W)
104	6225042	FRONT PANEL ASSEMBLY (U,C,FS,BS,AU)	144	6288681	KNOB ASSEMBLY (RECORD L) (U,C,FS,BS,AU)
105	6225043	FRONT PANEL ASSEMBLY (W)	145	6288682	KNOB (RECORD L) (W)
106	6055482	RESET BUTTON	146	6291943	SLIDE KNOB (W)
107	6060391	PUSH BUTTON (ATRS)	147	6291942	SLIDE KNOB (U,C,FS,BS,AU)
108	6060392	PUSH BUTTON (FIXED)	148	6768754	FUNCTION BUTTON ASSEMBLY (W)
109	6060393	PUSH BUTTON (START) (U,C,FS,BS,AU)	149	6768751	FUNCTION BUTTON ASSEMBLY (U,C,FS,BS,AU)
110	6060395	PUSH BUTTON (START) (W)	150	6093531	CASSETTE DOOR ASSEMBLY
111	6768661	BUTTON HOLDER	151	6714214	NYLON RIVET
112	6055511	PUSH BUTTON (DOLBY NR,DOLBY B/C,MPX) (U,C,FS,BS,AU)	152	8698410	BT BIND SCREW-3MMDX10MM (FS,BS,AU)
113	6055512	PUSH BUTTON (DOLBY NR,DOLBY B/C,MPX) (W)	153	8699410	BT BIND HEAD SCREW-3MMDX10MM (BLACK) (U,C,W)

