SHARP OPTONICA SERVICE MANUAL

RT-3838H

DOLBY SYSTEM ®

* "Dolby" and the "Double-D" symbols are trade mark of Dolby Laboratories.
* Manufactured under licence from Dolby Laboratories.

ELECTRONIC TAPE PROCESSOR

MODEL RT-3838H

"In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified be used."

SPECIFICATIONS

Type:	4-track 2-channel stereo cassette tape recorder/ player deck with built-in Dolby noise reduction system
Power source:	AC 110/220/240V, 50/60 Hz
Power consumption:	18 Watts
Semi-conductors:	1-LSI (Large Scale Integrated Circuit) 7-IC (Integrated Circuit) 59-Transistor 34-Diode 2-LED (Light Emitting Diode)
Dimensions:	
Width:	442 mm (17-3/8")
Height:	144 mm (5-11/16")
Depth:	357 mm (14-1/16")
Weight:	9 kg (19.9 lbs)
Tape:	Philips standard compact cassette tape
Wow & flutter:	0,15% (DIN45 500)
Frequency response:	
Use of normal tape:	30 ~ 13,000 Hz under DIN45 500
Use of Fe-Cr tape:	30 ~ 16,000 Hz under DIN45 500
Use of MAXELL UDXL II tape:	30 ~ 15,000 Hz under DIN45 500
S/N ratio:	Better than 50 dB, for normal tape (weighted) at LINE-IN, without Dolby Noise Reduction.
Dolby NR effect:	10 dB (at over 5 kHz)
Input sensitivity and input impedance:	
Microphone:	0.2 mV (6.8k ohms)
Line:	50 mV (54k ohms)
Record/playback socket:	0.1mV/k ohm
Output level and loaded impedance:	
Headphones:	89 mV ('0' VU), 8 ohm
Line:	775 mV ('0' VU) 50k ohms
Record/playback socket:	775 mV ('0' VU)

SHARP CORPORATION OSAKA, JAPAN

DISASSEMBLY

TO THE PERSONS IN CHARGE OF TROUBLESHOOTING

Since this control unit (DUNTZ0285AF01) requires, when disassembled for the repairs, a very complicated, accurate technique and special instruments it is preferred for you not to engage in repairing it. Should the control unit get in trouble, please contact the Sharp Service Center, therefore.

In addition, avoid touching the adjusting holes located at the rear of the control unit, or the oscillation frequency will vary resulting in an increase of time error.

Note: Prior to disassembling the set, be sure to disconnect the power supply plug from a wall outlet. Further, remove all the connection cords located at the rear of the set and take the cassette out of cassette door.

REMOVAL OF THE CABINET (See Figure 1 and 2)

Remove the eight screws retaining the cabinet (four each for the right and left of it) and it is then possible to detach the cabinet.

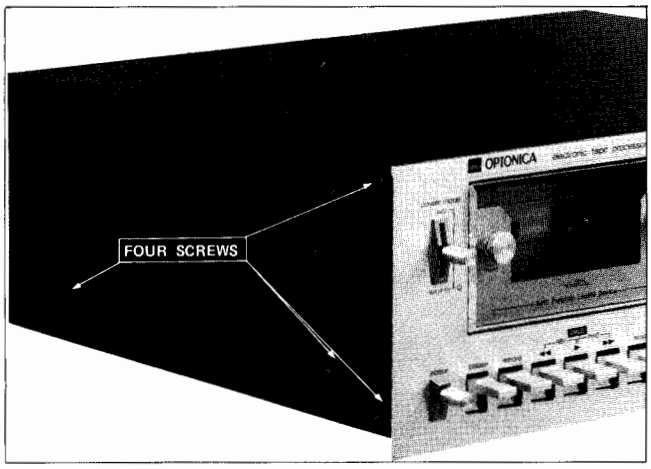


Figure 1

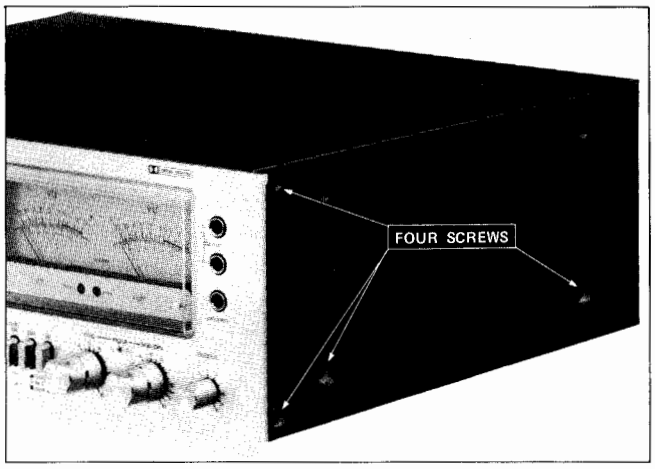


Figure 2

REMOVAL OF THE BOTTOM PLATE (See Figure 3)

Turn the set over and remove the three screws retaining the bottom plate. It is then possible to detach the bottom plate.

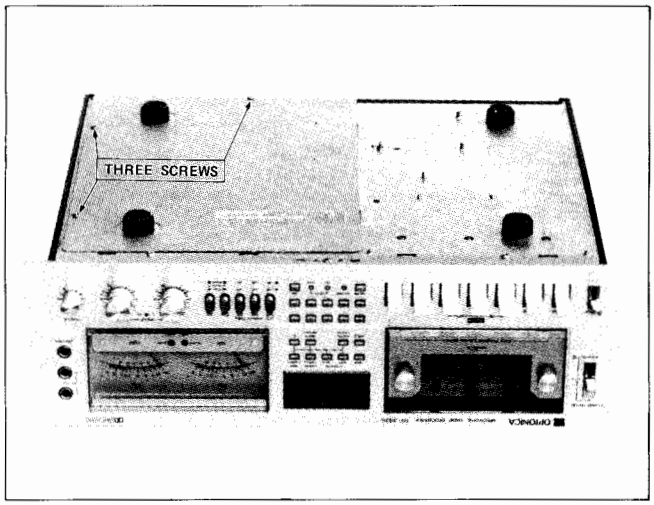


Figure 3

REMOVAL OF THE FRONT PANEL, VU METER AND CONTROL UNIT (See Figure 4 to 10)

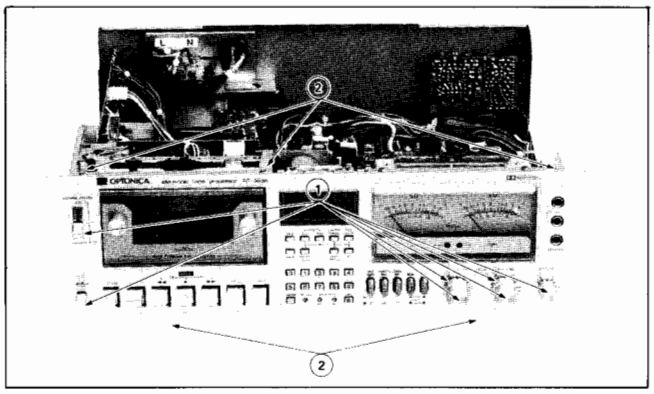


Figure 4

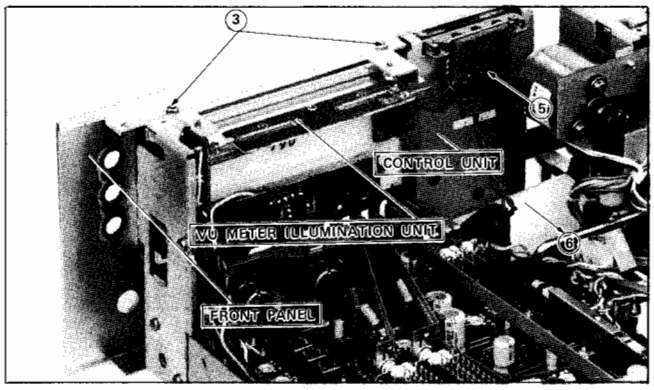


Figure 5

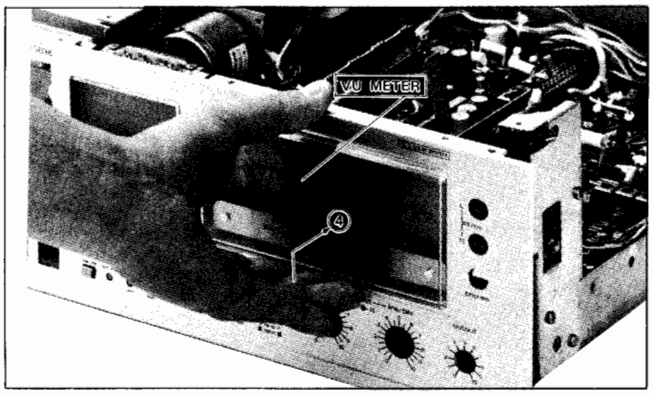


Figure 6

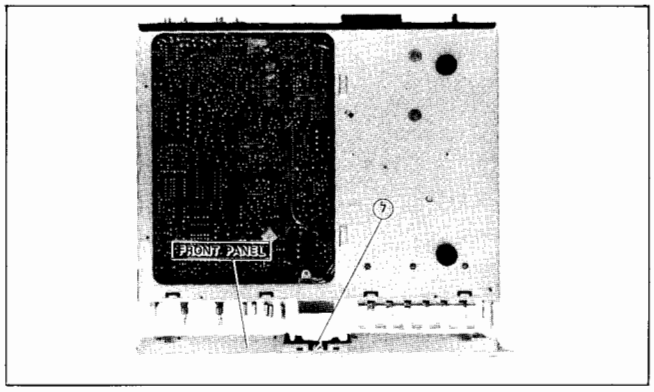


Figure 7

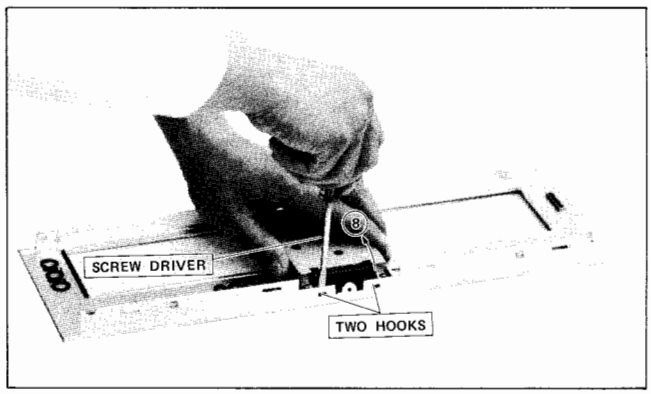


Figure 8

① Pull out the seven knobs in total —— the power mode switch knob (x1), editor switch knob (x1), line record level control knobs (x2), microphone record level control knobs (x2) and output level control knob (x1).

② Remove the five screws retaining the front panel and it is then possible to detach the control unit and VU meter unit together with the front panel.

③ Remove the two screws retaining the VU meter illumination unit and it is then possible to detach the meter illumination unit from the front panel.

④ Hold a lower part of the VU meter to push it toward the inside of the set and it is then possible to detach the VU meter from the front panel.

⑤ Remove the one screw retaining the LCD illumination P.W.B. to the control unit and it is then possible to detach the P.W.B. from the control unit.

⑥ Withdraw backward the flat cable connected to the control unit.
As a result, it becomes allowed to remove the front panel but in this case the control unit is still being attached to the front panel.

⑦ Remove the one screw retaining the control unit at a lower part of the front panel.

⑧ Turn the front panel over and use a screwdriver to lightly bend the two hooks provided at a lower part of the control unit. (If the hooks are given a strong force, they may be broken.)
Besides, there is an adhesive tape applied between the control unit and the front panel and detach them from each other by carefully removing the tape. In this way, the control unit and the front panel are separated from each other completely.

REF. NO.

F2, F3
F4
F1

SO502
SW5
SW16, SW17
SW15
SW2 (A ~ E)

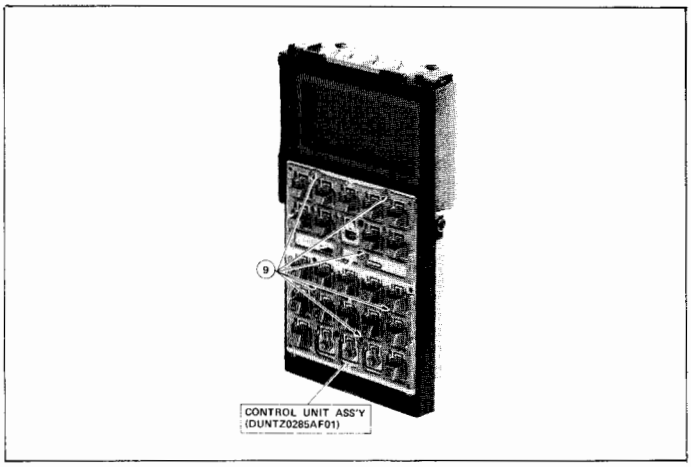


Figure 9

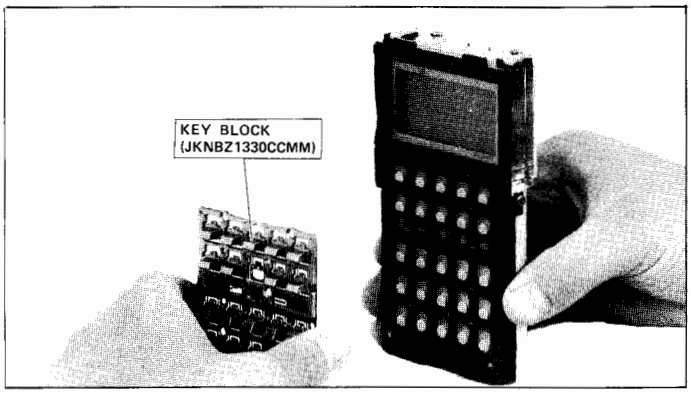


Figure 10

⑨ Remove the six screws retaining the control unit and it is then possible to detach the Key-block (JKNBZ 1330CCMM) from the control unit.

As to the control unit thus removed, since it includes C-MOS LSI which is not so resistive to static electricity and noise, be sure to cover its 16-pin terminals at its lower part with an aluminum foil for the purpose of storage.

MAINS VOLTAGE SELECTION (See Figure 11)

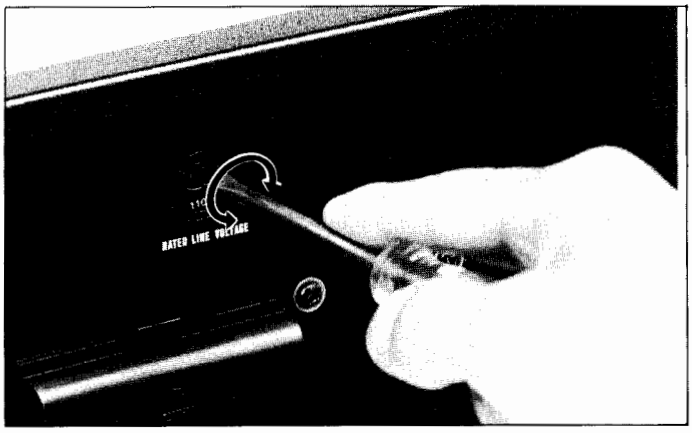
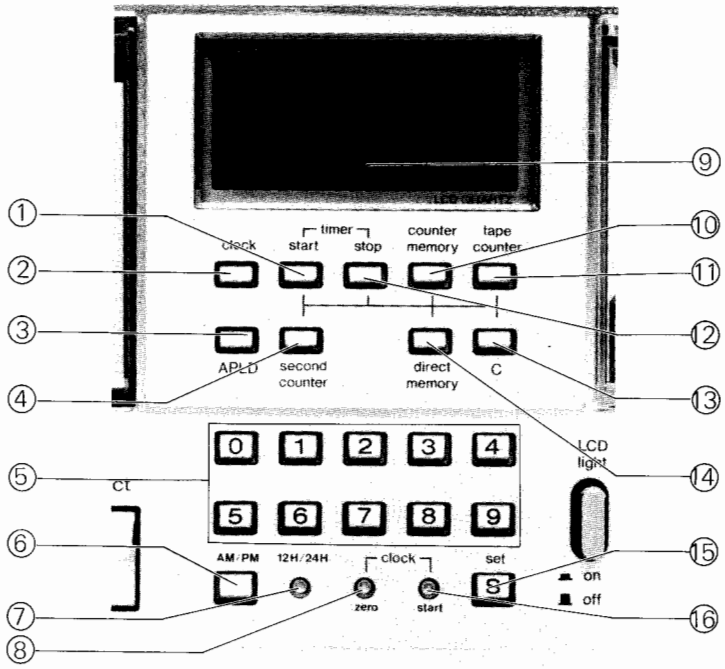


Figure 11

Check the preset voltage selector before connecting the power supply plug to a wall outlet. If the setting is different from that of your local mains supply voltage, the selector must be re-set as follows.
Rotate the voltage selector by using a screwdriver so that your local voltage number can be seen.

