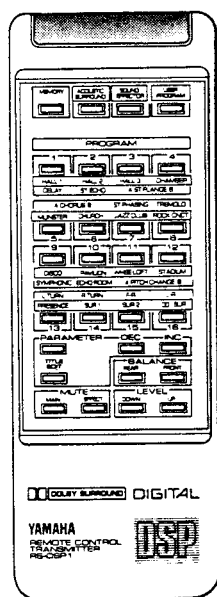
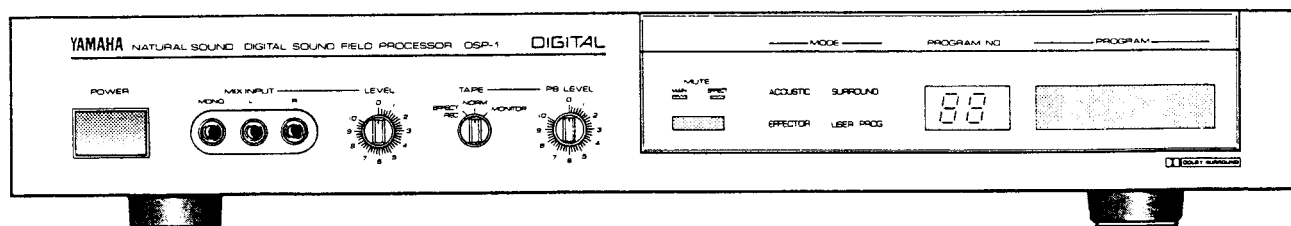


DIGITAL SOUND FIELD PROCESSOR DSP-1

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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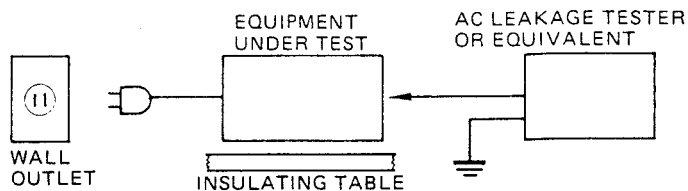
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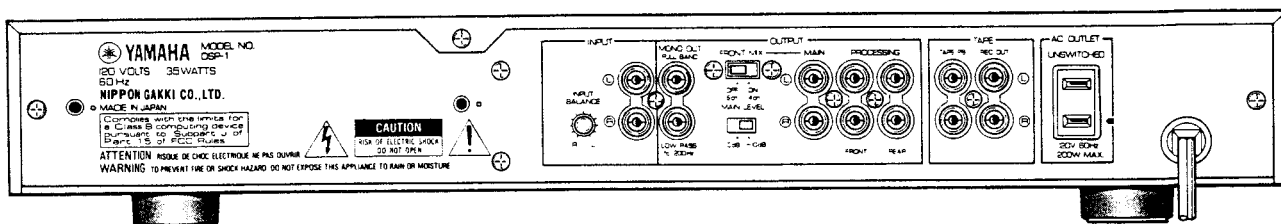
■ TO SERVICE PERSONNEL

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 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.

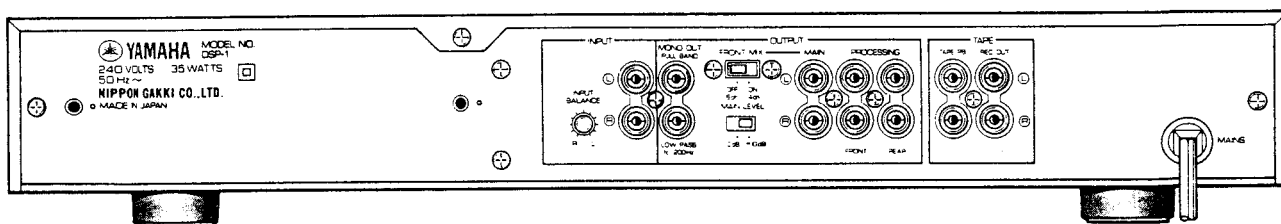


■ REAR PANELS

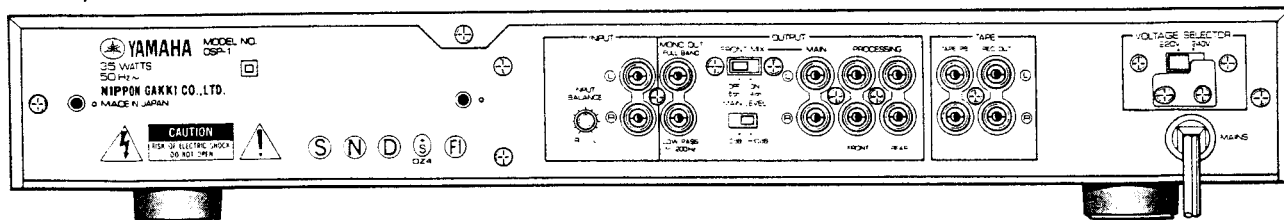
▼U.S.A. & Canadian models



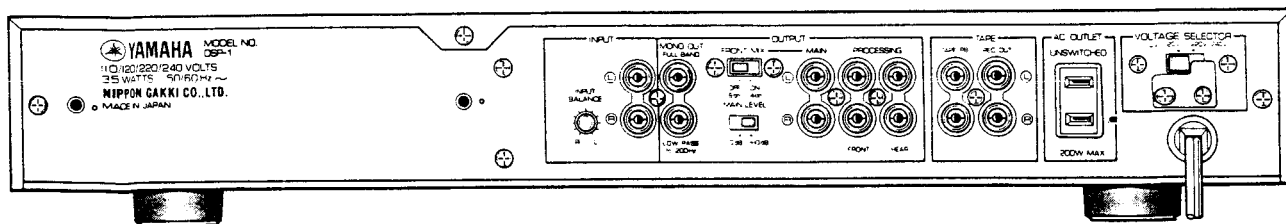
▼Australian model



▼European & British models



▼Other model



SPECIFICATIONS

Input/Output Jacks	
Inputs	INPUT L, R TAPE PB L, R MIXING INPUT L, R/MONO
Outputs	MAIN OUT L, R FRONT OUT L, R REAR OUT L, R REC OUT L, R MONO OUT (FULL BAND) MONO OUT (L.P.F.)
Tape	3 modes (NORMAL, MONITOR, EFFECT REC)
A/D, D/A Conversion	
Number of Bits on Quantization	16-bit linear
Sampling Rate	44.1 kHz
Program	
Acoustic/Surround	16 programs
Sound Effector	16 programs
User Program	16 programs
Maximum Allowable Input	3V, 1kHz
Maximum Output Level	3V, 1kHz
Dynamic Range (IHF-A)	110 dB (MAIN) 94 dB (PROCESSING)
Total Harmonic Distortion	0.002% (MAIN), 1 kHz, 3V 0.006% (PROCESSING), 1 kHz, 3V

Frequency Response	10Hz — 100kHz (MAIN), +0, -3 dB 20 Hz — 20 kHz (PROCESSING), +0, -3 dB
Gain	0 ± 0.5 dB (MAIN) 0 ± 0.5 dB (PROCESSING)
Power Requirements	
U.S.A. & Canadian models	AC 120V 60Hz
Australian & British models	AC 240V 50Hz
European model	AC 220V 50Hz
Other model	AC 110/120V, 220/240V 50/60Hz
Power Consumption	30 watts
AC Outlet (Unswitched)	200W max.
Dimensions (W x H x D)	435 x 72 x 312 mm (17-1/8 x 2-13/16 x 12-5/16 inch)
Weight	4.5 kg (9 lb 15 oz)

*Specifications and design subject to change without notice.

(U) U.S.A. model
(C) Canadian model
(A) Australian model
(B) British model
(G) European model
(R) Other model

DISASSEMBLY PROCEDURES (Remove parts in disassembly order as numbered)

1. Removal of Top Cover

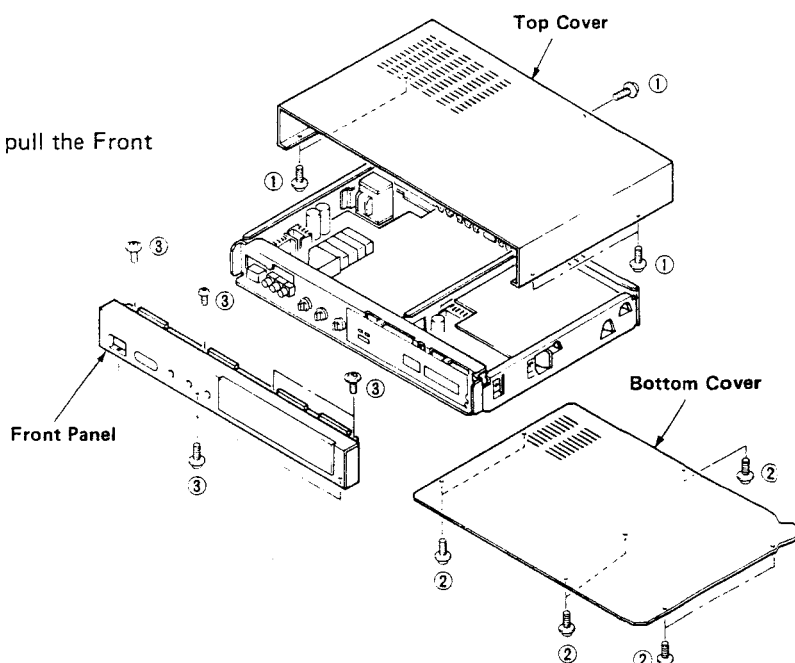
Remove 5 screws (①) in fig. 1, and slide the Top Cover to the back.

2. Removal of Bottom Cover

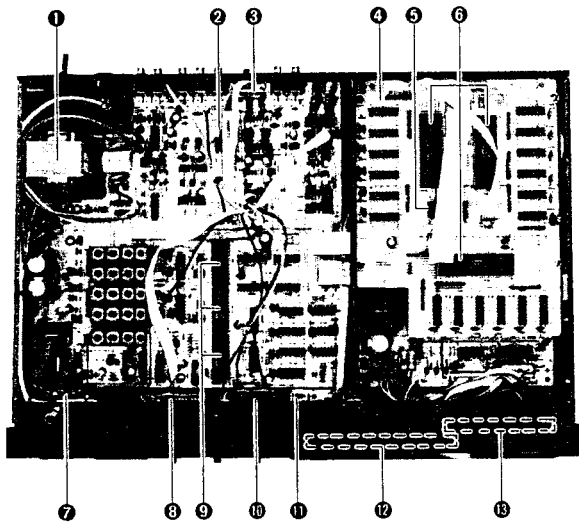
Remove 7 screws (③) in fig. 1.

3. Removal of Front Panel

Remove 7 screws (②) in Fig. 1, and pull the Front Panel forward.



INTERNAL VIEW



1 POWER TRANSFORMER

U.S.A. & Canadian models: XB307001

European & British models: XB308001

Australian model: XB610001

Other model: XB306001

2 ANALOG CIRCUIT BOARD (1)

3 ANALOG CIRCUIT BOARD (5)

4 DIGITAL CIRCUIT BOARD (2)

5 MOD (Modulation Data Generator): iT380700 (YM3807)

6 LSI (Digital Signal Processor): XA896001 (YM3804)

7 ANALOG CIRCUIT BOARD (6)

8 ANALOG CIRCUIT BOARD (7)

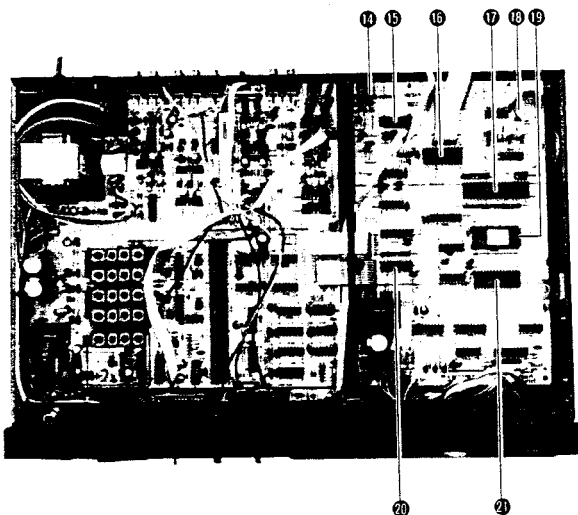
9 D/A CONVERTER: XA394001 (PCM54HP)

10 ANALOG CIRCUIT BOARD (4)

11 DIGITAL CIRCUIT BOARD (4)

12 DIGITAL CIRCUIT BOARD (3)

13 LCD UNIT: VB748900



14 DIGITAL CIRCUIT BOARD (1)

15 μ-COM: XB254001 (M50760-464P)

16 ACIA: iG133100 (HD63A50P)

17 CPU: iG093500 (HD6303RP)

18 BATTERY: VB750000

19 ROM: XB267001 (μPD27C256C-20)

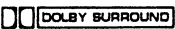
20 RAM: XB255001 (μPB421C)

21 RAM: XA995001 (μPD4464C-15L)

■PRESET PROGRAM LIST

● ACOUSTIC/SURROUND MODE

Program No.	Program Name	Parameters					
		1	2	3	4	5	6
1	HALL 1	TYPE A (A, B)	ROOM SIZE 1.0 (0.1 ~ 8.0)	LIVENESS 5 (0 ~ 10)	INIT DLY 30ms (5ms ~ 150ms)	HPF THRU (THRU, 32Hz ~ 1.0kHz)	LPF 7.0kHz (1.0kHz ~ 16kHz, THRU)
2	HALL 2	TYPE C (C, D)	ROOM SIZE 1.0 (0.1 ~ 8.0)	LIVENESS 5 (0 ~ 10)	INIT DLY 30ms (5ms ~ 150ms)	HPF THRU (THRU, 32Hz ~ 1.0kHz)	LPF 7.0kHz (1.0kHz ~ 16kHz, THRU)
3	HALL 3	TYPE LIVE CONCERT (LIVE CONCERT, ON STAGE)	ROOM SIZE 2.0 (0.1 ~ 8.0)	LIVENESS 5 (0 ~ 10)	INIT DLY 45ms (5ms ~ 150ms)	HPF THRU (THRU, 32Hz ~ 1.0kHz)	LPF 4.0kHz (1.0kHz ~ 16kHz, THRU)
4	CHAMBER	REV TIME 1.1s (0.3s ~ 99.0s)	HIGH 0.7 (0.1 ~ 1.0)	INIT DLY 15ms (5ms ~ 150ms)	HPF THRU (THRU, 32Hz ~ 1.0kHz)	LPF 10kHz (1.0kHz ~ 16kHz, THRU)	REV LVL 50% (0% ~ 100%)
5	Münster	REV TIME 4.0s (0.3s ~ 99.0s)	HIGH 0.8 (0.1 ~ 1.0)	INIT DLY 95ms (5ms ~ 150ms)	HPF THRU (THRU, 32Hz ~ 1.0kHz)	LPF 7.0kHz (1.0kHz ~ 16kHz, THRU)	REV LVL 100% (0% ~ 100%)
6	CHURCH	REV TIME 2.5s (0.3s ~ 99.0s)	HIGH 0.9 (0.1 ~ 1.0)	INIT DLY 40ms (5ms ~ 150ms)	HPF THRU (THRU, 32Hz ~ 1.0kHz)	LPF 8.0kHz (1.0kHz ~ 16kHz, THRU)	REV LVL 100% (0% ~ 100%)
7	JAZZ CLUB	TYPE LIVE (LIVE, DYNAMITE! REVERSE, SPACIOUS)	ROOM SIZE 1.0 (0.1 ~ 8.0)	LIVENESS 5 (0 ~ 10)	INIT DLY 20ms (5ms ~ 150ms)	HPF THRU (THRU, 32Hz ~ 1.0kHz)	LPF THRU (1.0kHz ~ 16kHz, THRU)
8	ROCK CONCERT	TYPE DYNAMITE! (LIVE, DYNAMITE! REVERSE, SPACIOUS)	ROOM SIZE 4.0 (0.1 ~ 8.0)	LIVENESS 9 (0 ~ 10)	INIT DLY 15ms (5ms ~ 150ms)	HPF THRU (THRU, 32Hz ~ 1.0kHz)	LPF THRU (1.0kHz ~ 16kHz, THRU)
9	DISCO	TYPE DYNAMITE! (LIVE, DYNAMITE! REVERSE, SPACIOUS)	ROOM SIZE 1.0 (0.1 ~ 8.0)	LIVENESS 6 (0 ~ 10)	INIT DLY 10ms (5ms ~ 150ms)	HPF THRU (THRU, 32Hz ~ 1.0kHz)	LPF THRU (1.0kHz ~ 16kHz, THRU)
10	PAVILION	REV TIME 1.9s (0.3 ~ 99.0s)	HIGH 0.9 (0.1 ~ 1.0)	INIT DLY 5ms (5ms ~ 150ms)	HPF 56Hz (THRU, 32Hz ~ 1.0kHz)	LPF 2.5kHz (1.0kHz ~ 16kHz, THRU)	REV LVL 100% (0% ~ 100%)
11	WAREHOUSE LOFT	REV TIME 1.0s (0.3s ~ 99.0s)	HIGH 0.7 (0.1 ~ 1.0)	INIT DLY 20ms (5ms ~ 150ms)	HPF THRU (THRU, 32Hz ~ 1.0kHz)	LPF 9.0kHz (1.0kHz ~ 16kHz, THRU)	REV LVL 100% (0% ~ 100%)
12	STADIUM	TYPE SPACIOUS (LIVE, DYNAMITE! REVERSE, SPACIOUS)	ROOM SIZE 4.0 (0.1 ~ 8.0)	LIVENESS 5 (0 ~ 10)	INIT DLY 85ms (5ms ~ 150ms)	HPF THRU (THRU, 32Hz ~ 1.0kHz)	LPF 3.6kHz (1.0kHz ~ 16kHz, THRU)
13	PRESENCE	FL DLY 20.0ms (0.1ms ~ 600.0ms)	FR DLY 28.0ms (0.1ms ~ 600.0ms)	RL DLY 24.0ms (0.1ms ~ 600.0ms)	RR DLY 36.0ms (0.1ms ~ 600.0ms)	HPF THRU (THRU, 32Hz ~ 1.0kHz)	LPF 8.0kHz (1.0kHz ~ 16kHz, THRU)
14	SURROUND 1	TYPE LIVE CONCERT (LIVE CONCERT, ON STAGE) TYPE A, TYPE B	ROOM SIZE 1.0 (0.1 ~ 8.0)	LIVENESS 5 (0 ~ 10)	INIT DLY 30ms (5ms ~ 150ms)	HPF THRU (THRU, 32Hz ~ 1.0kHz)	LPF 5.0kHz (1.0kHz ~ 16kHz, THRU)
15	SURROUND 2	TYPE LIVE (LIVE, DYNAMITE! REVERSE, SPACIOUS)	ROOM SIZE 1.0 (0.1 ~ 8.0)	LIVENESS 5 (0 ~ 10)	INIT DLY 20ms (5ms ~ 150ms)	HPF THRU (THRU, 32Hz ~ 1.0kHz)	LPF 7.0kHz (1.0kHz ~ 16kHz, THRU)
16	DOLBY SURROUND	DELAY 20.0ms (15.0ms ~ 30.0ms)					



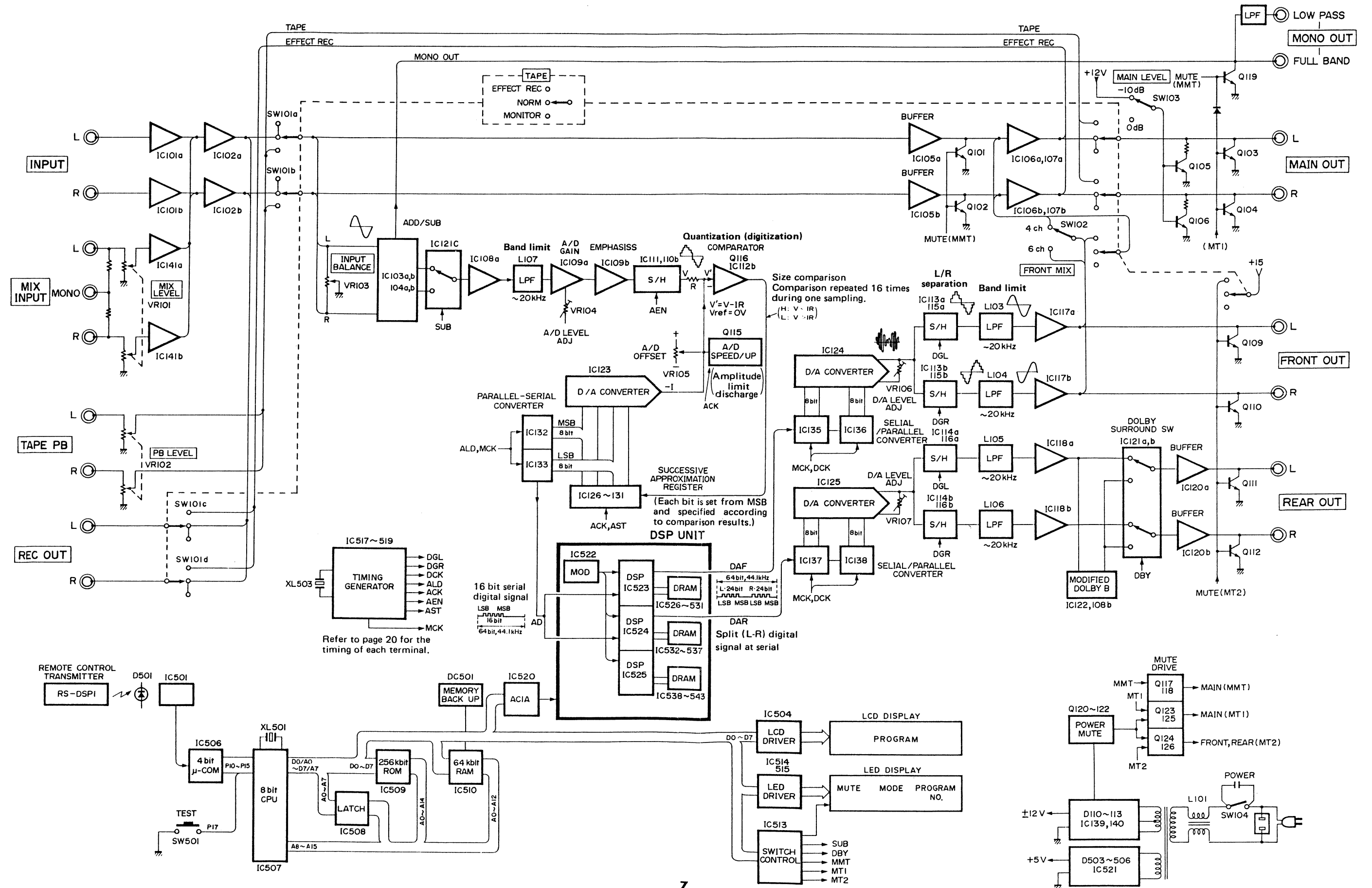
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● SOUND EFFECTOR MODE

