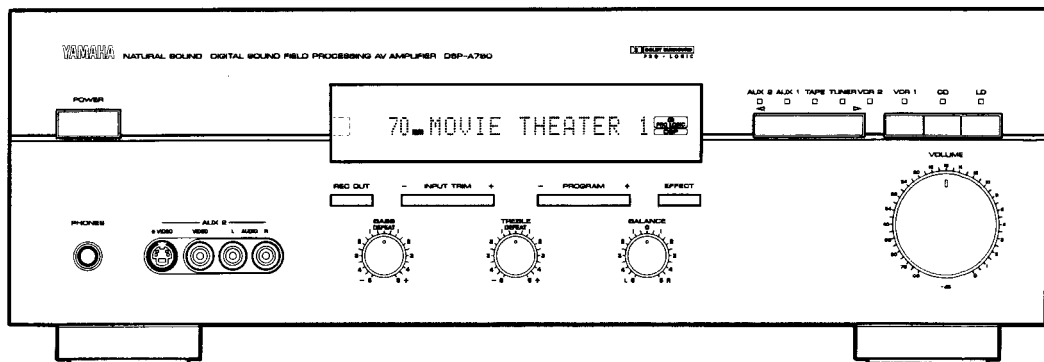
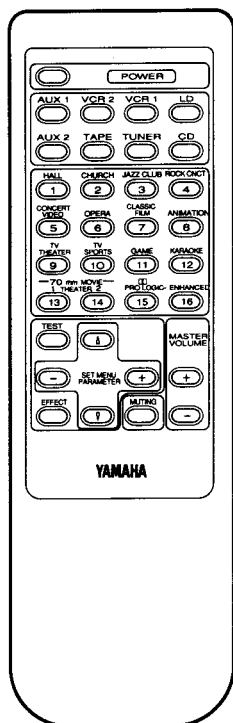


# DIGITAL SOUND FIELD PROCESSING AV AMPLIFIER

# DSP-A780

## SERVICE MANUAL



### IMPORTANT NOTICE

This manual has been provided for the use of authorized YAMAHA Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically YAMAHA Products, are already known and understood by the users, and have therefore not been restated.

**WARNING:** Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components and failure of the product to perform as specified. For these reasons, we advise all YAMAHA product owners that all service required should be performed by an authorized YAMAHA Retailer or the appointed service representative.

**IMPORTANT:** The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of YAMAHA are continually striving to improve YAMAHA products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

**WARNING:** Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

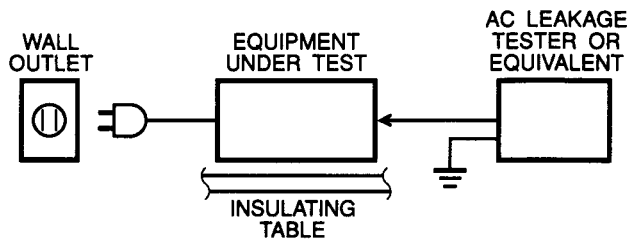
**IMPORTANT:** Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

### CONTENTS

TO SERVICE PERSONNEL .....	1	BLOCK DIAGRAM .....	14~15
REAR PANELS .....	1~2	PRINTED CIRCUIT BOARD .....	16~25
SPECIFICATIONS .....	3	DISPLAY DATA .....	26
PROGRAM PARAMETER TABLE .....	4	TEST POINT WAVEFORMS .....	27
INTERNAL VIEW .....	5	IC BLOCKS .....	28~29
DISASSEMBLY PROCEDURES .....	5	SCHEMATIC DIAGRAM .....	30~32
DIAGNOSTICS MODE .....	6~8	PARTS LIST .....	33~46
PROTECTION FUNCTION .....	8	REMOTE CONTROL TRANSMITTER .....	47
IC DATA .....	9~13		

## ■ TO SERVICE PERSONNEL

1. Critical Components Information.  
Components having special characteristics are marked and must be replaced with parts having specifications equal to those originally installed.
2. Leakage Current Measurement (For 120V Models Only).  
When service has been completed, it is imperative to verify that all exposed conductive surfaces are properly insulated from supply circuits.
  - Meter impedance should be equivalent to 1500 ohm shunted by 0.15μF.
  - Leakage current must not exceed 0.5mA.
  - Be sure to test for leakage with the AC plug in both polarities.



## WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and/or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

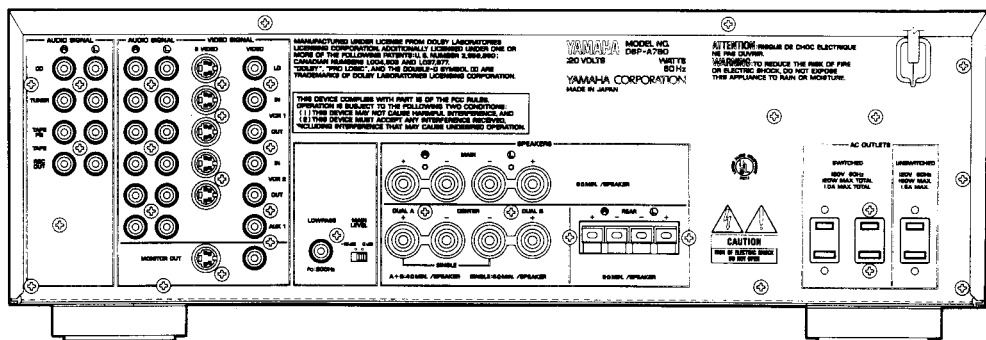
DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHATSOEVER!

Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

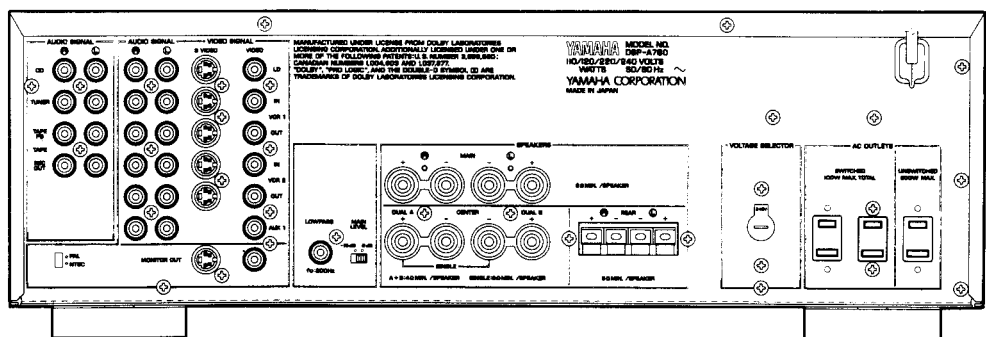
If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

## ■ REAR PANELS

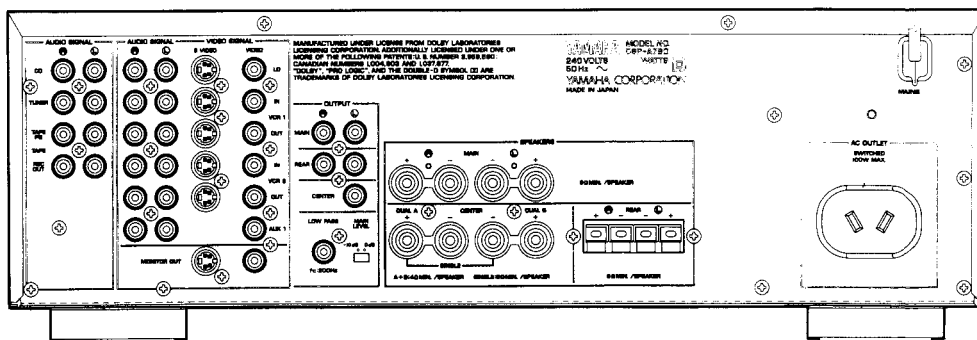
### ▼ U, C models



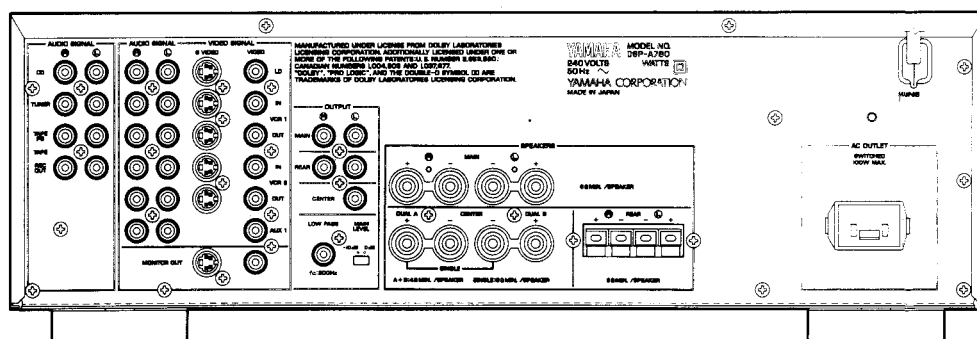
### ▼ R model



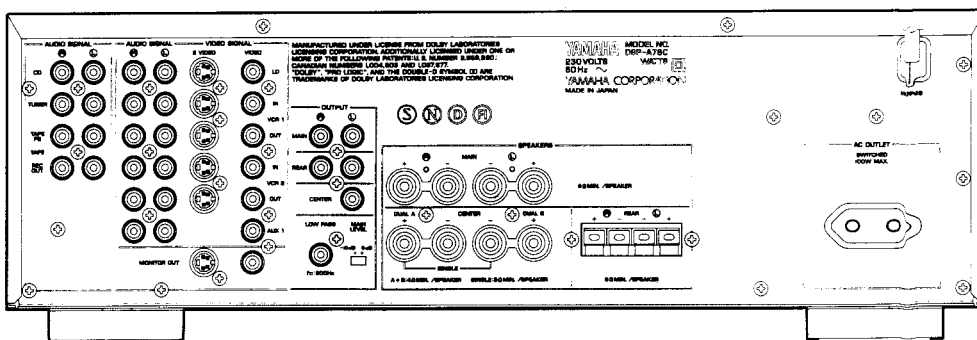
▼ A model



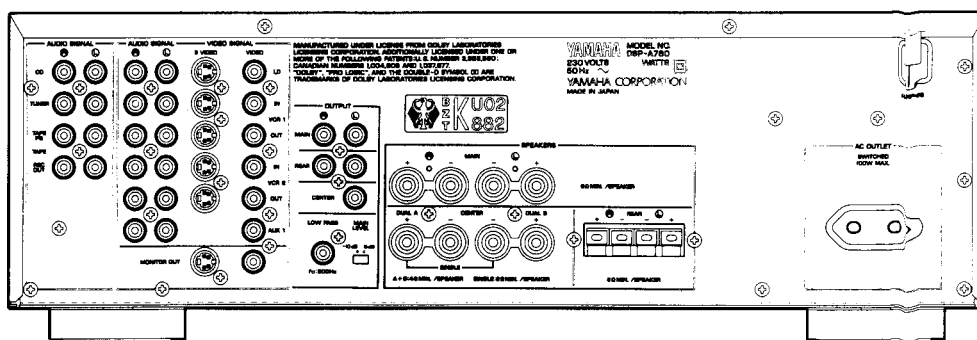
▼ B model



▼ H, L models



▼ W model



DSP-A780

## ■ SPECIFICATIONS

<b>Minimum RMS Output Power Per Channel</b>		
Main, Center (20Hz—20kHz 0.015% THD 8Ω) (U, C models)	65W	
(R, A, B, H, W, L models)	60W	
Rear Effect (1kHz 0.03% THD 8Ω)	25W	
<b>Dynamic Power Per Channel (U, C models)</b> (by IHF Dynamic Headroom Measuring Method)		
Main (8Ω/6Ω/4Ω)	75W/90W/105W	
<b>DIN Standard Output Power Per Channel (H, W, L models)</b>		
Main (1kHz 0.7% THD 4Ω)	100W	
<b>Dynamic Headroom (U, C models)</b>		
Main (8Ω)	1.2dB	
<b>IEC Power (H, W, L models)</b>		
Main (1kHz 0.015% THD 8Ω)	70W	
<b>Damping Factor</b>		
Main, Center (1kHz 8Ω)	75	
<b>Input Sensitivity/Impedance</b>		
CD etc	150mV/47kΩ	
<b>Maximum Input Signal (1kHz)</b>		
CD etc (EFFECT ON 0.05% THD)	2.3V	
<b>Output Level/Impedance</b>		
REC OUT (PHONO)	150mV/1kΩ	
PRE OUT (LOW PASS)	4.0V/1.8kΩ	
<b>Headphone Jack Rated Output/Impedance</b>		
Input 50mV RL=8Ω	0.2V	
Impedance	100Ω	
<b>Frequency Response (20Hz—20kHz)</b>		
CD etc. to MAIN L, R	0±0.5dB	
<b>Total Harmonic Distortion (20Hz—20kHz)</b>		
CD etc. to SP out (MAIN L, R) 30W/8Ω	0.02%	
<b>Signal-to-Noise Ratio (IHF-A Network)</b>		
CD etc (Input Shorted)	96dB	
<b>Residual Noise (IHF-A Network)</b>		
MAIN L, R SP out	150μV	
<b>Channel Separation (Vol -30dB)</b>		
CD etc Input 5.1kΩ Terminated 1kHz/10kHz	60dB/45dB	
<b>Tone Control Characteristics</b>		
Bass Boost/Cut	±10dB (50Hz)	
Turnover frequency	350Hz	
Treble Boost/Cut	±10dB (20kHz)	
Turnover frequency	3.5kHz	
<b>Filter Characteristics (LOW PASS)</b>		
High cut Filter	fc=200Hz, 6dB/oct	
<b>Audio Muting</b>		
	-20dB	
<b>Video</b>		
Video Signal Type	(U, C, L models) NTSC (A, B, H, W models) PAL (R model) NTSC/PAL	
Video Signal Level	1Vp-p/75Ω	
S-Video Signal Level	Y 1Vp-p/75Ω C 0.286Vp-p/75Ω	
Maximum Input Level	1.5Vp-p	
S/N	50dB	
Monitor Out Frequency response	5Hz—10MHz, -3dB	

<b>Power Supply</b>	
U, C models	AC120V 60Hz
A, B models	AC240V 50Hz
H, W, L models	AC230V 50Hz
R model	AC110/120/220/240V 60/50Hz

<b>Power Consumption</b>	
U, C models	230W, 320VA
A, B, H, W, R, L models	230W

<b>AC Outlets</b>	
2 Switched Outlets (U, C models)	120W max. total
(R model)	100W max. total
1 Switched Outlets (A, B, H, W, L models)	100W max. total
1 Unswitched Outlets (U, C models)	180W max.
(R model)	200W max.

<b>Dimensions (W x H x D)</b>	435 x 146 x 410mm (17-1/8" x 5-3/4" x 16-1/8")
-------------------------------	---

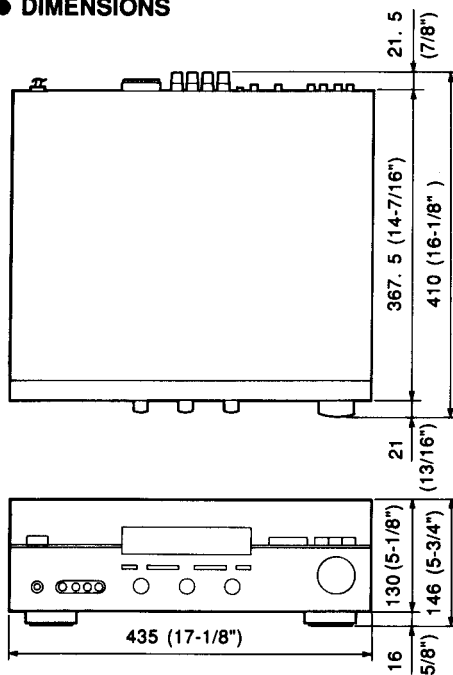
<b>Weight</b>	11.0kg (24 lbs. 4 oz)
---------------	-----------------------

\*Specifications are subject to change without notice.

U ..... U. S. A. model	H ..... European model
C ..... Canadian model	R ..... General model
B ..... British model	W ..... Germany model
A ..... Australian model	L ..... Singapore model

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### ● DIMENSIONS



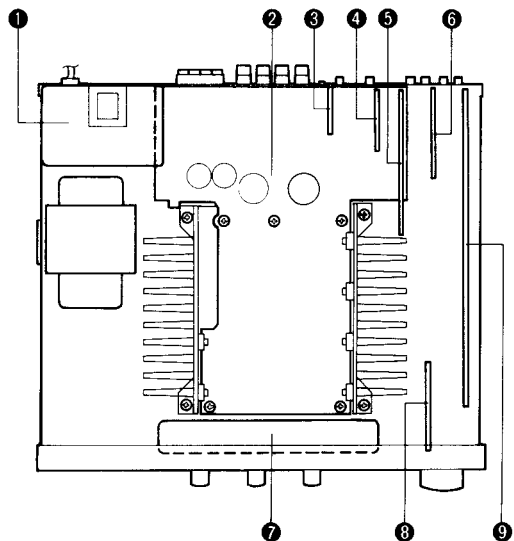
Unit : mm (Inch)



## ■ PROGRAM PARAMETER TABLE

No.	Program Name	Parameter Name	Preset Value	Control Range	Change Value
1	CONCERT HALL	INIT. DLY	45ms	1ms~49ms	
		ROOM SIZE	1.0	0.1~2.0	
		EFCT TRIM	0dB	-3dB~+3dB	
2	CHURCH	INIT. DLY	40ms	1ms~49ms	
		REV. TIME	2.5s	1.0s~5.0s	
		EFCT TRIM	0dB	-3dB~+3dB	
3	JAZZ CLUB	INIT. DLY	18ms	1ms~49ms	
		ROOM SIZE	1.0	0.1~2.0	
		EFCT TRIM	0dB	-3dB~+3dB	
4	ROCK CONCERT	INIT. DLY	37ms	1ms~49ms	
		ROOM SIZE	1.0	0.1~2.0	
		EFCT TRIM	0dB	-3dB~+3dB	
5	CONCERT VIDEO	INIT. DLY	13ms	1ms~49ms	
		ROOM SIZE	1.0	0.1~2.0	
		EFCT TRIM	0dB	-3dB~+3dB	
6	OPERA	INIT. DLY	24ms	1ms~49ms	
		ROOM SIZE	1.0	0.1~2.0	
		EFCT TRIM	0dB	-3dB~+3dB	
7	CLASSIC FILM	INIT. DLY	46ms	1ms~49ms	
		ROOM SIZE	1.0	0.1~2.0	
		EFCT TRIM	0dB	-3dB~+3dB	
8	ANIMATION	INIT. DLY	16ms	1ms~49ms	
		ROOM SIZE	1.0	0.1~2.0	
		EFCT TRIM	0dB	-3dB~+3dB	
9	TV THEATER	INIT. DLY	15ms	1ms~49ms	
		ROOM SIZE	1.0	0.1~2.0	
		EFCT TRIM	0dB	-3dB~+3dB	
10	TV SPORTS	INIT. DLY	9ms	1ms~49ms	
		ROOM SIZE	1.0	0.1~2.0	
		EFCT TRIM	0dB	-3dB~+3dB	
11	GAME	INIT. DLY	13ms	1ms~49ms	
		ROOM SIZE	1.0	0.1~2.0	
		EFCT TRIM	0dB	-3dB~+3dB	
12	KARAOKE	INIT. DLY	45ms	1ms~49ms	
		ROOM SIZE	1.0	0.1~2.0	
		EFCT TRIM	0dB	-3dB~+3dB	
13	70mm MOVIE THEATER 1	INIT. DLY	15ms	1ms~49ms	
		ROOM SIZE	1.0	0.1~2.0	
		EFCT TRIM	0dB	-3dB~+3dB	
14	70mm MOVIE THEATER 2	INIT. DLY	15ms	1ms~49ms	
		ROOM SIZE	1.0	0.1~2.0	
		EFCT TRIM	0dB	-3dB~+3dB	
15	PRO LOGIC	DELAY	20ms	15ms~30ms	
16	PRO LOGIC ENHANCED	DELAY	20ms	15ms~30ms	
		ROOM SIZE	1.0	0.1~2.0	
		EFCT TRIM	0dB	-3dB~+3dB	

## INTERNAL VIEW



- ① P. C. B. OPERATION (5)
- ② P. C. B. MAIN (1)
- ③ P. C. B. OPERATION (8) ..... Except U, C, R model
- ④ P. C. B. DSP (3)
- ⑤ P. C. B. DSP (2)
- ⑥ P. C. B. DSP (4)
- ⑦ P. C. B. OPERATION (2)
- ⑧ P. C. B. OPERATION (1)
- ⑨ P. C. B. DSP (1)

## DISASSEMBLY PROCEDURES (Remove parts in disassembly order as numbered.)

### 1. Removal of Top Cover

a. Remove 4 screws ( ① ) and 2 screws ( ② ) in Fig. 1.

### 2. Removal of Bottom Cover

a. Remove 9 screws ( ③ ) in Fig. 1.

### 3. Removal of Front Panel

a. Remove 4 knobs.

b. Remove 6 screws ( ④ ) in Fig. 1.

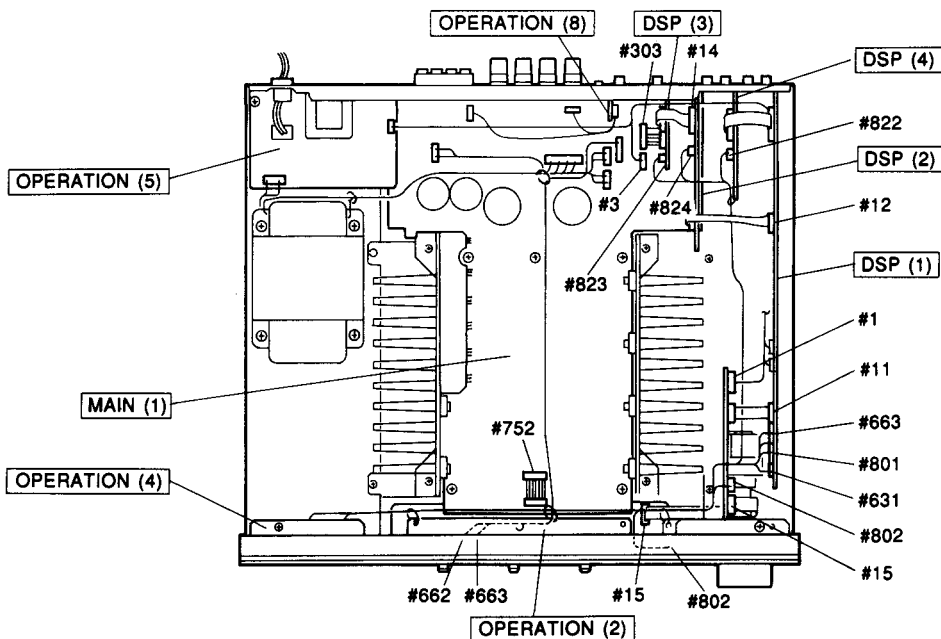
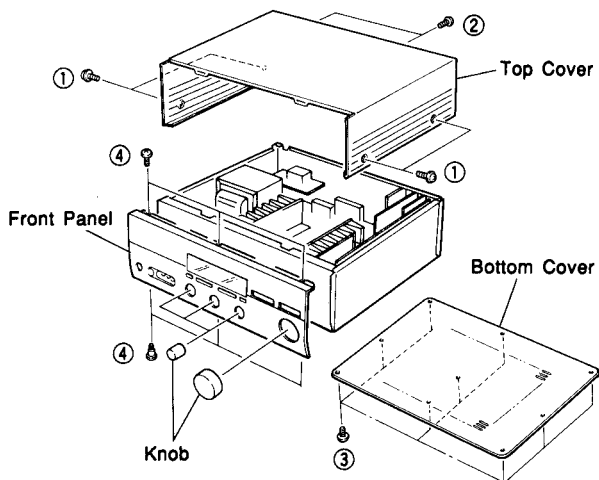


Fig. 1

Fig. 2

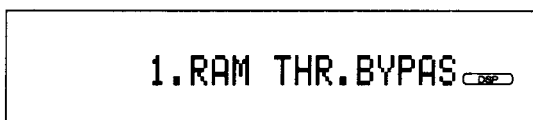
## ■ DIAGNOSTICS MODE

The DSP-A780 has a self-diagnosis program called "DIAGNOSTICS" mode which facilitates inspection and measurement. It can be started according to the following procedure.

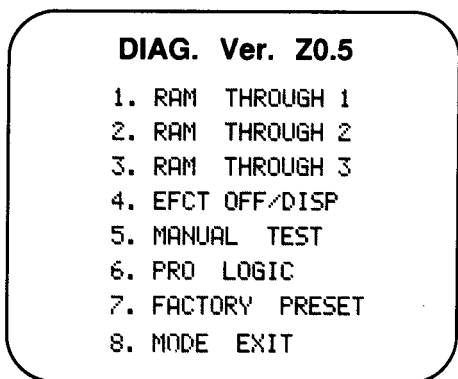
### 1. Start-up Procedure and Diagnosis Content

Turn ON the power while pressing both "PROGRAM +" and "EFFECT" keys simultaneously and to initiate the DIAGNOSTICS mode. When the keys are released, the display will appear as follows.

Example of display on Main Unit



Monitor screen



The menu of the DIAGNOSTICS mode is displayed on the monitor screen and kept as it is until cancelled.

### 2. Operation Procedure

There are No.1 to No.8 menu items in the "DIAGNOSTICS" mode and each menu item has sub-menu items.

The menu and sub-menu selection methods are as follows. (No sub-menu item belongs to No. 1, 2 and 8 menus.)

- **PROGRAM No. 1 to No. 8 keys on remote control unit.**  
No. 1 to No. 8 menu items can be selected directly, Pressing the same No. key twice or more, a sub-menu item can be selected.
- **PROGRAM +/-keys on Main Unit**  
Menu items No. 1 to No. 8 can be scrolled up and down.
- **EFFECT key on Main Unit**  
Sub-menu items in each menu item can be selected.

### 3. Cancellation Procedure

The self-diagnosis mode can be cancelled by using either of the following methods and the normal mode will be restored.

- Turn OFF the power
- Select DIAG. No.8 EXIT menu and press the EFFECT key.

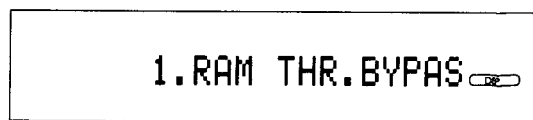
**Note)** To store the user memory, check to make sure that "7. KEEP DATA" is set for DIAG. No. 7 (where the previously set data will be retained.)

### 4. Details of Diagnosis Content

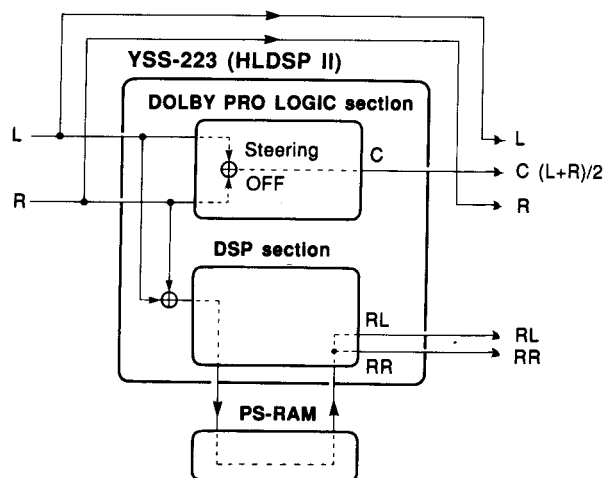
**DIAG No. 1** : RAM THROUGH 1

- The MAIN L/R is output through the bypass.
- The CENTER is output with the steering off and at  $(L + R)/2$ .
- RL/RR is output by way of PS-RAM at DSP THROUGH.
- CENTER/SURROUND level is -10dB.

Example of display on Main Unit



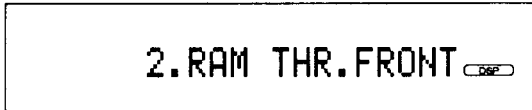
There is no sub-menu



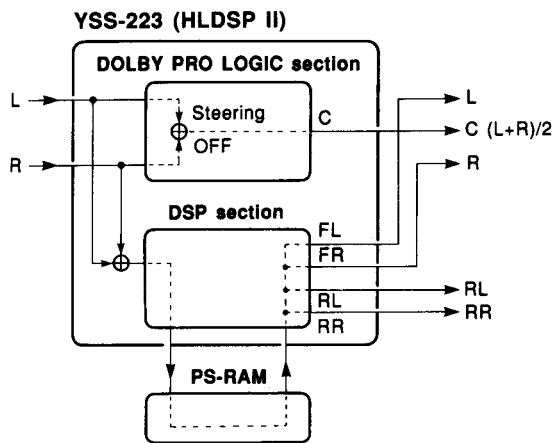
**DIAG No. 2 : RAM THROUGH 2**

- RL/RR is output by way of PS-RAM at DSP THROUGH.
- FL/FR is output by way of PS-RAM to Main L/R at DSP THROUGH.
- CENTER is output with the steering off and at  $(L + R)/2$ .
- CENTER / SURROUND level is -10dB.

Example of display on Main Unit



There is no sub-menu

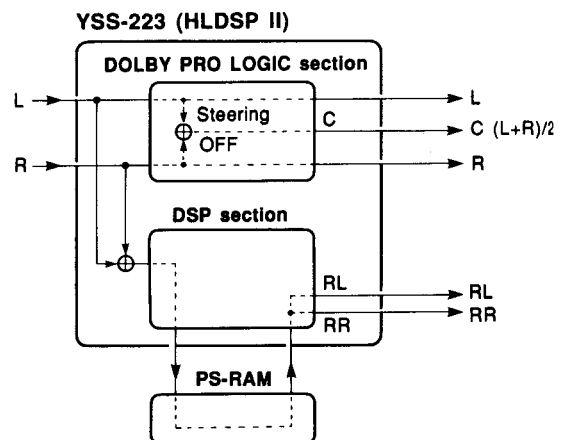
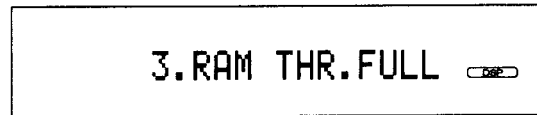


**DIAG No. 3 : RAM THROUGH 3**

- Main L/R is output at DSP THROUGH.
- RL/RR is output by way of PS-RAM at DSP THROUGH.
- CENTER is output with the steering off and at  $(L + R)/2$ .
- With the sub-menu, CENTER / SURROUND level can be selected +10dB and -10dB.

	Content of sub-menu	FL display
1	CENTER/SURROUND level : +10dB	"3. RAM THR. FULL"
2	CENTER/SURROUND level : -10dB	"3. RAM THR. -10dB"

Example of display on Main Unit



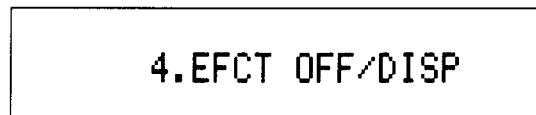
**DIAG No. 4 : EFFECT OFF/DISPLAY CHECK**

- Selecting sub-menu 1 will set EFFECT OFF.
- Selecting sub-menu 2 will cause the volume LED to flash, input LED's to flash one after another and then all of them to light.

Meanwhile, all FL's will light and then the FL display will appear as shown below 2.

	Content of sub-menu	FL display
1	EFFECT OFF	"4. EFCT OFF/DISP"
2	DISPLAY CHECK	"4. EFCT OFF/DISP"

Example of display on Main Unit

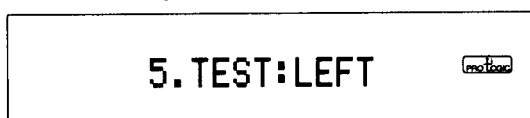


**DIAG No. 5 : MANUAL TEST**

- WIDE is selected for the CENTER mode.
- The test noise shifts in the order of →L→C→R→S according to the sub-menu.
- CENTER / SURROUND level is -10dB.
- Audio mute is ON.

	Content of sub-menu	FL display
1	TEST NOISE : LEFT	"5. TEST : LEFT"
2	TEST NOISE : CENTER	"5. TEST : CENTER"
3	TEST NOISE : RIGHT	"5. TEST : RIGHT"
4	TEST NOISE : SURROUND	"5. TEST : SURROUND"

Example of display on Main Unit

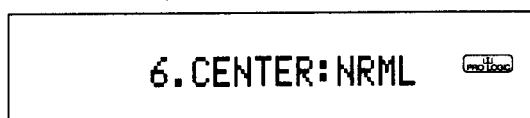


**DIAG No. 6 : PRO LOGIC**

- The automatic input balance which is ON in the normal state is turned OFF.
- With the sub-menu, selection from among CENTER NORMAL/CENTER WIDE/CENTER PHANTOM/BYPASS.
- CENTER / SURROUND level is -10dB.

	Content of sub-menu	FL display
1	Center MODE : NORMAL	"6. CENTER : NRML"
2	Center MODE : WIDE	"6. CENTER : WD"
3	Center MODE : PHANTOM	"6. CENTER : PHNTM"
4	EFFECT OFF	"6. BYPASS"

Example of display on Main Unit

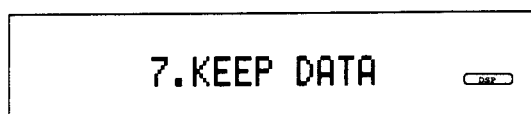


**DIAG No. 7 : FACTORY PRESET (See page 4)**

- By selecting the sub-menu, whether or not FACTORY PRESET is necessary (initialization of back-up RAM content) is set.
- \* FACTORY PRESET is performed with the power turned "OFF" after setting.

	Content of sub-menu	FL display
1	PRESET CONTENT KEPT	"7. KEEP DATA"
2	FACTORY PRESET	"7. PRESET"

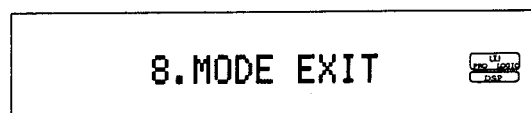
Example of display on Main Unit



**DIAG No. 8 : DIAG. MODE EXIT**

- By using the EFFECT key, the self-diagnosis mode is cancelled and the normal mode is restored.

Example of display on Main Unit



There is no sub-menu

**PROTECTION FUNCTION**

The protection function is activated and the power turns OFF when :

1. DC occurs in the output of any power amplifier channel.
2. An abnormal current flows through any power amplifier channel. (ie ; a short circuit in the speaker)
3. ±15V is abnormal
4. ±5V is abnormal
5. ±B is abnormal

Also, there are cases when the power is turned OFF due to an error in detecting the above conditions or abnormality in the protection circuit itself.

The protection circuit consists of a microcomputer (IC1), IC18 and a peripheral diode.

