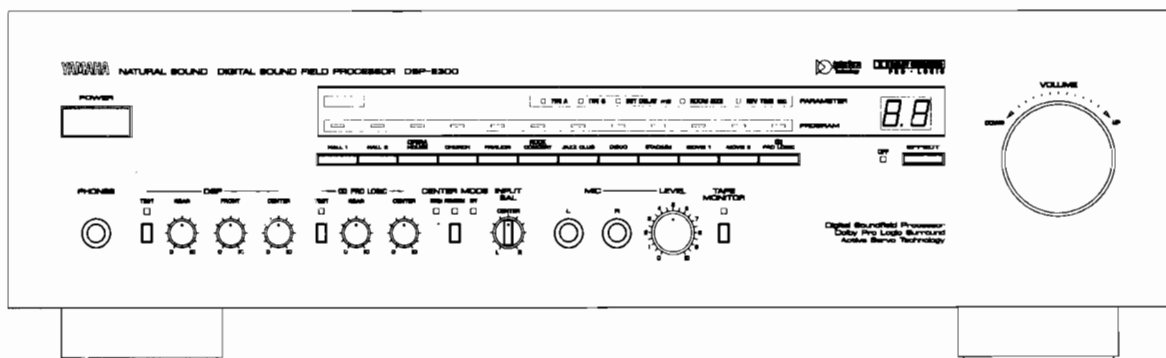


# DIGITAL SOUND FIELD PROCESSOR DSP-E300

## 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).

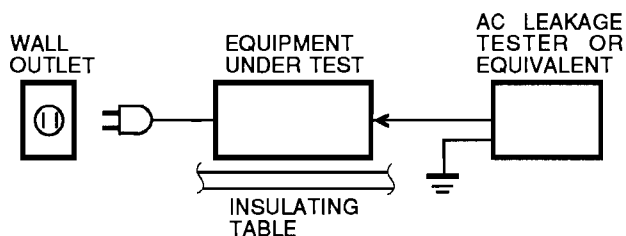
**IMPORTANT:** Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

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## ■ TO SERVICE PERSONNEL

- Critical Components Information.**  
Components having special characteristics are marked and must be replaced with parts having specifications equal to those originally installed.
- Leakage Current Measurement (For 120V Model Only).**  
When service has been completed, it is imperative that you 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.



- **POLARIZATION (U, C models only)**  
This processor product is equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature.

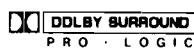
## ■ SPECIFICATIONS

<b>■ EFFECT POWER AMP SECTION</b>	
● <b>Minimum RMS Output Power Per Channel</b> (YST switch off) 1kHz, 1%, 6Ω	15W

<b>■ PROCESSOR SECTION</b>	
● <b>A/D Converter</b>	Resolution 16 bit linear Features 2 ch A/D, 18-bit calibration
● <b>D/A Converter</b>	Resolution 16 bit linear
● <b>Preset Programs</b>	DSP Sound Field Programs 11 programs, 20 subprograms Dolby Pro Logic Surround
● <b>Input Sensitivity/Input Impedance</b>	INPUT, TAPE PB 150mv / 47kΩ MIC 500μV/5.6kΩ
● <b>Frequency Response (20Hz—20kHz)</b>	MAIN OUT 0±1dB

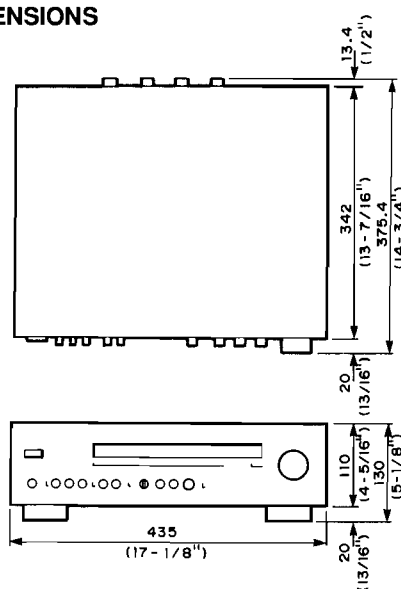
<b>■ GENERAL</b>	
● <b>Power Requirements</b>	U. S. & Canada AC 120V, 60Hz General AC 110/120/220/240V, 50/60Hz U.K., Australia AC 240V, 50Hz Europe AC 220V, 50Hz
● <b>Power Consumption</b>	U. S. & Canada 170W Other Areas 110W
● <b>AC Outlets (U. S., Canada, General models only)</b>	SWITCHED x 2 100W max. UNSWITCHED x 1 200W max.
● <b>Dimensions (WxHxD)</b>	435x130x375.4mm (17-1/8"x5-1/8"x14-3/4")
● <b>Weight</b>	10kg (22 lb)

- U ..... U. S. A. model
- C ..... Canadian model
- B ..... British model
- A ..... Australian model
- G ..... European model
- R ..... General model



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### ● DIMENSIONS

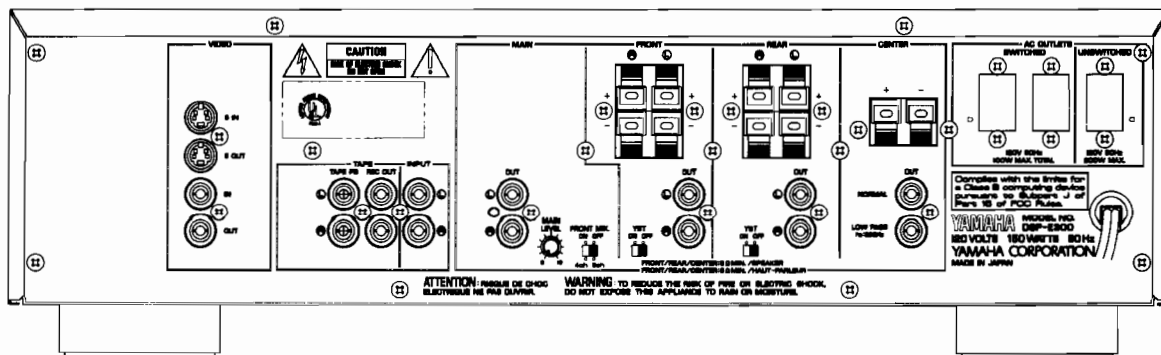


Unit : mm (inch)

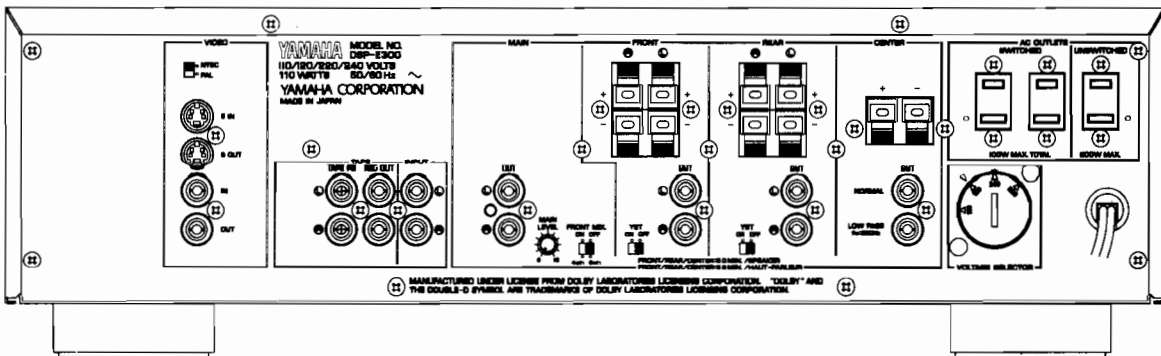
\*Specifications are subject to change without notice.

# REAR PANELS

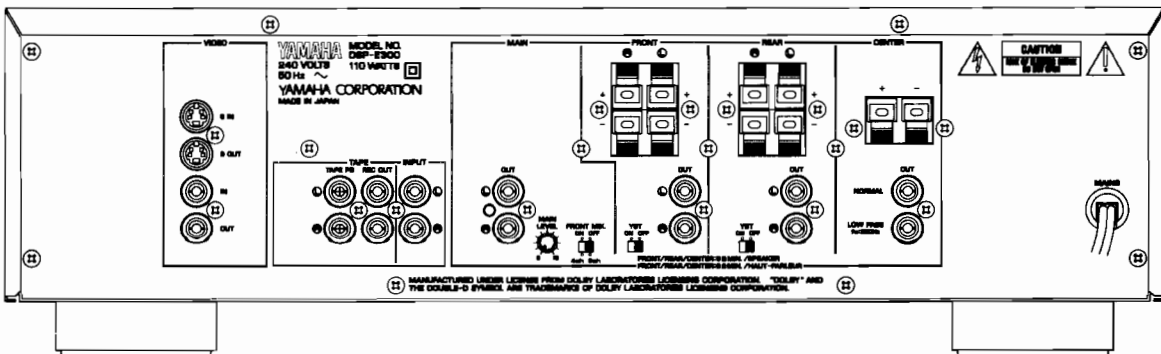
## U. C model



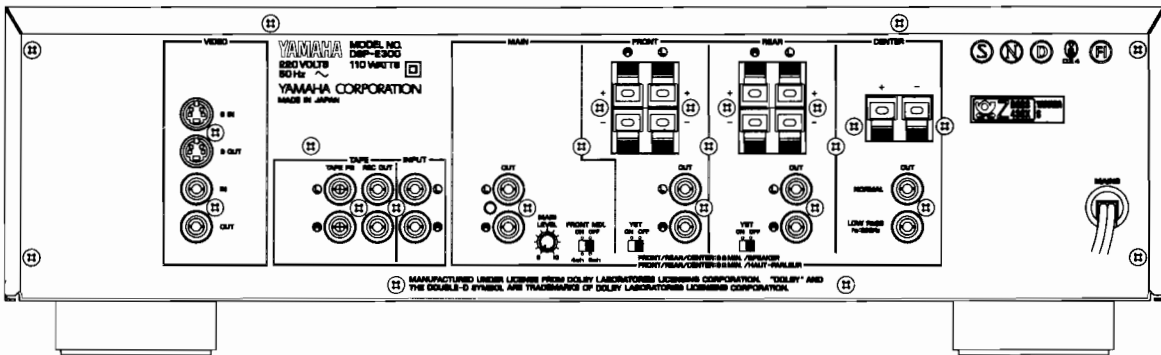
## R model



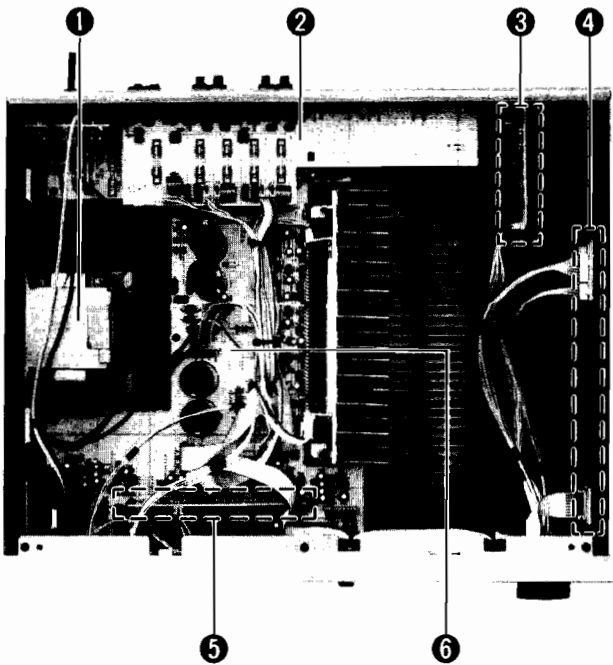
## A, B models



## G model



■ INTERNAL VIEW



- ① POWER TRANSFORMER  
 U model : XG782B00  
 R model : XG783B00  
 A, B models : XG784B00  
 G model : XG785B00  
 C model : XH153B00
- ② OPERATION CIRCUIT BOARD (3)
- ③ EFFECT AMP CIRCUIT BOARD (4) : S-VIDEO SECTION
- ④ OPERATION CIRCUIT BOARD (2) : DSP SECTION
- ⑤ OPERATION CIRCUIT BOARD (4) : DOLBY PRO-LOGIC SECTION
- ⑥ EFFECT AMP CIRCUIT BOARD (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.
- b. Lift the Top Cover to the back side and move it rearward slantingly.

2. Removal of Bottom Cover

Remove 10 screws (③) in Fig. 1.

3. Removal of Operation Circuit Board (2)

Remove 4 screws (④) in Fig. 1.

