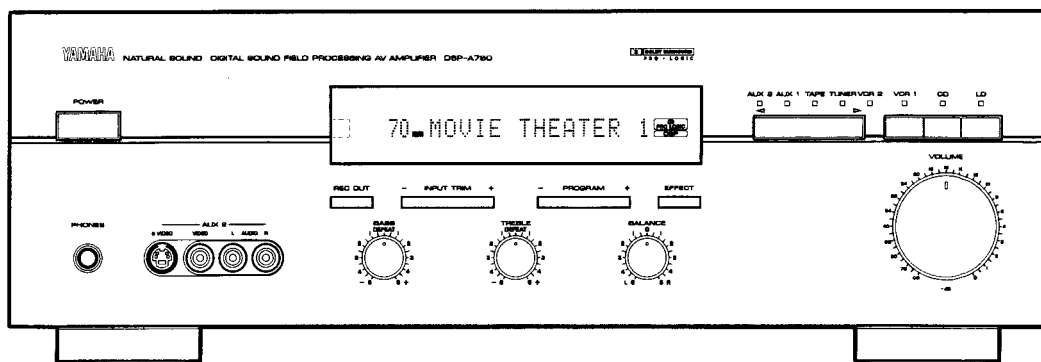
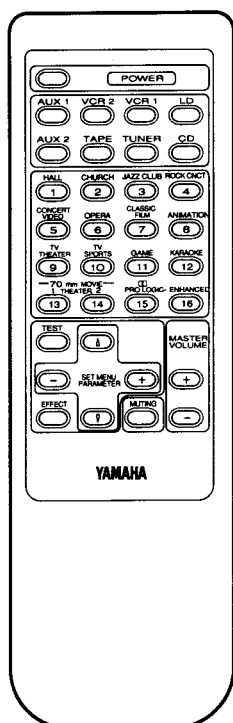


# DIGITAL SOUND FIELD PROCESSING AV AMPLIFIER

# DSP-A780

## SERVICE MANUAL



### IMPORTANT NOTICE

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

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

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

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

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

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

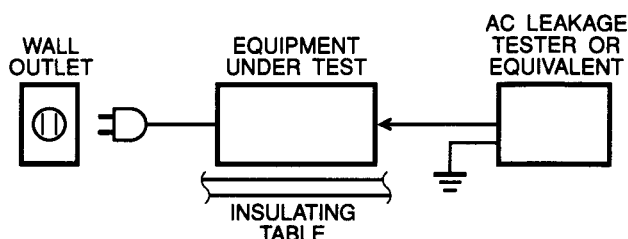
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## ■ TO SERVICE PERSONNEL

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 Models Only).  
When service has been completed, it is imperative to verify that all exposed conductive surfaces are properly insulated from supply circuits.
  - Meter impedance should be equivalent to 1500 ohm shunted by 0.15μF.
  - Leakage current must not exceed 0.5mA.
  - Be sure to test for leakage with the AC plug in both polarities.



## WARNING: CHEMICAL CONTENT NOTICE!

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

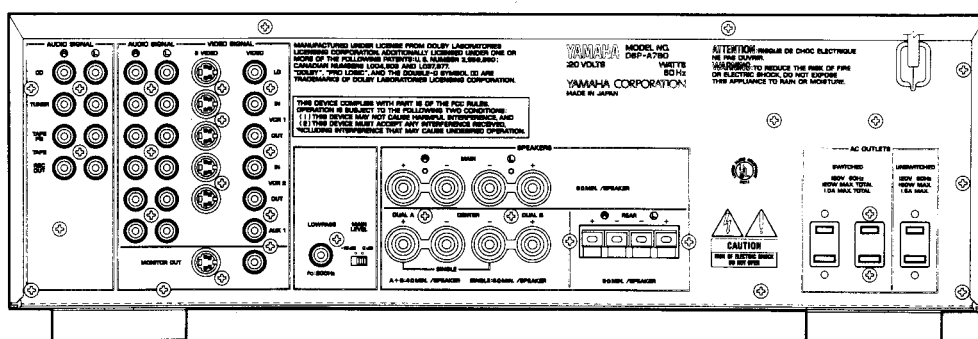
DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHATSOEVER!