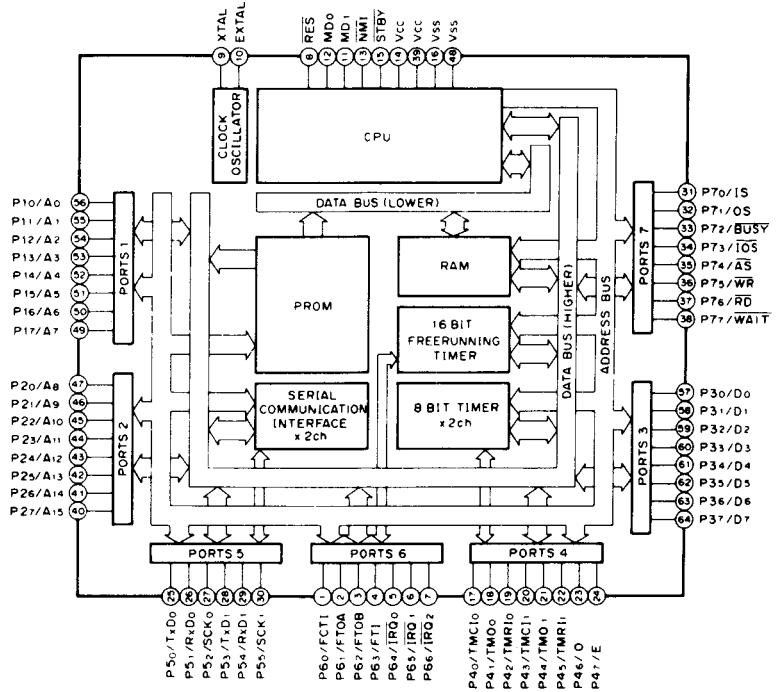
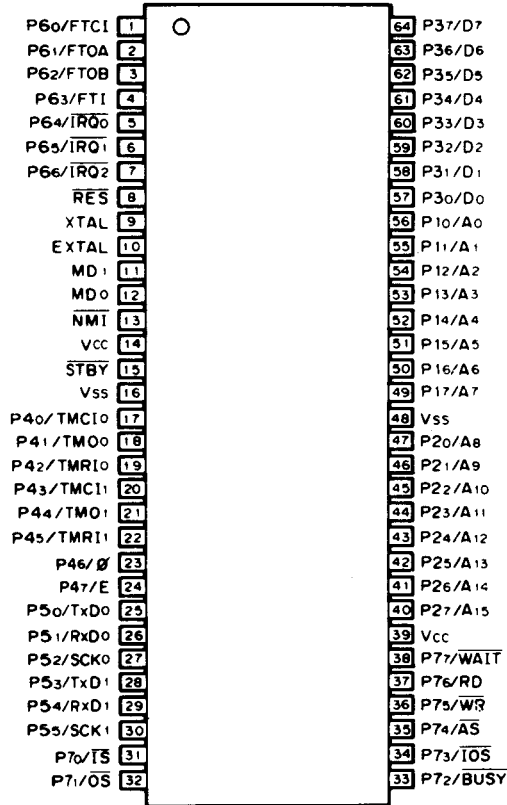
The function of each element is as follows.

- a) IC18 :  
Detecting abnormality and sending that signal to the microcomputer (IC1)
- b) PRT (7) terminal of microcomputer (IC1):  
Input terminal of the signal from IC18
- c) PRY (41) terminal of microcomputer (IC1):  
Output terminal for the signal to the power ON/OFF relay
- d) SRY (20) terminal of microcomputer (IC1):  
Output terminal for the ON/OFF signal to the speaker protection relay.

The microcomputer and interface do not detect abnormality for 2 seconds after the power is turned ON. During this time, abnormality can be located by checking the above listed conditions 1 to 5. Before this check, however, make sure to check that there is no danger of smoke.

# IC DATA

IC1 : HD6433238A47P  
8 bit  $\mu$ -COM



No.	Name	Function	POWER ON	POWER OFF	BACK UP
1	P60-INH2	V-REC 2 inhibit (VCR 2)	O	OL	→
2	P61-INH1	V-REC 1 inhibit (VCR 1)	O	OL	→
3	P62-I/E	INT/EXT detect	I	I	I
4	P63-PAL/NTSC	PAL/NTSC detect	I (pu)	OL	→
5	P64-REM IN	Remote control input interrupt	I	→	→
6	P65-PWR DET	Power detect interrupt	I	→	→
7	P66-PRT	Protection detect	I	→	→
8	RES	RESET			
9	XTAL	10MHz			
10	EXTAL	OSC			
11	MD 1	H			
12	MD 0	H			
13	NMI	H			
14	VCC	+5V			
15	SYBY	H			
16	VSS	GND			
17	P40-VERG	MARKET 0 (L : G)	I (pu)	→	OL
18	P41-VERR	MARKET 1 (L : R)	I (pu)	→	OL
19	P42-780/580	PRODUCT MODE	I (pu)	→	OL

Note) In the above table,  $\bar{\quad}$  means negative logic and (pu) the internal pulled-up state.

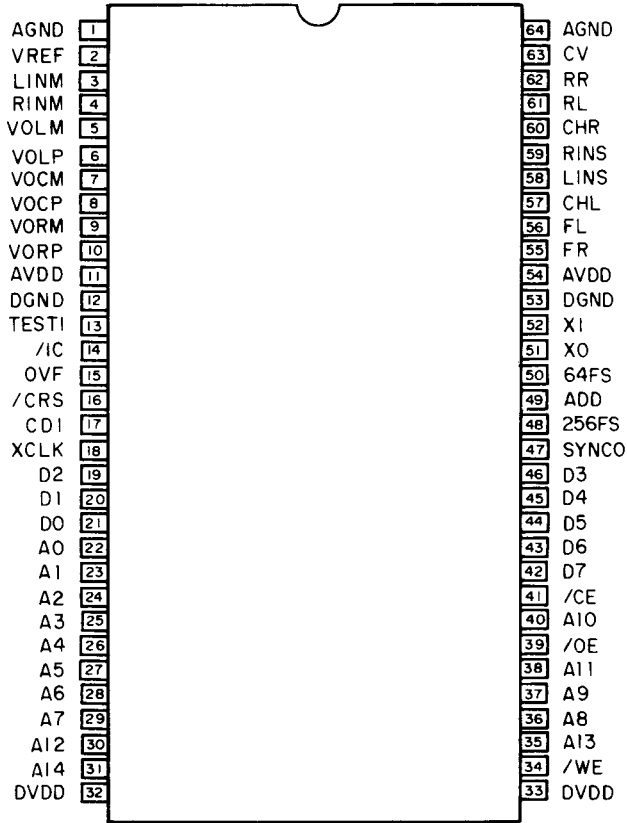
No.	Name	Function	POWER ON	POWER OFF	BACK UP
20	P43-SP RELAY	Speaker relay	O	OL	→
21	P44-CE0	CE	O	OL	→
22	P45-CEFL	CE VFD	O	OL	→
23	P46	—	I	→	→
24	P57-FMT	FULL MUTE	O	OL	→
25	P50-SDT	Serial data	Serial 0	OL	→
26	P51-CES	On screen CE	O	OL	→
27	P52-SCK	Serial clock	Serial clk	OL	→
28	P53-CD0	DSP serial data	Serial 0	OL	→
29	P54- $\overline{\text{CRS}}$	DSP reset	O	OL	→
30	P55-XCLK	DSP serial clock	Serial clk	OL	→
31	P70-PWR	Power relay reverse	O	I	→
32	P71	—	OL	→	→
33	P72	—	OL	→	→
34	P73	—	OL	→	→
35	P74	—	OL	→	→
36	P75	—	OL	→	→
37	P76	—	OL	→	→
38	P77	—	OL	→	→
39	VCC	+5V			
40	P27- $\overline{\text{AMT}}$	Audio mute	O	OL	→
41	P26-PWR	Power relay	OH	OL	→
42	P25- $\overline{\text{FLRST}}$	VFD RESET	OH	OL	→
43	P24-V DN	VOLUME DOWN	O	OL	→
44	P23-V UP	VOLUME UP	O	OL	→
45	P22- $\overline{\text{VIND}}$	VOLUME LED	O	I	→
46	P21- $\overline{\text{SIND}}$	STANDBY LED	O	O	→
47	P20	—	O	I	→
48	VSS	GND			
49	P17	—	OL	→	→
50	P16-K2	KEY 2	I	OL	→
51	P15-K1	KEY 1	I	OL	→
52	P14-K0	KEY 0	I	OL	→
53	P13-D3	DIGIT 3	O	OL	→
54	P12-D2	DIGIT 2	O	OL	→
55	P11-D1	DIGIT 1	O	OL	→
56	P10-D0	DIGIT 0	O	OL	→
57	P30-LO	LED 0	O	OL	→
58	P31-L1	LED 1	O	OL	→
59	P32-PSW	POWER SW	I	→	→
60	P33- $\overline{\text{HMT}}$	Headphone MUTE	O	OL	→
61	P34- $\overline{\text{HPI}}$	Headphone detect	I (pu)	OL	→
62	P35-VIC	VIDEO C	O	OL	→
63	P36-VIB	VIDEO B	O	OL	→
64	P37-VIA	VIDEO A	O	OL	→

Note) In the above table, — means negative logic and (pu) the internal pulled-up state.

DSP-A780

IC2 : YSS223

Digital Dolby Pro Logic Decoder with Auto Input Balance



Pin No.	Pin Name	I/O	Function
1	AGND	A—	Ground (Analog section)
2	VREF	AI	Multiplying DAC reference voltage input
3	LINM	AI	L channel Multiplying DAC input
4	RINM	AI	R channel Multiplying DAC input
5	VOLM	AO	L channel operation amplifier, connected to (-) terminal
6	VOLP	AO	L channel operation amplifier, connected to (+) terminal
7	VOCM	AO	C channel operation amplifier, connected to (-) terminal
8	VOCP	AO	C channel operation amplifier, connected to (+) terminal
9	VORM	AO	R channel operation amplifier, connected to (-) terminal
10	VORP	AO	R channel operation amplifier, connected to (+) terminal
11	AVDD	A—	+5V power supply (Analog section)
12	DGND	—	Ground (digital section)
13	TESTI	Ic	LSI test terminal Normally connected to DGND
14	/IC	Ics	Initial clear terminal (Power ON resetting is necessary)
15	OVF	O	A/D Converter, Overflow detect terminal
16	CRS	I <sub>ts</sub>	Microprocessor interface reset terminal
17	CDI	I <sub>ts</sub>	Microprocessor interface data input terminal
18	XCLK	I <sub>ts</sub>	Microprocessor interface clock input terminal
19	D2	I/O <sub>t</sub>	External delay RAM data terminal
20	D1	I/O <sub>t</sub>	External delay RAM data terminal
21	D0	I/O <sub>t</sub>	External delay RAM data terminal

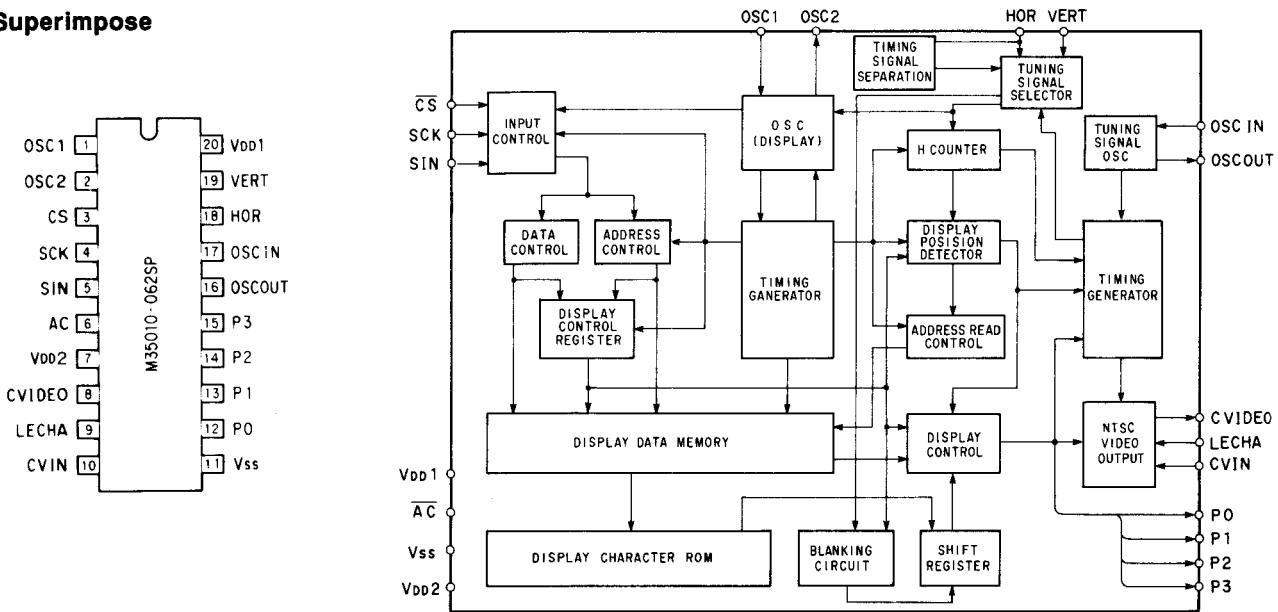


Pin No.	Pin Name	I/O	Function
22	A0	O	External data RAM address terminal
23	A1	O	External data RAM address terminal
24	A2	O	External data RAM address terminal
25	A3	O	External data RAM address terminal
26	A4	O	External data RAM address terminal
27	A5	O	External data RAM address terminal
28	A6	O	External data RAM address terminal
29	A7	O	External data RAM address terminal
30	A12	O	External data RAM address terminal
31	A14	O	External data RAM address terminal
32	DVDD	—	+5V power supply (digital section)
33	DVDD	—	+5V power supply (digital section)
34	/WE	O	External delay RAM write enable terminal
35	A13	O	External delay RAM address terminal
36	A8	O	External delay RAM address terminal
37	A9	O	External delay RAM address terminal
38	A11	O	External delay RAM address terminal
39	/OE	O	External delay RAM output enable terminal
40	A10	O	External delay RAM address terminal
41	/CE	O	External delay RAM chip enable terminal
42	D7	I/Ot	External delay RAM data terminal
43	D6	I/Ot	External delay RAM data terminal
44	D5	I/Ot	External delay RAM data terminal
45	D4	I/Ot	External delay RAM data terminal
46	D3	I/Ot	External delay RAM data terminal
47	SYNCO	O	External A/D converter word clock terminal
48	256FS	O	External A/D converter 256fs clock terminal
49	ADD	I <sub>t</sub>	External A/D converter data input terminal
50	64FS	O	External A/D converter 64fs clock terminal
51	XO	O	Crystal oscillator connecting terminal
52	XI	I	Crystal oscillator connecting terminal
53	DGND	—	Ground (digital section)
54	AVDD	A—	+5V power supply (Analog section)
55	FR	AO	FR channel D/A input
56	FL	AO	FL channel D/A output
57	CHL	A—	LINS input Sample/hold Capacitor external terminal
58	LINS	AI	L channel A/D input
59	RINS	AI	R channel A/D input
60	CHR	A—	RINS input Sample/hold Capacitor external terminal
61	RL	AO	RL channel D/A output
62	RR	AO	RR channel D/A input
63	CV	AO	A/D, multiplying DAC center voltage
64	AGND	A—	Ground (Analog section)

Note : Alphabets used in the above I/O column represent as follows.

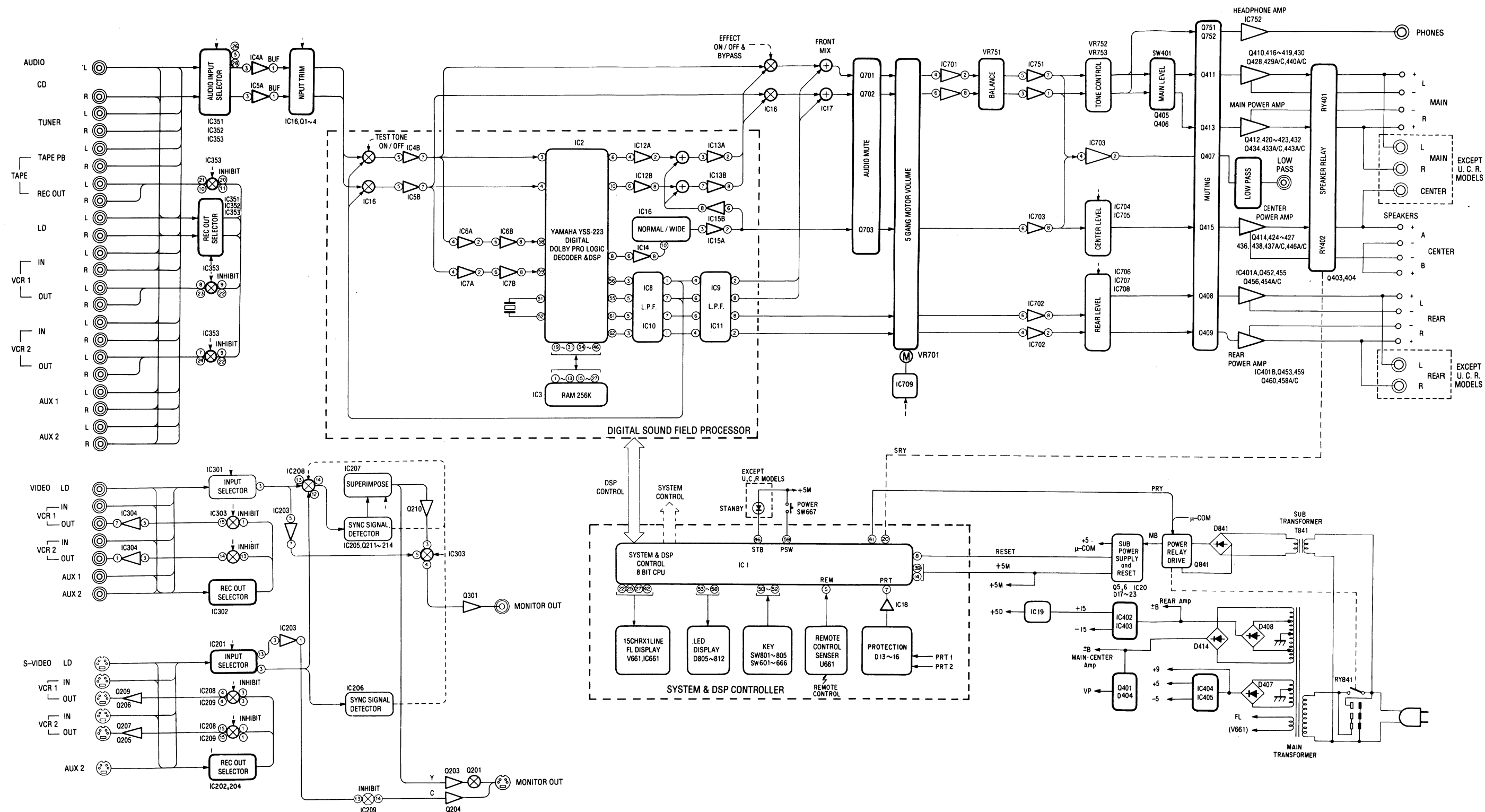
I : Input terminal    O : Output terminal    t : TTL level    C : CMOS level    S : Schmidt input    A : Analog

IC207 : M35010-062SP  
Superimpose



Pin No.	Symbol	Terminal name	Function
1	OSC1	External terminal for oscillation circuit	External terminal of oscillation circuit for display. The standard oscillation frequency is about 7MHz. The display position in the horizontal direction and width of characters on the TV screen are determined according to this oscillation frequency.
2	OSC2	External terminal for oscillation circuit	
3	$\overline{CS}$	Chip select input	Chip select terminal "L" is set when the serial data is transferred. Hysteresis input. A pull-up resistor is built in.
4	SCK	Serial clock input	When CS terminal is "L", the SIN serial data is taken in at the SCK rise. Hysteresis input. A pull-up resistor is built in.
5	SIN	Serial data input	The data and addresses for the display control register and display data memory are input in serial form. Hysteresis input. A pull-up resistor is built in.
6	$\overline{AC}$	Auto clear input	The IC internal circuit is reset when in "L" state. Hysteresis input. A pull-up resistor is built in.
7	VDD2	Power supply terminal	Analog type power supply terminal that should be connected to +5V.
8	CVIDEO	Composite video signal output	Output terminal for composite video signal 2Vp-p composite video signal is output. When making a superimposition, the character output and other features are superimposed on the composite video signals inputted through the CVIN terminal.
9	LECHA	Character level input	Input terminal to determine the output level for the characters in the composite video signals. The color of characters is white.
10	CVIN	Video input	Input terminal for external composite video signals. When making a superimposition, the character output and other features are superimposed on these composite video signals.
11	VSS	Ground terminal	Connection to GND.
12	P0	Port 0 output	Port terminal output or character background signals (BLNK1) are output. The polarity can be selected when determining the font ROM.
13	P1	Port 1 output	Port terminal output or character background signals (CO1) are output. The polarity can be selected when determining the font ROM.
14	P2	Port 2 output	Port terminal output or character background signals (BLNK2) are output. The polarity can be selected when determining the font ROM.
15	P3	Port 3 output	Port terminal output or character background signals (CO2) are output. The polarity can be selected when determining the font ROM.
16	OSCOUT	Oscillation circuit for generation of synchronous signals	External terminal of the oscillation circuit for generation of synchronous signals. The oscillation frequency is 14.32MHz when the NTSC system is used and 17.73MHz when the PAL system is used.
17	OSCIN		
18	HOR	Horizontal synchronous signal input	Horizontal synchronous signal input. Hysteresis input The polarity can be selected when determining the font ROM.
19	VERT	Vertical synchronous signal input	Vertical synchronous signal input. Hysteresis input The polarity can be selected when determining the font ROM.
20	VDD1	Power supply terminal	Digital type power supply terminal that should be connected to +5V.

■ BLOCK DIAGRAM



PRINTED CIRCUIT BOARD (Foil side)

Semiconductor Location

Ref No.	Location	Ref No.	Location
Q401	E2	IC401	D3
Q402	F2	IC402	E4
Q403	F5	IC403	E4
Q404	F5	IC404	E2
Q405	C3	IC405	E2
Q406	B3		
Q407	B3		
Q408	D3		
Q409	D3		
Q410	B4		
Q411	C3		
Q412	B3		
Q413	B3		
Q414	C3		
Q415	B3		
Q416	B4		
Q417	B4		
Q418	B4		
Q419	B4		
Q420	B3		
Q421	B3		
Q422	B3		
Q423	B2		
Q424	C3		
Q425	C2		
Q426	C2		
Q427	D2		
Q428	B4		
Q429A	B4		
Q429C	B4		
Q430	B4		
Q432	B2		
Q433A	B2		
Q433C	B2		
Q434	B2		
Q436	D2		
Q437A	D2		
Q437C	D2		
Q438	D2		
Q440A	C4		
Q440C	B4		
Q441	B4		
Q443A	C2		
Q443C	B2		
Q444	B2		
Q446A	D2		
A446C	D2		
Q447	D2		
Q449	E2		
Q450	E4		
Q451	E3		
Q452	D3		
Q453	D3		
Q454A	D4		
Q454C	D4		
Q455	D4		
Q456	D4		
Q458A	C4		
Q458C	D4		
Q459	C4		
Q460	C4		
Q462	D4		
Q463	C4		

Confirmation of idling

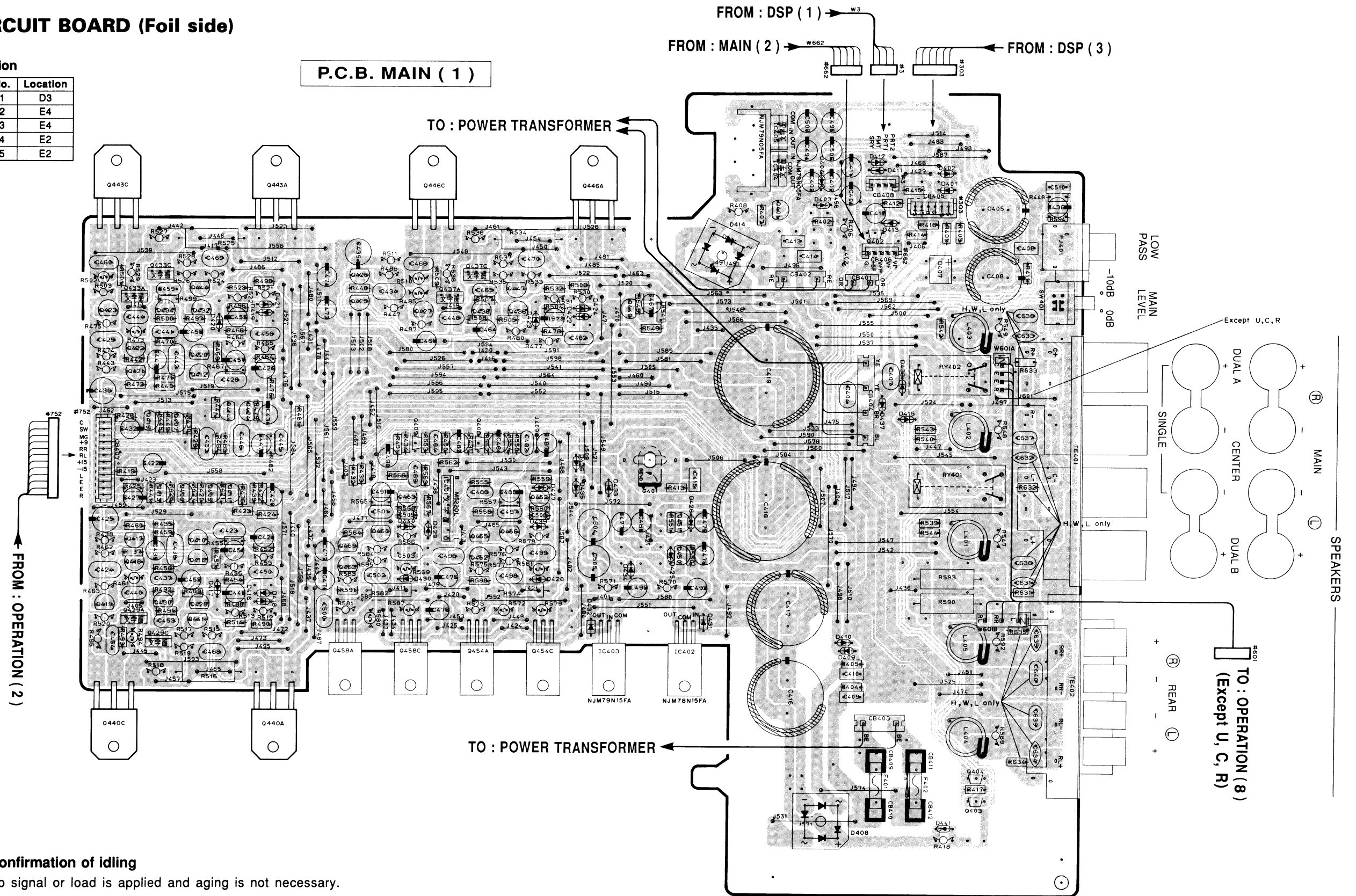
No signal or load is applied and aging is not necessary.

Item	Test Point	Rating (DC)
MAIN L	Between B and E of Q440A	0. 2V~0. 4V
MAIN R	Between B and E of Q443A	
CENTER	Between B and E of Q446A	
REAR L	Both ends of R574	0. 25mV~0. 5mV
REAR R	Both ends of R582	

OR

REAR L	Between B and E of Q454C	0. 2V~0. 4V
REAR R	Between B and E of Q458C	

P.C.B. MAIN (1)



1  
2  
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5  
6



PRINTED CIRCUIT BOARD (Foil side)

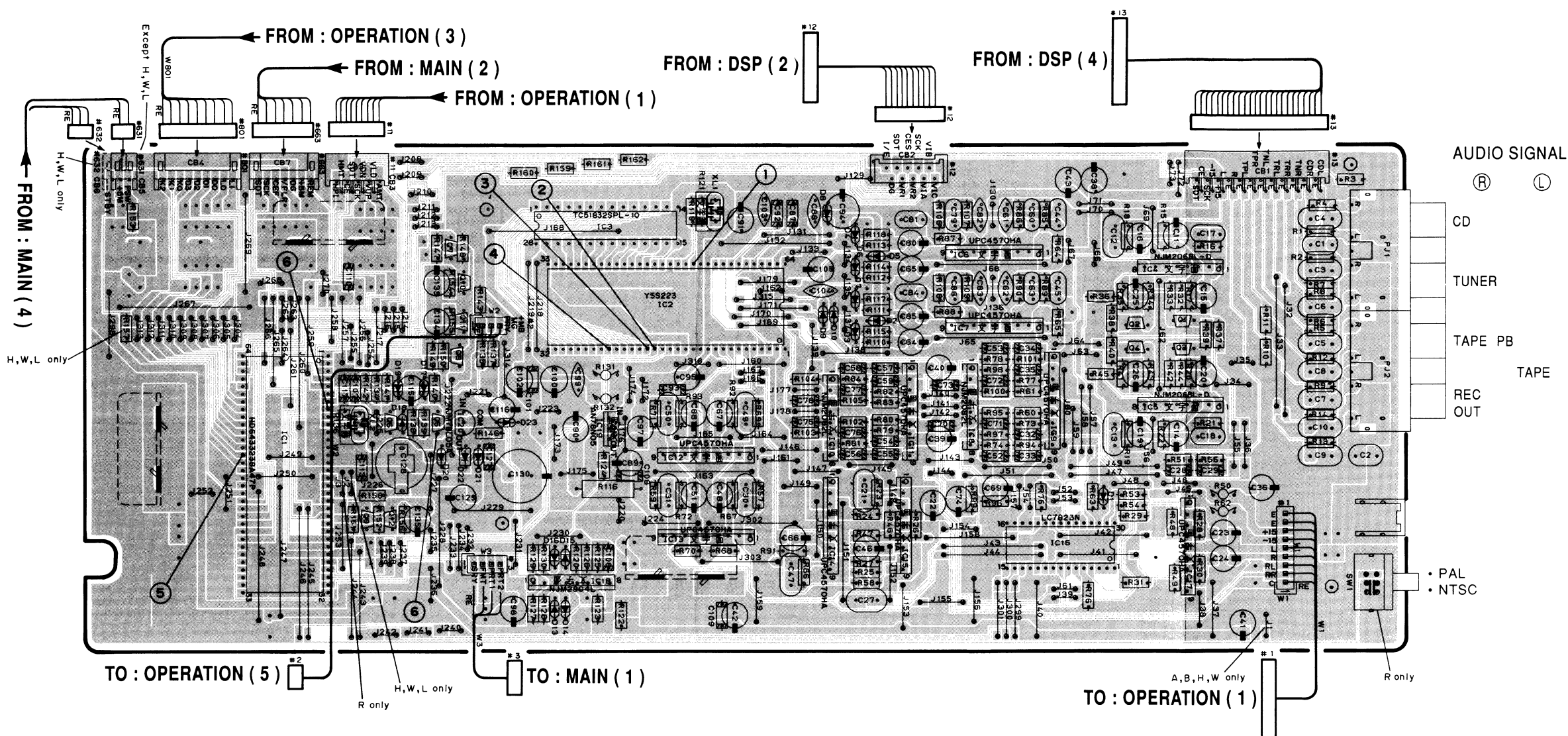
Semiconductor Location

Ref No.	Location
IC 1	C3
IC 2	D2
IC 3	D2
IC 4	F2
IC 5	F3
IC 6	E2
IC 7	E3
IC 8	E3
IC 9	F3
IC10	E3
IC11	E3
IC12	D3
IC13	D3
IC14	E3
IC15	E3
IC16	F4
IC17	F4
IC18	D4
IC19	D3
IC20	C3

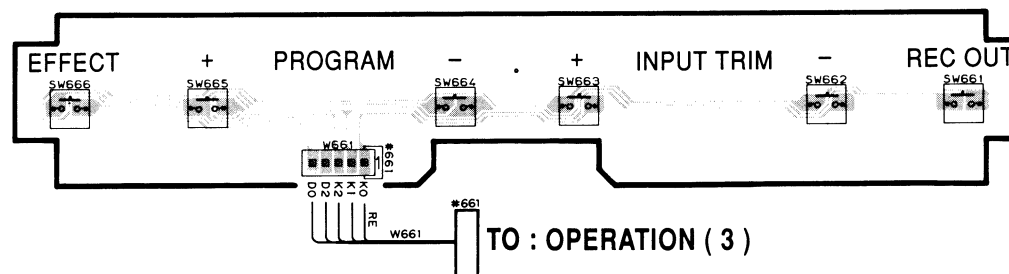
Ref No.	Location
Q 1	F3
Q 2	F3
Q 3	F3
Q 4	F3
Q 5	C3
Q 6	C3
Q 7	C2
Q 8	C3
Q 9	C3
Q10	C2
Q11	C3
Q12	C3

① to ⑥ : TEST POINT WAVEFORMS (See page 27)

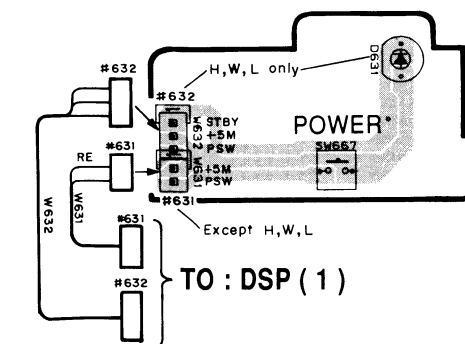
P.C.B. DSP ( 1 )



P.C.B. MAIN ( 3 )

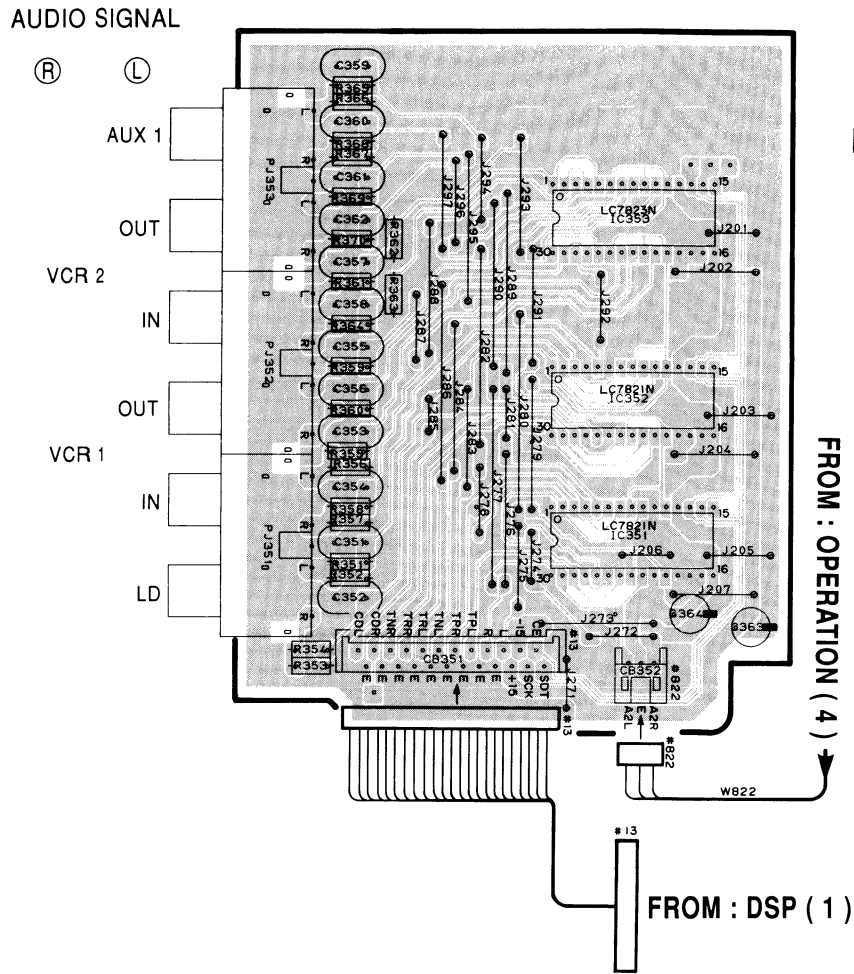


P.C.B. MAIN ( 4 )