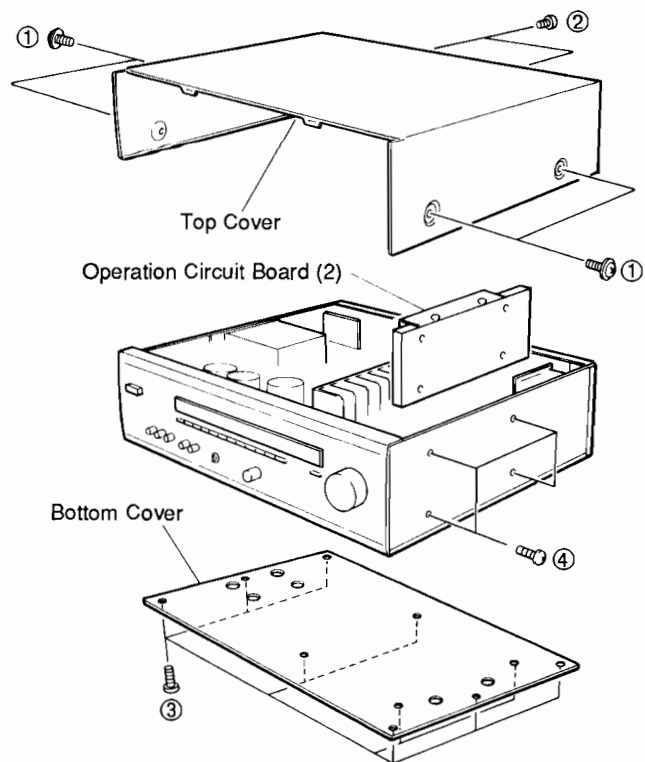


Fig. 1

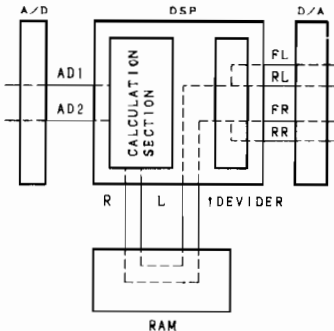
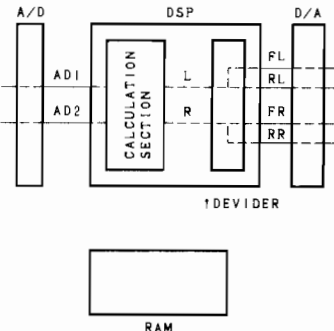
## ■ TEST PROGRAM

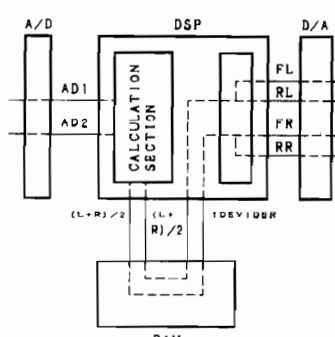
The DSP-E300 has a self-diagnosis function performed by using internal test programs. Be sure to verify all test programs.

### ● Starting Test Program

While holding down 3 program keys (HALL 1, HALL 2 and OPERA HOUSE) simultaneously, turn on the POWER switch.

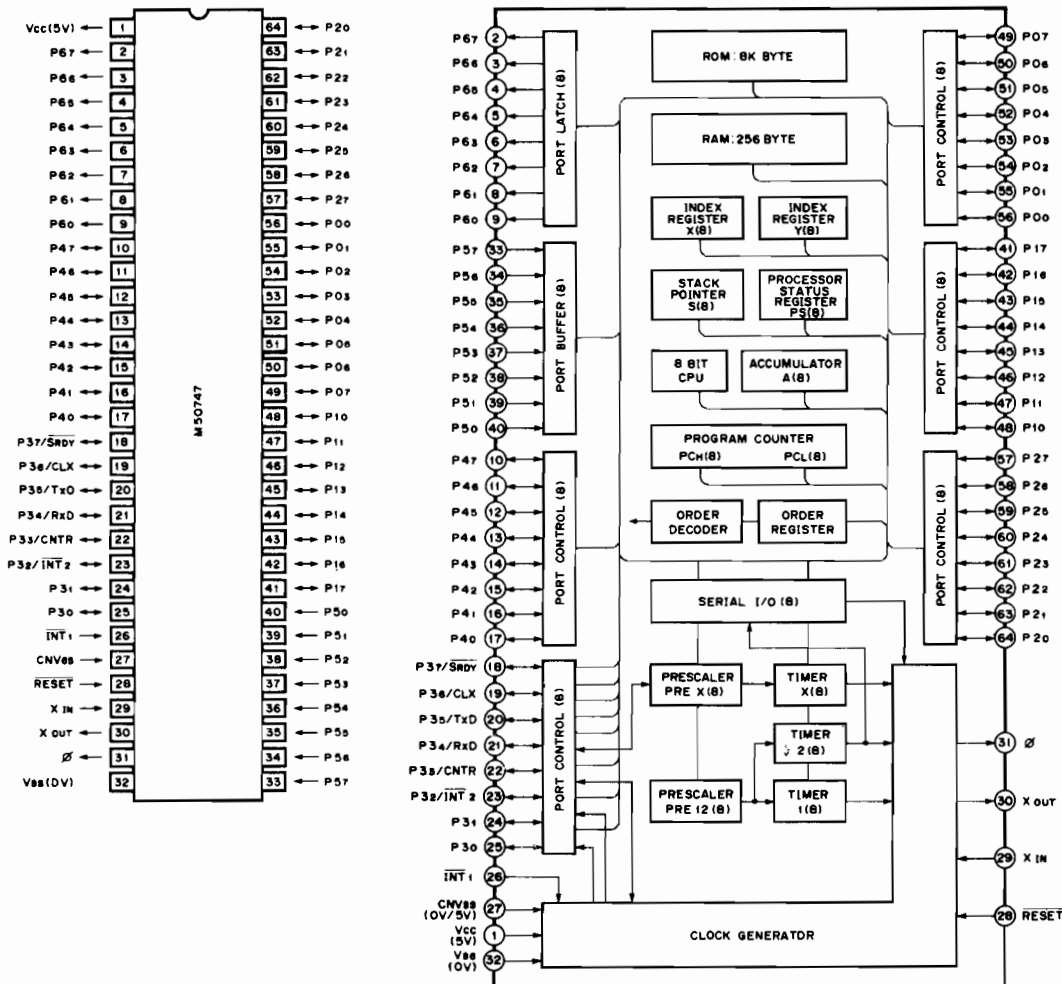
#### Content of Test Program

Program	Item	Operation	Program	Item	Operation
<b>No. 1 (HALL 1)</b>	EXIT DIAG	Sets back to the normal operation mode from the test program mode.	<b>No.7 (JAZZ-CLUB)</b>	RAM THROUGH	1. Sets to the RAM THROUGH mode.
<b>No. 2 (HALL 2)</b>	TEST LED-1	1.LEDs light in the following order. 7seg LED 0.0 1 1 2.2 3 3 4.4 5 5 6.6 7 7 8.8 9 9 HALL 1 HALL 2 OPERA HOUSE CHURCH PAVILION ROCK CONCERT JAZZ CLUB DISCO STADIUM MOVIE 1 MOVIE 2 PRO LOGIC TYPE A TYPE B INIT DELAY ROOM SIZE REV TIME DSP TEST PRO LOGIC TEST NORMAL PHANTOM OFF TAPE MONITOR EFFECT OFF 2. Finally, all LEDs other than 7seg LED light and then the 7seg LED indicates "7".		L OUT R OUT	 <p>As A/D input is in 2 channels, (L+R) /2 and (L-R), calculation done inside the DSP according to this program is as follows.                      Supposing <math>AD1=(L+R) /2</math> and <math>AD2=L-R</math>,  <math>FL, RL=AD1+AD 2/2=</math>  <math>(L+R) /2+(L-R) /2=L</math>  <math>FR, RR=AD1-AD 2/2=</math>  <math>(L+R) /2-(L-R) /2=R</math></p> 2. The 7seg LED indicates "7".
<b>No.3 (OPERA-HOUSE)</b>	TEST LED-2	All 7seg LEDs light. LEDs from HALL 1 to PRO LOGIC all light. LEDs from TYPE A to REV TIME all light. LEDs from DSP TEST to EFFECT OFF all light.	<b>No.8 (DISCO)</b>	DSP THROUGH	1. Sets to the DSP THROUGH mode.
				L OUT R OUT	 <p><math>FL, RL=AD1+AD 2/2 =</math>  <math>(L+R) /2+(L-R) /2=L</math>  <math>FR, RR=AD1-AD 2/2=</math>  <math>(L+R) /2+(L-R) /2=R</math></p> 2. The 7seg LED indicates "8".

Program	Item	Operation
No.9 (STADIUM)	RAM THROUGH (L+R) /2 OUT	<p>1. Sets to the RAM THROUGH mode.</p>  <p>FL, RL=AD1=(L+R) /2 FR, RR=AD1=(L+R) /2</p> <p>2. The 7seg LED indicates "9".</p>

IC DATA

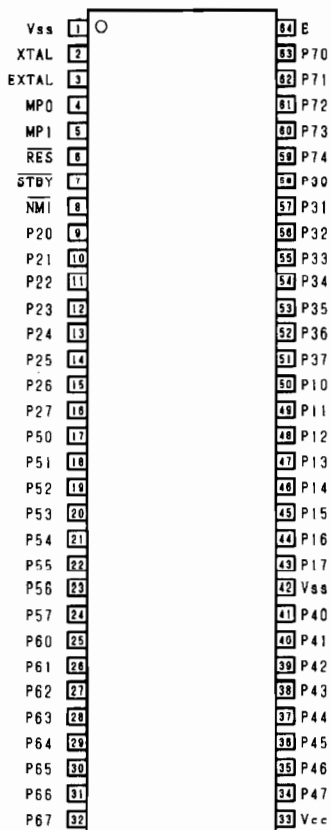
IC2 : M50747-B87  
8bit  $\mu$ -COM



DSP-E300

Pin No.	Pin name	Function Name	I/O	Active	Description
1	Vcc	VDD	—		+5V
2	P67	SH	O	H	LED segment
3	P66	SG	O	H	
4	P65	SF	O	H	
5	P64	SE	O	H	
6	P63	SD	O	H	
7	P62	SC	O	H	
8	P61	SB	O	H	
9	P60	SA	O	H	
10	P47	DA7	O	L/H	Digital signal for VCA control (When DA0 (LSB) to DA7 (MSB) are all "L", VCA is - When ATTs are all "H", VCA is 0dB. )
11	P46	DA6	O	L/H	
12	P45	DA5	O	L/H	
13	P44	DA4	O	L/H	
14	P43	DA3	O	L/H	
15	P42	DA2	O	L/H	
16	P41	DA1	O	L/H	
17	P40	DA0	O	L/H	
18	P37/SRDY	X	O	—	Unused
19	P36/CLK	CLK1	I		Clock data for serial transmission of the superimpose IC.
20	P35/TXD	SO	O		
21	P34/RXD	CLK0	O		
22	P33/CNTR	CE	O	L	Chip select of the superimpose IC
23	P32/INT2	SY DET	I	L/H	Picture detect (External picture input available at "H")
24	P31	N/P	I	L	PAL/NTSC select (NTSC at "L")
25	P30	REM IN	I		Remote control beam reception signal input
26	INT1	REM IN	—		
27	CNVSS	CN V <sub>ss</sub>	—		GND
28	RESET	RESM	—		Reset
29	X IN	OSC1	—		Clock(8MHz)
30	X OUT	OSC0	—		
31	φ	φ	—		Unused
32	V <sub>ss</sub>	V <sub>ss</sub>	I		GND
33	P57	PDET	I	L/H	Power ON/OFF detect (OFF at "L")
34	P56	X	I		Unused
35	P55	ENCB	I		Rotary encoder input
36	P54	ENCA	I		
37	P53	K3	I	H	Key input (Key input available at "H")
38	P52	K2	I	H	
39	P51	K1	I	H	
40	P50	K0	I	H	
41	P17	D4	O	H	Digit line
42	P16	D3	O	H	
43	P15	D2	O	H	
44	P14	D1	O	H	
45	P13	D0	O	H	
46	P12	CMT	O	H	Center Effect mute signal Main
47	P11	EMT	O	L	
48	P10	MMT	O	H	
49	P07	CMD	O	L/H	DOLBY center mode select (Normal at "H")
50	P06	CCH	O	L/H	DOLBY center channel select (OFF at "H")
51	P05	DBY	O	L/H	DOLBY select (ON at "H")
52	P04	RES	—		
53	P03	TAPE	O	L/H	TAPE MONITOR select (Tape monitor ON at "H")
54	P02	CE1	O		Chip select of input select IC
55	P01	DACS	O		Unused
56	P00	DSPTS	O		Interface with HD63BOIY
57	P27	DSP7	O		
58	P26	DSP6	O		
59	P25	DSP5	O		
60	P24	DSP4	O		
61	P23	DSP3	O		
62	P22	DSP2	O		
63	P21	DSP1	O		
64	P20	DSP0	O		