Program No.	Program Name	Parameters					
		1	2	3	4	5	6
1	DELAY	FL DLY 100.0ms (0.1ms ~ 600.0ms)	FR DLY 200.0ms (0.1ms ~ 600.0ms)	RL DLY 300.0ms (0.1ms ~ 600.0ms)	RR DLY 400.0ms (0.1ms ~ 600.0ms)	HPF THRU (THRU, 32Hz ~ 1.0kHz)	LPF THRU (1.0kHz ~ 16kHz, THRU)
2	STEREO ECHO	Lch DLY 170.0ms (0.1ms ~ 270.0ms)	Lch F.B +60% (-95% ~ +95%)	Rch DLY 178.0ms (0.1ms ~ 270.0ms)	Rch F.B +58% (-95% ~ +95%)	HIGH 0.9 (0.1 ~ 1.0)	
3	STEREO FLANGE A	MOD. FRQ 2.5Hz (0.1Hz ~ 20.0Hz)	MOD. DEPTH 50% (0% ~ 100%)	MOD. DLY 1.2ms (0.1ms ~ 100.0ms)	F.B. GAIN 35% (0% ~ 95%)		
4	STEREO FLANGE B	MOD. FRQ 0.5Hz (0.1Hz ~ 20.0Hz)	MOD. DEPTH 90% (0% ~ 100%)	MOD. DLY 1.0ms (0.1ms ~ 100.0ms)	F.B. GAIN 40% (0% ~ 95%)		
5	CHORUS A	MOD. FRQ 0.2Hz (0.1Hz ~ 20.0Hz)	DM DEPTH 72% (0% ~ 100%)	AM DEPTH 40% (0% ~ 100%)			
6	CHORUS B	MOD. FRQ 0.6Hz (0.1Hz ~ 20.0Hz)	DM DEPTH 50% (0% ~ 100%)	AM DEPTH 10% (0% ~ 100%)			
7	STEREO PHASING	MOD. FRQ 1.1Hz (0.1Hz ~ 20.0Hz)	MOD. DEPTH 100% (0% ~ 100%)	MOD. DLY 3.0ms (0.1ms ~ 5.0ms)			
8	TREMOLO	MOD. FRQ 6.0Hz (0.1Hz ~ 20.0Hz)	MOD. DEPTH 70% (0% ~ 100%)				
9	SYMPHONIC	MOD. FRQ 0.7Hz (0.1Hz ~ 20.0Hz)	MOD. DEPTH 70% (0% ~ 100%)				
10	ECHO ROOM	REV TIME 2.6s (0.3s ~ 99.0s)	DELAY 180ms (40ms ~ 270ms)	HIGH 0.9 (0.1 ~ 1.0)			
11	PITCH CHANGE A	PITCH +0 (-12 ~ +12)	FINE +0 (-100 ~ +100)	DELAY 0.1ms (0.1ms ~ 300.0ms)	F.B. GAIN 0% (0% ~ 60%)		
12	PITCH CHANGE B	L PITCH +0 (-12 ~ +12)	L FINE +8 (-100 ~ +100)	L DLY 0.1ms (0.1ms ~ 120.0ms)	R PITCH +0 (-12 ~ +12)	R FINE -8 (-100 ~ +100)	R DLY 0.1ms (0.1ms ~ 120.0ms)
13	PAN L-TURN	PAN SPEED 0.7Hz (0.1Hz ~ 20.0Hz)	DEPTH 75% (0% ~ 100%)				
14	PAN R-TURN	PAN SPEED 0.7Hz (0.1Hz ~ 20.0Hz)	DEPTH 75% (0% ~ 100%)				
15	PAN F-R	PAN SPEED 0.7Hz (0.1Hz ~ 20.0Hz)	DIRECTION F • -R (F, -R, F • -R, F • R)	DEPTH 75% (0% ~ 100%)			
16	PAN L-R	PAN SPEED 0.7Hz (0.1Hz ~ 20.0Hz)	DIRECTION L • -R (L, -R, L • -R, L • R)	DEPTH 75% (0% ~ 100%)			

* In each space of the parameter section, the parameter name is given at the top, the preset value in the middle and the variable range at the bottom in the parenthesis ().

■ BLOCK DIAGRAM

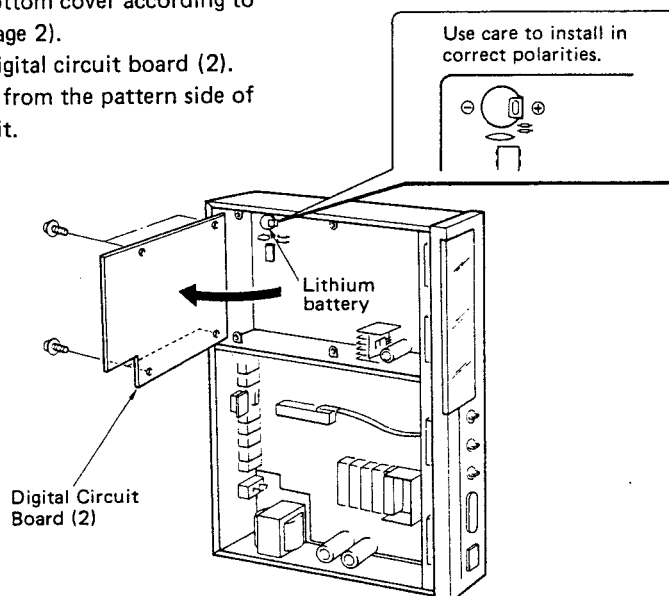


■ ADJUSTMENT/TEST SPECIFICATIONS

● LITHIUM BATTERY REPLACEMENT

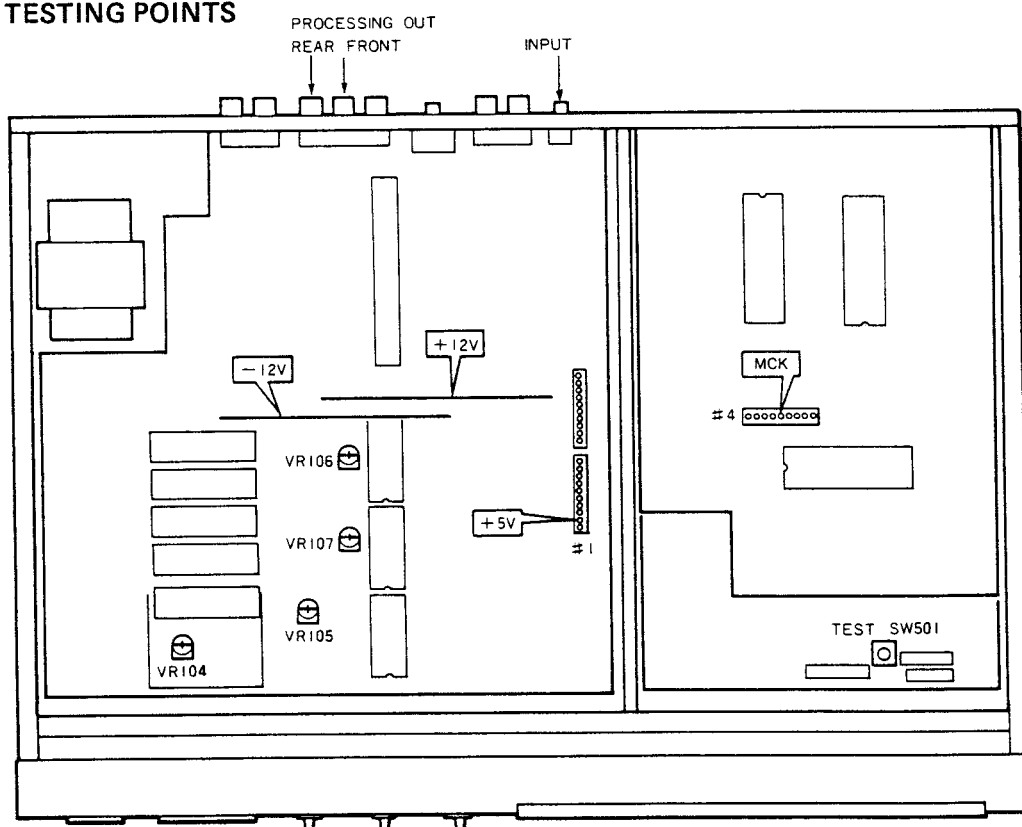
Note) Due to the danger of explosion it is only allowed to use a battery of the same type and manufacturer when it has to be shifted.

1. Remove the top cover and bottom cover according to the disassembly procedure (page 2).
2. Remove 4 screws fixing the digital circuit board (2).
3. Unsolder the lithium battery from the pattern side of the circuit board and replace it.



* When replacing the battery, be sure to carry out the procedures described under "1. The program activation" and "6. Maker preset" of " **3 Test program** " section. (If the program is not maker preset, "LOW BATTERY" is displayed on the LCD.

● TESTING POINTS



MEASURING INSTRUMENTS

- Audio frequency oscillator (A.F. OSC.) : x 1
- AC voltmeter (ACVM) : x 1
- DC voltmeter (DCVM) : x 1
- Distortion meter : x 1
- Oscilloscope : x 1
- Frequency counter : x 1

SETTINGS

Unless otherwise specified, the controls and switches should be set as follows.

Rear panel

- INPUT BALANCE : Center
- FRONT MIX : OFF 6ch
- MAIN LEVEL : 0dB

Front panel

- MIXING LEVEL : 0
- TAPE : NORM
- PB LEVEL : 0

1 Confirmation of power voltage	
Point for measurement	Voltage
Bus bar (Front)	DC -12V ± 1V
Bus bar (Rear)	DC +12V ± 1V
+5V (#1)	DC +5V ± 1V

2 Confirmation of MCLK oscillation

Measure the output of MCK (#4) with a frequency counter.

Standard: FMCK = 2.81MHz to 2.83MHz

3 Test program

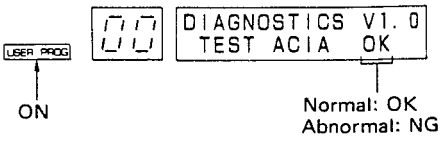
The DSP-1 has built-in test programs for checking its various functions. Note that check sum of the ROM · S-RAM and read/write test are automatically performed during normal operation by the main program when the POWER switch is switched ON.

Contents of Test Program

- Test program activation DSP · MOD control circuit check
- Test program 1 LCD unit operation check
- Test program 2 LED unit operation check
- Test program 3 Remote control key check
- Test program 4 A/D offset adjustment
- Test program 5 Maker preset
- Test program 6 LCD control unit check
- Test program 9 A/D level, D/A level adjustment
- Test program 9 to 14 DRAM operation check

1. Test program activation

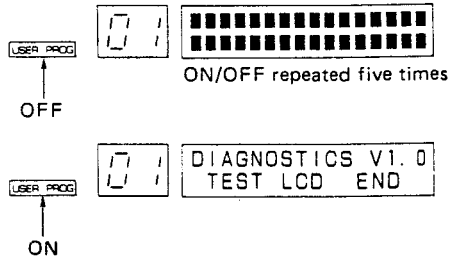
- ① Turn ON the POWER switch while pressing the TEST switch (SW501). (Refer to Testing points on page 8.)
- ② Check to make sure that the PROGRAM display appears as follows.



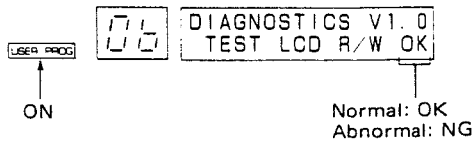
- ③ If "NG" is displayed, it is possible that a trouble lies somewhere in IC520 and 522 to 525.

2. LCD unit operation check

- ① Press the remote control key 1. (Test program 1)
- ② All LCD display dots should repeat ON/OFF five times followed by the "END" display. Check all dots for proper ON/OFF operation.



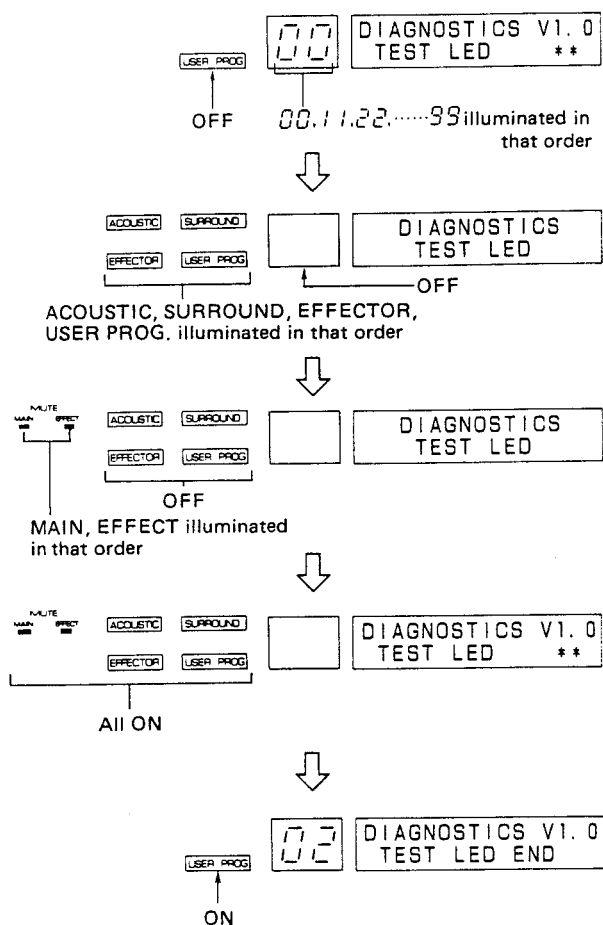
- ③ If the check result is satisfactory, proceed to Step 3.
- ④ If the check result is not satisfactory, press the remote control key 6. (Test program 6)
- ⑤ Check the PROGRAM display.



- ⑥ If "OK" is displayed, it is possible that the LCD unit (VB74890) is defective. If "NG" is displayed, it is possible that IC504, 505 or LCD unit is defective.

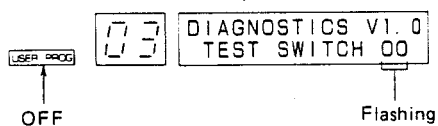
3. LED unit operation check

- ① Press the remote control key 2. (Test program 2)
- ② The test illuminates the PROGRAM No. display in the sequence of 00, 11, 22 to 99 first, and then MODE indicators in the sequence of ACOUSTIC, SURROUND, EFFECTOR, USER PROG followed by MUTE indicators in the sequence of MAIN and EFFECT, resulting that all indicators are ON but the PROGRAM No. display.
- ③ Upon completion of the above cycle, "02" appears in the PROGRAM No. display and "END" in the PROGRAM display.

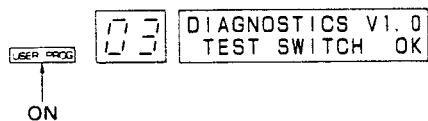


4. Remote control key check

- ① Press the remote control key 3. (Test program 3).
- ② "00" flashes in the PROGRAM display.



- ③ In this state, press remote control keys in the sequence of ACOUSTIC SURROUND, SOUND EFFECTOR, 1, 5 and 9 and 01, 02, 03, 04 and 05 flash respectively.
- ④ Next, press the remote control key 13, and "OK" appears in the PROGRAM display.

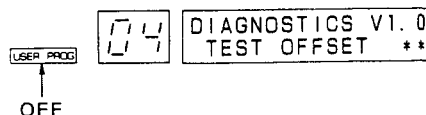


* If the keys are pressed in a wrong order or existence of some abnormality is detected, "NG" is displayed.

- ⑤ If "NG" is displayed due to any other reason than erroneously pressed key, it is possible that a trouble exists somewhere in IC501, 506, P10 to P15 lines.

5. A/D offset adjustment

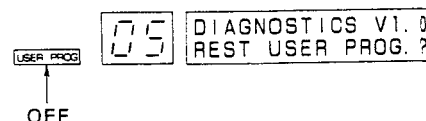
- ① To stabilize the operation, wait for 10 minutes after turning ON the power for aging without applying signal.
- ② Press the remote control key 4. (Test program 4)
- ③ Check to make sure that the PROGRAM display appears as follows.



- ④ Without applying signal, minimize the PROCESSING OUT (FRONT) output waveform (short waveform) by adjusting VR105. (Refer to Testing points on page 8.)

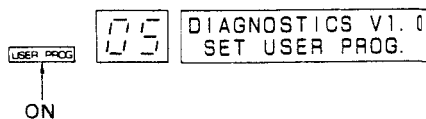
6. Maker preset

- ① Press the remote control key 5. (Test program 5)
- ② Check to make sure that the PROGRAM display appears as follows.



- ③ In this state, press the remote control key 5 again.

- ④ Check to make sure that the PROGRAM display appears as follows.
(It is indicated that the operation is in good condition and the maker preset is to USER PROGRAM 1 to 16.)



* If the USER PROGRAM is not written in or some abnormality exists in the memory back-up, the following message is displayed when the power is turned ON in normal operation.

WARNING
LOW BATTERY

- ⑤ If the warning message as shown above is displayed, it is possible that a trouble exists in IC503, Q501 or Q502 in the reset circuit, lithium battery or IC510.

7. DRAM check

The condition of the DRAM connected to the DSP IC is checked by varying the resolution of the signal to be sent to the D/A converter in 16 bit to 4 bit accuracy in the DSP IC.

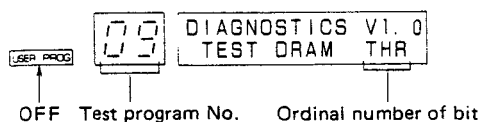
- ① Apply a 1kHz, 2.5V (10.2dBm) to INPUT (both L and R channels) and measure the distortion at PROCESSING OUT (both FRONT and REAR). (Refer to Testing points on page 8.)
- ② Press the remote control key 14. (Test program 14)
Standard: 4% or less
- ③ Press the remote control key 13. (Test program 13)
Standard: 0.25% or less

- ④ Press the remote control key 12. (Test program 12)
Standard: 0.03% or less
- ⑤ Press the remote control key 11. (Test program 11)
Standard: 0.02% or less
- ⑥ Press the remote control key 10. (Test program 10)
Standard: 0.02% or less
- ⑦ Press the remote control key 9. (Test program 9)
Standard: 0.02% or less
- ⑧ If the check result is not satisfactory, refer to Table 1 to determine where a failure exists.

Example: If the REAR L distortion of the test programs 10 to 14 is within specification and only that of the test program 9 is out of specification, it is possible that the IC532 is defective.

<Table 1> Test programs 9 to 14, Output-to-DSP, DRM relationship

Output		DSP used		DRAM used																							
				4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
FRONT	L	IC 523		IC 526				IC 527				IC 528				IC 529				IC 530				IC 531			
REAR	L	IC 524		IC 532				IC 533				IC 534				IC 535				IC 536				IC 537			
FRONT REAR	R	IC 525		IC 538				IC 539				IC 540				IC 541				IC 542				IC 543			
Test program 09		Indi- cation THR	Accu- racy 16bit	M S B	15	14	13	12	11	10	9	8	7	6	5	4	3	2	L S B								
10		04 B	16bit					M S B	15	14	13	12	11	10	9	8	7	6	5								
11		08 B	16bit													M S B	15	14	13	12	11	10	9	8	7	6	5
12		12 B	12bit																					M S B	11	10	9
13		16 B	8 bit																								
14		20 B	4 bit																								



* When the remote control key 15 is pressed, “-MX” is displayed and when 16 is pressed, “+MX” is displayed.

8. A/D level adjustment

Apply a 1kHz, 3.16V (10dBV) to INPUT (both L and R channels) and measure the output at PROCESSING OUT (FRONT).

- ① Press the remote control key 9. (Test program 9)
- ② With VR104, adjust to the maximum level within the range where the output is not distorted.

9. D/A level adjustment

Apply a 1kHz, 3.16V (10dBV) to INPUT (both L and R channels) and measure the output at PROCESSING OUT (FRONT, REAR).

* Make sure that this adjustment is performed after A/D level adjustment.