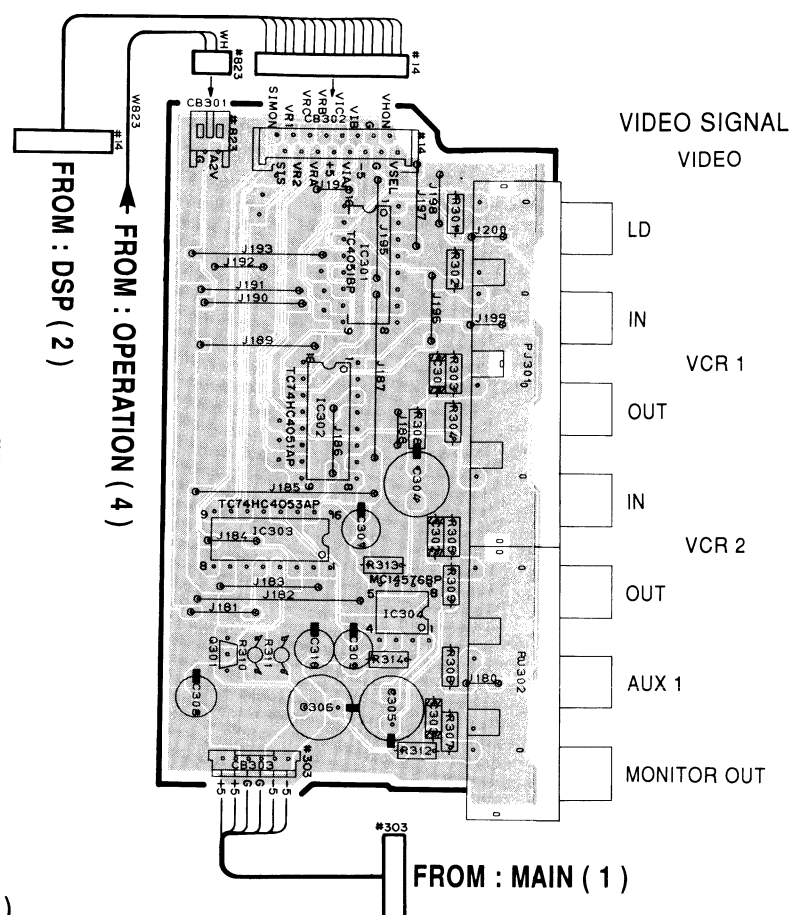


■ PRINTED CIRCUIT BOARD (Foil side)

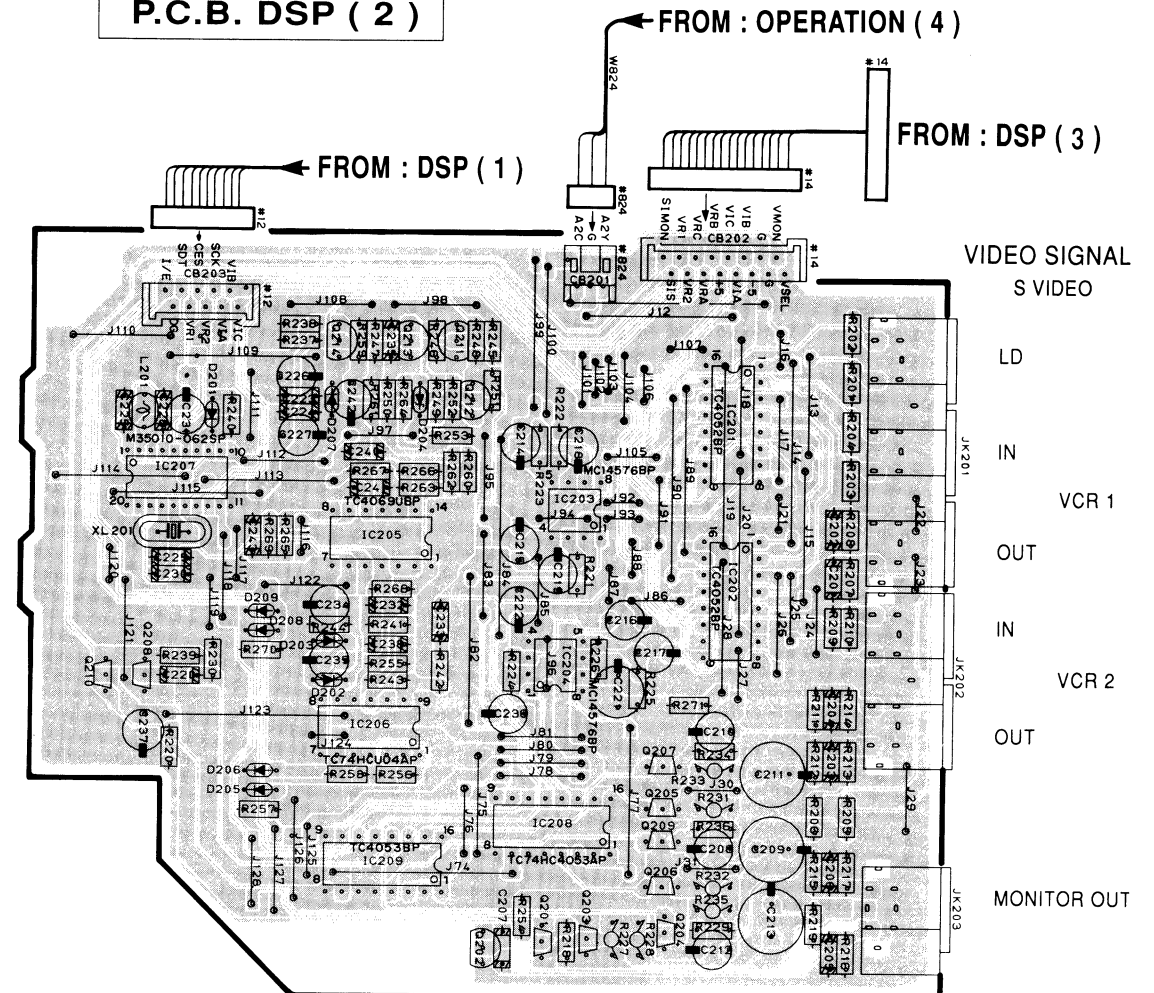
P.C.B. DSP ( 4 )



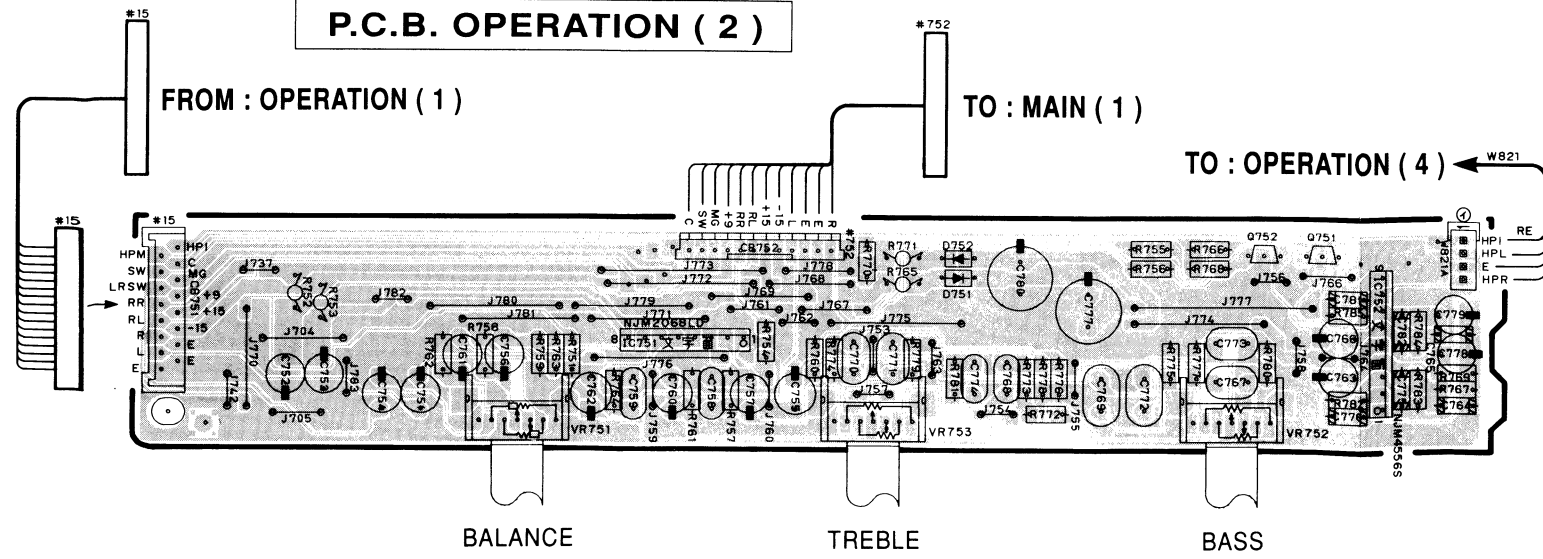
P.C.B. DSP ( 3 )



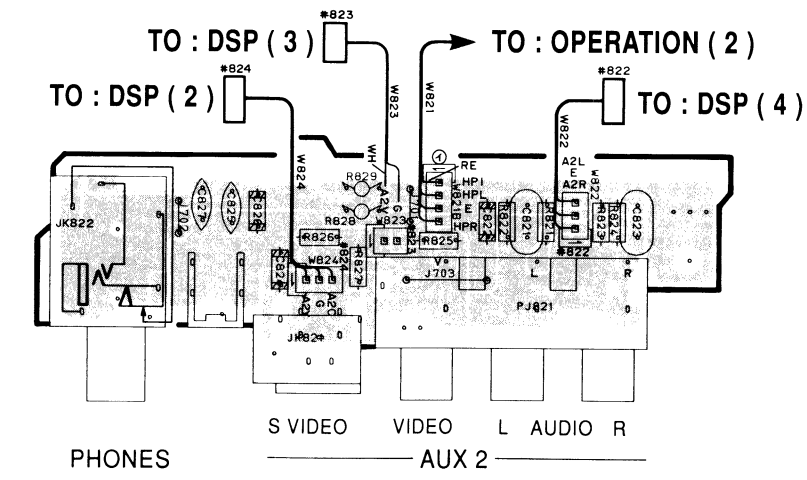
P.C.B. DSP ( 2 )



P.C.B. OPERATION ( 2 )



P.C.B. OPERATION ( 4 )

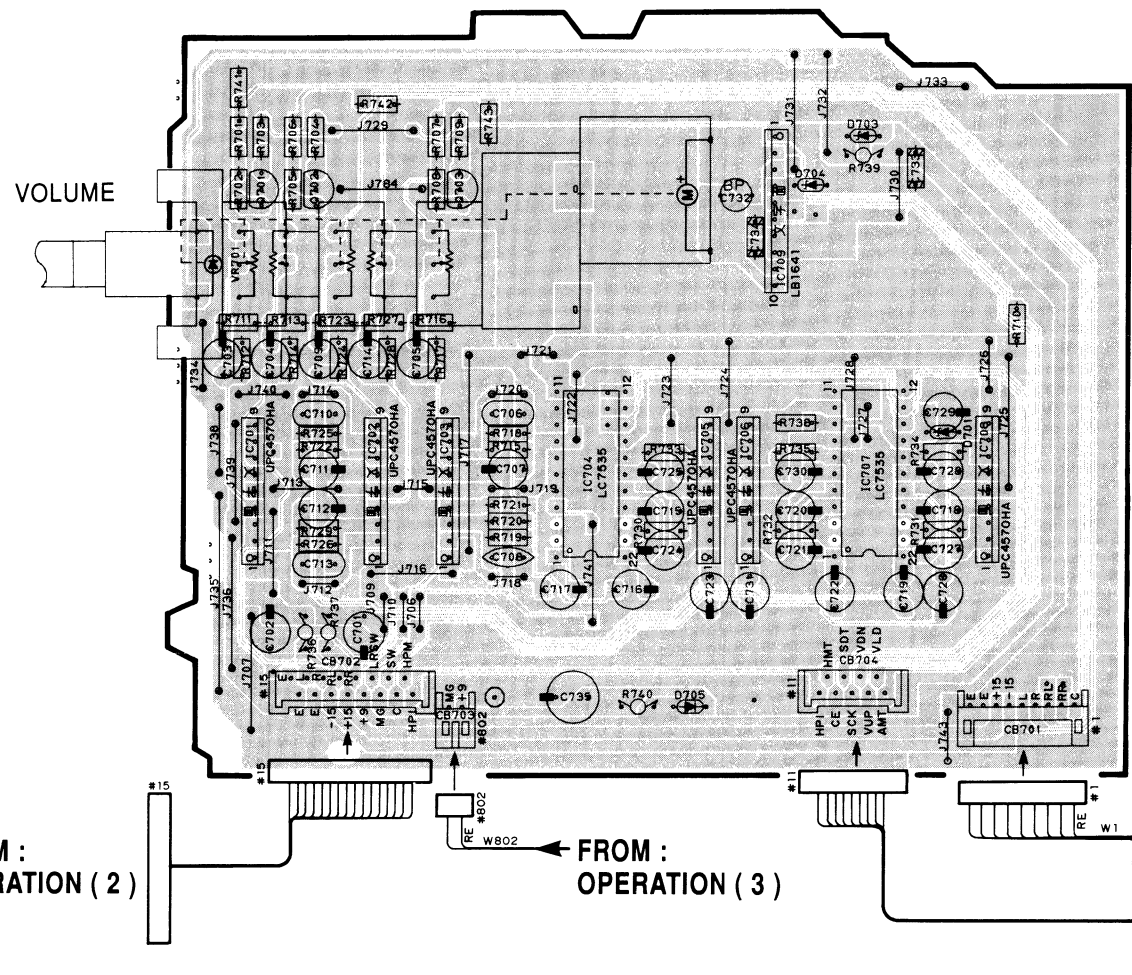


1  
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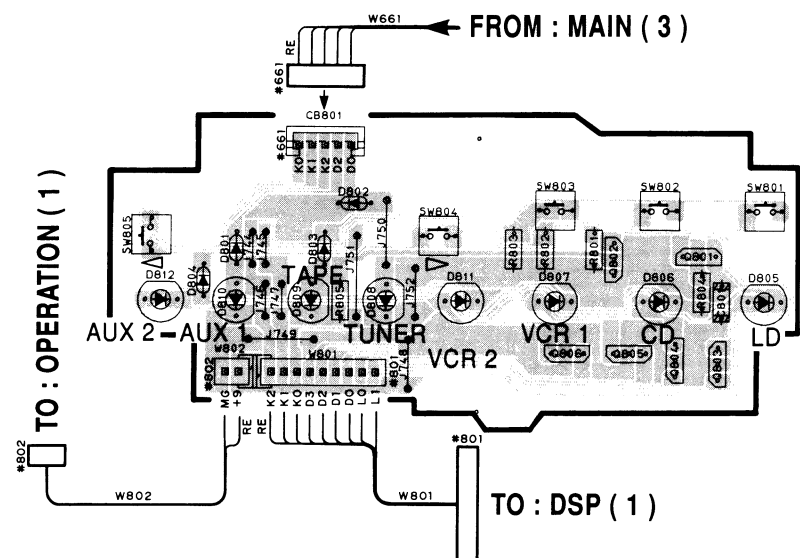


PRINTED CIRCUIT BOARD (Foil side)

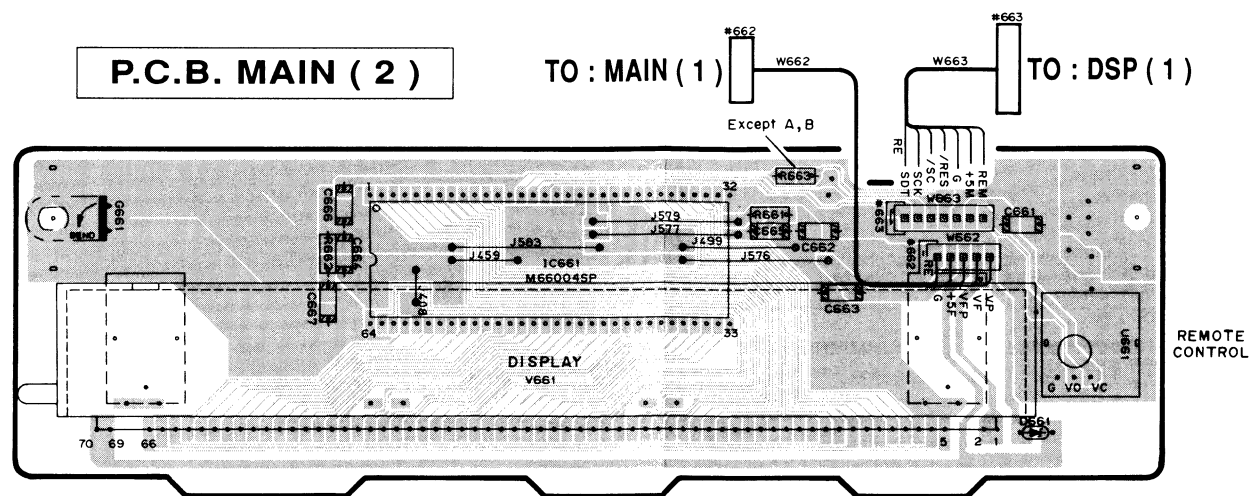
P.C.B. OPERATION ( 1 )



P.C.B. OPERATION ( 3 )

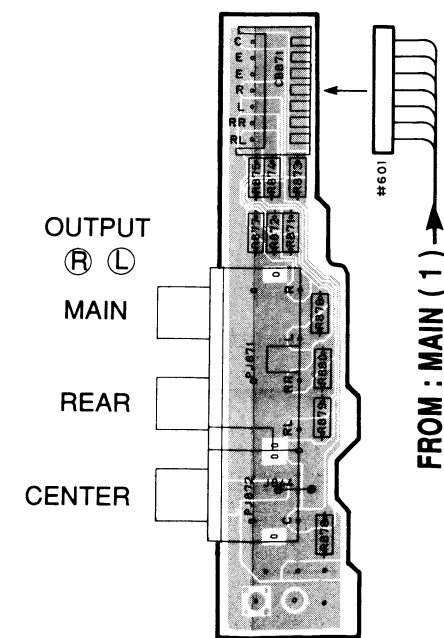


P.C.B. MAIN ( 2 )



● Except U, C, R

P.C.B. OPERATION ( 8 )



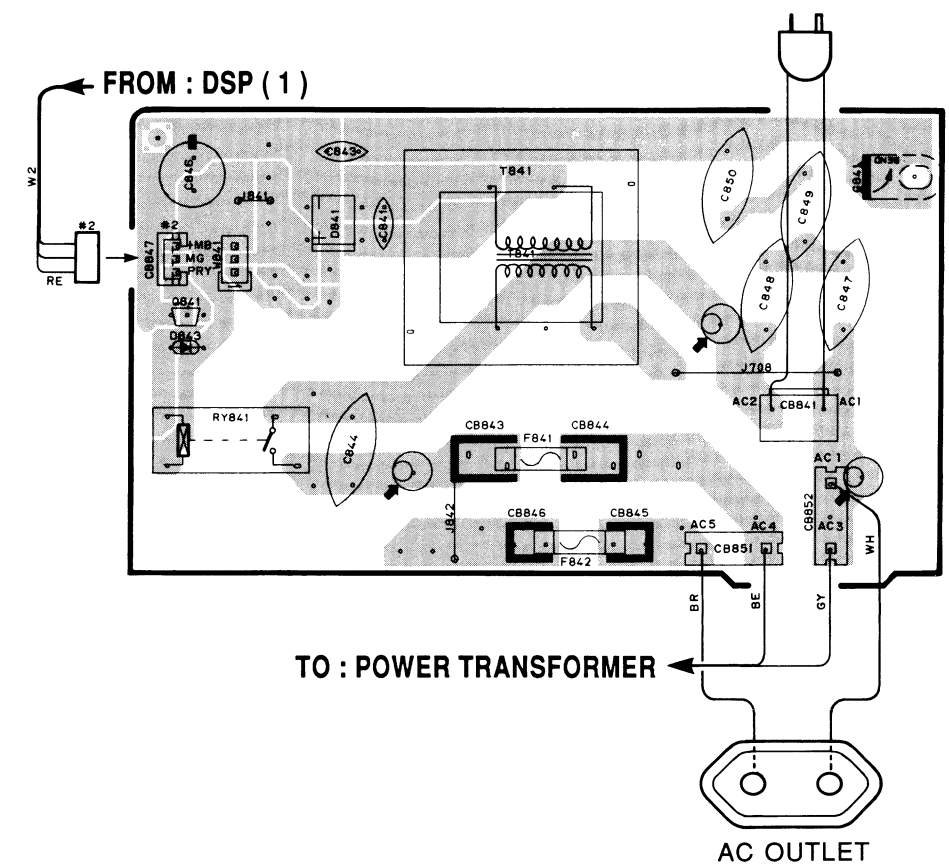
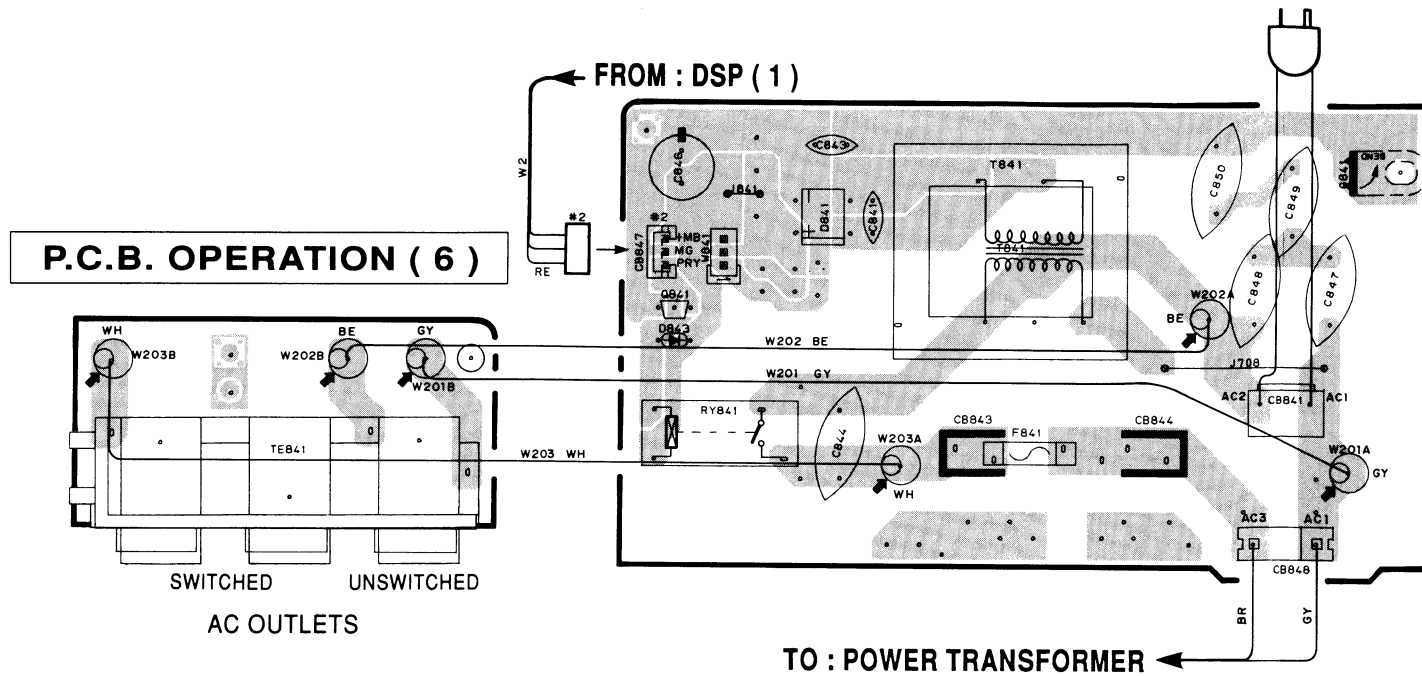
■ PRINTED CIRCUIT BOARD (Foil side)

● U, C models

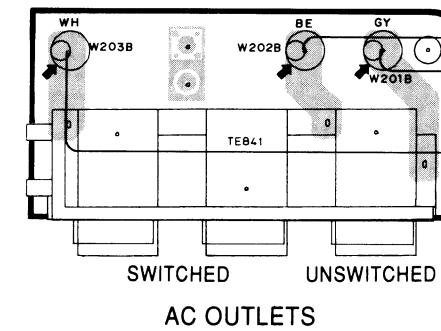
P.C.B. OPERATION ( 5 )

● H, W, L models

P.C.B. OPERATION ( 5 )

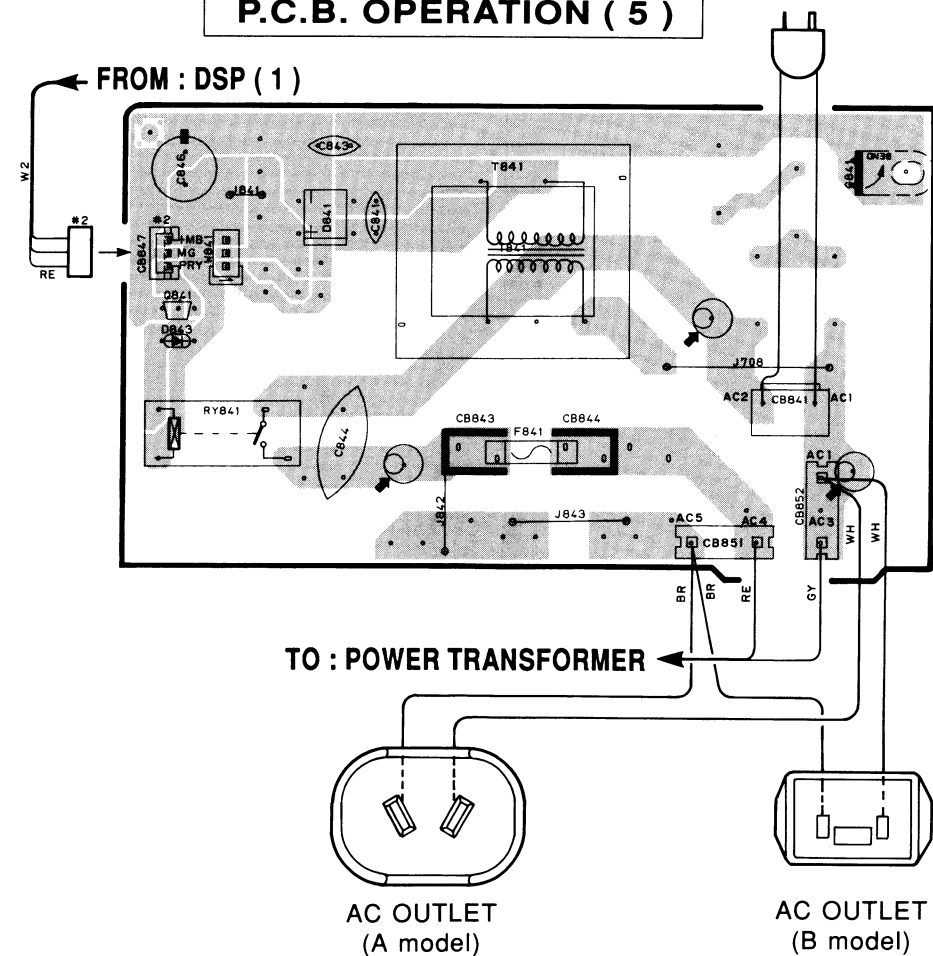


P.C.B. OPERATION ( 6 )

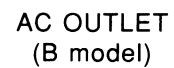
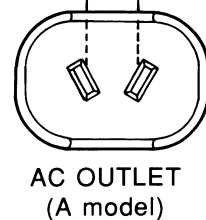


● A, B models

P.C.B. OPERATION ( 5 )



TO : POWER TRANSFORMER

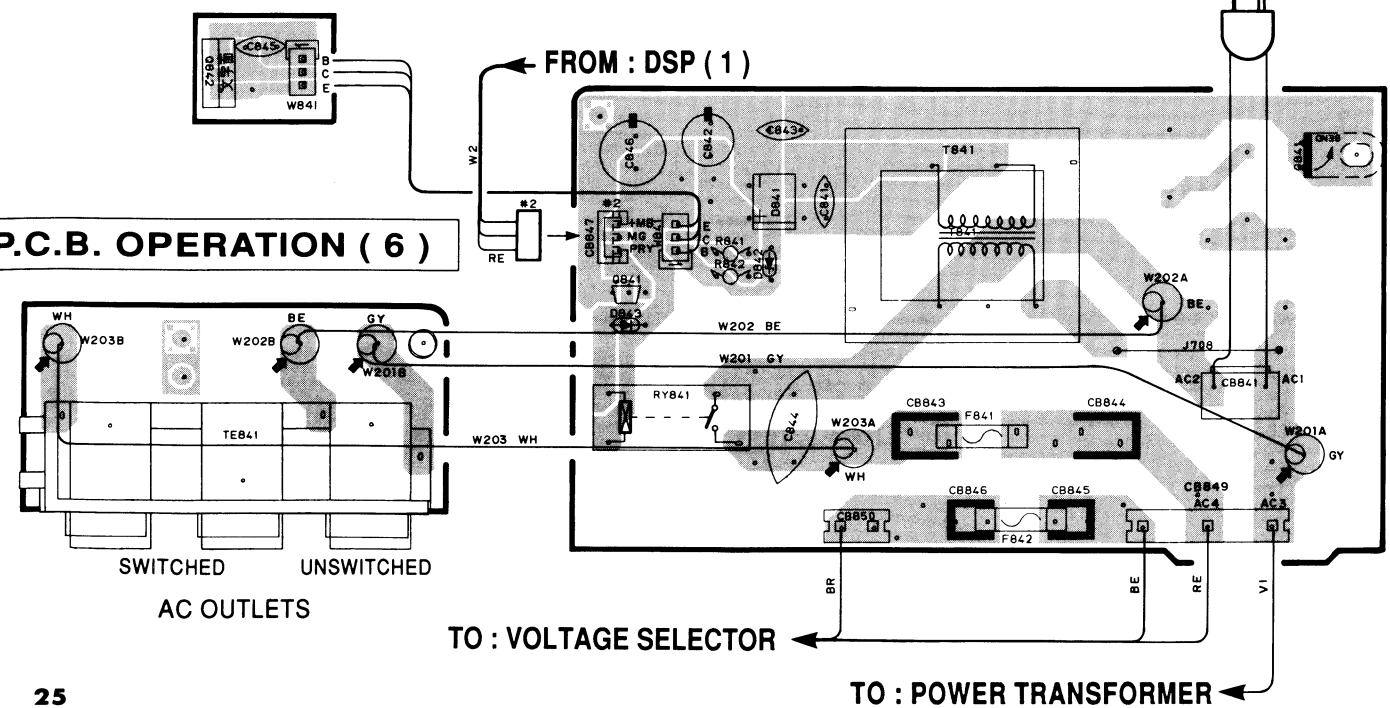


● R model

P.C.B. OPERATION ( 7 )

P.C.B. OPERATION ( 5 )

P.C.B. OPERATION ( 6 )



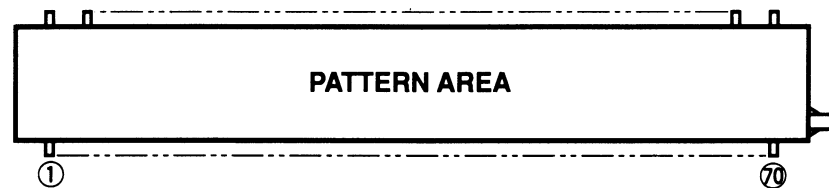
TO : VOLTAGE SELECTOR

TO : POWER TRANSFORMER



■ DISPLAY DATA (VQ905900)

● V661 : 17-BT-05GK

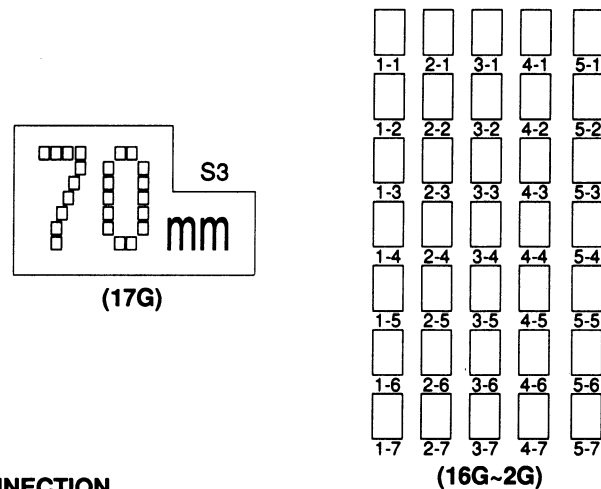
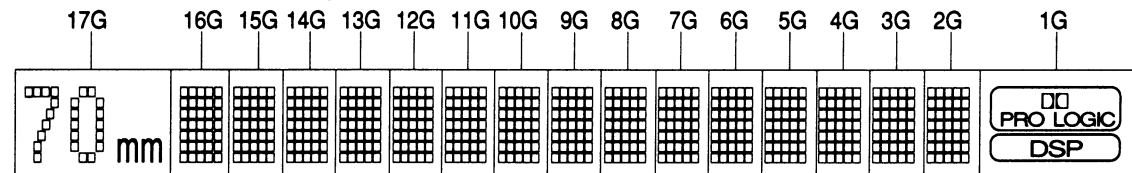


PIN CONNECTION

Pin No.	Connection	Pin No.	Connection	Pin No.	Connection	Pin No.	Connection	Pin No.	Connection	Pin No.	Connection	Pin No.	Connection
1	F1	11	P32	21	NC	31	7G	41	P23	51	P13	61	P3
2	F2	12	P33	22	16G	32	6G	42	P22	52	P12	62	P2
3	NP	13	P34	23	15G	33	5G	43	P21	53	P11	63	P1
4	NP	14	P35	24	14G	34	4G	44	P20	54	P10	64	P37
5	17G	15	NC	25	13G	35	3G	45	P19	55	P9	65	P36
6	P38	16	NC	26	12G	36	2G	46	P18	56	P8	66	1G
7	P28	17	NC	27	11G	37	P27	47	P17	57	P7	67	NP
8	P29	18	NC	28	10G	38	P26	48	P16	58	P6	68	NP
9	P30	19	NC	29	9G	39	P25	49	P15	59	P5	69	F2
10	P31	20	NC	30	8G	40	P24	50	P14	60	P4	70	F2

Note : F1, F2 : Filament NP : No Connection DL : Datum Line 1G~16G : Grid

GRID ASSIGNMENT

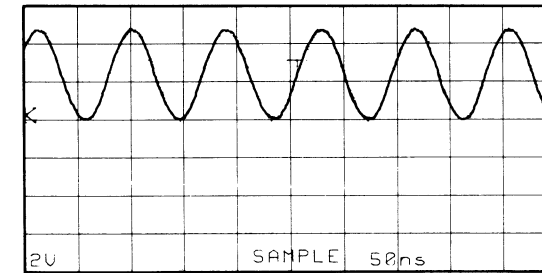


ANODE CONNECTION

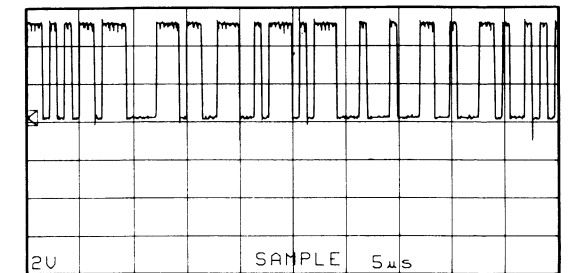
	17G	16G~2G	1G		17G	16G~2G	1G		17G	16G~2G	1G		17G	16G~2G	1G
P1	—	1-1	—	P11	—	1-3	—	P21	—	1-5	—	P31	—	1-7	—
P2	—	2-1	—	P12	—	2-3	—	P22	—	2-5	—	P32	—	2-7	—
P3	—	3-1	—	P13	—	3-3	—	P23	—	3-5	—	P33	—	3-7	—
P4	—	4-1	—	P14	—	4-3	—	P24	—	4-5	—	P34	—	4-7	—
P5	—	5-1	—	P15	—	5-3	—	P25	—	5-5	—	P35	—	5-7	—
P6	—	1-2	—	P16	—	1-4	—	P26	—	1-6	—	P36	—	—	S1
P7	—	2-2	—	P17	—	2-4	—	P27	—	2-6	—	P37	—	—	S2
P8	—	3-2	—	P18	—	3-4	—	P28	—	3-6	—	P38	S3	—	—
P9	—	4-2	—	P19	—	4-4	—	P29	—	4-6	—				
P10	—	5-2	—	P20	—	5-4	—	P30	—	5-6	—				

■ TEST POINT WAVEFORMS

Point ① (Pin 52 of IC2)  
V : 2V/div H : 50nsec/div  
DC range 1 : 1 probe



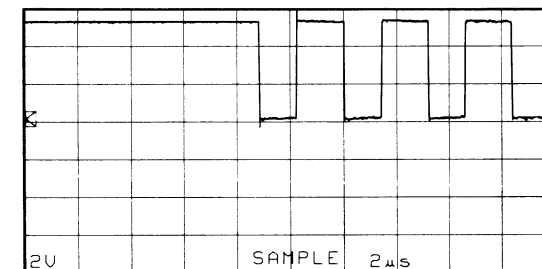
Point ④ (Pin 24 of IC2)  
V : 2V/div H : 5µsec/div  
DC range 1 : 1 probe



Point ② (Pin 18 of IC2)

\* This waveform is produced when the sound field program is changed.

