

# SERVICE MANUAL

4-CHANNEL AMPLIFIER

**SANSUI QA-7000**



**Sansui**

SANSUI ELECTRIC CO., LTD.

This service manual is designed for service engineers to repair, adjust, maintain and order the replacement parts of the QA-7000 correctly.

When ordering the parts, use the stock number and parts name specifically referring to the Parts Locations & Parts List.

For general usage and maintenance of the unit, please refer to the Operating Instructions attached with the unit.

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# 1. SPECIFICATIONS

## POWER OUTPUT (at rated distortion)

- MUSIC POWER(IHF) .... 108W (4 $\Omega$  1,000Hz)  
88W (8 $\Omega$  1,000Hz)
- CONTINUOUS POWER (each channel driven)  
..... 24W/ch. (4 $\Omega$  1,000Hz)  
20W/ch. (8 $\Omega$  1,000Hz)
- CONTINUOUS POWER (all channels driven)  
..... 15  $\times$  4W (8 $\Omega$  1,000Hz)  
12  $\times$  4W (8 $\Omega$  20 to 20,000Hz)
- MUSIC POWER (IHF, B.T.L. connection)  
..... 160W (4 $\Omega$  1,000Hz)  
144W (8 $\Omega$  1,000Hz)
- CONTINUOUS POWER (B.T.L. connection)  
Each Channel Driven .. 50/50W (8 $\Omega$  1,000Hz)  
All Channels Driven.... 40+40W (8 $\Omega$  1,000Hz)

## TOTAL HARMONIC DISTORTION (at rated power output)

- PRE AMPLIFIER ONLY.... less than 0.05%
- MAIN (POWER) AMPLIFIER ONLY  
..... less than 0.1%

## INTERMODULATION DISTORTION (at rated output 70Hz:7,000Hz=4:1 SMPTE method)

- MAIN (POWER) AMPLIFIER ONLY  
..... less than 0.15%

## POWER BANDWIDTH (IHF) .. 10 to 30,000Hz

## FREQUENCY RESPONSE (power output at 1 Watt)

- OVERALL (from AUX).... 20 to 40,000Hz  $\pm$ 1 dB
- MAIN (POWER) AMPLIFIER ONLY

..... 10 to 50,000Hz  $\pm$ 1dB

## RIAA CURVE DEVIATION .. 30 to 15,000Hz $\pm$ 0.5dB

## LOAD IMPEDANCE..... 4 to 16 $\Omega$

## DAMPING FACTOR..... 100 (8 $\Omega$ )

## INPUT SENSITIVITY AND IMPEDANCE (at 1,000Hz)

- PHONO-1, 2 ..... 2.5mV 50k $\Omega$   
Max. Input Capability .. 270mV  
(T.H.D.: less than 0.5%)

4-CH. TUNER..... 100mV 50k $\Omega$

4-CH. AUX-1, 2..... 100mV 50k $\Omega$

2-CH. TAPE DECK-1, 2

Pin ..... 100mV 50k $\Omega$

DIN ..... 100mV 50k $\Omega$

4-CH. TAPE DECK-1, 2.... 100mV 50k $\Omega$

MAIN (POWER) INPUT.... 800mV 50k $\Omega$

## OUTPUT LEVEL AND IMPEDANCE (at 1,000Hz)

2-CH. TAPE DECK

Pin ..... 100mV 2k $\Omega$

DIN ..... 30mV 65k $\Omega$

4-CH. TAPE DECK-1, 2.... 100mV 2k $\Omega$

PRE OUTPUT..... 800mV 600 $\Omega$

Max. Output Voltage .. 6.5V (T.H.D.: less than 0.5%)

## HUM AND NOISE (IHF)

- PHONO-1, 2 ..... better than 70dB
- 4-CH. TUNER..... better than 80dB
- 4-CH. AUX-1, 2..... better than 80dB
- MAIN (POWER) INPUT.... better than 90dB

## CROSSTALK (rated output at 1,000Hz)

- PHONO-1, 2 ..... better than 45dB
- 4-CH. TUNER..... better than 50dB
- 4-CH. AUX-1, 2..... better than 50dB
- MAIN (POWER) INPUT .. better than 60dB

## CONTROLS

- BASS ..... +15dB, -15dB at 50Hz
- TREBLE ..... +15dB, -15dB at 15,000Hz
- LOUDNESS (Volume Control at -30dB)  
..... +8dB at 50Hz  
+3dB at 10,000Hz

LEVEL METER..... 0dB=100mV

## 4-CHANNEL SYNTHESIZER/DECODER CIRCUIT

- ..... QS regular matrix system  
with vario-matrix circuit

## OTHERS

### SEMICONDUCTORS

- TRANSISTORS ..... 97
- FETs..... 2
- ZENER DIODES..... 2
- DIODES ..... 62

POWER REQUIREMENTS .. 100, 117, 220, 240V 50/60Hz

### AC OUTLETS

- SWITCHED ..... 50W
- UNSWITCHED ..... total 300W

POWER CONSUMPTION.. 115W (rated), 340VA (max.)

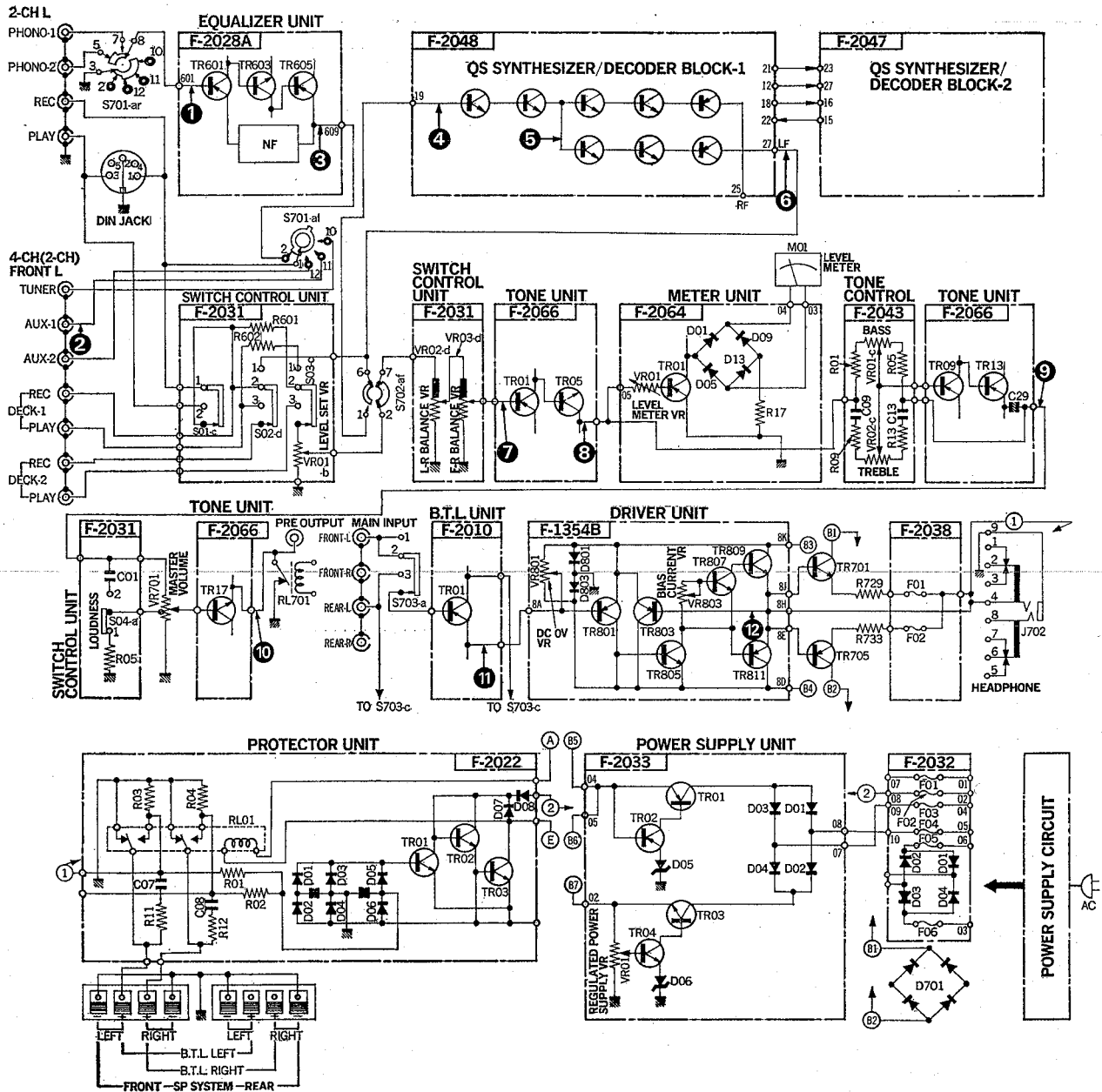
DIMENSIONS ..... 140mm (5 $\frac{5}{16}$ " H,  
440mm (17 $\frac{3}{8}$ " W,  
322mm (12 $\frac{1}{16}$ " D)

WEIGHT ..... 14kg (30.9 lbs)

\* Design and specification subject to change without notice for improvements.

## 2. BLOCK DIAGRAM AND LEVEL DIAGRAM

### 2-1. Block Diagram



S701-af~cr SELECTOR

1. PHONO-2
2. PHONO-1
3. TUNER
4. AUX-1
5. AUX-2

S702-af~er FUNCTION

1. 2-CH
2. QS SYNTHESIZER HALL
3. QS SYNTHESIZER SURROUND
4. QS SURROUND
5. QS HALL
6. PHASE MATRIX
7. DISCRETE

S703-a~d B.T.L. SWITCH

1. FRONT SIGNAL
2. FRONT
3. REAR SIGNAL

S704 POWER SWITCH

1. OFF
2. ON

S01-a~d 2-CH TAPE MONITOR

1. SOURCE
2. PLAYBACK

S02-a~d 4-CH TAPE MONITOR

1. DECODER SIGNAL
2. SOURCE
3. DECK 1▶2

S03-a~d 4-CH TAPE MONITOR

1. PLAYBACK DECK-1
2. SOURCE
3. PLAYBACK DECK-2

S04-a~d LOUDNESS

1. OUT
2. IN



## 2-2. Level Diagram

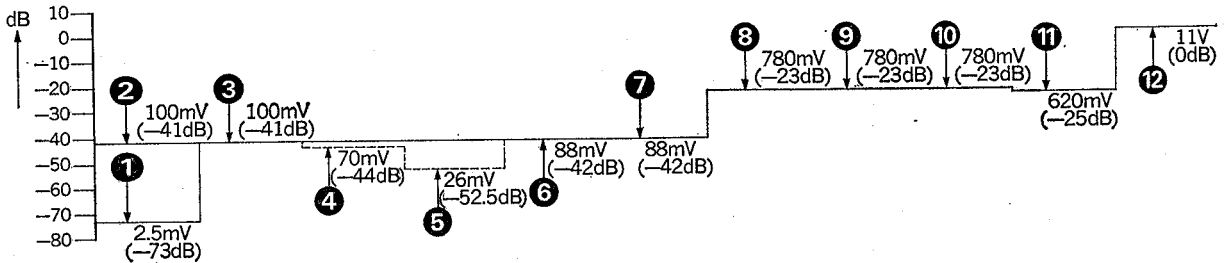
\*Each number (①, ②, ③...) indicated in Level Diagram corresponds to the number in Block Diagram.

1. MASTER VOLUME, LEVEL SET volume control  
.....Maximum
2. BASS, TREBLE, BALANCE volume control..Center
3. Input.....PHONO-1 2.5mV 1kHz Sine Wave

AUX-1 100mV 1kHz Sine Wave  
(output impedance of 600Ω at an audio oscillator)

4. Output.... 11V (15W) 8Ω

**Note:** Each voltage value is for reference and measured by a VTVM. In some recorders, the actual voltage value is in minor difference from the reference value.



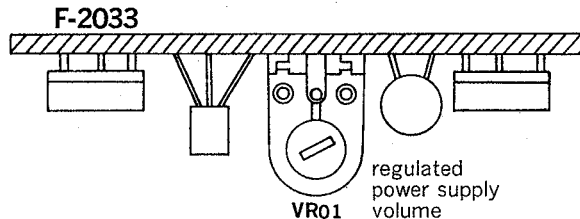
## 3. ADJUSTMENTS

### 3-1. Regulated Power Supply Board Adjustment (See Fig. 3-1)

- Note:** 1. Function.....QS Synthesizer  
2. Master Volume.....Minimum

STEP	SUBJECT	EQUIPMENT	MEASURE OUTPUT	ADJUST	ADJUST FOR	CONDITION
1	Regulated Power supply	DC volt meter	F-2033 terminal 03	F-2033 VR01	25±0.1V	

Fig. 3-1



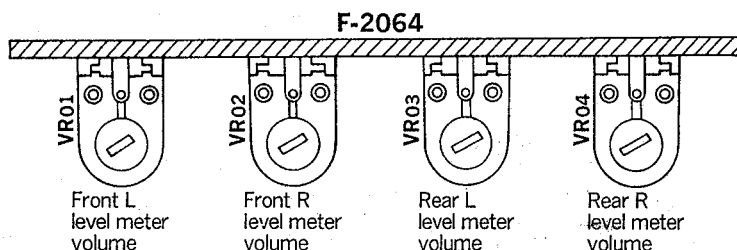
### 3-2. Level Meter Adjustment (See Fig. 3-2)

- Note:** 1. Function.....QS Synthesizer  
2. Selector.....AUX-1  
3. Master Volume.....Minimum

4. Level Set Volume.....Maximum
5. For adjustment, run the unit for more than 2 minutes after the power is switched on.

STEP	SUBJECT	FEED SIGNAL		MEASURE OUTPUT	ADJUST	ADJUST FOR	CONDITION
		FROM	TO				
1	Level Meter	1kHz Output: 100mV Audio Oscillator	FRONT, REAR AUX-1 L, R-ch	Level Meter	F-2064 VR01 (front L) VR02 (front R) VR03 (rear L) VR04 (rear R)	0 level	o Feed signal to 4-CH (both FRONT and REAR)

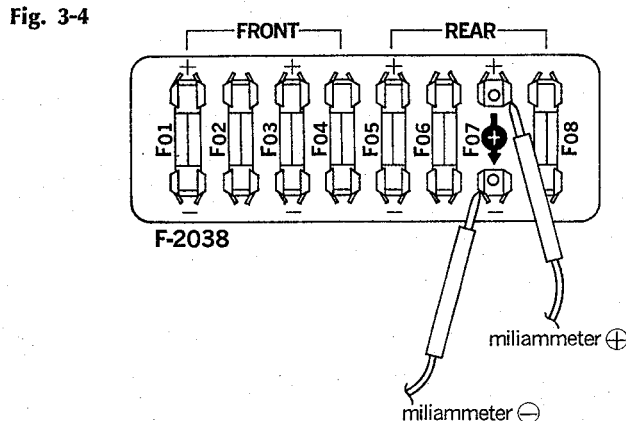
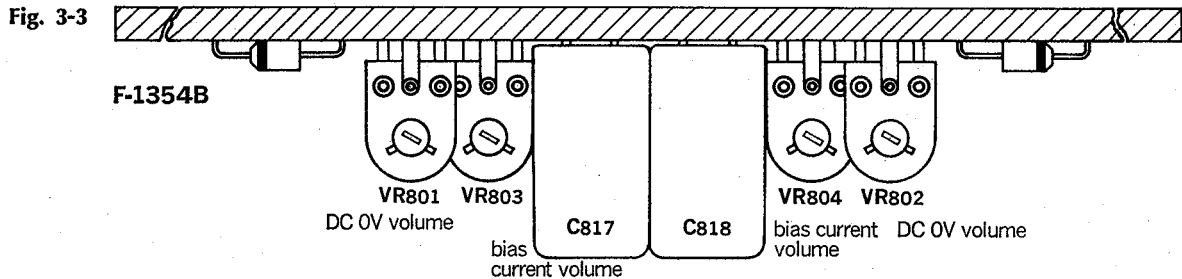
Fig. 3-2



### 3-3. Driver Circuit Board Adjustment (See Figs. 3-3 and 3-4)

- Note: 1. Master Volume.....Minimum  
 2. Make the SP terminal free (no load).  
 3. Confirm the AC Power Supply voltage.  
 4. After adjustment, run the unit for more than 5 minutes, then check and readjust necessary.  
 5. Room temperature should be 18~28°C (65~83°F) for bias current adjustment.