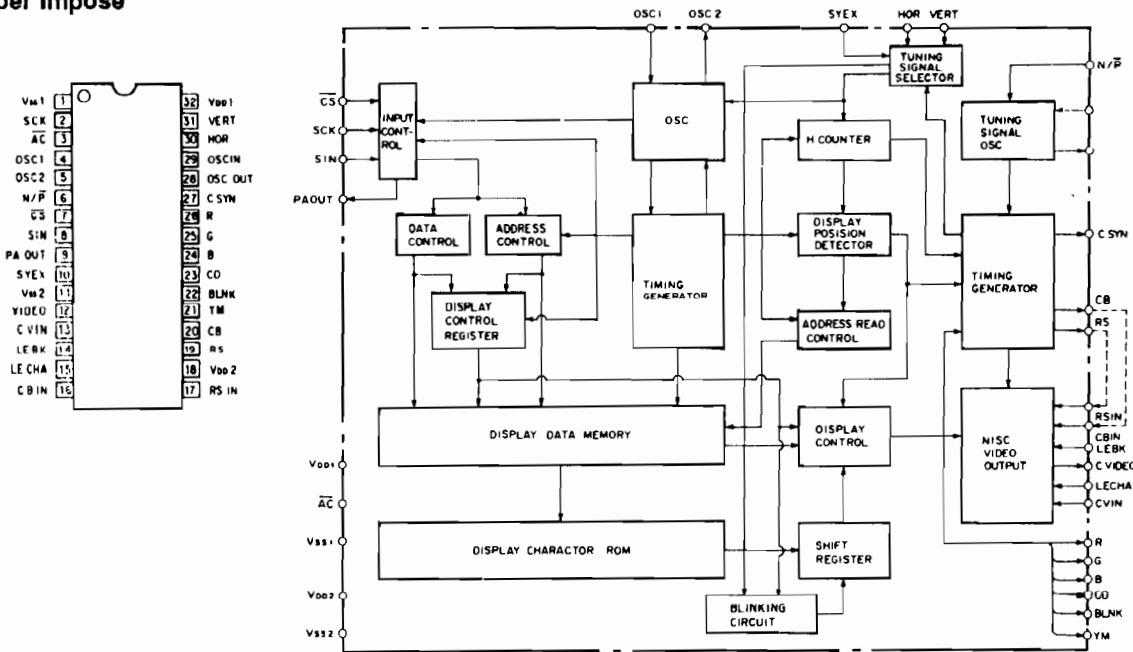
IC27 : HD63B01YORL37P  
8bit  $\mu$ -COM





Pin No.	Pin name	Function Name	I/O	Description
1	Vss	Vss	—	GND
2	XTAL	XTAL	—	Unused
3	EXTAL	EXTAL	I	Clock input
4	MP0	MP0	I	} "H" mode setting (with single chip mode fixed)
5	MP1	MP1	I	
6	RES	RES	I	Reset input
7	STBY	STBY	I	} "H" unused
8	NMI	NMI	I	
9	P20		O	} Output port (unused)
10	P21		O	
11	P22	SCLK	O	Clock for transmitting serial data to DSP
12	P23	RX	I	Serial data input port (unused)
13	P24	TX	O	Serial data output port to DSP
14	P25		O	} Output port (unused)
15	P26		O	
16	P27		O	
17	P50		I	} "L" unused
18	P51		I	
19	P52		I	
20	P53		I	Command format select ("H")
21	P54	DSPS	I	Command input strobe signal
22	P55		I	"L" unused
23	P56	CRS	O	DSP serial data input reset
24	P57	DBY	O	Output port (unused)
25	P60	DSP0	I	} Command input port
26	P61	DSP1	I	
27	P62	DSP2	I	
28	P63	DSP3	I	
29	P64	DSP4	I	
30	P65	DSP5	I	
31	P66	DSP6	I	
32	P67	DSP7	I	+5V
33	Vcc	Vcc	—	} Output port (unused)
34	P47		O	
35	P46		O	
36	P45		O	
37	P45		O	
38	P43		O	
39	P42		O	
40	P41		O	
41	P40		O	
42	Vss	Vss	—	GND
43	P17		O	} Output port (unused)
44	P16		O	
45	P15		O	
46	P14		O	
47	P13		O	
48	P12		O	
49	P11		O	
50	P10		O	
51	P37		O	
52	P36		O	
53	P35		O	
54	P34		O	
55	P33		O	
56	P32		O	
57	P31		O	
58	P30		O	
59	P74	BA	O	
60	P73	LIR	O	
61	P72	R/W	O	
62	P71	WR	O	
63	P70	RD	O	
64	WE	E	O	System clock (unused)

IC703 : M50455-060SP  
Supper Impose

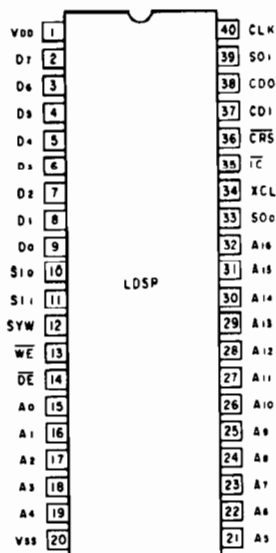


Pin No.	Pin Name	Pin Description	Function
1	VSS 1	Earth terminal	Connect with GND by digital system earth terminal.
2	SCX	Serial clock input	When it is SC terminal "L", serial data of S IN is taken in with the start-up of SCK. Histeresis input.
3	AC	Automatic clear input	Reset IC internal circuit with "L" status. Pull-up resistance has been contained. Hysteresis input.
4	OSC 1	Oscillation circuit external terminal	External terminal for oscillation circuit for indication use. The standard oscillation frequency is about 7MHz.
5	OSC 2		Display position toward horizontal direction of TV picture and letter width are determined by the oscillation frequency.
6	N/P	NISC/PAL switching input	It is NTSC or PAL system synchronized signal generation switching terminal.
7	CS	Chip selection input	Chip selection terminal. When serial data transfer is conducted, the chip selection terminal shall be "L" status.
8	S IN	Serial data input	Data and address of memory for use in the display resistor and display data are input by serial.
9	PA OUT	Parity output	It is odd number parity output, and it will detect 1 bit mistake in a word of S IN.
10	SYEX	Synchronized signal changeover input	Externally synchronized or internally synchronized signal switching terminal. Under "H" status, it becomes externally synchronized signal mode, and with "L" status, it becomes internally synchronized signal mode. SYEX composes or of priority of internal synchronization and EX. Resistor of address 243 in the display control resistor. Pull-up resistance is contained.
11	VSS 1	Earth terminal	Connect with GND by analog earth terminal.
12	VIDEO	Composite video output	It is composite video signal output terminal. Composite video signal of 2Vp-p is output. When it is super imposition, it will output increasing the volume of letter output to CV IN signal.
13	CV IN	Composite video input	It is composite video signal input terminal. When it is super impose, letter output etc. Will be increases for the composite video signal.
14	LEBK	Blanking level	It is input terminal to determine blanking level of video signal.
15	LECHA	Character level input	It is input terminal to determine the letter output level in the video signal. Color of letter is white.
16	CB IN	Color burst input	It will input transforming CB output to color burst level by external circuit.

DSP-E300

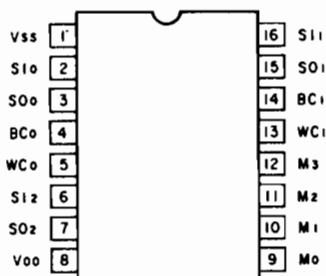
Pin No.	Pin Name	Pin Description	Function
17	RS IN	Lettering background carrier color signal input	Input is done transforming RS output to carrier color signal level of video signal by external circuit.
18	VDD 2	Power source terminal	Connect with +5V by analog system power source terminal.
19	RS	Lettering background carrier color signal output	It is carrier color signal output for the coloring background. It will output signal having phase angle for the color burst signal CB. Amplitude : 5V.
20	CB	Color burst output	When it is NTSC system, it will output color burst of 3.58MHz and 4.43MHz when it is PAL system. Amplitude : 5V.
21	YM	Brightness signal output	It is brightness signal output. Polarity selection can be done when lettering type ROM is determined.
22	BLNK	Lettering background output	It will output lettering background signal. POLarity selection can be done when lettering type ROM is decided.
23	CO	Lettering type output	Lettering type signal is output. POLarity selection can be done when lettering type is determined.
24	B	Blue output	It is blue output terminal. Polarity selection can be done when lettering type ROM is determined.
25	G	Green output	It is green output terminal. Polarity selection can be done when lettering type ROM is determined.
26	R	Red output	It is red output terminal. Polarity selection can be done when lettering type ROM is determined.
27	CSYN	Composite burst output	NTSC or PAL system composite burst is output. Polarity is negative polarity, and amplitude is 5V.
28	OSC OUT	Oscillation circuit for burst generation	It is external terminal of oscillation circuit for the generation of burst. When it is NTSC system, it is 14.32MHz.
29	OSC IN		When it is PAL system, oscillation frequency of 17.73MHz is used.
30	HOR	Horizontal burst	Horizontal burst is output. Histeresis input. Polarity selection can be done when lettering type ROM is determined.
31	VERT	Vertical burst	Vertical burst is input. Histeresis input. Polarity selection can be done when lettering type ROM is determined.
32	VDD2	Power source terminal	Connect with +5V by digital power source terminal.

IC28 : YM3413  
LDSP

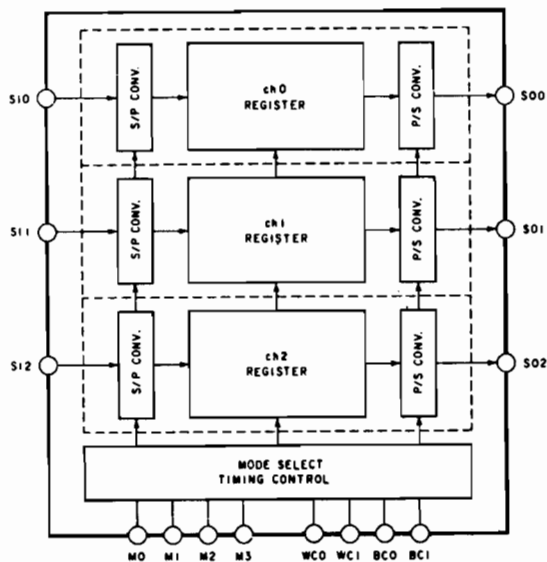


Pin No.	Pin Name	I/O	Function	Pin No.	Pin Name	I/O	Function
1	VDD	—	+5V Voltage Supply	40	CLK	I	Master clock input
2	D7	I/O	I/O pins connected to memory data bus (8 bit)	39	SO1	O	Serial data output
3	D6	I/O		38	CD0	O	CD data output
4	D5	I/O		37	CD1	I	CD data input
5	D4	I/O		36	CRS	I	CD data sync signal input
6	D3	I/O		35	IC	I	LDSP initial clear signal input
7	D2	I/O		34	XCLK	I	ACIA clock input
8	D1	I/O		33	SD0	O	Serial data output
9	D0	I/O		32	A16	O	Outputs connected to memory's address bus
10	SI0	I	31	A15	O		
11	SI1	I	30	A14	O		
12	SYW	I	29	A13	O		
13	WE	O	28	A12	O		
14	OE	O	27	A11	O		
15	A0	O	26	A10	O		
16	A1	O	25	A9	O		
17	A2	O	24	A8	O		
18	A3	O	23	A7	O		
19	A4	O	22	A6	O		
20	VSS	O	GND	21	A5	O	

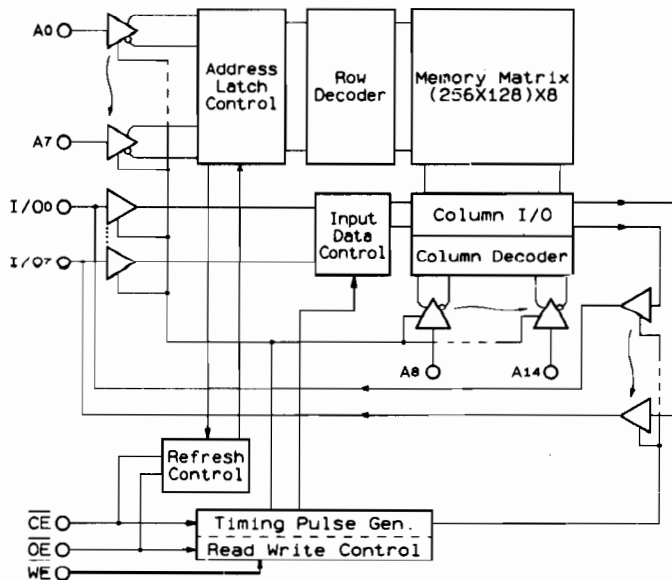
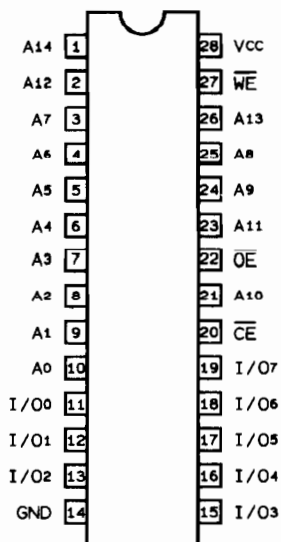
IC26 : YM3422  
Digital Signal Format Converter