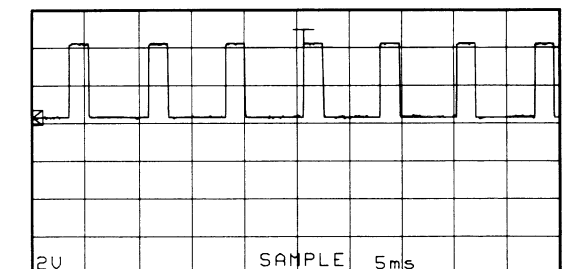
V : 2V/div H : 2µsec/div  
DC range 1 : 1 probe



Point ⑤ (Pin 51 of IC1)

\* This waveform is produced when the function is (—) changed.

V : 2V/div H : 0.1sec/div  
DC range 1 : 1 probe



Point ③ (Pin 19 of IC2)

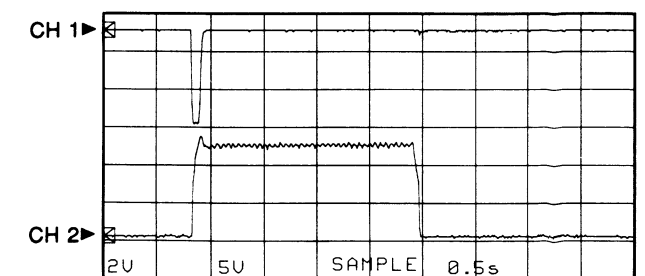
V : 2V/div H : 5µsec/div  
DC range 1 : 1 probe



Point ⑥

CH 1 : Pin 8 of IC1  
CH 2 : Emitter of Q5

V : 2V/div H : 0.5sec/div  
DC range 1 : 1 probe

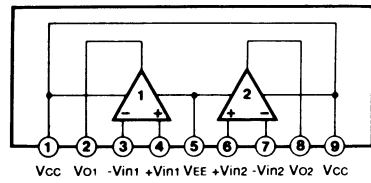


With the POWER switch turned ON, connect the power cord to the AC outlet. Disconnect the power cord from the AC outlet.

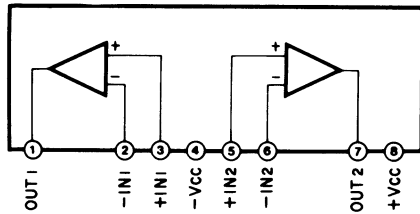
\* This waveform is not available by pushing the power switch ON and OFF.

■ IC BLOCKS (DSP & MAIN)

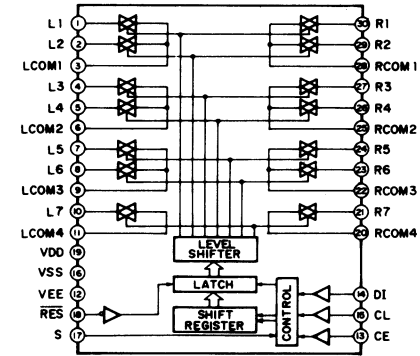
IC6, 7, 9, 11~15, 17 :  $\mu$ PC4570HA  
Dual OP-Amp



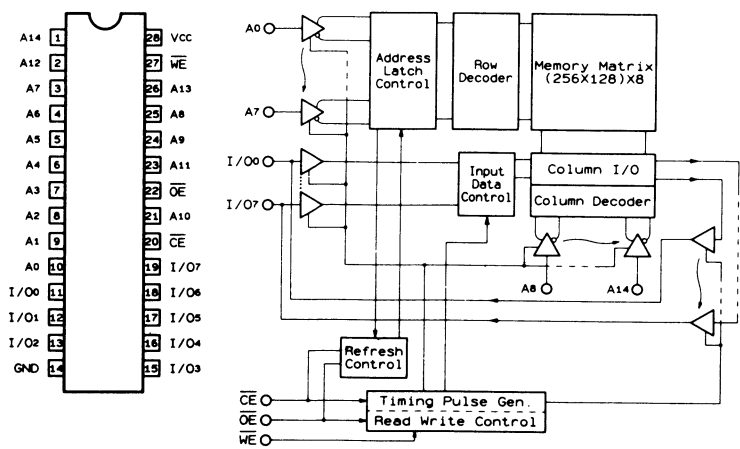
IC18 : NJM2904L  
IC4, 5 : NJM2068L-D  
IC8, 10 : NJM2082L  
IC401 : M5220L  
Dual OP-Amp



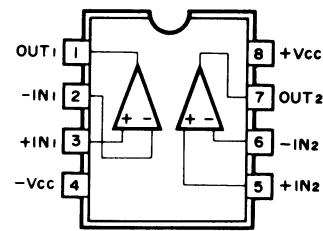
IC16, 353 : LC7823N  
Analog Function Switch



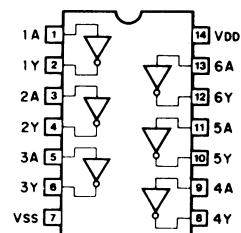
IC3 : TC51832SPL-10  
32768-word x 8 bit High Speed Pseudo Static RAM



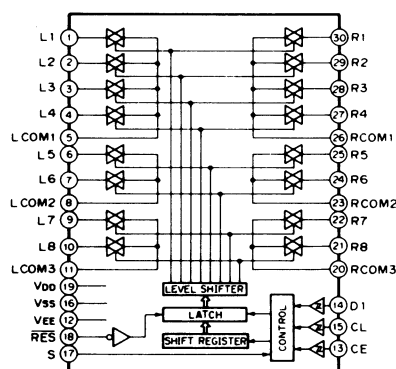
IC203, 204, 304 : MC14576BP  
Dual Video Amp



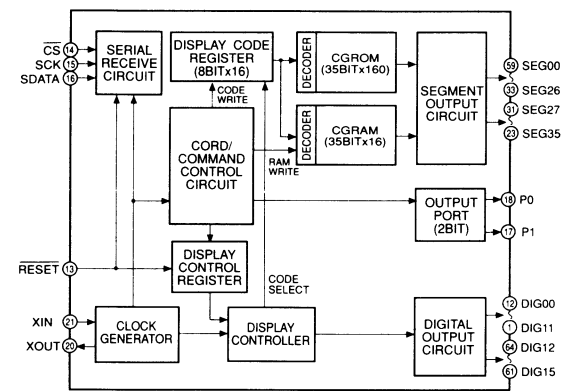
IC205 : TC4069UBP  
IC206 : TC74HC04AP  
Hex Inverters



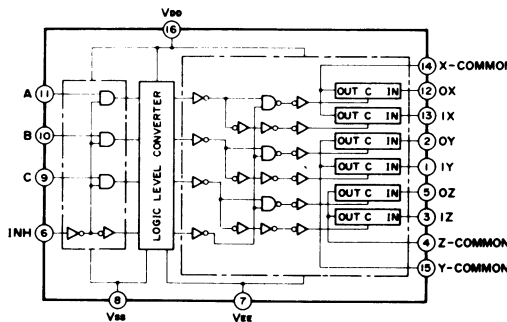
IC351, 352 : LC7821N  
Analog Function Switch



IC661 : M66004SP  
16 Digit 5 x 7 Segment VFD Controller



IC209 : TC4053BP  
IC208, 303 : TC74HC4053AP  
Triple 2-Channel Multiplexer/Demultiplexer



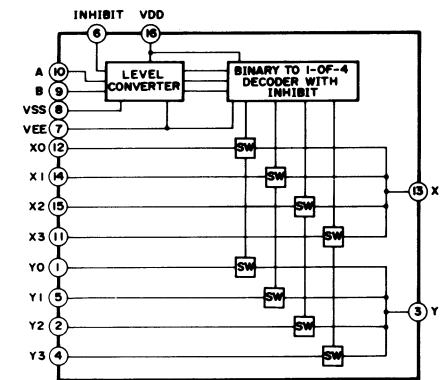
CONTROL INPUTS				"ON" CHANNEL
INHBIT (Pin 6)	C (Pin 9)	B (Pin 10)	A (Pin 11)	OX (Pin 12), OY (Pin 2), OZ (Pin 5) 1X (Pin 13), 1Y (Pin 1), 1Z (Pin 3)
L	L	L	L	OX, OY, OZ
L	L	L	H	1X, OY, OZ
L	L	H	L	OX, OY, OZ
L	L	H	H	1X, 1Y, OZ
L	H	L	L	OX, OY, 1Z
L	H	L	H	1X, OY, 1Z
L	H	H	L	OX, 1Y, 1Z
L	H	H	H	1X, 1Y, 1Z
H	*	*	*	NONE

\* : Don't Care

Other IC's

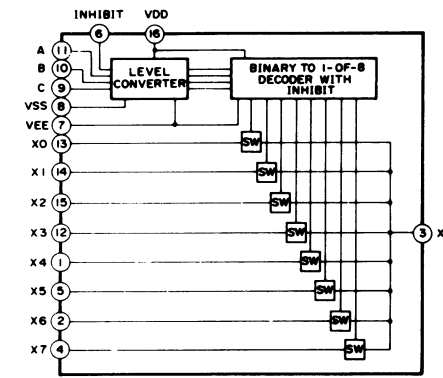
- IC1 : HD6433238A47P → See page 9
- IC2 : YSS223 → See page 11
- IC207 : M35010-062SP → See page 13

IC201, 202 : TC4052BP  
Dual 4 Channel Analog Multiplexer/Demultiplexer



INHBIT	B	A	OX, OY
0	0	0	OX, OY
0	0	1	1X, 1Y
0	1	0	2X, 2Y
0	1	1	3X, 3Y
1	X	X	NONE

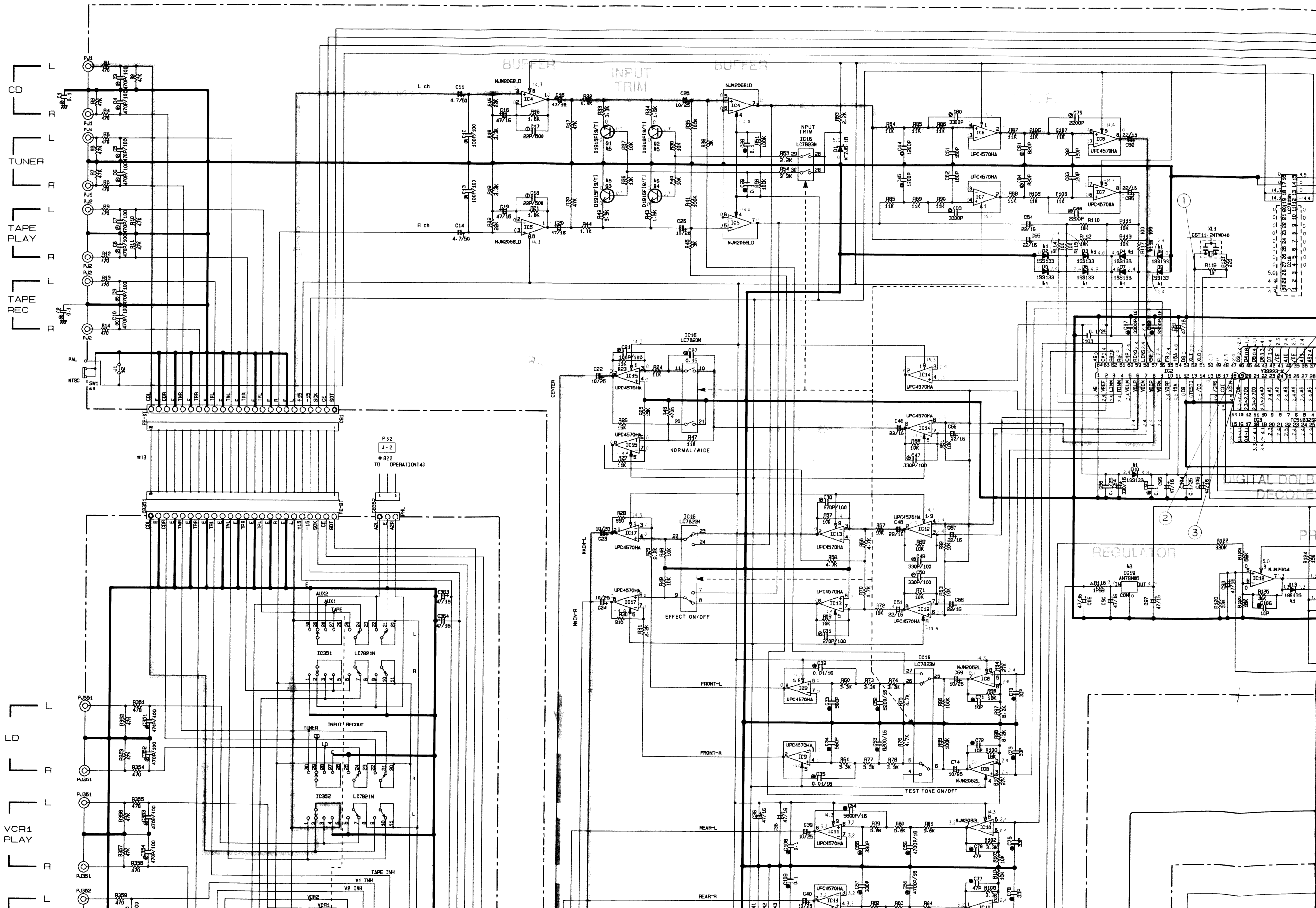
IC301 : TC4051BP  
IC302 : TC74HC4051AP  
Signal 8-Channel Multiplexer/Demultiplexer

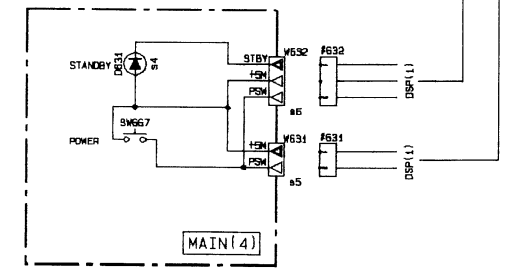
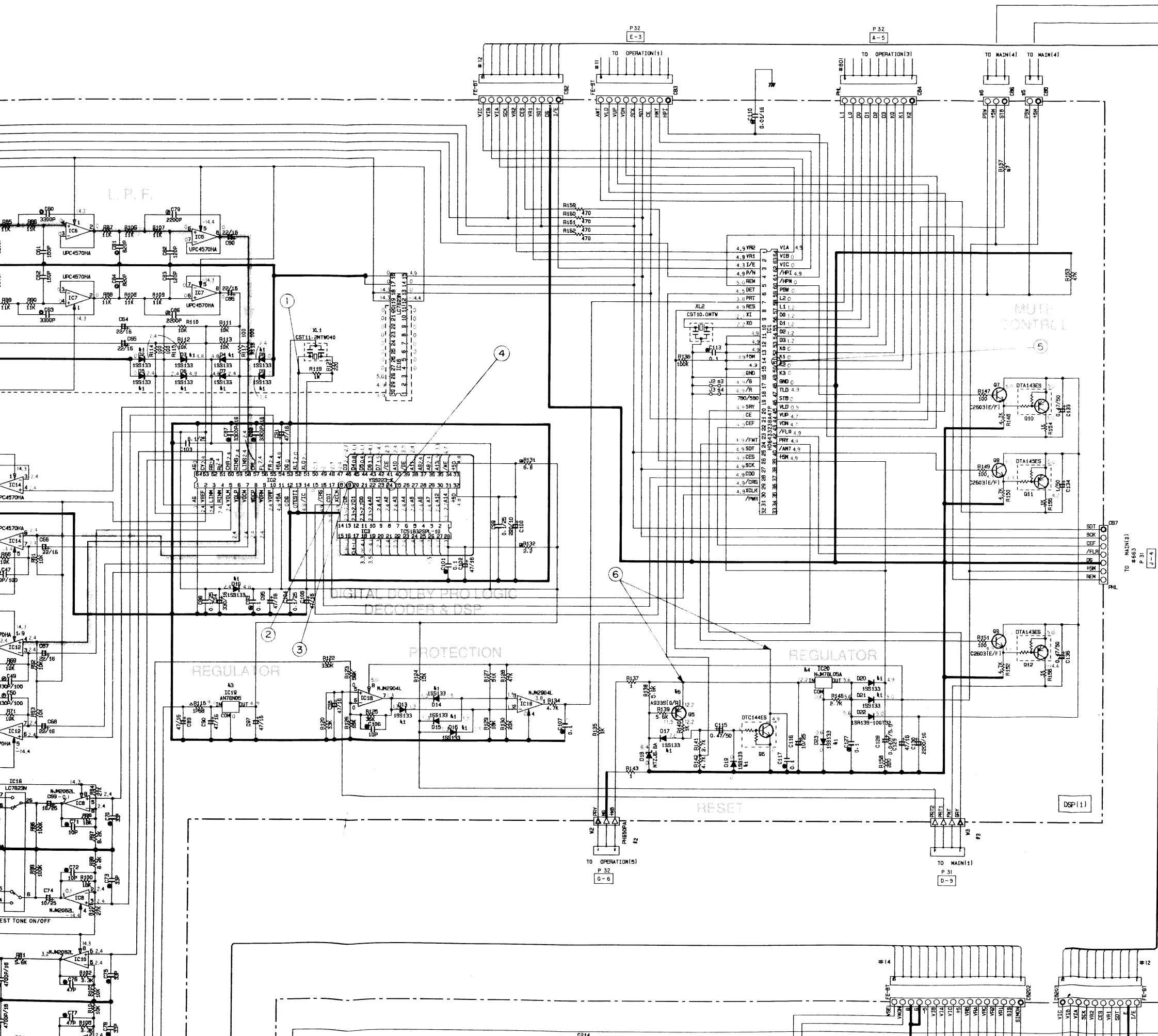


INPUT STATES				"ON CHANNEL (S)"
INHBIT	C	B	A	
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	X	X	X	NONE

# ■ SCHEMATIC DIAGRAM (DSP)

① to ⑥ : TEST POINT WAVEFORMS (See page 27)





P.C.B. MAIN

Mark	J-U-C	A-B-R	HL	V	
4	D631	X	X	SLR-305VCA47	SLR-305VCA47
5	W631	VQ50950	VQ50950	X	X
6	W632	X	X	VQ61120	VQ61120

Interchangeable Parts at Manufacture-Stage

Mark	Reference Parts Number	Parts Name
A1	00-10, 13-17, 19-21, 23, 201-203, 205-209	ISS133 HSD1047D
A2	0208	DTC144ES UN4211
A3	IC19	AN78M05 L78M05
A4	IC20	N.M.78L05A AN78L05
A5	01-A-202	26D1915F/16/71 25C28761A/B1
A6	00	2SA93351Q/R1 2SA1151E/F1 2SA1309A1Q/R/S1
A7	IC205	TC4069BP UPD4059C
A8	IC301	TC4051BP UPD4051BC
A9	IC209	TC4053BP UPD4053BC
A10	IC206	TC74HCUD4AP SN74HCUD4N NC74HCUD4N
A11	IC201, 202	TC4052BP UPD4052BC

P.C.B. DSP

Mark	Ref. No.	J	U-C	R	A-B	H-W	L
1	SW1	X	X	YMG1970	X	X	X
2	J1	X	X	X	X	X	X
3	J2	X	X	X	X	X	X
4	J3	X	X	X	X	X	X
5	C85	V805010	V805010	V805010	V805010	X	X
6	C86	X	X	X	X	V805020	V805020
7	RL57	X	X	X	X	560	560
8	XL201	14.3MHz	14.3MHz	14.3MHz	17.7MHz	17.7MHz	14.3MHz

5

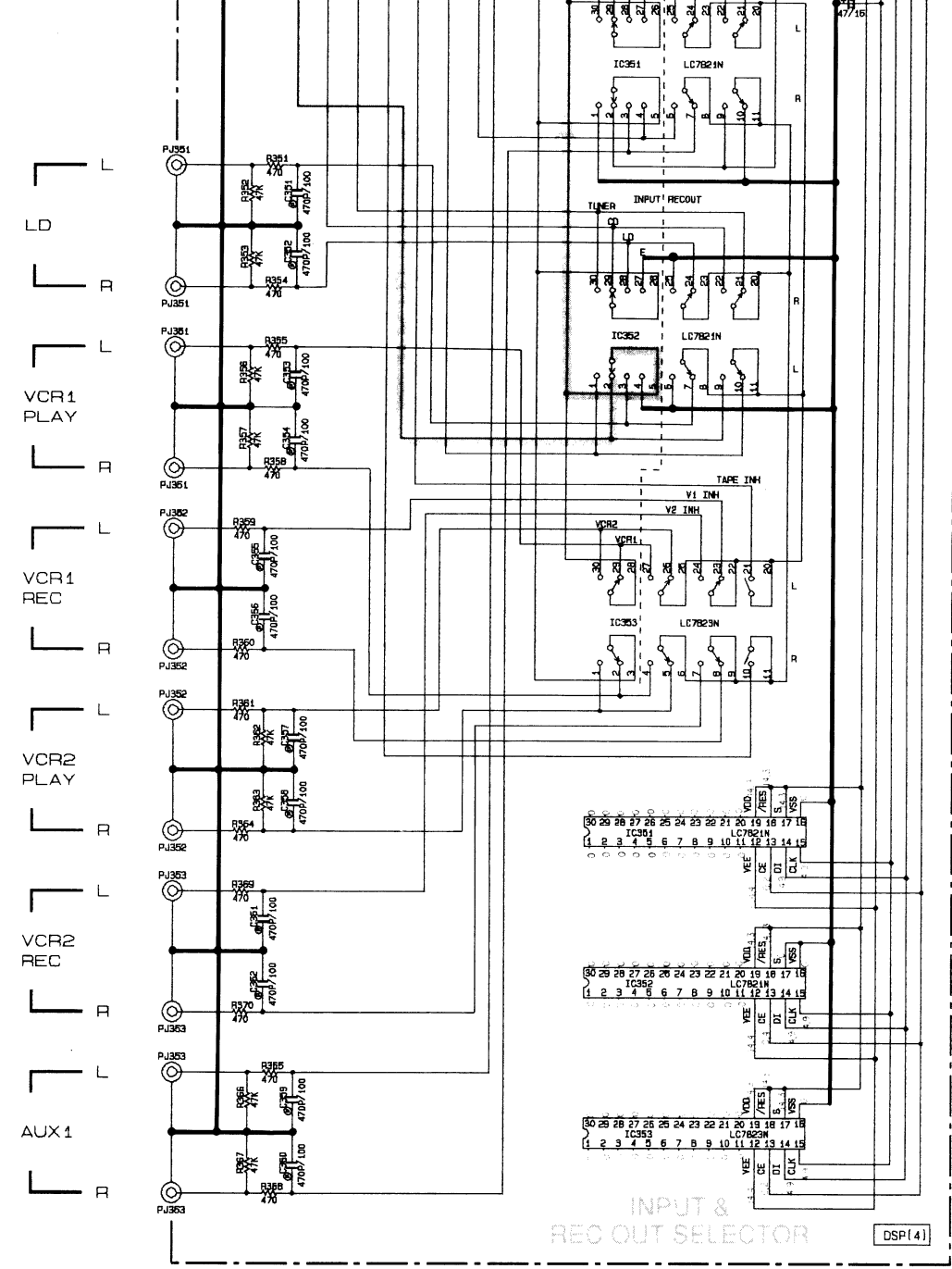
6

7

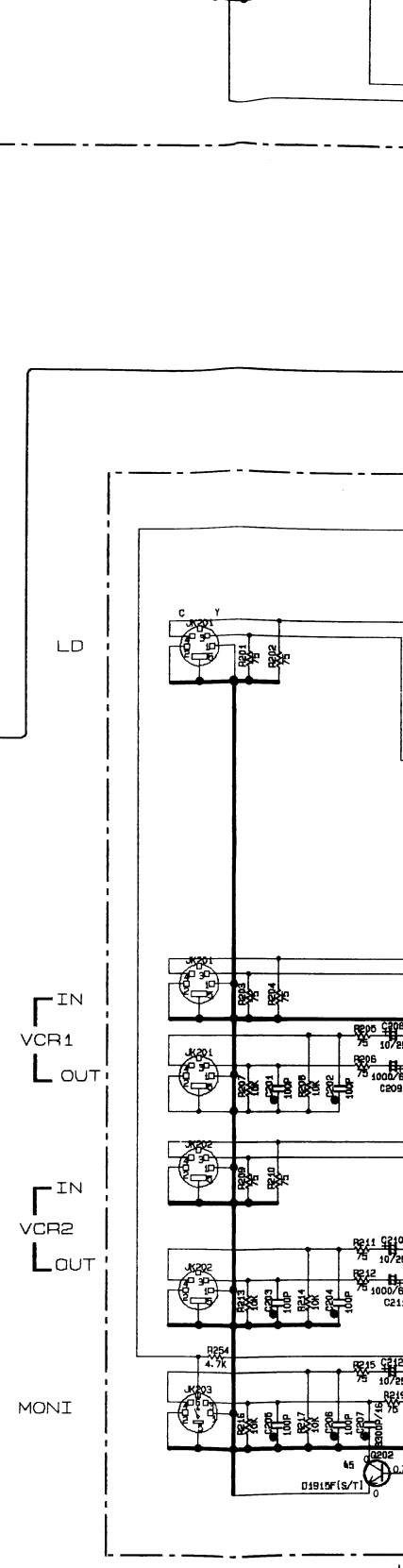
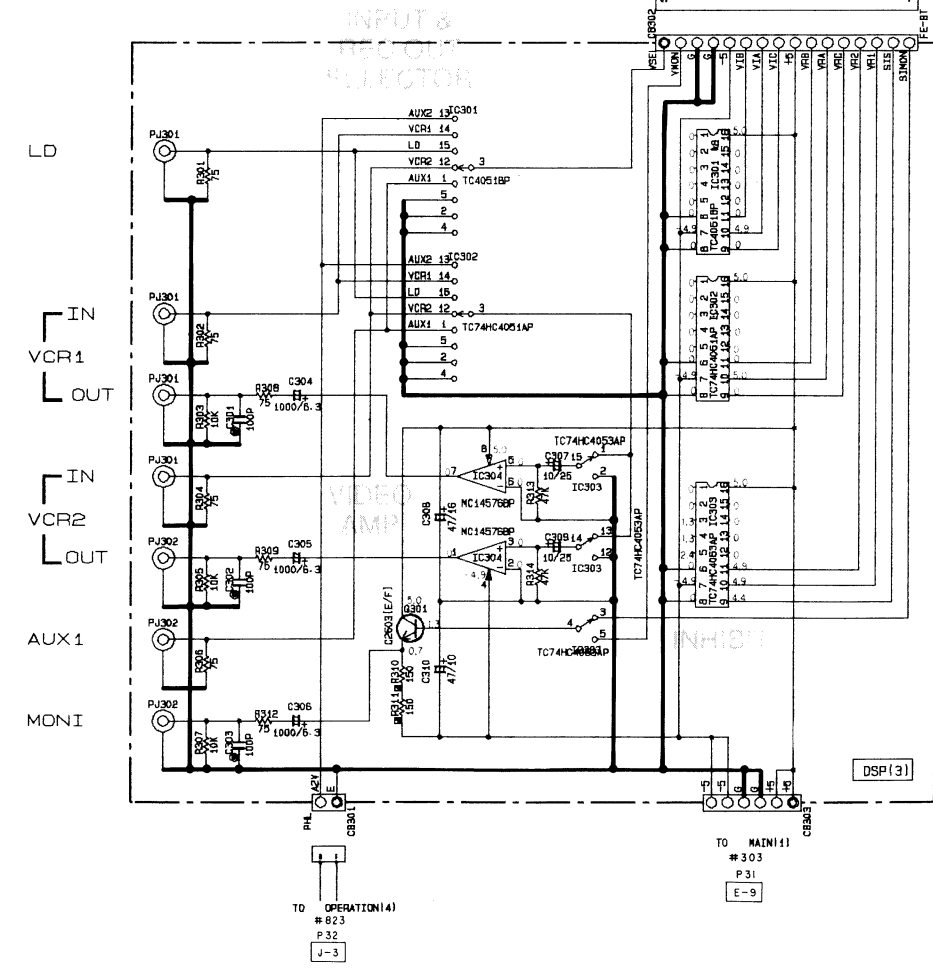
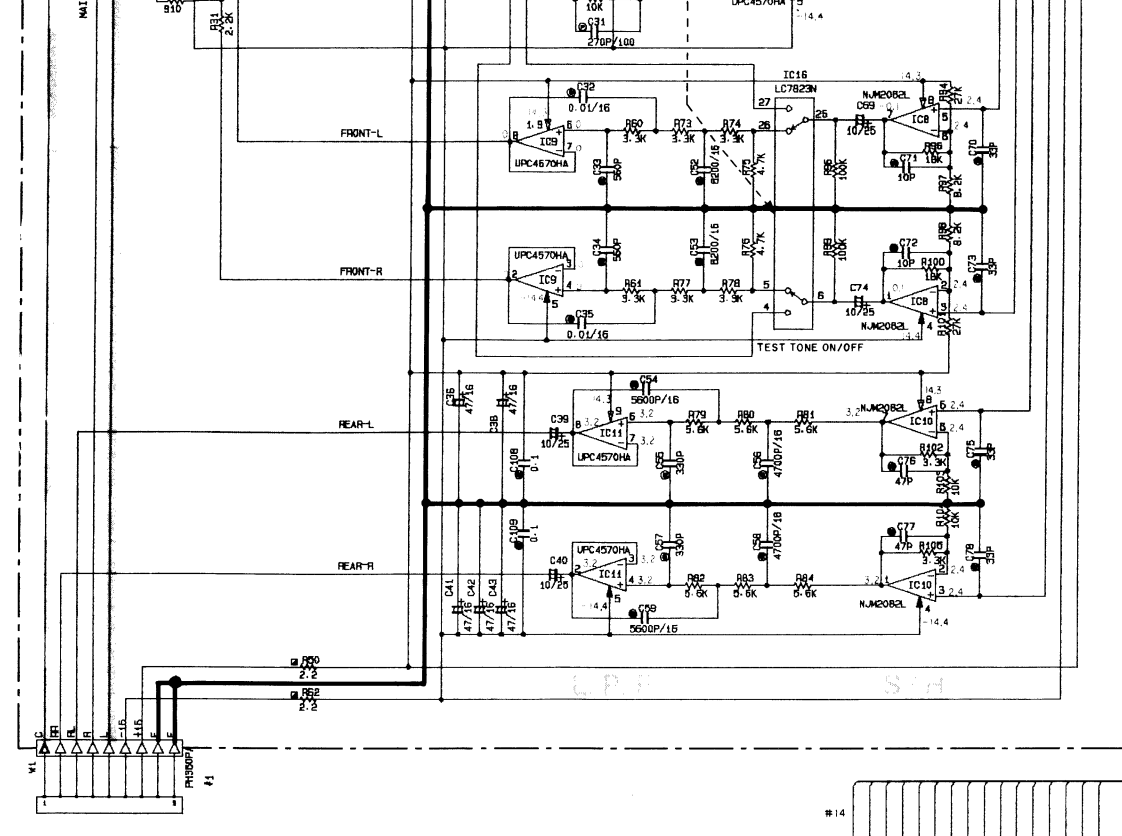
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9