STEP	SUBJECT	EQUIPMENT	MEASURE OUTPUT	ADJUST	ADJUST FOR	CONDITION
1	DC 0V Front L-ch	DC volt meter	F-1354B terminal 8H (left side board)	F-1354B VR801 (left side board)	0V	○Step down mete's range accordingly
2	DC 0V Front R-ch	Same as above	F-1354B terminal 8P (left side board)	F-1354B VR802 (left side board)	Same as above	Same as above
3	DC 0V Rear L-ch	Same as above	F-1354B terminal 8H (right side board)	F-1354B VR801 (right side board)	Same as above	Same as above
4	DC 0V Rear R-ch	Same as above	F-1354B terminal 8P (right side board)	F-1354B VR802 (right side board)	Same as above	Same as above
5	Bias current Front L-ch	DC miliammeter	F-2038 F01 Fig. 3-4	F-1354B VR803 (left side board)	25mA	○Step down meter's range accordingly
6	Bias current Front R-ch	Same as above	F-2038 F03 Fig. 3-4	F-1354B VR804 (left side board)	Same as above	Same as above
7	Bias current Rear L-ch	Same as above	F-2038 F05 Fig. 3-4	F-1354B VR803 (right side board)	Same as above	Same as above
8	Bias current Rear R-ch	Same as above	F-2038 F07 Fig. 3-4	F-1354B VR804 (right side board)	Same as above	Same as above



## 4. TROUBLESHOOTING CHART

### 4-1. Troubleshooting on Power Supply Section

Symptom	Check Point	Cause & What to Do
<b>1. No power supplied to each section</b>		
1-1. Each lamp not lighted		<ul style="list-style-type: none"> <li>1. Power supply cord open</li> <li>2. Power fuse F701 open</li> <li>3. Imperfect contact of power switch S704</li> <li>4. Defective power transformer T701</li> </ul>
1-2. Each lamp lighted		
	1) +22V (-22V) not supplied to collector of power transistor	5. Defective D701
	2) +33.5V (-33.5V) not supplied to terminal <b>8K</b> , <b>8L</b> , <b>8D</b> , <b>8S</b> on F-1354B	<ul style="list-style-type: none"> <li>6. F05, F06 on F-2032 open</li> <li>7. Defective D01, D04 (D02, D03) on F-2032</li> </ul>
	3) No power supplied to terminal <b>02</b> <b>04</b> on F-2033	8. F03, F04 on F-2032 open
	4) +25V not supplied to terminal <b>02</b> on F-2033	<ul style="list-style-type: none"> <li>9. Defective D02, D04 on F-2033</li> <li>10. Defective TR03 on F-2033</li> </ul>
	5) -44V not supplied to terminal <b>04</b> on F-2033	<ul style="list-style-type: none"> <li>11. Defective D01, D03 on F-2033</li> <li>12. Defective TR01 on F-2033</li> </ul>
	6) Wrong voltage supplied to terminal <b>02</b> on F-2033	<ul style="list-style-type: none"> <li>13. Defective TR03 on F-2033</li> <li>14. Defective TR04 on F-2033</li> <li>15. Defective D06 on F-2033</li> <li>16. Imperfect contact of VR01 on F-2033</li> <li>17. Defective D05 on F-2033</li> <li>18. Defective TR01 on F-2033</li> <li>19. Defective TR02 on F-2033</li> </ul>
	7) Wrong voltage supplied to terminal <b>04</b> on F-2033	

### 4-2. Troubleshooting on Protector Section

#### 1. Protector circuit inoperative

(In case that DC voltage between center and ground on power section is over 2.5V)

- 1. Defective D01~D06 on F-2022
- 2. Defective TR01 on F-2022

#### 2. No output power from both speaker terminals approx 10 minutes after the power is on

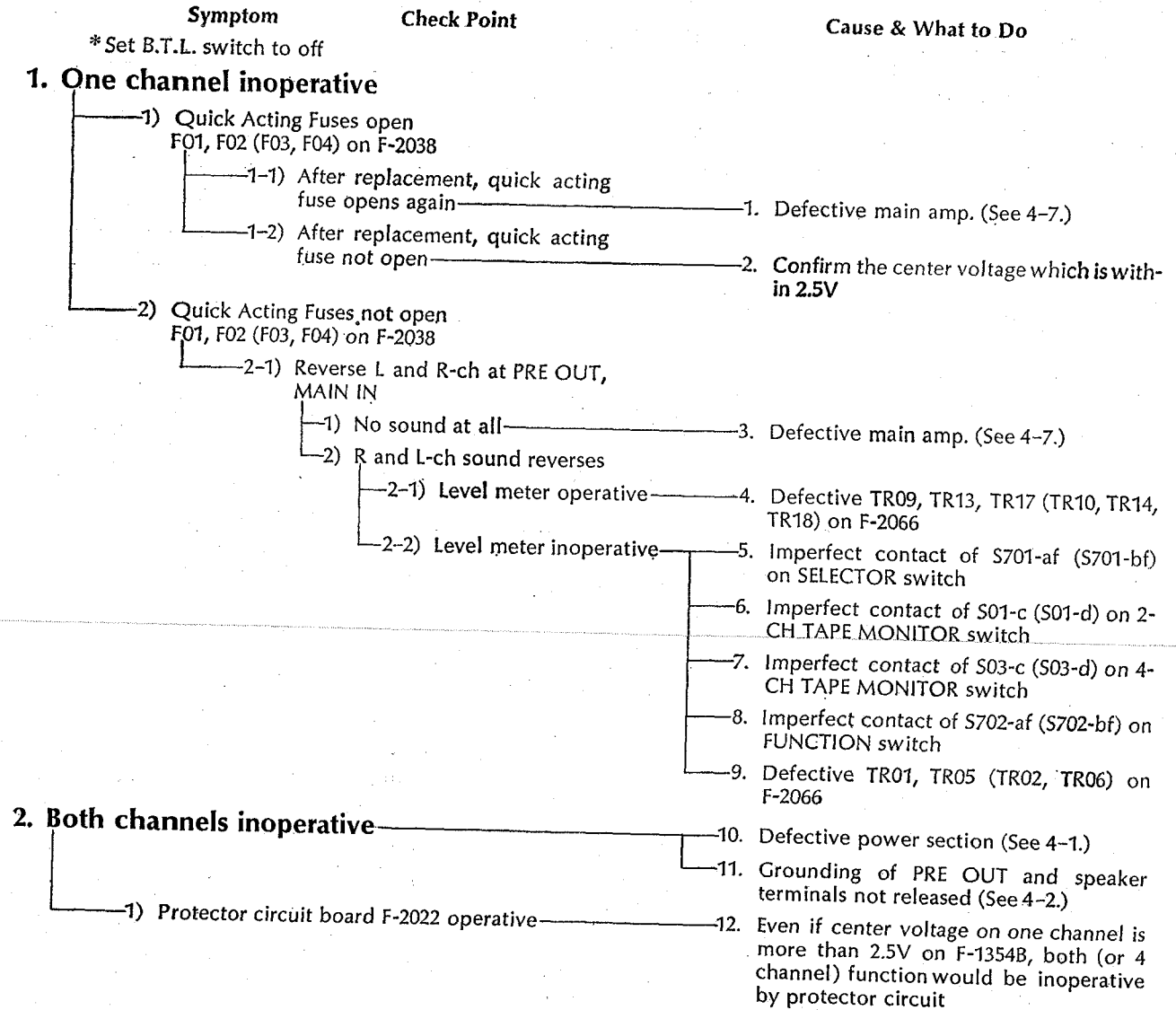
(Grounding of PRE OUT and speaker terminals not released)

- 3. Defective D08 on F-2022
- 4. Defective D07 on F-2022
- 5. Imperfect contact of headphone jack (J702, J703)
- 6. Defective RL01 on F-2022
- 7. Defective RL701
- 8. Defective TR03 on F-2022

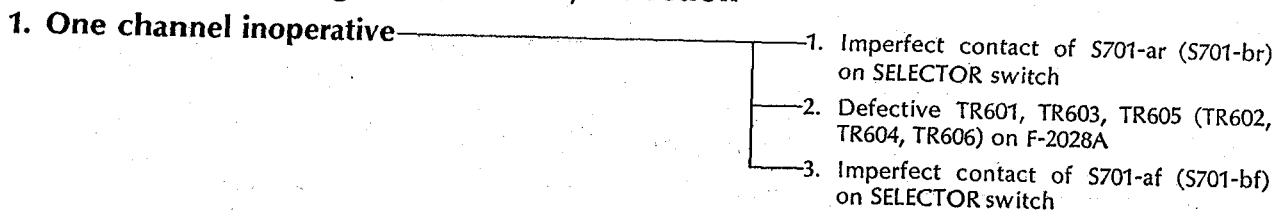
#### 3. Generates popping noise after the power is ON

- 9. Defective TR01~TR03 on F-2022

### 4-3. Troubleshooting on 2-CH Section



### 4-4. Troubleshooting on PHONO-1, 2 Section



#### 4-5. Level Meter Inoperative

Symptom	Check Point	Cause & What to Do
(When switching to FRONT L-ch position)		<ul style="list-style-type: none"> <li>1. Defective level meter M01</li> <li>2. Defective D01, D05, D09, D13 on F-2064</li> <li>3. Defective TR01 on F-2064</li> <li>4. Imperfect contact of VR01 on F-2064</li> </ul>

#### 4-6. Troubleshooting on QS SYNTHESIZER Section

(2-CH of FUNCTION switch operative)

1. Both Front and Rear function inoperative — 1. Defective TR01~TR04 on F-2048

2. Front function inoperative

1) L-ch inoperative	<ul style="list-style-type: none"> <li>2. Defective TR05, TR09, TR13 on F-2048</li> <li>3. Imperfect contact of S702-af on FUNCTION switch</li> </ul>
2) R-ch inoperative	<ul style="list-style-type: none"> <li>4. Defective TR06, TR10, TR14 on F-2048</li> <li>5. Imperfect contact of S702-bf on FUNCTION switch</li> </ul>

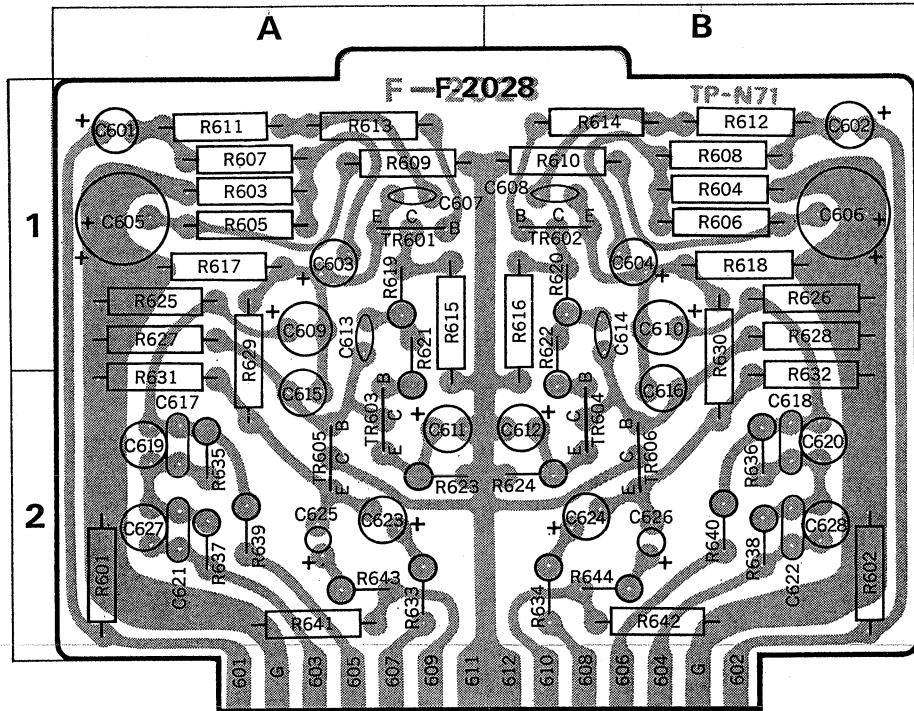
#### 4-7. Troubleshooting on Main Section

- 1. Defective TR701, TR702 on F-1354B
- 2. Defective TR809, TR811 on F-1354B
- 3. Defective TR807 on F-1354B
- 4. Defective TR801, TR803 on F-1354B