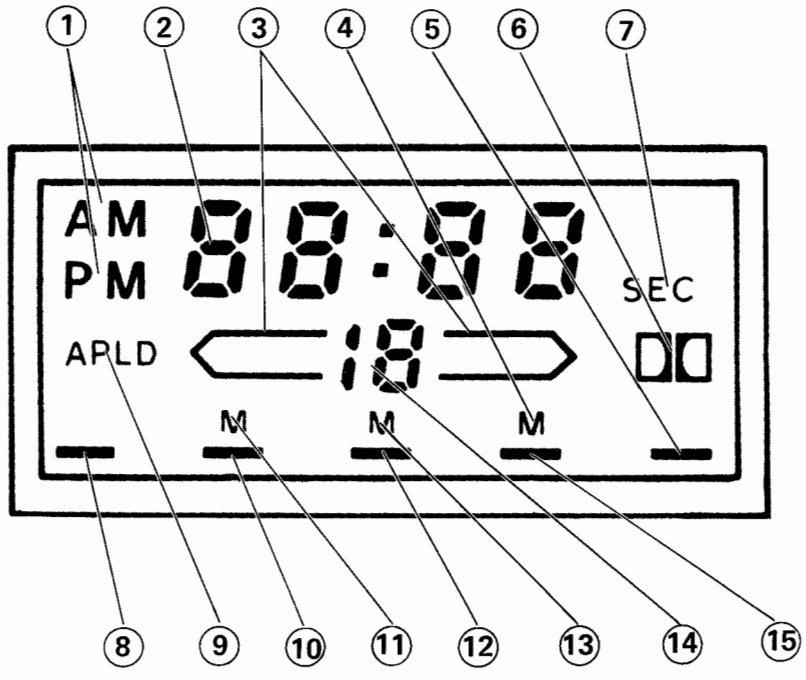
CONTROL UNIT LAY OUT



① Timer Start Key
② Clock Key
③ APLD Key
④ Second Counter Key
⑤ Number Input Key
⑥ AM/PM Display Key
⑦ 12/24-Hour Display Key
⑧ Clock Zero Key
⑨ LCD (See Figure 13).
⑩ Counter Memory Key
⑪ Tape Counter Key
⑫ Timer Stop Key
⑬ Clear Key
⑭ Direct Memory Key
⑮ Set Key
⑯ Clock Start Key

Figure 12

LCD LAY OUT



① AM/PM Indicator
② Clock or Time of Day Counter/ Second Counter (88:88)Indicator
③ Tape Running Indicators
④ Counter Memory Indicator
⑤ Tape Counter Mode Indicator
⑥ Dolby NR Indicator
⑦ Second Counter Mode Indicator
⑧ Clock Mode Indicator
⑨ APLD Function Indicator
⑩ Timer Start Mode Indicator
⑪ Timer Start Memory Indicator
⑫ Timer Stop Mode Indicator
⑬ Timer Stop Memory Indicator
⑭ APLD Number Indicator
⑮ Counter Memory Mode Indicator

Figure 13

CHECKING OF THE CONTROL UNIT

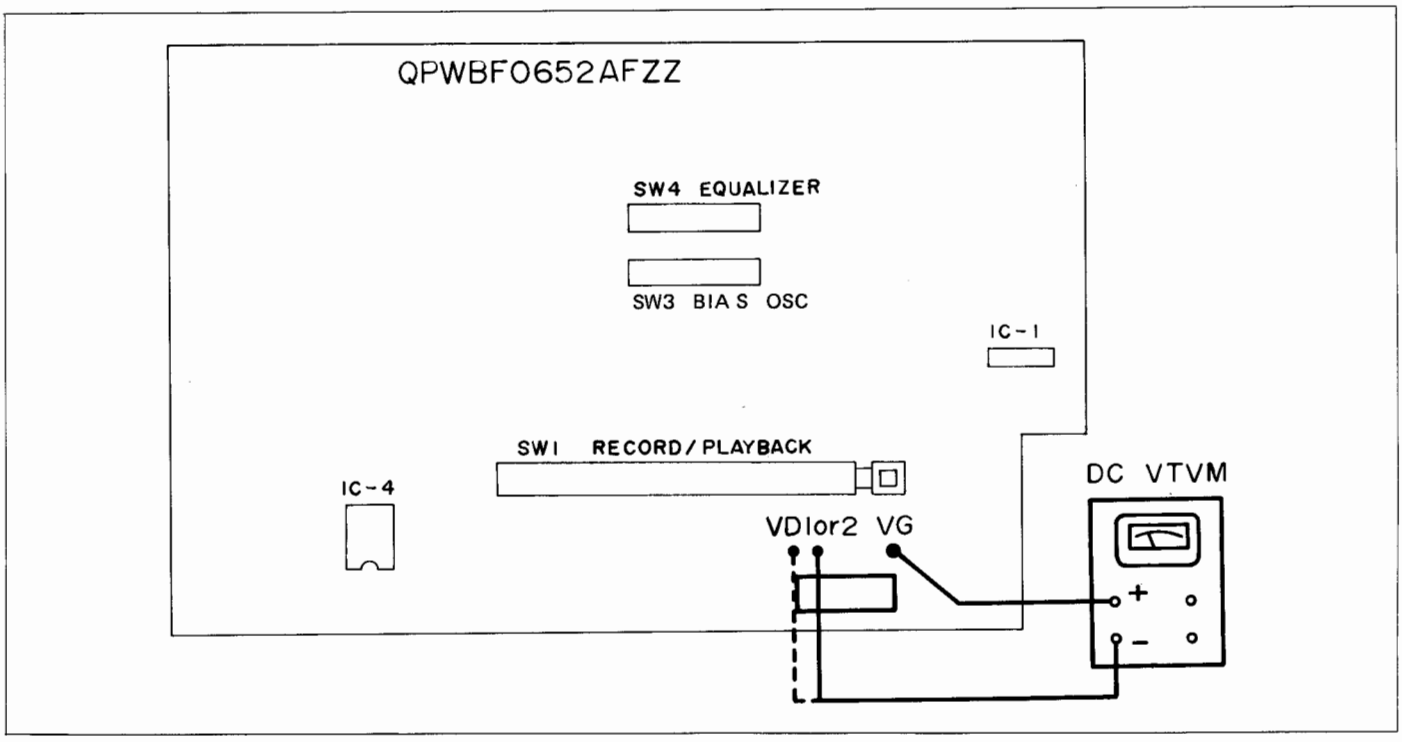


Figure 14

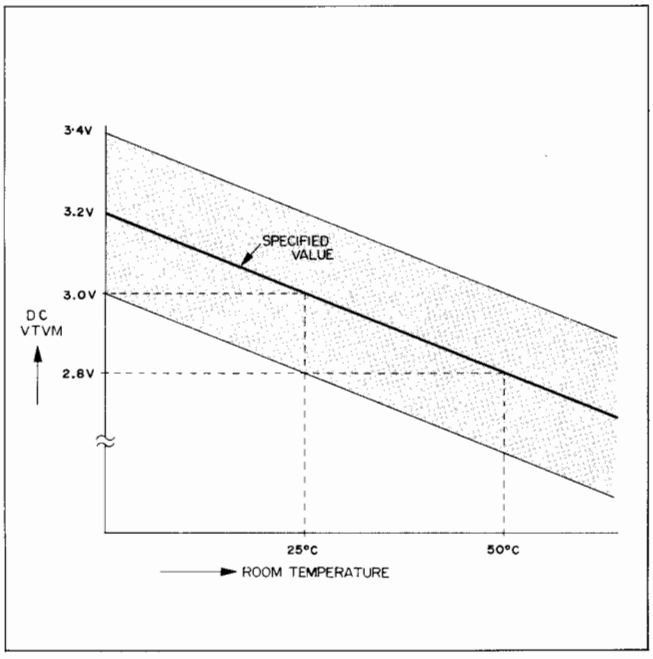


Figure 15

1. Prior to replacement of the control unit, be sure to check for its power supply source after disconnecting the flat cable. Insert the power supply plug into a wall outlet and use a VTVM (DC) to measure a voltage between the terminals VG and VD (VD1 or VD2) of the record-playback P.W.B. (QPWBF0652AFZZ). (See Figure 14.)
   At the time, make sure that the VTVM is within the indication in Figure 15.
   (Figure 15 shows the relation between the room temperature (in the horizontal axis) and the voltage amount indicated by the VTVM (in the vertical axis). Referring to the figure, check that the measured voltage is within ± 0.2 V of the specified value.)
2. If the measured voltage is found to be beyond ± 0.2 V of the specified value, turn the LSI voltage Adjust Control (VR801) located at the power P.W.B. to adjust so that the VTVM will read the specified value. (See Figure 16.)
3. After taking the voltage adjustment in the steps 1 and 2 above, next proceed with the performance check for the control unit according to the "Performance Test Program" in the Tables 1 and 2. The Tables 1 and 2 are carried on the pages 27 to 30.
   If both the control unit and the set (RT-3838H) are found to meet the requirements in the "Performance Test Program", the remedial operation can be said to have been finished. However, there is something troublesome found as a result of the above operation, it becomes necessary to further located whether such trouble(s) lies in the control unit or other parts in the set.

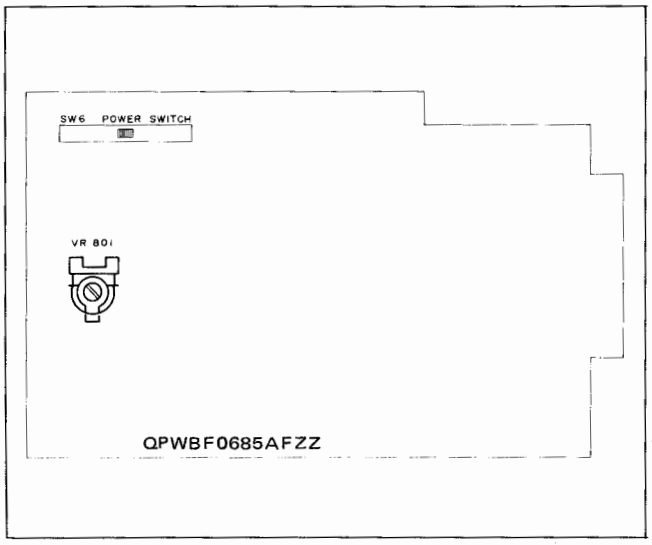


Figure 16

4. Make a normal set (RT-3838H) be available in your hands. From this set remove the control unit according to the procedures stated in the "Disassembly" in the pages 2 to 4. (This normal set is to be used as a checker.)
5. Remove the control unit from the set which seems to have got in trouble, in the same manner as in the step 4 above.
6. Attach the control unit which has been removed in the step 5, to the normal set whose control unit has been detached in the step 4. In this attachment of the control unit, it is necessary to use only the flat cable but not the screws.
7. Check for the control unit according to the "Performance Test Program" (Tables 1 and 2).
   (1) As a result of this check, if the checker-use set satisfies the requirements on the "Performance Check List", this means that the control unit is not in trouble but the set itself does so.
   (2) On the other hand, if the checker-use set doesn't meet some of the requirements in "Performance Test Program", this means that the control unit is in trouble. Therefore, replace the control unit with a new one.
8. In the case of the trouble stated in the step 7-(2) caused, attach a new control unit to the test set in the place of the defective control unit and make sure that the set can operate in compliance with the requirements in the "Performance Test Program". Then assemble them up taking the reverse procedures of those for the "Disassembly". The remedial operation is thus completed. In addition, as to the control unit once removed from the checker-use set, also assemble them up in the reverse steps of those for the "Disassembly".

CAUTIONS ON REPLACEMENT OF THE CONTROL UNIT

(1) Prior to the voltage checking in the steps 1 and 2 above, be sure to insert the power supply plug into a wall outlet after disconnecting the flat cable. If dry batteries are instead used as a power source, the DC-VTVM tends to always indicate the battery potential (about 3 V) and it can't vary even if the LSI voltage adjust control (VR801) is rotated.

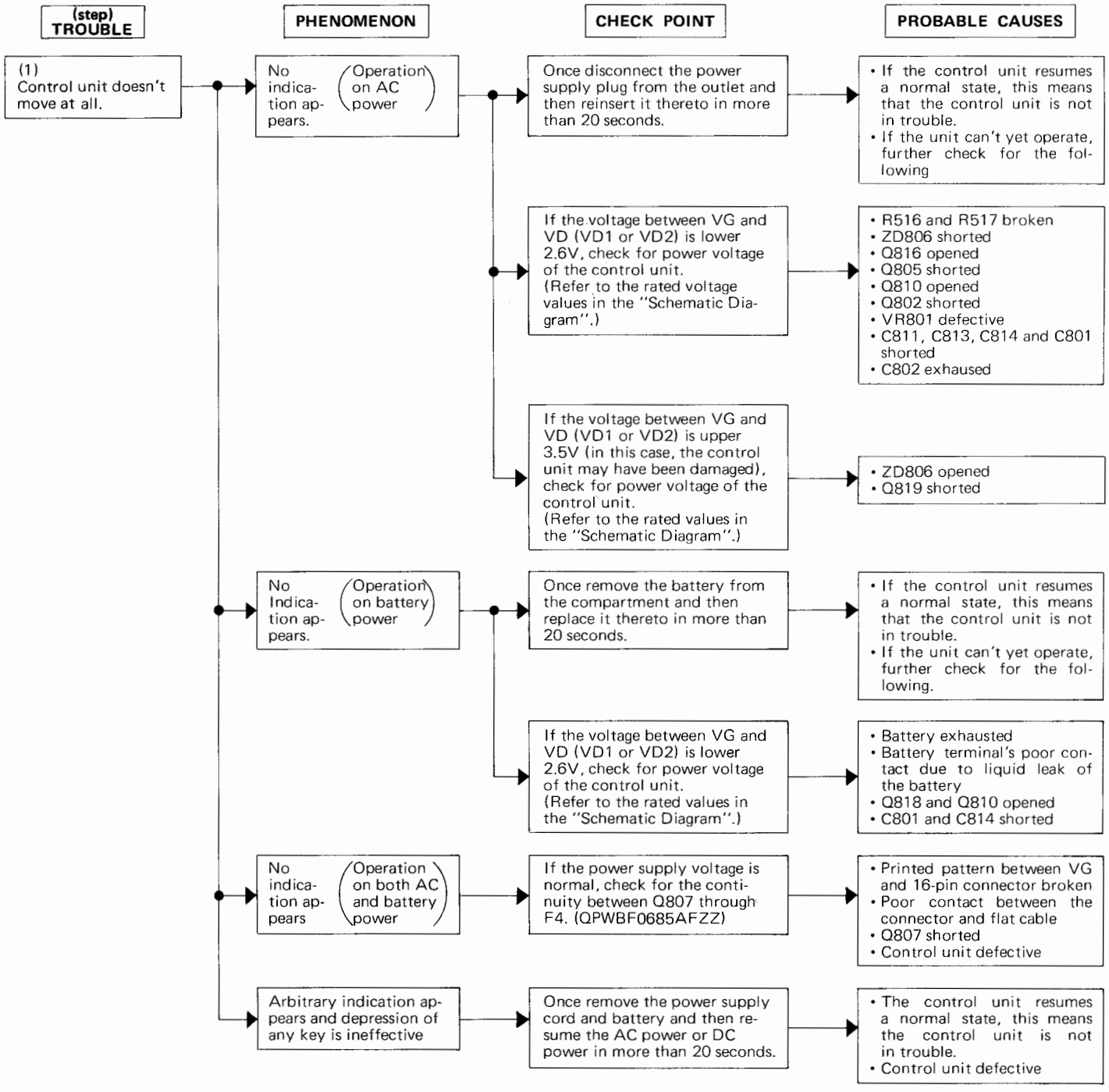
(2) With the power supply plug in connection (or with the battery placed), never attach the control unit to the set nor remove it, otherwise the control unit will be damaged.

(3) If a power supply to the control unit is cut for a short time (less than 20 seconds) —— actually saying, if under the condition without battery the power supply plug is once unplugged from the receptacle and then replaced thereto in less than 20 seconds, the control unit displays such unusual phenomena that it doesn't indicate at all or indicates too unexpected values. But this doesn't means that the control unit is in trouble. If such occurs, wait for more than 20 seconds before inserting the power supply plug once withdrawn, into the wall outlet. Even in the case of the set operating on only the battery, also observe the above cautions —— be sure to wait for more than 20 seconds before setting the battery once removed, in the compartment.