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

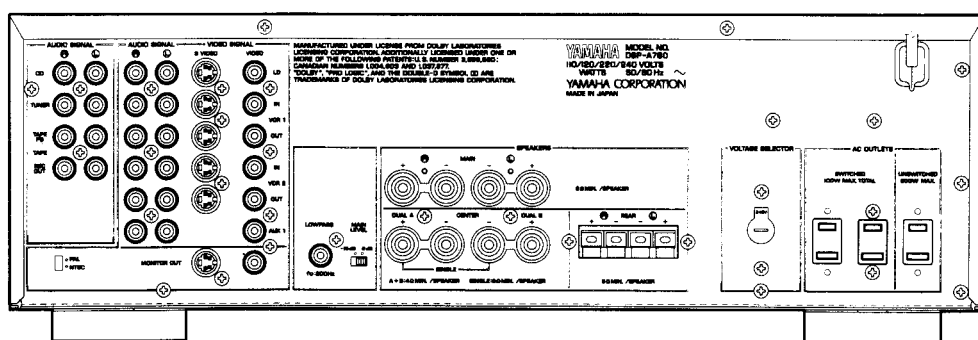
If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

## ■ REAR PANELS

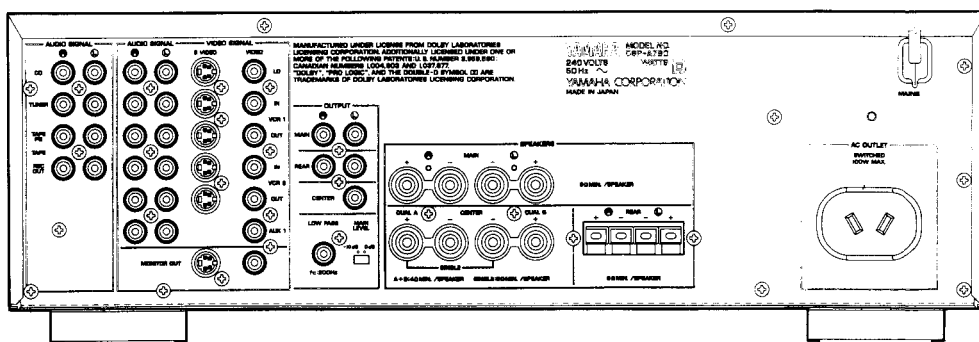
### ▼ U, C models



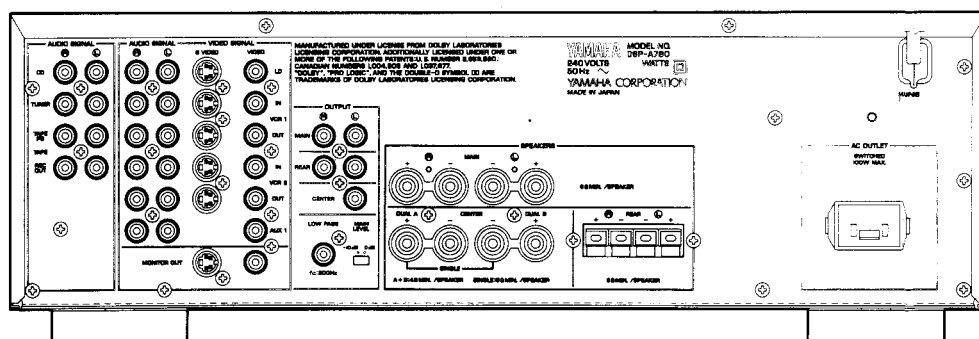
### ▼ R model



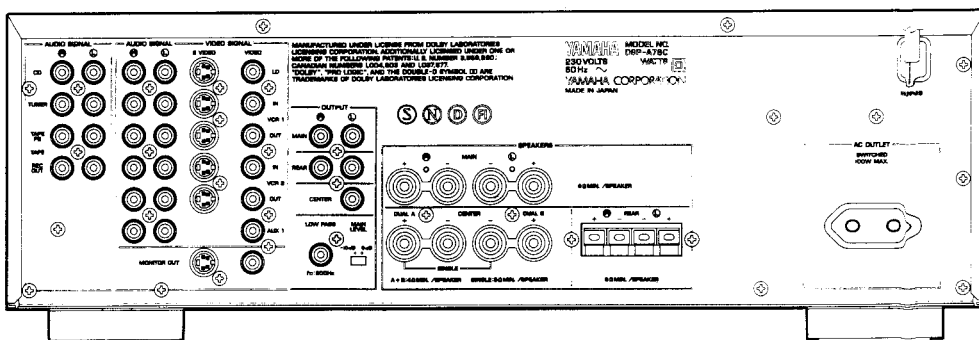
▼ A model



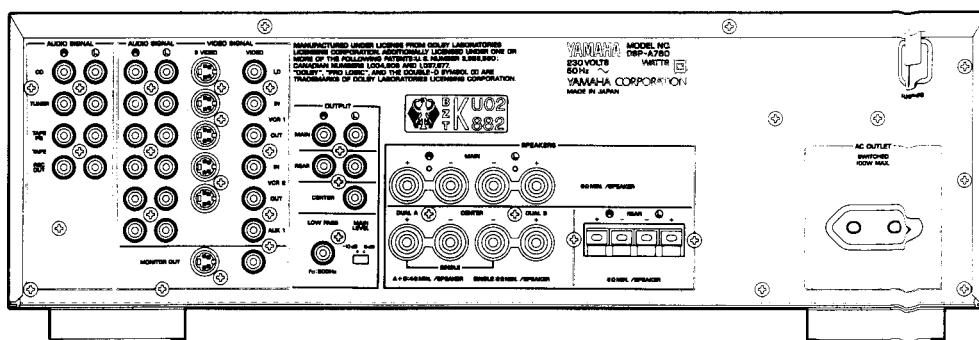
▼ B model



▼ H, L models



▼ W model



SPECIFICATIONS

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

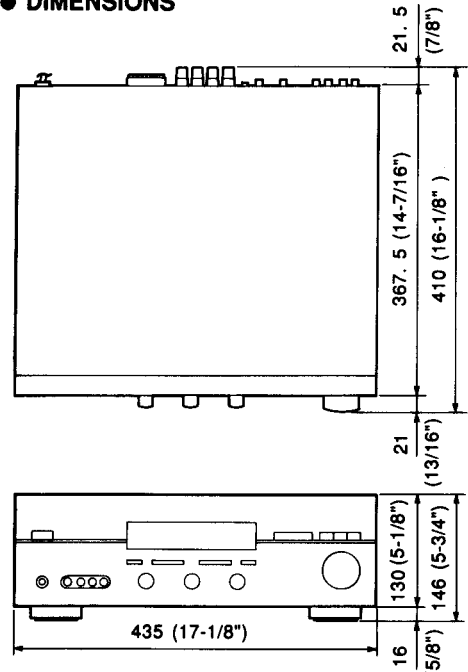
|                         |                              |
|-------------------------|------------------------------|
| Power Supply            |                              |
| U, C models             | AC120V 60Hz                  |
| A, B models             | AC240V 50Hz                  |
| H, W, L models          | AC230V 50Hz                  |
| R model                 | AC110/120/220/240V 60/50Hz   |
| Power Consumption       |                              |
| U, C models             | 230W, 320VA                  |