- ① Press the remote control key 9. (Test program 9)
- ② With VR106 (FRONT) and VR107 (REAR), adjust so that the output becomes +10dBV (+3.16V) $\pm$ 0.3dB.

4 Analog circuit

● **Settings**

- a. Unless otherwise specified, the following settings should be used.

Input INPUT (both L and R channels)

Test signal . . . 1kHz, 1V

Mode Test program 9 (Refer to the "Test Program" section.)

- b. Refer to page 9 for the settings of the controls and switches.

10. A/D offset readjustment

Measure S/N at PROCESSING OUT (REAR Rch) without applying signal.

- ① Press the remote control key 4. (Test program 4)
- ② With VR105, adjust so that S/N becomes less than 78dB (for S = 1kHz, 1V).

1. Input check

- ① Set to the test program 9.
- ② Apply a test signal to each input terminal while referring to Table 2 and check the output at MAIN OUT.

<Table 2>

Input (1kHz, 1V)	Switch, control	Output	Remarks
INPUT Lch only		MAIN OUT Lch only 1 kHz, $0.95 \pm 0.1V$	There should be no output at Rch.
MIX INPUT Lch only	MIXING LEVEL $\rightarrow$ Max.		
TAPE PB Lch only	TAPE $\rightarrow$ MONITOR PB LEVEL $\rightarrow$ Max.		
INPUT Rch only		MAIN OUT Rch only 1 kHz, $0.95 \pm 0.1V$	There should be no output at Lch.
MIX INPUT Rch only	MIXING LEVEL $\rightarrow$ Max.		
TAPE PB Rch only	TAPE $\rightarrow$ MONITOR PB LEVEL $\rightarrow$ Max.		
MIX INPUT MONO	MIXING LEVEL $\rightarrow$ Max.	MAIN OUT both channels 1 kHz, $0.8 \pm 0.2V$	

2. Output check

- ① Set to the test program 9.
- ② Apply a test signal to the INPUT while referring to Table 3 and check the output at each output terminal.

<Table 3>

Input	Output	Remarks	Input	Output	Remarks
INPUT Lch only (1 kHz, 1 V)	MAIN OUT Lch only $1 \pm 0.1V$	There should be no output at Rch.	INPUT Rch only (1 kHz, 1 V)	MAIN OUT Rch only $1 \pm 0.1V$	There should be no output at Lch.
	REC OUT Lch only $1 \pm 0.1V$			REC OUT Rch only $1 \pm 0.1V$	
	FRONT, REAR OUT both channels $0.5 \pm 0.1V$			FRONT, REAR OUT both channels $0.5 \pm 0.1V$	
	MONO OUT (FULL BAND) $0.4 \pm 0.1V$			MONO OUT (FULL BAND) $0.4 \pm 0.1V$	
			INPUT Lch only (20Hz, 1 V)	MONO OUT (LOW PASS) $0.4 \pm 0.1V$	

3. MUTING check

- ① Using the remote control key and according to the normal operation, set to the DELAY program. (SOUND EFFECTOR mode 1)
- ② Apply a test signal to INPUT (both L and R channels) and check the output at each output terminal.
 - MAIN MUTE – When MAIN MUTE is ON, no output signal should be obtained at MAIN OUT (both L and R channels) and MONO OUT.
 - EFFECT MUTE – When EFFECT MUTE is ON, no output signal should be obtained at FRONT and REAR OUT (both L and R channels).
 - POWER MUTE – For 3 ± 1 seconds after the power is turned ON, no output signal should be obtained at MAIN, FRONT, REAR and MONO OUT, but after this time delay, $1 \pm 0.1V$ output signal should be obtained at MAIN, FRONT and REAR OUT and $0.83 \pm 0.1V$ output signal at MONO OUT (FULL BAND).

4. MAIN LEVEL check

- ① Set to the test program 9.
- ② Set the MAIN LEVEL switch to $-10dB$.
- ③ Apply a test signal to INPUT (both L and R channels) and check that $0.33V \pm 0.03V$ output is obtained at MAIN OUT (both L and R channels).

5. FRONT MIX check

- ① Using the remote control key and according to the normal operation, set to the DELAY program (SOUND EFFECTOR mode 1).
- ② Set the FRONT MIX switch to "ON 4ch".
- ③ Apply a test signal to INPUT (both L and R channels). Set MAIN MUTE ON and check that $0.95V \pm 0.1V$ output is obtained at MAIN OUT (both L and R channels).

6. INPUT BALANCE check

- ① Using the remote control key and according to the normal operation, set to the ACOUSTIC/SURROUND mode.
- ② Apply a test signal to INPUT (both L and R channels) and check the output at REAR OUT (both L and R channels).

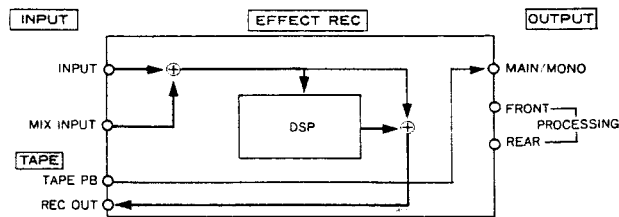
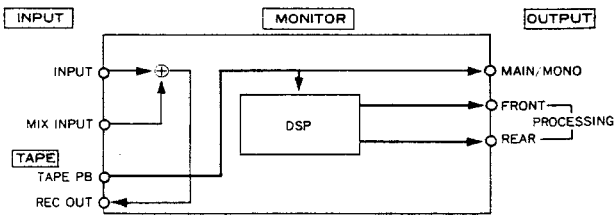
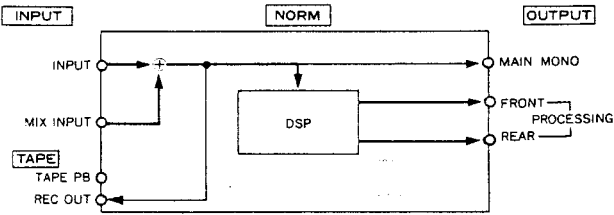
INPUT BALANCE	REAR OUT
Center position	Minimum output at both L and R channels
L side	Maximum output at both L and R channels
R side	

7. DOLBY SURROUND check

- ① Using the remote control key and according to the normal operation, set to the DOLBY SURROUND program (ACOUSTIC/SURROUND mode 16).
- ② Apply a 1kHz, $-30dBV$ ($0.0316V$) signal to the INPUT Lch and check that $-33.5dBV$ ($0.021V$) $\pm 2dB$ output is obtained at REAR OUT (both L and R channels).

8. TAPE selector check

- ① Using the remote control key and according to the normal operation, set to the DELAY program (SOUND EFFECTOR mode 1).
- ② Set the TAPE selector to MONITOR or EFFECT REC.
- ③ While referring to Tables 4 and 5, apply a test signal and check the output.



<Table 4>

When set to MONITOR position

Input (1kHz, 1V)	Switch, control	Output	Remarks
INPUT Lch only		REC OUT Lch only $0.95 \pm 0.1V$	There should be no output at Rch and other output terminals.
INPUT Rch only		REC OUT Rch only $0.95 \pm 0.1V$	There should be no output at Lch and other output terminals.
TAPE PB Lch only	PB LEVEL → Max.	MAIN OUT Lch only $0.95 \pm 0.1V$	There should be no output at Rch.
		FRONT, REAR OUT both channels $0.5 \pm 0.1V$	FRONT and REAR levels should vary at EFFECT LEVEL.
TAPE PB Rch only		MAIN OUT Rch only $0.95 \pm 0.1V$	There should be no output at Lch.
		FRONT, REAR OUT both channels $0.5 \pm 0.1V$	FRONT and REAR levels should vary at EFFECT LEVEL.

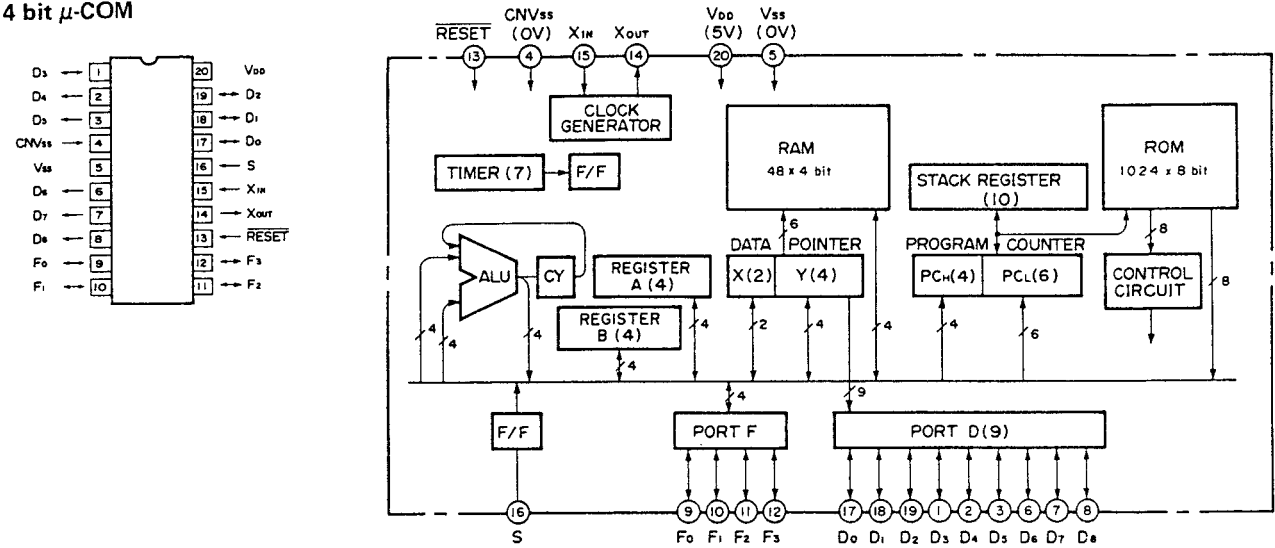
<Table 5>

When set to EFFECT REC position

Input (1kHz, 1V)	Switch, control	Output	Remarks
INPUT Lch only	EFFECT MUTE → ON	REC OUT Lch only $0.95 \pm 0.1V$	There should be no output at Rch.
	EFFECT MUTE → OFF MAIN MUTE → ON	REC OUT both channels $0.5 \pm 0.1V$	Level should vary at EFFECT LEVEL.
INPUT Rch only	EFFECT MUTE → ON	REC OUT Rch only $0.95 \pm 0.1V$	There should be no output at Lch. Level should not vary at EFFECT LEVEL.
	EFFECT MUTE → OFF MAIN MUTE → ON	REC OUT both channels $0.5 \pm 0.1V$	Level should vary at EFFECT LEVEL.
TAPE PB Lch only	PB LEVEL → Max.	MAIN OUT Lch only $0.95 \pm 0.1V$	There should be no output at Rch, FRONT and REAR OUT.
TAPE PB Rch only		MAIN OUT Rch only $0.95 \pm 0.1V$	There should be no output at Lch, FRONT and REAR OUT.

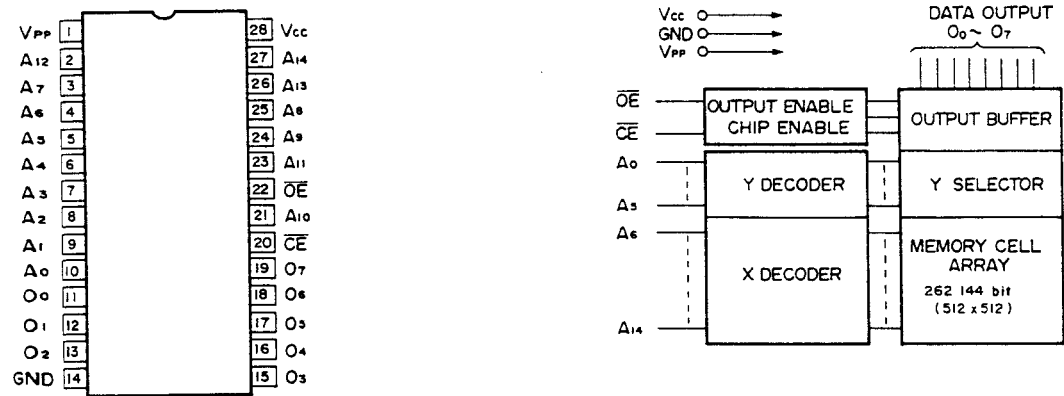
LSI DATA

IC506: M50760-464P
4 bit μ -COM



Pin No.	Name	I/O	Function	Pin No.	Name	I/O	Function
1	D ₃	I/O	PARALLEL DATA OUTPUT INV. D ₀ INV. D ₁ INV. D ₂	11	F ₂	I/O	GND
2	D ₄			12	F ₃		
3	D ₅			13	RESET	I	RESET INPUT INV.
4	CN V _{ss}	I	GND	14	XOUT	O	CLOCK OUTPUT
5	V _{ss}	I	GND	15	XIN	I	CLOCK INPUT
6	D ₆	O	PARALLEL DATA OUTPUT INV. D ₃ INV. D ₄	16	S	I	REMOCON INPUT (LEVEL SENSE)
7	D ₇			17	D ₀	—	OPEN
8	D ₈	O	REM MONITOR OUTPUT INV.	18	D ₁		
9	F ₀	I/O	GND	19	D ₂		
10	F ₁			20	VDD	I	+5V

IC509: μ PD27C256C-20
256k bit ROM



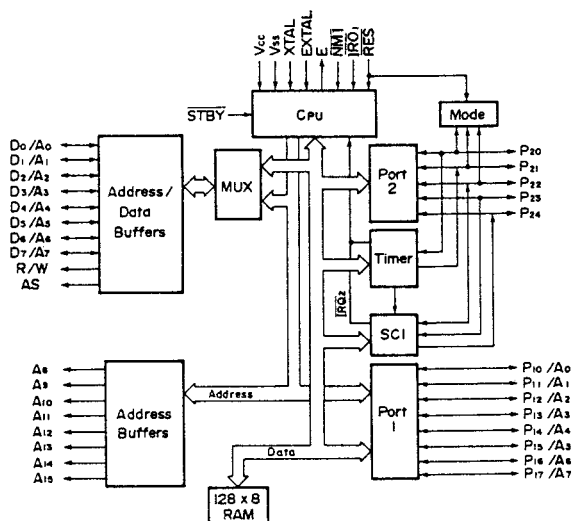
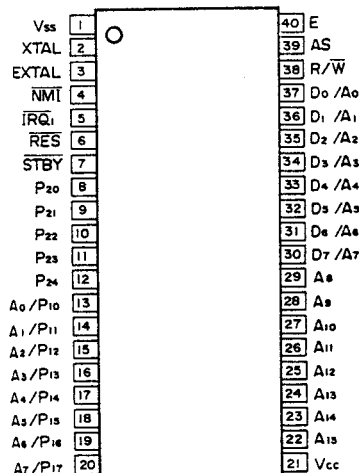
A ₀ ~ A ₇	Address input
O ₀ ~ O ₁	Data output
CE	Chip enable input
OE	Output enable input
V _{cc}	Power supply input
V _{pp}	Program power supply input
GND	Ground

Mode	Terminal	CE	OE	V _{pp}	V _{cc}	O ₀ ~ O ₇
Read		V _{IL}	V _{IL}	+5V	+5V	Data output
Output disable		V _{IL}	V _{IH}	+5V	+5V	High impedance
Standby		V _{IH}	X	+5V	+5V	High impedance
Program		V _{IL}	V _{IH}	+21V	+6V	Data input
Program verify		V _{IL}	V _{IL}	+21V	+6V	Data output
Program inhibit		V _{IH}	X	+21V	+6V	High impedance

X : V_{IL} or V_{IH}

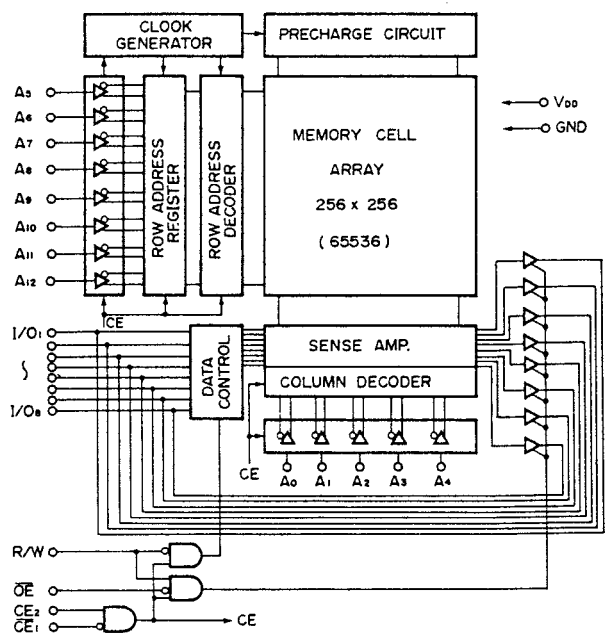
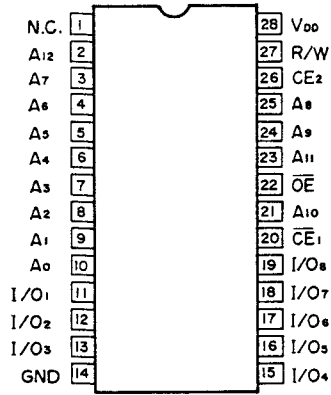
IC507: HD6303RP

8 bit CPU



Pin No.	Name	Function	Pin No.	Name	Function
1	V _{ss}	GND	22	A ₁₅	TTL compatible terminal After resetting, each becomes an upper order address (A ₈ ~ A ₁₅) output terminal
2	XTAL	Connecting terminal for AT cut parallel resonant type crystal oscillator	23	A ₁₄	
3	EXTAL		24	A ₁₃	
4	NMI	When the end of the input signal is detected, the non-maskable interrupt sequence is initiated in CPU.	25	A ₁₂	
5	IRQ ₁	Level detecting terminal which generates the interrupt sequence in CPU.	26	A ₁₁	
6	RES	Resets and starts MPU from the power OFF state.	27	A ₁₀	
7	STBY	Sets MPU to the stand-by mode.	28	A ₉	
8	P ₂₀	I/O port 2 Input/output direction is determined by the data direction register. After resetting MPU, I/O terminals all become input. During the reset period, P ₂₀ , P ₂₁ and P ₂₂ are used for mode programming.	29	A ₈	Each becomes exclusively for the data bus (D ₀ ~ D ₇) in the expanded non-multiplex mode. In the expanded multiplex mode, the data bus (D ₀ ~ D ₇) and low order 8 bit (A ₀ ~ A ₇) of the address bus are multiplexed and used.
9	P ₂₁		30	D ₇ /A ₇	
10	P ₂₂		31	D ₆ /A ₆	
11	P ₂₃		32	D ₅ /A ₅	
12	P ₂₄		33	D ₄ /A ₄	
13	A ₀ /P ₁₀	I/O port 1, TTL compatible terminal 8 bit port, each bit is determined for the output or input according to the content of the corresponding data direction register. After resetting MPU, port 1 operates as a parallel I/O terminal in the expanded multiplex mode and becomes a low order address (A ₀ ~ A ₇) output terminal in the expanded non-multiplex mode.	34	D ₃ /A ₃	
14	A ₁ /P ₁₁		35	D ₂ /A ₂	
15	A ₂ /P ₁₂		36	D ₁ /A ₁	
16	A ₃ /P ₁₃		37	D ₀ /A ₀	
17	A ₄ /P ₁₄		38	R/W	TTL compatible output signal, which indicates whether CPU is "read" (high) or "write" (low) for peripheral and memory.
18	A ₅ /P ₁₅		39	AS	Address strobe is output when operating in the expanded multiplex mode.
19	A ₆ /P ₁₆		40	E	E clock output terminal
20	A ₇ /P ₁₇				
21	V _{cc}	Power supply input +5V			

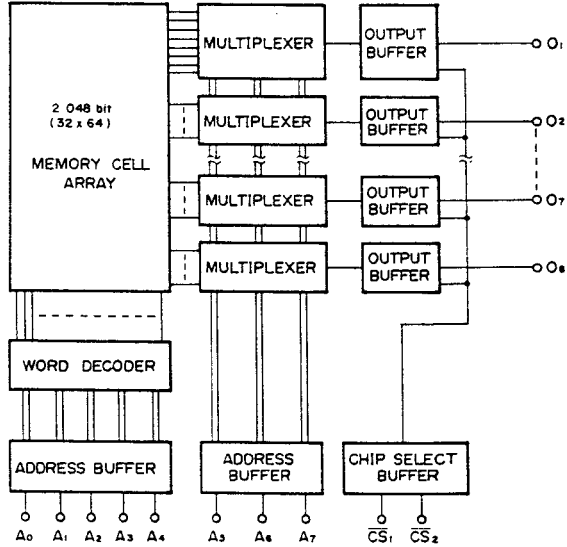
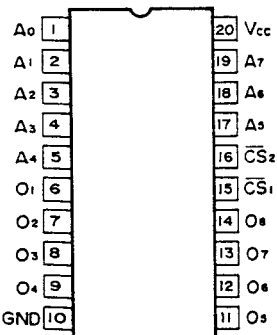
IC510: μ PD4464C-15L, TC5564PL-20 or TC5564PL-15
64k bit RAM



$A_0 \sim A_{12}$	Address input
R/W	Read/write control input
$\overline{OE}$	Output enable input
$\overline{CE}_1, \overline{CE}_2$	Chip enable input
$I/O_1 \sim I/O_8$	Data input/output
VDD	Power supply input (+5V)
GND	Ground
N.C.	Not used