TROUBLE SHOOTING GUIDE

The check point refers to the wrapping pin located on the PWB (QPWBF0652AFZZ).

IMPORTANT KEY FOR THE TROUBLESHOOTING
First of all, check whether the tape running indicators are normal or not and if there is something abnormal in them, this means that the entire of the set is not assured of its usual operation.



(step) TROUBLE	PHENOMENON	CHECK POINT	PROBABLE CAUSES
(2) Even if the power mode switch (SW6) is set to "on" from "stand-by", the clock display mode is not changed to the tape counter mode.		Check for the continuity among the power mode switch and the pins O38 and O48. Check for the continuity between F4 through Q807. (QPWBF0685AFZZ)	• Imperfect changeover of the power mode switch (SW6) • Printed pattern between the pins O48 and O38 at the connector broken • Poor contact between the 16-pin connector and flat cable • Poor soldering of the pins O48 and O38 of the power PWB (QPWBF0685AFZZ) • Q807 opened • Control unit defective
(3) Tape running indicators don't operate.	No indication appears even if any of the mechanical keys (PLAY, REV, FWD, PAUSE) is pushed.	Check for the continuity between the mechanism PWB (QPWBF0654AFZZ) and CON-2. Check for the continuity between F4 through Q807.	• Q807 opened • Solenoid Switch defective (SW15) • Poor contact between the 16-pin connector and flat cable • Mechanism transport connector (CON-2) defective • Control unit defective
	No "PLAY" indication appears even if the PLAY key is pushed.	Check for the continuity between SW12 through O17.	• Play Switch defective (SW12) • Poor contact of the mechanism transport connector (CON-2) • Poor contact between the 16-pin connector and flat cable • Control unit defective
	No "FWD" (FWD, APLD) indication appears even if the FWD key is pushed.	Check for the continuity between SW9 through O37.	• Fast-forward·Forward APLD Switch defective (SW9) • Poor contact of the mechanism transport connector (CON-2) • Poor contact between the 16-pin connector and flat cable • Control unit defective
	No "REV" (REV, APLD) indication appears even if the REV key is pushed.	Check for the continuity between SW11 through O47.	• Rewind·Reverse APLD Switch defective (SW11) • Poor contact of the mechanism transport connector (CON-2) • Poor contact between the 16-pin connector and flat cable • Control unit defective
(4) Tape counter can't count up even if the tape counter mode.	Tape running indicators are normal. Note: If there is something abnormal in the tape running indicators, take the procedures in the step 3 before.	Check for the continuity between the Hall IC (IC-5) and α input circuit. There is no change between low and high level of α terminal signal.	• Hall IC (IC-5) defective • Poor contact of the power PWB (QPWBF0685AFZZ) 6-pin connector • Q808 shorted or opened
		There is a change between low and high levels of α terminal signal.	• The α pin printed pattern broken • Poor contact between the 16-pin connector and flat cable. • Control unit defective

(step) TROUBLE	PHENOMENON	CHECK POINT	PROBABLE CAUSES
(5) APLD don't operate. (APLD number indication don't count down)	Both the tape running indicator and APLD function indicator are normal. Note: If there is something abnormal in tape running indicators, take the procedures in the step 3.	Check for the continuity between the APLD blank signal detection circuit through β input circuit. No high pusle appears at blank signal of β terminal.	• APLD blank signal detection circuit defective (during the equalizer amp. through Q817). • Q809 shorted or opened
		High pulse appears at blank signal of β terminal.	• The β-pin printed pattern broken. • Poor contact of the 16-pin connector and flat cable • Control unit defective
(6) Second counter can't count up even if the second counter display mode.		No "PLAY" indication appears in the tape running indicators. Check for the continuity between SW7 through Q27. Take the procedures in the step 3.	• Pause Switch defective (SW7) • Poor contact between the mechanism relay connector (CON-2).
		The tape running indicators are normal.	• Poor contact between the 16-pin connector and flat cable • Control unit defective
(7) No correct number nor symbol appears when the key is pushed.	All keys can't be keyed in.	Take the procedures stated in the step 1.	
	Specially key can't be keyed in.		• Control unit defective • Keyblock defective
(8) No memory indicator "M" appears even if the S key is pushed under the mode of T·SA, T·SO, CM or D·IN.		Take the procedures stated in the step 2.	• Power mode switch (SW6) defective • Record-playback switch (SW1-P) defective • Poor changeover of the record-playback switch (SW1) • Control unit defective
(9) No Dolby indicator DD mark appears even if the Dolby NR switch (SW2) is turned on.		Check for the continuity between the Dolby NR switch (SW2) through Q18.	• Dolby NR switch (SW2) defective • Poor contact between the 16-pin connector and flat cable • Control unit defective
(10) Counter memory doesn't operate. (Direct memory doesn't operate.)	The plunger doesn't operate although the memory indication (M) disappears. The tape running indicator is kept normal Note: If the tape running indicator is abnormal, take the procedures in the step 3.	Check for the continuity between the terminal F1 and Q801. Check if there is output signal at the terminal F1. Remove the flat cable and supply +3V to the terminal F1 and 0V to the VD. (QPWBF0685AFZZ)	When the plunger resumes the operation. • Poor contact between the flat cable and 16-pin connector • Breakage between the terminal F1 and 16-pin connector • Control unit defective
			When the plunger can't operate. • Q804 shorted • Q803 opened • Q802 opened • Q801 opened • Plunger broken • Poor contact of the 6-pin connector at the power PWB (PWBF0685AFZZ)

(step) TROUBLE	PHENOMENON	CHECK POINT	PROBABLE CAUSES
(11) The memory rewind doesn't operate.	The tape running indicator is kept normal. Note: If the tape running indicator is abnormal, take the procedures in the step 3.	Check for the continuity between R1 through Q801. Check if there is output signal at the terminal R1. Remove the flat cable and supply +3V to the terminal R1 and 0V to that VD.	When the plunger resumes the operate. • Poor contact between the flat cable and 16-pin connector • Breakage between the terminal R1 and 16-pin connector • Control unit defective
			When the plunger can't operate. • Q804 shorted • Q803 opened • Q802 opened • Q801 opened • Plunger lead broken • Poor contact of the 6-pin connector at the power PWB (QPWBF0685AFZZ) • SW10 defective
(12) The APLD doesn't operate. (the APLD number indication counts down to disappear:)	Although the tape running indicator is kept normal. the APLD Note: If the tape running indicator is abnormal, take the procedures in the step 3.	The same as in the step (10).	• The same as in the step (10).
(13) The full auto stop doesn't operate.	The tape running indicator is kept normal. Note: If the tape running indicator is abnormal, take the procedures in the step 3.	The same as in the step (10).	• The same as in the step (10).
(14) Timer doesn't operate.	If the tape running indicator is abnormal, take the procedures in the step 3.	Check for the countinuity between the terminal R2 through Q503.	• Power mode switch (SW6) defective • Power switch changeover lever positionally defective • Q821 shorted • Q505 shorted or opened • Q504 shorted or opened • Q503 shorted or opened • Relay broken • Poor contact between the 16-pin connector and flat cable • Pattern breakage of the connector R2 • Control unit defective
	The pause lever is not released with the timer start operation.	The same as in the step (10).	
	The set is not stopped automatically with the timer stop operation.		

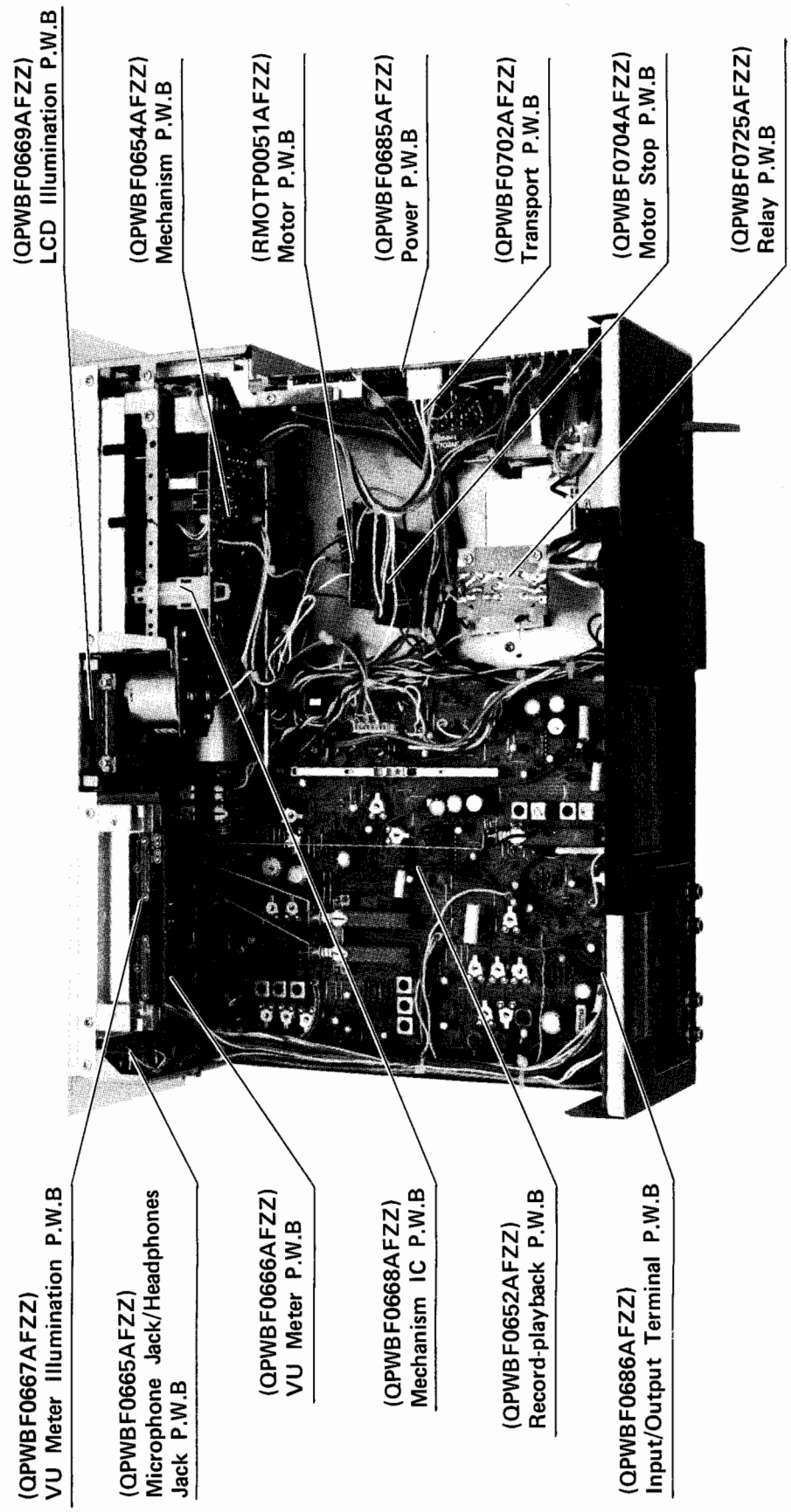
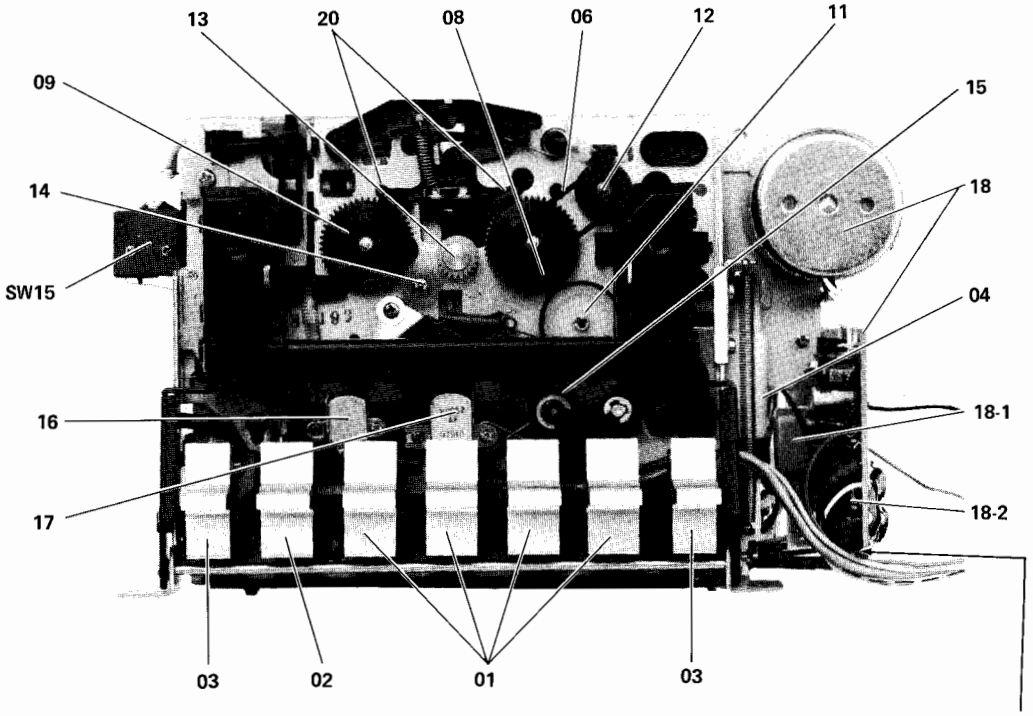

(QPWBF0669AFZZ)
LCD Illumination P.W.B
(QPWBF0654AFZZ)
Mechanism P.W.B
(RMOTP0051AFZZ)
Motor P.W.B
(QPWBF0685AFZZ)
Power P.W.B
(QPWBF0702AFZZ)
Transport P.W.B
(QPWBF0704AFZZ)
Motor Stop P.W.B
(QPWBF0725AFZZ)
Relay P.W.B
(QPWBF0667AFZZ)
VU Meter Illumination P.W.B
(QPWBF0665AFZZ)
Microphone Jack/Headphones
Jack P.W.B
(QPWBF0666AFZZ)
VU Meter P.W.B
(QPWBF0668AFZZ)
Mechanism IC P.W.B
(QPWBF0652AFZZ)
Record-playback P.W.B
(QPWBF0686AFZZ)
Input/Output Terminal P.W.B

Figure 17

Note: The numerals given to the parts in this Figure 18 and 19 are equivalent to those of the parts listed in the "MISCELLANEOUS".



This PWB is attached to the main chassis of the set. (See Figure 21.)