# 5. PARTS LOCATIONS AND PARTS LIST

## 5-1. F-2028A Equalizer Circuit Board (Stock No. 7550430 Complete Circuit Board F-2028A)

Conductor Side

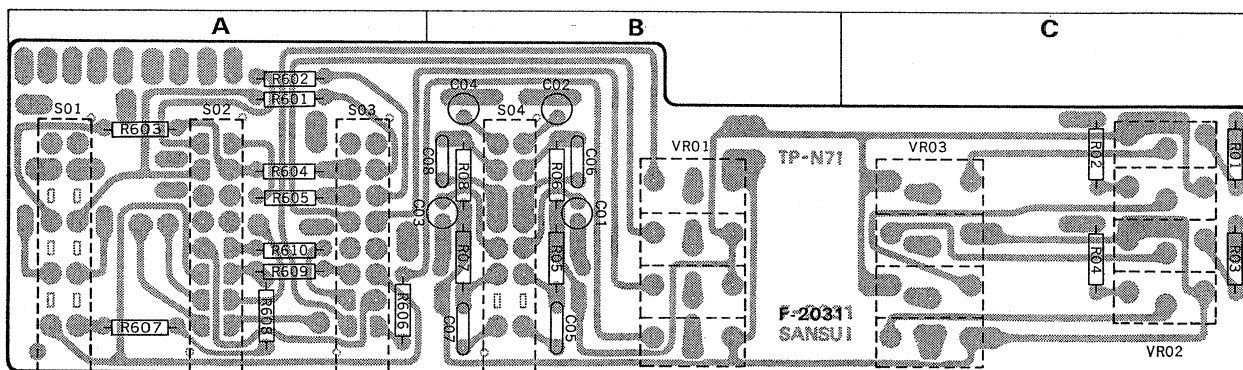


### Parts List

Parts No.	Stock No.	Description	Position	Parts No.	Stock No.	Description	Position
TR601	0300451	2SA493 (GR)	1 A	C613	0660120	6.8pF	± 10% 50V C.C.
	or	or		C614	0660120	6.8pF	
TR602	0300410, 1	2SA726®(F. G)	1 B	C615	0620391	390pF	± 5% 50V P.C.
	or	or		C616	0620391	390pF	
TR603	0300451	2SA493 (GR)	2 A	C617	0600226	0.0022µF	± 5% 50V M.C.
	or	or		C618	0600226	0.0022µF	
TR604	0300410, 1	2SA726®(F. G)	2 B	C619	0620221	220pF	± 5% 50V P.C.
	or	or		C620	0620221	220pF	
TR605	0300451	2SA493 (GR)	2 A	C621	0600806	0.008µF	± 5% 50V M.C.
	or	or		C622	0600806	0.008µF	
TR606	0300410, 1	2SA726®(F. G)	2 B	C623	0515100	10µF	50V
	or	or		C624	0515100	10µF	
C601	0573229	2.2µF	± 20% 25V T.C.	C625	0519101	1µF	50V
C602	0573229	2.2µF		C626	0519101	1µF	
C603	0513100	10µF	25V } E.C.	C627	0620152	1500pF	± 5% 50V P.C.
C604	0513100	10µF		C628	0620152	1500pF	
C605	0515330	33µF	50V } E.C.	R601	0107563	56kΩ	2 A
C606	0515330	33µF		R602	0107563	56kΩ	
C607	0660151	150pF	50V } C.C.	R603	0107473	47kΩ	1 A
C608	0660151	150pF		R604	0107473	47kΩ	
C609	0514470	47µF	35V } E.C.	R605	0107124	120kΩ	1 A
C610	0514470	47µF		R606	0107124	120kΩ	
C611	0511330	33µF	10V } E.C.	R607	0107104	100kΩ	± 5% ¼W C.R.
C612	0511330	33µF		10V	R608	0107104	
				R609	0107104	100kΩ	1 A
				R610	0107104	100kΩ	1 B
				R611	0107222	2.2kΩ	1 A
				R612	0107222	2.2kΩ	1 B
				R613	0107221	220Ω	1 A

## 5-2. F-2031 Switch Control Circuit Board (Stock No. 7591470 Complete Circuit Board F-2031)

### Conductor Side



### F-2031 Parts List

Parts No.	Stock No.	Description	Position
C01	0620911	910pF	B
C02	0620911	910pF	B
C03	0620911	910pF	B
C04	0620911	910pF	B
C05	0600108	0.1 $\mu$ F	B
C06	0600108	0.1 $\mu$ F	B
C07	0600108	0.1 $\mu$ F	B
C08	0600108	0.1 $\mu$ F	B
} $\pm 5\%$ 50V P.C.			
} $\pm 5\%$ 50V M.C.			
R01	0107103	10k $\Omega$	C
R02	0107103	10k $\Omega$	C
R03	0107103	10k $\Omega$	C
R04	0107103	10k $\Omega$	C
R05	0107562	5.6k $\Omega$	B
R06	0107562	5.6k $\Omega$	B
R07	0107562	5.6k $\Omega$	B
R08	0107562	5.6k $\Omega$	B
R601	0107479	4.7 $\Omega$	A
R602	0107479	4.7 $\Omega$	A
R603	0107479	4.7 $\Omega$	A
R604	0107479	4.7 $\Omega$	A
R605	0107479	4.7 $\Omega$	A
R606	0107479	4.7 $\Omega$	A
R607	0107479	4.7 $\Omega$	A
R608	0107479	4.7 $\Omega$	A
R609	0107479	4.7 $\Omega$	A
R610	0107479	4.7 $\Omega$	A
} $\pm 5\%$ $\frac{1}{4}$ W C.R.			
VR01	1060150, 1	250k $\Omega$ (B) $\times 4$	B
VR02	1060180, 1	250k $\Omega$ (MN) $\times 4$	C
VR03	1060190, 1	250k $\Omega$ (MN) $\times 4$	C
} Variable Resistor			
S01	1170300	SLC14251	A
S02	1170290	SLC14351	A
S03	1170290	SLC14351	A
S04	1170270	SLC14201	B
} Lever Switch			

### F-2028A Parts List

Parts No.	Stock No.	Description	Position
R614	0107221	220 $\Omega$	1 B
R615	0107223	22k $\Omega$	1 A
R616	0107223	22k $\Omega$	1 B
R617	0107104	100k $\Omega$	1 A
R618	0107104	100k $\Omega$	1 B
R619	0106561	560 $\Omega$	1 A
R620	0106561	560 $\Omega$	1 B
R621	0106561	560 $\Omega$	1, 2 A
R622	0106561	560 $\Omega$	1, 2 B
R623	0106122	1.2k $\Omega$	2 A
R624	0106122	1.2k $\Omega$	2 B
R625	0107821	820 $\Omega$	1 A
R626	0107821	820 $\Omega$	1 B
R627	0107683	68k $\Omega$	1 A
R628	0107683	68k $\Omega$	1 B
R629	0107824	820k $\Omega$	1, 2 A
R630	0107824	820k $\Omega$	1, 2 B
R631	0107682	6.8k $\Omega$	2 A
R632	0107682	6.8k $\Omega$	2 B
R633	0106561	560 $\Omega$	2 A
R634	0106561	560 $\Omega$	2 B
R635	0106273	27k $\Omega$	2 A
R636	0106273	27k $\Omega$	2 B
R637	0106564	560k $\Omega$	2 A
R638	0106564	560k $\Omega$	2 B
R641	0107683	68k $\Omega$	2 A
R642	0107683	68k $\Omega$	2 B
R643	0106152	1.5k $\Omega$	2 A
R644	0106152	1.5k $\Omega$	2 B
} $\pm 5\%$ $\frac{1}{4}$ W C.R. (E.L.R.)			

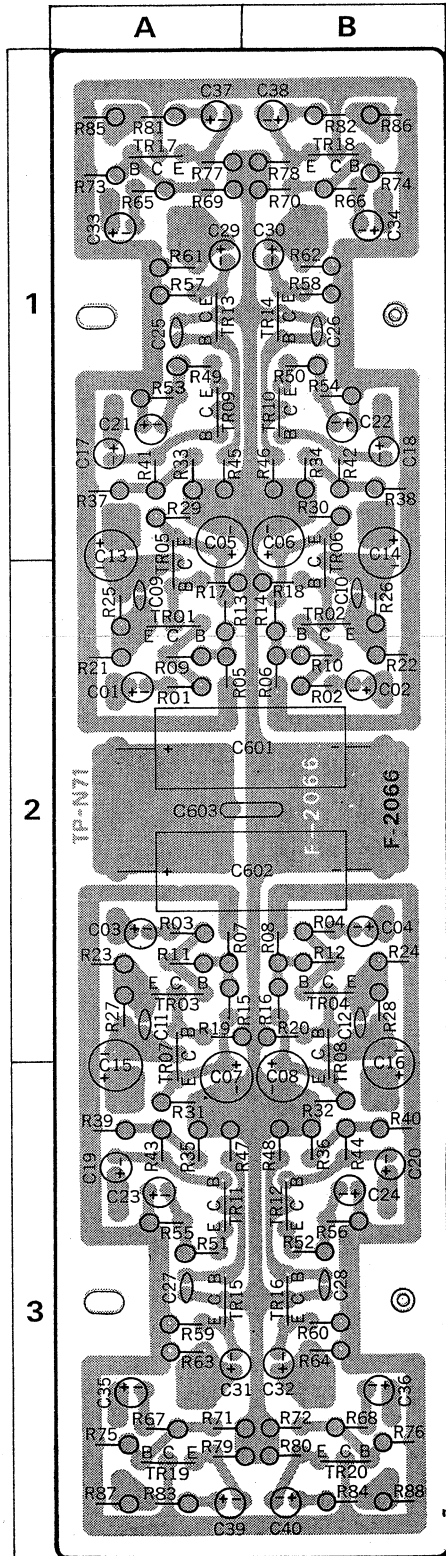
### Abbreviations

<b>C.R.</b> : Carbon Resistor	<b>BP.E.C.:</b> Bi-Pola Electrolytic Capacitor
<b>S.R.</b> : Solid Resistor	<b>C.C.</b> : Ceramic Capacitor
<b>Ce.R.</b> : Cement Resistor	<b>Mi.C.</b> : Mica Capacitor
<b>M.R.</b> : Metallized Film Resistor	<b>O.C.</b> : Oil Capacitor
<b>M.C.</b> : Mylar Capacitor	<b>P.C.</b> : Polystyrene Capacitor
<b>E.C.</b> : Electrolytic Capacitor	<b>T.C.</b> : Tantalum Capacitor

### 5-3. F-2066 Tone Circuit Board

(Stock No. 7560650 Complete Circuit Board F-2066)

#### Conductor Side



#### Parts List

Parts No.	Stock No.	Description	Position
TR01	0300302, 3	2SA640 Ⓢ (K, L)	2 A
TR02	0300302, 3	2SA640 Ⓢ (K, L)	2 B
TR03	0300302, 3	2SA640 Ⓢ (K, L)	2 A
TR04	0300302, 3	2SA640 Ⓢ (K, L)	2 B
TR05	0306011	2SC1222 (E)	1, 2 A
TR06	0306011	2SC1222 (E)	1, 2 B
TR07	0306011	2SC1222 (E)	2, 3 A
TR08	0306011	2SC1222 (E)	2, 3 B
TR09	0300302, 3	2SA640 Ⓢ (K, L)	1 A
TR10	0300302, 3	2SA640 Ⓢ (K, L)	1 B
TR11	0300302, 3	2SA640 Ⓢ (K, L)	3 A
TR12	0300302, 3	2SA640 Ⓢ (K, L)	3 B
TR13	0300302, 3	2SA640 Ⓢ (K, L)	1 A
TR14	0300302, 3	2SA640 Ⓢ (K, L)	1 B
TR15	0300302, 3	2SA640 Ⓢ (K, L)	3 A
TR16	0300302, 3	2SA640 Ⓢ (K, L)	3 B
TR17	0306011	2SC1222 (E)	1 A
TR18	0306011	2SC1222 (E)	1 B
TR19	0306011	2SC1222 (E)	3 A
TR20	0306011	2SC1222 (E)	3 B
C01	0573478	0.47 $\mu$ F 25V	2 A
C02	0573478	0.47 $\mu$ F 25V	2 B
C03	0573478	0.47 $\mu$ F 25V	2 A
C04	0573478	0.47 $\mu$ F 25V	2 B
C05	0512470	47 $\mu$ F 16V	1 A
C06	0512470	47 $\mu$ F 16V	1 B
C07	0512470	47 $\mu$ F 16V	2, 3 A
C08	0512470	47 $\mu$ F 16V	2, 3 B
C09	0660100	10 pF 50V	2 A
C10	0660100	10 pF 50V	1 B
C11	0660100	10 pF 50V	2 A
C12	0660100	10 pF 50V	2 B
C13	0519106	4.7 $\mu$ F 50V	1, 2 A
C14	0519106	4.7 $\mu$ F 50V	1, 2 B
C15	0519106	4.7 $\mu$ F 50V	2, 3 A
C16	0519106	4.7 $\mu$ F 50V	2, 3 B
C17	0519101	1 $\mu$ F 50V	1 A, 2 A
C18	0519101	1 $\mu$ F 50V	1 B, 2 B
C19	0519101	1 $\mu$ F 50V	3 A
C20	0519101	1 $\mu$ F 50V	3 B
C21	0512330	33 $\mu$ F 16V	1 A
C22	0512330	33 $\mu$ F 16V	1 B
C23	0512330	33 $\mu$ F 16V	3 A
C24	0512330	33 $\mu$ F 16V	3 B
C25	0660100	10 pF 50V	1 A
C26	0660100	10 pF 50V	1 B
C27	0660100	10 pF 50V	3 A
C28	0660100	10 pF 50V	3 B
C29	0519101	1 $\mu$ F 50V	1 A
C30	0519101	1 $\mu$ F 50V	1 B
C31	0519101	1 $\mu$ F 50V	3 A
C32	0519101	1 $\mu$ F 50V	3 B
C33	0519102	3.3 $\mu$ F 50V	1 A
C34	0519102	3.3 $\mu$ F 50V	1 B
C35	0519102	3.3 $\mu$ F 50V	3 A
C36	0519102	3.3 $\mu$ F 50V	3 B
C37	0519102	3.3 $\mu$ F 50V	1 A
C38	0519102	3.3 $\mu$ F 50V	1 B
C39	0519102	3.3 $\mu$ F 50V	3 A
C40	0519102	3.3 $\mu$ F 50V	3 B
C601	0505101	100 $\mu$ F 50V	2 A, B