Operation mode	$\overline{CE}_1$	$\overline{CE}_2$	$\overline{OE}$	R/W	$I/O_1 \sim I/O_8$	Power
Read	L	H	L	H	D_{OUT}	I_{DDO}
Write	L	H	*	L	D_{IN}	I_{DDO}
Output disable	*	*	H	*	High - Z	I_{DDO}
Standby	H	L	*	*	"	I_{DDS}

IC518: μ PB421C
2048 bit ROM



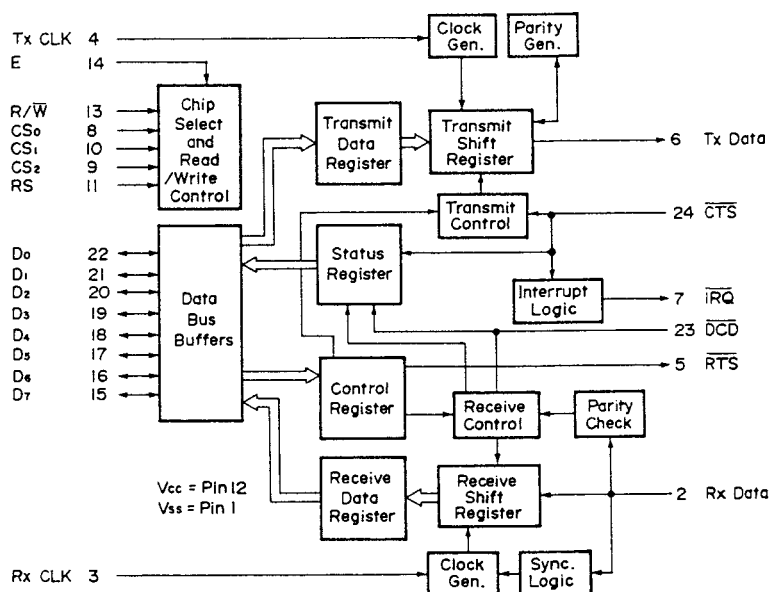
- $A_0 \sim A_7$: Address input
- $O_1 \sim O_8$: Data output
- $\overline{CS}_1, \overline{CS}_2$: Chip select input
- VCC : Power supply input (+5V)
- GND : Ground

Mode \ Terminal	$\overline{CS}$	$\overline{CS}$
Read	L	L
Output disable	H	X
	X	H

H: High level L: LOW LEVEL X: H or L

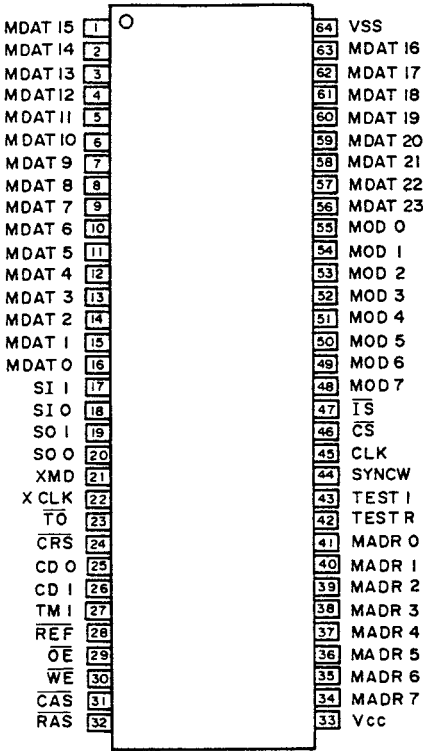
IC520: HD63A50P

ACIA (Asynchronous Communications Interface Adapter)



Pin No.	Name	Function	Pin No.	Name	Function
1	V _{ss}	GND	13	R/W	TTL compatible input, which controls the data transmit direction of the ACIA bidirectional data bus.
2	Rx Data	Input signal to receive the receive data and serial data.	14	E	TTL compatible input, which enables data input from the data bus and data output to the data bus and also synchronizes the data transmission between MPU and ACIA.
3	Rx CLK	Receive clock input, which synchronizes with received data.	15	D ₇	Bidirectional data bus Used to transmit data between ACIA and MPU
4	Tx CLK	Transmit clock input, which is used to synchronize with transmitted data and transmits the data at the end of the clock.	16	D ₆	
5	RTS	TTL compatible output, which is controlled by writing from MPU to the control register bits 5 and 6 according to the program.	17	D ₅	
6	Tx Data	Transmit data, which transmits the serial data to the modem or other input/output devices.	18	D ₄	
7	IRQ	Open drain TTL compatible output, which demands interrupt into MPU.	19	D ₃	
8	CS ₀	TTL compatible input, which determines ACIA address.	20	D ₂	
9	CS ₂		21	D ₁	
10	CS ₁		22	D ₀	
11	RS	TTL compatible input, which selects either the transmit data register/receive data register of control register/status register.	23	DCD	Input signal which corresponds to the "carrier detect" signal which indicates detection of the modem carrier.
12	V _{cc}	Power supply input +5V.	24	CTS	Input signal which enables to read the TDRE flag in ACIA and to output a request for transmission interrupt.

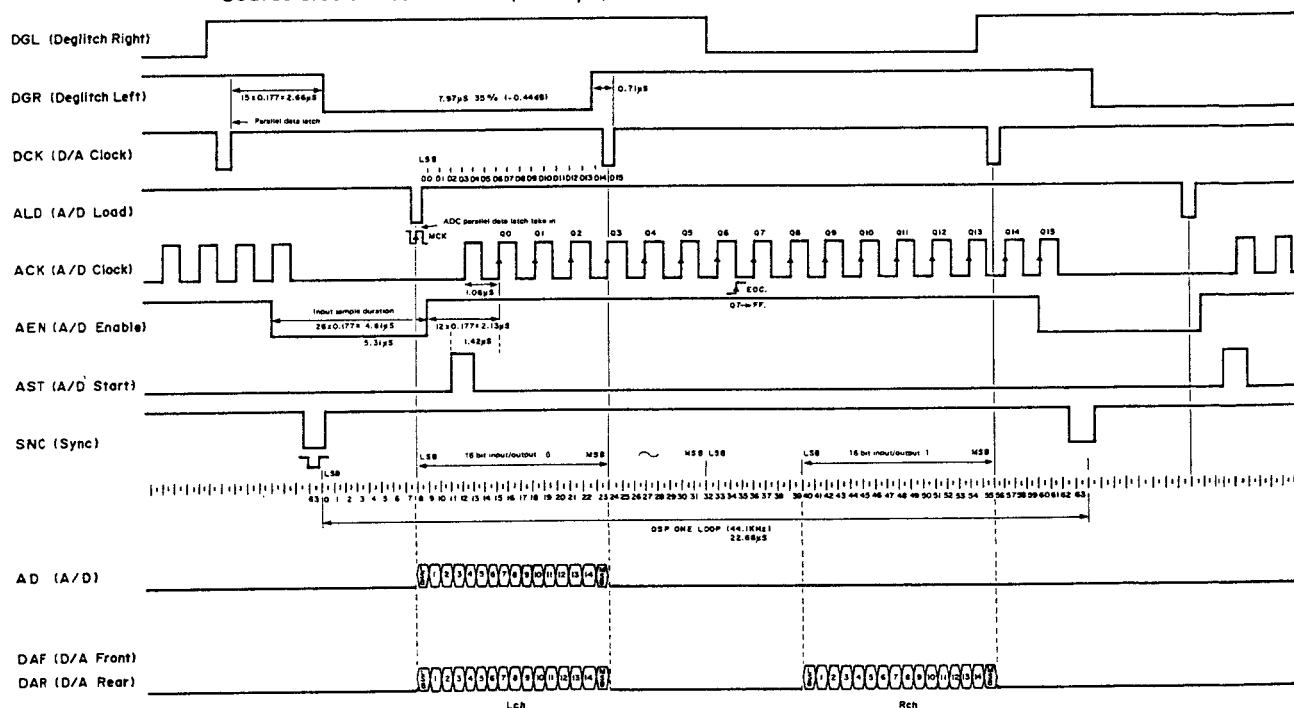
IC523 ~ 525: YM3804
DSP (Digital Signal Processor)



Pin No.	Name	I/O	Function	Pin No.	Name	I/O	Function
1	MDAT 15	I/O	I/O pins connected to memory data bus (24 bit)	64	VSS	—	Ground (0 V)
2	MDAT 14	I/O		63	MDAT 16	I/O	I/O pins connected to memory's data bus (24 bit)
3	MDAT 13	I/O		62	MDAT 17	I/O	
4	MDAT 12	I/O		61	MDAT 18	I/O	
5	MDAT 11	I/O		60	MDAT 19	I/O	
6	MDAT 10	I/O		59	MDAT 20	I/O	
7	MDAT 9	I/O		58	MDAT 21	I/O	
8	MDAT 8	I/O		57	MDAT 22	I/O	
9	MDAT 7	I/O		56	MDAT 23	I/O	
10	MDAT 6	I/O		55	MOD 0	I	Inputs to accept modulation signal from MOD (8 bit)
11	MDAT 5	I/O		54	MOD 1	I	
12	MDAT 4	I/O		53	MOD 2	I	
13	MDAT 3	I/O		52	MOD 3	I	
14	MDAT 2	I/O		51	MOD 4	I	
15	MDAT 1	I/O		50	MOD 5	I	
16	MDAT 0	I/O		49	MOD 6	I	
17	SI 1	I	Serial data input	48	MOD 7	I	
18	SI 0	I		47	IC	I	Initial Clear signal input
19	SO 1	O	Serial data output	46	CS	I	Chip Select input
20	SO 0	O		45	CLK	I	Master Clock input (2.8224MHz)
21	XMD	I	Synchronous/asynchronous select signal input for serial interfaces CDI and CDO	44	SYNCW	I	System sync. signal input (44.1kHz cycle)
22	XCLK	I	Data send/receive clock input used when serial interface is placed in asynchronous mode (705.6kHz)	43	TEST 1	I	Chip test input (+5V)
23	T0	O	Time Out output	42	TEST R	I	
24	CRS	I	CDI data counter reset input	41	MADR 0	O	Outputs connected to memory's address bus
25	CDO	O	Serial data output used for connecting serial interfaces in cascade	40	MADR 1	O	
26	CDI	I	Serial interface input	39	MADR 2	O	
27	TM 1	O	General-purpose timing signal output	38	MADR 3	O	
28	REF	O	Memory control signal output	37	MADR 4	O	
29	OE	O		36	MADR 5	O	
30	WE	O		35	MADR 6	O	
31	CAS	O		34	MADR 7	O	
32	RAS	O		33	Vcc	—	Power supply input (+5 V)

● Timing Chart

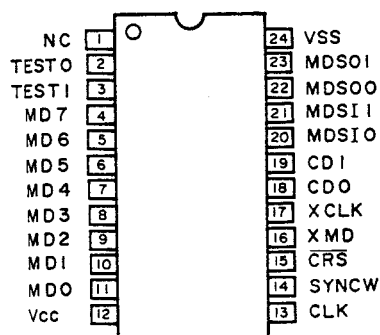
Master clock : $44.1\text{kHz} \times 64 = 2.8224\text{MHz}$ ($0.354\mu\text{s}$)
 Source clock : 5.6448MHz ($0.177\mu\text{s}$)



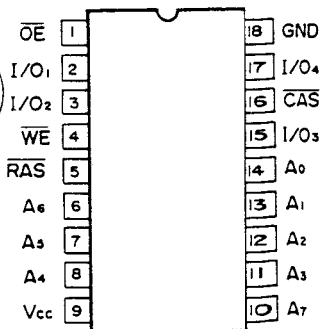
IC526 ~ 543: $\mu\text{PD41416C-15}$, MB81416-12, MSM4416P-12,
 MSM4416P-15, MN4264-15 or MN4264-12
 64 k bit (16 k x 4) RAM

IC522: YM3807

MOD (Modulation Data Generator)



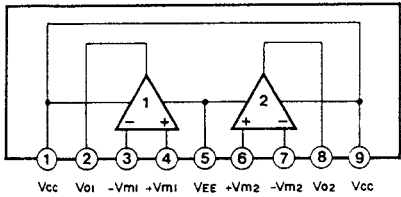
$A_0 \sim A_7$: Address input
 ($A_0 \sim A_7$ low address input
 $A_1 \sim A_6$ column address input)
 $I/O_1 \sim I/O_4$: Data input/output
 $\overline{\text{RAS}}$: Low address strobe input
 $\overline{\text{CAS}}$: Column address strobe input
 $\overline{\text{WE}}$: Read/write control input
 $\overline{\text{OE}}$: Output enable input
 V_{cc} : Power supply input
 GND : Ground



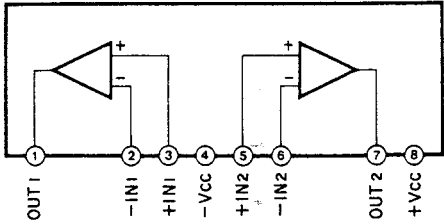
Pin No.	Name	I/O	Function	Pin No.	Name	I/O	Function
1	NC	I	Initial Clear signal input (presently not used)	24	VSS	—	GND
2	TEST 0	I	Chip test inputs	23	MDSO 1	O	Serial waveform data outputs
3	TEST 1	I		22	MDSO 0	O	
4	MD 7	O	8-bit parallel multiplexed outputs for waveform data	21	MDSI 1	I	Data inputs to MOD's internal address
5	MD 6	O		20	MDSI 0	I	
6	MD 5	O		19	CDI	I	Serial interface input
7	MD 4	O		18	CDO	O	Serial data output used to connect serial interfaces in cascade
8	MD 3	O		17	XCLK	I	Data send/receive clock input for asynchronous mode
9	MD 2	O		16	XMD	I	Synchronous (L)/asynchronous (H) select input for serial interfaces CDI and CDO
10	MD 1	O		15	CRS	I	Reset input to reset the serial input CDI data counter
11	MD 0	O		14	SYNCW	I	System sync. signal input
12	Vcc	—	+5V				
13	CLK	I	Master clock input				

IC BLOCK

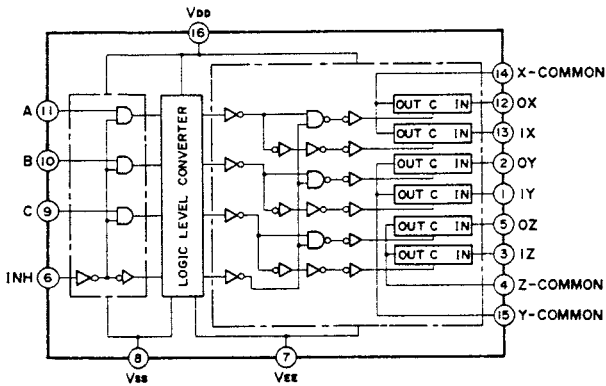
IC101 ~ 109, 117, 118, 120, 141: μ PC4570HA
Operational Amplifier



IC110, 115, 116: M5238L
FET Input Operational Amplifier



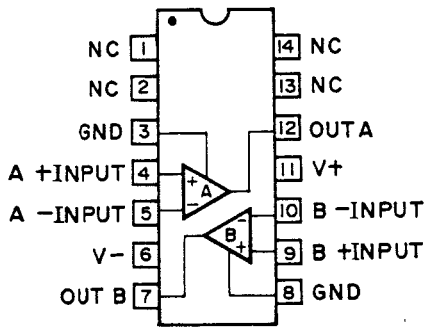
IC111, 113, 114, 121: μ PD4053BC
S/H (Multiplexer/Demultiplexer)



CONTROL INPUTS				"ON" CHANNEL
INHIBIT (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, 1Y, 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	*	*	*	NOTE

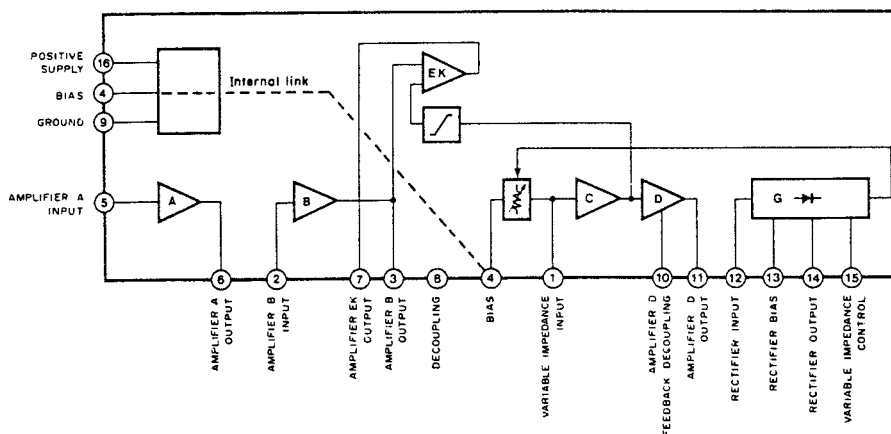
* Don't Care

IC112: μ PC319C or NJM319D.
COMPARATOR



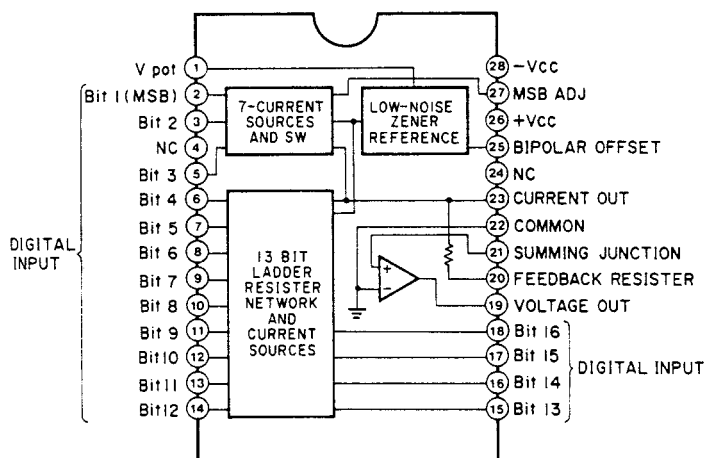
IC122: LM1111

Dolby B-type Noise Reduction Processor



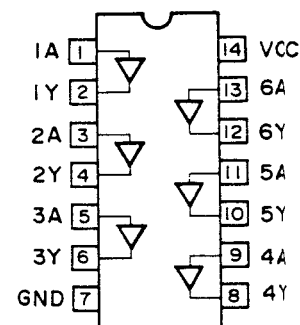
IC123 ~ 125: PCM54HP

D/A Converter



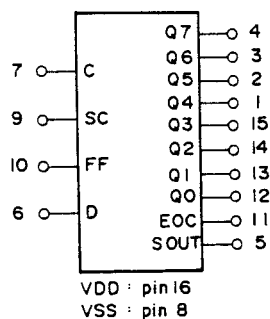
IC126: HD7407P, M53207P or MB74LS07M

Hex Buffers/Drivers



IC127: HD14559B or MC14559BCP

Approximation Register



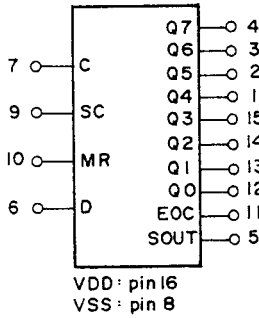
Truth table

SC	SC (t-1)	EOC	Clock	Action
*	*	*		None
1	0	0		Start Conversion
*	1	0		Continue Conversion
0	0	0		Continue Conversion
0	*	1		Retain Conversion Result
1	*	1		Start Conversion

* = Don't Care

t-1 = State at Previous Clock

IC128: HD14549B or MC14549BCP
Approximation Register



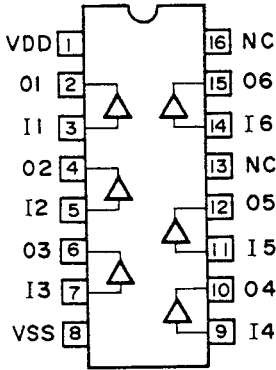
Truth table

SC	SC (t-1)	MR	MR (t-1)	Clock	Action
*	*	*	*		None
*	*	1	*		Reset
1	0	0	0		Start Conversion
1	*	0	1		Start Conversion
1	1	0	0		Continue Conversion
0	*	0	*		Continue Previous Operation

* = Don't Care
t-1 = State at Previous Clock

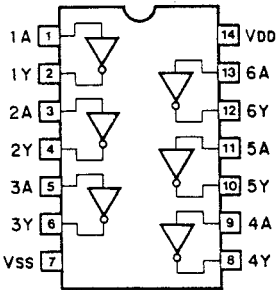
IC129 ~ 131: MN4050B, TC4050BP,
BU4050B or μPD4050C