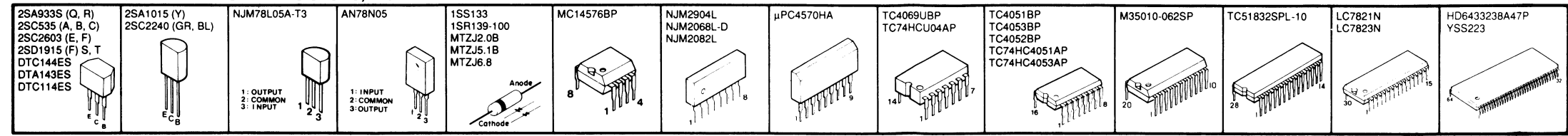
10

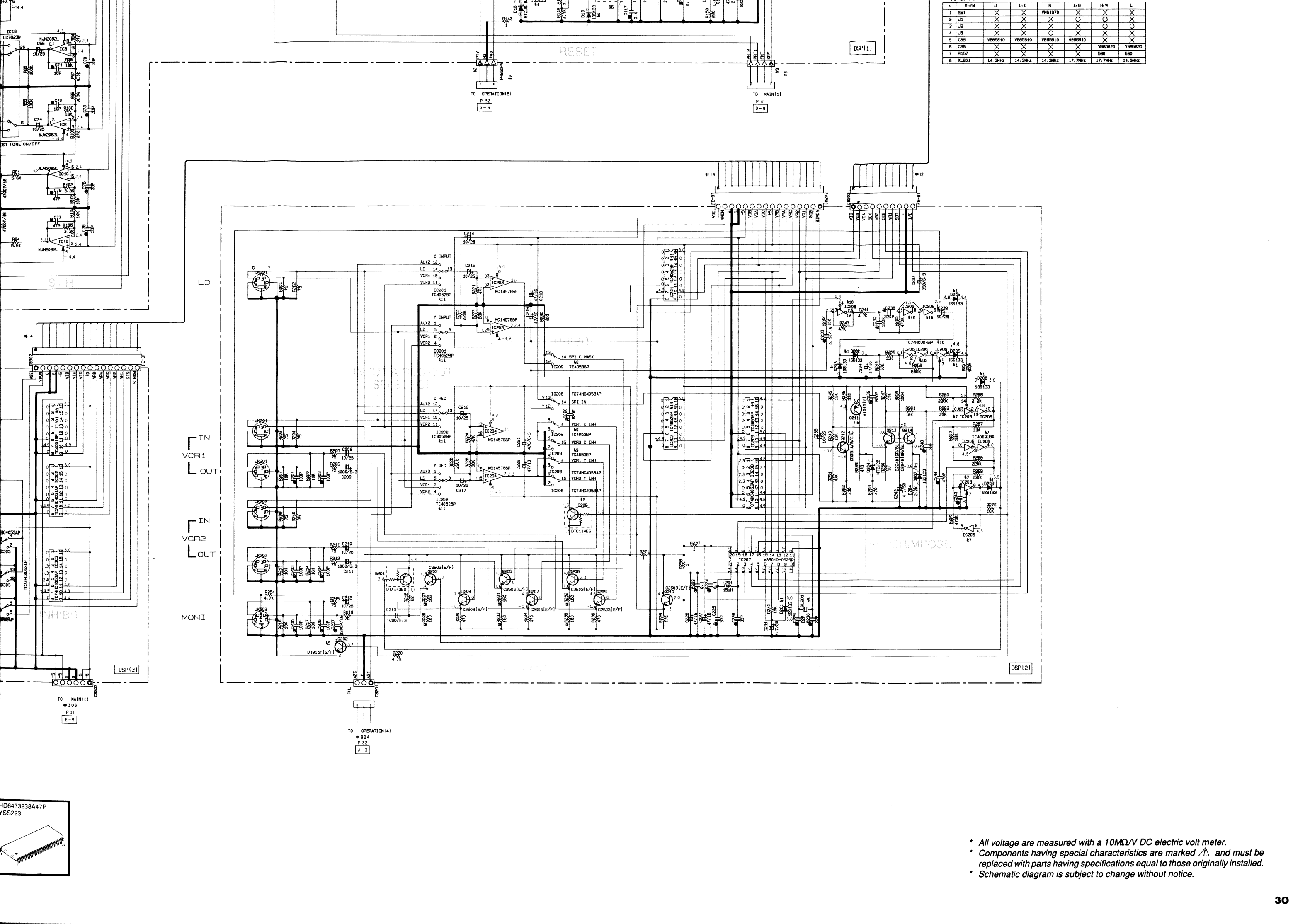


RESISTOR		CAPACITOR	
REMARKS	PARTS NAME	REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)	NO MARK	ELECTROLYTIC CAPACITOR
□	CARBON FILM RESISTOR (P=10)	⊗	TANTALUM CAPACITOR
△	METAL OXIDE FILM RESISTOR	NO MARK	CERAMIC CAPACITOR
▴	METAL FILM RESISTOR	⊙	CERAMIC TUBULAR CAPACITOR
▾	METAL PLATE RESISTOR	⊕	POLYESTER FILM CAPACITOR
■	FIRE PROOF CARBON FILM RESISTOR	○	POLYSTYRENE FILM CAPACITOR
□	CEMENT MOLDED RESISTOR	⊖	MICA CAPACITOR
⊕	SEMI VARIABLE RESISTOR	⊙	POLYPROPYLENE FILM CAPACITOR
■	CHIP RESISTOR	●	SEMICONDUCTIVE CERAMIC CAPACITOR



**PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICs.**



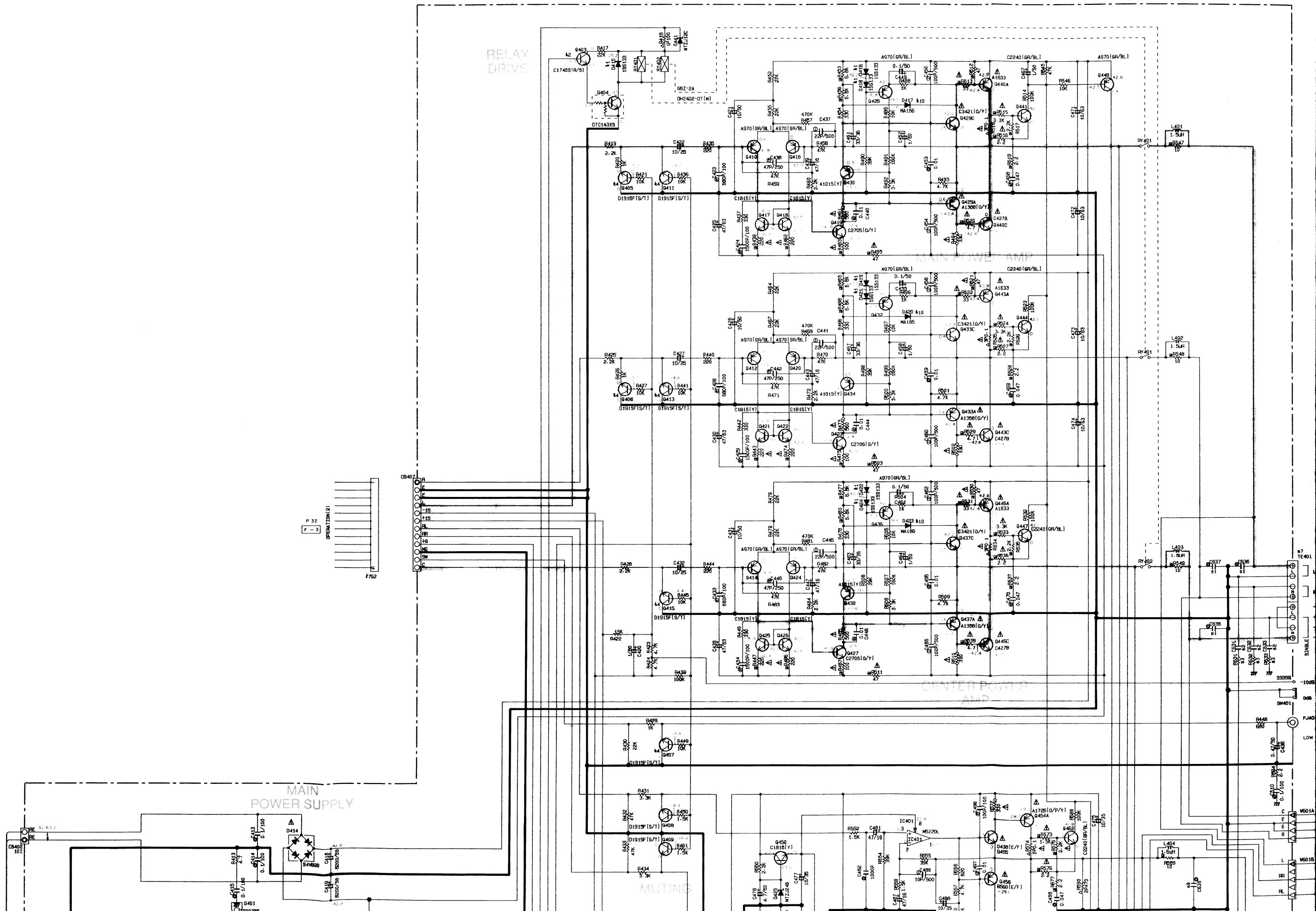


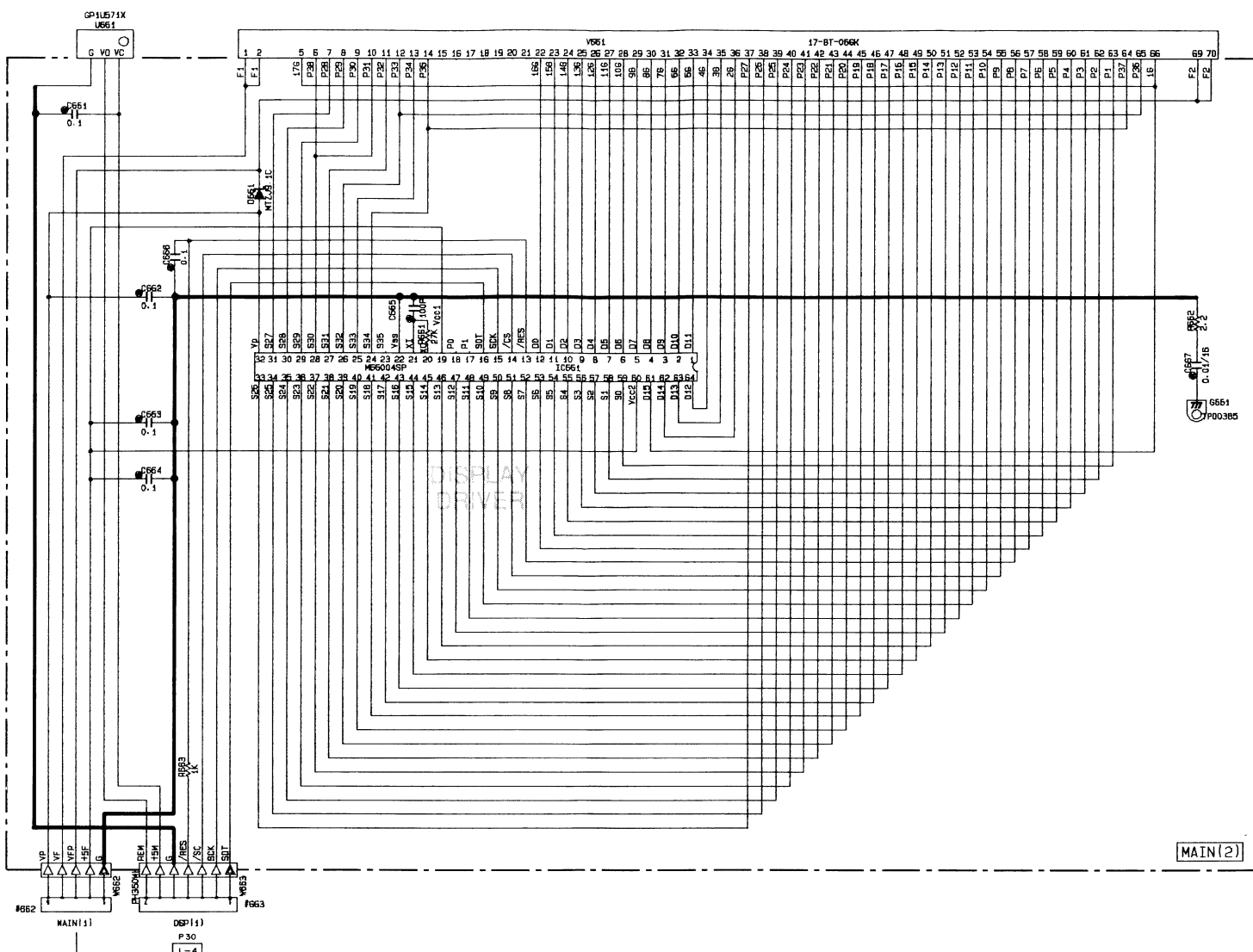
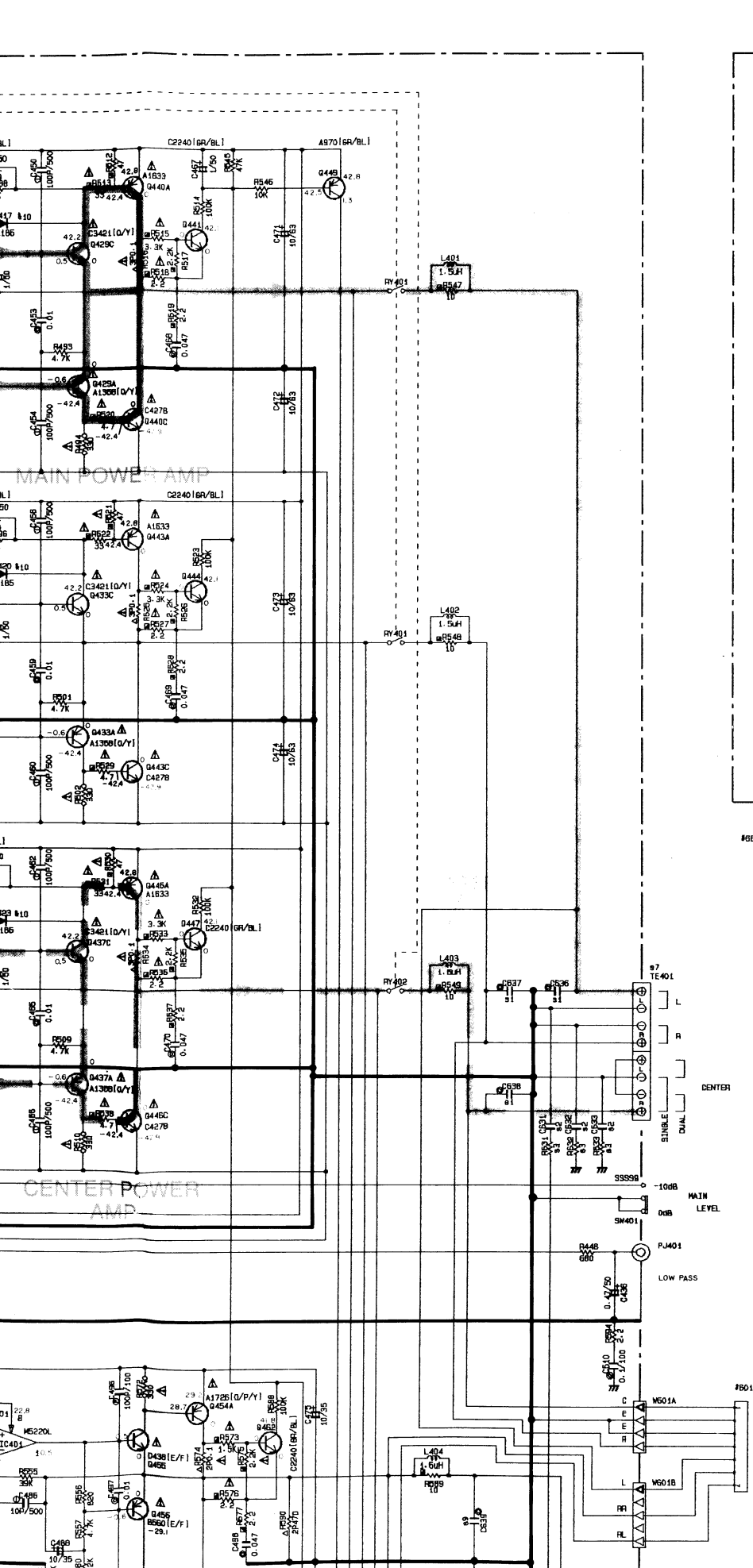
	Ref N	J	U.C	R	A-B	H-W	L
1	SW1	X	X	X	X	X	X
2	J1	X	X	X	X	X	X
3	J2	X	X	X	X	X	X
4	J3	X	X	X	X	X	X
5	CR5	VDR5010	VDR5010	VDR5010	VDR5010	X	X
6	CR6	X	X	X	VDR5020	VDR5020	X
7	R157	X	X	X	560	560	X
8	XL201	14.3MHz	14.3MHz	14.3MHz	17.7MHz	17.7MHz	14.3MHz

\* All voltage are measured with a 10MΩ/V DC electric volt meter.  
 \* Components having special characteristics are marked Δ and must be replaced with parts having specifications equal to those originally installed.  
 \* Schematic diagram is subject to change without notice.



■ SCHEMATIC DIAGRAM (MAIN)





P.C.B. MAIN

QTY	DESCRIPTION	J. U. C.	A. B. R.	H. L.	W.
1	C636-638	X	X	0.045	0.045
2	C631-635	X	X	0.022	0.022
3	R631-635	X	X	2.2	2.2
4					
5					
6					
7	TE401	VC31370	YC31370	YC7090	VC31370
8	F401.402	K800364	K800324	K800324	K800324
9	C639.640	6A 125V	T5A 250V	T5A 250V	T5A 250V
11		X	X	0.01	0.01

CAPACITOR

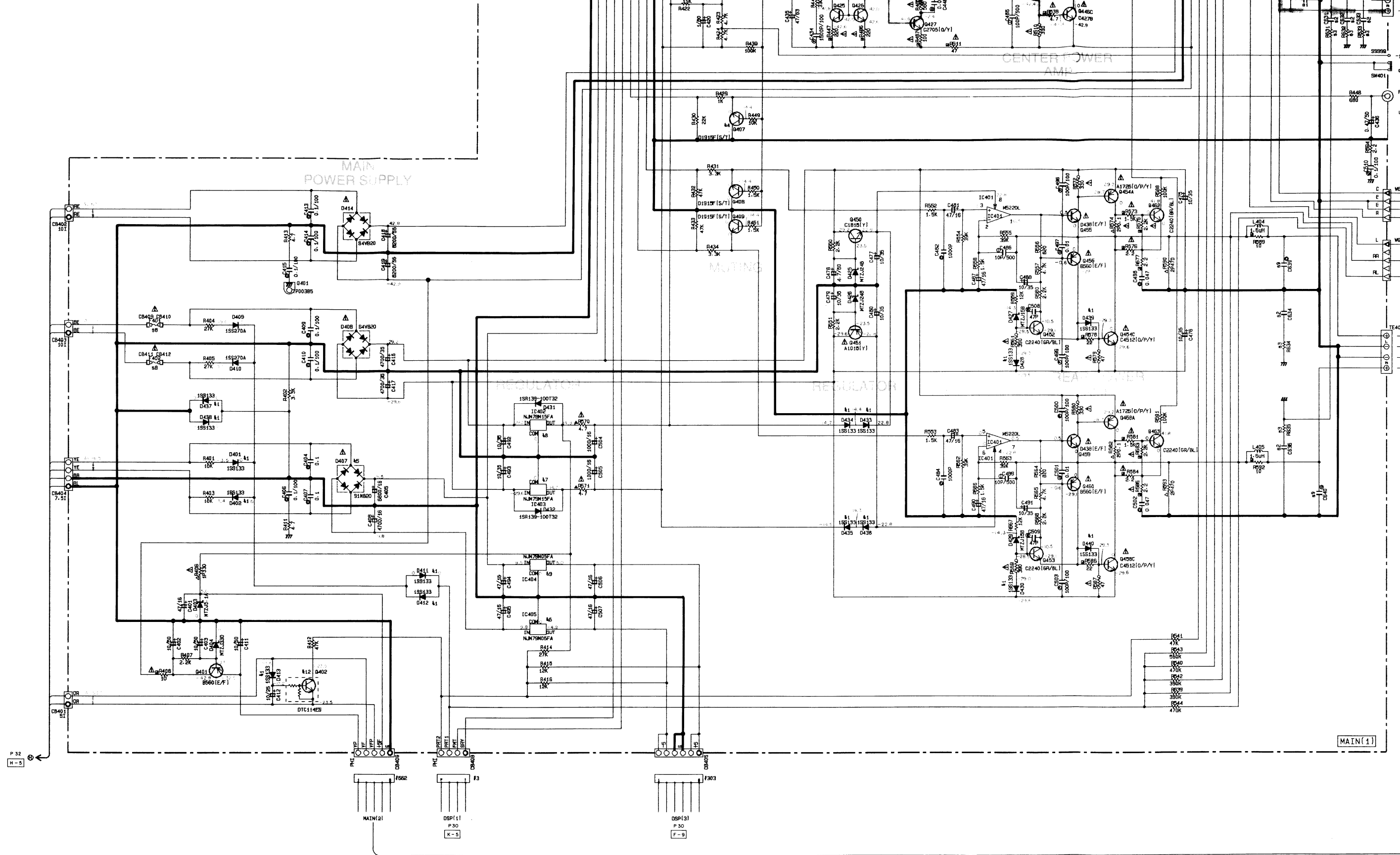
REMARKS	PARTS NAME	QTY
NO MARK	ELECTROLYTIC CAPACITOR	17
⊗	TANTALUM CAPACITOR	
NO MARK	CERAMIC CAPACITOR	
⊙	CERAMIC TUBULAR CAPACITOR	
⊕	POLYESTER FILM CAPACITOR	
○	POLYSTYRENE FILM CAPACITOR	11
⊖	MICA CAPACITOR	
⊙	POLYPROPYLENE FILM CAPACITOR	
●	SEMICONDUCTIVE CERAMIC CAPACITOR	

RESISTOR

REMARKS	PARTS NAME	QTY
NO MARK	CARBON FILM RESISTOR (P=5)	
⊠	CARBON FILM RESISTOR (P=10)	



5  
6  
7  
8  
9

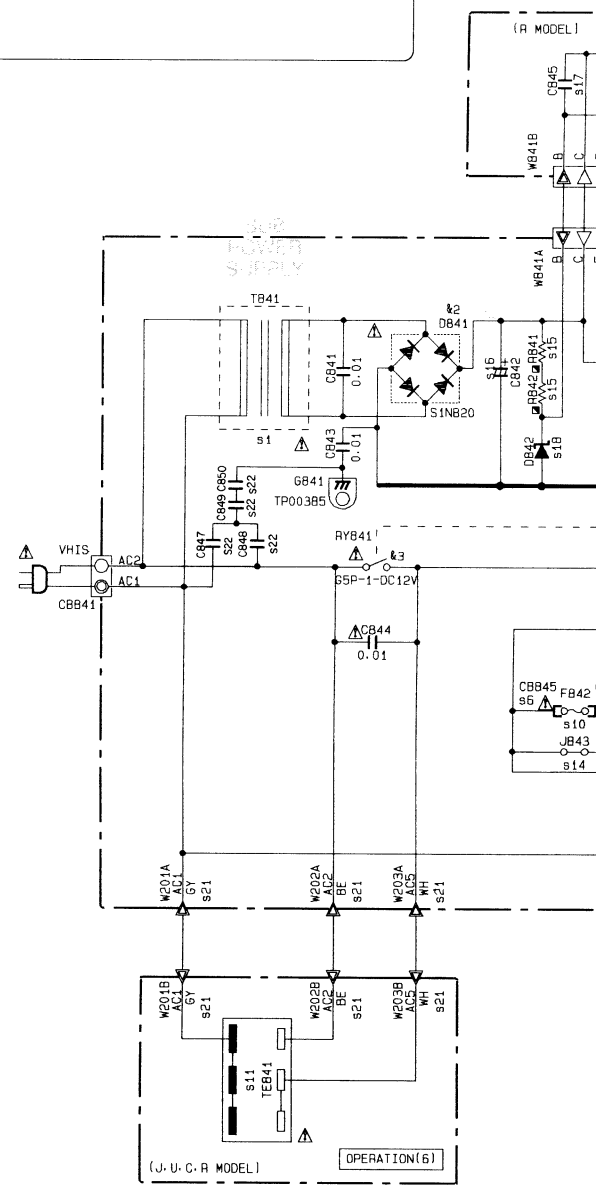
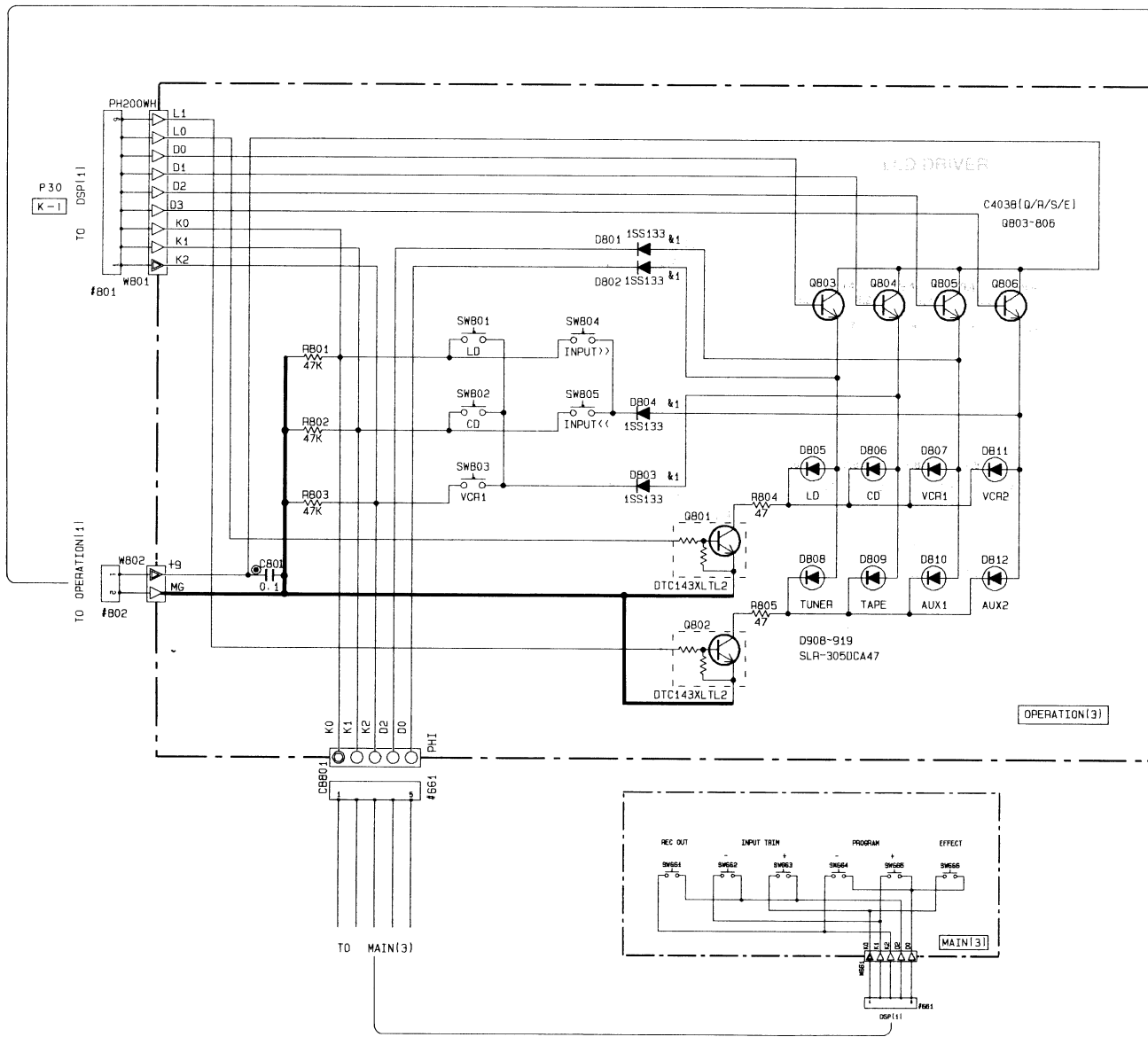
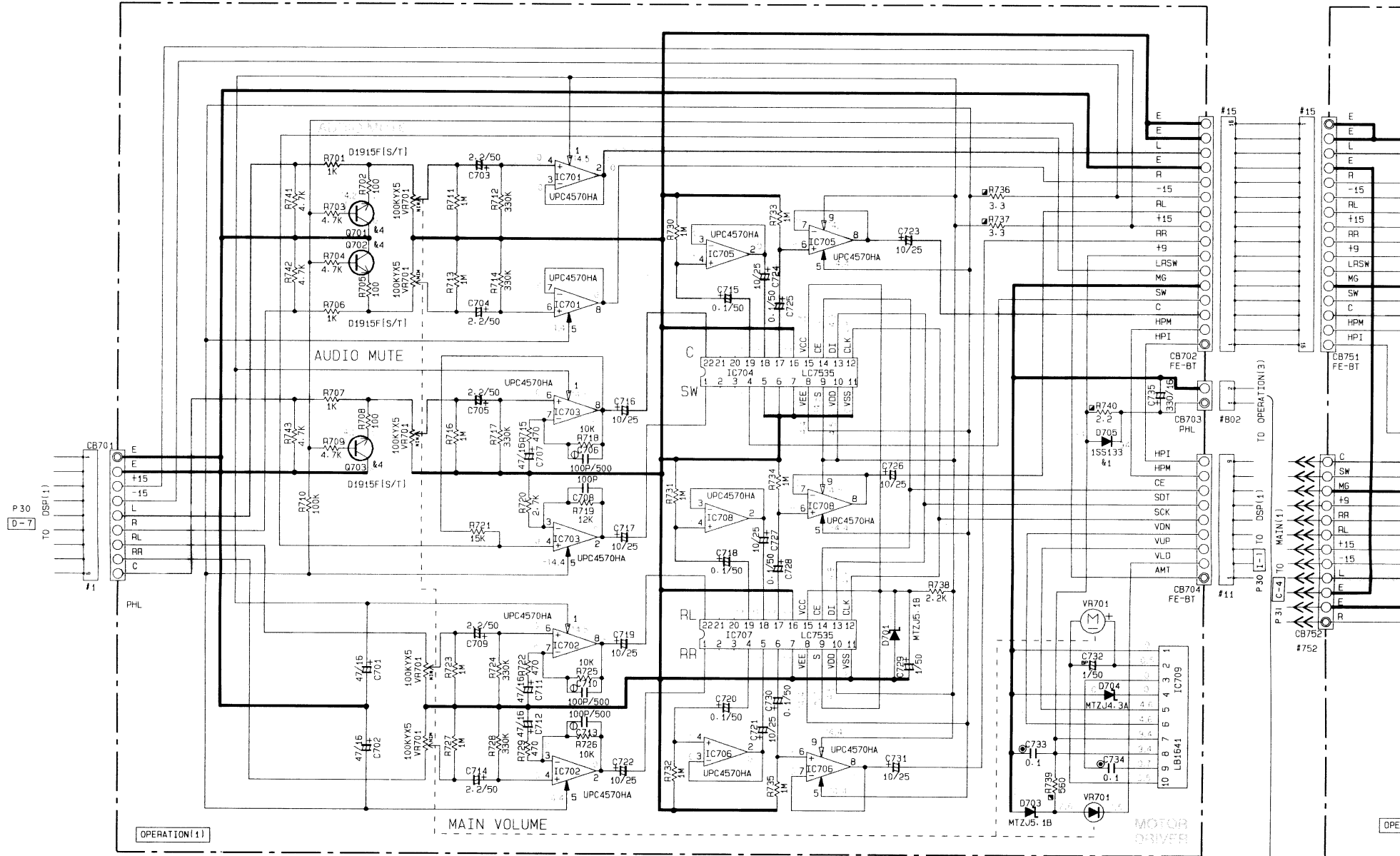


**PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICs.**

<p>2SC1740S (R, S) 2SD1915 (F) S, T DTC143XS DTC114ES</p>	<p>2SA970 (GR, BL) 2SA1015 (Y) 2SB560 (E, F) 2SC1815 (Y) 2SC2240 (GR, BL) 2SC2705 (O, Y) 2SD438 (E, F)</p>	<p>2SA1726 (O, P, Y) 2SC4512 (O, P, Y)</p>	<p>2SA1633 (D, E, F) 2SC4278 (D, E, F)</p>	<p>2SA1358 (O, Y) 2SC3421 (O, Y)</p>	<p>NUM79M05FA NUM79M15FA</p>	<p>NUM78M15FA NUM78M05FA</p>	<p>1SS133 MA185 1SR139-100 1SS270A MTZJ5.1A MTZJ9.1C MTZJ15.0B MTZJ24.0B MTZJ33.0D</p>	<p>S4VB20</p>	<p>S1NB20</p>	<p>M5220L</p>	<p>M66004SP</p>
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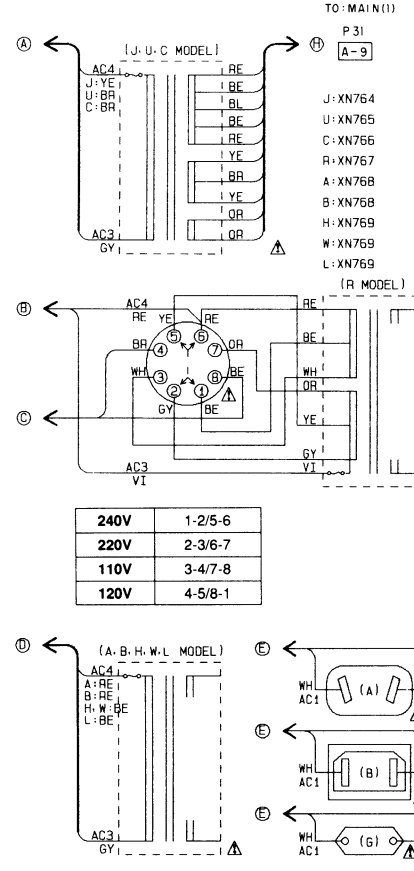
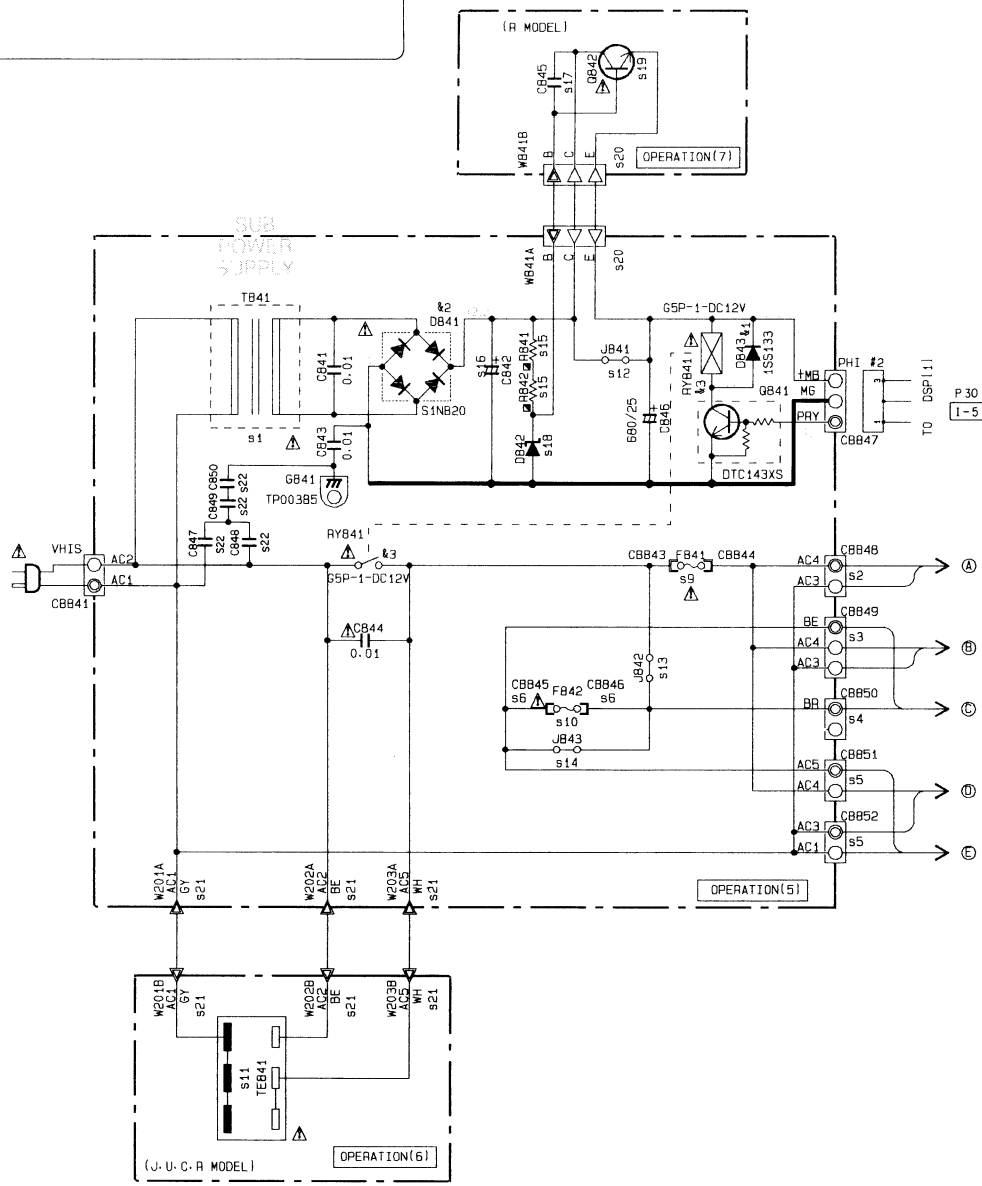
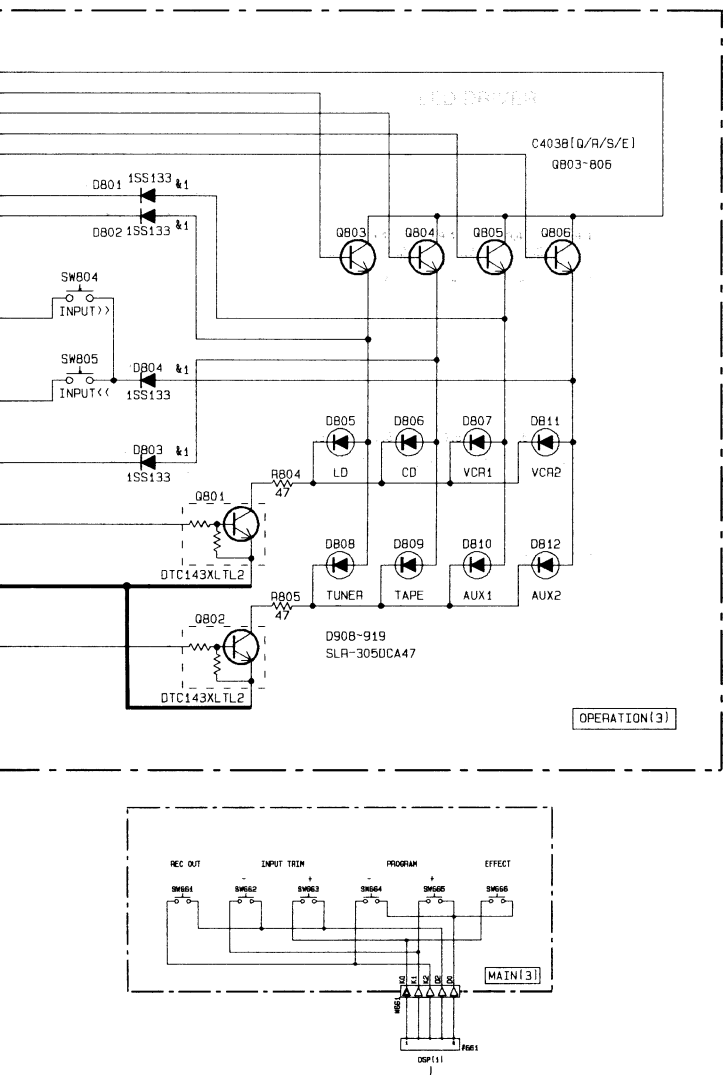
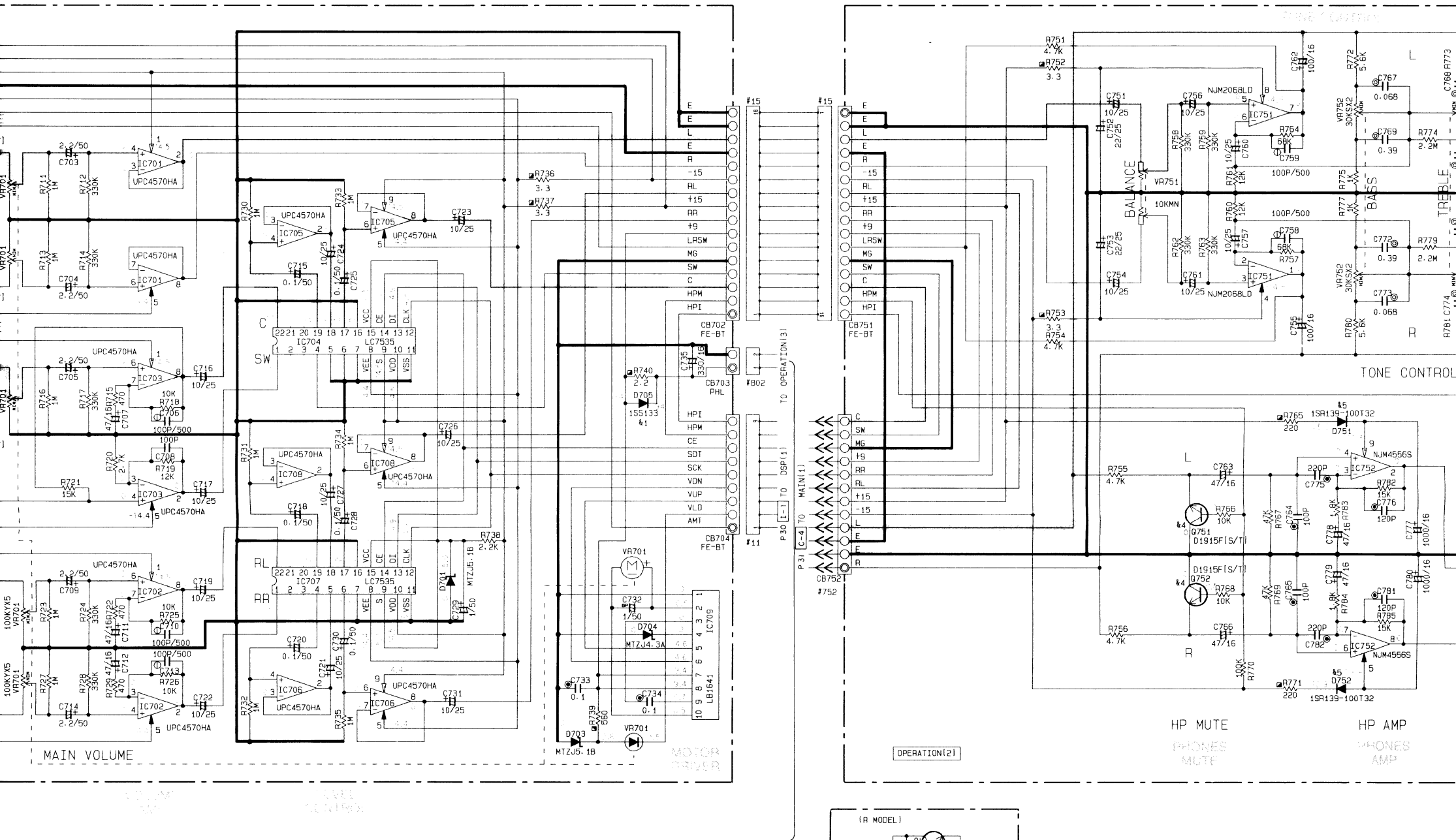
# SCHEMATIC DIAGRAM (OPERATION)



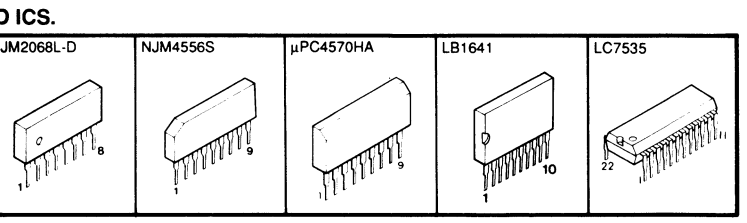
## PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICs.

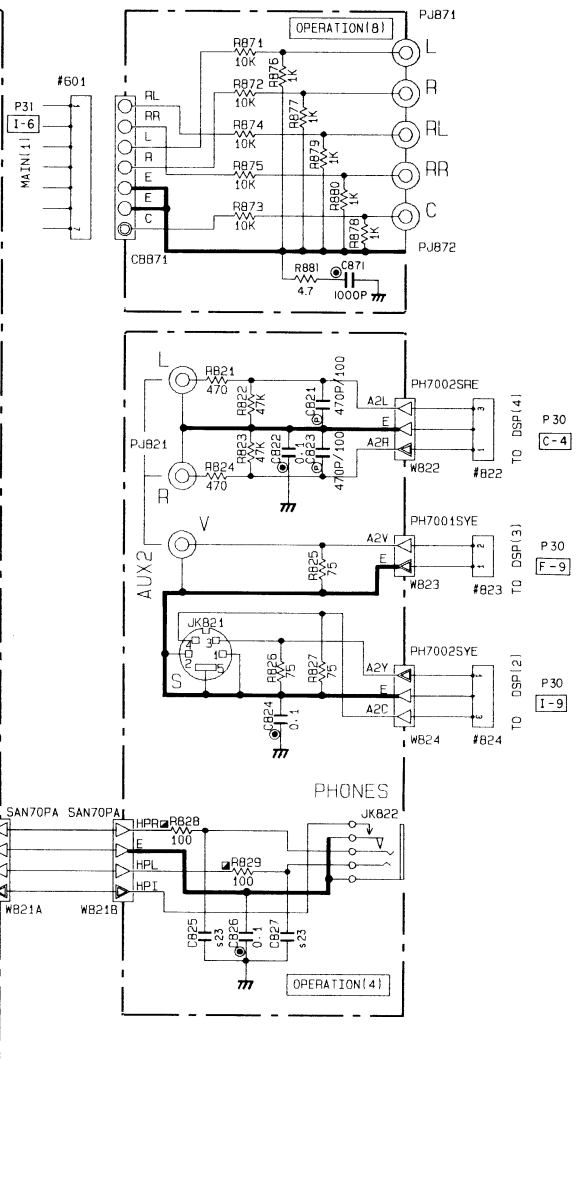
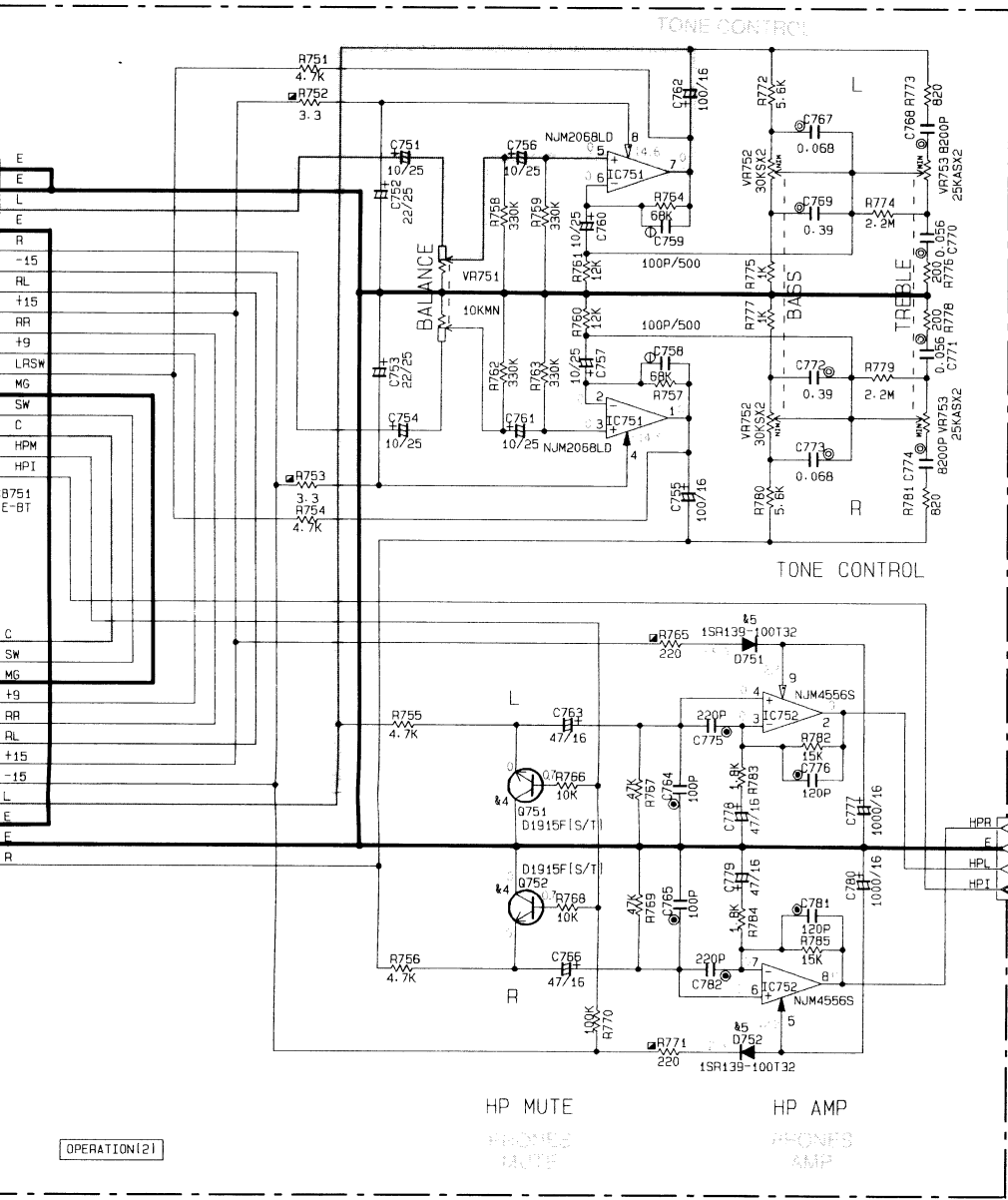
<b>2SD1915 (F) S, T</b> <b>DTC143XS</b> 	<b>DTC143XLT2</b> <b>2SC4038 (Q, R, S, E)</b> 	<b>1SS133</b> <b>1SR139-100</b> <b>MTZJ4.3A</b> <b>MTZJ5.1B</b> <b>MTZJ13.0A</b> 	<b>SINB20</b> 	<b>NJM2068L-D</b> 	<b>NJM4556S</b> 	<b>μPC4570HA</b> 	<b>LB1641</b> 	<b>LC7535</b> 
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ATION)

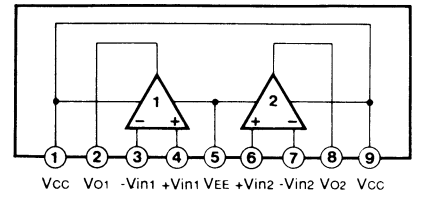


240V	1-2/5-6
220V	2-3/6-7
110V	3-4/7-8
120V	4-5/8-1

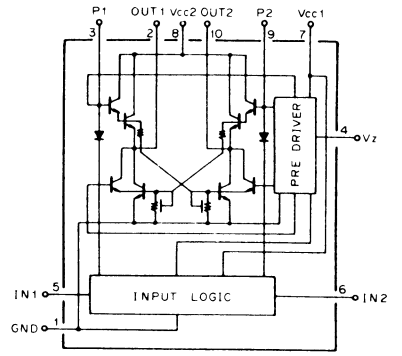




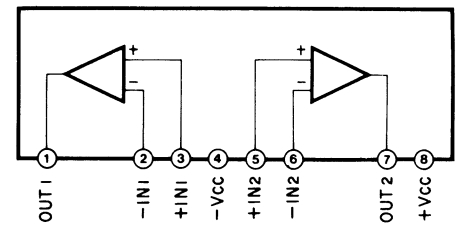
IC752 : NJM4558S  
IC701~703, 705, 706, 708 :  $\mu$ PC4570HA  
Dual OP-Amp



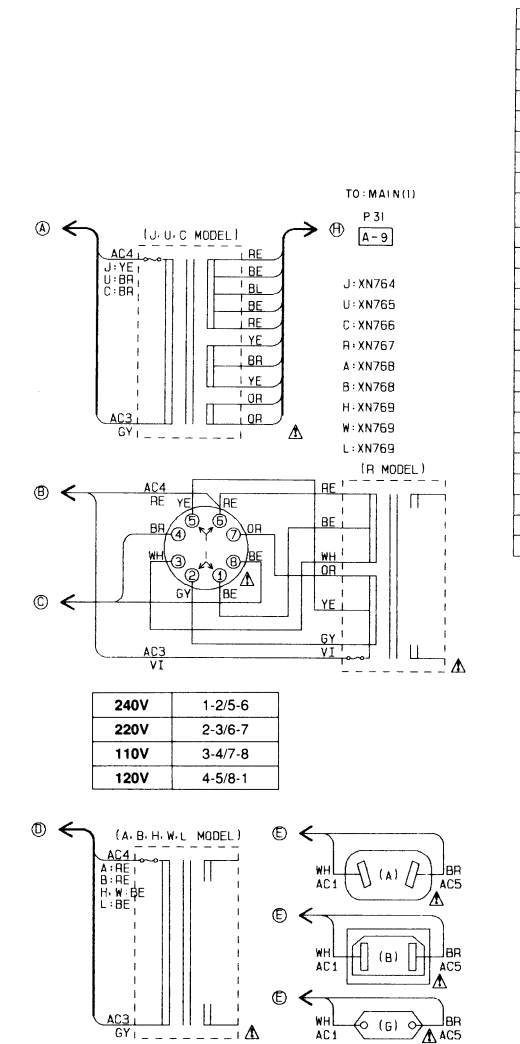
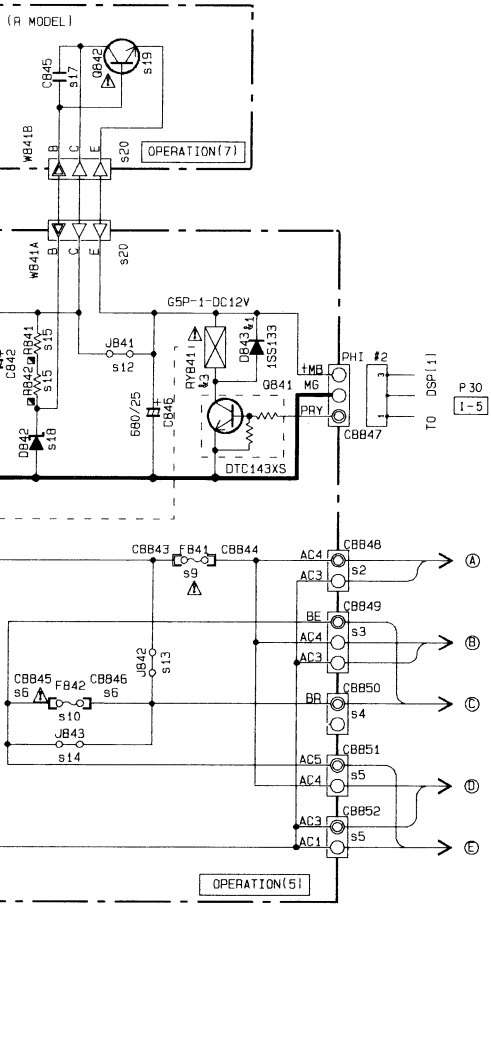
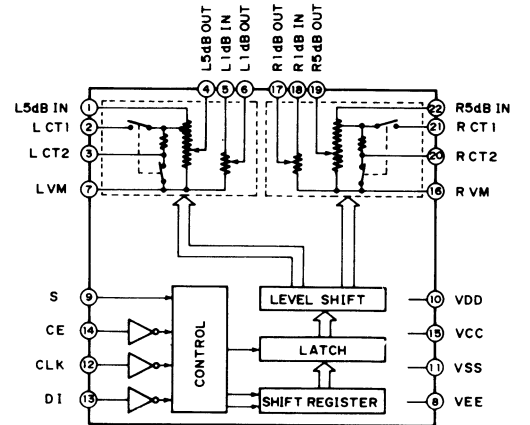
IC709 : LB1641  
Motor Driver



IC751 : NJM2068L-D  
Dual OP-Amp



IC704, 707 : LC7535  
Electric Controlled Volume



P.C.B. OPERATION

s	RefN	J	U.C	R	A.B	H.W.L
1	T841	XC332	XC116	XC115	XC117	XK354
2	CB848	LA00214	LA00214	x	x	x
3	CB849	x	x	LA00215	x	x
4	CB850	x	x	LA00211	x	x
5	CB851-852	x	x	x	LA00214	LA00214
6	CB845-846	x	x	VP20650	x	VP20650
7						
8						
9	F841	(KB0012B) 6A250V	(KB00125) 6A250V	(KB0012B) 6A250V	(KB00076) T3-15A250V	(KB00076) T3-15A250V
10	F842	x	x	T3-15A250V	x	T2-5A250V
11	TE841	VP92400	VP92400	VP92400	x	x
12	JB41	O	O	x	O	O
13	JB42	x	x	x	O	O
14	JB43	x	x	x	O	x
15	RB41-842	x	x	5.6K	x	x
16	CB42	x	x	47/63	x	x
17	CB45	x	x	1000P	x	x
18	DB42	x	x	MTZJ13A	x	x
19	QB42	x	x	D2396 [J/K]	x	x
20	WB41	x	x	O	x	x
21	W201-203	O	O	O	x	x
22	CB47-850	x	4700P/400	x	x	4700/400
23	CB25,827	1000P	1000P	1000P	1000P	4700P
PWB		XN657	XN658	XN659	XN660	XN661
PCB		VR39350	VR39360	VR39370	VR39380	VR39390

Interchangeable Parts at Manufacture-Stage

Mark	Reference Parts Number	Parts Name
k1	D705-801-804-843	1SR133 HSS104TD
k2	DB41	SINB20 DF02M
k3	RY841	G5P-1-DC12V DG1201-01M
k4	Q701-703, 751-752	2SC2878(A/B) 2SD1915F[S/T]
k5	D751-752	1SR139-100T32 11ES4 TE1

All voltage are measured with a 10M $\Omega$ /V DC electric volt meter.  
 \* Components having special characteristics are marked  $\Delta$  and must be replaced with parts having specifications equal to those originally installed.  
 \* Schematic diagram is subject to change without notice.

# PARTS LIST

## ■ ELECTRICAL PARTS

### ■ WARNING

Components having special characteristics are marked  $\triangle$  and must be replaced with parts having specifications equal to those originally installed.

- Carbon resistors (1/6W or 1/4W) are not included in the ELECTRICAL PARTS List. For the parts No. of the carbon resistors, refer to last page.

### ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS :

C.A.EL.CHP	: CHIP ALUMI. ELECTROLYTIC CAP	L.EMIT	: LIGHT EMITTING MODULE
C.CE	: CERAMIC CAP	LED.DSPLY	: LED DISPLAY
C.CE.ARRAY	: CERAMIC CAP ARRAY	LED.INFRD	: LED, INFRARED
C.CE.CHP	: CHIP CERAMIC CAP	MODUL.RF	: MODULATOR, RF
C.CE.ML	: MULTILAYER CERAMIC CAP	PHOT.CPL	: PHOTO COUPLER
C.CE.M.CHP	: CHIP MULTILAYER CERAMIC CAP	PHOT.INTR	: PHOTO INTERRUPTER
C.CE.SAFTY	: RECOGNIZED CERAMIC CAP	PHOT.RFLCT	: PHOTO REFLECTOR
C.CE.TUBLR	: CERAMIC TUBULAR CAP	PIN.TEST	: PIN, TEST POINT
C.CE.SMI	: SEMI CONDUCTIVE CERAMIC CAP	PLST.RIVET	: PLASTIC RIVET
C.EL	: ELECTROLYTIC CAP	R.ARRAY	: RESISTOR ARRAY
C.MICA	: MICA CAP	R.CAR	: CARBON RESISTOR
C.ML.FLM	: MULTILAYER FILM CAP	R.CAR.CHP	: CHIP RESISTOR
C.MP	: METALLIZED PAPER CAP	R.CAR.FP	: FLAME PROOF CARBON RESISTOR
C.MYLAR	: MYLAR FILM CAP	R.FUS	: FUSABLE RESISTOR
C.MYLAR.ML	: MULTILAYER MYLAR FILM CAP	R.MTL.CHP	: CHIP METAL FILM RESISTOR
C.PAPER	: PAPER CAPACITOR	R.MTL.FLM	: METAL FILM RESISTOR
C.PLS	: POLYSTYRENE FILM CAP	R.MTL.OXD	: METAL OXIDE FILM RESISTOR
C.POL	: POLYESTER FILM CAP	R.MTL.PLAT	: METAL PLATE RESISTOR
C.POLY	: POLYETHYLENE FILM CAP	RSNR.CE	: CERAMIC RESONATOR
C.PP	: POLYPROPYLENE FILM CAP	RSNR.CRYS	: CRYSTAL RESONATOR
C.TNTL	: TANTALUM CAP	R.TW.CEM	: TWIN CEMENT FIXED RESISTOR
C.TNTL.CHP	: CHIP TANTALUM CAP	R.WW	: WIRE WOUND RESISTOR
C.TRIM	: TRIMMER CAP	SCR.BND.HD	: BIND HEAD B-TITE SCREW
CN	: CONNECTOR	SCR.BW.HD	: BW HEAD TAPPING SCREW
CN.BS.PIN	: CONNECTOR, BASE PIN	SCR.CUP	: CUP TITE SCREW
CN.CANNON	: CONNECTOR, CANNON	SCR.TERM	: SCREW TERMINAL
CN.DIN	: CONNECTOR, DIN	SCR.TR	: SCREW, TRANSISTOR
CN.FLAT	: CONNECTOR, FLAT CABLE	SUPRT.PCB	: SUPPORT, P.C.B.
CN.POST	: CONNECTOR, BASE POST	SURG.PRTCT	: SURGE PROTECTOR
COIL.MX.AM	: COIL, AM MIX	SW.TACT	: TACT SWITCH
COIL.AT.FM	: COIL, FM ANTENNA	SW.LEAF	: LEAF SWITCH
COIL.DT.FM	: COIL, FM DETECT	SW.LEVER	: LEVER SWITCH
COIL.MX.FM	: COIL, FM MIX	SW.MICRO	: MICRO SWITCH
COIL.OUTPT	: OUTPUT COIL	SW.PUSH	: PUSH SWITCH
DIOD.ARRAY	: DIODE ARRAY	SW.RT.ENC	: ROTARY ENCODER
DIODE.BRG	: DIODE BRIDGE	SW.RT.MTR	: ROTARY SWITCH WITH MOTOR
DIODE.CHP	: CHIP DIODE	SW.RT	: ROTARY SWITCH
DIODE.VAR	: VARACTOR DIODE	SW.SLIDE	: SLIDE SWITCH
DIOD.Z.CHP	: CHIP ZENER DIODE	TERM.SP	: SPEAKER TERMINAL
DIODE.ZENR	: ZENER DIODE	TERM.WRAP	: WRAPPING TERMINAL
DSCR.CE	: CERAMIC DISCRIMINATOR	THRMST.CHP	: CHIP THERMISTOR
FER.BEAD	: FERRITE BEADS	TR.CHP	: CHIP TRANSISTOR
FER.CORE	: FERRITE CORE	TR.DGT	: DIGITAL TRANSISTOR
FET.CHP	: CHIP FET	TR.DGT.CHP	: CHIP DIGITAL TRANSISTOR
FL.DSPLY	: FLUORESCENT DISPLAY	TRANS	: TRANSFORMER
FLTR.CE	: CERAMIC FILTER	TRANS.PULS	: PULSE TRANSFORMER
FLTR.COMB	: COMB FILTER MODULE	TRANS.PWR	: POWER TRANSFORMER ASS'y
FLTR.LC.RF	: LC FILTER, EMI	TUNER.AM	: TUNER PACK, AM
GND.MTL	: GROUND PLATE	TUNER.FM	: TUNER PACK, FM
GND.TERM	: GROUND TERMINAL	TUNER.PK	: FRONT-END TUNER PACK
HOLDER.FUS	: FUSE HOLDER	VR	: ROTARY POTENTIOMETER
IC.PRTCT	: IC PROTECTOR	VR.MTR	: POTENTIOMETER WITH MOTOR
JUMPER.CN	: JUMPER CONNECTOR	VR.SW	: POTENTIOMETER WITH ROTARY SW
JUMPER.TST	: JUMPER, TEST POINT	VR.SLIDE	: SLIDE POTENTIOMETER
L.DTCT	: LIGHT DETECTING MODULE	VR.TRIM	: TRIMMER POTENTIOMETER

Note) Those parts marked with "#" are not included in the P.C.B. ass'y.