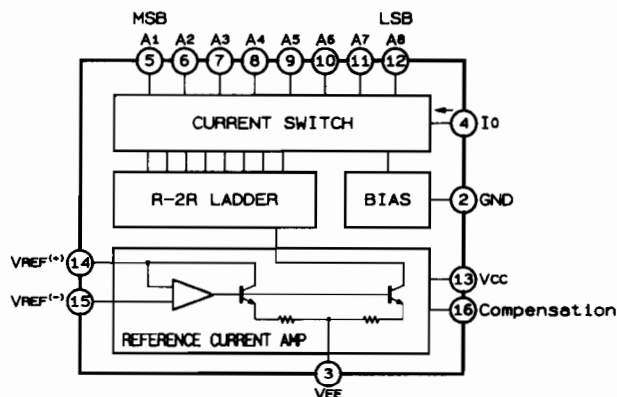
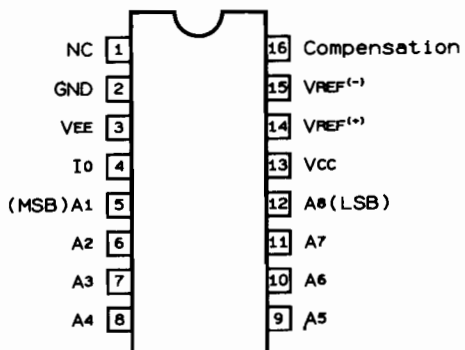
Pin No.	Pin Name	I/O	Function
1	VSS	—	GND terminal
2	SI0	IN	Serial data input (ch 0)
3	SO0	OUT	Serial data output (ch 0)
4	BC0	IN	Bit clock input
5	WC0	IN	System synchronized signal input
6	SI2	IN	Serial data input (ch 0)
7	SO2	OUT	Serial data output (ch 0)
8	VDD	—	Voltage supply (+5V)
9	M0	IN	Mode select signal
10	M1	IN	Mode select signal
11	M2	IN	Mode select signal
12	M3	IN	Mode select signal
13	WC1	IN	System synchronized signal input (Word clock)
14	BC1	IN	Bit clock input
15	SC1	IN	Serial data output (ch 1)
16	SI1	OUT	Serial data input (ch 1)



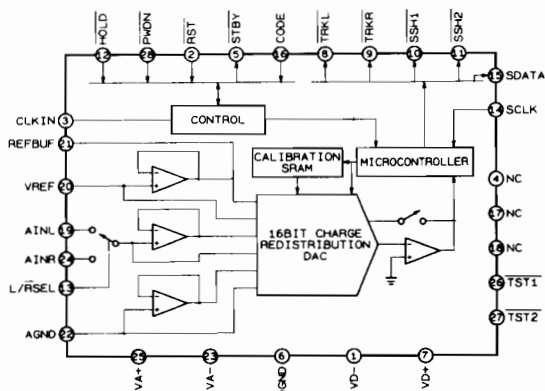
**IC29 : HM65256BLP-10 or TC51832PL-10**  
**32768-word x 8-bit High Speed Pseudo Static RAM**



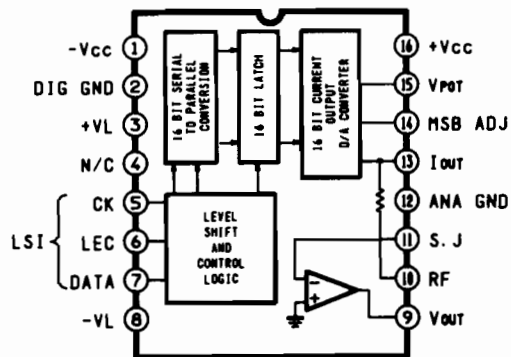
**IC1 : HA17408P**  
**8-bit Multiplying Digital - to - Analog Converter**



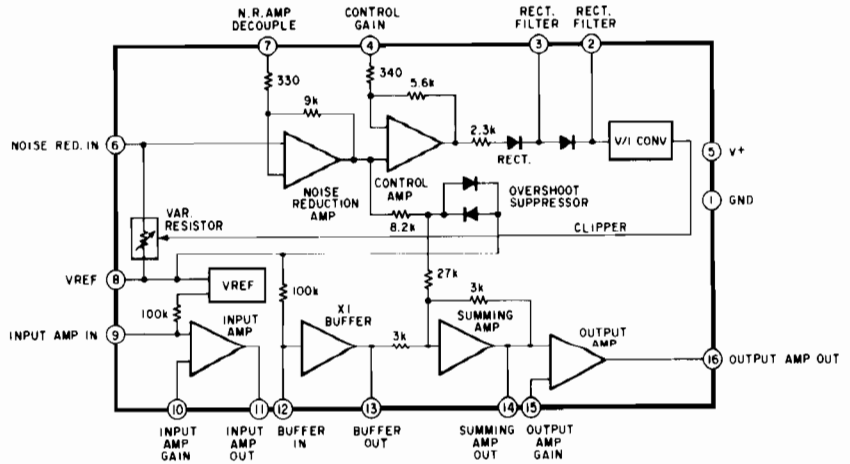
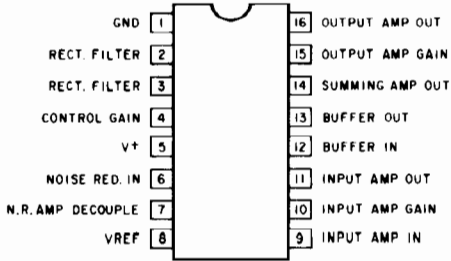
**IC17 : AK9201A or AK9201**  
**A/D Converter**



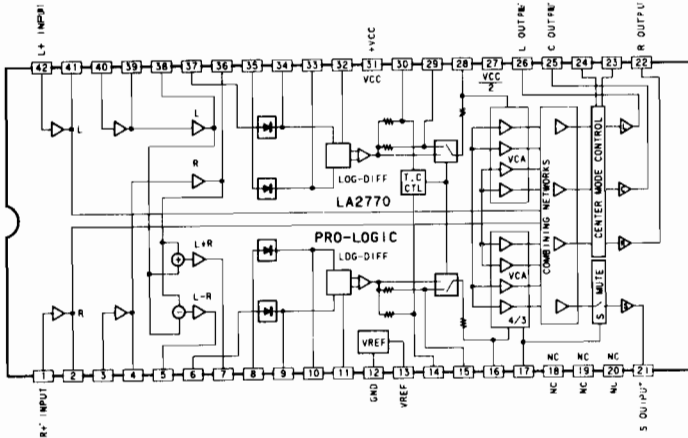
**IC18, 19 : PCM56P**  
**D/A Converter**



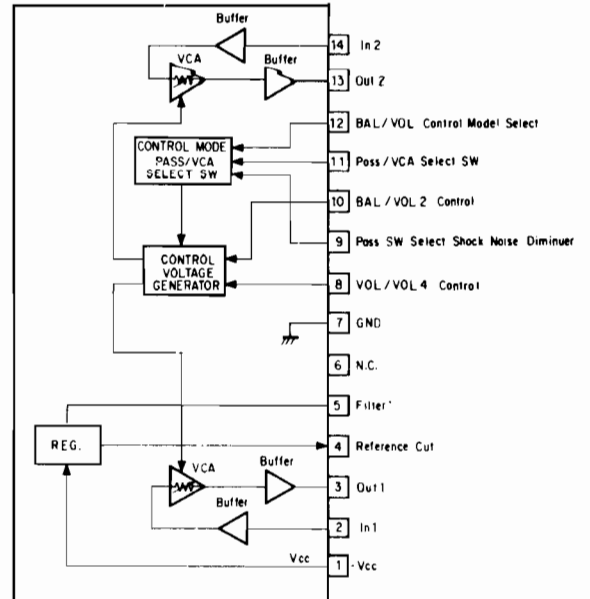
**IC5 : LA2730**  
Dolby Encoder/Decoder



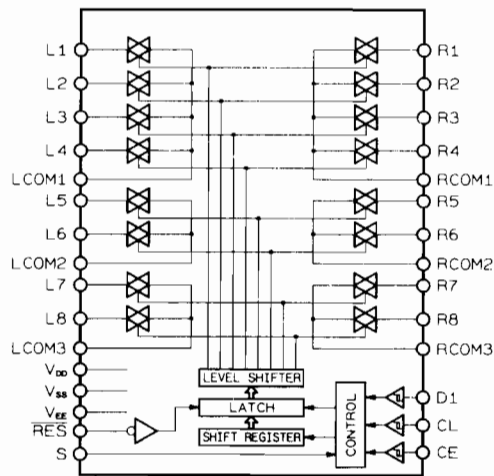
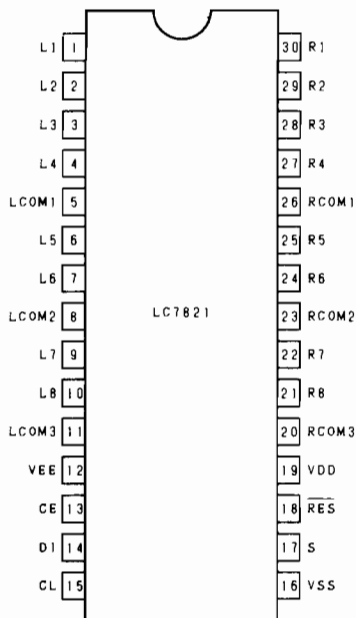
**IC6 : LA2770**  
Dolby Pro Logic



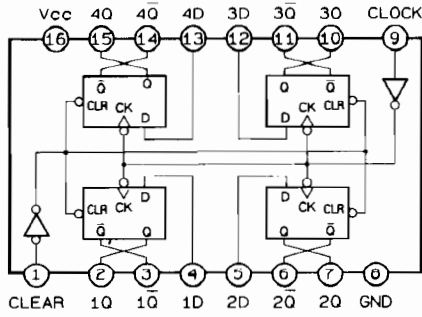
**IC208, 210, 213, 216 : M51132L**  
2-Channel Volume/Balance Controller



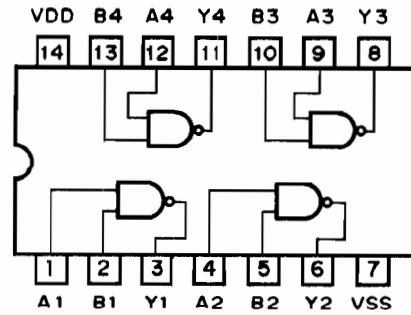
**IC225 : LC7821N**  
Analog Function Switch



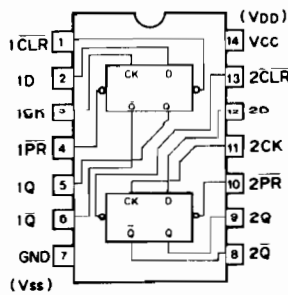
**IC24 :  $\mu$ PD74HC175G-T1 or MN74HC175S**  
Quad D-FFs



**IC25 :  $\mu$ PD74HC00G-T1**  
Quad 2-Input NAND Gate



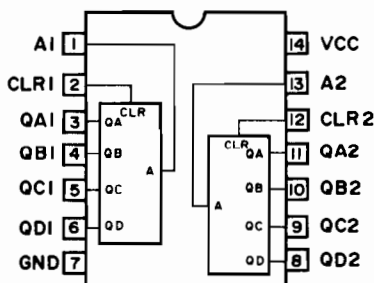
**IC21, 22 :  $\mu$ PD74HC74G-T1**  
Dual D-FFs with Preset and Clear



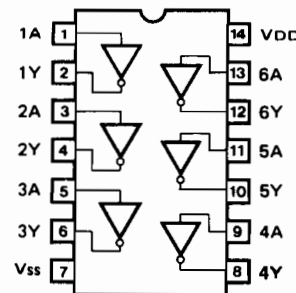
INPUTS			OUTPUTS		
PR	CLR	CLK	D	Q	Q-bar
L	H	X	X	H	L
H	L	X	X	L	H
L	L	X	X	H <sup>1</sup>	H <sup>1</sup>
H	H	/	H	H	L
H	H	/	L	L	H
H	H	L	X	Q <sup>0</sup>	Q <sup>0</sup>

- Note)
1. X : Either "H" or "L"
  2. / : Rise in positive direction
  3. Q<sup>0</sup> : Q level before the input conditions in the table are established.
  4. Q<sup>0</sup> : Q level before the input conditions in the table are established.
  5. H<sup>1</sup> : When the preset and clear are "L", Q and Q-bar are "H" but when the preset and clear are made "H" simultaneously, the level of Q and Q-bar can not be predicted.