Buffer

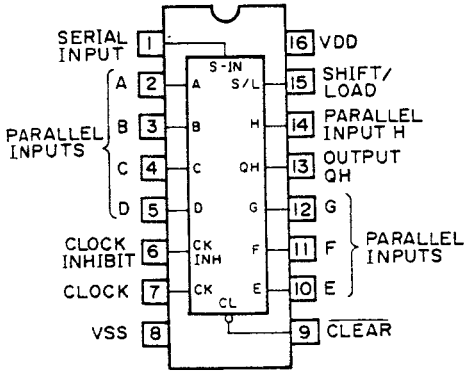


IC134, 516: TC74HC04P, μPD74HC04C,
M74HC04P or MN74HC04

Hex Inverter



IC132, 133: TC74HC166P or μPD74HC166C
Parallel-Serial Converter

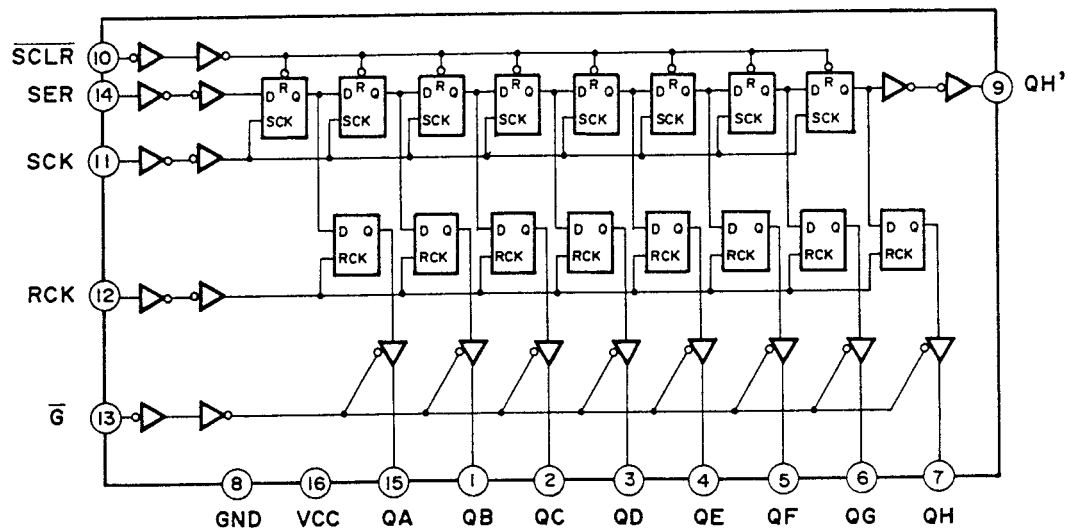


Truth table

INPUTS							OUTPUTS			FUNCTION MODE
CLEAR	SHIFT/ LOAD	CLOCK INHIBIT	CLOCK	SERIAL INPUT	PARALLEL INPUT		INTERNAL		QH	
					A	H	QA	QB		
L	*	*	*	*	*	*	L	L	L	Clear
H	H	L	↑	L	*	*	L	QAn	QGn	Shift
H	H	L	↑	H	*	*	H	QAn	QGn	
H	L	L	↑	*	L	L	L	PINB	L	Parallel Load
H	L	L	↑	*	L	H	L	PINB	H	
H	L	L	↑	*	H	L	H	PINB	L	
H	L	L	↑	*	H	H	H	PINB	H	
H	*	H	*	*	*	*	QAO	QBO	QHO	Hold
H	*	*	↓	*	*	*	QAO	QBO	QHO	No change

* = Don't care Qno = Data 1 clock ahead

IC135 ~ 138: TC74HC595P or HD74HC595P
Serial-Parallel Converter

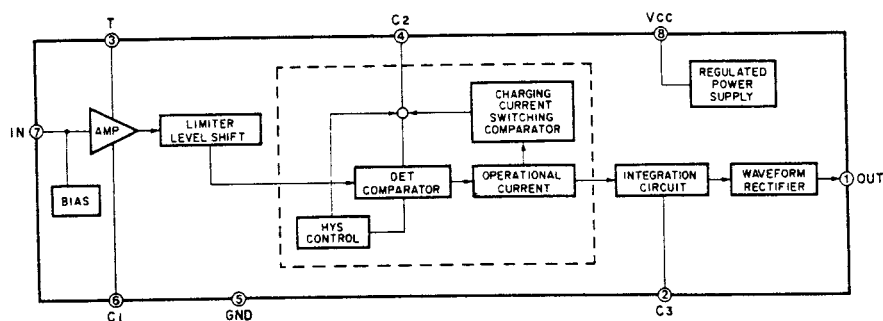


Truth table

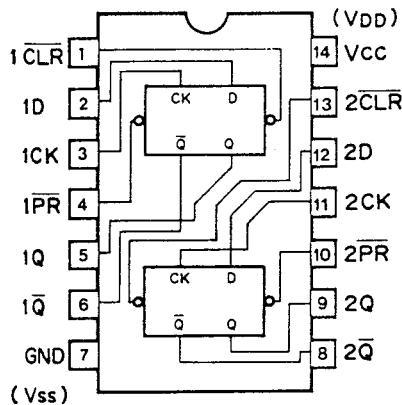
INPUTS					FUNCTION
SI	SCK	SCLR	RCK	G	
*	*	*	*	H	Output (QA ~ QH) disable
*	*	*	*	L	Output (QA ~ QH) enable
*	*	L	*	*	Shift register is cleared
L		H	*	*	The first step of the shift register is in "L" state. Each of the other steps stores the data of the previous step.
H		H	*	*	The first step of the shift register is in "H" state. Each of the other steps stores the data of the previous step.
*		*	*	*	Shift register remains unchanged.
*	*	*		*	The data of the shift register is stored in the storage register.
*	*	*		*	Storage register remains unchanged.

* : Don't Care

IC501: BA6340
Infrared Ray Remote Control Receiving System



IC502: TC74HC74P, μ PD74HC74C, M74HC74P or MN74HC74
Dual D-Type Flip-Flop with Preset and Clear



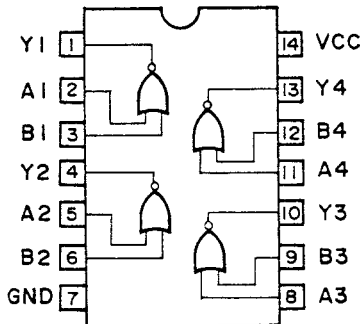
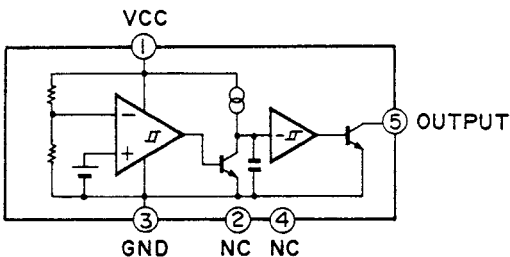
Truth table

INPUTS				OUTPUTS	
PR	CLR	CLK	D	Q	$\bar{Q}$
L	H	x	x	H	L
H	L	x	x	L	H
L	L	x	x	H*	H*
H	H		H	H	L
H	H		L	L	H
H	H	L	x	Q0	$\bar{Q}0$

NOTE)
X : Either "H" or "L" will do.
 : Rise in the positive direction
Q₀ : Q level before input conditions are established as specified in the table.
 $\bar{Q}_0$: $\bar{Q}$ level before input conditions are established as specified in the table.
H* : When PR (preset) and CL (clear) are "L", Q and $\bar{Q}$ are "H", but when they are "H", the state of Q and $\bar{Q}$ can't be predicted.

IC505: TC74HC02P, μ PD74HC02C, M74HC02P or MN74HC02
Quadrupple 2-Input Positive Nor Gate

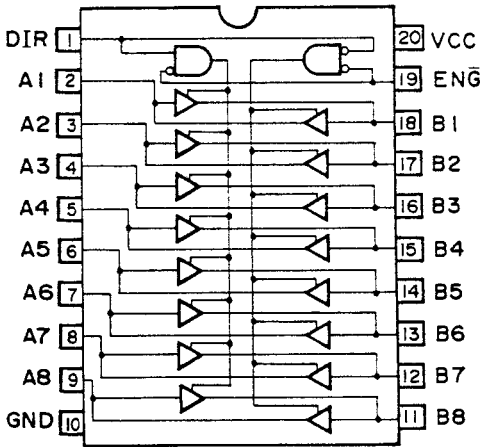
IC503: M51951BL
Line Voltage Detecting Delay Circuit



Truth table

Inputs		Outputs
A	B	Y
L	L	H
L	H	L
H	L	L
H	H	L

IC504: TC74HC245P, μ PD74HC245C or MN74HC245
Octal TRI-STATE Transceivers

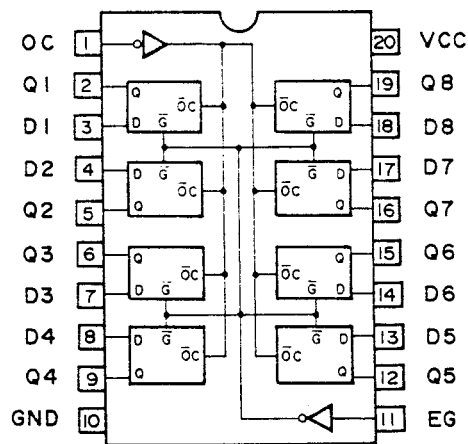


Truth table

Inputs		Output
$\bar{G}$	DIR	Operation
L	L	Bdata or Abus
L	H	Adata or Bbus
H	X	Hi-Z

NOTE) X : "H" or "L"
Hi-Z : High impedance

IC508: TC74HC373P, μ PD74HC373C, M74HC373P or MN74HC373
Octal TRI-STATED-Type Latches

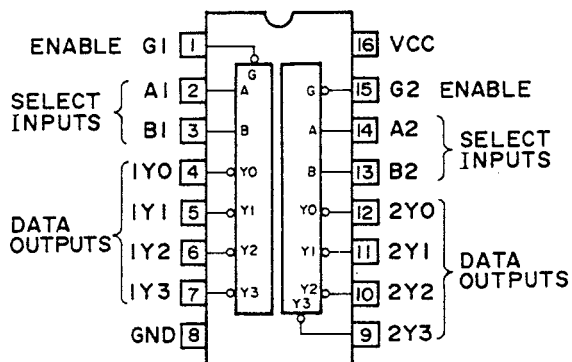


Truth table

Output Control	Latch Enable $\bar{G}$	Data	373 Output
L	H	H	H
L	H	L	L
L	L	X	X
L	X	X	X

IC511: TC74HC139P, μ PD74HC139C, M74HC139P or MN74HC139

Dual 2-to-4 Line Decoders

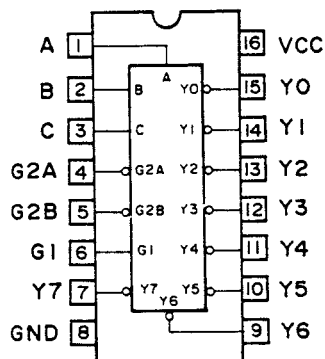


Truth table

Inputs			Outputs			
Enable	Select					
G	B	A	Y0	Y1	Y2	Y3
H	X	X	H	H	H	H
L	L	L	L	H	H	H
L	L	H	H	L	H	H
L	H	L	H	H	L	H
L	H	H	H	H	H	L

IC512: TC74HC138P, μ PD74HC138C, M74HC138P or MN74HC138

3-to-8 Line Decoder



Truth table

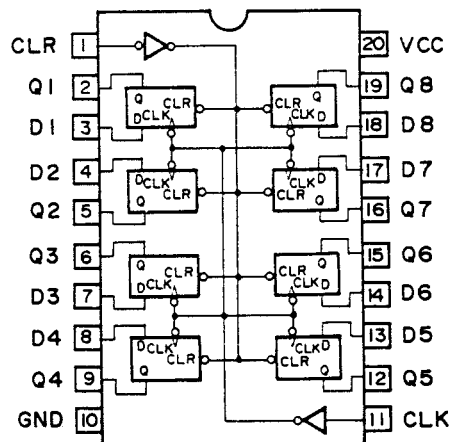
Input					Output							
Enable		Select										
G1	G2	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
x	H	x	x	x	H	H	H	H	H	H	H	H
L	x	x	x	x	H	H	H	H	H	H	H	H
H	L	L	L	L	H	H	H	H	H	H	H	H
H	L	L	L	H	H	H	H	H	H	H	H	H
H	L	L	H	L	H	H	H	H	H	H	H	H
H	L	L	H	H	H	H	H	H	H	H	H	H
H	L	H	L	L	H	H	H	H	H	H	H	H
H	L	H	L	H	H	H	H	H	H	H	H	H
H	L	H	H	L	H	H	H	H	H	H	H	H
H	L	H	H	H	H	H	H	H	H	H	H	H

NOTE) $G2 = G2A + G2B$
 x : "H" or "L"

IC513, 514, 519: TC74HC273P, μ PD74HC273C, M74HC273P

MN74HC273

Octal D-Type Flip Flop with Clear



Truth table

Input			Output
CLR	CLK	D	Q
L	x	x	L
H	↗	H	H
H	↘	L	L
H	L	x	Q ₀

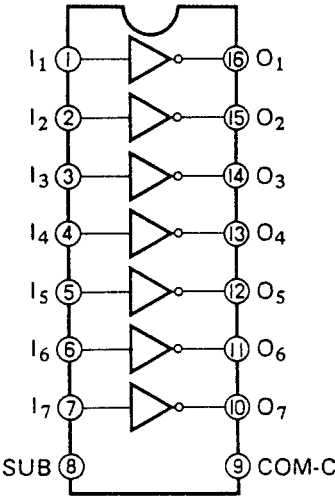
NOTE)

↗ : Data input is transmitted to the output at the clock rise from "L" to "H".

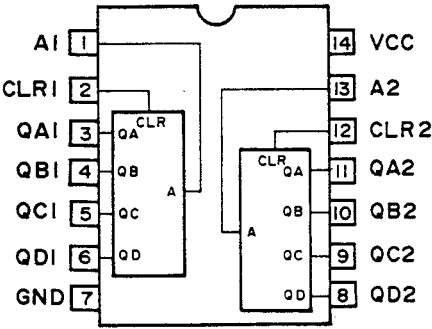
X : Either "H" or "L" will do.

Q₀ : Q level before input conditions are established is specified in the table.

IC515: LB1216
Transistor Array



IC517: TC74HC393P, μ PD74HC393C, M74HC393P
or MN74HC393
Dual 4-bit Binary Counters



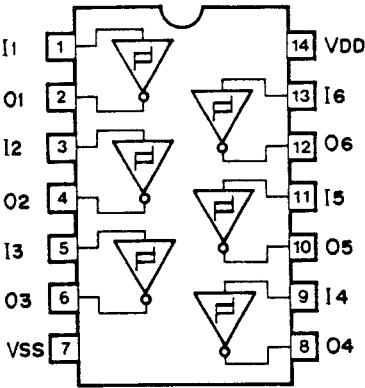
Truth table

A	CLR	Output
	L	Counted
X	H	Every output is "L" level.

: Change from "H" to "L"
X : Either "H" or "L" will do

Count	QD	QC	QB	QA
0	L	L	L	L
1	L	L	L	H
2	L	L	H	L
3	L	L	H	H
4	L	H	L	L
5	L	H	L	H
6	L	H	H	L
7	L	H	H	H
8	H	L	L	L
9	H	L	L	H
10	H	L	H	L
11	H	L	H	H
12	H	H	L	L
13	H	H	L	H
14	H	H	H	L
15	H	H	H	H

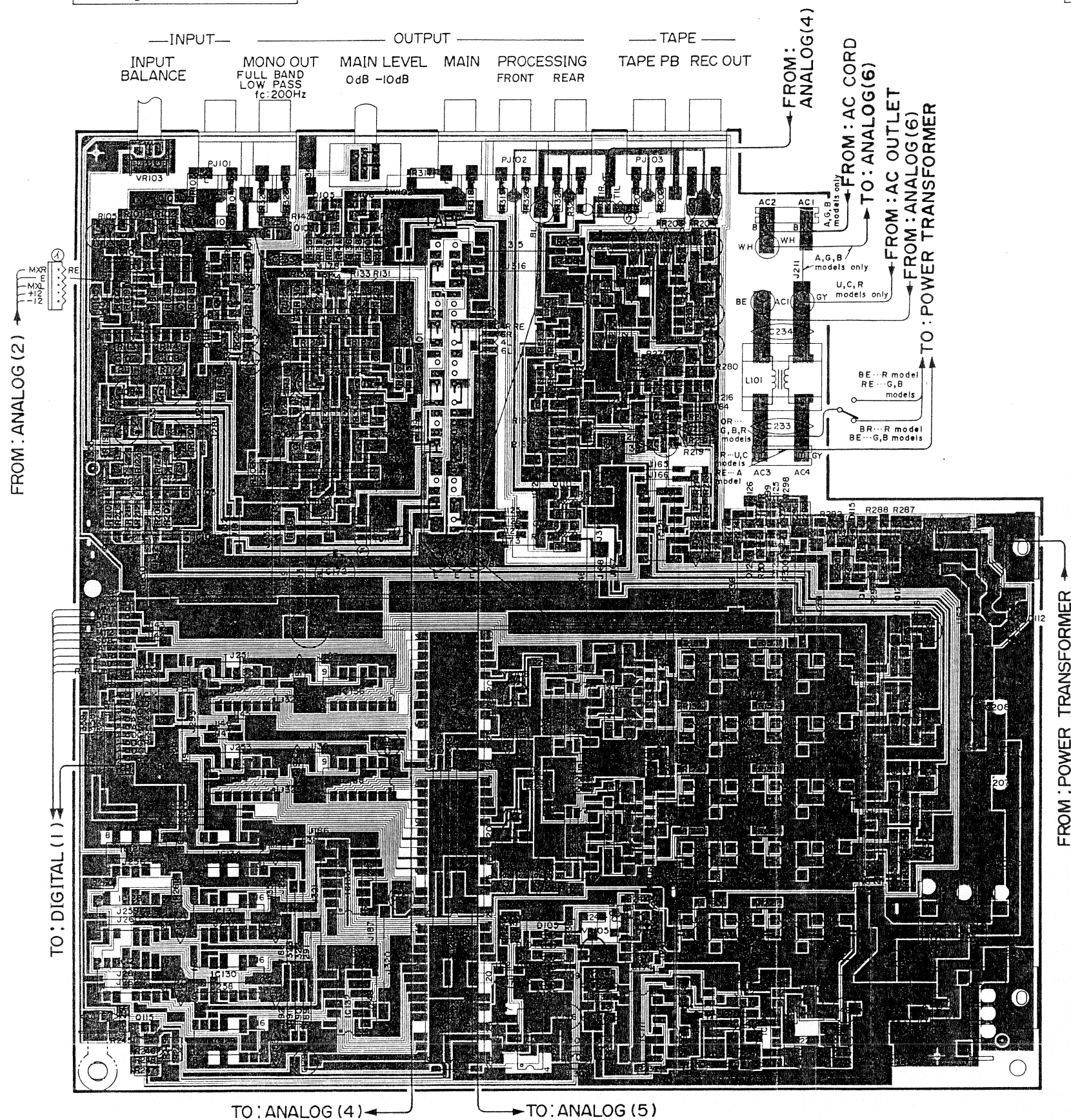
IC544: TC74HC14P, μ PD74HC14C, M74HC14P
or MN74HC14
Hex Inverting Schmitt Trigger



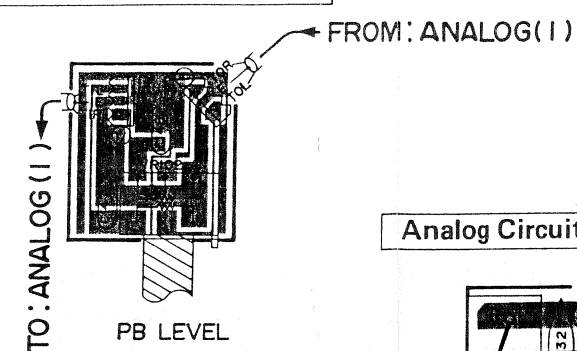
PRINTED CIRCUIT BOARD (Pattern side)

Note) 文字面 : Component side

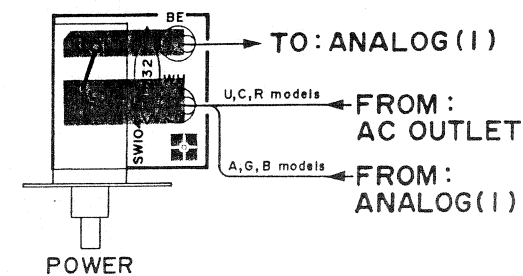
Analog Circuit Board (1)



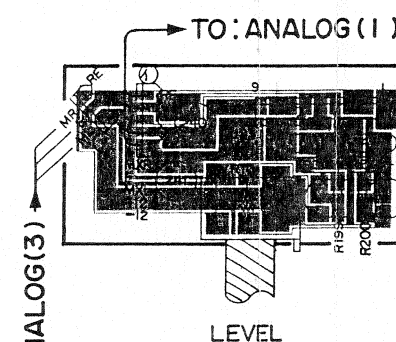
Analog Circuit Board (4)



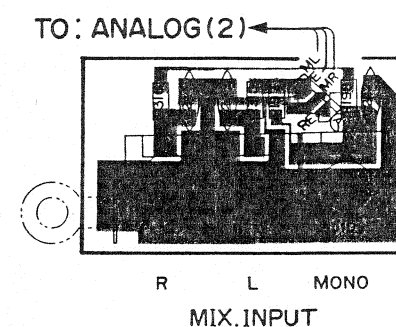
Analog Circuit Board (6)



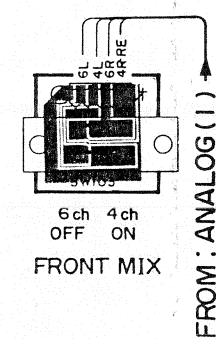
Analog Circuit Board (2)



Analog Circuit Board (3)