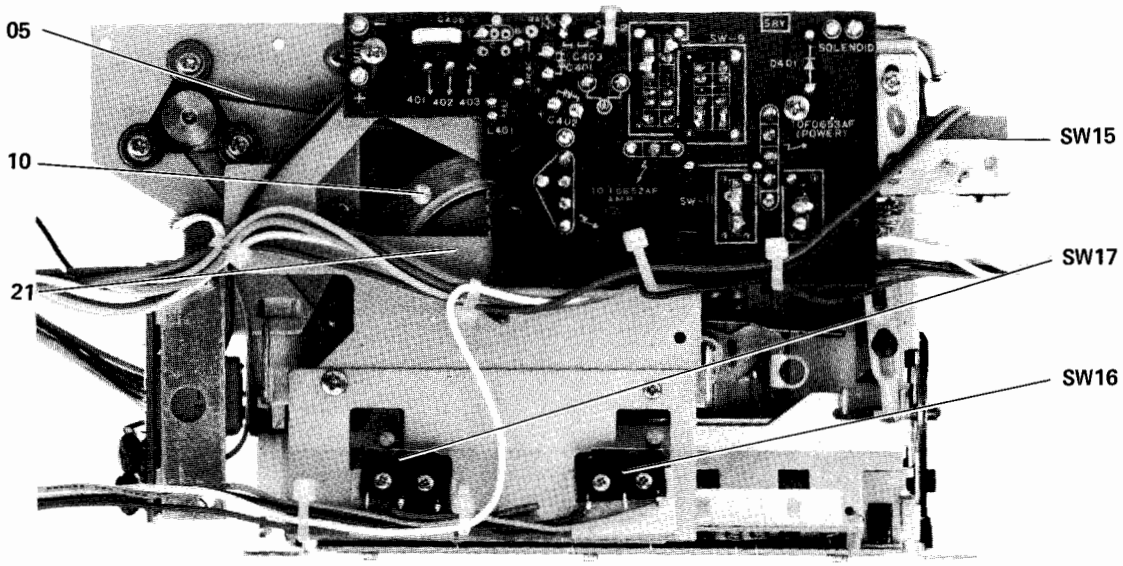
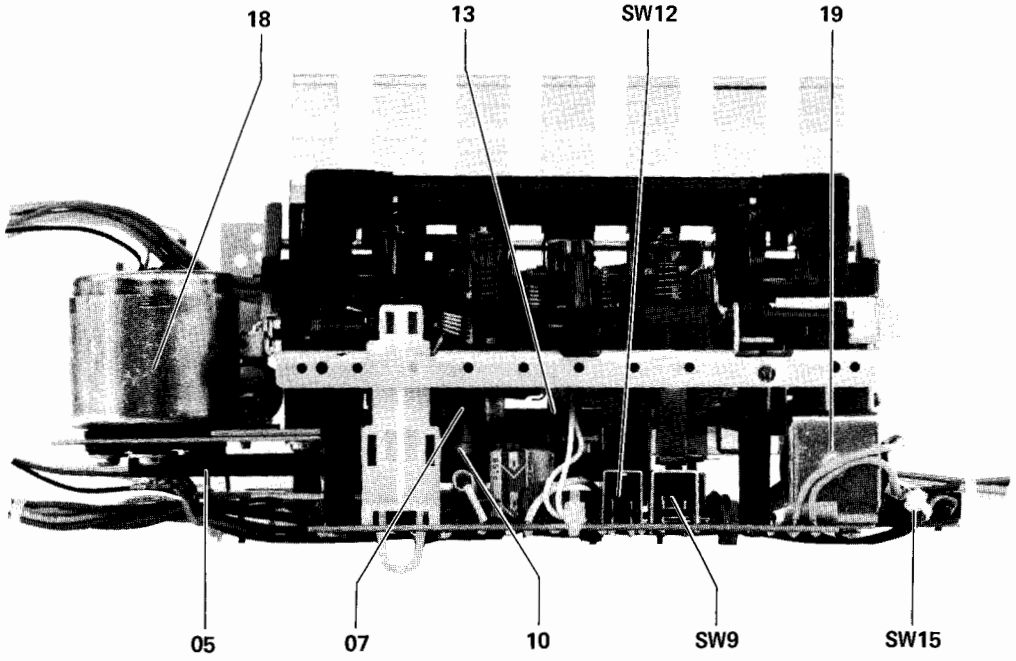
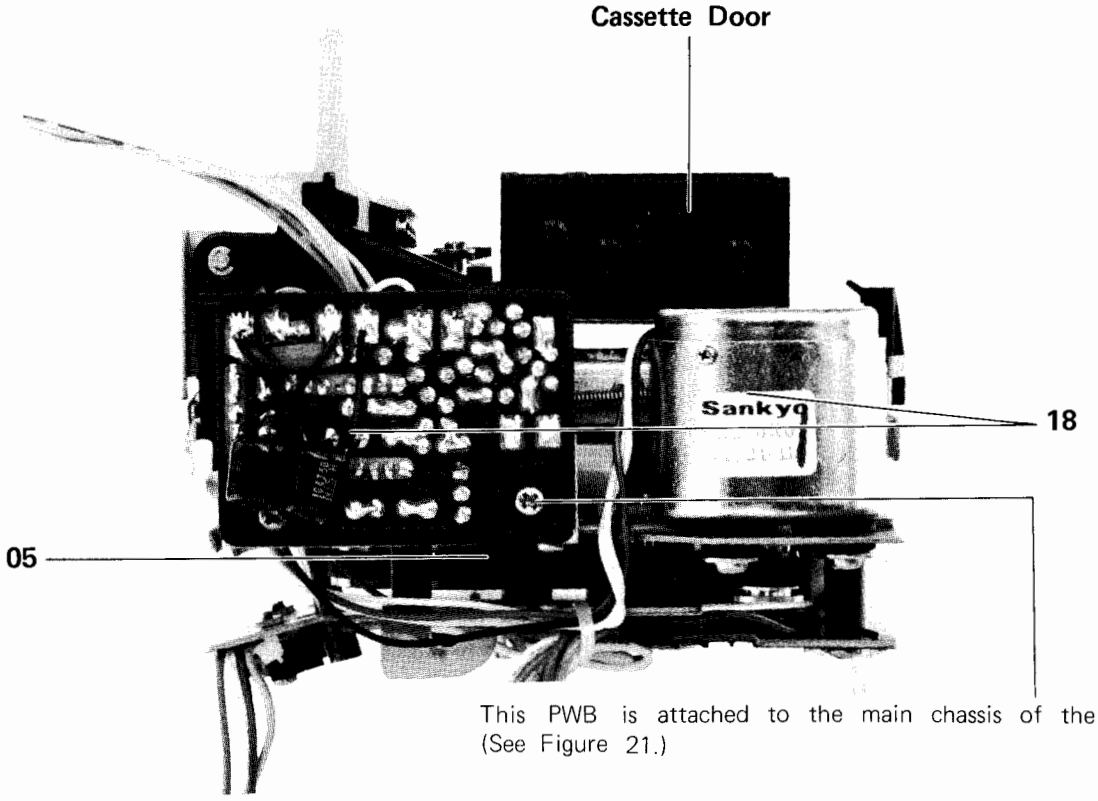


Figure 18

Note: The numerals given to the parts in this Figure 18 and 19 are equivalent to those of the parts listed in the "MISCELLANEOUS".





This PWB is attached to the main chassis of the set. (See Figure 21.)

Figure 19

IDENTIFICATION OF THE CONTROLS

Note: The numerals given to the parts in this Figure 20 and 21 are equivalent to those of the parts listed in the "MISCELLANEOUS".

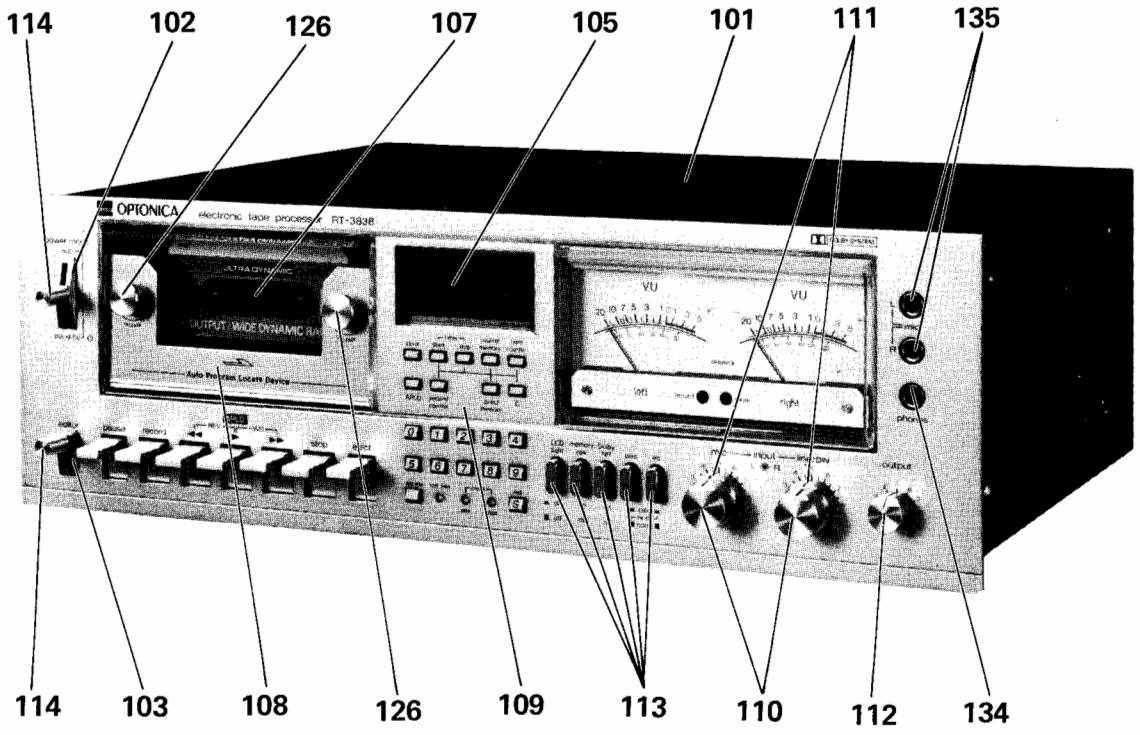


Figure 20

Note: The numerals given to the parts in this Figure 20 and 21 are equivalent to those of the parts listed in the "MISCELLANEOUS".

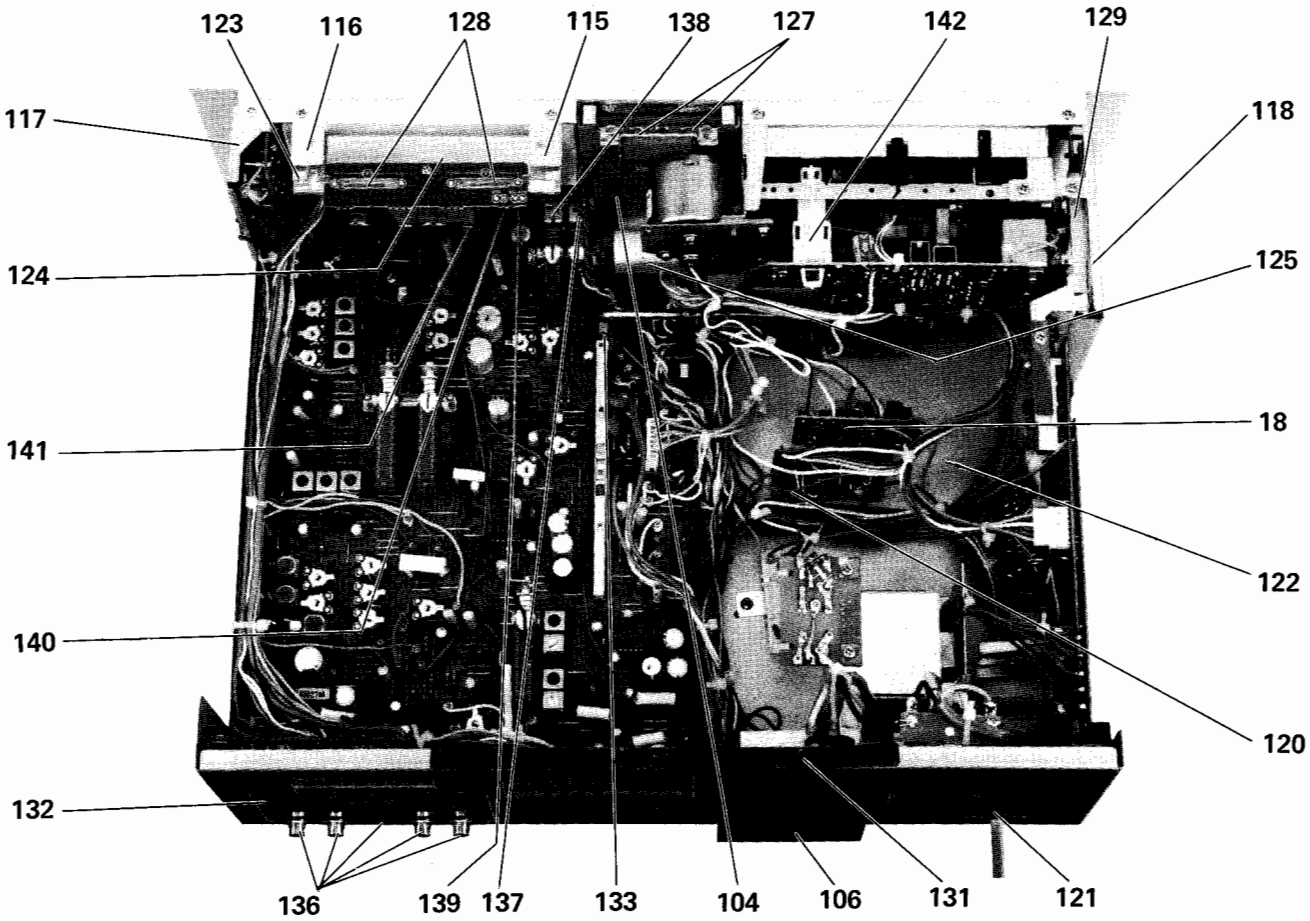
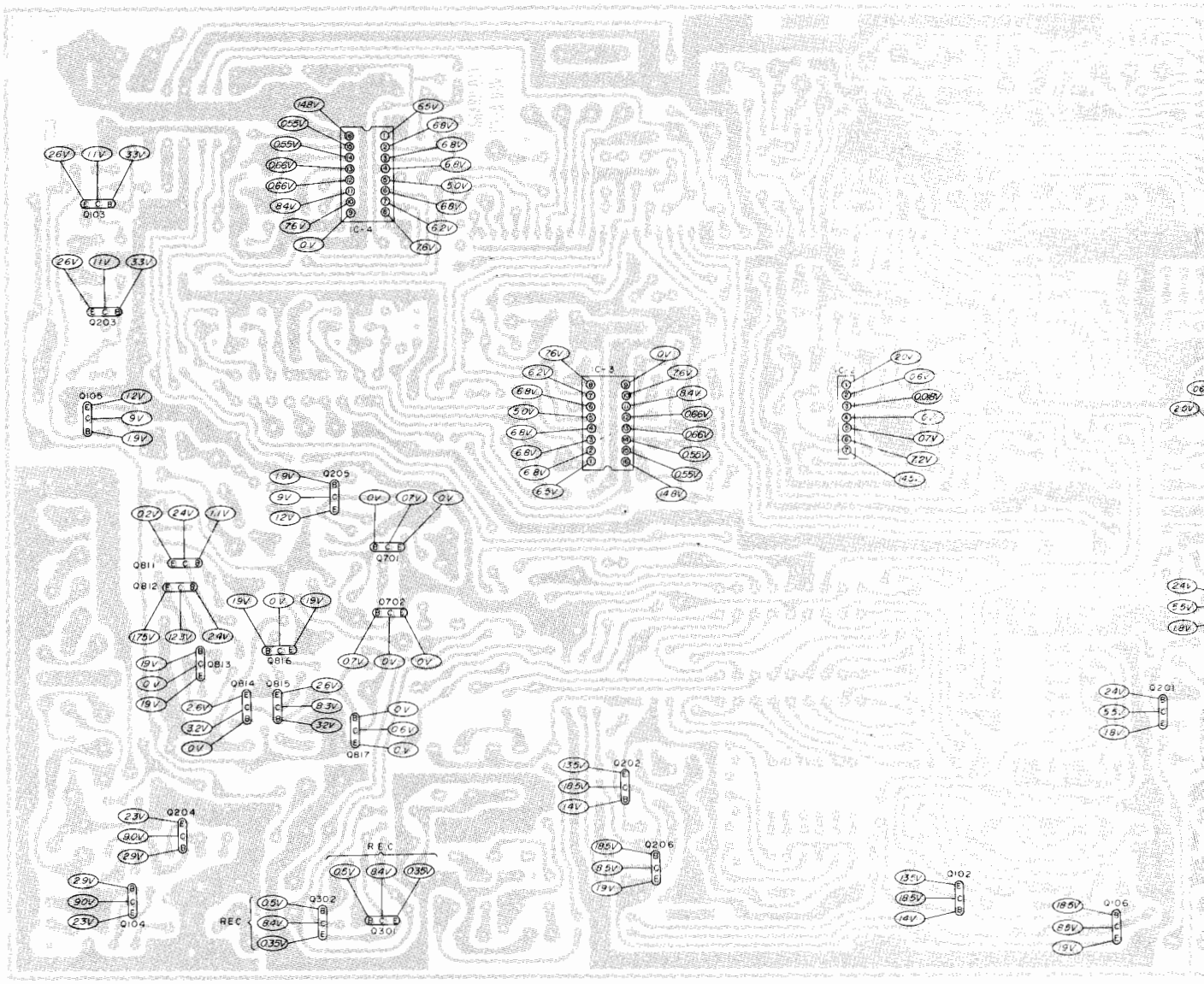
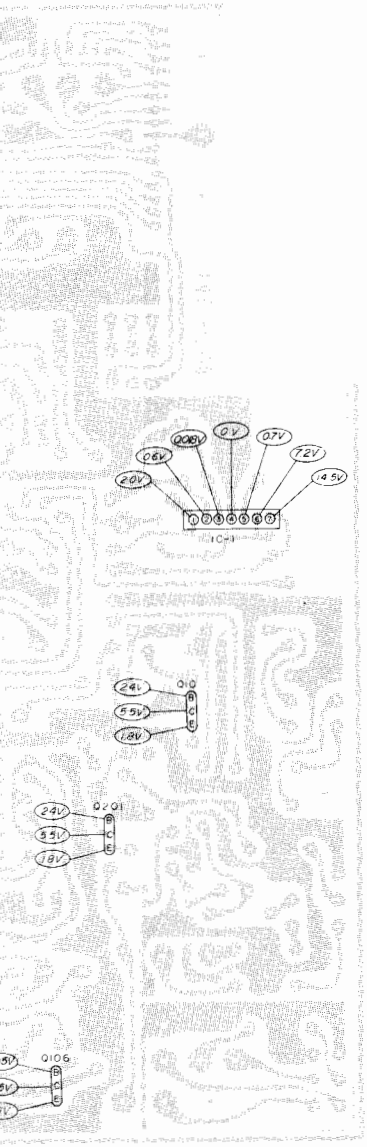