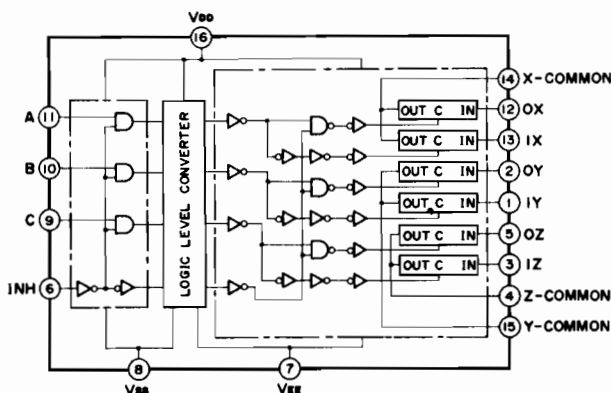
**IC23 :  $\mu$ PD74HC393G-T1 or MN74HC393S**  
Dual 4-Bit Binary Counters



**IC8 : TC4069UBP**  
**IC20 :  $\mu$ PD74HCU04G-T1 or MN74HCU04S**  
**IC701 :  $\mu$ PD74HCU04C**  
Hex Inverters



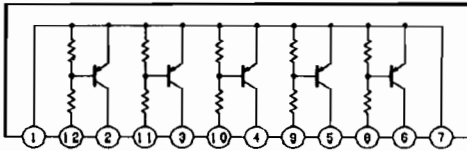
**IC30, 31 :  $\mu$ PD4053BC**  
**IC205 :  $\mu$ PD4053G-T1**  
**IC215, 704 : TC4053BP**  
Triple-2 Channel Multiplexer/Demultiplexer



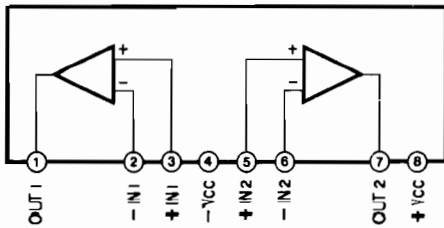
INHIBIT (Pin 6)	CONTROL INPUTS			"ON" CHANNEL	
	C (Pin 9)	B (Pin 10)	A (Pin 11)	0X (Pin 12), 0Y (Pin 2), 0Z (Pin 5)	1X (Pin 13), 1Y (Pin 1), 1Z (Pin 3)
L	L	L	L	0X, 0Y, 0Z	
L	L	L	H	1X, 0Y, 0Z	
L	L	H	L	0X, 1Y, 0Z	
L	L	H	H	1X, 1Y, 0Z	
L	H	L	L	0X, 0Y, 1Z	
L	H	L	H	1X, 0Y, 1Z	
L	H	H	L	0X, 1Y, 1Z	
L	H	H	H	1X, 1Y, 1Z	
H	*	*	*	NOTE	

\* Don't Care

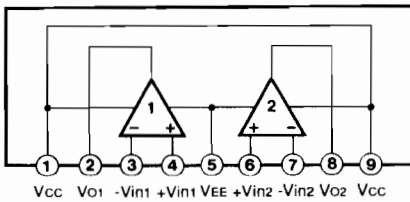
IC4 : DT5A143E  
Transistor Array



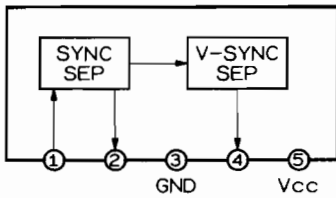
IC14, 16 : M5238L  
Dual Ope-amp



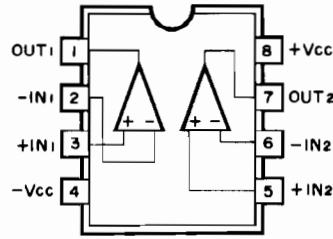
IC9~13, 15, 202, 204, 206, 207, 211,  
212, 217, 218, 224 :  $\mu$ PC4570HA  
IC203 :  $\mu$ PC4072HA  
IC209 : NJM4556S  
Dual Ope-amp



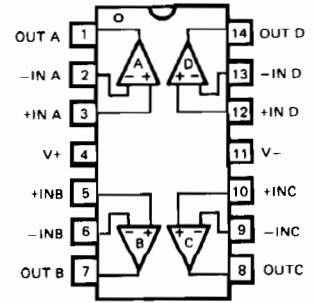
IC702 : LA7213  
Video Sync. Sep.



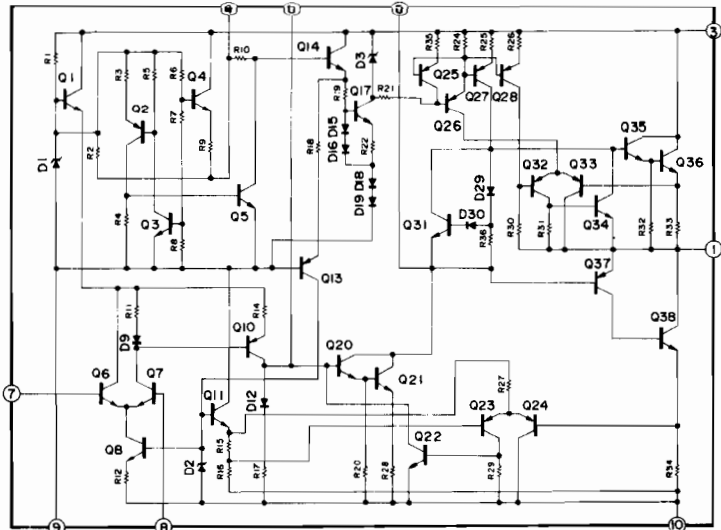
IC201 :  $\mu$ PC4570G2-T1  
Dual Ope-amp



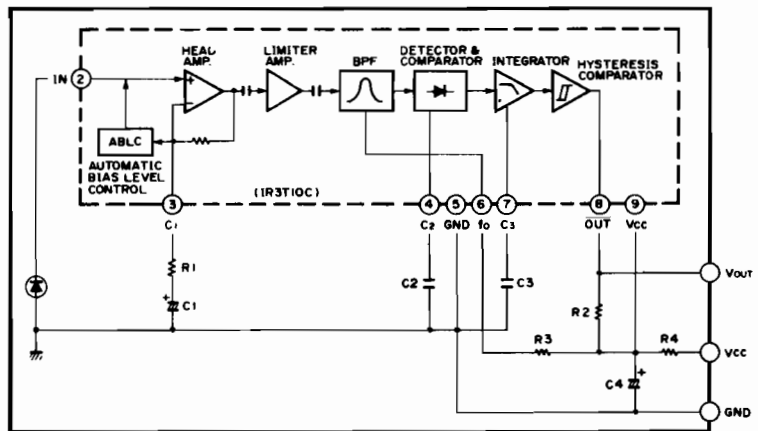
IC36, IC214 :  $\mu$ PC4574C  
4-channel Ope-amp



IC219~223 :  $\mu$ PC1188H  
Power Amp

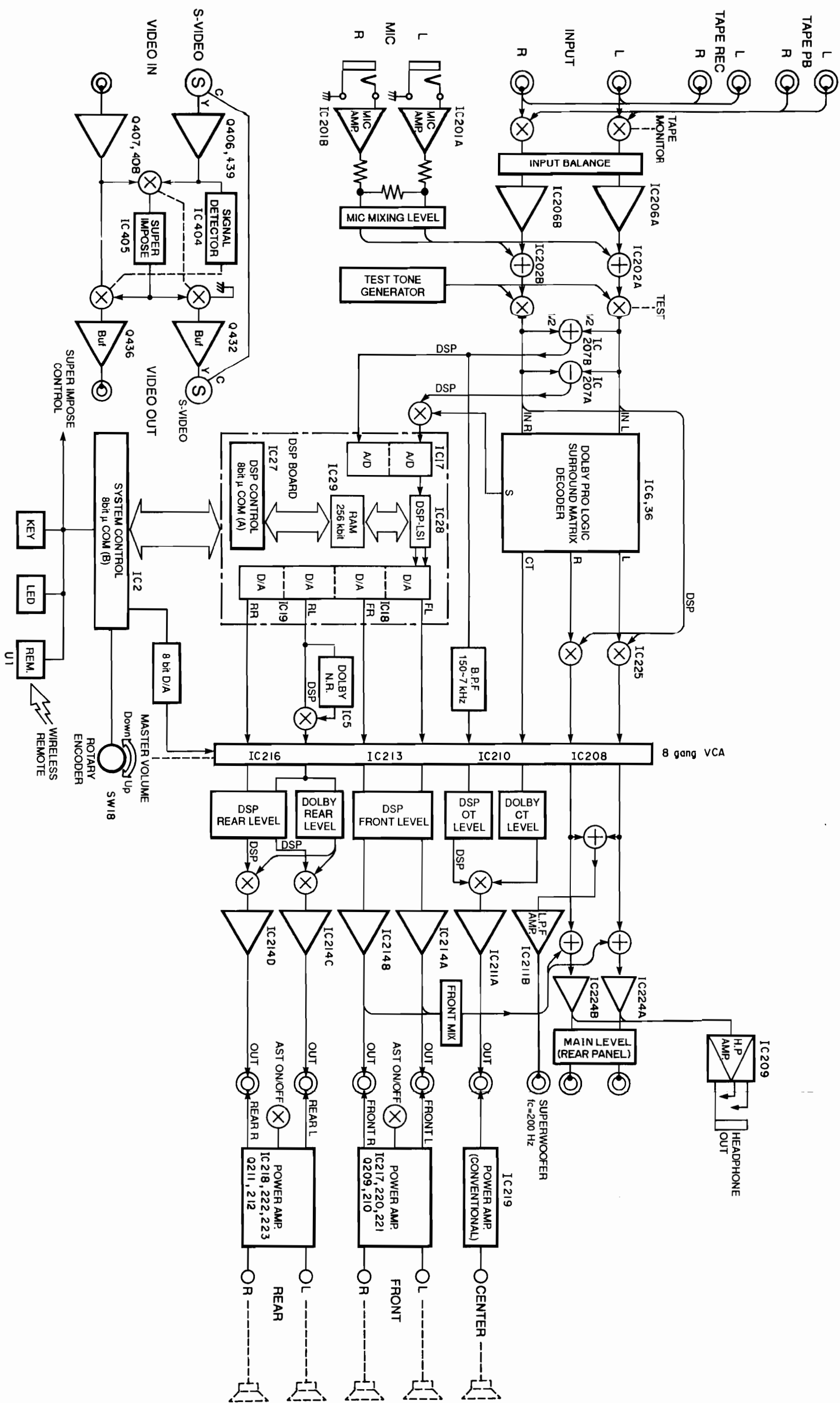


UI : GP1U501X  
Remote Control Receptor



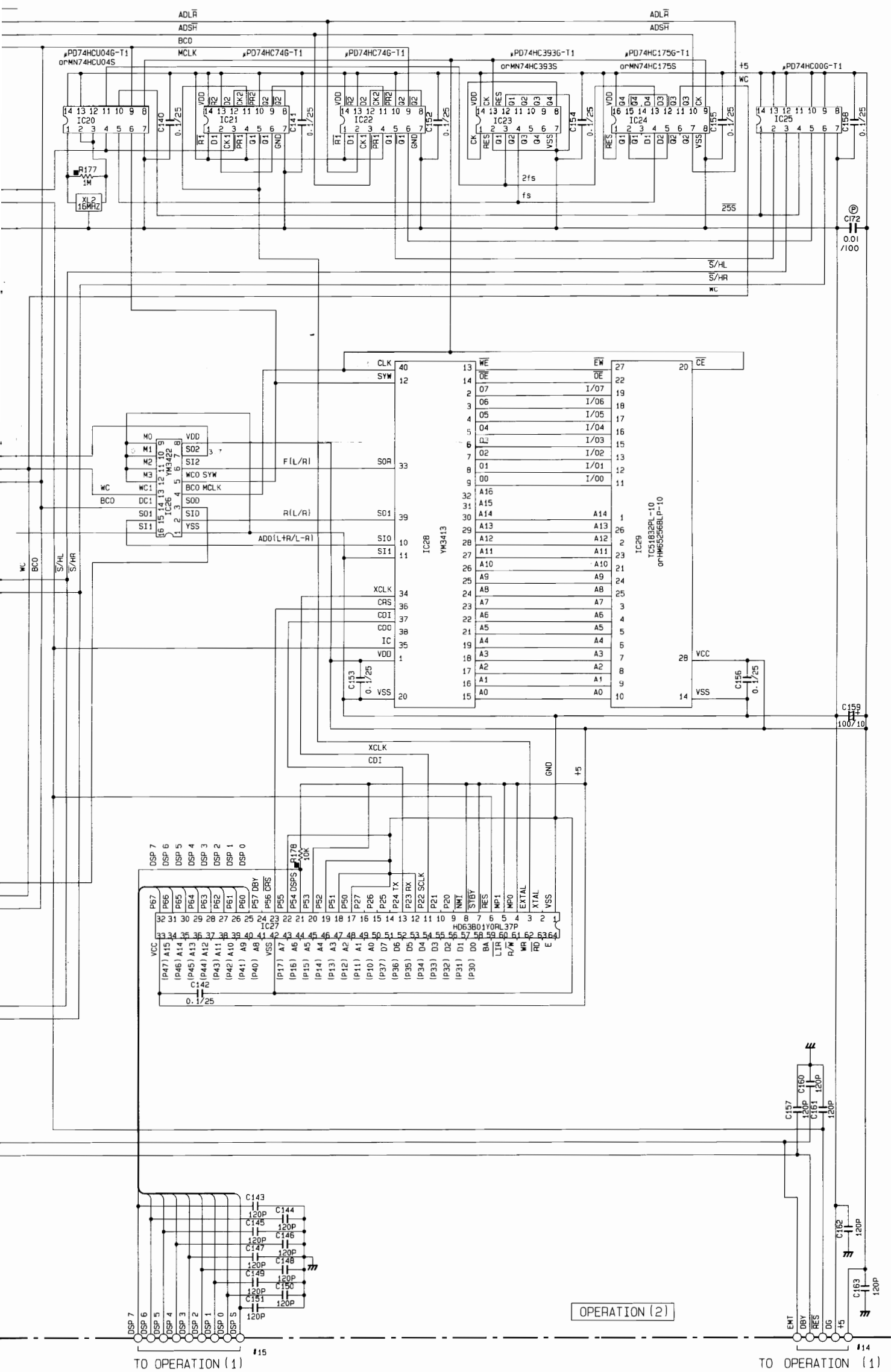


■ BLOCK DIAGRAM









NOTICE  
 (J)..... Japanese model  
 (U)..... U.S.A model  
 (C)..... Canadian model  
 (A)..... Australian model  
 (G)..... European model  
 (B)..... British model  
 (R)..... General model  
 (P)..... RP model