Parts No.	Stock No.	Description	Position
C602	0505101	100 $\mu$ F 50V	E.C. 2 A, B
C603	0601477	0.047 $\mu$ F 50V	M.C. 2 A, B
R01	0106122	1.2k $\Omega$	2 A
R02	0106122	1.2k $\Omega$	2 B
R03	0106122	1.2k $\Omega$	2 A
R04	0106122	1.2k $\Omega$	2 B
R05	0106473	47k $\Omega$	2 A
R06	0106473	47k $\Omega$	2 B
R07	0106473	47k $\Omega$	2 A
R08	0106473	47k $\Omega$	2 B
R09	0106394	390k $\Omega$	2 A
R10	0106394	390k $\Omega$	2 B
R11	0106394	390k $\Omega$	2 A
R12	0106394	390k $\Omega$	2 B
R13	0106564	560k $\Omega$	2 A
R14	0106564	560k $\Omega$	2 B
R15	0106564	560k $\Omega$	2 A
R16	0106564	560k $\Omega$	2 B
R17	0106224	220k $\Omega$	2 A
R18	0106224	220k $\Omega$	2 B
R19	0106224	220k $\Omega$	2 A
R20	0106224	220k $\Omega$	2 B
R21	0106331	330 $\Omega$	2 A
R22	0106331	330 $\Omega$	2 B
R23	0106331	330 $\Omega$	2 A
R24	0106331	330 $\Omega$	2 B
R25	0106272	2.7k $\Omega$	2 A
R26	0106272	2.7k $\Omega$	2 B
R27	0106272	2.7k $\Omega$	2 A
R28	0106272	2.7k $\Omega$	2 B
R29	0106102	1k $\Omega$	1 A
R30	0106102	1k $\Omega$	1 B
R31	0106102	1k $\Omega$	3 A
R32	0106102	1k $\Omega$	3 B
R33	0106394	390k $\Omega$	1 A
R34	0106394	390k $\Omega$	1 B
R35	0106394	390k $\Omega$	3 A
R36	0106394	390k $\Omega$	3 B
R37	0106333	33k $\Omega$	1 A
R38	0106333	33k $\Omega$	1 B
R39	0106333	33k $\Omega$	3 A
R40	0106333	33k $\Omega$	3 B
R41	0106394	390k $\Omega$	1 A
R42	0106394	390k $\Omega$	1 B
R43	0106394	390k $\Omega$	3 A
R44	0106394	390k $\Omega$	3 B
R45	0106183	18k $\Omega$	1 A
R46	0106183	18k $\Omega$	1 B
R47	0106183	18k $\Omega$	3 A
R48	0106183	18k $\Omega$	3 B
R49	0106151	150 $\Omega$	1 A
R50	0106151	150 $\Omega$	1 B
R51	0106151	150 $\Omega$	3 A
R52	0106151	150 $\Omega$	3 B
R53	0106102	1k $\Omega$	1 A
R54	0106102	1k $\Omega$	1 B
R55	0106102	1k $\Omega$	3 A
R56	0106102	1k $\Omega$	3 B
R57	0106392	3.9k $\Omega$	1 A
R58	0106392	3.9k $\Omega$	1 B
R59	0106392	3.9k $\Omega$	3 A

Parts No.	Stock No.	Description	Position
R60	0106392	3.9k $\Omega$	3 B
R61	0106184	180k $\Omega$	1 A
R62	0106184	180k $\Omega$	1 B
R63	0106184	180k $\Omega$	3 A
R64	0106184	180k $\Omega$	3 B
R65	0106122	1.2k $\Omega$	1 A
R66	0106122	1.2k $\Omega$	1 B
R67	0106122	1.2k $\Omega$	3 A
R68	0106122	1.2k $\Omega$	3 B
R69	0106474	470k $\Omega$	1 A
R70	0106474	470k $\Omega$	1 B
R71	0106474	470k $\Omega$	3 A
R72	0106474	470k $\Omega$	3 B
R73	0106224	220k $\Omega$	1 A
R74	0106224	220k $\Omega$	1 B
R75	0106224	220k $\Omega$	3 A
R76	0106224	220k $\Omega$	3 B
R77	0106392	3.9k $\Omega$	1 A
R78	0106392	3.9k $\Omega$	1 B
R79	0106392	3.9k $\Omega$	3 A
R80	0106392	3.9k $\Omega$	3 B
R81	0106471	470 $\Omega$	1 A
R82	0106471	470 $\Omega$	1 B
R83	0106471	470 $\Omega$	3 A
R84	0106471	470 $\Omega$	3 B
R85	0106473	47k $\Omega$	1 A
R86	0106473	47k $\Omega$	1 B
R87	0106473	47k $\Omega$	3 A
R88	0106473	47k $\Omega$	3 B

$\pm 5\%$   $\frac{1}{4}W$  C.R.  
(E.L.R.)

$\pm 5\%$   $\frac{1}{4}W$  C.R.  
(E.L.R.)

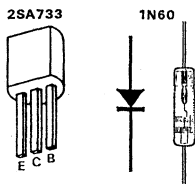
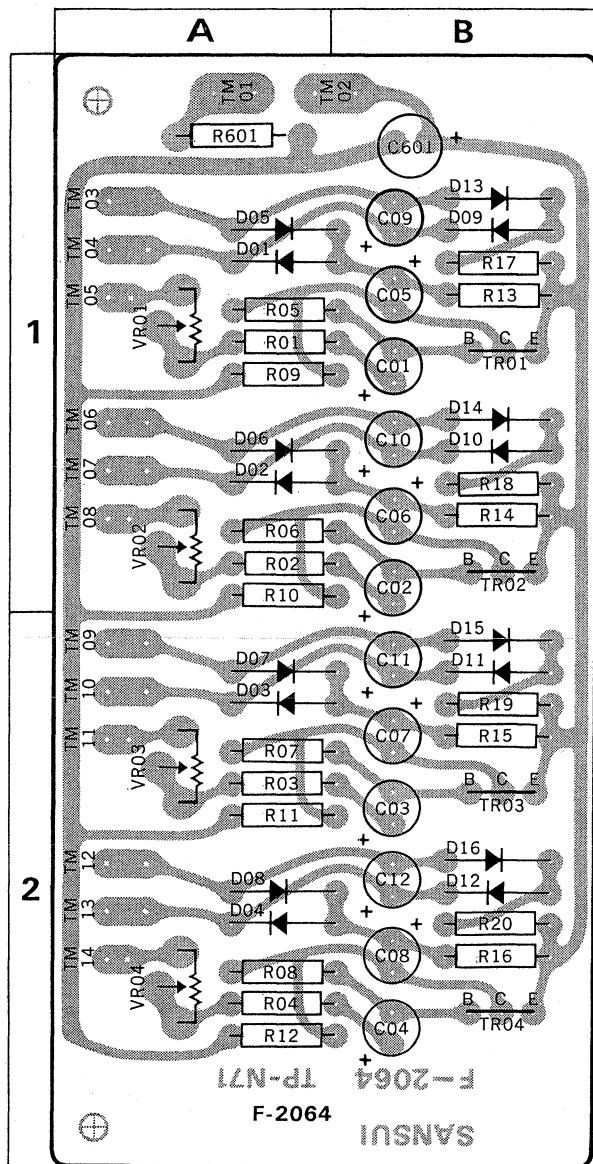
==Abbreviations==

- |  |  |
|--|--|
| <b>C.R.</b> : Carbon Resistor          | <b>BP.E.C.:</b> Bi-Pola Electrolytic Capacitor |
| <b>S.R.</b> : Solid Resistor           | <b>C.C.</b> : Ceramic Capacitor                |
| <b>Ce.R.</b> : Cement Resistor         | <b>Mi.C.</b> : Mica Capacitor                  |
| <b>M.R.</b> : Metallized Film Resistor | <b>O.C.</b> : Oil Capacitor                    |
| <b>M.C.</b> : Mylar Capacitor          | <b>P.C.</b> : Polystyrene Capacitor            |
| <b>E.C.</b> : Electrolytic Capacitor   | <b>T.C.</b> : Tantalum Capacitor               |

### 5-4. F-2064 Meter Circuit Board

[(Stock No. 7591480 Complete Circuit Board F-2064)]

#### Conductor Side



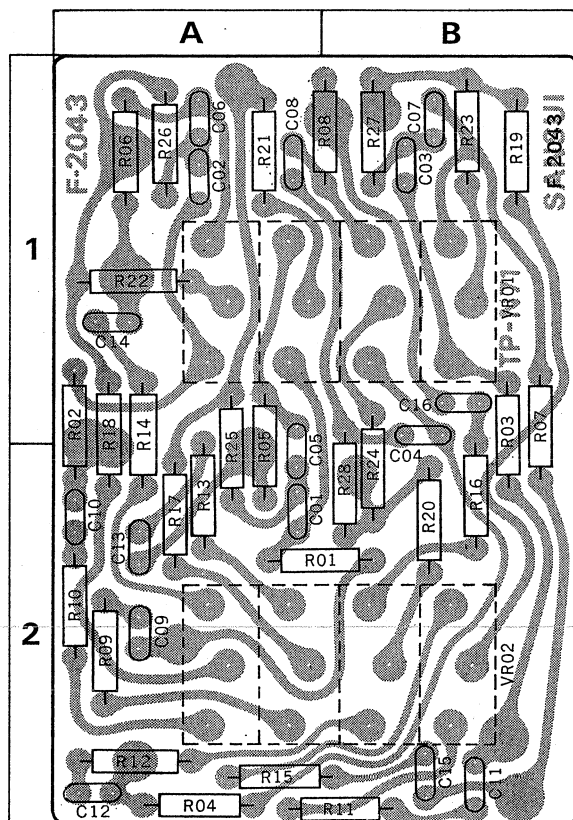
#### Parts List

Parts No.	Stock No.	Description	Position	
TR01	0300510, 1	2SA733 (P,Q)	} Transistor 1 B	
TR02	0300510, 1	2SA733 (P,Q)		1 B
TR03	0300510, 1	2SA733 (P,Q)		2 B
TR04	0300510, 1	2SA733 (P,Q)		2 B
D01	0310330, 1	1N60	} Diode 1 A	
D02	0310330, 1	1N60		1 A
D03	0310330, 1	1N60		2 A
D04	0310330, 1	1N60		2 A
D05	0310330, 1	1N60		1 A
D06	0310330, 1	1N60		1 A
D07	0310330, 1	1N60		2 A
D08	0310330, 1	1N60		2 A
D09	0310330, 1	1N60		1 B
D10	0310330, 1	1N60		1 B
D11	0310330, 1	1N60		2 B
D12	0310330, 1	1N60		2 B
D13	0310330, 1	1N60		1 B
D14	0310330, 1	1N60		1 B
D15	0310330, 1	1N60		2 B
D16	0310330, 1	1N60		2 B
C01	0601477	0.047 $\mu$ F 50V	} M.C. 1 B	
C02	0601477	0.047 $\mu$ F 50V		1 B
C03	0601477	0.047 $\mu$ F 50V		2 B
C04	0601477	0.047 $\mu$ F 50V		2 B
C05	0515109	1 $\mu$ F 50V	} E.C. 1 B	
C06	0515109	1 $\mu$ F 50V		1 B
C07	0515109	1 $\mu$ F 50V		2 B
C08	0515109	1 $\mu$ F 50V		2 B
C09	0515109	1 $\mu$ F 50V		1 B
C10	0515109	1 $\mu$ F 50V		1 B
C11	0515109	1 $\mu$ F 50V		2 B
C12	0515109	1 $\mu$ F 50V		2 B
C601	0513330	33 $\mu$ F 25V		1 B
R01	0107563	56k $\Omega$		} $\pm 5\%$ $\frac{1}{4}$ W C.R. 1 A
R02	0107563	56k $\Omega$		
R03	0107563	56k $\Omega$	2 A	
R04	0107563	56k $\Omega$	2 A	
R05	0107105	1M $\Omega$	1 A	
R06	0107105	1M $\Omega$	1 A	
R07	0107105	1M $\Omega$	2 A	
R08	0107105	1M $\Omega$	2 A	
R09	0107472	4.7k $\Omega$	1 A	
R10	0107472	4.7k $\Omega$	1 A	
R11	0107472	4.7k $\Omega$	2 A	
R12	0107472	4.7k $\Omega$	2 A	
R13	0107474	470k $\Omega$	1 B	
R14	0107474	470k $\Omega$	1 B	
R15	0107474	470k $\Omega$	2 B	
R16	0107474	470k $\Omega$	2 B	
R17	0107822	8.2k $\Omega$		
R18	0107822	8.2k $\Omega$		
R19	0107822	8.2k $\Omega$		
R20	0107822	8.2k $\Omega$		
R601	0103222	2.2k $\Omega$ $\pm 5\%$ $\frac{1}{2}$ W C.R.	1 A	
VR01	1031140-2	100k $\Omega$ (B)	} Semi-Variable Resistor 1 A	
VR02	1031140-2	100k $\Omega$ (B)		1 A
VR03	1031140-2	100k $\Omega$ (B)		2 A
VR04	1031140-2	100k $\Omega$ (B)		2 A

## 5-5. F-2043 Tone Control Circuit Board

(Stock No. 7560660 Complete Circuit Board F-2043)

### Conductor Side



### Parts List

Parts No.	Stock No.	Description	Position
C01	0600307	0.03 $\mu$ F	2A
C02	0600307	0.03 $\mu$ F	1A
C03	0600307	0.03 $\mu$ F	1B
C04	0600307	0.03 $\mu$ F	1B
C05	0600307	0.03 $\mu$ F	1, 2A
C06	0600307	0.03 $\mu$ F	1A
C07	0600307	0.03 $\mu$ F	1B
C08	0600307	0.03 $\mu$ F	1A
C09	0600806	0.008 $\mu$ F	$\pm 5\%$ 50V M.C. 2A
C10	0600806	0.008 $\mu$ F	2A
C11	0600806	0.008 $\mu$ F	2B
C12	0600806	0.008 $\mu$ F	2A
C13	0600806	0.008 $\mu$ F	2A
C14	0600806	0.008 $\mu$ F	1A
C15	0600806	0.008 $\mu$ F	2B
C16	0600806	0.008 $\mu$ F	1B
R01	0107822	8.2k $\Omega$	2A, B
R02	0107822	8.2k $\Omega$	1, 2A
R03	0107822	8.2k $\Omega$	1, 2B
R04	0107822	8.2k $\Omega$	2A
R05	0107822	8.2k $\Omega$	1, 2A
R06	0107822	8.2k $\Omega$	1A
R07	0107822	8.2k $\Omega$	1, 2B
R08	0107822	8.2k $\Omega$	1A, B
R09	0107102	1k $\Omega$	2A
R10	0107102	1k $\Omega$	2A
R11	0107102	1k $\Omega$	2A, B
R12	0107102	1k $\Omega$	2A
R13	0107102	1k $\Omega$	2A
R14	0107102	1k $\Omega$	1, 2A
R15	0107102	1k $\Omega$	2A, B
R16	0107102	1k $\Omega$	2A, B
R17	0107221	220 $\Omega$	2B
R18	0107221	220 $\Omega$	2A
R19	0107221	220 $\Omega$	1, 2A
R20	0107221	220 $\Omega$	1B
R21	0107472	4.7k $\Omega$	2B
R22	0107472	4.7k $\Omega$	1A
R23	0107472	4.7k $\Omega$	1B
R24	0107472	4.7k $\Omega$	1, 2B
R25	0107222	2.2k $\Omega$	1, 2 B
R26	0107222	2.2k $\Omega$	1A
R27	0107222	2.2k $\Omega$	1B
R28	0107222	2.2k $\Omega$	1, 2 B
VR01	1060160,1	100k $\Omega$ (B) $\times$ 4	$\pm 5\%$ $\frac{1}{4}$ W C.R. Dual Shaft Variable Resistor 1A, B
VR02	1060160,1	100k $\Omega$ (B) $\times$ 4	2A, B