Figure 21


IC-4
IC-3
Q103
Q203
Q105
Q701
Q811
Q812
Q813
Q816
Q708
Q814
Q815
Q817
Q205
Q202
Q204
Q206
Q104
Q302
Q301
REC
Q201
Q102
Q106

Figure


0.06V
0V
0.7V
7.2V
2.0V
14.5V
IC01
2.4V
5.5V
1.8V
Q10
Q201
Q106

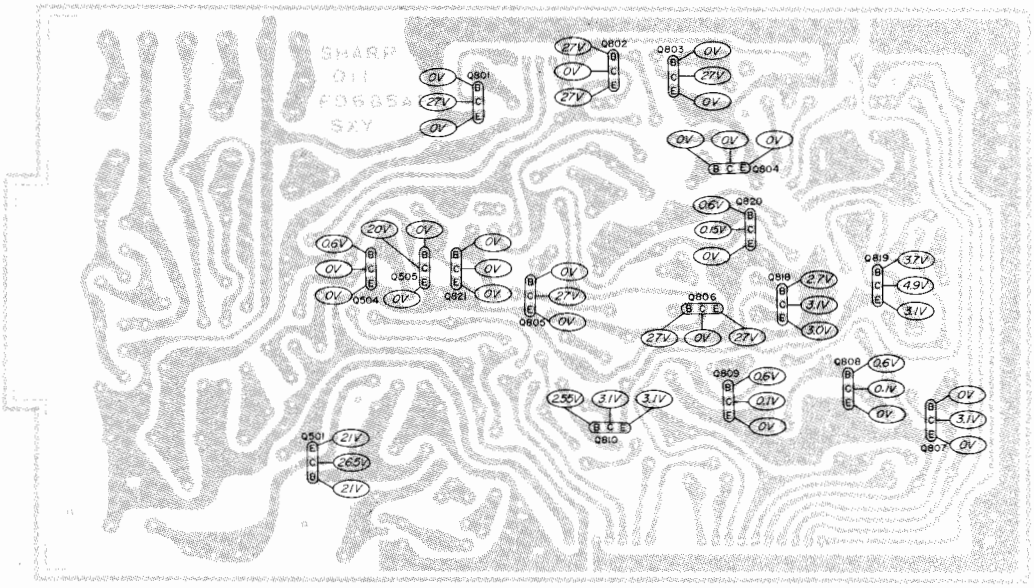
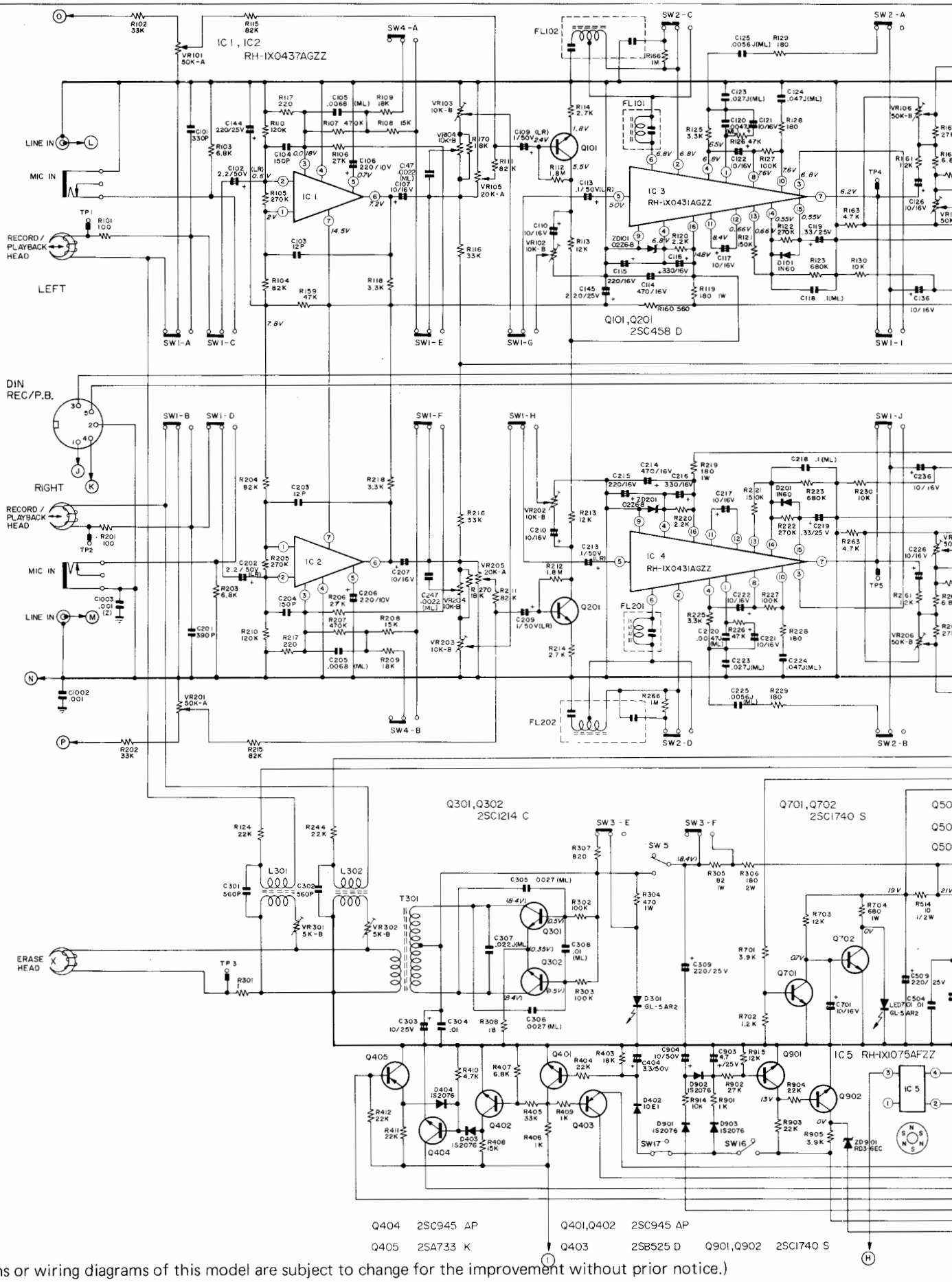
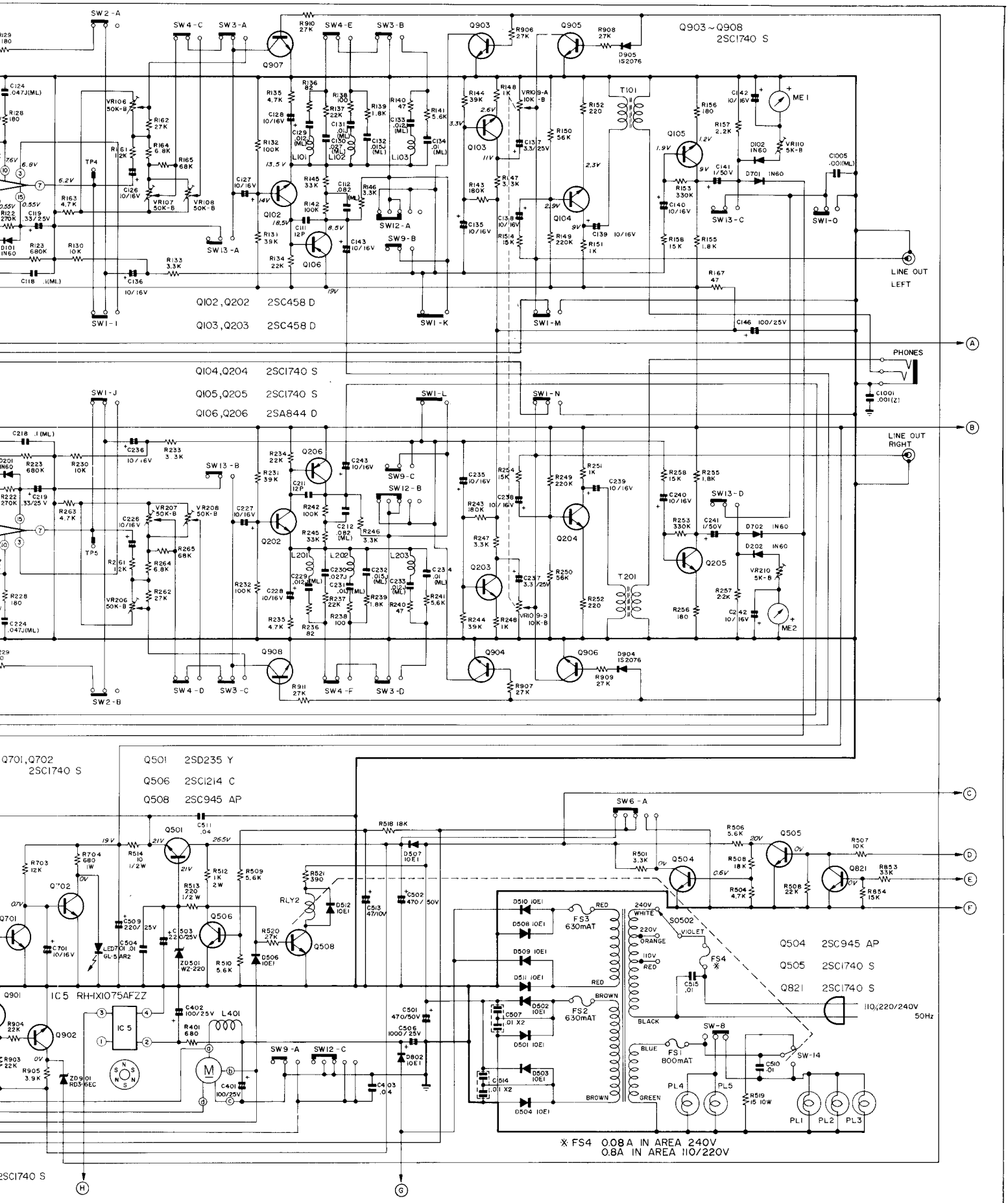

SHARP
CE
FO685A
SXY
Q801
Q802
Q803
Q804
Q805
Q806
Q807
Q808
Q809
Q810
Q818
Q819
Q820
Q821
Q501
Q504
Q505
27V
0V
20V
0.6V
0.15V
3.7V
4.9V
3.1V
30V
0.1V
2.55V
2.65V
21V

Figure 22

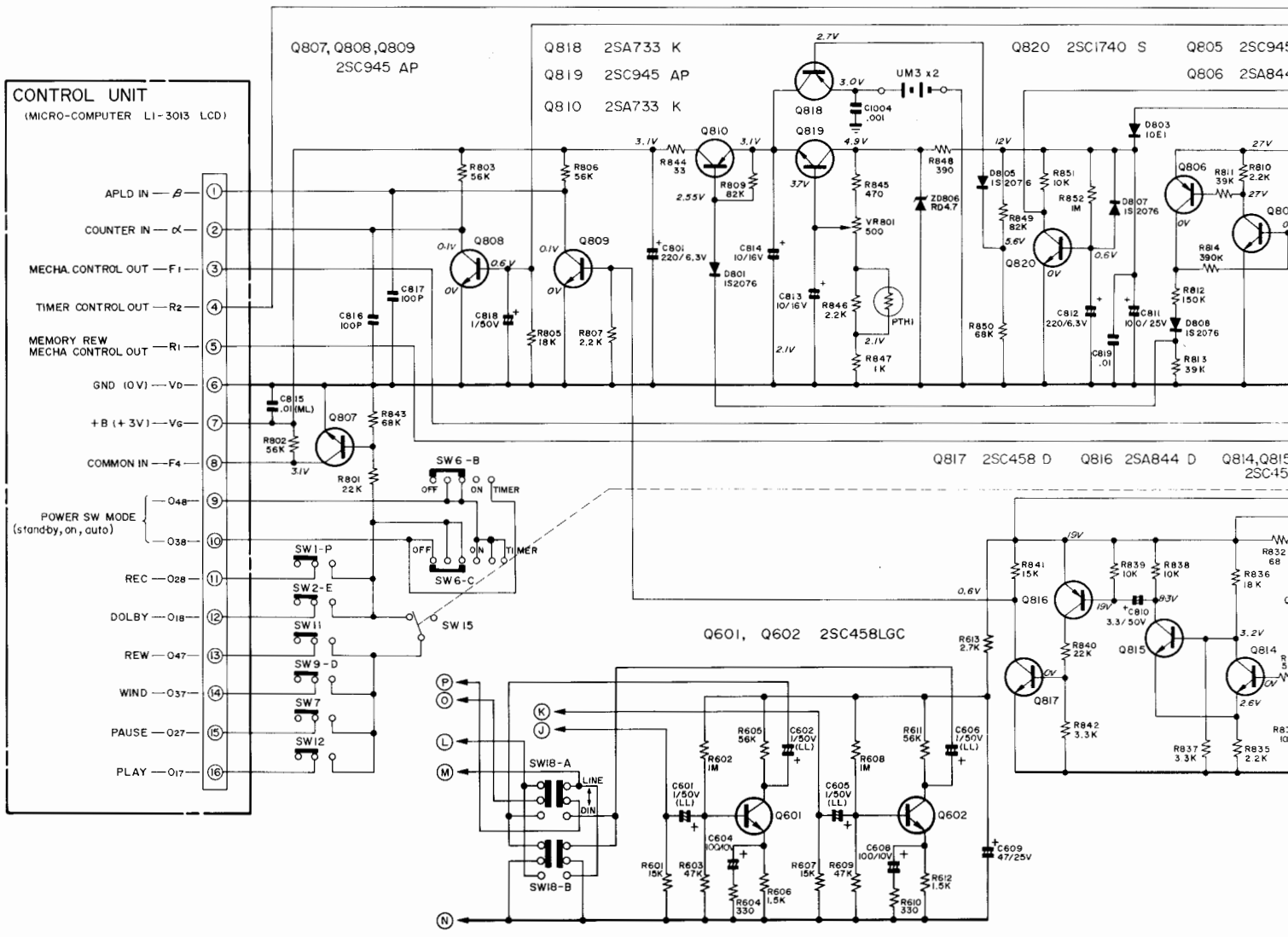


(Specifications or wiring diagrams of this model are subject to change for the improvement without prior notice.)

Figure 23 SCHEMATIC DIAGRAM OF AM

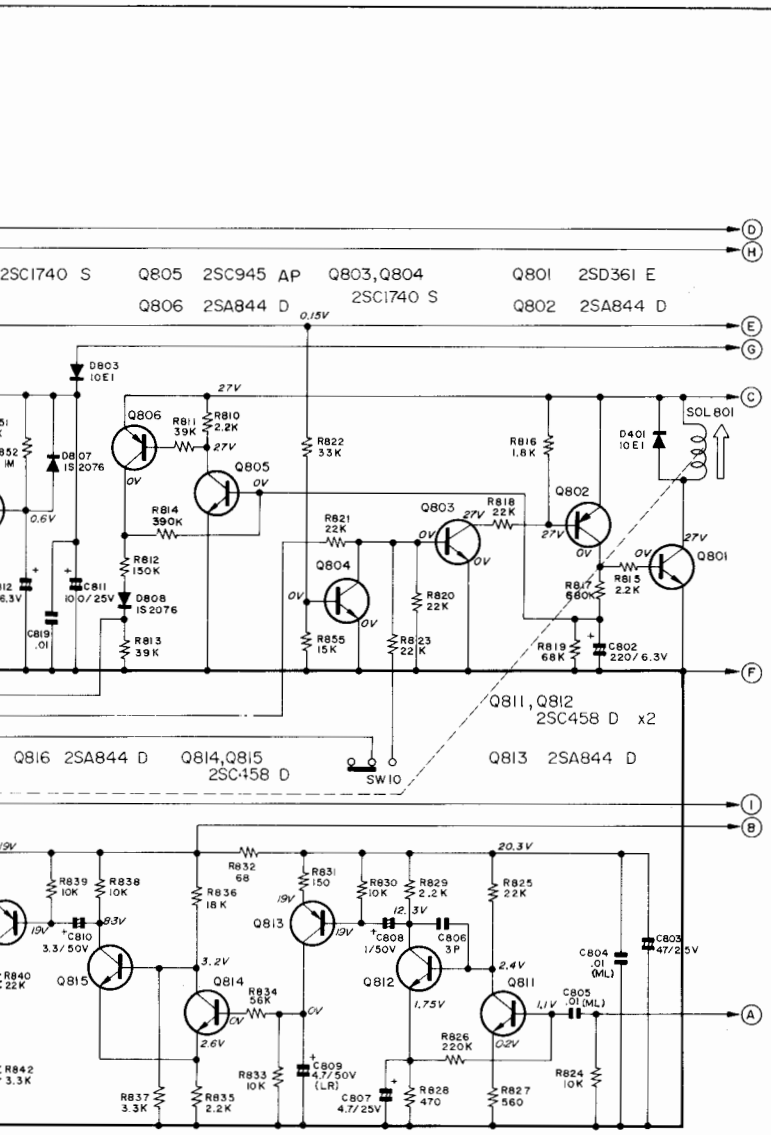


TIC DIAGRAM OF AMP. SECTION



(Specifications or wiring diagrams of this model are subject to change for the improvement without prior notice.)