REMARKS	PARTS NAME	SYMBOL
NO MARK	ELECTROLYTIC CAPACITOR	⊘
⊗	TANTALUM CAPACITOR	⊗
NO MARK	CERAMIC CAPACITOR	⊖
⊖	POLYESTER FILM CAPACITOR	⊖
⊙	POLYSTYRENE FILM CAPACITOR	⊙
Ⓜ	MICA CAPACITOR	Ⓜ
Ⓟ	POLYPROPYLENE FILM CAPACITOR	Ⓟ
Ⓢ	SEMICONDUCTIVE CERAMIC CAPACITOR	Ⓢ

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (1/6W)
⊠	CARBON FILM RESISTOR (1/4W)
⊡	METAL OXIDE FILM RESISTOR
⊢	METEL FILM RESISTOR
⊣	METEL PLATE RESISTOR
⊤	FIRE PROOF CARBON FILM RESISTOR
⊥	SEMENT MOLDED RESISTOR
⊦	SEMI VARIABLE RESISTOR
⊧	CHIP RESISTOR

MAIN EFFECT	MAIN AMP	EFFECT AMP

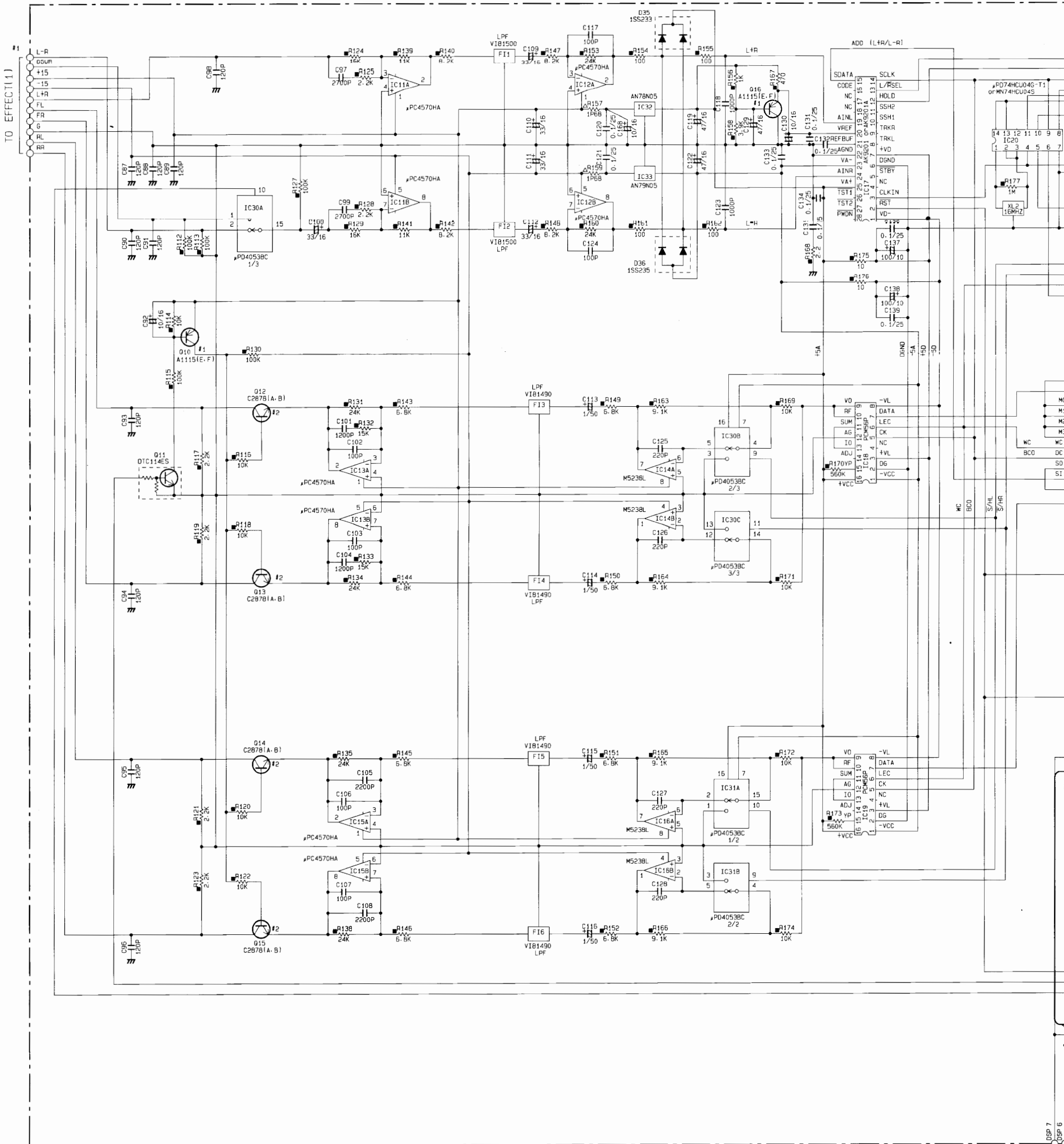
A1115(E, F) or A9335(I, R) or A1309A(Q, R, S)  
 C2878(A, B) or C3327 or D1915(S, T)

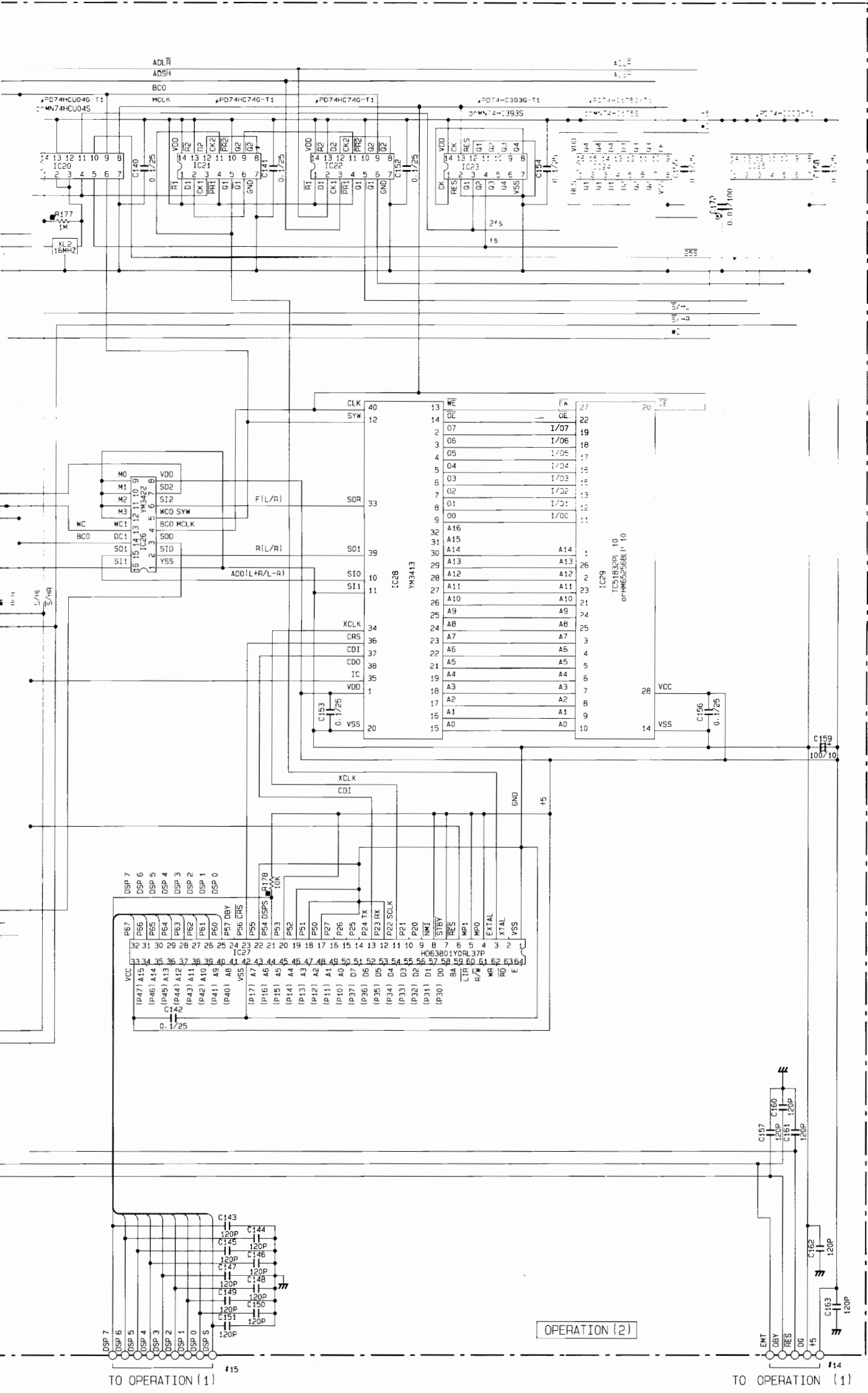
OPERATION		
	LAST NO.	UN LISTED NO.
C	171	
R	184	
G	16	
D	37	
IC	35	

OPERATION (2)

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

■ SCHEMATIC DIAGRAM (1/4) ..... OPERATION C. B C / D





**NOTICE**  
 (J)..... Japanese Code  
 (U)..... U.S.A. Code  
 (C)..... Canadian Code  
 (A)..... Australia Code  
 (G)..... European Code  
 (B)..... British Code  
 (R)..... General Code  
 (P)..... RP Code

**CAPACITOR**

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
⊖	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
⊖	POLYESTER FILM CAPACITOR
⊖	POLYSTYRENE FILM CAPACITOR
⊖	MICA CAPACITOR
⊖	POLYPROPYLENE FILM CAPACITOR
⊖	SEMICONDUCTIVE CERAMIC CAPACITOR

**RESISTOR**

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (1/6W)
⊖	CARBON FILM RESISTOR (1/4W)
⊖	METAL OXIDE FILM RESISTOR
⊖	METAL FILM RESISTOR
⊖	METAL PLATE RESISTOR
⊖	FIRE PROOF CARBON FILM RESISTOR
⊖	CEMENT MOUNTED RESISTOR
⊖	SEMI-VARIABLE RESISTOR
⊖	CHIP RESISTOR

**Interchangeable Parts at Manufacture-Stage**

Mark	Reference Parts Number	Parts Name
#1	Q10-15	2SA1115(E.F) 2SA933S(Q.R) 2SA1309A(Q.R.S)
#2	Q12-15	2SC287B(A.B) 2SC3327 2SD1915

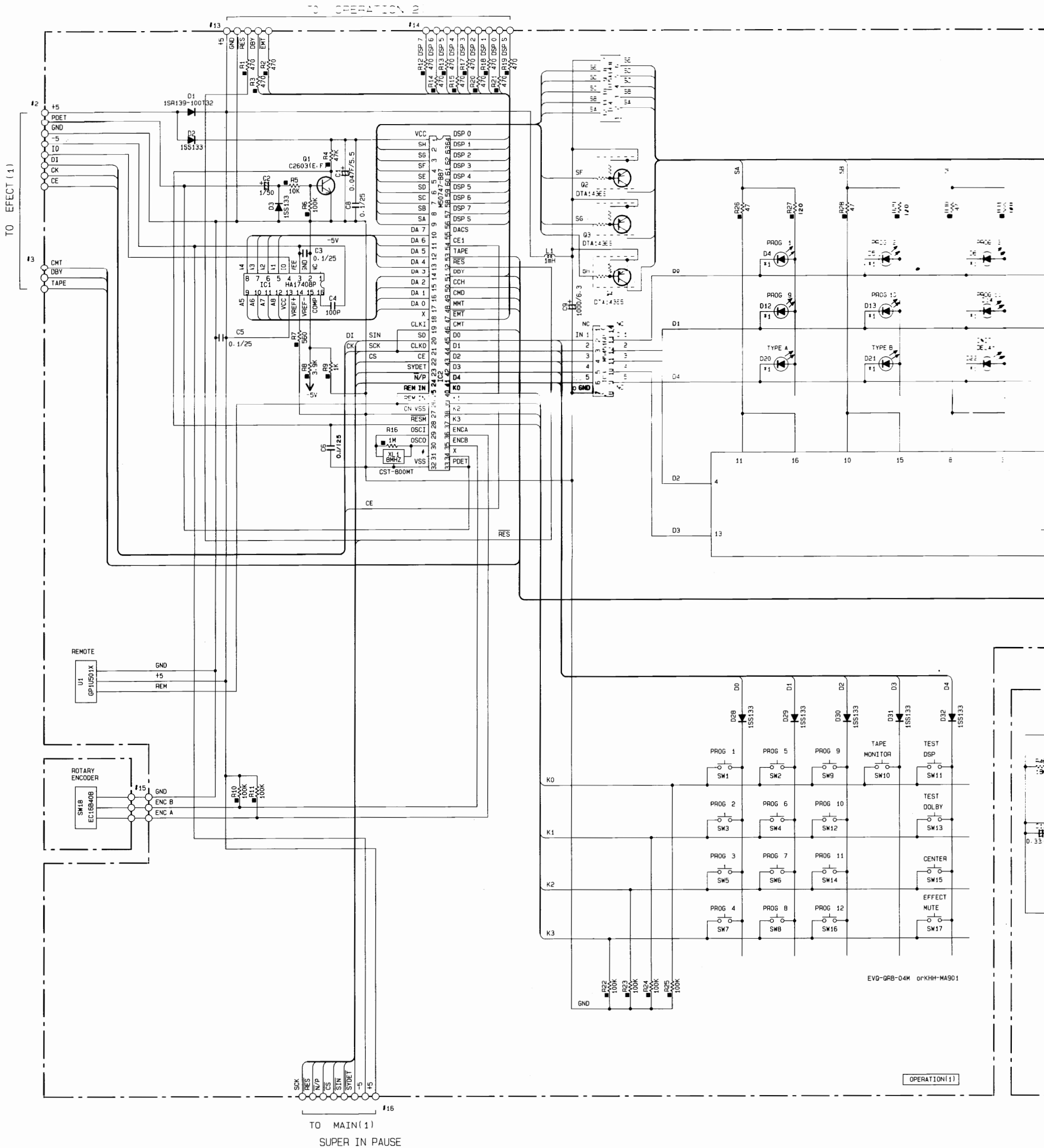
MAIN	MAIN AMP
EFFECT	EFFECT AMP

**OPERATION**

	LAST NO.	UN LISTED NO.
C	177	
R	201	
Q	16	
D	37	
IC	36	

\* All voltage are measured with a 10MΩ/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 (2/4) ..... OPERATION C. B **B**