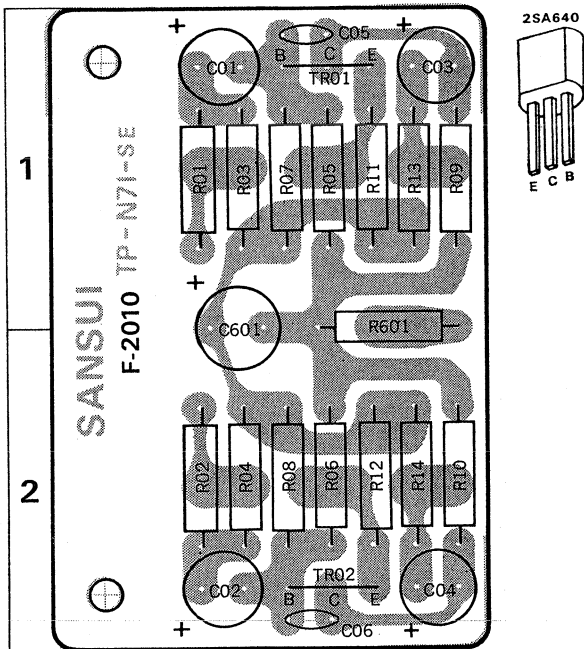
### —Abbreviations—

<b>C.R.</b> : Carbon Resistor	<b>BP.E.C.:</b> Bi-Pola Electrolytic Capacitor
<b>S.R.</b> : Solid Resistor	<b>C.C.</b> : Ceramic Capacitor
<b>Ce.R.</b> : Cement Resistor	<b>Mi.C.</b> : Mica Capacitor
<b>M.R.</b> : Metallized Film Resistor	<b>O.C.</b> : Oil Capacitor
<b>M.C.</b> : Mylar Capacitor	<b>P.C.</b> : Polystyrene Capacitor
<b>E.C.</b> : Electrolytic Capacitor	<b>T.C.</b> : Tantalum Capacitor

### 5-6. F-2010 B.T.L. Circuit Board

(Stock No. 7591760 Complete Circuit Board F-2010)

#### Conductor Side



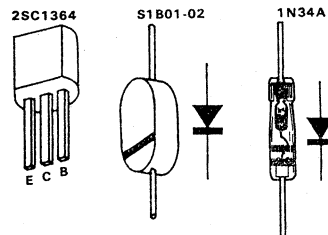
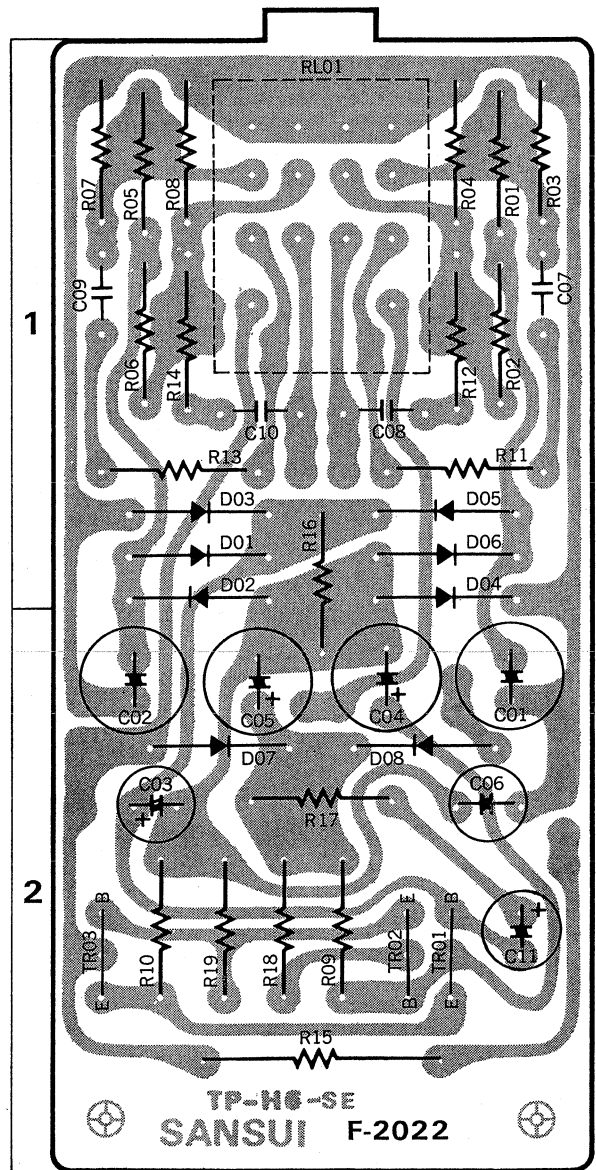
#### Parts List

Parts No.	Stock No.	Description	Position
TR01	0300301,3,5	2SA640 (M, K, L)	1
TR02	0300301,3,5	2SA640 (M, K, L)	2
C01	0515339	3.3 $\mu$ F 50V	1
C02	0515339	3.3 $\mu$ F 50V	2
C03	0515339	3.3 $\mu$ F 50V	1
C04	0515339	3.3 $\mu$ F 50V	2
C05	0660150	15pF $\pm 10\%$ 50V	C.C. 1
C06	0660150	15pF $\pm 10\%$ 50V	C.C. 2
C601	0513470	47 $\mu$ F 25V E.C.	1, 2
R01	0107561	560 $\Omega$	1
R02	0107561	560 $\Omega$	2
R03	0107394	390k $\Omega$	1
R04	0107394	390k $\Omega$	2
R05	0107224	220k $\Omega$	1
R06	0107224	220k $\Omega$	2
R07	0107823	82k $\Omega$	1
R08	0107823	82k $\Omega$	2
R09	0107392	3.9k $\Omega$	1
R10	0107392	3.9k $\Omega$	2
R11	0107392	3.9k $\Omega$	1
R12	0107392	3.9k $\Omega$	2
R13	0107124	120k $\Omega$	1
R14	0107124	120k $\Omega$	2
R601	0107822	8.2k $\Omega$	1, 2

### 5-7. F-2022 Protector Circuit Board

(Stock No. 7598130 Complete Circuit Board F-2022)

#### Conductor Side



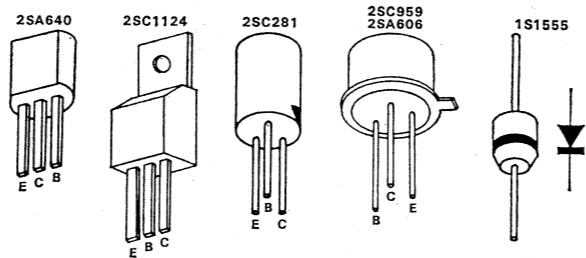
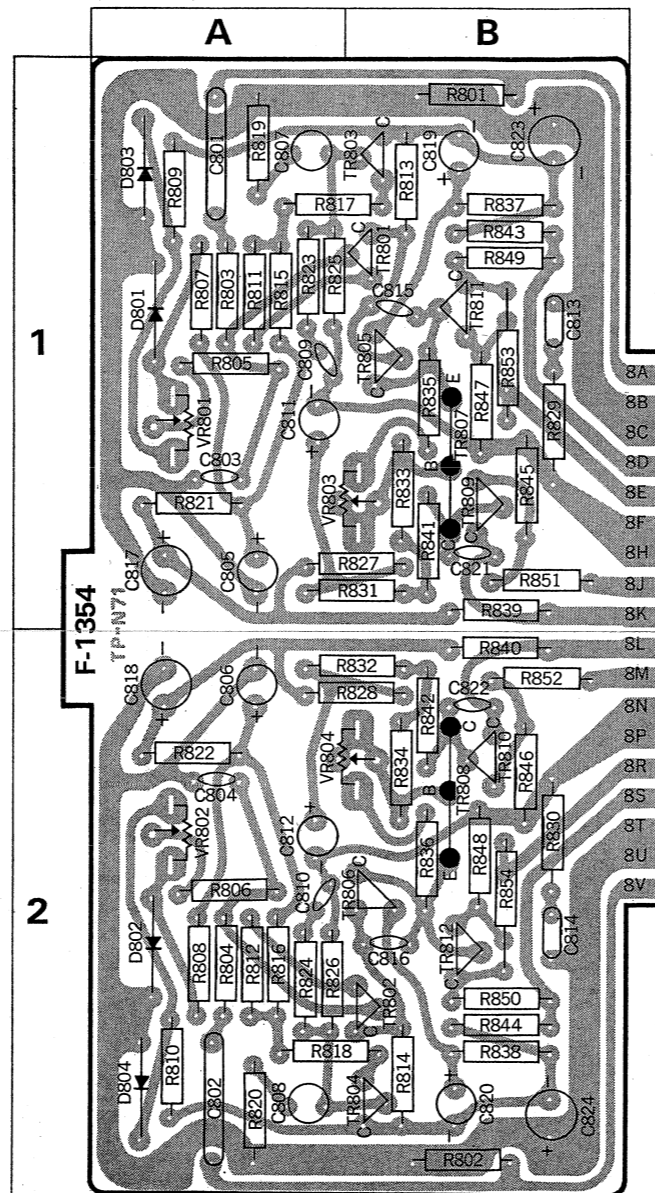
Parts List

Parts No.	Stock No.	Description	Position
TR01	0306131-3	2SC1364 (6, 7, 8)	Transistor
TR02	0306131-3	2SC1364 (6, 7, 8)	
TR03	0306131-3	2SC1364 (6, 7, 8)	
D01	0310400	1N34A	Diode
D02	0310400	1N34A	
D03	0310400	1N34A	
D04	0310400	1N34A	
D05	0310400	1N34A	
D06	0310400	1N34A	
D07	0311150	S1B01-02	
D08	0311150	S1B01-02	
C01	0530470	47 μF 6.3V	E.C.
C02	0530470	47 μF 6.3V	
C03	0515109	1 μF 50V	
C04	0510331	330 μF 6.3V	
C05	0515330	33 μF 50V	
C06	0535109	1 μF 50V	
C07	0600108	0.1 μF	
C08	0600108	0.1 μF	
C09	0600108	0.1 μF	
C10	0600108	0.1 μF	
C11	0519103	0.47 μF 50V	
R01	0107473	47kΩ	± 5% 1/4W C.R.
R02	0107473	47kΩ	
R03	0107332	3.3kΩ	
R04	0107332	3.3kΩ	
R05	0107473	47kΩ	
R06	0107473	47kΩ	
R07	0107332	3.3kΩ	
R08	0107332	3.3kΩ	
R09	0107154	150kΩ	
R10	0107479	4.7Ω	
R11	0103100	10Ω	
R12	0103100	10Ω	
R13	0103100	10Ω	
R14	0103100	10Ω	
R15	0182681	680Ω ±10%	
R16	0107474	470kΩ	
R17	0107394	390kΩ	
R18	0107102	1kΩ	
R19	0107124	120kΩ	
RL01	1150101	MY4-0-US-SA Relay	

5-8. F-1354B Driver Circuit Board

(Stock No. 7570760 Complete Circuit Board F-1354B)

Conductor Side



Parts List

Parts No.	Stock No.	Description	Position
TR801	0300301,3,5	2SA640 (M. K. L.)	Transistor
TR802	0300301,3,5	2SA640 (M. K. L.)	
TR803	0300301,3,5	2SA640 (M. K. L.)	
TR804	0300301,3,5	2SA640 (M. K. L.)	
TR805	0305901,2	2SC1124 (2, 3)	
TR806	0305901,2	2SC1124 (2, 3)	
TR807	0305122	2SC281 (C)	
TR808	0305122	2SC281 (C)	
TR809	0305741-3	2SC959 (M, K, L)	
TR810	0305741-3	2SC959 (M, K, L)	
TR811	0300211-3	2SA606 (M, K, L)	
TR812	0300211-3	2SA606 (M, K, L)	
D801	0311040	1S1555	Diode
D802	0311040	1S1555	
D803	0311040	1S1555	
D804	0311040	1S1555	
C801	0515109	1 μF 50V	E.C.
C802	0515109	1 μF 50V	
C803	0660220	22pF ±10%	C.C.
C804	0660220	22pF ±10%	
C805	0515470	47 μF 50V	E.C.
C806	0515470	47 μF 50V	
C807	0531470	47 μF 10V	B.P.E.C.
C808	0531470	47 μF 10V	
C809	0660409	4pF ±5pF	C.C.
C810	0660409	4pF ±5pF	
C811	0515470	47 μF 50V	E.C.
C812	0515470	47 μF 50V	
C813	0600477	0.047 μF ±5%	M.C.
C814	0600477	0.047 μF ±5%	
C815	0660150	15pF ±10%	C.C.
C816	0660150	15pF ±10%	
C817	0515101	100 μF 50V	E.C.
C818	0515101	100 μF 50V	
C819	0510221	220 μF 6.3V	E.C.
C820	0510221	220 μF 6.3V	
C821	0515101	100 μF 50V	E.C.
C824	0515101	100 μF 50V	
R801	0107474	470kΩ	± 5% 1/4W C.R.
R802	0107474	470kΩ	
R803	0107183	18kΩ	
R804	0107183	18kΩ	
R805	0107473	47kΩ	
R806	0107473	47kΩ	
R807	0107183	18kΩ	
R808	0107183	18kΩ	
R809	0107183	18kΩ	
R810	0107183	18kΩ	
R811	0107121	120Ω	
R812	0107121	120Ω	
R813	0107332	3.3kΩ	
R814	0107332	3.3kΩ	
R815	0107183	18kΩ	
R816	0107183	18kΩ	
R817	0107121	120Ω	
R818	0107121	120Ω	
R819	0107182	1.8kΩ	
R820	0107182	1.8kΩ	
R821	0107332	3.3kΩ	
R822	0107332	3.3kΩ	