Figure 24 SCHEMATIC DIAGRAM OF LCD SECTION



SW1 (A ~ O)	Record-playback Switch (Playback Position)
SW2 (A ~ E)	Dolby NR Switch (ON Position)
SW3 (A ~ F)	Bias Selector Switch (Normal/FeCr Position)
SW4 (A ~ F)	Equalization Selector (Normal Position)
SW5	Oscillator Circuit Switch (OFF Position)
SW6 (A ~ C)	Power Switch (Stand-by Position)
SW7	Pause Switch (OFF Position)
SW8	LCD Light Switch (OFF Position)
SW9 (A ~ D)	Fast-forward·Forward APLD Switch (OFF Position)
SW10	Memory Rewind Switch (OFF Position)
SW11	Rewind·Reverse APLD Switch (OFF Position)
SW12 (A ~ D)	Play Switch (OFF Position)
SW13 (A ~ D)	Editor Switch (OFF Position)
SW15	Solenoid Switch (OFF Position)
SW16	Mechanical Stop Switch (OFF Position)
SW17	Brake Switch (OFF Position)
SW18 (A, B)	Record-playback·Line Selector Switch (Line Position)

Note: Capacitance values are in MFD, P=MMFD
Resistance values are in ohm, K=1000, M=10^6
Voltages reading are measured with VTVM Under no signal input.
Voltage without parentheses are measured in playback mode.
Voltage in perentheses are measured in record mode.

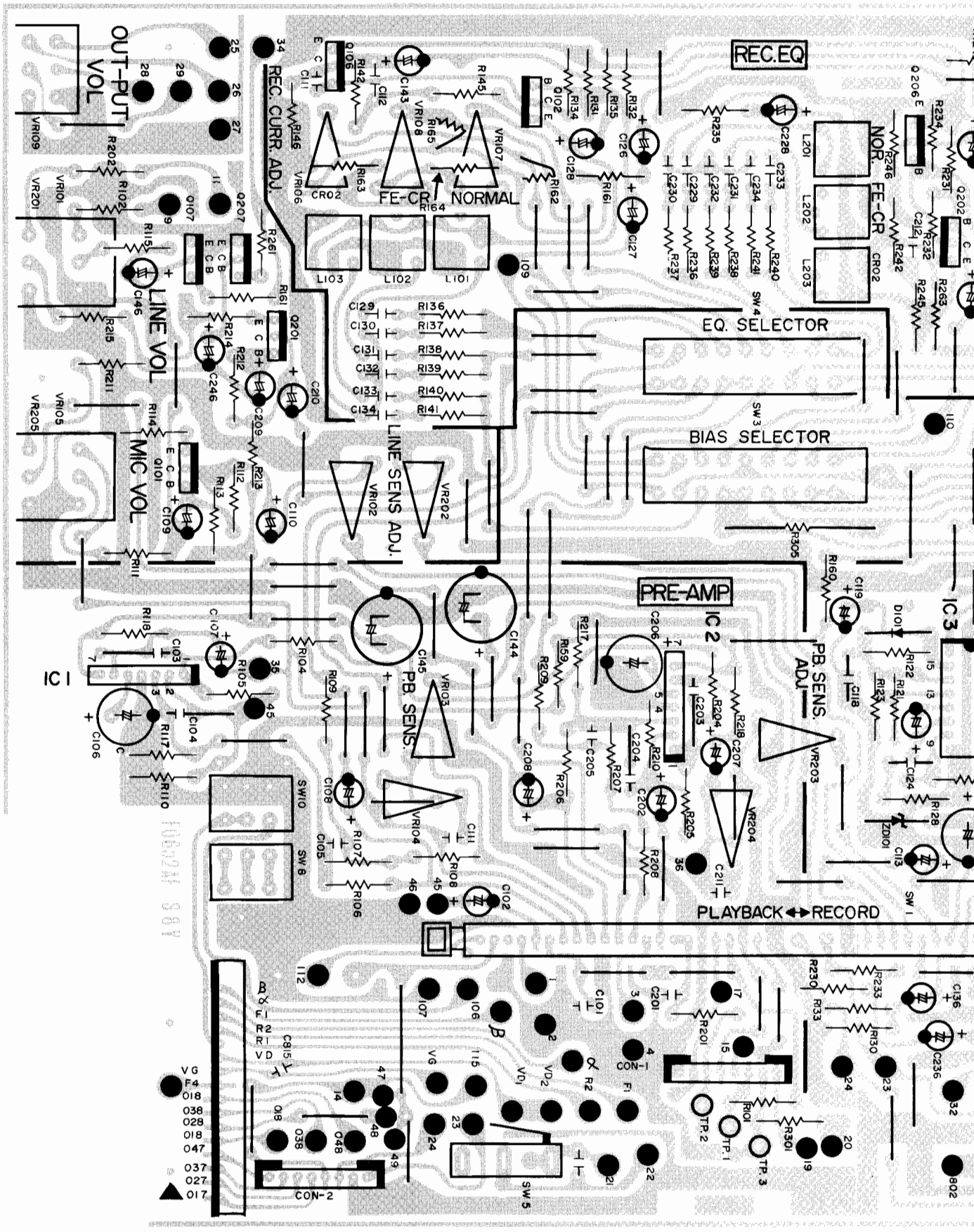
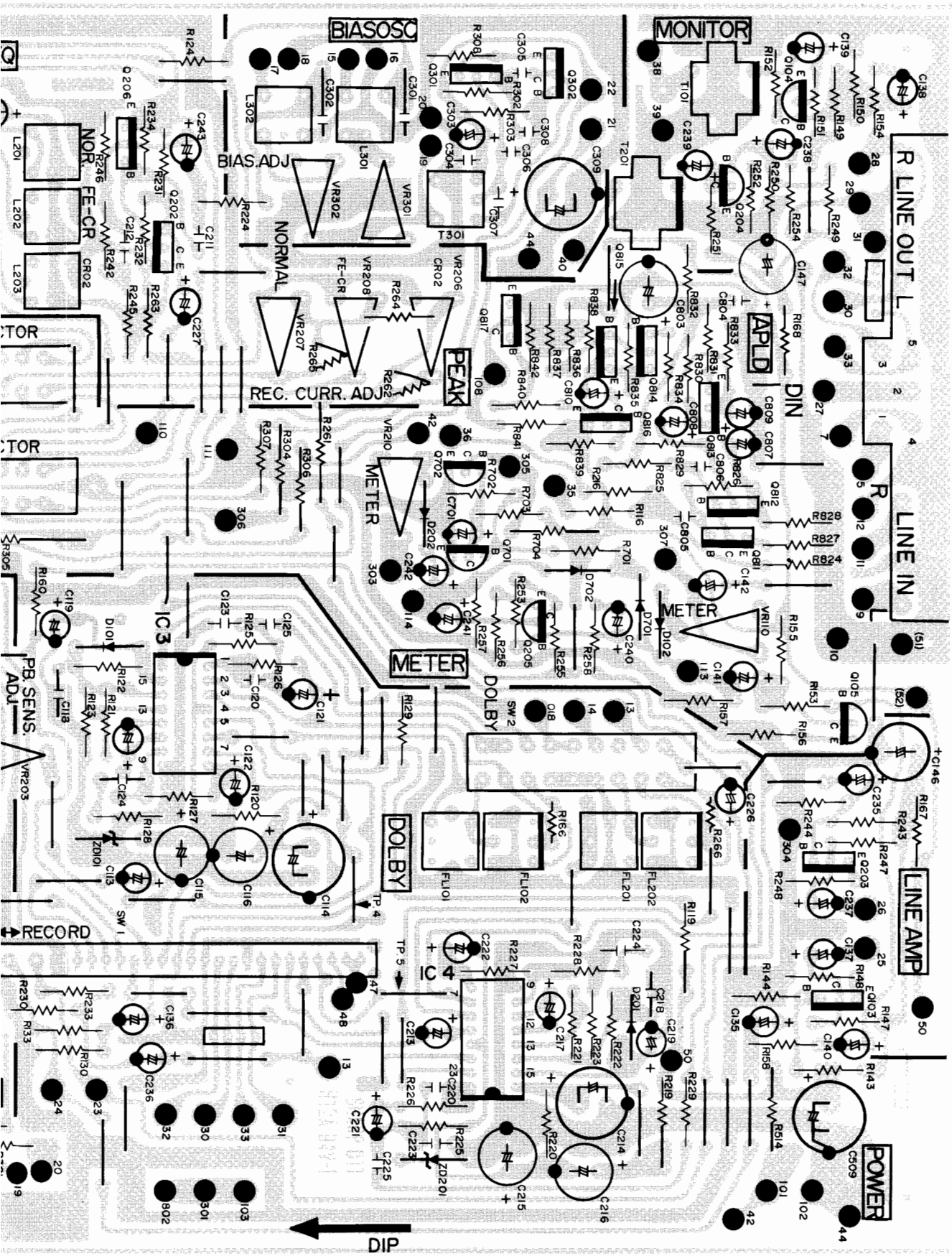
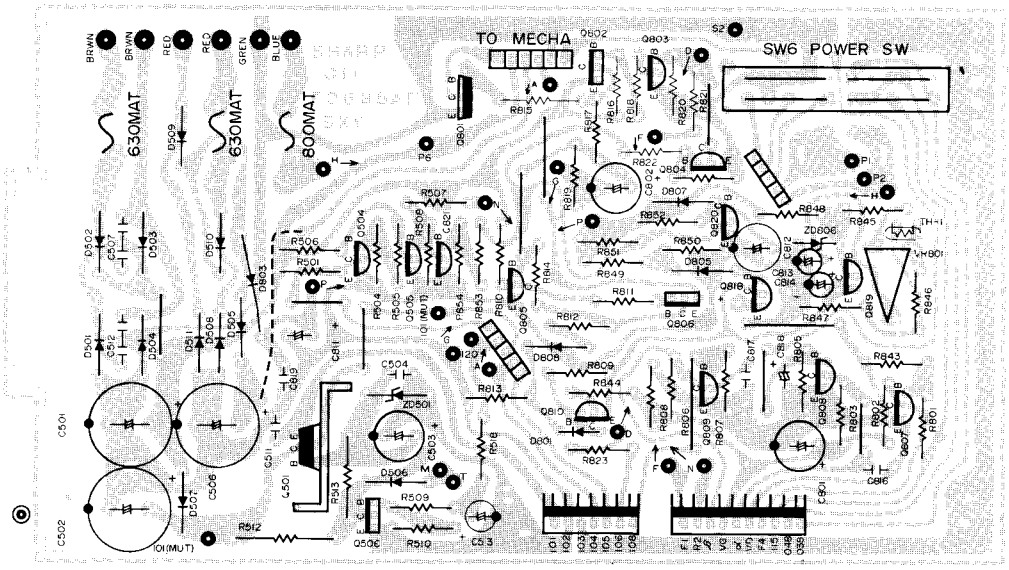