**NOTICE**  
 (J)..... Japanese model  
 (U)..... U.S.A model  
 (C)..... Canadian model  
 (A)..... Australian model  
 (G)..... European model  
 (B)..... British model  
 (R)..... General model  
 (P)..... AP model

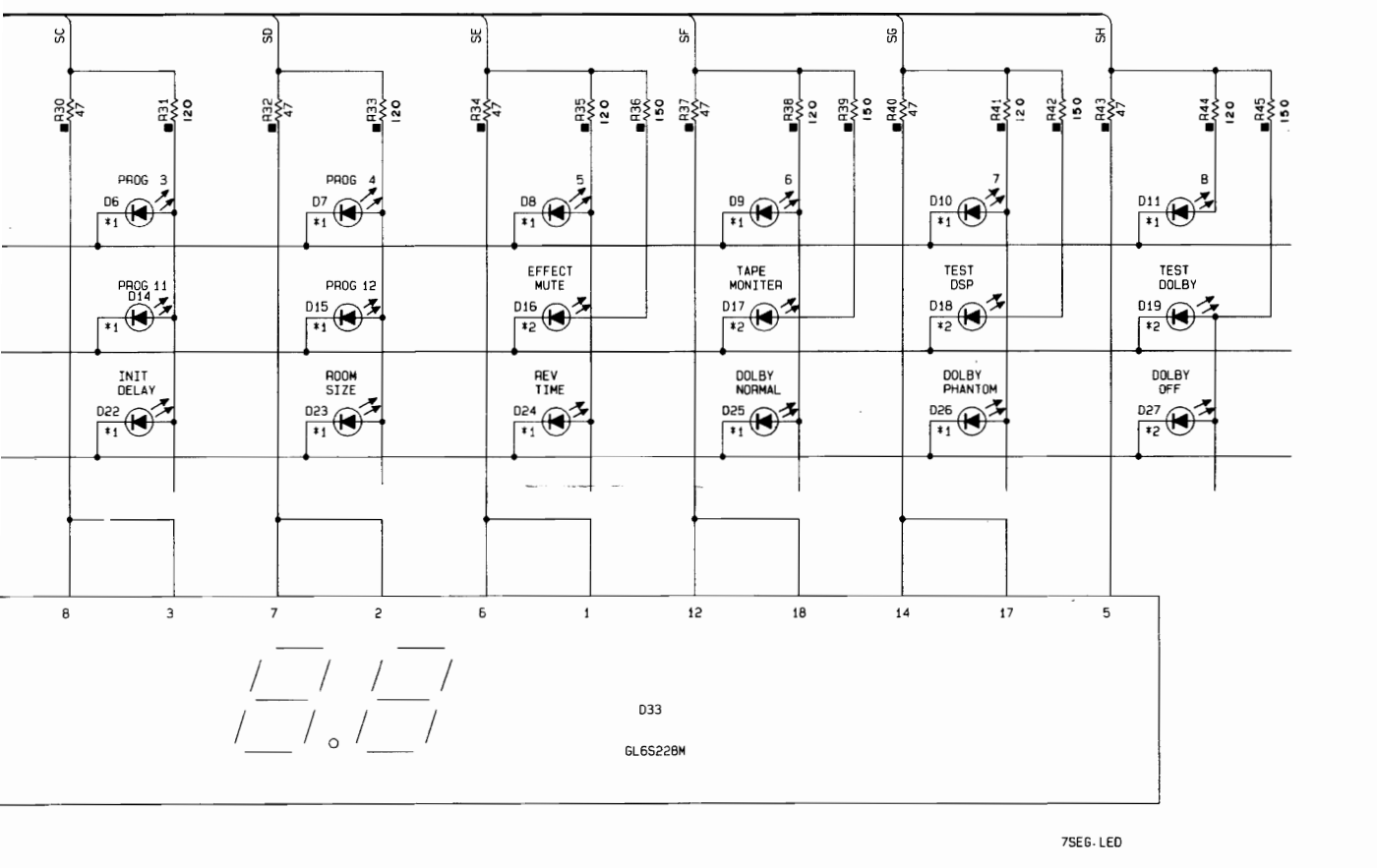
REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (1/6W)
□	CARBON FILM RESISTOR (1/4W)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
⊞	FIRE PROOF CARBON FILM RESISTOR
□	SEMENT MOLDED RESISTOR
⊞	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

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

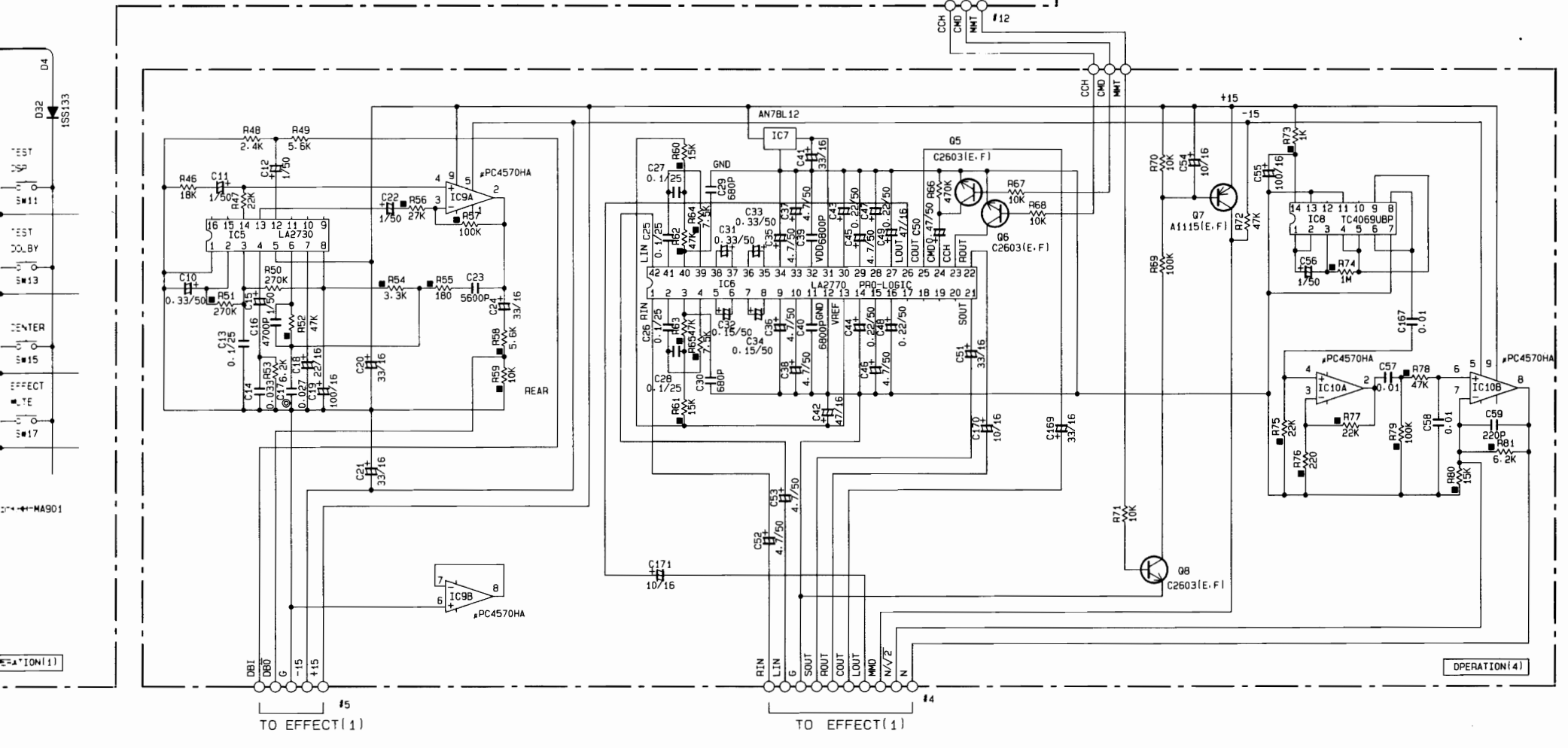
MAIN	MAIN AMP
EFFECT	EFFECT AMP

A1115(E.F)	orA9335(G.R)	orA1309A(G.R.S)
C2603(E.F)	orC17405(S.R)	orC3311A(G.R.S)

OPERATION	
LAST NO.	UN LISTED NO.
C	171
R	184
Q	16
D	37
IC	35



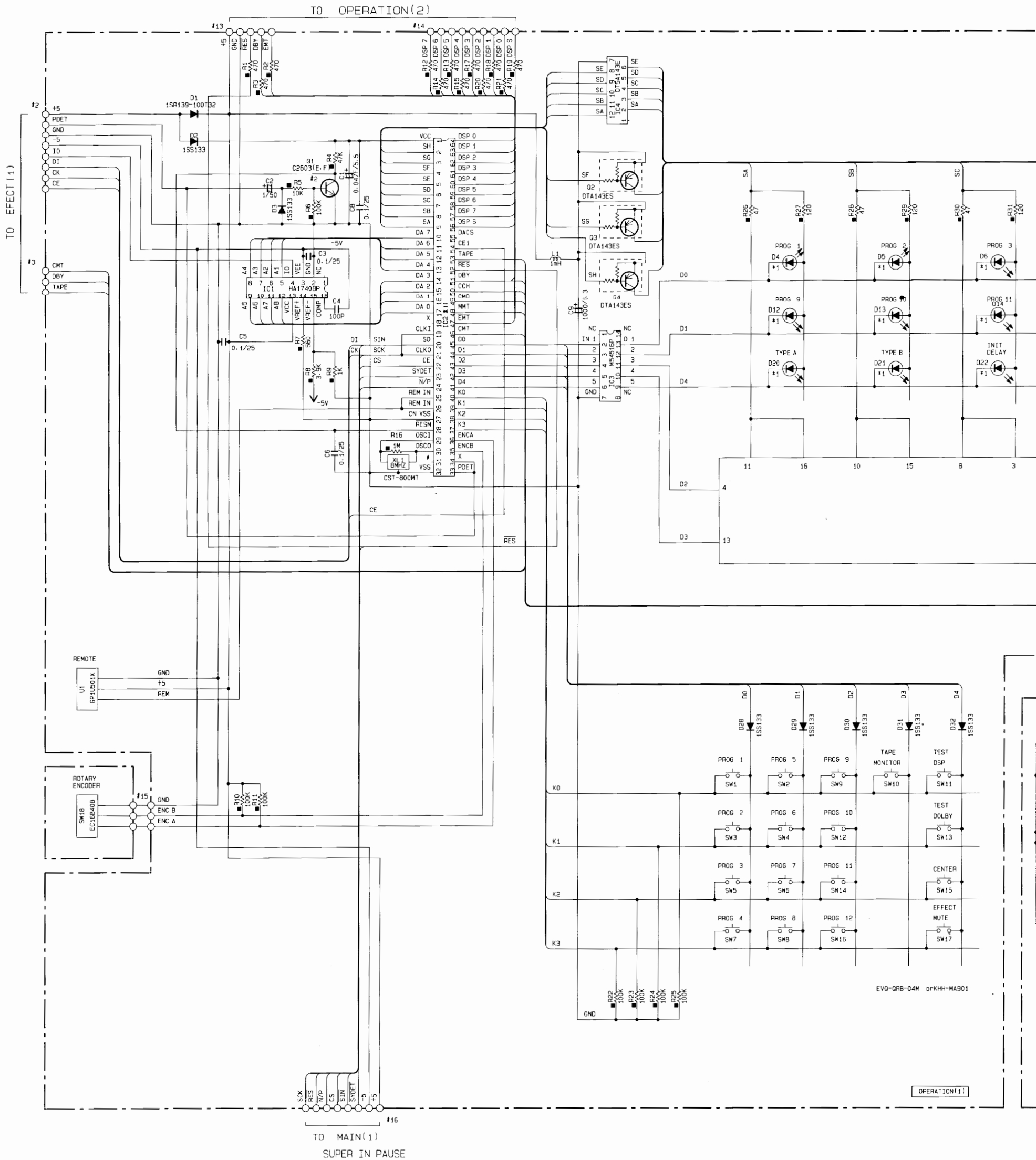
LED #1 SLR-340C3H3  
 #2 SLR-34VC3H3



\* All voltage are measured with a 10MΩ/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.