Parts No.	Stock No.	Description	Position
R823	0107224	220kΩ	± 5% 1/4W C.R.
R824	0107224	220kΩ	
R825	0107473	47kΩ	± 5% 1/4W C.R.
R826	0107473	47kΩ	
R827	0107182	1.8kΩ	± 5% 1/2W C.R.
R828	0107182	1.8kΩ	
R829	0103100	10Ω	± 5% 1/2W C.R.
R830	0103100	10Ω	
R831	0107472	4.7kΩ	± 5% 1/4W C.R.
R832	0107472	4.7kΩ	
R833	0107332	3.3kΩ	± 5% 1/4W C.R.
R834	0107332	3.3kΩ	
R835	0107821	820Ω	± 5% 1/4W C.R.
R836	0107821	820Ω	
R837	0107221	220Ω	± 5% 1/4W C.R.
R838	0107221	220Ω	
R839	0107181	180Ω	± 5% 1/4W C.R.
R840	0107181	180Ω	
R841	0107390	39Ω	± 5% 1/4W C.R.
R842	0107390	39Ω	
R843	0107331	330Ω	± 5% 1/4W C.R.
R844	0107331	330Ω	
R845	0107221	220Ω	± 5% 1/4W C.R.
R846	0107221	220Ω	
R847	0107221	220Ω	± 5% 1/4W C.R.
R848	0107221	220Ω	
R851	0107100	10Ω	± 5% 1/4W C.R.
R852	0107100	10Ω	
R853	0107100	10Ω	± 5% 1/4W C.R.
R854	0107100	10Ω	
VR801	1031092	5kΩ (B)	Semi-Variable Resistor
VR802	1031092	5kΩ (B)	
VR803	1031052	1kΩ (B)	
VR804	1031052	1kΩ (B)	
5936610		Heat Sink	

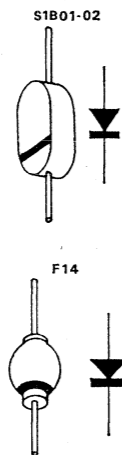
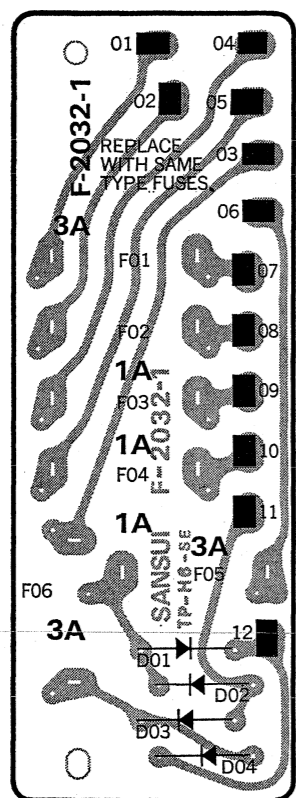
Abbreviations

C.R. : Carbon Resistor	BP.E.C.: Bi-Pola Electrolytic Capacitor
S.R. : Solid Resistor	C.C. : Ceramic Capacitor
Ce.R. : Cement Resistor	Mi.C. : Mica Capacitor
M.R. : Metallized Film Resistor	O.C. : Oil Capacitor
M.C. : Mylar Capacitor	P.C. : Polystyrene Capacitor
E.C. : Electrolytic Capacitor	T.C. : Tantalum Capacitor

### 5-9. F-2032 Fuse Circuit Board

(Stock No. 7591770 Complete Circuit Board F-2032)

#### Conductor Side



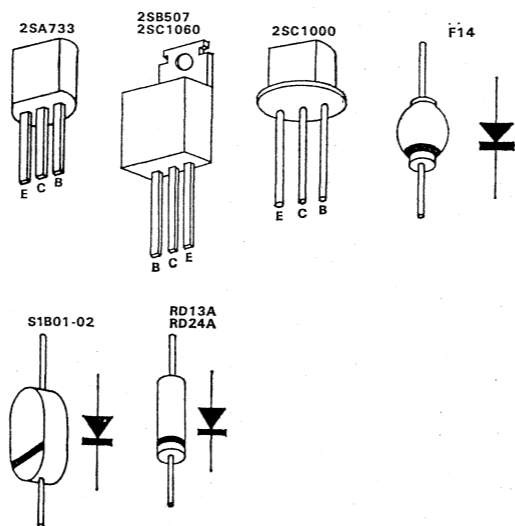
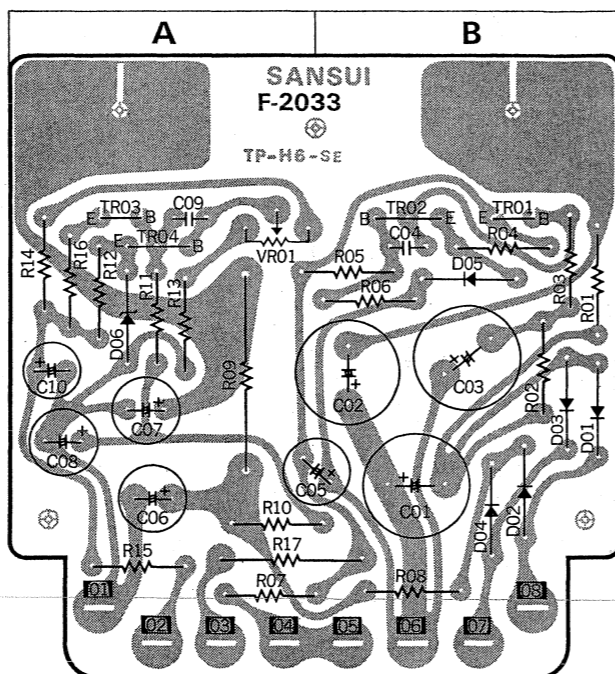
#### Parts List

Parts No.	Stock No.	Description
D01	0310940	F14A
D02	0310940	F14A
D03	0310940	F14A
D04	0310940	F14A
		} Diode
F01	0432870	MF52NB-3A
F02	0432830	MF52NB-1A
F03	0432830	MF52NB-1A
F04	0432830	MF52NB-1A
F05	0432830	MF52NB-1A
		} Wired-in Fuse
	2250051	2212-2 Fasten Tub

### 5-10. F-2033 Power Supply Circuit Board

(Stock No. 7500850 Complete Circuit Board F-2033)

#### Conductor Side



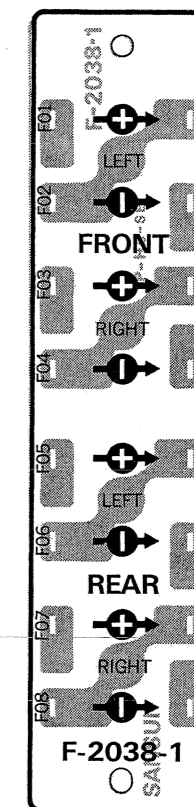
#### Parts List

Parts No.	Stock No.	Description	Position
TR01	0303231-3	2SB507 (D, E, F)	B
TR02	0300510-2	2SA733 (P, Q, R)	B
TR03	0305711, 2	2SC1060 (B, C)	A
TR04	0305880, 1	2SC1000 (GR, BL)	A
		} Transistor	
D01	0311200	F14C	B
	0311150	S1B01-02	B
D02	0311200	F14C	B
	0311150	S1B01-02	B
D03	0311020	F14C	B
	0311150	S1B01-02	B
D04	0311200	F14C	B
	0311150	S1B01-02	B
D05	0315410	RD24A (M)	B
D06	0315280	RD13A (K)	A
		} Zener Diode	
C01	0519903	100µF 80V	B
C02	0519903	100µF 80V	E.C. B
C03	0519903	100µF 80V	B
C04	0660471	470pF 50V	C.C. B
C05	0515330	33µF 50V	A, B
C06	0519902	47µF 80V	A
C07	0515470	47µF 50V	E.C. A
C08	0515330	33µF 50V	A
C09	0660471	470pF 50V	C.C. A
C10	0513330	33µF 25V	E.C. A
R01	0103330	33Ω ± 5% 1/2W C.R.	B
R02	0107152	1.5kΩ	B
R03	0107472	4.7kΩ	B
R04	0107563	56kΩ	B
R05	0107153	15kΩ ± 5% 1/4W C.R.	B
R06	0107183	18kΩ	B
R07	0107560	56Ω	A
R08	0107100	10Ω	B
R09	0183391	390kΩ ± 10% 3W Ce.R.	A
R10	0107472	4.7kΩ	A, B
R11	0107562	5.6kΩ	A
R12	0107333	33kΩ	A
R13	0107562	5.6kΩ ± 5% 1/4W C.R.	A
R14	0107472	4.7kΩ	A
R15	0107560	56Ω	A
R16	0107479	4.7Ω	A
VR01	1031090	5kΩ (B) Semi-Variable Resistor	A
	2250020	Fasten Tab A	

### 5-11. F-2038 Fuse Circuit Board

(Stock No. 7591780 Complete Circuit Board F-2038)

#### Conductor Side



#### Parts List

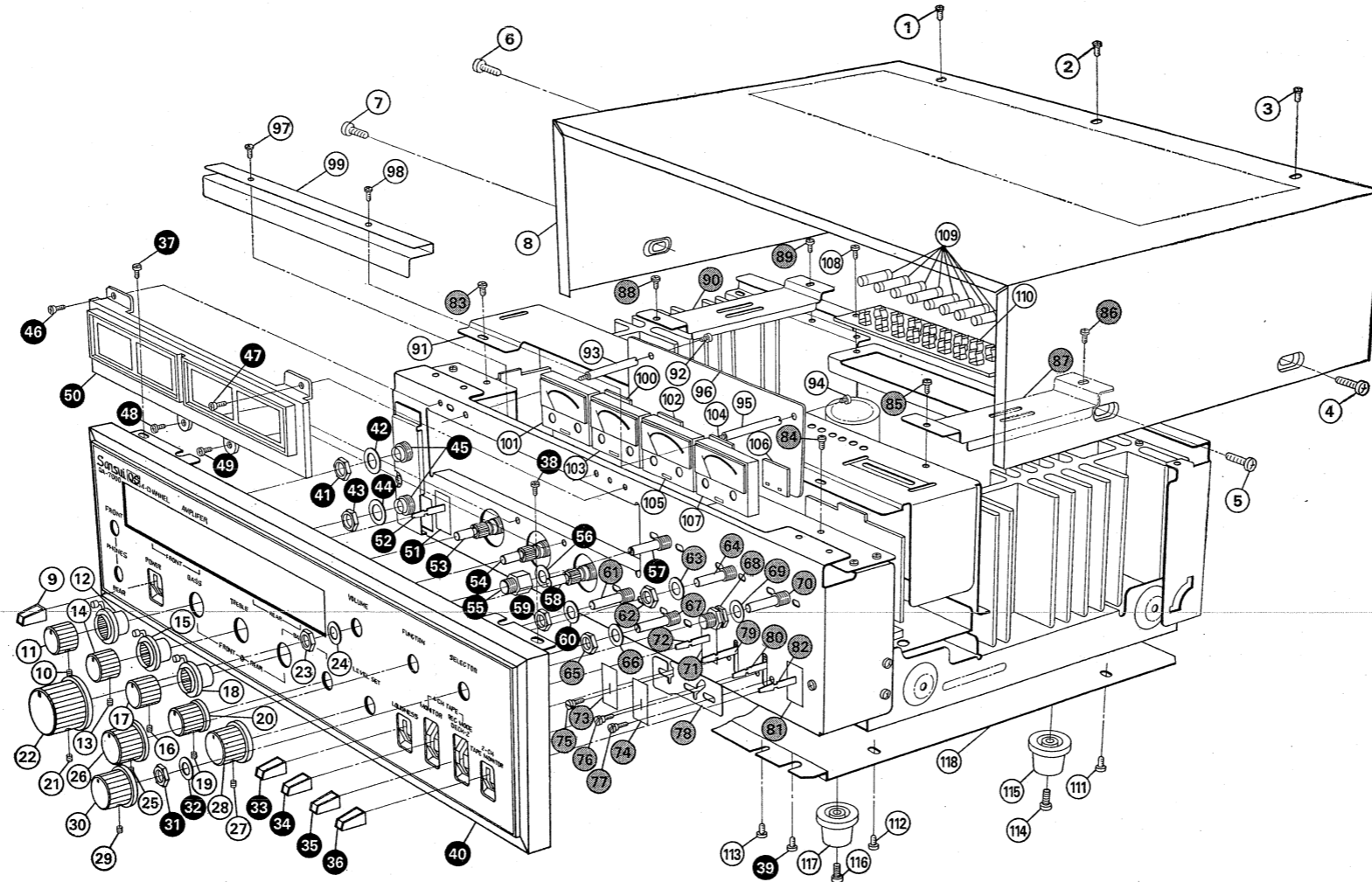
Parts No.	Stock No.	Description
F01	0433620	MF51SH
F02	0433620	MF51SH
F03	0433620	MF51SH
F04	0433620	MF51SH
F05	0433620	MF51SH
F06	0433620	MF51SH
F07	0433620	MF51SH
F08	0433620	MF51SH
		} 3A Quick Acting Fuse

#### Abbreviations

C.R. : Carbon Resistor	BP.E.C.: Bi-Pola Electrolytic Capacitor
S.R. : Solid Resistor	C.C. : Ceramic Capacitor
Ce.R. : Cement Resistor	Mi.C. : Mica Capacitor
M.R. : Metallized Film Resistor	O.C. : Oil Capacitor
M.C. : Mylar Capacitor	P.C. : Polystyrene Capacitor
E.C. : Electrolytic Capacitor	T.C. : Tantalum Capacitor



5-12. Other Parts (Front Side)