P. C. B. DSP

Schm Ref.	PART NO.	Description		
* VR396000	P. C. B.	DSP (UC)		
* VR396100	P. C. B.	DSP (R)		
* VR396200	P. C. B.	DSP (AB)		
* VR396300	P. C. B.	DSP (HW)		
* VR909300	P. C. B.	DSP (L)		
* CB1	VP361600	CN. BS. PIN	24P	
CB2	VN923100	CN	FE	10P TE
* CB3	VP360100	CN. BS. PIN	9P	
CB4	VB858800	CN. BS. PIN	9P	
CB5	VB858100	CN. BS. PIN	2P (RAB)	
CB6	VB858200	CN. BS. PIN	3P (HWL)	
CB7	VB858600	CN. BS. PIN	7P	
CB201	VB858200	CN. BS. PIN	3P	
CB202	VN923700	CN	FE	16P TE
CB203	VN923100	CN	FE	10P TE
CB301	VB858100	CN. BS. PIN	2P	
CB302	VN923700	CN	FE	16P TE
* CB351	VN924500	CN	24P	
CB352	VB858200	CN. BS. PIN	3P	
C1	UA655100	C. MYLAR	0. 1uF	50V
C2	UA655100	C. MYLAR	0. 1uF	50V
C3	UT452470	C. PP	470pF	100V
C4	UT452470	C. PP	470pF	100V
C5	UT452470	C. PP	470pF	100V
C6	UT452470	C. PP	470pF	100V
C7	UT452470	C. PP	470pF	100V
C8	UT452470	C. PP	470pF	100V
C9	UT452470	C. PP	470pF	100V
C10	UT452470	C. PP	470pF	100V
C11	Vi845200	C. EL	4. 7uF	50V
C12	UT452100	C. PP	100pF	100V
C13	UT452100	C. PP	100pF	100V
C14	Vi845200	C. EL	4. 7uF	50V
C15	VH620800	C. EL	47uF	25V
C16	Vi845600	C. EL	47uF	50V
C17	FU351220	C. MICA	22pF	500V
C18	FU351220	C. MICA	22pF	500V
C19	Vi845600	C. EL	47uF	50V
C20	VH620800	C. EL	47uF	25V
C21	UT452100	C. PP	100pF	100V
C22	Vi845900	C. EL	10uF	63V
C23	Vi845900	C. EL	10uF	63V
C24	Vi845900	C. EL	10uF	63V
C25	Vi845900	C. EL	10uF	63V
C26	Vi845900	C. EL	10uF	63V
C27	UA655150	C. MYLAR	0. 15uF	50V
C28	VH053100	C. CE. TUBLR	0. 1uF	50V
C29	VH053100	C. CE. TUBLR	0. 1uF	50V
C30	UT452270	C. PP	270pF	100V
C31	UT452270	C. PP	270pF	100V
C32	VF467300	C. CE. TUBLR	0. 01uF	16V
C33	VG278800	C. CE. TUBLR	560pF	50V
C34	VG278800	C. CE. TUBLR	560pF	50V

Schm Ref.	PART NO.	Description		
C35	VF467300	C. CE. TUBLR	0. 01uF	16V
C36	Vi845600	C. EL	47uF	50V
C38	Vi845600	C. EL	47uF	50V
C39	Vi845900	C. EL	10uF	63V
C40	Vi845900	C. EL	10uF	63V
C41	Vi845600	C. EL	47uF	50V
C42	Vi845600	C. EL	47uF	50V
C43	Vi845600	C. EL	47uF	50V
C44	UA653120	C. MYLAR	1200pF	50V
C45	UA653120	C. MYLAR	1200pF	50V
C46	Vi846000	C. EL	22uF	63V
C47	UT452330	C. PP	330pF	100V
C48	Vi846000	C. EL	22uF	63V
C49	UT452330	C. PP	330pF	100V
C50	UT452330	C. PP	330pF	100V
C51	Vi846000	C. EL	22uF	63V
C52	VG280000	C. CE. TUBLR	8200pF	16V
C53	VG280000	C. CE. TUBLR	8200pF	16V
C54	VG279800	C. CE. TUBLR	5600pF	16V
C55	VG278600	C. CE. TUBLR	330pF	50V
C56	VF467100	C. CE. TUBLR	4700pF	16V
C57	VG278600	C. CE. TUBLR	330pF	50V
C58	VF467100	C. CE. TUBLR	4700pF	16V
C59	VG279800	C. CE. TUBLR	5600pF	16V
C60	UA653330	C. MYLAR	3300pF	50V
C61	FG212150	C. CE	150pF	50V
C62	FG212150	C. CE	150pF	50V
C63	UA653330	C. MYLAR	3300pF	50V
C64	Vi846000	C. EL	22uF	63V
C65	Vi846000	C. EL	22uF	63V
C66	Vi846000	C. EL	22uF	63V
C67	Vi846000	C. EL	22uF	63V
C68	Vi846000	C. EL	22uF	63V
C69	Vi845900	C. EL	10uF	63V
C70	VG277000	C. CE. TUBLR	33pF	50V
C71	VF466600	C. CE. TUBLR	10pF	50V
C72	VF466600	C. CE. TUBLR	10pF	50V
C73	VG277000	C. CE. TUBLR	33pF	50V
C74	Vi845900	C. EL	10uF	63V
C75	VG277000	C. CE. TUBLR	33pF	50V
C76	VF466700	C. CE. TUBLR	47pF	50V
C77	VF466700	C. CE. TUBLR	47pF	50V
C78	VG277000	C. CE. TUBLR	33pF	50V
C79	UA653220	C. MYLAR	2200pF	50V
C80	Vi846000	C. EL	22uF	63V
C81	UA652820	C. MYLAR	820pF	50V
C82	FG212120	C. CE	120pF	50V
C83	FG212120	C. CE	120pF	50V
C84	UA652820	C. MYLAR	820pF	50V
C85	Vi846000	C. EL	22uF	63V
C86	UA653220	C. MYLAR	2200pF	50V
C87	VG279600	C. CE. TUBLR	3300pF	16V
C88	FZ005880	C. CE. ML	0. 1uF	25V

\* New Parts

\* New Parts

P. C. B. DSP

Schm Ref.	PART NO.	Description		
C89	Vi845600	C. EL	47uF	50V
C90	Vi845600	C. EL	47uF	50V
C91	Vi845600	C. EL	47uF	50V
C92	VG279600	C. CE. TUBLR	3300pF	16V
C93	VH053100	C. CE. TUBLR	0. 1uF	50V
C94	Vi842800	C. EL	330uF	16V
C95	Vi845600	C. EL	47uF	50V
C97	Vi845600	C. EL	47uF	50V
C98	Vi845600	C. EL	47uF	50V
C99	FZ005880	C. CE. ML	0. 1uF	25V
C100	Vi841900	C. EL	220uF	10V
C101	VH053100	C. CE. TUBLR	0. 1uF	50V
C102	Vi845600	C. EL	47uF	50V
C103	FZ005880	C. CE. ML	0. 1uF	25V
C104	FZ005880	C. CE. ML	0. 1uF	25V
C105	Vi845600	C. EL	47uF	50V
C106	VF466600	C. CE. TUBLR	10pF	50V
C107	VH053100	C. CE. TUBLR	0. 1uF	50V
C108	VH053100	C. CE. TUBLR	0. 1uF	50V
C109	VH053100	C. CE. TUBLR	0. 1uF	50V
C110	VF467300	C. CE. TUBLR	0. 01uF	16V
C113	VH053100	C. CE. TUBLR	0. 1uF	50V
C115	Vi844800	C. EL	0. 47uF	50V
C116	Vi845900	C. EL	10uF	63V
C117	VH053100	C. CE. TUBLR	0. 1uF	50V
C127	VH053100	C. CE. TUBLR	0. 1uF	50V
C128	VE632800	C. EL	0. 047F	5. 5V
C129	Vi845600	C. EL	47uF	50V
C130	VK180500	C. EL	2200uF	16V
C133	Vi844800	C. EL	0. 47uF	50V
C134	Vi844900	C. EL	1uF	50V
C135	Vi844800	C. EL	0. 47uF	50V
C201	VF466800	C. CE. TUBLR	100pF	50V
C202	VF466800	C. CE. TUBLR	100pF	50V
C203	VF466800	C. CE. TUBLR	100pF	50V
C204	VF466800	C. CE. TUBLR	100pF	50V
C205	VF466800	C. CE. TUBLR	100pF	50V
C206	VF466800	C. CE. TUBLR	100pF	50V
C207	VG279600	C. CE. TUBLR	3300pF	16V
C208	Vi845900	C. EL	10uF	63V
C209	Vi841400	C. EL	1000uF	6. 3V
C210	Vi845900	C. EL	10uF	63V
C211	Vi841400	C. EL	1000uF	6. 3V
C212	Vi845900	C. EL	10uF	63V
C213	Vi841400	C. EL	1000uF	6. 3V
C214	Vi845900	C. EL	10uF	63V
C215	Vi845900	C. EL	10uF	63V
C216	Vi845900	C. EL	10uF	63V
C217	Vi845900	C. EL	10uF	63V
C218	Vi845600	C. EL	47uF	50V
C219	Vi845600	C. EL	47uF	50V
C220	VG279000	C. CE. TUBLR	820pF	50V
C221	Vi841300	C. EL	470uF	6. 3V

\* New Parts

Schm Ref.	PART NO.	Description		
C222	Vi845600	C. EL	47uF	50V
C223	VH053100	C. CE. TUBLR	0. 1uF	50V
C224	VH053100	C. CE. TUBLR	0. 1uF	50V
C225	VG277000	C. CE. TUBLR	33pF	50V
C226	VH620800	C. EL	47uF	25V
C227	VH620800	C. EL	47uF	25V
C228	VG277000	C. CE. TUBLR	33pF	50V
C229	VG276600	C. CE. TUBLR	22pF	50V
C230	VG276600	C. CE. TUBLR	22pF	50V
C231	Vi845200	C. EL	4. 7uF	50V
C232	VG278100	C. CE. TUBLR	120pF	50V
C233	VF467300	C. CE. TUBLR	0. 01uF	16V
C234	Vi845600	C. EL	47uF	50V
C235	VG279000	C. CE. TUBLR	820pF	50V
C236	Vi845900	C. EL	10uF	63V
C237	Vi841200	C. EL	330uF	6. 3V
C238	VG278400	C. CE. TUBLR	220pF	50V
C239	Vi845900	C. EL	10uF	63V
C240	VG277000	C. CE. TUBLR	33pF	50V
C241	VF466900	C. CE. TUBLR	470pF	50V
C242	Vi845200	C. EL	4. 7uF	50V
C243	VH053100	C. CE. TUBLR	0. 1uF	50V
C301	VF466800	C. CE. TUBLR	100pF	50V
C302	VF466800	C. CE. TUBLR	100pF	50V
C303	VF466800	C. CE. TUBLR	100pF	50V
C304	Vi841400	C. EL	1000uF	6. 3V
C305	Vi841400	C. EL	1000uF	6. 3V
C306	Vi841400	C. EL	1000uF	6. 3V
C307	Vi845900	C. EL	10uF	63V
C308	Vi845600	C. EL	47uF	50V
C309	Vi845900	C. EL	10uF	63V
C310	Vi845600	C. EL	47uF	50V
C351	UT452470	C. PP	470pF	100V
C352	UT452470	C. PP	470pF	100V
C353	UT452470	C. PP	470pF	100V
C354	UT452470	C. PP	470pF	100V
C355	UT452470	C. PP	470pF	100V
C356	UT452470	C. PP	470pF	100V
C357	UT452470	C. PP	470pF	100V
C358	UT452470	C. PP	470pF	100V
C359	UT452470	C. PP	470pF	100V
C360	UT452470	C. PP	470pF	100V
C361	UT452470	C. PP	470pF	100V
C362	UT452470	C. PP	470pF	100V
C363	Vi845600	C. EL	47uF	50V
C364	Vi845600	C. EL	47uF	50V
D1	VG437400	DIODE. ZENR	MTZJ5. 1B	5. 1 V
D2	iF004600	DIODE	1SS133	
D3	iF004600	DIODE	1SS133	
D4	iF004600	DIODE	1SS133	
D5	iF004600	DIODE	1SS133	
D6	iF004600	DIODE	1SS133	
D7	iF004600	DIODE	1SS133	

\* New Parts

DSP-A780



P. C. B. DSP

Schm Ref.	PART NO.	Description
D8	iF004600	DIODE 1SS133
D9	iF004600	DIODE 1SS133
D10	iF004600	DIODE 1SS133
D13	iF004600	DIODE 1SS133
D14	iF004600	DIODE 1SS133
D15	iF004600	DIODE 1SS133
D16	iF004600	DIODE 1SS133
D17	iF004600	DIODE 1SS133
D18	VG438200	DIODE. ZENR MTZJ6. 8A 6. 8V
D19	iF004600	DIODE 1SS133
D20	iF004600	DIODE 1SS133
D21	iF004600	DIODE 1SS133
D22	VH770800	DIODE 1SR139-100
D23	iF004600	DIODE 1SS133
D201	iF004600	DIODE 1SS133
D202	iF004600	DIODE 1SS133
D203	iF004600	DIODE 1SS133
D204	VG435100	DIODE. ZENR MTZJ2B 2. 0V
D205	iF004600	DIODE 1SS133
D206	iF004600	DIODE 1SS133
D207	iF004600	DIODE 1SS133
D208	iF004600	DIODE 1SS133
D209	iF004600	DIODE 1SS133
* IC1	XN493A00	IC HD6433238
IC2	XL816A00	IC YSS223-K
* IC3	XN667A00	IC TC51832SPL-10 PS-R
IC4	XM356A00	IC NJM2068LD
IC5	XM356A00	IC NJM2068LD
IC6	XB247301	IC uPC4570HA
IC7	XB247301	IC uPC4570HA
* IC8	XN796A00	IC NJM2082L
IC9	XB247301	IC uPC4570HA
* IC10	XN796A00	IC NJM2082L
IC11	XB247301	IC uPC4570HA
IC12	XB247301	IC uPC4570HA
IC13	XB247301	IC uPC4570HA
IC14	XB247301	IC uPC4570HA
IC15	XB247301	IC uPC4570HA
IC16	XG758A00	IC LC7823N
IC17	XB247301	IC uPC4570HA
* IC18	Xi358A00	IC NJM2904L
IC19	XA507A00	IC AN78N05
IC20	XJ757A00	IC NJM78L05A-T3
IC201	XA053A00	IC TC4052BP
IC202	XA053A00	IC TC4052BP
IC203	Xi109C00	IC MC14576BP
IC204	Xi109C00	IC MC14576BP
IC205	iG001720	IC TC4069UBP
IC206	iG142200	IC TC74HCU04AP
IC207	XL314A00	IC M35010-062SP
IC208	iR405300	IC TC74HC4053AP
IC209	iG055100	IC TC4053BP
IC301	iG001770	IC TC4051BP

Schm Ref.	PART NO.	Description
IC302	XL493A00	IC TC74HC4051AP
IC303	iR405300	IC TC74HC4053AP
IC304	Xi109C00	IC MC14576BP
IC351	XG732A00	IC LC7821N
IC352	XG732A00	IC LC7821N
IC353	XG758A00	IC LC7823N
JK201	VN938100	CN. DIN 3P S
JK202	VP113600	CN. DIN 2P YKF51-5510
* JK203	VQ960400	JACK. DIN 1P
L201	VM703900	COIL 15uH
PJ1	VJ696300	JACK. PIN 4P
PJ2	VJ696300	JACK. PIN 4P
PJ301	VM750500	JACK. PIN 4P
PJ302	VJ695900	JACK. PIN 3P
PJ351	VJ696300	JACK. PIN 4P
PJ352	VJ696300	JACK. PIN 4P
PJ353	VJ696300	JACK. PIN 4P
Q1	VK432900	TR 2SD1915F S, T
Q2	VK432900	TR 2SD1915F S, T
Q3	VK432900	TR 2SD1915F S, T
Q4	VK432900	TR 2SD1915F S, T
Q5	iA093320	TR 2SA933S Q, R
Q6	VG722000	TR. DGT DTC144ES
Q7	iC260320	TR 2SC2603 E, F
Q8	iC260320	TR 2SC2603 E, F
Q9	iC260320	TR 2SC2603 E, F
Q10	VH964100	TR. DGT DTA143ES
Q11	VH964100	TR. DGT DTA143ES
Q12	VH964100	TR. DGT DTA143ES
Q201	VH964100	TR. DGT DTA143ES
Q202	VK432900	TR 2SD1915F S, T
Q203	iC260320	TR 2SC2603 E, F
Q204	iC260320	TR 2SC2603 E, F
Q205	iC260320	TR 2SC2603 E, F
Q206	iC260320	TR 2SC2603 E, F
Q207	iC260320	TR 2SC2603 E, F
Q208	VD678700	TR. DGT DTC114ES
Q209	iC260320	TR 2SC2603 E, F
Q210	iC260320	TR 2SC2603 E, F
Q211	iA101521	TR 2SA1015 Y
Q212	iC053540	TR 2SC535 A, B, C
Q213	iC224030	TR 2SC2240 GR, BL
Q214	iC224030	TR 2SC2240 GR, BL
Q301	iC260320	TR 2SC2603 E, F
R50	HV453220	R. CAR. FP 2. 2Ω 1/4W
R62	HV453220	R. CAR. FP 2. 2Ω 1/4W
R116	HL314680	R. MTL. OXD 68Ω 1W
R131	HV453680	R. CAR. FP 6. 8Ω 1/4W
R132	HV453220	R. CAR. FP 2. 2Ω 1/4W
R227	HV455180	R. CAR. FP 180Ω 1/4W
R228	HV455180	R. CAR. FP 180Ω 1/4W
R231	HV455150	R. CAR. FP 150Ω 1/4W
R232	HV455150	R. CAR. FP 150Ω 1/4W

\* New Parts

\* New Parts

**P. C. B. DSP & MAIN**

Schm Ref.	PART NO.	Description
R233	HV455150	R. CAR. FP 150 Ω 1/4W
R235	HV455150	R. CAR. FP 150 Ω 1/4W
R310	HV455150	R. CAR. FP 150 Ω 1/4W
R311	HV455150	R. CAR. FP 150 Ω 1/4W
SW1	VM619700	SW. SLIDE SSSS92(R)
XL1	VK175200	RSNR. CE 11.28MHz
* XL2	VQ791000	RSNR. CE 10MHz
XL201	VD980900	RSNR. CRY3 14.3181MHz (RL)
XL201	VF066800	RSNR. CRY3 17.7344MHz (ABHW)
	BB071360	SCR. TERM 8.3x13
	VB966900	CN IMSA-6024
	VQ441400	GND. MTL

\* New Parts

Schm Ref.	PART NO.	Description
*	VR392900	P. C. B. MAIN(UC)
*	VR393000	P. C. B. MAIN(AB)
*	VR393100	P. C. B. MAIN(R)
*	VR393200	P. C. B. MAIN(HL)
*	VR393300	P. C. B. MAIN(W)
	CB401	LA002110 TERM. WRAP 2P
	CB402	LA002140 TERM. WRAP 2P
	CB403	LA002140 TERM. WRAP 2P
	CB404	LA002330 TERM. WRAP 4P
	CB406	VD004800 CN. BS. PIN 5P
	CB408	VD004700 CN. BS. PIN 4P
	CB409	VP206500 HOLDER. FUS EYF-52BC
	CB410	VP206500 HOLDER. FUS EYF-52BC
	CB411	VP206500 HOLDER. FUS EYF-52BC
	CB412	VP206500 HOLDER. FUS EYF-52BC
	C401	Vi845600 C. EL 47uF 50V
	C402	Vi845900 C. EL 10uF 63V
	C403	Vi845900 C. EL 10uF 63V
	C404	UA655100 C. MYLAR 0.1uF 50V
	C405	VK180800 C. EL 6800uF 16V
	C406	Vi862200 C. POLY 0.1uF 100V
	C407	UA655100 C. MYLAR 0.1uF 50V
	C408	VK180700 C. EL 4700uF 16V
	C409	Vi862200 C. POLY 0.1uF 100V
	C410	Vi862200 C. POLY 0.1uF 100V
	C411	Vi845900 C. EL 10uF 63V
	C412	Vi845900 C. EL 10uF 63V
	C413	Vi862200 C. POLY 0.1uF 100V
	C414	Vi862200 C. POLY 0.1uF 100V
	C415	Vi862200 C. POLY 0.1uF 100V
*	C416	VR499300 C. EL 4700uF 35V
*	C417	VR499300 C. EL 4700uF 35V
*	C418	VR499200 C. EL 8200uF 56V
*	C419	VR499200 C. EL 8200uF 56V
	C420	Vi844900 C. EL 1uF 50V
	C421	Vi845900 C. EL 10uF 63V
	C422	Vi845900 C. EL 10uF 63V
	C423	UT452680 C. PP 680pF 100V
	C424	UT453150 C. PP 1500pF 100V
	C425	Vi846200 C. EL 47uF 63V
	C426	Vi845900 C. EL 10uF 63V
	C427	Vi845900 C. EL 10uF 63V
	C428	UT452680 C. PP 680pF 100V
	C429	UT453150 C. PP 1500pF 100V
	C430	Vi846200 C. EL 47uF 63V
	C431	Vi845900 C. EL 10uF 63V
	C432	Vi845900 C. EL 10uF 63V
	C433	UT452680 C. PP 680pF 100V
	C434	UT453150 C. PP 1500pF 100V
	C435	Vi846200 C. EL 47uF 63V
	C436	Vi844800 C. EL 0.47uF 50V
	C437	FU351220 C. MICA 22pF 50OV
	C438	UT451470 C. PP 47pF 25OV

\* New Parts

DSP-A780

P. C. B. MAIN

Schm Ref.	PART NO.	Description		
C439	Vi845600	C. EL	47uF	50V
C440	UA654100	C. MYLAR	0.01uF	50V
C441	FU351220	C. MICA	22pF	500V
C442	UT451470	C. PP	47pF	250V
C443	Vi845600	C. EL	47uF	50V
C444	UA654100	C. MYLAR	0.01uF	50V
C445	FU351220	C. MICA	22pF	500V
C446	UT451470	C. PP	47pF	250V
C447	Vi845600	C. EL	47uF	50V
C448	UA654100	C. MYLAR	0.01uF	50V
C449	Vi844500	C. EL	0.1uF	50V
C450	FU452100	C. MICA	100pF	500V
* C451	Vi844100	C. EL	33uF	35V
C452	Vi844900	C. EL	1uF	50V
C453	UA654100	C. MYLAR	0.01uF	50V
C454	FU452100	C. MICA	100pF	500V
C455	Vi844500	C. EL	0.1uF	50V
C456	FU452100	C. MICA	100pF	500V
* C457	Vi844100	C. EL	33uF	35V
C458	Vi844900	C. EL	1uF	50V
C459	UA654100	C. MYLAR	0.01uF	50V
C460	FU452100	C. MICA	100pF	500V
C461	Vi844500	C. EL	0.1uF	50V
C462	FU452100	C. MICA	100pF	500V
* C463	Vi844100	C. EL	33uF	35V
C464	Vi844900	C. EL	1uF	50V
C465	UA654100	C. MYLAR	0.01uF	50V
C466	FU452100	C. MICA	100pF	500V
C467	Vi844900	C. EL	1uF	50V
C468	UA654470	C. MYLAR	0.047uF	50V
C469	UA654470	C. MYLAR	0.047uF	50V
C470	UA654470	C. MYLAR	0.047uF	50V
C471	Vi845900	C. EL	10uF	63V
C472	Vi845900	C. EL	10uF	63V
C473	Vi845900	C. EL	10uF	63V
C474	Vi845900	C. EL	10uF	63V
* C475	Vi843900	C. EL	10uF	35V
* C476	Vi843900	C. EL	10uF	35V
* C477	Vi843900	C. EL	10uF	35V
C478	Vi845200	C. EL	4.7uF	50V
* C479	Vi843900	C. EL	10uF	35V
* C480	Vi843900	C. EL	10uF	35V
C481	Vi845600	C. EL	47uF	50V
C482	UA653100	C. MYLAR	1000pF	50V
C483	Vi845600	C. EL	47uF	50V
C484	UA653100	C. MYLAR	1000pF	50V
C486	FU451100	C. MICA	10pF	500V
C487	Vi845600	C. EL	47uF	50V
* C488	Vi843900	C. EL	10uF	35V
C489	FU451100	C. MICA	10pF	500V
C490	Vi845600	C. EL	47uF	50V
* C491	Vi843900	C. EL	10uF	35V
* C492	Vi843900	C. EL	10uF	35V

Schm Ref.	PART NO.	Description		
* C493	Vi843900	C. EL	10uF	35V
C494	VH620800	C. EL	47uF	25V
C495	VH620800	C. EL	47uF	25V
C496	UT452100	C. PP	100pF	100V
C497	UA654100	C. MYLAR	0.01uF	50V
C498	UA654470	C. MYLAR	0.047uF	50V
C499	UT452100	C. PP	100pF	100V
C500	UT452100	C. PP	100pF	100V
C501	UA654100	C. MYLAR	0.01uF	50V
C502	UA654470	C. MYLAR	0.047uF	50V
C503	UT452100	C. PP	100pF	100V
C504	VK180400	C. EL	1000uF	16V
C505	VK180400	C. EL	1000uF	16V
C506	Vi845600	C. EL	47uF	50V
C507	Vi845600	C. EL	47uF	50V
C508	VF466700	C. CE. TUBLR	47pF	50V
C509	VF466700	C. CE. TUBLR	47pF	50V
C510	Vi862200	C. POLY	0.1uF	100V
C631	FG244220	C. CE	0.022uF	50V (HWL)
C632	FG244220	C. CE	0.022uF	50V (HWL)
C633	FG244220	C. CE	0.022uF	50V (HWL)
C634	FG244220	C. CE	0.022uF	50V (HWL)
C635	FG244220	C. CE	0.022uF	50V (HWL)
C636	UA654150	C. MYLAR	0.015uF	50V (HWL)
C637	UA654150	C. MYLAR	0.015uF	50V (HWL)
C638	UA654150	C. MYLAR	0.015uF	50V (HWL)
C639	UA654100	C. MYLAR	0.01uF	50V (HWL)
C640	UA654100	C. MYLAR	0.01uF	50V (HWL)
C661	VH053100	C. CE. TUBLR	0.1uF	50V
C662	VH053100	C. CE. TUBLR	0.1uF	50V
C663	VH053100	C. CE. TUBLR	0.1uF	50V
C664	VH053100	C. CE. TUBLR	0.1uF	50V
C665	VF466800	C. CE. TUBLR	100pF	50V
C666	VH053100	C. CE. TUBLR	0.1uF	50V
C667	VF467300	C. CE. TUBLR	0.01uF	16V
D401	iF004600	DIODE	1SS133	
D402	iF004600	DIODE	1SS133	
D403	VG437300	DIODE. ZENR	MTZJ5.1A	5.1V
* D404	VG443900	DIODE. ZENR	MTZJ33D	33V
* Δ D407	VR253700	DIODE. BRG	S1NB20	1.0A 200V
* Δ D408	iH001090	DIODE. BRG	S4VB20	2.6A 200V
D409	VN008700	DIODE	1SS270A	
D410	VN008700	DIODE	1SS270A	
D411	iF004600	DIODE	1SS133	
D412	iF004600	DIODE	1SS133	
D413	iF004600	DIODE	1SS133	
* Δ D414	iH001090	DIODE. BRG	S4VB20	2.6A 200V
D415	iF004600	DIODE	1SS133	
D416	iF004600	DIODE	1SS133	
D417	VC398400	DIODE	MA185	
D418	iF004600	DIODE	1SS133	
D419	iF004600	DIODE	1SS133	
D420	VC398400	DIODE	MA185	

\* New Parts

\* New Parts

**P. C. B. MAIN**

Schm Ref.	PART NO.	Description
D421	iF004600	DIODE 1SS133
D422	iF004600	DIODE 1SS133
D423	VC398400	DIODE MA185
D424	iF004600	DIODE 1SS133
D425	VG442500	DIODE. ZENR MTZJ24B 24V
D426	VG442500	DIODE. ZENR MTZJ24B 24V
D427	VG440800	DIODE. ZENR MTZJ15B 15V
D428	iF004600	DIODE 1SS133
D429	VG440800	DIODE. ZENR MTZJ15B 15V
D430	iF004600	DIODE 1SS133
D431	VH770800	DIODE 1SR139-100
D432	VH770800	DIODE 1SR139-100
D433	iF004600	DIODE 1SS133
D434	iF004600	DIODE 1SS133
D435	iF004600	DIODE 1SS133
D436	iF004600	DIODE 1SS133
D437	iF004600	DIODE 1SS133
D438	iF004600	DIODE 1SS133
D439	iF004600	DIODE 1SS133
D440	iF004600	DIODE 1SS133
D441	VG440300	DIODE. ZENR MTZJ12C 12V
D631	VP594000	LED (re) SLR-305VCA47 (HWL)
D661	VG439300	DIODE. ZENR MTZJ9.1C 9.1V
△ F401	KB003240	FUSE T5.0A 250V (ABRHWL)
△ F401	KB003640	FUSE T6.0A 125V (UC)
△ F402	KB003240	FUSE T5.0A 250V (ABRHWL)
△ F402	KB003640	FUSE T6.0A 125V (UC)
* G401	VR463400	TERM. GND φ 3.5 TP00385
* G661	VR463400	TERM. GND φ 3.5 TP00385
IC401	iG092000	IC M5220L
IC402	XJ603A00	IC NJM78M15FA
IC403	XG505A00	IC NJM79M15FA
IC404	XJ604A00	IC NJM78M05FA
IC405	XE436A00	IC NJM79M05FA
* IC661	XN173A00	IC M66004SP
L401	GD900470	COIL 1.5uH
L402	GD900470	COIL 1.5uH
L403	GD900470	COIL 1.5uH
L404	GD900470	COIL 1.5uH
L405	GD900470	COIL 1.5uH
PJ401	VK437600	JACK. PIN 1P
Q401	iB056020	TR 2SB560 E, F
Q402	VD678700	TR. DGT DTC114ES
Q403	iC174020	TR 2SC1740S R, S
Q404	VD488500	TR. DGT DTC143XS
Q405	VK432900	TR 2SD1915F S, T
Q406	VK432900	TR 2SD1915F S, T
Q407	VK432900	TR 2SD1915F S, T
Q408	VK432900	TR 2SD1915F S, T
Q409	VK432900	TR 2SD1915F S, T
Q410	iA097000	TR 2SA970 GR, BL
Q411	VK432900	TR 2SD1915F S, T
Q412	iA097000	TR 2SA970 GR, BL

\* New Parts

Schm Ref.	PART NO.	Description
Q413	VK432900	TR 2SD1915F S, T
Q414	iA097000	TR 2SA970 GR, BL
Q415	VK432900	TR 2SD1915F S, T
Q416	iA097000	TR 2SA970 GR, BL
Q417	iC1815C0	TR 2SC1815 Y
Q418	iC1815C0	TR 2SC1815 Y
Q419	VE198800	TR 2SC2705 O, Y
Q420	iA097000	TR 2SA970 GR, BL
Q421	iC1815C0	TR 2SC1815 Y
Q422	iC1815C0	TR 2SC1815 Y
Q423	VE198800	TR 2SC2705 O, Y
Q424	iA097000	TR 2SA970 GR, BL
Q425	iC1815C0	TR 2SC1815 Y
Q426	iC1815C0	TR 2SC1815 Y
Q427	VE198800	TR 2SC2705 O, Y
Q428	iA097000	TR 2SA970 GR, BL
△ Q429A	iX603580	TR 2SA1358
△ Q429C	iX603590	TR 2SC3421
Q430	iA101521	TR 2SA1015 Y
Q432	iA097000	TR 2SA970 GR, BL
△ Q433A	iX603580	TR 2SA1358
△ Q433C	iX603590	TR 2SC3421
Q434	iA101521	TR 2SA1015 Y
Q436	iA097000	TR 2SA970 GR, BL
△ Q437A	iX603580	TR 2SA1358
△ Q437C	iX603590	TR 2SC3421
Q438	iA101521	TR 2SA1015 Y
△ # Q440A	iX632650	TR 2SA1633 D, E, F
△ # Q440C	iX632660	TR 2SC4278 D, E, F
Q441	iC224030	TR 2SC2240 GR, BL
△ # Q443A	iX632650	TR 2SA1633 D, E, F
△ # Q443C	iX632660	TR 2SC4278 D, E, F
Q444	iC224030	TR 2SC2240 GR, BL
△ # Q446A	iX632650	TR 2SA1633 D, E, F
△ # Q446C	iX632660	TR 2SC4278 D, E, F
Q447	iC224030	TR 2SC2240 GR, BL
Q449	iA097000	TR 2SA970 GR, BL
△ Q450	iC1815C0	TR 2SC1815 Y
△ Q451	iA101521	TR 2SA1015 Y
Q452	iC224030	TR 2SC2240 GR, BL
Q453	iC224030	TR 2SC2240 GR, BL
△ Q454A	iX619590	TR 2SA1726 O, P, Y
△ Q454C	iX619600	TR 2SC4512 O, P, Y
△ Q455	iD043820	TR 2SD438 E, F
△ Q456	iB056020	TR 2SB560 E, F
△ Q458A	iX619590	TR 2SA1726 O, P, Y
△ Q458C	iX619600	TR 2SC4512 O, P, Y
△ Q459	iD043820	TR 2SD438 E, F
△ Q460	iB056020	TR 2SB560 E, F
Q462	iC224030	TR 2SC2240 GR, BL
Q463	iC224030	TR 2SC2240 GR, BL
△ * R406	HL315330	R. MTL. OXD 330 Ω 1W
△ R408	HV454100	R. CAR. FP 10 Ω 1/4W

\* New Parts

DSP-A780

P. C. B. MAIN

Schm Ref.	PART NO.	Description		
△ R418	HL315100	R. MTL. OXD	100 Ω	1W
△ R438	HV455220	R. CAR. FP	220 Ω	1/4W
△ R443	HV455220	R. CAR. FP	220 Ω	1/4W
△ R447	HV455220	R. CAR. FP	220 Ω	1/4W
R453	HV456680	R. CAR. FP	6.8K Ω	1/4W
R456	HV456680	R. CAR. FP	6.8K Ω	1/4W
△ R461	VK188700	R. FUS	560 Ω	1/4W
△ R462	HV455220	R. CAR. FP	220 Ω	1/4W
△ R463	HV455100	R. CAR. FP	100 Ω	1/4W
R465	HV456680	R. CAR. FP	6.8K Ω	1/4W
R468	HV456680	R. CAR. FP	6.8K Ω	1/4W
△ R473	VK188700	R. FUS	560 Ω	1/4W
△ R474	HV455220	R. CAR. FP	220 Ω	1/4W
△ R475	HV455100	R. CAR. FP	100 Ω	1/4W
R477	HV456680	R. CAR. FP	6.8K Ω	1/4W
R480	HV456680	R. CAR. FP	6.8K Ω	1/4W
△ R485	VK188700	R. FUS	560 Ω	1/4W
△ R486	HV455220	R. CAR. FP	220 Ω	1/4W
△ R487	HV455100	R. CAR. FP	100 Ω	1/4W
△ R494	VK188400	R. FUS	330 Ω	1/4W
△ R495	HV454470	R. CAR. FP	47 Ω	1/4W
△ R502	VK188400	R. FUS	330 Ω	1/4W
△ R503	HV454470	R. CAR. FP	47 Ω	1/4W
△ R510	VK188400	R. FUS	330 Ω	1/4W
△ R511	HV454470	R. CAR. FP	47 Ω	1/4W
R512	HV454470	R. CAR. FP	47 Ω	1/4W
△ R513	HV454330	R. CAR. FP	33 Ω	1/4W
△ R515	HV456330	R. CAR. FP	3.3K Ω	1/4W
△* R516	VR412900	R. MTL. OXD	0.1 Ω	3W
R517	HV456220	R. CAR. FP	2.2K Ω	1/4W
△ R518	HV453220	R. CAR. FP	2.2 Ω	1/4W
R519	HV453220	R. CAR. FP	2.2 Ω	1/4W
△ R520	HV453470	R. CAR. FP	4.7 Ω	1/4W
△ R521	HV454470	R. CAR. FP	47 Ω	1/4W
△ R522	HV454330	R. CAR. FP	33 Ω	1/4W
△ R524	HV456330	R. CAR. FP	3.3K Ω	1/4W
△* R525	VR412900	R. MTL. OXD	0.1 Ω	3W
R526	HV456220	R. CAR. FP	2.2K Ω	1/4W
△ R527	HV453220	R. CAR. FP	2.2 Ω	1/4W
R528	HV453220	R. CAR. FP	2.2 Ω	1/4W
△ R529	HV453470	R. CAR. FP	4.7 Ω	1/4W
△ R530	HV454470	R. CAR. FP	47 Ω	1/4W
△ R531	HV454330	R. CAR. FP	33 Ω	1/4W
△ R533	HV456330	R. CAR. FP	3.3K Ω	1/4W
△* R534	VR412900	R. MTL. OXD	0.1 Ω	3W
R535	HV456220	R. CAR. FP	2.2K Ω	1/4W
△ R536	HV453220	R. CAR. FP	2.2 Ω	1/4W
R537	HV453220	R. CAR. FP	2.2 Ω	1/4W
△ R538	HV453470	R. CAR. FP	4.7 Ω	1/4W
R547	HV454100	R. CAR. FP	10 Ω	1/4W
R548	HV454100	R. CAR. FP	10 Ω	1/4W
R549	HV454100	R. CAR. FP	10 Ω	1/4W
△ R561	VK188500	R. FUS	390 Ω	1/4W

\* New Parts

Schm Ref.	PART NO.	Description		
△ R569	VK188500	R. FUS	390 Ω	1/4W
△ R570	VP939700	R. MTL. OXD	4.7 Ω	1W
△ R571	VP939700	R. MTL. OXD	4.7 Ω	1W
△ R572	VK188400	R. FUS	330 Ω	1/4W
△ R573	HV456150	R. CAR. FP	1.5K Ω	1/4W
△ R574	VE869300	R. MTL. OXD	0.1 Ω	2W
△ R575	HV456220	R. CAR. FP	2.2K Ω	1/4W
△ R576	HV453220	R. CAR. FP	2.2 Ω	1/4W
R577	HV453220	R. CAR. FP	2.2 Ω	1/4W
R578	HV454220	R. CAR. FP	22 Ω	1/4W
△ R579	VK187400	R. FUS	47 Ω	1/4W
△ R580	VK188400	R. FUS	330 Ω	1/4W
△ R581	HV456150	R. CAR. FP	1.5K Ω	1/4W
△ R582	VE869300	R. MTL. OXD	0.1 Ω	2W
△ R583	HV456220	R. CAR. FP	2.2K Ω	1/4W
△ R584	HV453220	R. CAR. FP	2.2 Ω	1/4W
△ R585	HV453220	R. CAR. FP	2.2 Ω	1/4W
R586	HV454220	R. CAR. FP	22 Ω	1/4W
△ R587	VK187400	R. FUS	47 Ω	1/4W
R589	HV454100	R. CAR. FP	10 Ω	1/4W
R590	HL325470	R. MTL. OXD	470 Ω	2W
R592	HV454100	R. CAR. FP	10 Ω	1/4W
R593	HL325470	R. MTL. OXD	470 Ω	2W
RY401	VK438300	RELAY	DH24D2-OTM-II	
RY402	VK913100	RELAY	DC G5Z-2A	
SW401	VM619700	SW. SLIDE	SSSS92	
SW661	VG392900	SW. TACT	SKHVAA	
SW662	VG392900	SW. TACT	SKHVAA	
SW663	VG392900	SW. TACT	SKHVAA	
SW664	VG392900	SW. TACT	SKHVAA	
SW665	VG392900	SW. TACT	SKHVAA	
SW666	VG392900	SW. TACT	SKHVAA	
SW667	VG392900	SW. TACT	SKHVAA	
TE401	VC313700	TERM. SP	8P (UCRABW)	
TE401	VC720900	TERM. SP	8P (HL)	
* TE402	VQ977200	TERM. SP	4P	
* U661	VM626600	L. DETCT	GP1U571X	
* V661	VQ905900	FL. DSPLY	17-BT-05GK	
	VR665100	HEAT. SINK		
	VA821500	RADIATOR		
*	VK697600	SCR. BND. HD	3x10	SP ZMC2-Y
	VK173200	SCR. TR	3x15	SP FCM3
*	VR056300	SUPPORT		
*	VR041400	SHEET	PVC0.2	