SCHEMATIC DIAGRAM (2/4) ..... OPERATION C. B C / D

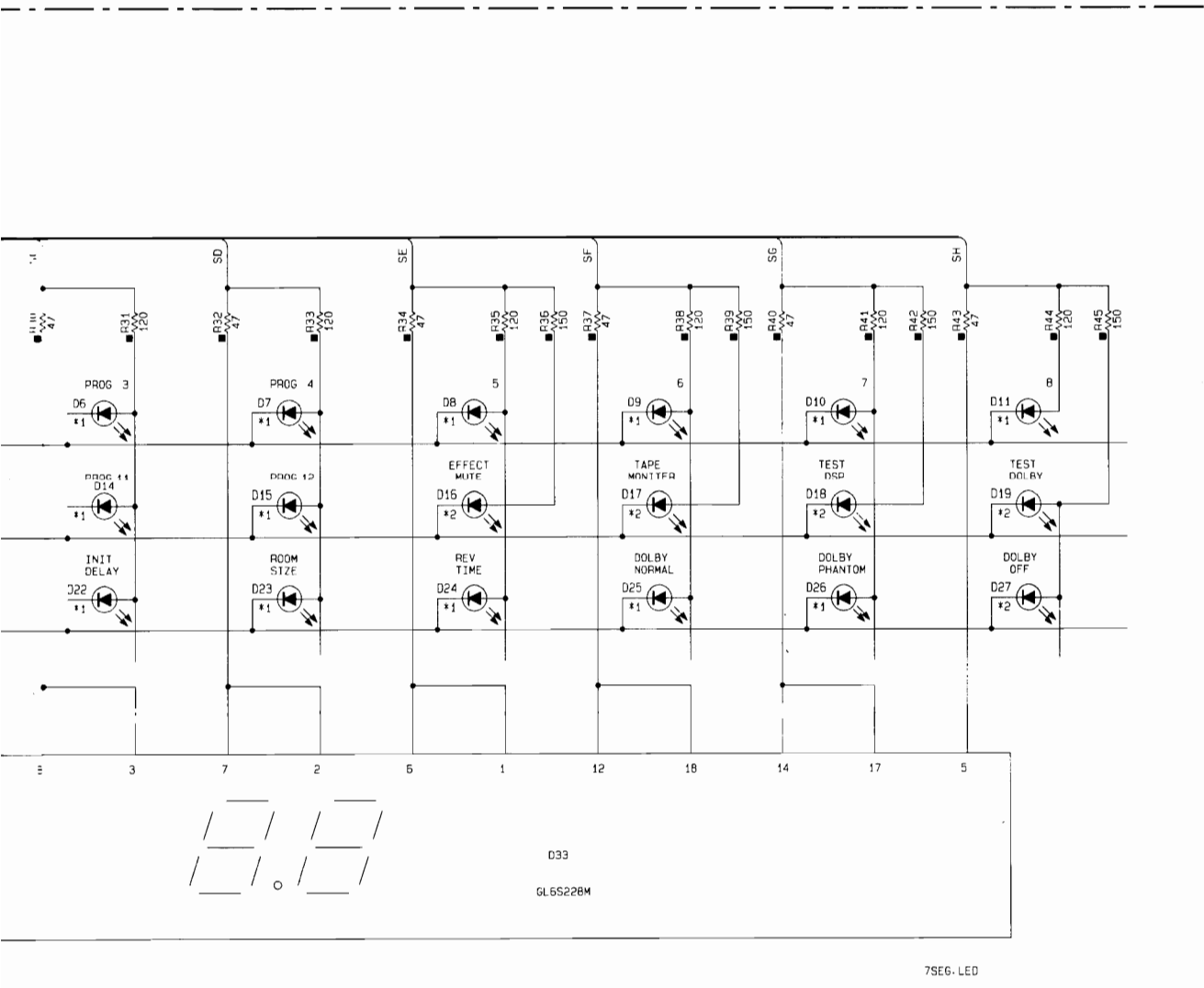


**NOTICE**  
 (J)..... Japanese model  
 (U)..... U.S.A model  
 (C)..... Canadian model  
 (A)..... Australian model  
 (G)..... European model  
 (B)..... British model  
 (R)..... General model  
 (P)..... RP model

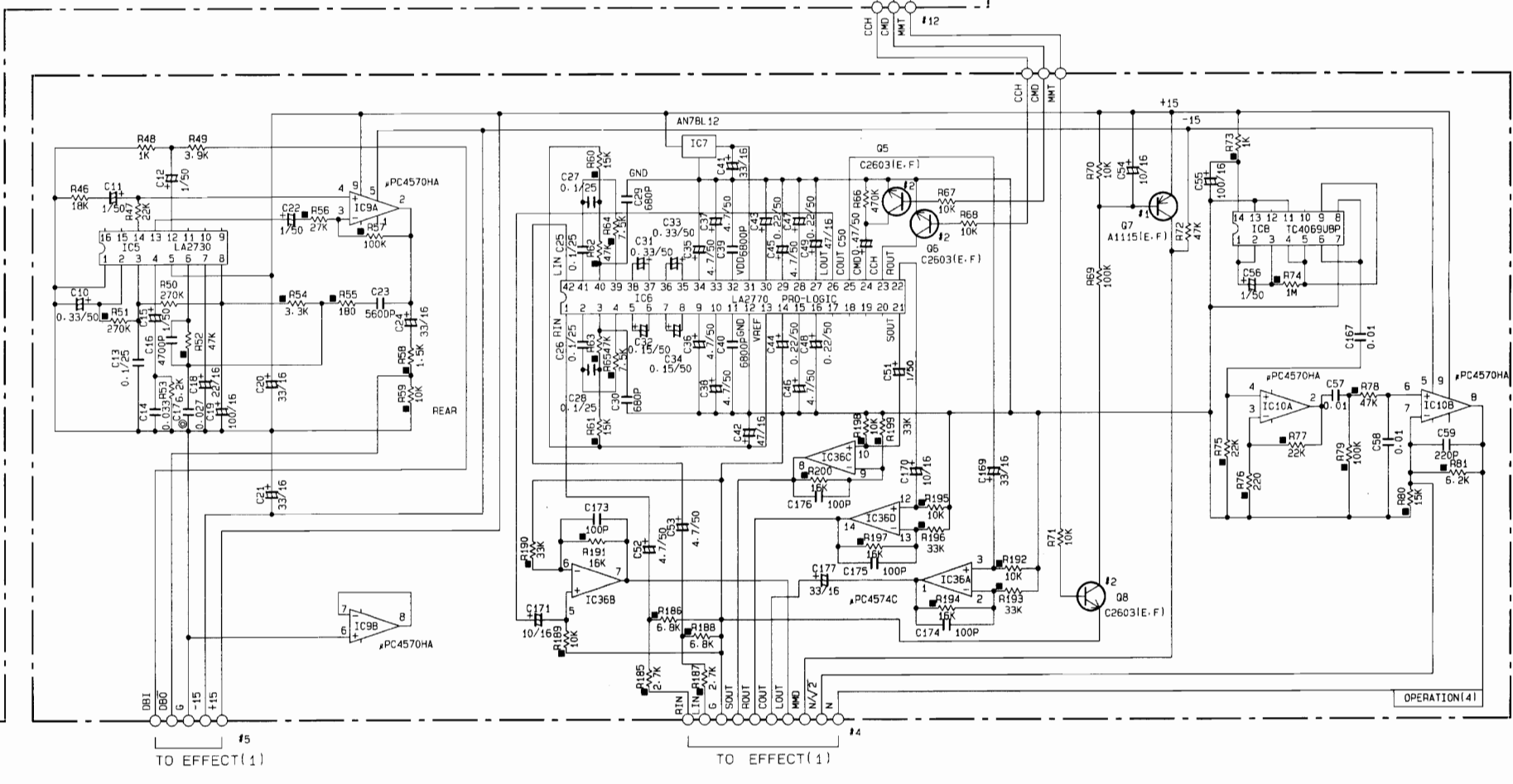
REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (1/6W)
□	CARBON FILM RESISTOR (1/4W)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
⊞	FIRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
⊙	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

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

Mark	Reference Parts Number	Parts Name
#1	07	2SA1115(E-F) 2SA933S(G-R) 2SA1309A(I-G, R-S)
#2	01-5-6-8	2SC1740S(S-R) 2SC2603(E-F) 2SC3311A(I-G, R-S)



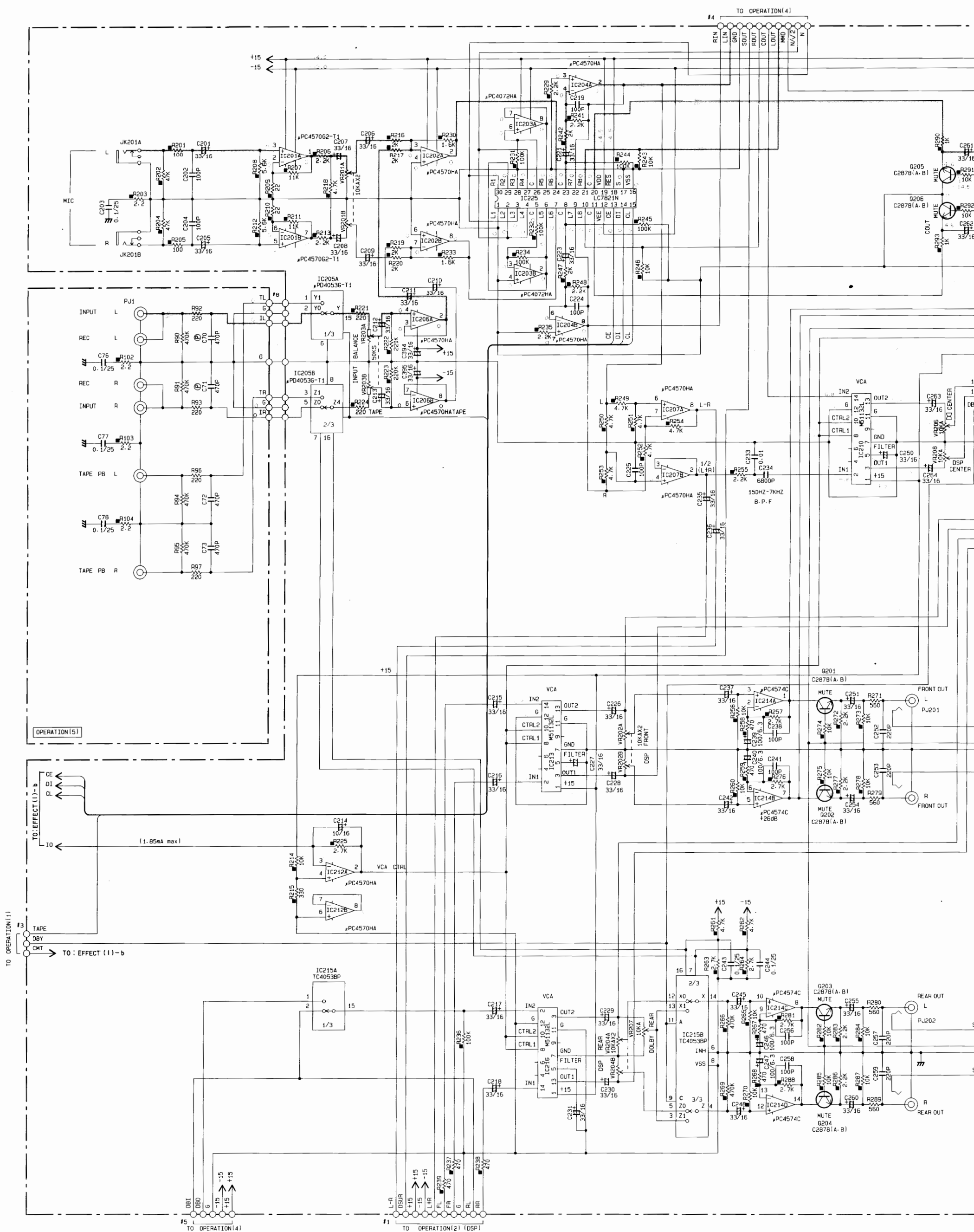
LED #1 SLR-34DC3H3  
#2 SLR-34VC3H3



X	J	U.C	R,A,B,G
II IC2	M50747-B87	M50747-C36	M50747-B87

\* All voltage are measured with a 10MΩ/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.

SCHEMATIC DIAGRAM (3/4) .....EFFECT AMP C. B C



REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (1/6W)
□	CARBON FILM RESISTOR (1/4W)
△	METAL OXIDE FILM RESISTOR
⊗	METAL FILM RESISTOR
⊙	METAL PLATE RESISTOR
■	FIRE PROOF CARBON FILM RESISTOR
□	SEMENT MOLDED RESISTOR
⊕	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

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

MAIN	MAIN AMP
CC0701(A-D)	or C33C7 or D1915
A933S1(Q-R)	or A1115(E-F) or A1309A(Q-R-S)