- 1 ~ 30
- 31 ~ 60
- 61 ~ 90
- 91 ~ 118

Parts List

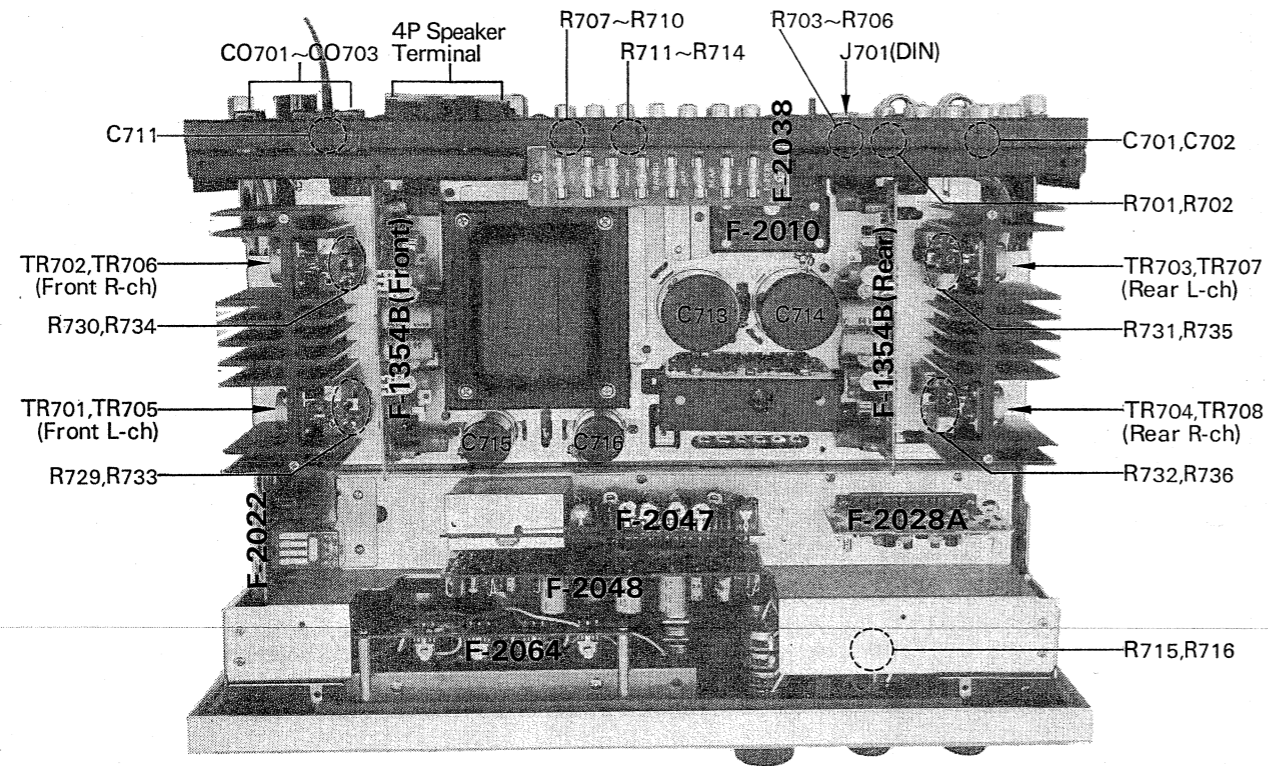
Parts No.	Stock No.	Description
1	5101143	Binding Head Screw, M3 × 6
2	5101143	Binding Head Screw, M3 × 6
3	5101143	Binding Head Screw, M3 × 6
4	5101161	Binding Head Screw, M4 × 6
5	5101161	Binding Head Screw, M4 × 6
6	5101161	Binding Head Screw, M4 × 6
7	5101161	Binding Head Screw, M4 × 6
8	5726673	Metal Bonnet
9	5326342	Button D, power
10		Hex. Socket Setscrew, M4 × 0.7 × 6
11	5317700	K-5 Type Knob, bass
12	5317711	L-5 Type Knob, bass
13		Hex. Socket Setscrew, M4 × 0.7 × 6
14	5317700	K-5 Type Knob, treble
15	5317711	L-5 Type Knob, treble
16		Hex. Socket Setscrew, M4 × 0.7 × 6
17	5317700	K-5 Type Knob, balance
18	5317711	L-5 Type Knob, balance

Parts No.	Stock No.	Description
19		Hex. Socket Setscrew, M4 × 0.7 × 6
20	5317402	Z-4 Type Knob, balance
21		Hex. Socket Setscrew, M4 × 0.7 × 6
22	5317412	A-5 Type Knob, volume
23	5110781	Hex. Nut M9, volume
24	5120184	Plane Washer 9φ, volume
25		Hex. Socket Setscrew, M4 × 0.7 × 6
26	5317422	B-5 Type Knob, function
27		Hex. Socket Setscrew, M4 × 0.7 × 6
28	5317422	B-5 Type Knob, level set
29		Hex. Socket Setscrew, M4 × 0.7 × 6
30	5317422	B-5 Type Knob, selector
31	5110781	Hex. Nut M9, selector
32	5120184	Plane Washer 9φ, selector
33	5326342	Button D, loudness
34	5326342	Button D, 4-ch tape mon.
35	5326342	Button D, 4-ch tape rec.
36	5326342	Button D, 2-ch tape mon.

Parts No.	Stock No.	Description
37	5101143	Binding Head Screw, M3 × 6
38	5101143	Binding Head Screw, M3 × 6
39	5101143	Binding Head Screw, M3 × 6
40	7006881	Front Panel
41		Hex. Nut M12, headphone
42		Plane Washer 12φ, headphone
43		Hex. Nut M12, headphone
44		Plane Washer 12φ, headphone
45	2430230	Jack, Headphone
46	5102543	Flat Countersunk Head Screw, M3 × 6
47	5102543	Flat Countersunk Head Screw, M3 × 6
48	5101043	Binding Head Screw, M3 × 6
49	5101043	Binding Head Screw, M3 × 6
50	5249680	Meter Frame
51	5047460	Masking, power switch
52	1170330	Lever Switch, power
53	1060160, 1	100kΩ (B) × 4 Bass Volume
54	1060160, 1	100kΩ (B) × 4 Treble Volume

Parts No.	Stock No.	Description
55	5176251	Spacer Nut (C)
56	5120183	Plane Washer 8φ, volume
57	1060170, 1	50kΩ (B) × 4 Volume
58	1060180, 1	250kΩ (MN) × 4 Balance (L-R)
59	5110780	Hex. Nut M8, balance
60	5120183	Plane Washer 8φ, balance
61	1060190, 1	250kΩ (B) × 4 Balance (F-R)
62	5110781	Hex. Nut M9, function
63	5120184	Plane Washer 9φ, function
64	1105170	Rotary Switch Y-5-19-7, function
65	5110780	Hex. Nut M8, level set volume
66	5120183	Plane Washer 8φ, level set volume
67	1060150, 1	250kΩ (B) × 4 Level Set Volume
68	5176261	Spacer Nut (D)
69	5120184	Plane Washer 9φ, selector
70	1103500, 1	Rotary Switch Y-3-8-5, selector
71	5047460	Masking, loudness switch
72	1170270	Lever Switch, loudness
73	5047470	Masking, 4-ch tape mon.
74	5047470	Masking, 4-ch rec.
75	5166512	Screw, lock plate
76	5166512	Screw, lock plate
77	5166512	Screw, lock plate
78	5249673	Lock Plate
79	1170290	Lever Switch, 4-ch tape mon.
80	1170290	Lever Switch, 4-ch tape rec.
81	5047460	Masking, 2-ch tape mon.
82	1170300	Lever Switch, 2-ch tape mon.
83	5109222	Binding Head Tapping Screw, M3 × 8
84	5109222	Binding Head Tapping Screw, M3 × 8
85	5109222	Binding Head Tapping Screw, M3 × 8
86	5109222	Binding Head Tapping Screw, M3 × 8
87	5269150	Holder, P.C.B.
88	5109222	Binding Head Tapping Screw, M3 × 8
89	5109222	Binding Head Tapping Screw, M3 × 8
90	5269150	Holder, P.C.B.
91	5037134	Front Shield Cover
92	5101043	Binding Head Screw, M3 × 6
93	5236520	Prop 6φ × 45
94	5101043	Binding Head Screw, M3 × 6
95	5236520	Prop 6φ × 45
96	7591480	Meter Amp. Unit F-2064
97	5101043	Binding Head Screw, M3 × 6
98	5101043	Binding Head Screw, M3 × 6
99	5268951	Meter Holder
100	7726040	Meter Lamp Unit B
101	4300630	Level Meter
102	7726040	Meter Lamp Unit B
103	4300630	Level Meter
104	7726040	Meter Lamp Unit B
105	4300630	Level Meter
106	7726040	Meter Lamp Unit B
107	4300630	Level Meter
108	5109222	Binding Head Tapping Screw, M3 × 8
109	0433620	3A Quick-Acting Fuse
110	7591780	Quick-Acting Fuse Unit F-2038
111	5101161	Binding Head Screw, M4 × 6
112	5101161	Binding Head Screw, M4 × 6
113	5101161	Binding Head Screw, M4 × 6
114	5100665	Binding Head Tapping Screw, M4 × 16
115	5516821	Foot
116	5100665	Binding Head Tapping Screw, M4 × 16
117	5516821	Foot
118	5058040	Bottom Plate

5-13. Other Parts (Top Side)

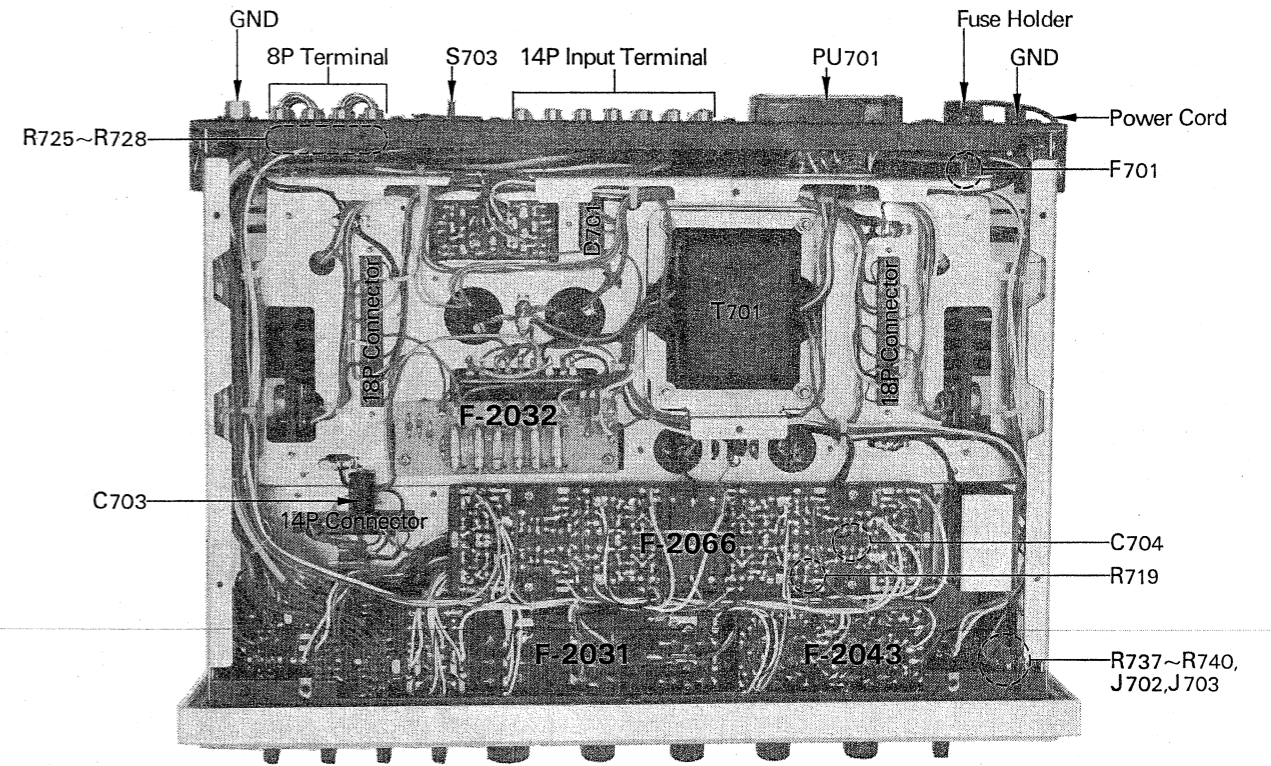


Top Side Parts List

Parts No.	Stock No.	Description
TR701	0305631, 2	2SC1030 (B, C)
TR702	0305631, 2	2SC1030 (B, C)
TR703	0305631, 2	2SC1030 (B, C)
TR704	0305631, 2	2SC1030 (B, C)
TR705	0300551, 2	2SA756 (B, C)
TR706	0300551, 2	2SA756 (B, C)
TR707	0300551, 2	2SA756 (B, C)
TR708	0300551, 2	2SA756 (B, C)
} Transistor		
C701	0657473	0.047 $\mu$ F 50V
C702	0657473	0.047 $\mu$ F 50V
C711	0659801	0.01 $\mu$ F 1.4kV
C713	0559107	10000 $\mu$ F 35V
C714	0559107	10000 $\mu$ F 35V
C715	0559302	1000 $\mu$ F 50V
C716	0559302	1000 $\mu$ F 50V
} C.C.		
} E.C.		
R701	0107334	330k $\Omega$
R702	0107334	330k $\Omega$
R703	0107104	100k $\Omega$
R704	0107104	100k $\Omega$
R705	0107184	180k $\Omega$
R706	0107184	180k $\Omega$
} $\pm 5\%$ $\frac{1}{2}$ W C.R.		

Parts No.	Stock No.	Description
R707	0107334	330k $\Omega$
R708	0107334	330k $\Omega$
R709	0107334	330k $\Omega$
R710	0107334	330k $\Omega$
R711	0107334	330k $\Omega$
R712	0107334	330k $\Omega$
R713	0107334	330k $\Omega$
R714	0107334	330k $\Omega$
R715	0107474	470k $\Omega$
R716	0107474	470k $\Omega$
R729	0153478	0.47 $\Omega$
R730	0153478	0.47 $\Omega$
R731	0153478	0.47 $\Omega$
R732	0153478	0.47 $\Omega$
R733	0153478	0.47 $\Omega$
R734	0153478	0.47 $\Omega$
R735	0153478	0.47 $\Omega$
R736	0153478	0.47 $\Omega$
} $\pm 5\%$ $\frac{1}{2}$ W C.R.		
} $\pm 10\%$ 3W Ce.R.		
J701	2430040	DIN Connector
CO701~3	2405004	AC Outlet
	2290100	4P Speaker Terminal

5-14. Other Parts (Bottom Side)



Bottom Side Parts List

Parts No.	Stock No.	Description
D701	0310660	5B2 Diode
C703	0505101	100 $\mu$ F 50V
C704	0503221	220 $\mu$ F 25V
} E.C.		
R719	0107180	18 $\Omega$
R725	0107822	8.2k $\Omega$
R726	0107822	8.2k $\Omega$
R727	0107822	8.2k $\Omega$
R728	0107822	8.2k $\Omega$
R737	0171271	270 $\Omega$
R738	0171271	270 $\Omega$
R739	0171271	270 $\Omega$
R740	0171271	270 $\Omega$
R741	0107224	220k $\Omega$
R742	0107224	220k $\Omega$
} $\pm 5\%$ $\frac{1}{4}$ W C.R.		
T701	4001341	Power Transformer
PU701	2410080	Voltage Selector, socket
	2410090	Voltage Selector, plug
	2300060	Power Fuse Holder
F701	0431270	4A Power Fuse (100~117V)
	0431240	2A Power Fuse (220~240V)

Parts No.	Stock No.	Description
J702, 3	2430230	Headphone Jack
	2420020	18P Connector
	2420040	14P Connector
	2200370	14P Input Terminal
	2200340	8P Output Terminal
	2230050	Ground Terminal
	3800020	KP-2 Power Cord