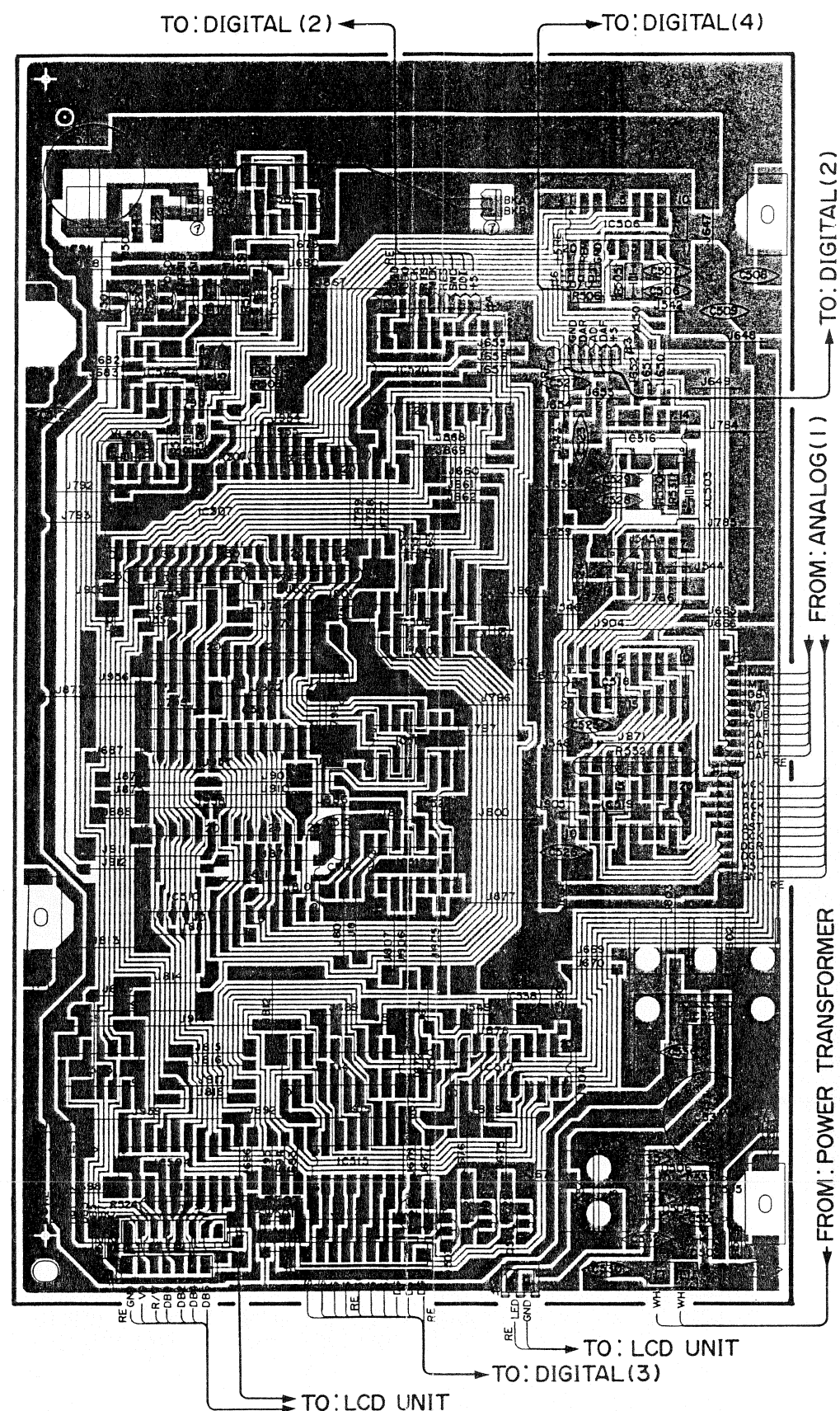
Analog Circuit Board (5)



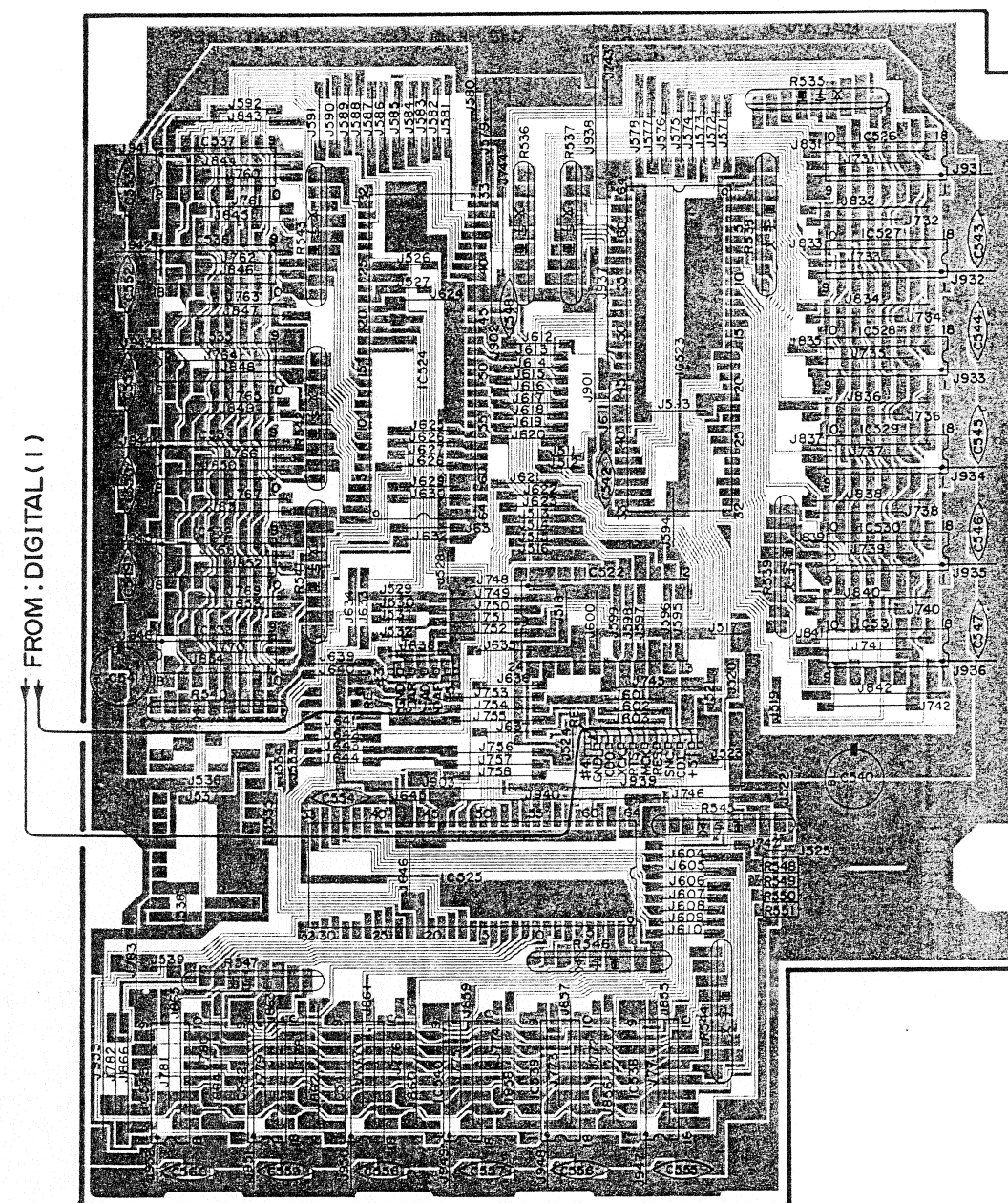
■ **PRINTED CIRCUIT BOARD(Pattern side)**

Note) 文字面 : Component side

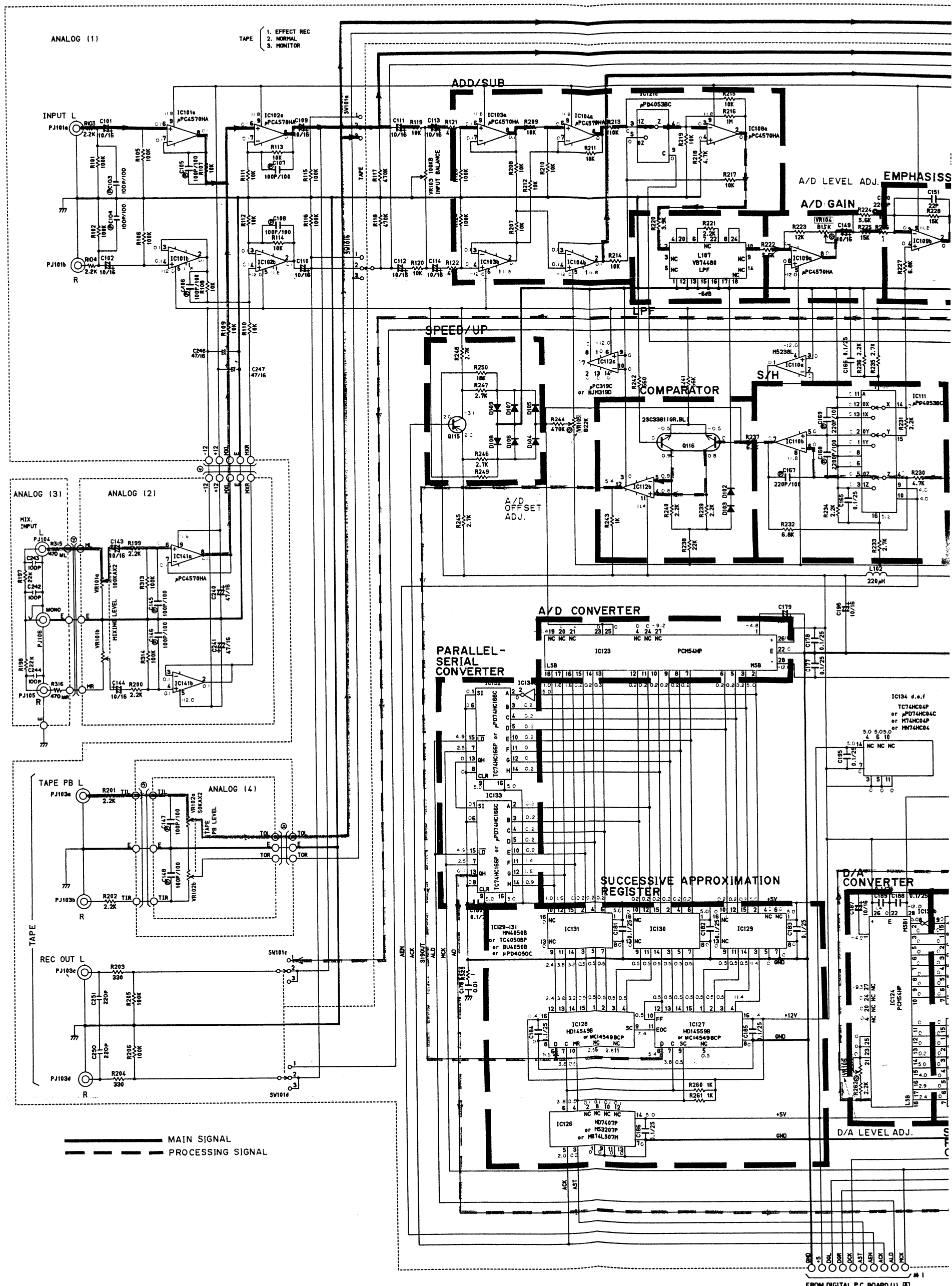
Digital Circuit Board (1)



Digital Circuit Board (2)



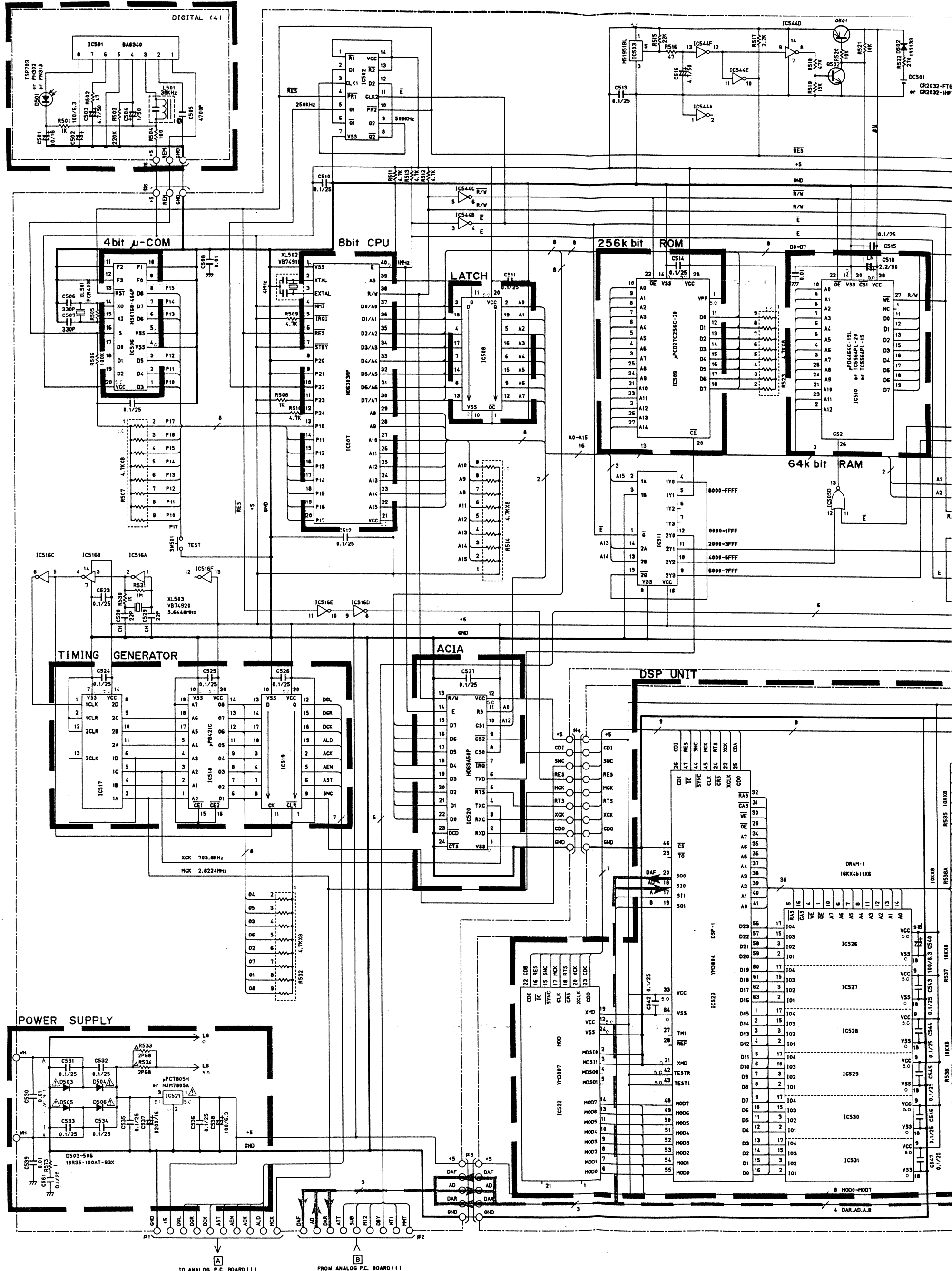
SCHEMATIC DIAGRAM (1/2)



PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICs.

2SA933 (Q, R) 2SA1115 (E, F) 2SA1310 (R, S, T) 2SC1740S (S, R) 2SC2603 (E, F) 2SC3312 (R, S, T) 2SC2878 (A, B)	1SS133 1SR35-100A MTZ5.6B	NJM78M12A NJM79M12A	2SC3381 (GR, BL)	M5238L	μPC4570HA	μPC319C NJM319D HD7407P TC74HC04P M74HC04P	TC47HC595P	MN4050B TC4050BP μPD4053BC HD14549B HD14559B	LM1111 TC74HC166P μPD74HC166C
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REMOTE CONTROL SENSOR

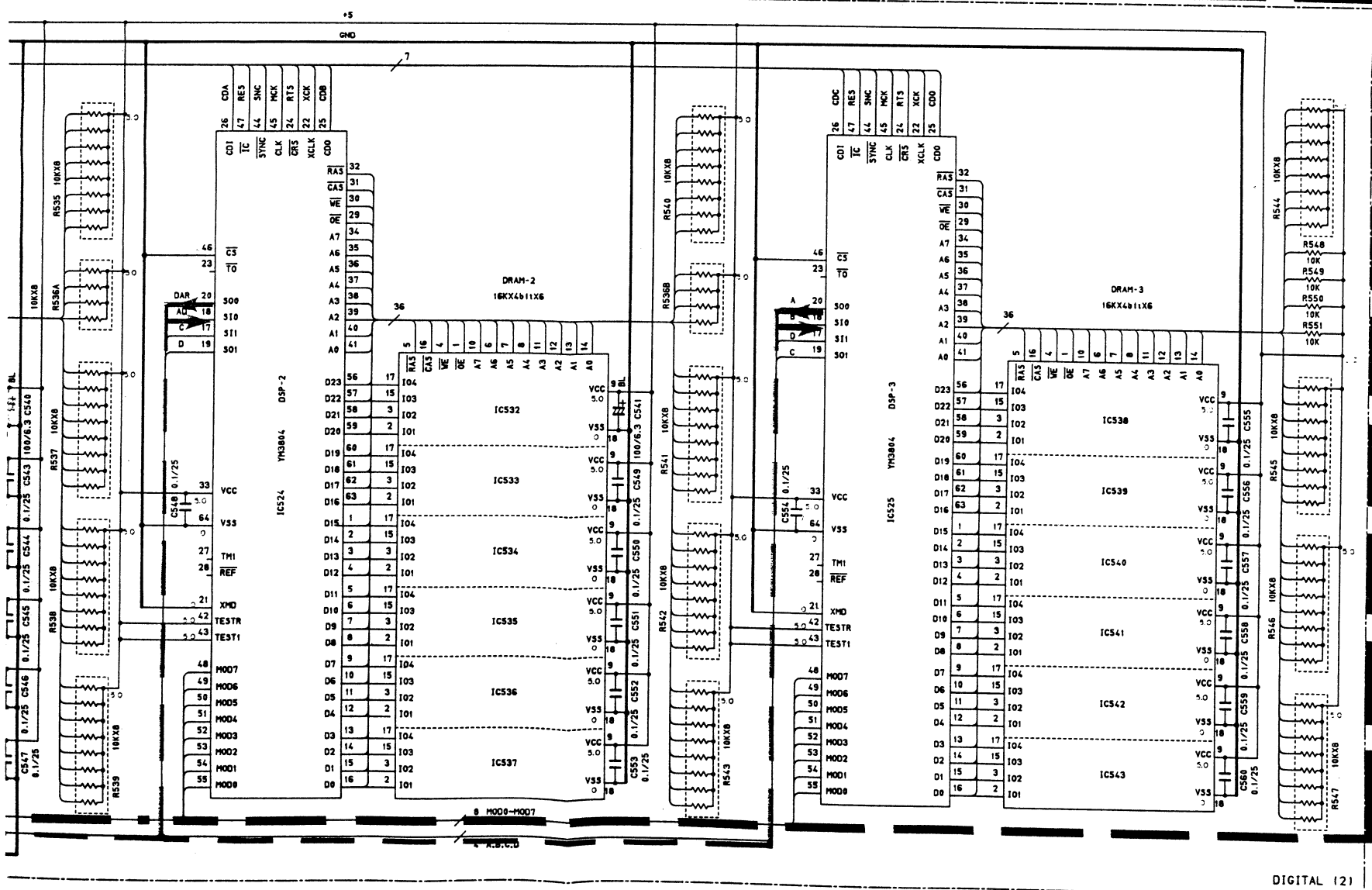
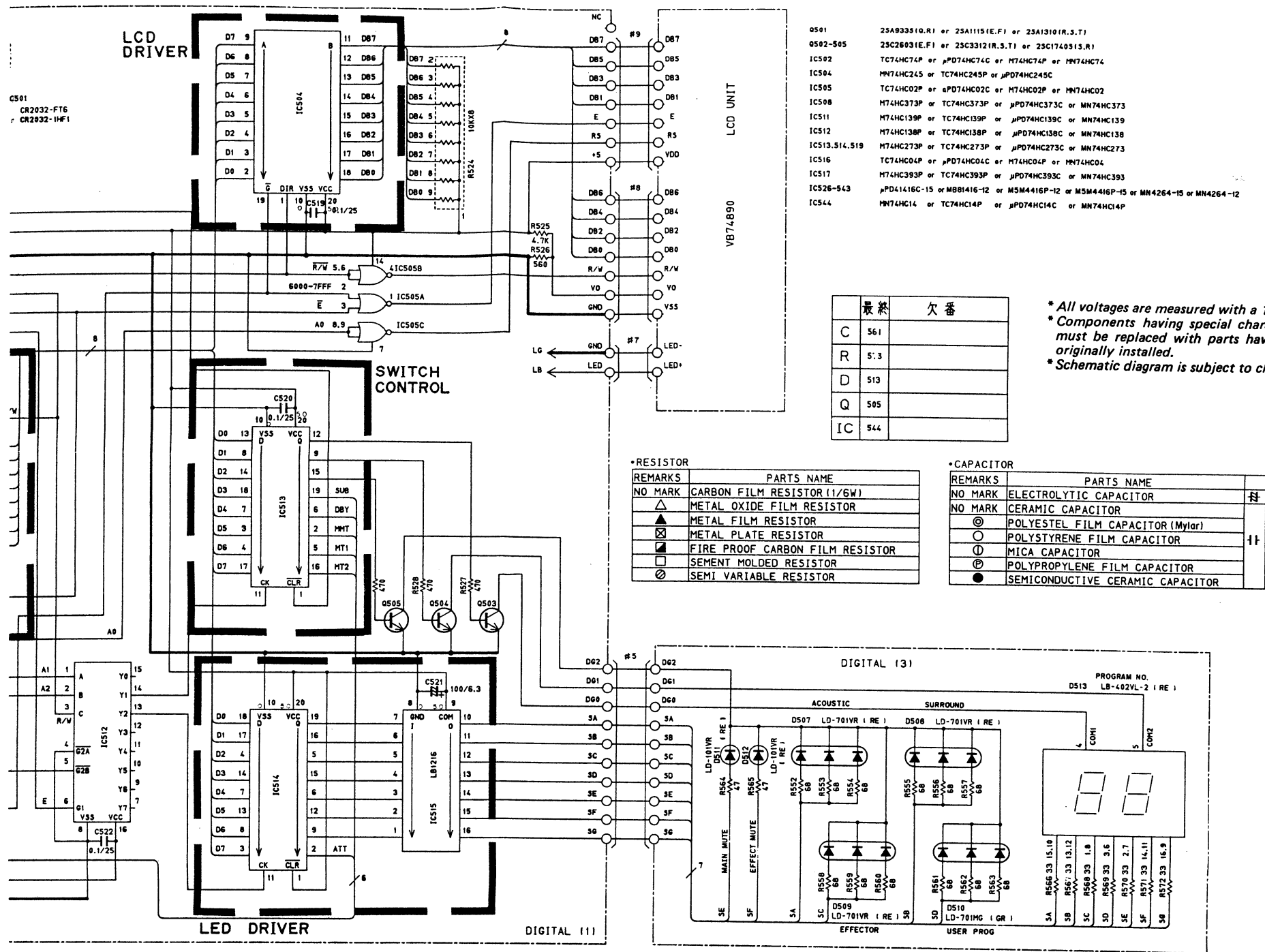