Figure 25 WIRING SIDE OF P.W. B

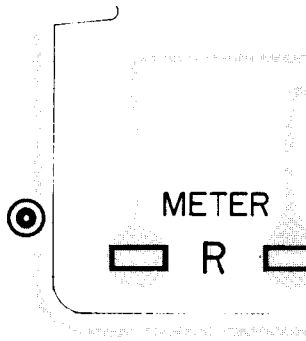


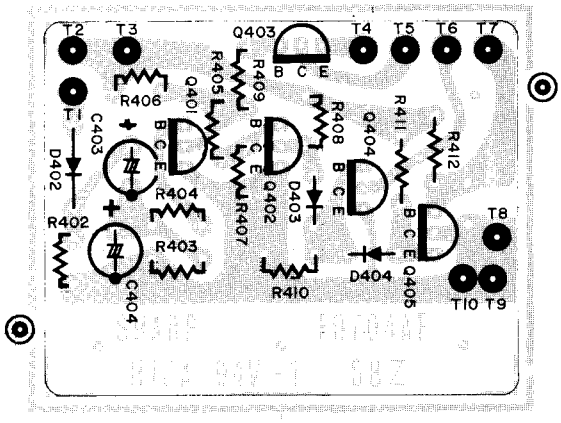
WBF0652AFZZ

RING SIDE OF P.W. BOARD

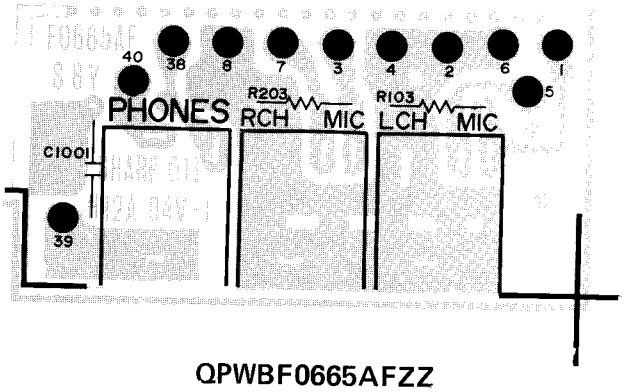


QPWBF0685AFZZ

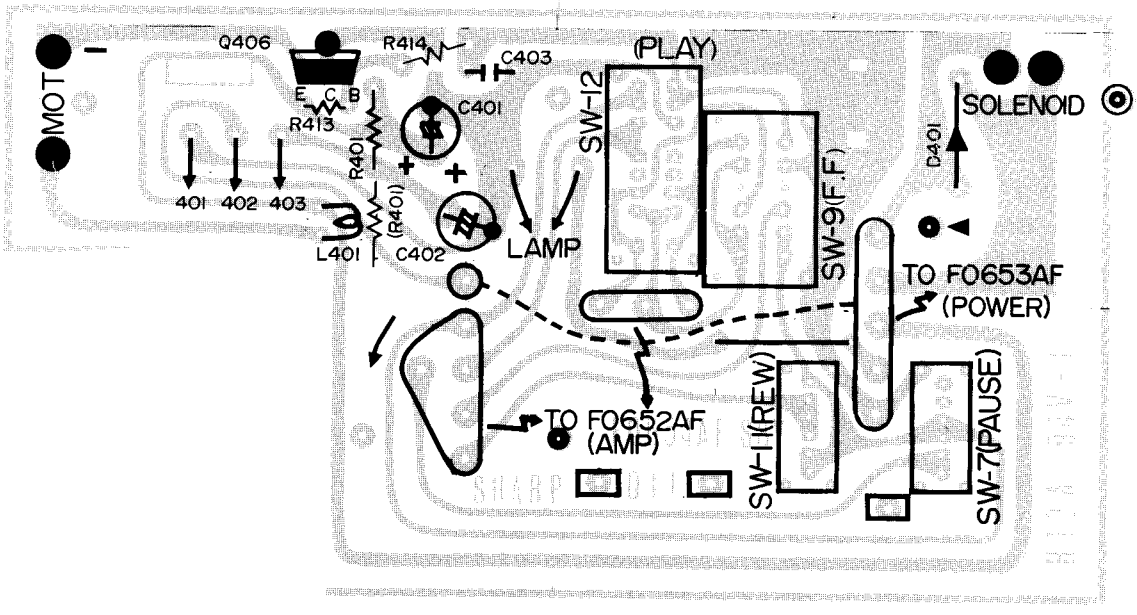




QPWBF0704AFZZ

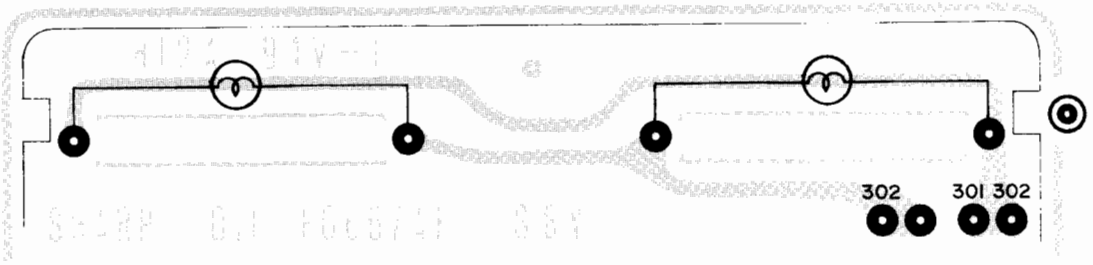


QPWBF0665AFZZ

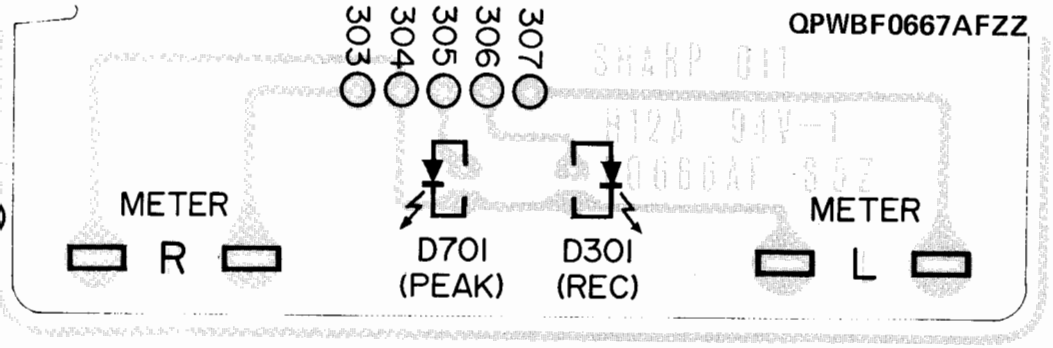


QPWBF0654AFZZ

Figure 26 WIRING SIDE O



QPWBF0667AFZZ



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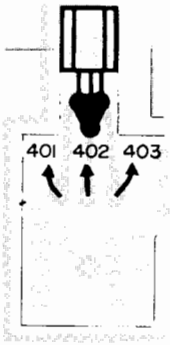
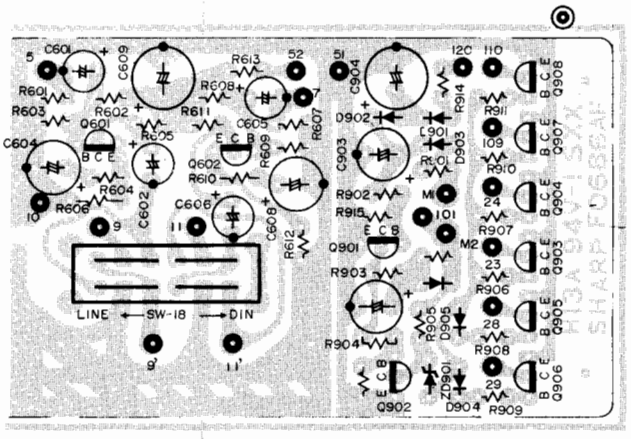


QPWBF0668AFZZ



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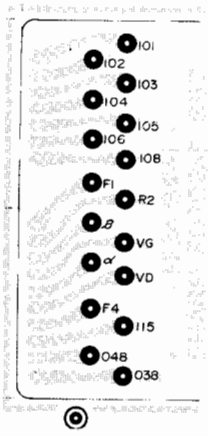

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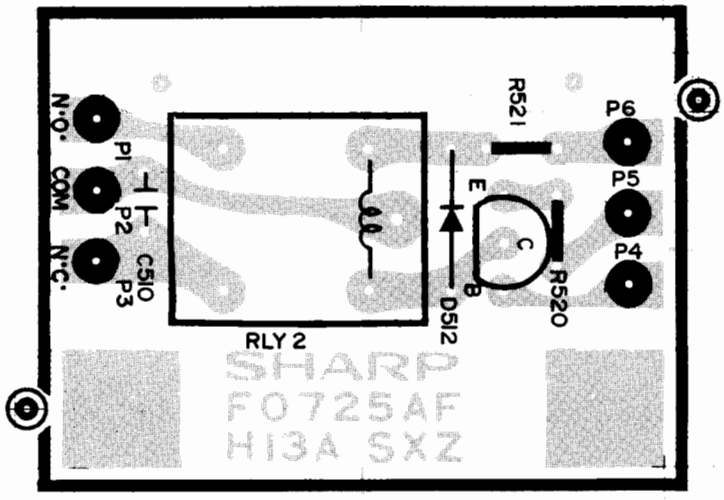

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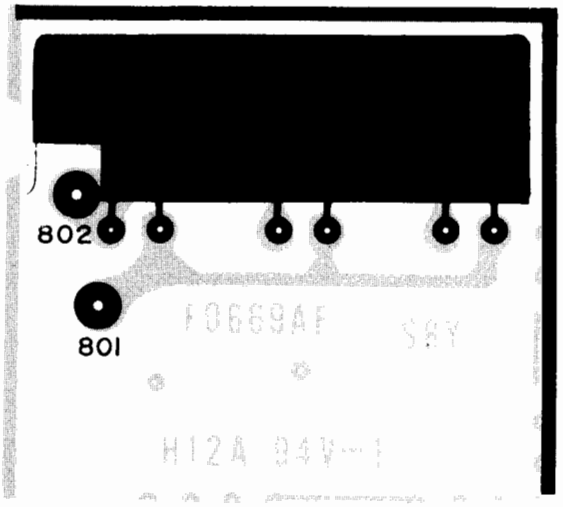


QPWBF0669AFZZ

e 26 WIRING SIDE OF P.W. BOARD

PERFORMANCE TEST PROGRAM

Note: In this Performance Check List, the parts of the control unit are referred in their abbreviation but not in full spelling. For better understanding of this list, please first refer to the following.

CLK	.....Clock key	TC	.....Tape counter key
T · SA	....Timer start key	SC	.....Second counter key
T · SO	....Timer stop key	D · IN	.....Direct memory key
CM	.....Counter memory key	CZ	.....Clock zero key
CS	.....Clock start key	S	.....Set key
C	.....Clear key	APLD	.....APLD key

In addition the LCD display [ ] in this display mean that they are blink.

	Step	Power switch	Mechanical key operation	Control unit key operation	LCD: Display before the (→) marked operation	LCD: Display after the (→) marked operation	Mechanical behavior	Deck on/off	Remarks
Clock operation	1	"stand-by"	"stop"	Insert the power supply plug into a wall outlet.	The indication is arbitrary for about 10 seconds.	88:88		"off"	Before the display becomes "88 : 88", the relay and solenoid should not function.
	2	Same as above	Same as above	TC APLD 0 5		88:88		Same as above	The display should remain as before.
	3	Same as step 1	Same as step 1	CLK 1 → CS	: 1	0:01		Same as step 1	The display (time of a day) varies every 1 minute.
	4	Same as step 1	Same as step 1	12H/24H → AM/PM CS	AM 12:01	PM 12:01		Same as step 1	
	5	Same as step 1	Same as step 1	CZ		PM 12:00		Same as step 1	
Auto-stop operation	6	Same as step 1	"play"			PM 12:00	The mechanism automatically stops in about 3 seconds after the play key operation.	Same as step 1	
	7	"on"	"stop"			0		"on"	It may sometimes occur that the display doesn't become "0" if the take-up turntable has operated until the step 6.
	8	Same as above	Same as above	TC APLD 0 5		88:88		Same as above	The display should remain as before.
	9	Same as above	Same as above	CLK 1 → CS	: 1	0:01		Same as above	The display (time of a day) varies every 1 minute.
	10	Same as above	Same as above	12H/24H → AM/PM CS	AM 12:01	PM 12:01		Same as above	
	11	Same as above	Same as above	CZ		PM 12:00		Same as above	

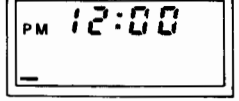
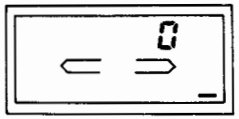
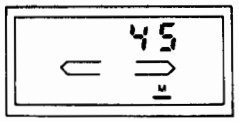
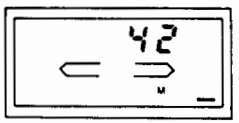
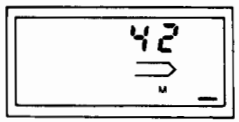
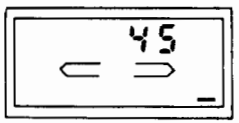
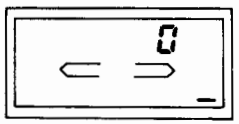
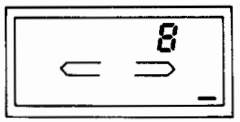
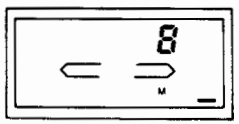
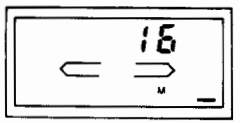
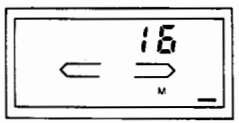
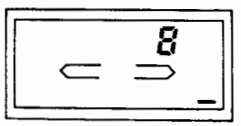
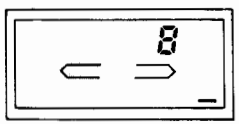
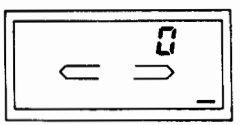
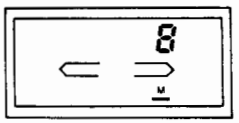
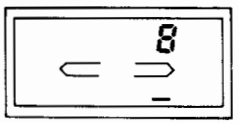
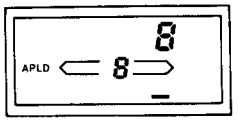
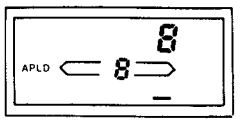
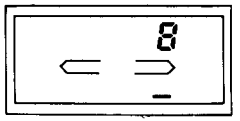
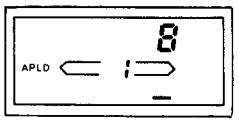
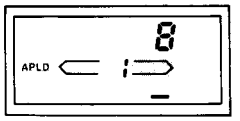
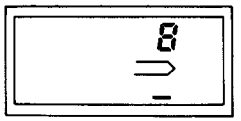
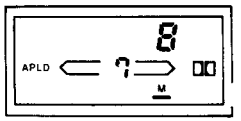
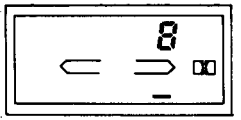
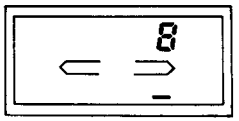
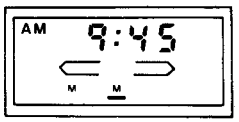
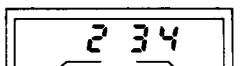
Auto-stop operation	6	Same as step 1	"play"								The mechanism automatically stops in about 3 seconds after the play key operation.	Same as step 1	
Tape counter operation (Memory rewind, direct memory, counter memory)	7	"on"	"stop"									"on"	It may sometimes occur that the display doesn't become "0" if the take-up turntable has operated until the step 6.
	8	Same as above	Same as above	CM	4	5	S					Same as above	
	9	Same as step 7	Same as step 7	TC	4	2	S					Same as step 7	
	10	Same as step 7	"play"							 	The mechanism automatically stops when the TC indicator becomes "45".	Same as step 7	This step requires no control unit key operation (the key operation in the steps 8 and 9 is necessary, however.) Pushing only the play key can provide the TC indication.
	11	Same as step 7	"stop"	C	→	8	S			 		Same as step 7	
	12	Same as step 7	Same as above	D·IN	→	1	6	S		 		Same as step 7	
	13	Same as step 7	"REV"							 	The mechanism automatically stops when the TC indicator becomes "8".	Same as step 7	This step requires no control unit key operation (the key operation in the steps 11 and 12 is necessary, however.) Pushing only the REV key can provide the TC indication.
	14	Same as step 7	Same as above							 	The mechanism automatically stops when the TC indicator becomes "0".	Same as step 7	The same as in the step 13 above. But, it is necessary to turn on the memory rewind switch before pushing the REV key.
	15	Same as step 7	"stop"	CM	S	→	C			 		Same as step 7	Turn off the memory rewind switch.

TABLE 1

APLD operation	16	Same as step 7	Same as above	APLD	1	9	8	→	S				Same as step 7	
	17	Same as step 7	Same as step 15	APLD	0	→	APLD	1	S				Same as step 7	
	18	Same as step 7	"play and FWD"									The mechanism gets automatically in the play mode when the APLD number indication disappears.	Same as step 7	This step requires no control unit key operation (the key operation in the step 17 is necessary, however.)
Second counter operation	19	Same as step 7	"stop"	SC	C								Same as step 7	
	20	Same as step 7	"play"										Same as step 7	The display varies every 1 second. Turn on the Dolby NR switch.
Memory indication disappearance at record mode	21	Same as step 7	"stop"	APLD	7	S	CM	S					Same as step 7	
	22	Same as step 7	"record"										Same as step 7	This step requires no control unit key operation (the key operation in the step 21 is necessary, however.)
Timer (Auto) operation	23	Same as step 7	"stop"										Same as step 7	Turn off the Dolby NR switch (SW2).
	24	Same as step 7	pause and play	T·SA	9	0	0	S					Same as step 7	
	25	Same as step 7	Same as above	T·SO	9	4	5	S					Same as step 7	
	26	"auto"	Same as step 24	T·C	1	2	3	4					"off"	

Timer (Auto) operation	24	Same as step 7	pause and play	T·SA	9	0	0	S				Same as step 7	
	25	Same as step 7	Same as above	T·SO	9	4	5	S				Same as step 7	
	26	"auto"	Same as step 24	T·C	1	2	3	4				"off"	
	27	Same as above	Same as step 24	CLK	9	0	0	AM/PM	CS		As soon as the CS key is pushed, the power is energized. In 3 seconds after, the pause function will be released to have the mechanism get in the play mode.	"on"	The display (time of a day) varies every 1 minute.
	28	Same as step 26	(play)	9	4	5	CS				As soon as the CS key is pushed, the power is cut off and in 3 seconds after, the mechanism will stop automatically.	"off"	
Memory indication disappearance with the power switch set in "Stand-by"	29	"on"	"stop"	T·SA	S	T·SO	S	CM	S			"on"	
				APLD	5	S							
	30	"stand-by"	Same as above									"off"	The display (time of a day) varies every 1 minute.

TABLE 2

REPLACEMENT PARTS LIST

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

REF. NO.	PART NO.	DESCRIPTION	CODE
		INTEGRATED CIRCUITS	
IC1, IC2	RH-IX0437AGZZ	Record/Playback Pre Amp.	
IC3, IC4	RH-IX0431AGZZ	Dolby	
IC5	RH-IX1075AFZZ	Detection, Auto Stop (HALL IC)	
		TRANSISTORS	
Q101, Q201	VS2SC458-D/-1	Mixing Amp. (2SC458 D)	
Q102, Q202	VS2SC458-D/-1	Record Equalizer Amp. (2SC458 D)	
Q103, Q203	VS2SC458-D/-1	Line Amp. (2SC458 D)	
Q104, Q204	VS2SC1740S/-1	Headphones Amp. (2SC1740S)	
Q105, Q205	VS2SC1740S/-1	VU Meter Amp. (2SC1740S)	
Q106, Q206	VS2SA844-D/-1	Record Equalizer Amp. (2SA844 D)	
Q301, Q302	VS2SC1214-C-1	Bias Oscillation (2SC1214 C)	
Q401, Q402	VS2SC945AP/-1	Motor Magnetic Control (2SC945 AP)	
Q403	VS2SB525-D/-1	Motor Magnetic Control (2SB525 D)	
Q404	VS2SC945AP/-1	Motor Magnetic Control (2SC945 AP)	
Q405	VS2SA733-K/-1	Motor Magnetic Control (2SA733 K)	
Q501	VS2SD235-Y/-1	Constant Voltage (2SD235 Y)	
Q504	VS2SC945AP/-1	Timer Control (2SC945 AP)	
Q505	VS2SC1740S/-1	Timer Control (2SC1740S)	
Q506	VS2SC1214-C-1	Switching, Power Amp. (2SC1214C)	
Q508	VS2SC945AP/-1	Relay Drive (2SC945 AP)	
Q601, Q602	VS2SC458LGC-1	DIN Amp. (2SC458 LGC)	
Q701, Q702	VS2SC1740S/-1	Peak Level Indicator (2SC1740S)	
Q801	VS2SD361-E/-1	Solenoid Drive (2SD361E)	
Q802	VS2SA844-D/-1	Solenoid Drive (2SA844 D)	
Q803	VS2SC1740S/-1	Solenoid Drive (2SC1740S)	
Q804	VS2SC1740S/-1	Solenoid Malfunction Protector (2SC1740S)	
Q805	VS2SC945AP/-1	LSI Output Detection (2SC945 AP)	
Q806	VS2SA844-D/-1	LSI Output Detection (2SA844 D)	
Q807, Q808, Q809	VS2SC945AP/-1	Level Interface (2SC945 AP)	
Q810	VS2SA733-K/-1	Control Unit, Voltage Detection (2SA733 K)	
Q811, Q812	VS2SC458-D/-1	APLD Signal Amp. (2SC458 D)	
Q813	VS2SA844-D/-1	APLD Switching (2SA844 D)	
Q814, Q815	VS2SC458-D/-1	APLD Level Detection (2SC458 D)	
Q816	VS2SA844-D/-1	APLD Blank Signal Detection (2SA844 D)	
Q817	VS2SC458-D/-1	APLD Blank Signal Detection (2SC458 D)	
Q818	VS2SA733-K/-1	AC/Battery Automatic Change-over (2SA733 K)	
Q819	VS2SC945AP/-1	LSI Power Compensation (2SC945 AP)	
Q820	VS2SC1740S/-1	AC ON/OFF Detection (2SC1740S)	
Q821	VS2SC1740S/-1	Relay Malfunction Protector (2SC1740S)	
Q901, Q902, Q903, Q904, Q905, Q906, Q907, Q908	VS2SC1740S/-1	Muting (2SC1740S)	
		DIODES	
D101, D201	VHD1N60////-1	Dolby Switching (1N60)	
D102, D202	VHD1N60////-1	VU Meter Rectifier (1N60)	
LED301	VHPGL-5AR2/-1	LED, Record Indicator Lamp (GL-5AR2)	
D401	VHD10E1////-1	Solenoid Back Electromotive Force (10E1)	
D402	RH-DX1006AFZZ	Brake Signal Backward Flow Protector (10E1)	
D403, D404	VHD1S2076//-1	Switching (1S2076)	
D501, D502, D503, D504	VHD10E1////-1	Power Rectifier (10E1)	
D506	VHD10E1////-1	Motor Switching (10E1)	
D507	VHD10E1////-1	Power Stabilizer (10E1)	
D508, D509, D510, D511	VHD10E1////-1	Power Rectifier (10E1)	
D512	VHD10E1////-1	Relay Back Electromotive Force (10E1)	
D701, D702	VHD1N60////-1	Peak Level Indicator Switching (1N60)	