\* New Parts

P. C. B. OPERATION

Schm Ref.	PART NO.	Description
* VR393600	P. C. B.	OPERATION (UC)
* VR393700	P. C. B.	OPERATION (R)
* VR393800	P. C. B.	OPERATION (AB)
* VR393900	P. C. B.	OPERATION (HWL)
CB701	VB858800	CN. BS. PIN 9P
CB702	VN923700	CN FE 16P TE
CB703	VB858100	CN. BS. PIN 2P
* CB704	VN923000	CN 9P
CB751	VN923700	CN FE 16P TE
CB801	VDO04800	CN. BS. PIN 5P
CB841	VG879900	CN. BS. PIN 2P
CB843	LB201880	HOLDER. FUS PC-FH1
CB844	LB201880	HOLDER. FUS PC-FH1
CB845	VP206500	HOLDER. FUS EYF-52BC (RHWL)
CB846	VP206500	HOLDER. FUS EYF-52BC (RHWL)
CB847	VDO04600	CN. BS. PIN 3P
CB848	LA002140	TERM. WRAP 2P (UC)
CB849	LA002150	TERM. WRAP 3P (R)
CB850	LA002110	TERM. WRAP 2P (R)
CB851	LA002140	TERM. WRAP 2P (ABHWL)
CB852	LA002140	TERM. WRAP 2P (ABHWL)
CB871	LB919070	CN. BS. PIN 7P (ABHWL)
C701	VH620800	C. EL 47uF 25V
C702	VH620800	C. EL 47uF 25V
C703	Vi845000	C. EL 2.2uF 50V
C704	Vi845000	C. EL 2.2uF 50V
C705	Vi845000	C. EL 2.2uF 50V
C706	FU452100	C. MICA 100pF 500V
C707	Vi845600	C. EL 47uF 50V
C708	FG212100	C. CE 100pF 50V
C709	Vi845000	C. EL 2.2uF 50V
C710	FU452100	C. MICA 100pF 500V
C711	Vi845600	C. EL 47uF 50V
C712	Vi845600	C. EL 47uF 50V
C713	FU452100	C. MICA 100pF 500V
C714	Vi845000	C. EL 2.2uF 50V
C715	Vi844500	C. EL 0.1uF 50V
C716	Vi845900	C. EL 10uF 63V
C717	Vi845900	C. EL 10uF 63V
C718	Vi844500	C. EL 0.1uF 50V
C719	Vi845900	C. EL 10uF 63V
C720	Vi844500	C. EL 0.1uF 50V
C721	Vi845900	C. EL 10uF 63V
C722	Vi845900	C. EL 10uF 63V
C723	Vi845900	C. EL 10uF 63V
C724	Vi845900	C. EL 10uF 63V
C725	Vi844500	C. EL 0.1uF 50V
C726	Vi845900	C. EL 10uF 63V
C727	Vi845900	C. EL 10uF 63V
C728	Vi844500	C. EL 0.1uF 50V
C729	Vi844900	C. EL 1uF 50V
C730	Vi844500	C. EL 0.1uF 50V
C731	Vi845900	C. EL 10uF 63V

\* New Parts

Schm Ref.	PART NO.	Description
C732	VG722100	C. EL 1uF 50V
C733	VH053100	C. CE. TUBLR 0.1uF 50V
C734	VH053100	C. CE. TUBLR 0.1uF 50V
C735	Vi842800	C. EL 330uF 16V
C751	Vi845900	C. EL 10uF 63V
C752	Vi846000	C. EL 22uF 63V
C753	Vi846000	C. EL 22uF 63V
C754	Vi845900	C. EL 10uF 63V
C755	Vi842600	C. EL 100uF 16V
C756	Vi845900	C. EL 10uF 63V
C757	Vi845900	C. EL 10uF 63V
C758	FU452100	C. MICA 100pF 500V
C759	FU452100	C. MICA 100pF 500V
C760	Vi845900	C. EL 10uF 63V
C761	Vi845900	C. EL 10uF 63V
C762	Vi842600	C. EL 100uF 16V
C763	Vi845600	C. EL 47uF 50V
C764	VF466800	C. CE. TUBLR 100pF 50V
C765	VF466800	C. CE. TUBLR 100pF 50V
C766	Vi845600	C. EL 47uF 50V
C767	UA654680	C. MYLAR 0.068uF 50V
C768	UA653820	C. MYLAR 8200pF 50V
C769	UA655390	C. MYLAR 0.39uF 50V
C770	UA654560	C. MYLAR 0.056uF 50V
C771	UA654560	C. MYLAR 0.056uF 50V
C772	UA655390	C. MYLAR 0.39uF 50V
C773	UA654680	C. MYLAR 0.068uF 50V
C774	UA653820	C. MYLAR 8200pF 50V
C775	VG278400	C. CE. TUBLR 220pF 50V
C776	VG278100	C. CE. TUBLR 120pF 50V
C777	VK180400	C. EL 1000uF 16V
C778	Vi845600	C. EL 47uF 50V
C779	Vi845600	C. EL 47uF 50V
C780	VK180400	C. EL 1000uF 16V
C781	VG278100	C. CE. TUBLR 120pF 50V
C782	VG278400	C. CE. TUBLR 220pF 50V
C801	VH053100	C. CE. TUBLR 0.1uF 50V
C821	UT452470	C. PP 470pF 100V
C822	VH053100	C. CE. TUBLR 0.1uF 50V
C823	UT452470	C. PP 470pF 100V
C824	VH053100	C. CE. TUBLR 0.1uF 50V
C825	FG213100	C. CE 1000pF 50V (UCRAB)
C825	FG213470	C. CE 4700pF 50V (HWL)
C826	VH053100	C. CE. TUBLR 0.1uF 50V
C827	FG213100	C. CE 1000pF 50V (UCRAB)
C827	FG213470	C. CE 4700pF 50V (HWL)
C841	FG214100	C. CE 0.01uF 50V
C842	Vi846200	C. EL 47uF 63V (R)
C843	FG214100	C. CE 0.01uF 50V
△ C844	Fi414100	C. CE. SAFTY 0.01uF VA-1
C845	FG213100	C. CE 1000pF 50V (R)
C846	VP795900	C. EL 680uF 25V
C847	Fi383470	C. CE. SAFTY 4700pF 400V (UCHWL)

\* New Parts

P. C. B. OPERATION

Schm Ref.	PART NO.	Description
C848	Fi383470	C. CE. SAFTY 4700pF 400V (UCHWL)
C849	Fi383470	C. CE. SAFTY 4700pF 400V (UCHWL)
C850	Fi383470	C. CE. SAFTY 4700pF 400V (UCHWL)
C871	VF467000	C. CE. TUBLR 1000pF 50V (ABHWL)
D701	VG437400	DIODE. ZENR MTZJ5.1B 5.1V
D703	VG437400	DIODE. ZENR MTZJ5.1B 5.1V
D704	VG436700	DIODE. ZENR MTZJ4.3A 4.3V
D705	iF004600	DIODE 1SS133
D751	VH770800	DIODE 1SR139-100
D752	VH770800	DIODE 1SR139-100
D801	iF004600	DIODE 1SS133
D802	iF004600	DIODE 1SS133
D803	iF004600	DIODE 1SS133
D804	iF004600	DIODE 1SS133
D805	VP593800	LED (or) SLR-305DCA47
D806	VP593800	LED (or) SLR-305DCA47
D807	VP593800	LED (or) SLR-305DCA47
D808	VP593800	LED (or) SLR-305DCA47
D809	VP593800	LED (or) SLR-305DCA47
D810	VP593800	LED (or) SLR-305DCA47
D811	VP593800	LED (or) SLR-305DCA47
D812	VP593800	LED (or) SLR-305DCA47
△* D841	VR253700	DIODE. BRG SINB20 1.0A 200V
D842	VG440400	DIODE. ZENR MTZJ13A 13V (R)
D843	iF004600	DIODE 1SS133
△ F841	KB000760	FUSE T3.15A 250V (ABHWL)
△ F841	KB001250	FUSE 6.0A 250V (UC)
△ F841	KB001280	FUSE 6.0A 250V (R)
△ F842	KB000760	FUSE T3.15A 250V (R)
△ F842	KB002980	FUSE T2.5A 250V (HWL)
* G841	VR463400	TERM. GND φ 3.5 TPO0385
IC701	XB247301	IC uPC4570HA
IC702	XB247301	IC uPC4570HA
IC703	XB247301	IC uPC4570HA
IC704	XE536001	IC LC7535
IC705	XB247301	IC uPC4570HA
IC706	XB247301	IC uPC4570HA
IC707	XE536001	IC LC7535
IC708	XB247301	IC uPC4570HA
IC709	XF494A00	IC LB1641
IC751	XM356A00	IC NJM2068LD
IC752	iG077400	IC NJM4556S
* JK821	VR406200	JACK. DIN 1P
* JK822	VR406100	JACK. PHONE
* PJ821	VR406000	JACK. PIN 3P
PJ871	VM725800	JACK. PIN 4P (ABHWL)
PJ872	VK437600	JACK. PIN 1P (ABHWL)
Q701	VK432900	TR 2SD1915F S, T
Q702	VK432900	TR 2SD1915F S, T
Q703	VK432900	TR 2SD1915F S, T
Q751	VK432900	TR 2SD1915F S, T
Q752	VK432900	TR 2SD1915F S, T
Q801	VP602500	TR. DGT DTC143XL

\* New Parts

Schm Ref.	PART NO.	Description
Q802	VP602500	TR. DGT DTC143XL
Q803	VP602400	TR 2SC4038 Q, R, S, E
Q804	VP602400	TR 2SC4038 Q, R, S, E
Q805	VP602400	TR 2SC4038 Q, R, S, E
Q806	VP602400	TR 2SC4038 Q, R, S, E
Q841	VD488500	TR. DGT DTC143XS
△* Q842	VR510800	TR 2SD2396 J, K (R)
R736	HV453330	R. CAR. FP 3.3Ω 1/4W
R737	HV453330	R. CAR. FP 3.3Ω 1/4W
R739	HV455560	R. CAR. FP 560Ω 1/4W
R740	HV453220	R. CAR. FP 2.2Ω 1/4W
R752	HV453330	R. CAR. FP 3.3Ω 1/4W
R753	HV453330	R. CAR. FP 3.3Ω 1/4W
R765	HV455220	R. CAR. FP 220Ω 1/4W
R771	HV455220	R. CAR. FP 220Ω 1/4W
R828	HV455100	R. CAR. FP 100Ω 1/4W
R829	HV455100	R. CAR. FP 100Ω 1/4W
R841	HV456560	R. CAR. FP 5.6KΩ 1/4W (R)
R842	HV456560	R. CAR. FP 5.6KΩ 1/4W (R)
△ RY841	VH230800	RELAY G5P-1-DC12V
SW801	VG392900	SW. TACT SKHVAA
SW802	VG392900	SW. TACT SKHVAA
SW803	VG392900	SW. TACT SKHVAA
SW804	VG392900	SW. TACT SKHVAA
SW805	VG392900	SW. TACT SKHVAA
△ T841	XC115A00	TRANS. PWR (R)
△ T841	XC116A00	TRANS. PWR (UC)
△ T841	XC117A00	TRANS. PWR (AB)
△ T841	XK354A00	TRANS. PWR (HWL)
△ TE841	VP924000	OUTLET. AC 3P (UCR)
VR701	VM929700	VR. MTR 100KY Ω x5
* VR751	VR406300	VR MN10K Ω
* VR752	VR406500	VR 30K Ω
* VR753	VR406400	VR A25K Ω
	BB071360	SCR. TERM 8.3x13
	VB966900	CN IMSA-6024

\* New Parts

DSP-A780

EXPLODED VIEW

1

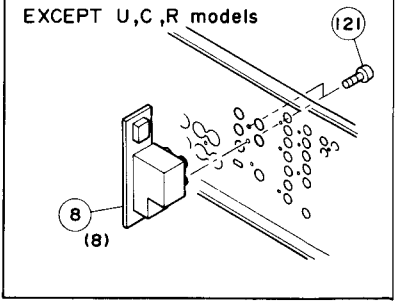
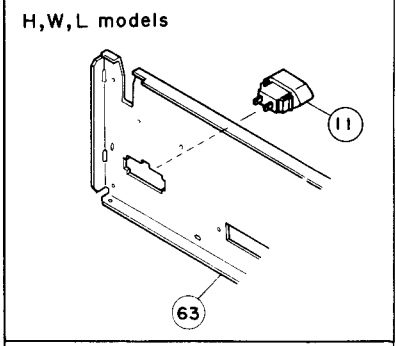
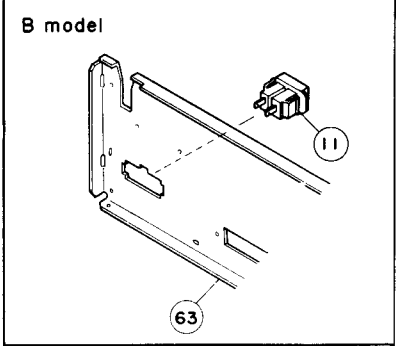
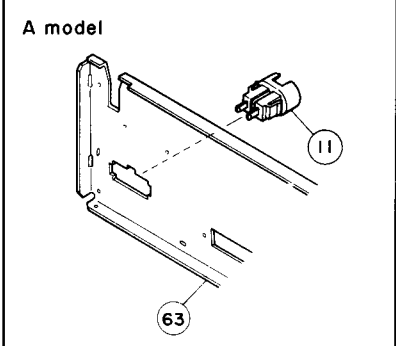
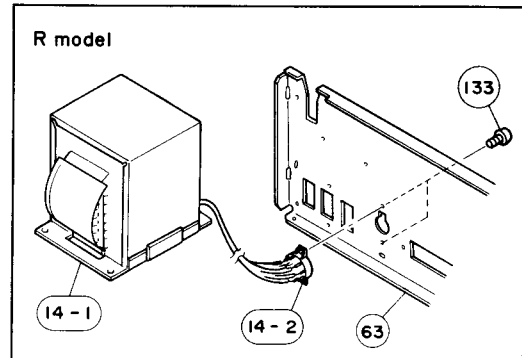
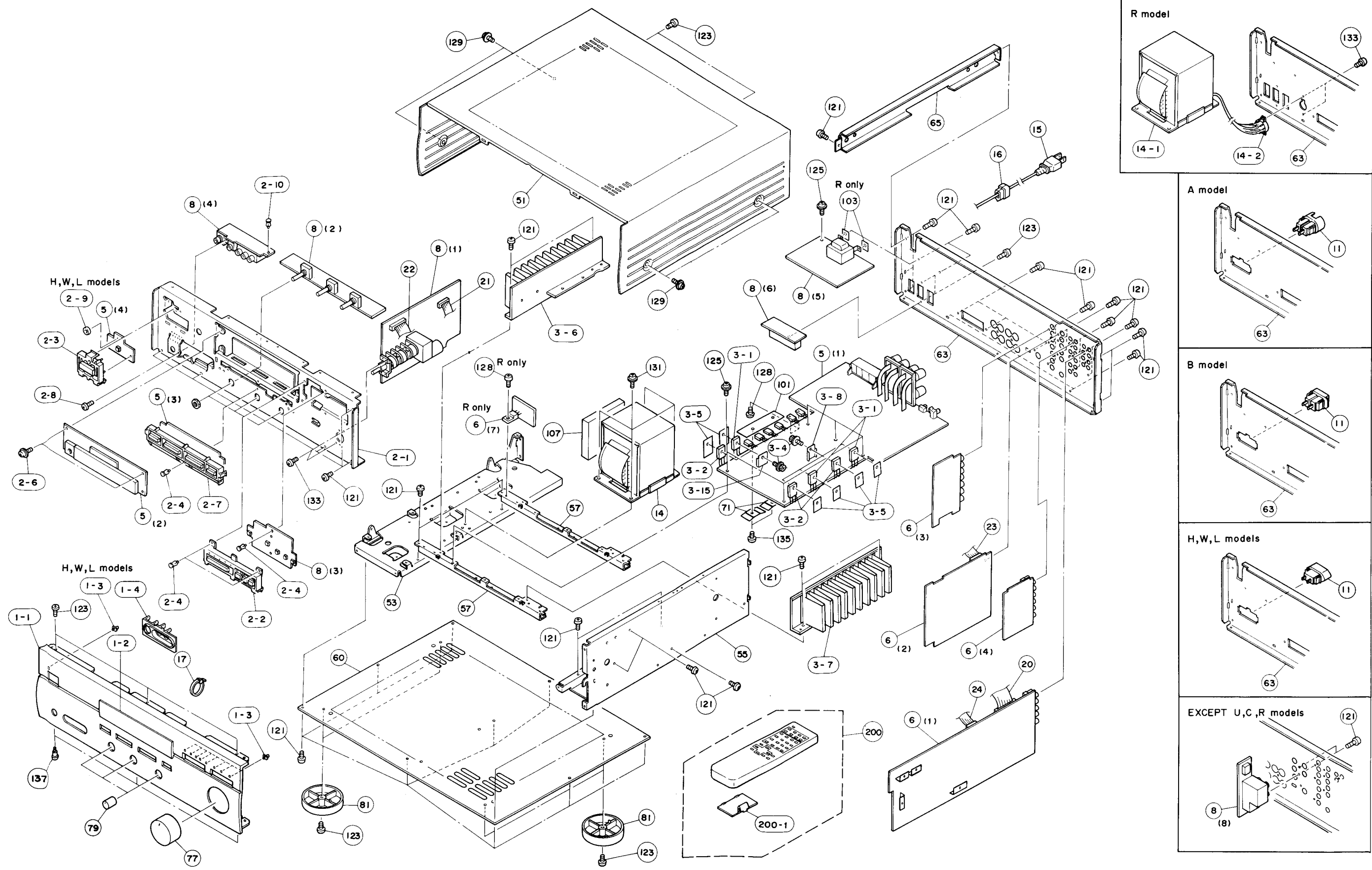
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**MECHANICAL PARTS**

Ref. No.	PART NO.	Description	Remarks	Markets
* 1- 1	VR057200	FRONT PANEL		(HWL)
* 1- 1	VR071500	FRONT PANEL		(UCRAB)
* 1- 2	VR041000	WINDOW PANEL		
1- 3	Vi777100	LENS		
* 1- 4	VR057800	ESCUTCHEON		
* 2- 1	VR039800	SUB CHASSIS		
* 2- 2	VR041100	BUTTON, 4P		
* 2- 3	VR056100	BUTTON		
2- 4	CB605620	PLASTIC RIVET	No. 1781	
2- 6	EK930010	BW HEAD TAPPING SCREW	3x8-8 FCRM3-BL	
* 2- 7	VR057600	BUTTON, DSP		
2- 8	EN301010	BIND HEAD BONDING TAP. SCREW	3x8 FCRM3-BL	
2- 9	VR528400	DAMPER		(HWL)
2-10	CB099600	PLASTIC RIVET	No. 920	
△ 3- 1	iX632650	TRANSISTOR	2SA1633 D,E,F	Q440A, 443A, 446A
△ 3- 2	iX632660	TRANSISTOR	2SC4278 D,E,F	Q440C, 443C, 446C
3- 4	VK173200	SCREW, TRANSISTOR	3x15 SP FCM3	
3- 5	VK195900	SHEET	19x24	
* 3- 6	VR057400	HEAT SINK	L	
* 3- 7	VR057500	HEAT SINK	R	
3- 8	VR760700	SUPPORT, TR.	POWER	
* 5	VR392900	P. C. B. ASS'Y	MAIN	(UCR)
* 5	VR393000	P. C. B. ASS'Y	MAIN	(AB)
* 5	VR393100	P. C. B. ASS'Y	MAIN	(R)
* 5	VR393200	P. C. B. ASS'Y	MAIN	(HL)
* 5	VR393300	P. C. B. ASS'Y	MAIN	(W)
* 6	VR396000	P. C. B. ASS'Y	DSP	(UC)
* 6	VR396100	P. C. B. ASS'Y	DSP	(R)
* 6	VR396200	P. C. B. ASS'Y	DSP	(AB)
* 6	VR396300	P. C. B. ASS'Y	DSP	(HW)
* 6	VR909300	P. C. B. ASS'Y	DSP	(L)
* 8	VR393600	P. C. B. ASS'Y	OPERATION	(UC)
* 8	VR393700	P. C. B. ASS'Y	OPERATION	(R)
* 8	VR393800	P. C. B. ASS'Y	OPERATION	(AB)
* 8	VR393900	P. C. B. ASS'Y	OPERATION	(HWL)
△ 11	VJ775000	AC OUTLET	2P	(B)
△ 11	VJ775100	AC OUTLET	2P	(HWL)
△ 11	VP418700	AC OUTLET	2P	(A)
△* 14	XN765A00	POWER TRANSFORMER		(U)
△* 14	XN766A00	POWER TRANSFORMER		(C)
△* 14	XN768A00	POWER TRANSFORMER		(AB)
△* 14	XN769A00	POWER TRANSFORMER		(HWL)
△* 14- 1	XN767A00	POWER TRANSFORMER		(R)
△ 14- 2	Vi449800	VOLTAGE SELECTOR	ESE-37284-F	(R)
△ 15	VL012900	POWER CORD ASS'Y		(UC)
△ 15	VL238900	POWER CORD ASS'Y		(HWL)
△ 15	VP418300	POWER CORD ASS'Y		(A)
△ 15	VQ458400	POWER CORD ASS'Y		(R)
△ 15	VN804500	POWER CORD ASS'Y		(B)
16	VN158600	CORD STOPPER	No. 2104	
17	CB069250	BINDING TIE	BK-1	
* 20	VR407100	CONNECTOR, FLAT CABLE	24P 70mm	

\* New Parts

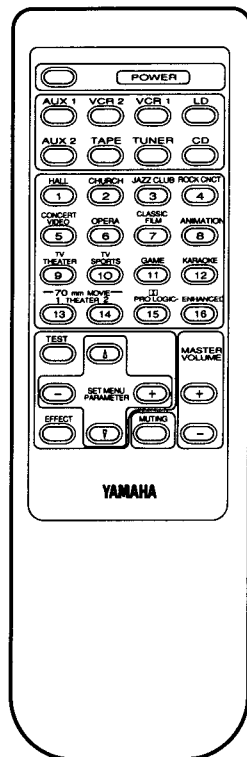
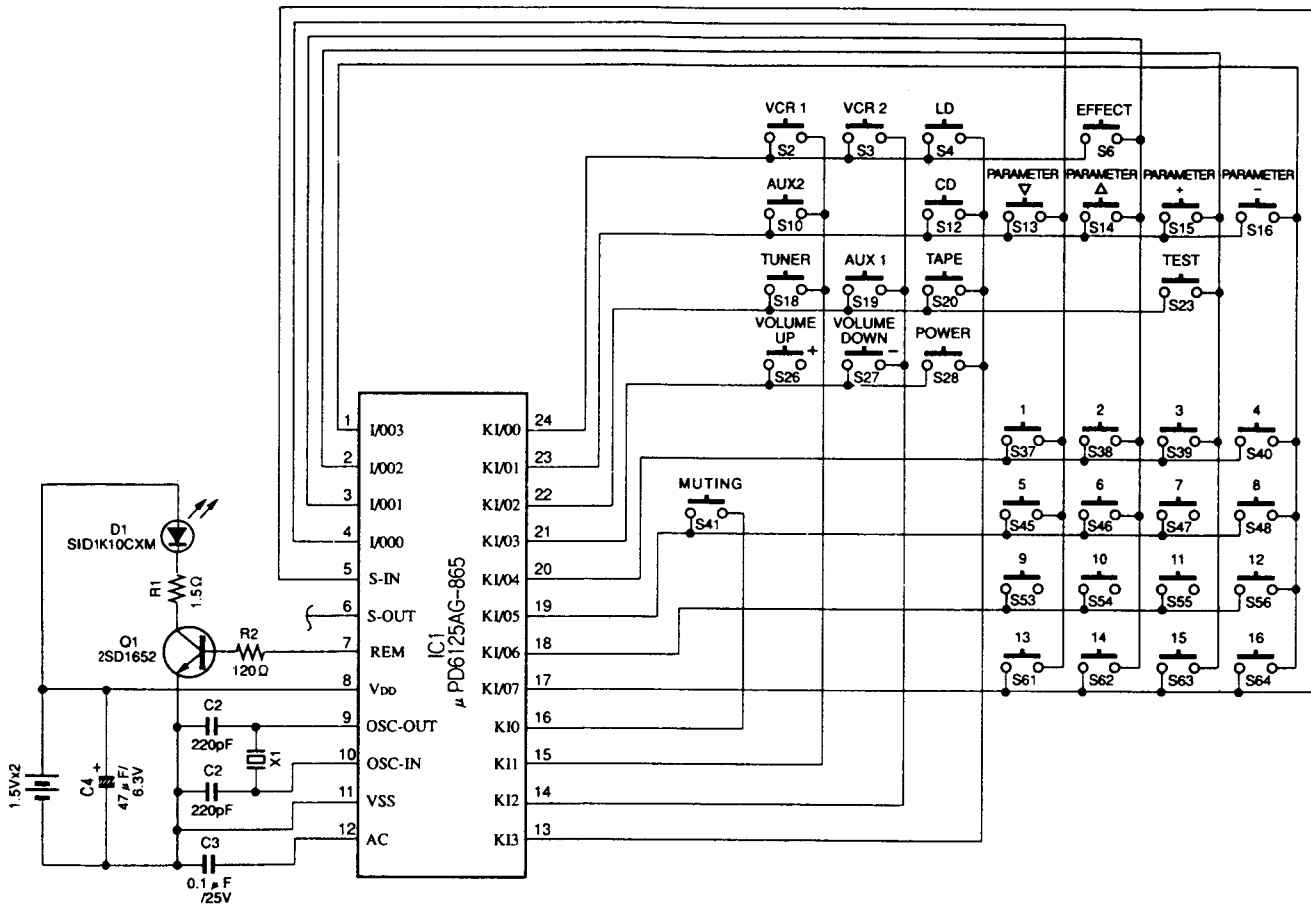
Ref. No.	PART NO.	Description	Remarks	Markets
* 21	VR406900	CONNECTOR, FLAT CABLE	9P 70mm	
* 22	VR407000	CONNECTOR, FLAT CABLE	16P 190mm	
23	VQ157200	CONNECTOR, FLAT CABLE	16P 60mm	
24	VQ357300	CONNECTOR, FLAT CABLE	10P 100mm	
* 51	VR039600	TOP COVER		BL
53	VP866300	FRAME	L	
55	VP866400	FRAME	R	
* 57	VR056900	FRAME	CENTER	
60	VP866200	BOTTOM COVER		
* 63	VR056500	REAR PANEL		(UC)
* 63	VR056600	REAR PANEL		(R)
* 63	VR056700	REAR PANEL		(AB)
* 63	VR056800	REAR PANEL		(W)
* 63	VR234800	REAR PANEL		(HL)
65	VP866700	FRAME	SIDE	
* 71	VR424000	SUPPORT	TR	
* 77	VQ945500	KNOB WITH LED	φ 42	BL
* 79	VQ779200	KNOB	φ 16	BL
* 81	VQ780300	LEG	D60xH16	
* 101	VR193900	SHEET, RADIATOR	21x74	
103	Vi707300	DAMPER		(R)
107	VR630000	DAMPER	TRANS.	
121	EN301010	BIND HEAD BONDING TAP. SCREW	3x8 FCRM3-BL	
123	Ei330086	BIND HEAD B-TITE SCREW	3x8 FCRM3-BL	
125	EK930010	BW HEAD TAPPING SCREW	3x8-8 FCRM3-BL	
* 128	VK697600	BIND HEAD B-TITE SCREW	3x10 SP ZMC2-Y	
129	EL300470	BW HEAD S-TITE SCREW	4x8-10 FCRM3-BL	BL
129	EX601150	BW HEAD S-TITE SCREW	4x8-10 FNM3-BL	TI
131	EL300470	BW HEAD S-TITE SCREW	4x8-10 FCRM3-BL	BL
133	ED330066	BIND HEAD SCREW	3x6 FCRM3-BL	
* 135	VR428100	SPECIAL SCREW	3B-8	
* 137	VR602100	SPECIAL SCREW	3B-8	
* 200	VR112900	ACCESSORIES		
200-1	CX675310	REMOTE CONTROL TRANSMITTER	56x33BLKURON	K-PM2-385-0
		LID	SUM-3, AA, R06	
		BATTERY, MANGANESE		

\* New Parts



# REMOTE CONTROL TRANSMITTER

## ■ SCHEMATIC DIAGRAM



KEY No.	CUSTOM CODE (HEX)	DATA CODE (HEX)	FUNCTION
2	7D	81	VCR 1
3	7D	82	VCR 2
4	7D	83	LD
6	7D	C1	EFFECT
10	7D	85	AUX 2
12	7D	87	CD
13	7D	C4	PARAMETER ▽
14	7D	C5	PARAMETER △
15	7D	C6	PARAMETER +
16	7D	C7	PARAMETER -
18	7D	89	TUNER
19	7D	8A	AUX 1
20	7D	8B	TAPE
23	7D	CA	TEST
26	7D	8D	VOLUME UP
27	7D	8E	VOLUME DOWN
28	7D	8F	POWER
37	7D	D0	1
38	7D	D1	2
39	7D	D2	3
40	7D	D3	4
41	7D	94	MUTING
45	7D	D4	5
46	7D	D5	6
47	7D	D6	7
48	7D	D7	8
53	7D	D8	9
54	7D	D9	10
55	7D	DA	11
56	7D	DB	12
61	7D	DC	13
62	7D	DD	14
63	7D	DE	15
64	7D	DF	16

## Parts List for Carbon Resistors

Value	1/4W Type Part No.	1/6W Type Part No.	Value	1/4W Type Part No.	1/6W Type Part No.
1.0 Ω	HJ35 3100	HF85 3100	10 kΩ	HF45 7100	HF45 7100
1.8 Ω	HJ35 3180	*	11 kΩ	HF45 7110	HF45 7110
2.2 Ω	HJ35 3220	HF85 3220	12 kΩ	HJ35 7120	HF85 7120
3.3 Ω	HJ35 3330	HF85 3330	13 kΩ	HF45 7130	HF45 7130
4.7 Ω	HJ35 3470	HF85 3470	15 kΩ	HF45 7150	HF45 7150
5.6 Ω	HJ35 3560	HF85 3560	18 kΩ	HF45 7180	HF45 7180
10 Ω	HF45 4100	HF45 4100	22 kΩ	HF45 7220	HF45 7220
15 Ω	HJ35 4150	HF85 4150	24 kΩ	HF45 7240	HF45 7240
22 Ω	HF45 4220	HF45 4220	27 kΩ	HJ35 7270	HF85 7270
27 Ω	HJ35 4270	HF85 4270	30 kΩ	HF45 7300	HF45 7300
33 Ω	HF45 4330	HF45 4330	33 kΩ	HF45 7330	HF45 7330
39 Ω	HJ35 4470	HF85 4390	36 kΩ	HF45 7360	HF45 7360
47 Ω	HF45 4470	HF45 4470	39 kΩ	HF45 7390	HF45 7390
56 Ω	HF45 4560	HF45 4560	47 kΩ	HF45 7470	HF45 7470
68 Ω	HF45 4680	HF45 4680	51 kΩ	HF45 7510	HF45 7510
75 Ω	HF45 4750	HF45 4750	56 kΩ	HF45 7560	HF45 7560
82 Ω	HF45 4820	HF45 4820	62 kΩ	HF45 7620	HF45 7620
91 Ω	HF45 4910	HF45 4910	68 kΩ	HF45 7680	HF45 7680
100 Ω	HF45 5100	HF45 5100	82 kΩ	HF45 7820	HF45 7820
110 Ω	HJ35 5110	HF85 5110	91 kΩ	HF45 7910	HF45 7910
120 Ω	HF45 5120	HF45 5120	100 kΩ	HF45 8100	HF45 8100
150 Ω	HF45 5150	HF45 5150	110 kΩ	HF45 8110	HF45 8110
160 Ω	HJ35 5160	*	120 kΩ	HF45 8120	HF45 8120
180 Ω	HF45 5180	HF45 5180	150 kΩ	HF45 8150	HF45 8150
200 Ω	HF45 5200	HF45 5200	180 kΩ	HF45 8180	HF45 8180
220 Ω	HF45 5220	HF45 5220	220 kΩ	HJ35 8220	HF85 8220
270 Ω	HF45 5270	HF45 5270	270 kΩ	HF45 8270	HF45 8270
330 Ω	HF45 5330	HF45 5330	300 kΩ	HF45 8300	HF45 8300
390 Ω	HF45 5390	HF45 5390	330 kΩ	HF45 8330	HF45 8330
430 Ω	HF45 5430	HF45 5430	390 kΩ	HJ35 8390	HF85 8390
470 Ω	HF45 5470	HF45 5470	470 kΩ	HF45 8470	HF45 8470
510 Ω	HF45 5510	HF45 5510	560 kΩ	HJ35 8560	HF85 8560
560 Ω	HF45 5560	HF45 5560	680 kΩ	HJ35 8680	HF85 8680
680 Ω	HF45 5680	HF45 5680	820 kΩ	HJ35 8820	HF85 8820
820 Ω	HF45 5820	HF45 5820	1.0 MΩ	HF45 9100	HF45 9100
910 Ω	HF45 5910	HF45 5910	1.2 MΩ	HJ35 9120	*
1.0 kΩ	HF45 6100	HF45 6100	1.5 MΩ	HJ35 9150	HF85 9150
1.2 kΩ	HF45 6120	HF45 6120	1.8 MΩ	HJ35 9180	HF85 9180
1.5 kΩ	HF45 6150	HF45 6150	2.2 MΩ	HJ35 9220	HF85 9220
1.8 kΩ	HF45 6180	HF45 6180	3.3 MΩ	HJ35 9330	HF85 9330
2.0 kΩ	HJ35 6200	HF85 6200	3.9 MΩ	HJ35 9390	*
2.2 kΩ	HF45 6220	HF45 6220	4.7 MΩ	HJ35 9470	HF85 9470
2.4 kΩ	HJ35 6240	HF85 6240			
2.7 kΩ	HF45 6270	HF45 6270			
3.0 kΩ	HF45 6300	HF45 6300			
3.3 kΩ	HF45 6330	HF45 6330			
3.6 kΩ	HJ35 6360	HF85 6360			
3.9 kΩ	HF45 6390	HF45 6390			
4.7 kΩ	HF45 6470	HF45 6470			
5.1 kΩ	HF45 6510	HF45 6510			
5.6 kΩ	HF45 6560	HF45 6560			
6.8 kΩ	HF45 6680	HF45 6680			
8.2 kΩ	HF45 6820	HF45 6820			
9.1 kΩ	HF45 6910	HF45 6910			