TO ANALOG P.C. BOARD (1)

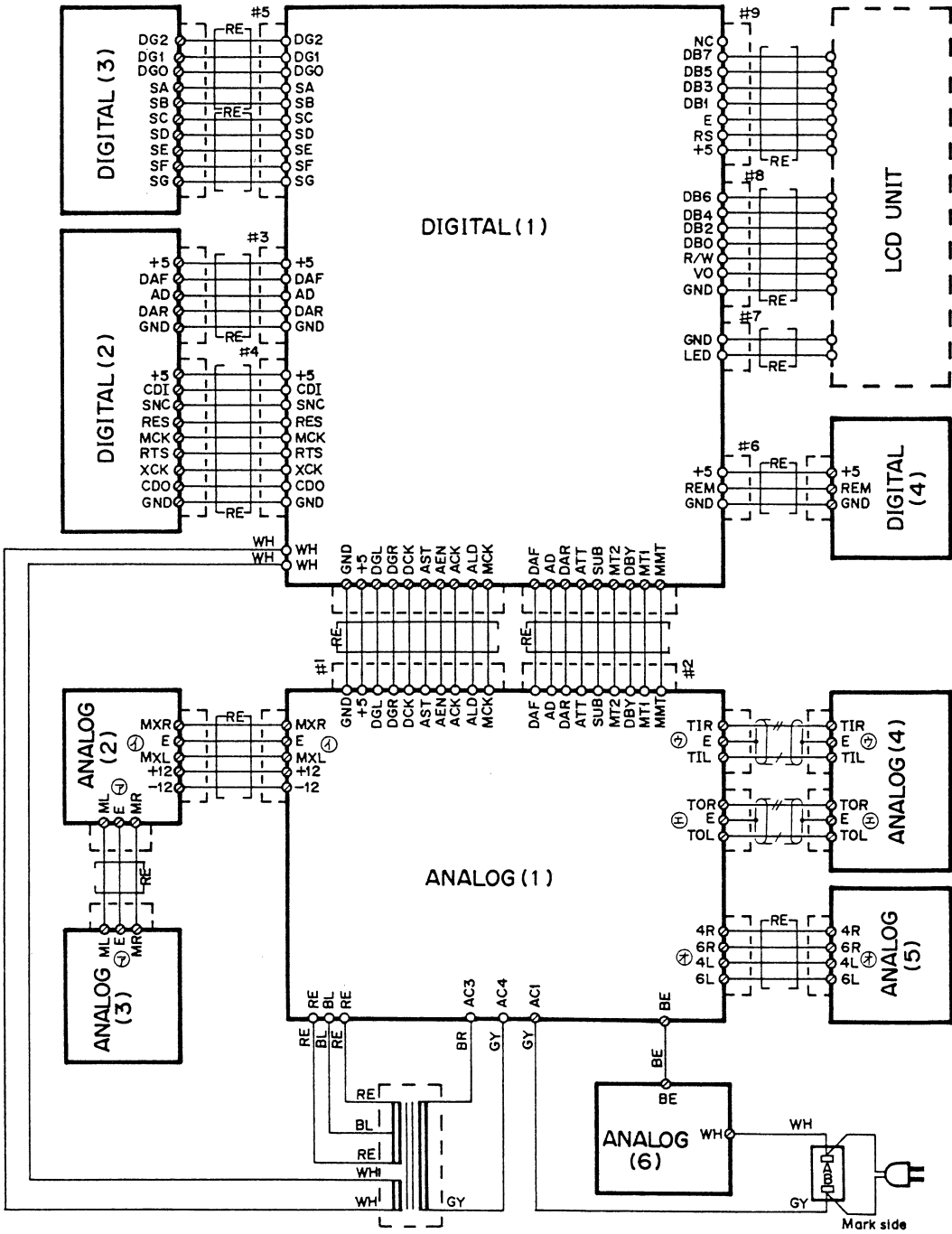
FROM ANALOG P.C. BOARD (1)

PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICS.

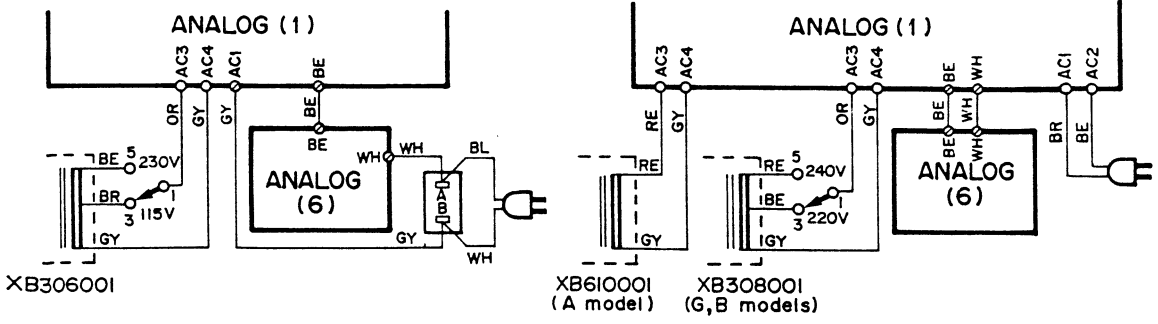
2SA933 (Q, R) 2SA1115 (E, F) 2SA1310 (R, S, T) 2SC1740S (S, R) 2SC2603 (E, F) 2SC3312 (R, S, T) 	1SS133 1SR35-100A 	LD-101VR 	TSP703 PH302 PN313 	LD-701VR LD-701MG 	μPC7805H 	M51951BL 	BA6340 	TC74HC74P M74HC74P M74HC393P 	TC74HC04P M74HC04P TC74HC02P M74HC02P TC74HC14P MN74HC14 	LB1216 
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■ WIRING



U,C models



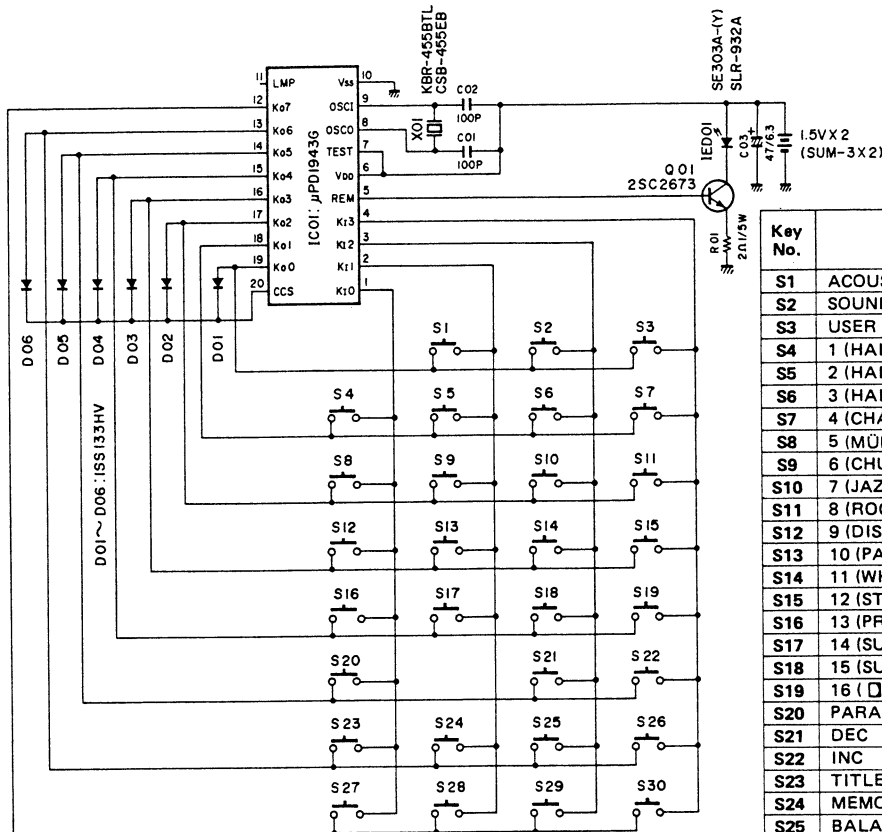
R model

A,G,B models

RS-DSP-1 REMOTE CONTROL TRANSMITTER

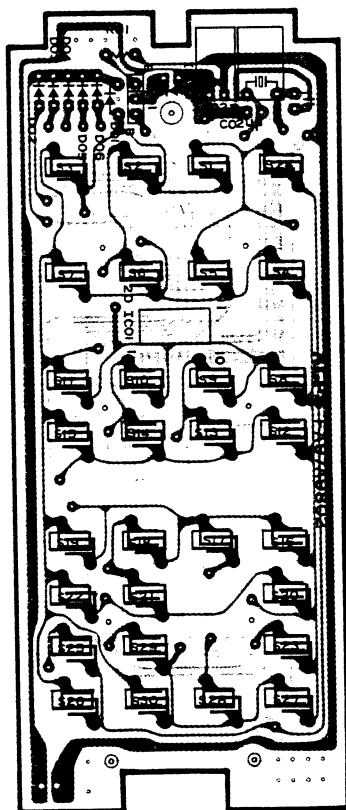
DSP-1

SCHEMATIC DIAGRAM

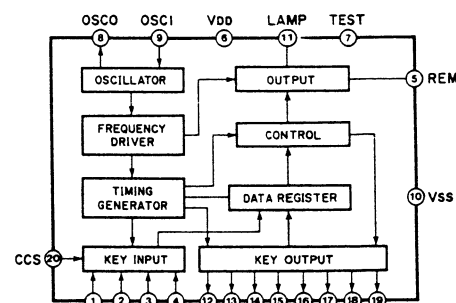
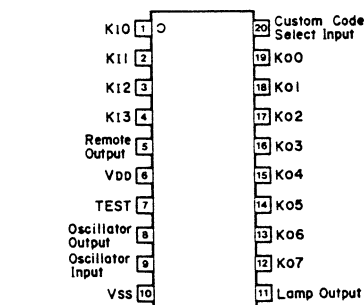


Key No.	Function	Hexadecimal notation
S1	ACOUSTIC/SURROUND	01
S2	SOUND EFFECTOR	02
S3	USER PROGRAM	03
S4	1 (HALL 1/DELAY)	04
S5	2 (HALL 2/ST ECHO)	05
S6	3 (HALL 3/ST FLANGE A)	06
S7	4 (CHAMBER/ST FLANGE B)	07
S8	5 (MÜNSTER/CHORUSA)	08
S9	6 (CHURCH/CHORUS B)	09
S10	7 (JAZZ CLUB/ST PHASING)	0A
S11	8 (ROCK CNCT/TREMOLO)	0B
S12	9 (DISCO/SYMPHONIC)	0C
S13	10 (PAVILION/ECHO ROOM)	0D
S14	11 (WHSE LOFT/PITCH CHANGE A)	0E
S15	12 (STADIUM/PITCH CHANGE B)	0F
S16	13 (PRESENCE/L TURN)	10
S17	14 (SUR 1/R TURN)	11
S18	15 (SUR 2/F-R)	12
S19	16 (□ SUR/L-R)	13
S20	PARAMETER	14
S21	DEC	16
S22	INC	17
S23	TITLE EDIT	18
S24	MEMORY	19
S25	BALANCE (FRONT)	1A
S26	LEVEL (UP)	1B
S27	MUTE (MAIN)	1C
S28	MUTE (EFFECT)	1D
S29	BALANCE (REAR)	1E
S30	LEVEL (DOWN)	1F
Custom Code		7D

PRINTED CIRCUIT BOARD



IC01: μPD1943G



DSP-1

PARTS LIST

■ ELECTRICAL PARTS

■WARNING

Components having special characteristics are marked Δ 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 resistor, refer to p. 33.

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※	NA 09:13:50	Analog Circuit Board	アナログシート				
	Fi 41:41:00	Ceramic Cap.	セラコン	C233,234	Interchangeable		
	Fi 51:41:00	"	"	"			
	Fi 38:41:00	"	"	C232		A,G,B	
	Fi 41:41:00	"	"	C232	Interchangeable	J,R,U,C	
	Fi 51:41:00	"	"	"		"	
	FG 41:12:20	"	"	C151			
	FG 41:21:00	"	"	C220,222,242~244			
	FG 41:22:20	"	"	C250,251			
	FG 41:24:70	"	"	C230			
	FG 41:31:00	"	"	C219,223,235,245			
	FG 41:34:70	"	"	C215			
	FG 44:41:00	"	"	C176,209,210,238			
	FG 44:42:20	"	"	C212			
	FG 44:44:70	"	"	C224			
	FZ 00:41:30	Semi-Conductive Ceramic Cap.	半導体セラコン	C139,140,163~166,177,178,180~186,188~190,192~195,197~202,205,206			
	FZ 00:55:70	Electrolytic Cap.	ブラックゲートコン	C172,173			
	UJ 15:92:20	"	ケミコン	C207,208			
	UH 13:71:00	"	"	C101,102,109~120,123,124,129,130,137,138,141~144,149,162,170,179,187,191,196,216,225,239			
	UJ 13:72:20	"	"	C237			
	UJ 13:74:70	"	"	C228,240,241,246~249			
	UH 13:81:00	"	"	C203,204			
	UJ 13:82:20	"	"	C229			
	UJ 16:51:00	"	"	C226			
	UJ 16:53:30	"	"	C227			
	UH 16:54:70	"	"	C211			
	UH 16:61:00	"	"	C214,218,221			
	UJ 16:71:00	"	"	C231			
	FA 15:45:60	Mylar Cap.	マイラーコン	C217			
	FA 15:51:00	"	"	C171			
	FA 15:32:20	"	"	C127,128,135,136,150			
	FT 66:21:00	Polypropylene Film Cap.	ポリプロコン	C103~108,121,122,125,126,133,134,145~148			
	FX 60:06:00	"	"	C167,169			
	UT 45:32:20	"	"	C168			
※	VB 10:96:00	Coil	コイル	L102			
※	VB 74:48:00	Filter	フィルター	L103~107			
	VA 77:84:00	"	"	L101			
	VA 78:79:00	Pre-set Potentiometer	半固定抵抗	VR106,107			
※	VC 05:52:00	"	"	VR104	Interchangeable		
※	VC 05:56:00	"	"	"			
	VA 78:81:00	"	"	VR105	Interchangeable		
※	VB 24:41:00	"	"	"			
※	VB 76:66:00	Potentiometer	可変抵抗	VR103			
※	VB 76:67:00	"	"	VR102			
※	VB 76:68:00	"	"	VR101			
	iA 09:33:00	Transistor	トランジスタ	Q115,118,122,125,126	Interchangeable		
	iA 11:15:10	"	"	"			
	iX 60:31:70	"	"	"			

※New Parts (新規部品) NR

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
	iC 17:40:00	Transistor	2SC1740S (S,R)	ト ラ ン ジ ス タ	Q117,120,121,123,124		
	iC 26:03:10	"	2SC2603 (E,F)	"	"	Interchangeable	
	iX 60:31:80	"	2SC3312(R,S,T)	"	"		
	iX 60:42:00	"	2SC2878 (A,B)	"	Q101~106,109~112,119		
	iC 33:81:00	Dual Transistor	2SC3381 (GR,BU)	デュアルトランジスタ	Q116		
	iG 10:59:00	IC	μPD4053BC	I C	IC111,113,114,121		
	iG 06:21:10	"	LM1111BN	"	IC122	Inter changeable	
	iG 11:44:00	"	LM1112CN	"	"		
	XA 39:40:01	"	PCM54HP	"	IC123~125		
※	iR 05:95:00	"	TC74HC595P	"	IC135~138		
※	iR 00:04:00	"	TC74HC04P	"	IC134	Interchangeable	
※	iR 00:04:80	"	M74HC04P	"	"		
	iR 01:66:00	"	TC74HC166P	"	IC132,133	Interchangeable	
※	iR 01:66:20	"	μPD74HC166C	"	"		
	iG 00:17:40	"	TC4050BP	"	IC129~131	Interchangeable	
※	XB 26:80:01	"	MN4050B	"	"		
	iG 05:85:00	"	HD7407P	"	IC126		
※	XB 25:20:01	"	M53207P	"	"		
	iG 10:45:00	"	HD14549B	"	IC128		
	iG 10:46:00	"	HD14559B	"	IC127		
	iG 08:67:00	"	μPC319C	"	IC112	Interchangeable	
※	XB 25:10:01	"	NJM319D	"	"		
※	XB 24:70:01	"	μPC4570HA	"	IC101~109,117,118,120,141		
※	XB 24:80:01	"	M5238L	"	IC110,115,116		
	iG 04:67:00	"	μPC78M12H	"	IC139	Interchangeable	
※	XB 24:90:01	"	NJM78M12A	"	"		
※	XB 25:00:01	"	NJM79M12A	"	IC140		
	iF 00:34:50	Diode	1SS133	ダ イ オ ード	D101~109		
	iF 00:84:80	"	1SR35-100AT	"	D110~114		
	iX 60:23:50	Zener Diode	MTZ5.6B	ツェナーダイオード			
	KA 40:09:40	Slide Switch	SSB-022	ス ラ イ ド ス イ ッ チ	SW103		
※	KA 40:12:80	"	SSP322 2-2	"	SW102		
	KA 80:51:50	"	ESB-8215V-F	パ ワ ー ス イ ッ チ	SW104		
※	VB 34:52:00	Rotary Switch		ロ ー タ リ ー ス イ ッ チ 部	SW101		
	VA 24:68:00	Pin Jack	1P	ピ ン ジャ ッ ク	PJ106		
	VA 31:70:00	"	1P	"	PL104,105		
※	VB 76:69:00	"	4P	"	PJ101,103	J,R,A	
※	VC 08:76:00	"	4P	"	"	U,G,C,B	
※	VA 98:43:00	"	6P	"	PJ102	J,R,A	
※	VC 08:77:00	"	6P	"	"	U,G,C,B	
	LA 00:21:20	Lapping Terminal	P=5 3P i-type	ラ ッ ピ ン グ 端 子 板			
	LA 00:21:40	"	P=10 2P i-type	"			
	LA 00:38:70	"	P=10 2P, WTM-type	"		A,G,B	
※	VB 21:96:00	Base Pin	9P	P H ベ ー ス ピ ン			
※	VB 22:18:00	"	10P	"			
	CB 64:46:70	Cover, Capacitor	HY-0105	コ ン デ ン サ ー カ バ ー		A,G,B	
	BA 09:29:70	Heat Sink		放 熱 板			
※	VB 68:03:00	Bus Bar	I=100	ア ー ス プ レ ー ト バ ス バ ー			