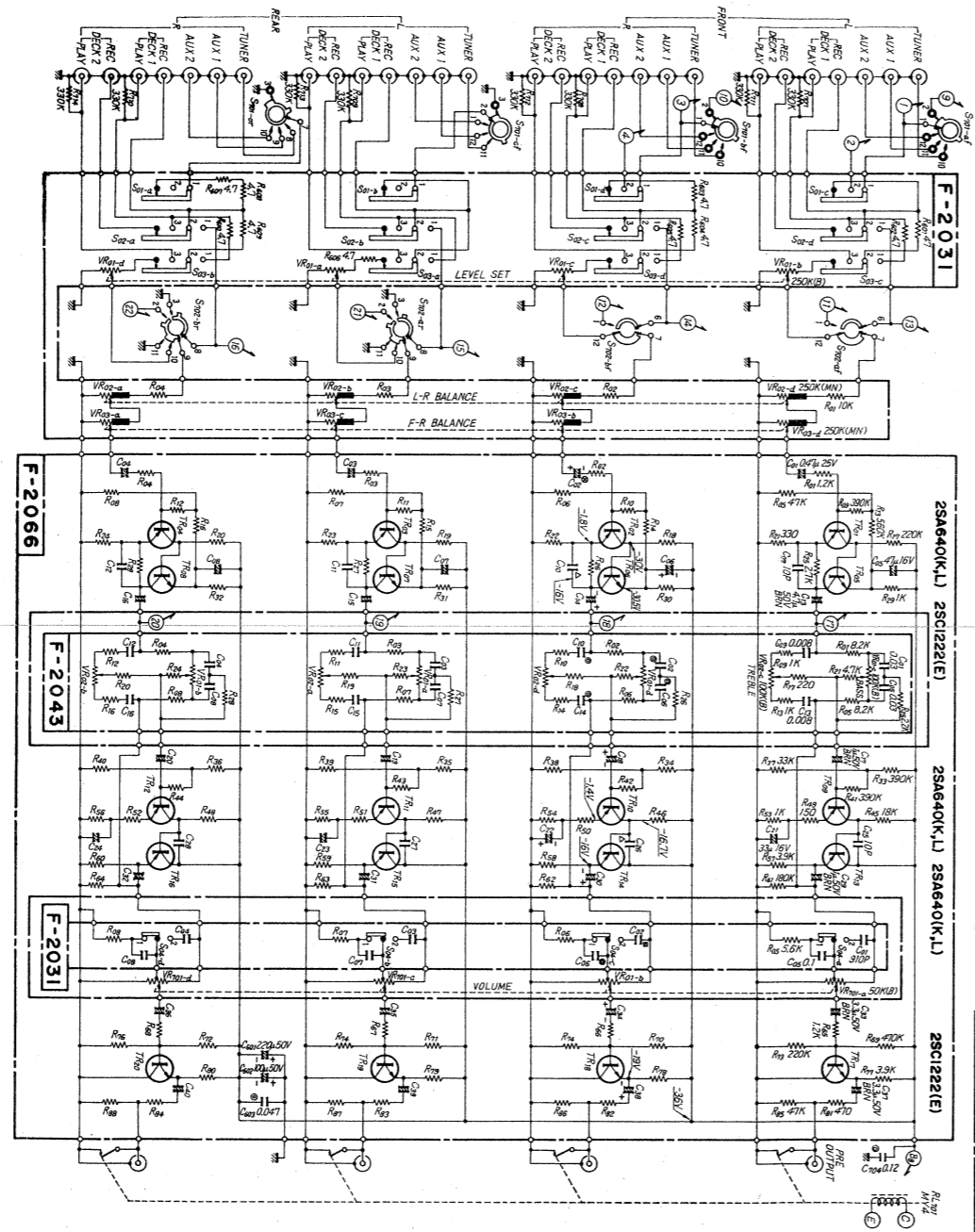
Abbreviations

C.R. : Carbon Resistor	BP.E.C.: Bi-Pola Electrolytic Capacitor
S.R. : Solid Resistor	C.C. : Ceramic Capacitor
Ce.R. : Cement Resistor	Mi.C. : Mica Capacitor
M.R. : Metallized Film Resistor	O.C. : Oil Capacitor
M.C. : Mylar Capacitor	P.C. : Polystyrene Capacitor
E.C. : Electrolytic Capacitor	T.C. : Tantalum Capacitor



# 6. SCHEMATIC DIAGRAM OF AUDIO SECTION-1

Design and specifications subject to change without notice for improvements.



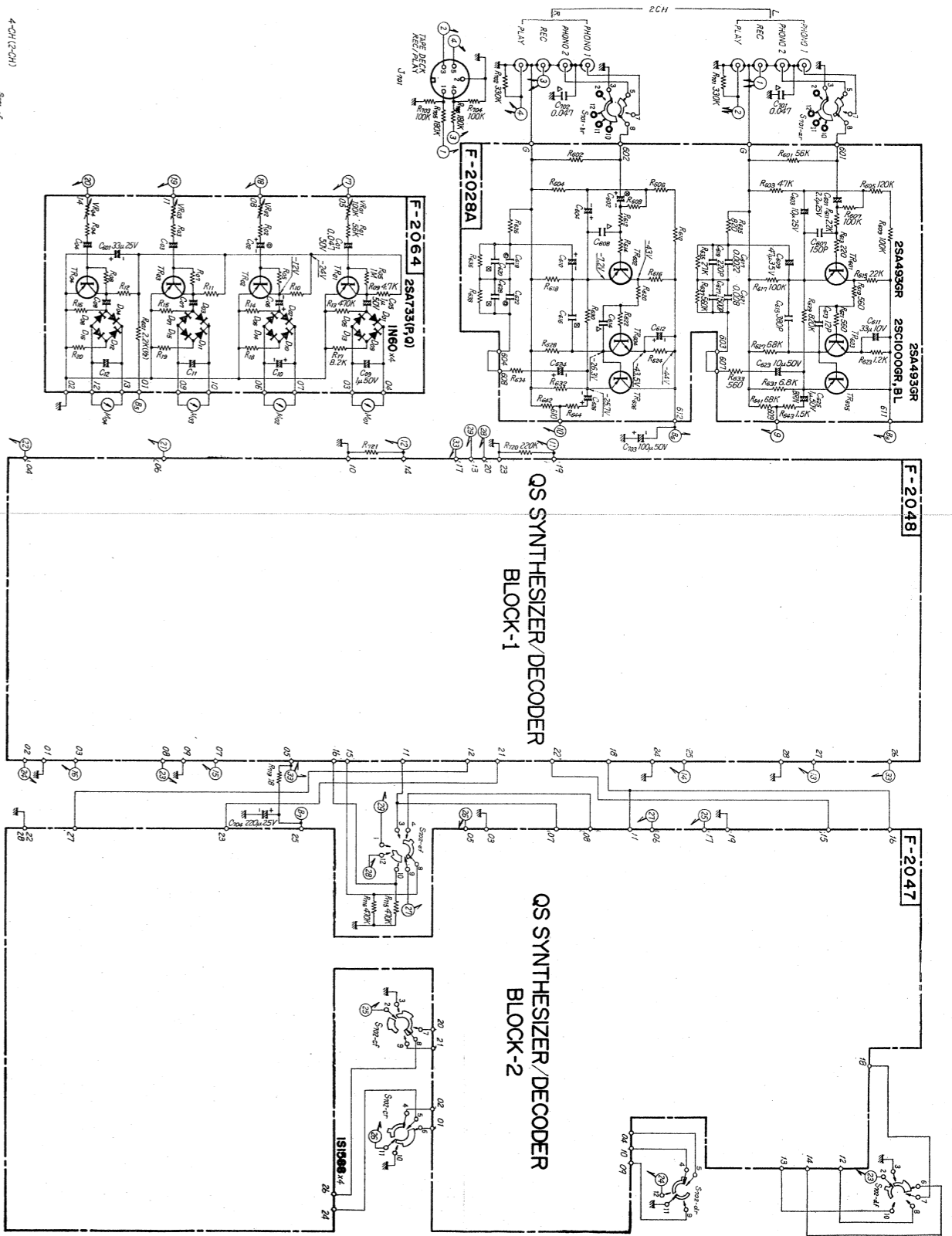
**NOTE:**  
 CAPACITOR:  
 ○ Ceramic  
 □ Paper  
 □ Nylon  
 □ Polyester Electrolytic  
 ○ B.T. Paper Electrolytic  
 RESISTOR:  
 □ Resistor in White  
 □ Resistor in Black

**SWITCHES & CONTROLS**  
 Switch Selector  
 1. PHONO 2  
 2. TUNER  
 3. TUNER  
 4. AUX 1  
 5. AUX 2

Switch 4-CH TAPE MONITOR  
 1. SOURCE  
 2. PLAY BACK  
 3. 4-CH TAPE MONITOR  
 4. REVERSE SIGNAL  
 5. DECK 1-2

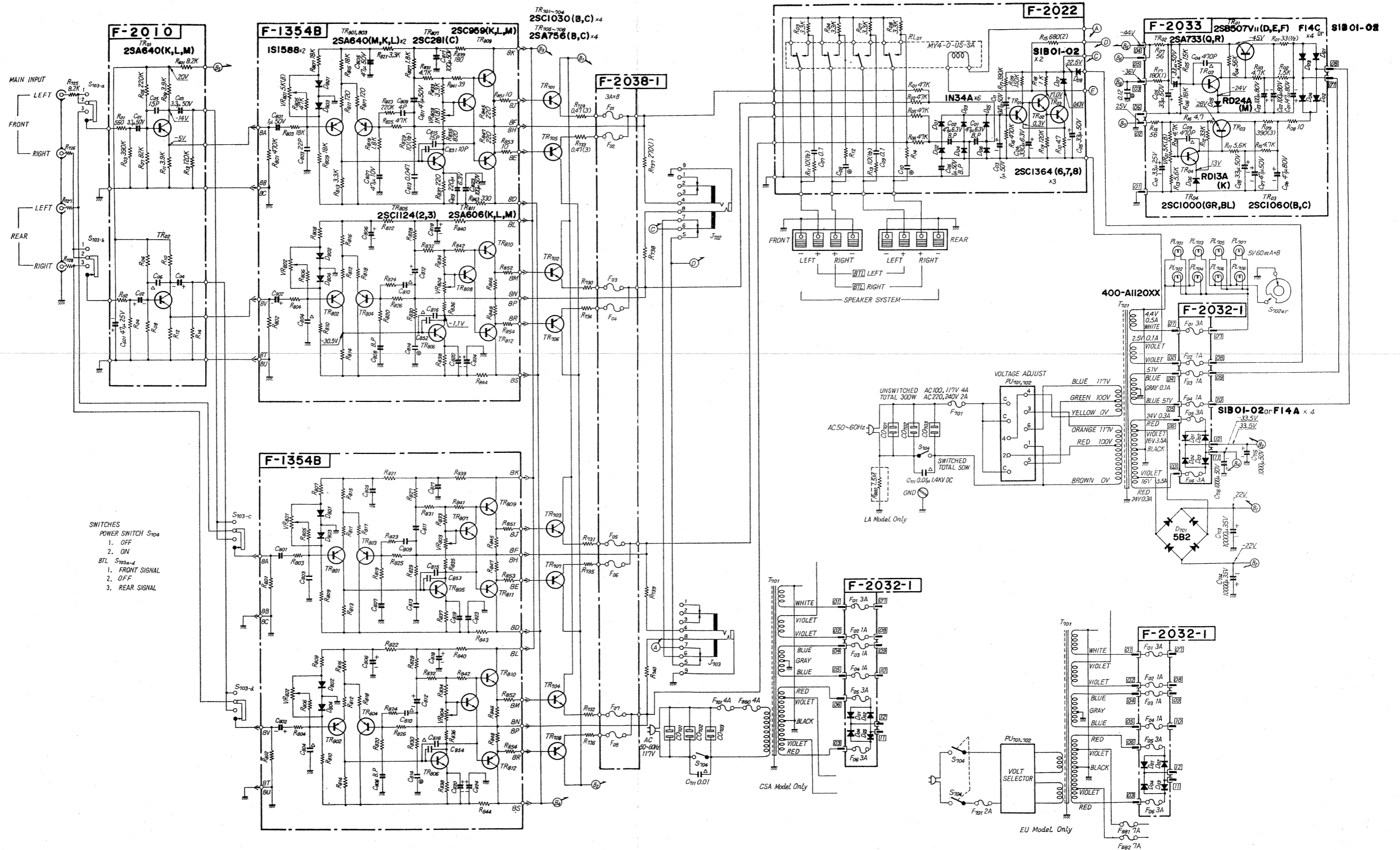
Switch 4-CH TAPE MONITOR  
 1. PLAY BACK DECK 1  
 2. PLAY BACK DECK 2  
 3. 4-CH TAPE MONITOR  
 4. IN

Switch 4-CH FUNCTION  
 1. 2-CH  
 2. OS SYNTHESIZER HALL  
 3. OS SYNTHESIZER SUBBAND  
 4. OS HALL  
 5. PHASE MATRIX  
 7. DISCRETE



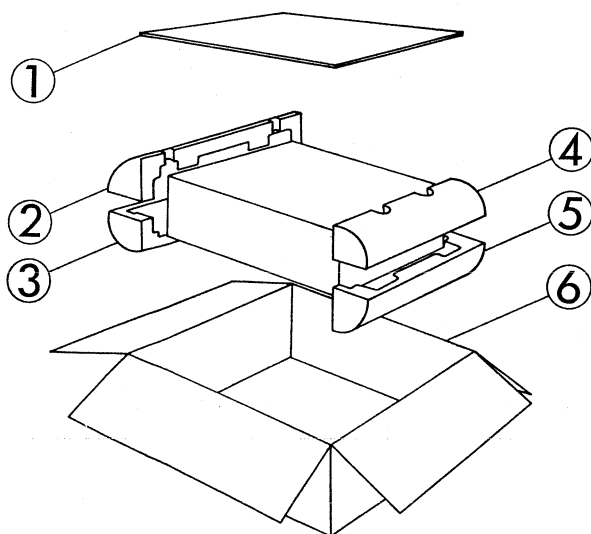
# 7. SCHEMATIC DIAGRAM OF AUDIO SECTION-2

\* Design and specifications subject to change without notice for improvements.



## 8. PACKING LIST

Parts No.	Stock No.	Description
1	9017201	Inner Packing (upper)
2	9027692	Styloform Packing
3	9027692	Styloform Packing
4	9027692	Styloform Packing
5	9027692	Styloform Packing
6	9007391	Carton Case



## 9. ACCESSORY PARTS LIST

Stock No.	Description
9406020	Polishing Cloth
0433620	3A Quick Acting Fuse
9207070	Operating Instructions
92207070	Operating Instruction sheet

## 10. MAINTENANCE

### 10-1. Voltage Adjustment

The Voltage Selector on the rear panel enables you to operate at correct voltage in any areas. The voltage has been preadjusted at the factory, but can be easily changed as follows.

- 1) Remove the two screws securing the name plate on the unit's rear panel, then remove the name plate.
- 2) Unplug the Voltage Selector plug once, and reset it so that the arrow mark on it faces the correct voltage indication. Also change the power fuse when the power supply voltage has changed. For 100, 117 volt operation, use a 4-ampere glass-tubed fuse. For 220/240 volt operation, use a 2-ampere one.

**Note:** The Voltage Selector can be used to eliminate the trouble caused by the considerable voltage fluctuation. In this case, it should be set to the peak voltage.