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
LED701	VHPGL-5AR2/-1	LED, Peak Level Indicator Lamp (GL-5AR2)	
D801	VHD1S2076//-1	Control Unit Voltage (1S2076)	
D802	VHD10E1////-1	Motor Circuit Rectifier (10E1)	
D803	VHD10E1////-1	AC Power ON/OFF (10E1)	
D805	VHD1S2076//-1	Battery Switching (1S2076)	
D807	VHD1S2076//-1	Capacitor Discharge (1S2076)	
D808	VHD1S2076//-1	LSI Output Detection (1S2076)	
D901, D902, D903	VHD1S2076//-1	Muting (1S2076)	

ZENER DIODES

ZD101, ZD201	VHE02Z6R8A/-1	Dolby Voltage Stabilizer (02Z6-8A)	
ZD501	VHEWZ220///-1	Voltage Stabilizer (WZ220)	
ZD806	VHERD4R7EC/-1	Control Unit, Voltage Stabilizer (RD4.7)	
ZD901	VHERD3R6EC/-1	Muting (RD3.6)	

COILS

L101, L102, L103, L201, L202, L203	RCILZ0058AFZZ	Equalizer	
L301, L302	RCILB0376AFZZ	Bias Trap	
L401	RCILF0014AGZZ	Motor	

TRANSFORMERS

T101, T201	RTRNS0027AGZZ	Headphones	
T301	RCILB0086AGZZ	Oscillation	
T501	RTRNP0528AFZZ	Power	

CERAMIC FILTERS

FL101, FL201	RCILL0053AFZZ	Bias Trap	
FL102, FL202	RCILL0054AFZZ	MPX Filter	

CONTROLS

VR101, VR201	RVR-A0117AFZZ	50K ohm(A), Line Rec. Level	
VR102, VR202	RVR-M0127AFZZ	10K ohm(B), Rec. Input Sensitivity Adjust	
VR103, VR203	RVR-M0127AFZZ	10K ohm(B), P.B. Sensitivity Adjust	
VR105, VR205	RVR-A0124AFZZ	20K ohm(A), Mic. Rec. Level	
VR106, VR206	RVR-M0130AFZZ	50K ohm(B), Rec. Current Adjust	
VR107, VR207	RVR-M0130AFZZ	50K ohm(B), Rec. Sensitivity Adjust	
VR108, VR208	RVR-M0130AFZZ	50K ohm(B), Rec. Sensitivity Adjust	
VR109 (A, B)	RVR-B0151AFZZ	10K ohm(B), Output Level	
VR110, VR210	RVR-M0126AFZZ	5K ohm(B), VU Meter Sensitivity Adjust	
VR301, VR302	RVR-M0126AFZZ	5K ohm(B), Bias Current Adjust	
VR801	RVR-M0122AFZZ	500 ohm (B), LSI Voltage Adjust	

THERMISTOR

PTH1	VHH31D26///-1	1K ohm, 15%	

RESISTORS

R119	VRS-PT3AB181K	180 ohm, 1W, ±10%, Oxide Film	
R167	VRG-ST2EA470J	47 ohm, 1/4W, ±5%, Fusible	
R219	VRS-PT3AB181K	180 ohm, 1W, ±10%, Oxide Film	
R304	VRS-PT3AB471K	470 ohm, 1W, ±10%, Oxide Film	
R305	VRS-PT3AB820K	82 ohm, 1W, ±10%, Oxide Film	
R306	VRS-PT3DB181K	180 ohm, 2W, ±10%, Oxide Film	
R512	VRS-PT3DB102K	1K ohm, 2W, ±10%, Oxide Film	
R513	VRC-MT2HG221J	220 ohm, 1/2W, ±5%, Carbon	
R514	VRG-ST2HA100J	10 ohm, 1/2W, ±5%, Fusible	
R515, R516, R517	VRG-ST2HA1R0J	1 ohm, 1/2W, ±5%, Fusible	
R520	RR-WZ1002AFZZ	15 ohm, 10W, ±10%, Cement	
R704	VRS-PT3AB681K	680 ohm, 1W, ±10%, Oxide Film	
R815	VRC-MT2HG222K	2.2K ohm, 1/2W, ±10%, Carbon	

MISCELLANEOUS

01	JKNBR0108AFSA	Key, Stop/Fast-forward·Forward APLD/Play/Rewind·Reverse APLD	
02	JKNBR0108AFSB	Key, Record	
03	JKNBR0109AFSA	Key, Pause/Cassette Eject	
04	MLIFP0001AFZZ	Lifter, Cassette Holder	
05	NBLTH0057AFZZ	Belt, Flywheel	
06	NBLTK0116AFZZ	Belt, Magnet Drive	
07	NBRGC0059AFZZ	Bearing, Capstan	
08	NDAIR0121AFSA	Turntable, Take-up	
09	NDAIR0122AFSA	Turntable, Supply	
10	NFLYC0068AFZZ	Flywheel	
11	NIDR-0057AFZZ	Idler, Take-up	
12	NPLYR0059AFZZ	Pulley, Magnet	
13	NROLW0004AFZZ	Gear, Supply/Take-up	
14	NROLX0003AFZZ	Gear, Take-up	

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
15	NROLY0011AFZZ	Pinch Roller	
16	RHEDA0050AFZZ	Erase Head	
17	RHEDH0062AFZZ	Record-playback Head	
18	RMOTP0051AFZZ	Motor (with Motor P.W. Board)	
19 (SOL-801)	RPLU-0070AFZZ	Solenoid	
20	PCUSG0026AG00	Cushion, Brake Lever	
21	LANGF0399AFZZ	Bracket, Flywheel	
101	GCAB-3050AFSA	Cabinet	
102	GCOVA1093AFSA	Cover, Power Mode Switch	
103	GCOVA1094AFSA	Cover, Editor Switch	
104	DUNTZ0285AF01	Control Unit Assembly	
105	GCOVA1096AFSA	Transparent Plate, Control Unit	
106	GFTAB1106AFSA	Lid, Battery Compartment	
107	GFTAF1003AFSA	Cassette Door (Transparent Plate)	
108	HDECB0067AFSA	Cassette Door (Decoration Plate)	
109	HPNLC3311AFSA	Front Panel	
110	JKNBK0164AFSA	Knob, Line Record Level Control/Microphone Record Level Control (Left)	
111	JKNBN0348AFSA	Knob, Line Record Level Control/Microphone Record Level Control (Right)	
112	JKNBN0349AFSA	Knob, Output Level	
113	JKNBP0078AFSA	Knob, LCD Light Switch/ Memory Rewind Switch/ Dolby NR Switch/Bias Selector Switch/Equalization Selector Switch	
114	JKNBP0079AFSA	Knob, Power Mode Switch/ Editor Switch	
115	LANGF0423AFZZ	Bracket, VU Meter Illumination Unit (Left)	
116	LANGF0424AFZZ	Bracket, VU Meter Illumination Unit (Right)	
117	LANGQ0526AFZZ	Bracket, Microphone Jack/ Headphones Jack	
118	LANGT0642AFZZ	Bracket, Power P.W. Board Settle	
120	LANGT0664AFZZ	Bracket, Motor Stop P.W. Board Settle	
121	LBSHC0007AFZZ	Bushing, AC Supply Cord (SCA)	
	LBSHC0002AGZZ	Bushing, AC Supply Cord (SUK)	
	LBSHC0004AGZZ	Bushing, AC Supply Cord (SEEG)	
122	LCHSM0286AFZZ	Main Chassis	
123	PCOVU3110AFZZ	Cover, VU Meter Illumination P.W. Board	
124	PCOVZ1051AFSA	Transparent Plate, VU Meter Illumination	
125	QCNW-0276AFZZ	Flat Cable	
126	LX-BZ0238AFSA	Screw, Decoration	
127	RLMPM0074AFZZ	Lamp, Control Unit Illumination	
128	RLMPM0072AFZZ	Lamp, VU Meter Illumination	
129	MLEVF0758AFZZ	Lever, Power Switch Changeover	
131	PSHEF0048AG00	Felt, Rear Panel	
132	TSPC-0464AFZZ	Sheet, Rear Panel	
133	MSPRC0123AFFJ	Spring, Record-playback Switch	
134	QJAKJ0059AFZZ	Jack, Headphone	
135	QJAKZ0066AFZZ	Jack, Microphones	
136	QSOCZ2476AFZZ	Jack, Output/Input/Record-playback	
137	MLEVF0753AFZZ	Lever, LCD Light Switch	
138	MLEVF0754AFZZ	Lever, Memory Rewind Switch	
139	MLEVF0755AFZZ	Lever, Dolby NR Switch	
140	MLEVF0756AFZZ	Lever, Bias Selector Switch	
141	MLEVF0757AFZZ	Lever, Equalization Selector Switch	
142	LHLDZ1071AFZZ	Holder, Mechanism IC P.W. Board	
	GCOVA1095AFSA	Cassette Chamber	
	GFTAC3055AF00	Cassette Holder (Left)	
	GFTAC3056AF00	Cassette Holder (Right)	
	GFTAU3070AFZZ	Bottom Plate	
	GLEGP0059AFZZ	Leg	
	HDECA0282AFSA	Decoration Plate, Cassette	
	LANGF0412AFZZ	Bracket, Power Transformer Settle	
	LANGQ0566AFZZ	Bracket, Record-playback (DIN) Socket	
	LANGQ0572AFZZ	Bracket, Record-playback (DIN) Switch	
	LANGT0643AFZZ	Bracket, Line Record Level/ Microphone Record Level/ Output Level	
	LBOSA0053AFFW	Spacer, Power Switch Connection Lever (Small)	
	LBOSK0052AFZZ	Spacer, Power Switch Connection Lever (Large)	
	LBSHS0001AG00	Cushion, Motor	
	LX-WZ3017CEFN	Shakeproof Lockwasher	
	MCAMP0050AFZZ	Insulation Plate, Power Switch Lever	
	MLEVF0759AFZZ	Lever, Editor Connection	
	MLEVF0760AFZZ	Lever, Editor Switch/Power Switch	
	MSPRP0166AFZZ	Spring, Plate Type, Power Switch Lever	
	MSPRT0482AFFJ	Spring, Record-playback	
	MSPRT0511AFFJ	Spring, Editor Switch Lever	
	NBALS0053AFZZ	Ball, 3.5ϕ	
	PCASB0052AFSA	Battery Case	
	PCOVM1052AF00	Cover, Liquid Leak Equipment	
	PCUSS0103AF00	Cushion, Power P.W. Board	
	PCUSS0104AFZZ	Cushion, VU Meter	
	PCUSS0105AFZZ	Cushion, Control Unit	
	PRDAR0153AFZZ	Heat Sink	
	PSHEF0119AF00	Sheet, Front Panel Support (Top)	
	PSHEZ0064AFZZ	Sheet, Front Panel Support (Bottom)	
	PSHEZ0065AFZZ	Sheet, VU Meter Support	
	PSLDC3066AFZZ	Shield Plate, Power Transformer	
	PSPAB0114AFFW	Spacer, Power Switch	
	PSPAS0057AFZZ	Spacer, Microphone Jack/ Headphones Jack	

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
	PSPAS0058AFZZ	Spacer, LCD Light Switch/ Memory/Rewind Switch/ Dolby NR Switch/Bias Selector Switch/Equalization Selector Switch	
	QACCB0052AF09	Power Supply Cord (SUK)	
	QACCL0001AFZZ	Power Supply Cord (SCA)	
	QACCV0001AGZZ	Power Supply Cord with Plug (SEEG)	
	QACCZ0002TA0F	Power Supply Cord with Plug	
	QACCZ0053AF00	Power Supply Cord with Plug	
F2, F3	QFS-C631CAGNI	Fuse, 630mAT	
F4	QFS-C800CAGNI	Fuse, 80mAT	
F1	QFS-C801CAGNI	Fuse, 800mAT	
	QFSHC0003AGZZ	Fuse Holder (F2, F3, F4)	
	QFSHC0003AGZZ	Fuse Holder (F1)	
	QPWBF0654AFZZ	P.W. Board, Mechanism	
	QPWBF0652AFZZ	P.W. Board, Record-playback	
	QPWBF0665AFZZ	P.W. Board, Microphone Jack/ Headphones Jack	
	QPWBF0666AFZZ	P.W. Board, VU Meter	
	QPWBF0667AFZZ	P.W. Board, VU Meter Illumination	
	QPWBF0668AFZZ	P.W. Board, Mechanism IC	
	QPWBF0669AFZZ	P.W. Board, LCD Illumination	
	QPWBF0685AFZZ	P.W. Board, Power	
	QPWBF0686AFZZ	P.W. Board, Input/Output Terminal	
	QPWBF0702AFZZ	P.W. Board, Transport	
	QPWBF0704AFZZ	P.W. Board, Motor Stop	
	QPWBF0725AFZZ	P.W. Board, Relay	
SO502	QSOCE0410AGZZ	Socket, Voltage Selector	
SW5	QSW-M0015AGZZ	Switch, Oscillator Circuit	
SW16, SW17	QSW-M0057AFZZ	Switch, Mechanical Stop/Brake	
SW15	QSW-M0058AFZZ	Switch, Solenoid (Auto Stop)	
SW2 (A～E)	QSW-P0154AFZZ	Switch, Dolby NR	
SW3 (A～F) SW4 (A～F)	QSW-P0155AFZZ	Switch, Bias Selector/Equalization Selector	
SW8, SW10	QSW-P0156AFZZ	Switch, LCD Light/Memory Rewind	
SW12 (A～D)	QSW-S0185AFZZ	Switch, Play	
SW7, SW11	QSW-S0188AFZZ	Switch, Pause/Rewind·Reverse APLD	
SW1 (A～O)	QSW-S0207AFZZ	Switch, Record-playback	
SW6 (A～C)	QSW-S0208AFZZ	Switch, Power	
SW9 (A～D)	QSW-S0210AFZZ	Switch, Fast-forward·Forward APLD	
SW13 (A～D)	QSW-S0213AFZZ	Switch, Editor	
SW18 (A, B)	QSW-S0215AFZZ	Switch, Record-playback (DIN) LINE (Pin) Selector	
	RLMPM0073AFZZ	Lamp, Cassette Chamber	
ME1, ME2	RMTRL0145AFZZ	Meter, VU	
RLY2	RRLYZ0059AFZZ	Relay	

ASSEMBLY PARTS

18	RMOTP0051AFZZ	PLL Motor (with Motor P.W. Board)
18-1	RSRSA0051AFZZ	Crystal (3579, 545kHz)
●18-2	RH-IX1076AFZZ	IC, Frequency Demultiplier (874Hz)
104	DUNTZ0285AF01	Control Unit Assembly
●	JKNBZ1330CCMM	Key-block block)

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