*New Parts (新規部品) NR

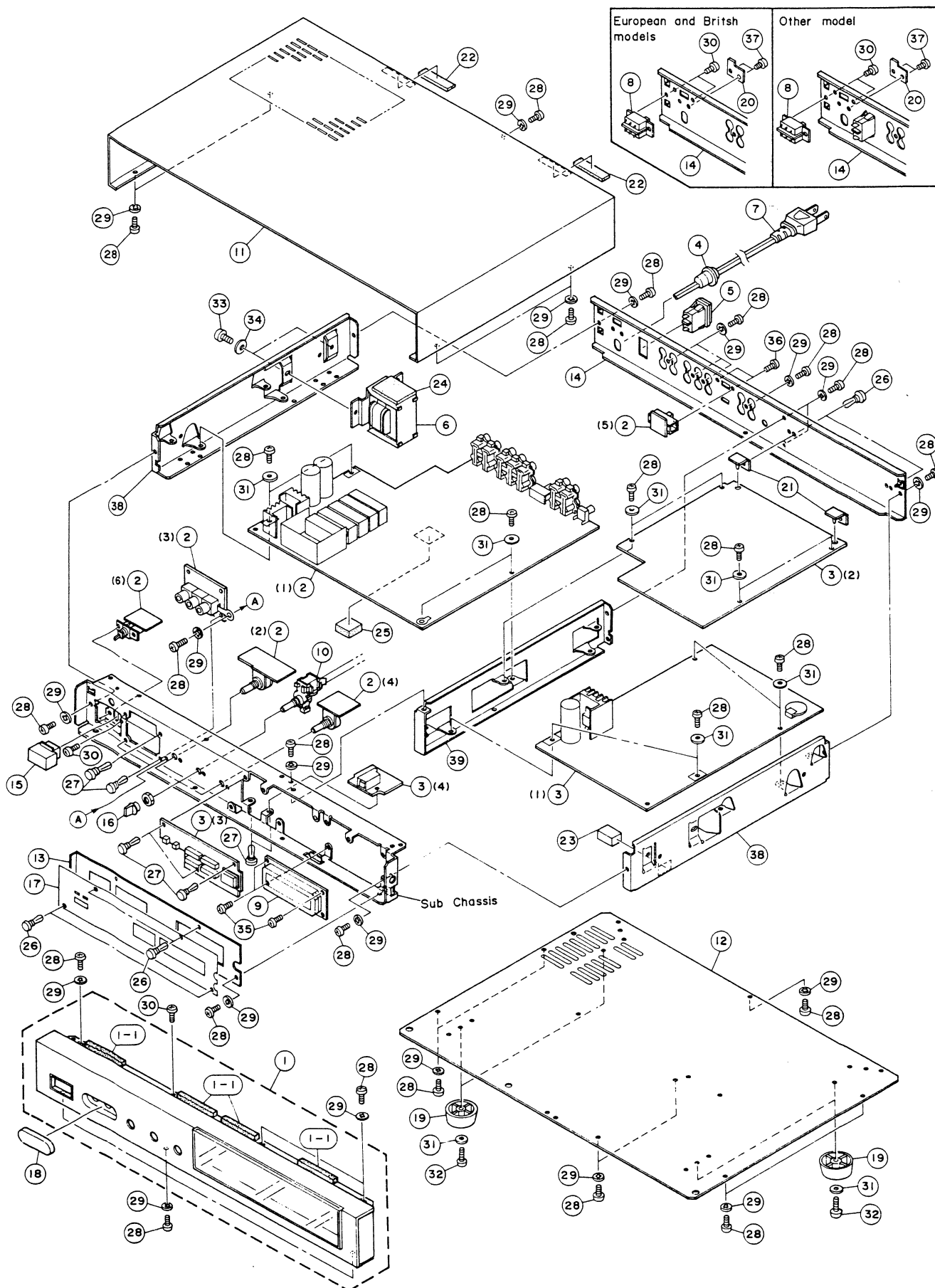
Ref. No.	Part No.			Description	部 品 名	Remarks	Common Model	Markets	ランク
	AA	61	99	50	Shielding Plate				
	BB	06	95	10	Land Metal Fitting				
	BB	06	62	90	Washer				
	ED	33	00	86	Binding Head Screw	3×8 FCRM3-BI	PACK		
	NA	09	13	90	Digital Circuit Board				
	FG	21	23	30	Ceramic Cap.	330pF 50V	セラコン	C506,507	
	FG	44	41	00	"	0.01μF 50V	"	C508,517,530,539	
	VA	76	10	00	"	22pF 50V	"	C528,529	
	FZ	00	41	30	Semi-Conductive Ceramic Cap.	0.1μF 25V	半導体セラコン	C509~515,519,520,522~527,531~536,542~561	
	FZ	00	54	10	Electrolytic Cap.	100μF 6.3V	ブラックゲートコン	C540,541	
	UH	11	81	00	"	100μF 6.3V	ケミコン	C502,521,538	
	UH	13	71	00	"	10μF 16V	"	C501	
	UH	16	61	00	"	1μF 50V	"	C504	
	UH	16	64	70	"	4.7μF 50V	"	C503,516	
	Ui	93	98	20	"	8200μF 16V	"	C537	
	UL	46	62	20	"	2.2μF 50V	"	C518	
	FA	15	34	70	Mylar Cap.	4700pF 50V	マイラーコン	C505	
	VA	92	68	00	Coil	38kHz	コイル	L501	
※	VB	74	91	00	Resonator	FAR-C4SA-4.0M-K	F A R 振 動 子	XL502	
※	VB	74	92	00	"	FAR-C1SA-5.6448M-G	"	XL503	
	GG	00	07	00	Ceramic Resonator	FCR-400K	セラミック振動子	XL501	
	HL	32	46	80	Metal Oxide Film Resistor	68Ω 2W	酸 金 抵 抗	R533,534	
	HZ	00	28	80	Resistor Array	10kΩ×8	抵 抗 ア レ ー	R524,535~547	
	HZ	00	47	40	"	4.7kΩ×8	"	R507,514,523,532	
	iA	09	33	00	Transistor	2SA933 (Q,R)	ト ラ ン ジ ス タ	Q501	
	iA	11	15	10	"	2SA1115 (E,F)	"	Interchangeable	
	iX	60	31	70	"	2SA1310(R,S,T)	"		
	iC	26	03	10	"	2SC2603 (E,F)	"	Q502~505	
	iX	60	31	80	"	2SC3312(R,S,T)	"	Interchangeable	
	iC	17	40	00	"	2SC1740S(S,R)	"		
	iF	00	45	90	Photo Diode	TPS703	フ ォ ト ダ イ オ ード	D501	
	iF	00	47	10	"	PH302	"	Interchangeable	
	iF	00	78	50	"	PN313	"		
	iF	00	34	50	Diode	1SS133	ダ イ オ ード	D502	
	iF	00	84	80	"	1SR35-100A	"	D503~506	
※	iF	00	49	40	LED	LD-101VR	L E D	D511,512	
※	VB	74	98	00	"	LD-701VR	"	D507~509	
※	VB	74	94	00	"	LB-402VL-2	"	D513	
※	VB	82	25	00	"	LD-701MG	"	D510	
	iG	03	33	50	IC	μPC7805H	I C	IC521	
	iG	09	35	00	"	HD6303RP	"	IC507	
	iG	13	31	00	"	HD63A50P	"	IC520	
	iG	14	92	00	"	BA6340	"	IC501	
※	XA	99	50	01	"	μPD4464C-15L	"	IC510	
※	XB	25	50	01	"	μPB421C	"	IC518	
※	XB	26	70	02	"	μPD27C256C-20	"	IC509	

※New Parts (新規部品) NR

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※	XB 25 40 01	IC	M50760-464P	I C	IC506		
※	XB 25 30 01	"	M51951BL	"	IC503		
※	XB 26 60 01	"	μPD41416C-15	"	IC526~543	Interchangeable	
	XA 69 00 01	"	MSM4416P-15	"	"		
※	iR 00 02 00	"	TC74HC02P	"	IC505	Interchangeable	
※	iR 00 02 80	"	M74HC02P	"	"		
※	iR 00 04 00	"	TC74HC04P	"	IC516	Interchangeable	
※	iR 00 04 80	"	M74HC04P	"	"		
※	iR 00 14 00	"	TC74HC14P	"	IC544	Interchangeable	
※	iR 00 14 90	"	MN74HC14	"	"		
※	iR 00 74 00	"	TC74HC74P	"	IC502	Interchangeable	
※	iR 00 74 80	"	M74HC74P	"	"		
※	iR 01 38 00	"	TC74HC138P	"	IC512	Interchangeable	
※	iR 01 38 80	"	M74HC138P	"	"		
※	iR 01 39 00	"	TC74HC139P	"	IC511	Interchangeable	
※	iR 01 39 80	"	M74HC139P	"	"		
※	iR 02 45 00	"	TC74HC245P	"	IC504	Interchangeable	
※	iR 02 45 90	"	MN74HC245	"	"		
※	iR 02 73 00	"	TC74HC273P	"	IC513,514,519	Interchangeable	
※	iR 02 73 80	"	M74HC273P	"	"		
※	iR 03 73 00	"	TC74HC373P	"	IC508	Interchangeable	
※	iR 03 73 80	"	M74HC373P	"	"		
※	iR 03 93 80	"	M74HC393P	"	IC517		
※	XA 89 60 01	"	YM3804	"	IC523~525		
※	iT 38 07 00	"	YM3807	"	IC522		
※	VB 74 93 00	Transistor Array	LB1216	トランジスタアレー	IC515		
	KA 90 63 80	Switch	EVQ-QRB-04M	ス イ ッ チ	SW501		
※	VB 75 00 00	Battery	CR2032-FT6	リ チ ウ ム 電 池	DC501	Interchangeable	
※	VB 82 24 00	"		"	"		
※	VB 21 89 00	Base Pin	2P	P H ベ ース ピ ン			
	LA 00 21 10	Lapping Terminal	P=5 2P i-type	ラ ッ ピ ン ぐ 端 子 板			
	LB 91 80 20	Base Pin	2P i-type	X H ベ ース ピ ン			
	LB 91 80 70	"	7P i-type	"			
	LB 91 80 80	"	8P i-type	"			
※	LB 91 81 00	"	10P i-type	"			
※	VB 21 90 00	"	3P i-type	P H ベ ース ピ ン			
※	VB 21 92 00	"	5P i-type	"			
※	VB 21 96 00	"	9P i-type	"			
※	VB 82 50 00	Socket, IC	CLC1028-0101	I C ソ ケ ッ ト			
※	VB 75 02 00	Heat Sink	OSH-3035-SP	放 熱 器			
	AA 62 26 10	Plate, Shield		シ ー ル ド 板			
	BB 06 95 10	Metal, Earth		ア ー ス 金 具		A-1060	
	ED 33 00 86	Binding Head Screw	3×8 FCRM3-BI	バ イ ン ド 小 ネ ジ	PACK		
※	VB 74 89 00	LCD Unit	BMDM007Z-1DL3	L C D ユ ニ ッ ト			
※	iX 60 72 80	IC	LC7930	I C			
※	iX 60 72 90	IC	HD44780A00	"			

*New Parts (新規部品) NR

EXPLODED VIEW



MECHANISM PARTS

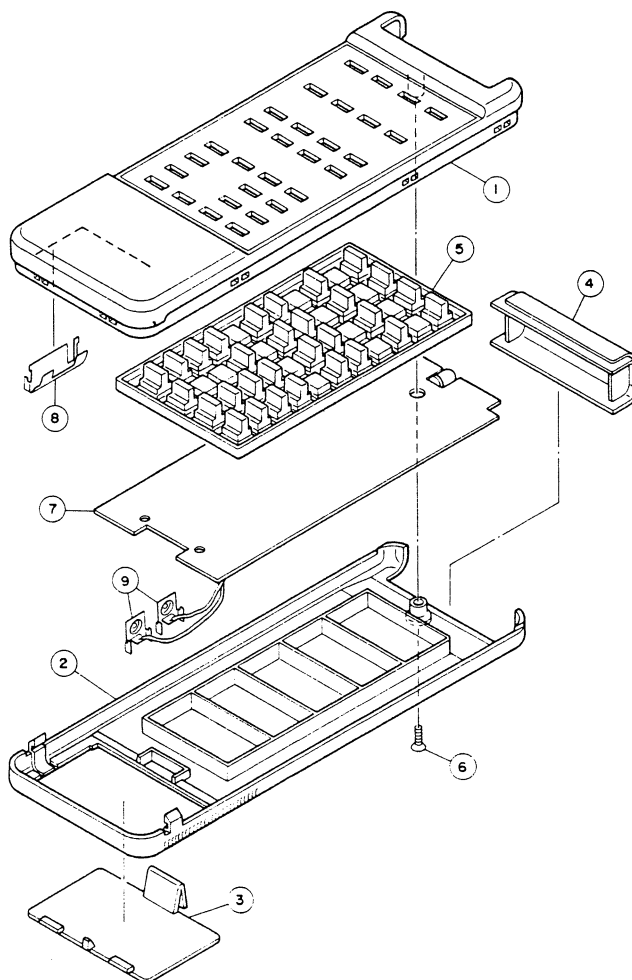
Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※ 1	NB 63 71 60	Panel Unit	パネ ル ユ ニ ッ ト				
※ 1-1	VB 79 73 00	Damper	ダ ン パ ー				
※ 2	NA 09 13 50	Analog Circuit Board	ア ナ ロ グ シ ー ト			J	
※ "	NA 09 13 60	"	"			R	
※ "	NA 09 13 70	"	"			A	
※ "	NA 09 13 80	"	"			G,B	
※ "	NA 09 16 00	"	"			U,C	
※ 3	NA 09 13 90	Digital Circuit Board	デ ジ タ ル シ ー ト			J	
4	CB 61 68 10	Cord Stopper	CM-22A	コ ー ド ス ト ッ パ ー			
"	CB 62 01 90	"	CM-22B	"		R,A,G,B	
"	CB 62 02 00	"	CM-22C	"		U,C	
5	LB 20 18 10	AC Outlet	A C ア ウ ト レ ッ ト			J,R	⬆
"	LB 20 30 60	"	"			U,C	⬆
※ 6	XB 30 50 01	Power Transformer	電 源 ト ラ ン ス			J	⬆
※ "	XB 30 60 01	"	"			R	⬆
※ "	XB 30 70 01	"	"			U,C	⬆
※ "	XB 30 80 01	"	"			G,B	⬆
※ "	XB 61 00 01	"	"			A	⬆
7	MG 00 16 30	Power Cord	6A 250V 2m	電 源 コ ー ド		R	⬆
"	MG 00 22 20	"	10A 125V 1.98m	"		U,C	⬆
"	MG 00 09 20	"	7.5A 250V 2.5m	"	Interchangeable	A	⬆
"	MG 00 14 90	"	7.5A 250V 2.5m	"		A	⬆
"	MG 00 23 10	"	7.5A 250V 2m	"		A	⬆
"	MG 00 16 20	"	2.5A 250V 2m	"	Interchangeable	G,B	⬆
"	MG 00 18 10	"	7A 125V 2.2m	"		J	⬆
"	MG 00 22 90	"	7A 125V 2m	"		J	⬆
8	KA 40 12 60	Slide Switch	ES-D39198S-F	ス ラ イ ド ス イ ッ チ		R,G,B	⬆
※ 9	VB 74 89 00	LCD Unit	BMDM007Z-1DL3	L C D ユ ニ ッ ト			
※ 10	VB 77 16 00	Remote Rotary Actuator	ECA-333019	リ モ ー ト ロ ー タ リ ー 操 作 部			
※ 11	VB 81 86 00	Top Cover		ト ッ プ カ バ ー			
※ 12	VB 79 71 00	Bottom Cover		ボ ト ム カ バ ー			
※ 13	VB 79 72 00	Shield Plate		シ ー ル ド プ レ ー ト			
※ 14	VB 67 84 00	Rear Panel		リ ア パ ネ ル		J	
※ "	VB 67 85 00	"		"		R	
※ "	VB 67 86 00	"		"		U,C	
※ "	VB 67 87 00	"		"		G,B	
※ "	VB 67 88 00	"		"		A	
15	NB 62 33 80	Button Ass'y		ボ タ ン Ass'y	POWER		
※ 16	VB 83 17 00	Knob		ツ マ ミ			
※ 17	VB 67 90 00	Sheet		シ ー ト			
※ 18	VB 67 92 00	Plate, PJ		プ レ ー ト P J			
19	CB 62 62 90	Leg		脚			
20	CB 60 14 40	Stopper, VS		V S ス ト ッ パ ー		R,G,B	
21	CB 09 95 40	Hinge, PCB		P C B ヒ ン ジ			
22	CB 64 81 00	Damper		ダ ン パ ー			
23	CB 64 20 50	"		"			
※ 24	VB 97 49 00	"		"			
※ 25	VC 08 57 00	"		"			
26	CB 06 88 80	Plastic Rivet		プ ラ ス テ ッ ク リ ベ ッ ト			
27	CB 60 56 20	"		"			
28	Ei 33 00 86	Binding Head Tapping Screw	3×8 FCRM3-BI	バ イ ン ド タ ッ ピ ン グ ネ ジ	PACK		
29	EV 41 30 36	Toothed Lock Washer	φ3 FCRM3-BI	歯 付 座 金	PACK		

*New Parts (新規部品)

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※New Parts (新規部品) NR

1 ■ EXPLODED VIEW(RS-DSP-1)



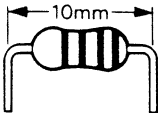
■ PARTS LIST

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※	VB 80 01 00	Remote Control Transmitter	RS-DSP1	リモコントランスミッター	Black		
※	1 XX 68 22 10	Case (A)		ケ ー ス (A)	Black		
※	2 XX 68 22 20	Case (B)		ケ ー ス (B)	Black		
※	3 XX 67 16 30	Case (C)		ケ ー ス (C)	Black		
※	4 XX 68 22 40	Filter		フ ィ ル タ ー	Black		
※	5 XX 68 22 50	Rubber, Contact		ゴ ム 接 点	Black		
※	6 EO 32 61 26	Flat Head Screw	2.6x12 FCRM3-BI	皿 小 ネ ジ	Pack		
※	7 XX 68 22 30	P.C. Board Ass'y		プ リ ン ト 基 板 Ass'y			
※	8 XX 67 16 80	Battery Terminal A		電 池 電 極 板 A			
※	XX 68 22 30	P.C. Board Ass'y		プ リ ン ト 基 板 Ass'y			
	iX 60 16 00	IC	PD1943G	I C	IC01		
	QX 60 00 40	Ceramic Resonator	KBR-455BTL	セ ラ ミ ッ ク 振 動 子	X01		
	FG 21 21 00	Ceramic Cap.	100pF 50V	セ ラ コ ン	C01,02		
	UJ 11 74 70	Electrolytic Cap.	47μF 6.3V	ケ ミ コ ン	C03		
	iX 60 36 00	IED	SLR-932A	I E D	IED01		
	iC 26 73 00	Transistor	2SC2673	ト ラ ン ジ ス タ	Q01		
	HX 60 14 00	Carbon Resistor	2Ω 1/4W	カ ー ボ ン 抵 抗	R01		
	iF 00 34 50	Diode	1SS133	ダ イ オ ード	D01~06		
9	XX 67 16 90	Battery Terminal B		電 池 電 極 板 B			

※New Parts (新規部品) NR

Parts List for Carbon Resistor

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	HJ353100	※	12K Ω	HJ357120	HF857120
1.8 "	HJ353180	※	15 "	HJ357150	HF857150
2.2 "	HJ353220	HF853220	18 "	HJ357180	HF857180
3.3 "	HJ353330	HF853330	22 "	HJ357220	HF857220
4.7 "	HJ353470	HF853470	27 "	HJ357270	HF857270
5.6 "	HJ353560	HF853560	33 "	HJ357330	HF857330
10 "	HJ354100	HF854100	39 "	HJ357390	HF857390
15 "	HJ354150	HF854150	47 "	HJ357470	HF857470
22 "	HJ354220	HF854220	56 "	HJ357560	HF857560
27 "	HJ354270	HF854270	68 "	HJ357680	HF857680
33 "	HJ354330	HF854330	82 "	HJ357820	HF857820
39 "	HJ354390	HF854390	91 "	HJ357910	HF857910
47 "	HJ354470	HF854470	100 "	HJ358100	HF858100
56 "	HJ354560	HF854560	120 "	HJ358120	HF858120
68 "	HJ354680	HF854680	150 "	HJ358150	HF858150
82 "	HJ354820	HF854820	180 "	HJ358180	HF858180
100 "	HJ355100	HF855100	220 "	HJ358220	HF858220
110 "	HJ355110	HF855110	270 "	HJ358270	HF858270
120 "	HJ355120	HF855120	330 "	HJ358330	HF858330
150 "	HJ355150	HF855150	390 "	HJ358390	HF858390
160 "	HJ355160	※	470 "	HJ358470	HF858470
180 "	HJ355180	HF855180	560 "	HJ358560	HF858560
220 "	HJ355220	HF855220	680 "	HJ358680	HF858680
270 "	HJ355270	HF855270	820 "	HJ358820	HF858820
330 "	HJ355330	HF855330	1.0M Ω	HJ359100	HF859100
390 "	HJ355390	HF855390	1.2 "	HJ359120	※
470 "	HJ355470	HF855470	1.5 "	HJ359150	HF859150
510 "	※	HF855510	1.8 "	HJ359180	HF859180
560 "	HJ355560	HF855560	2.2 "	HJ359220	HF859220
680 "	HJ355680	HF855680	3.3 "	HJ359330	HF859330
820 "	HJ355820	HF855820	3.9 "	HJ359390	※
910 "	HJ355910	HF855910	4.7 "	HJ359470	※
1.0K Ω	HJ356100	HF856100			
1.2 "	HJ356120	HF856120			
1.5 "	HJ356150	HF856150			
1.8 "	HJ356180	HF856180			
2.0 "	HJ356200	HF856200			
2.2 "	HJ356220	HF856220			
2.4 "	HJ356240	HF856240			
2.7 "	HJ356270	HF856270			
3.0 "	HJ356300	HF856300			
3.3 "	HJ356330	HF856330			
3.6 "	HJ356360	HF856360			
3.9 "	HJ356390	HF856390			
4.7 "	HJ356470	HF856470			
5.1 "	HJ356510	HF856510			
5.6 "	HJ356560	HF856560			
6.8 "	HJ356680	HF856680			
8.2 "	HJ356820	HF856820			
9.1 "	HJ356910	HF856910			
10 "	HJ357100	HF857100			

1/4W Type
HJ35○○○○
10mm


1/6W Type
HF85○○○○
5mm