| A, B, H, W, R, L models | 230W                         |
| AC Outlets              |                              |
| 2 Switched Outlets      |                              |
| (U, C models)           | 120W max. total              |
| (R model)               | 100W max. total              |
| 1 Switched Outlets      |                              |
| (A, B, H, W, L models)  | 100W max. total              |
| 1 Unswitched Outlets    |                              |
| (U, C models)           | 180W max.                    |
| (R model)               | 200W max.                    |
| Dimensions (W x H x D)  |                              |
|                         | 435 x 146 x 410mm            |
|                         | (17-1/8" x 5-3/4" x 16-1/8") |
| Weight                  |                              |
|                         | 11.0kg (24 lbs. 4 oz)        |

\*Specifications are subject to change without notice.

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

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DIMENSIONS



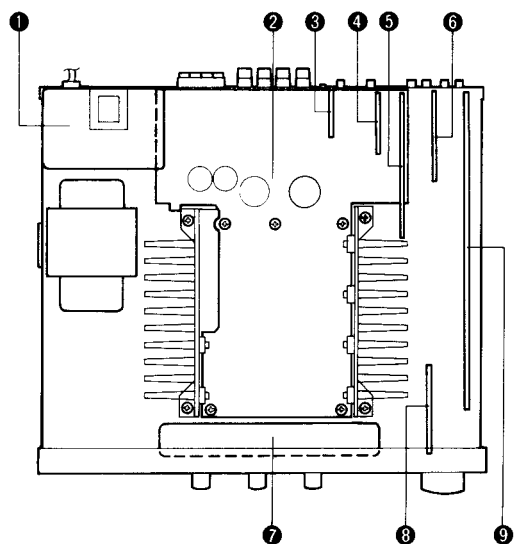
Unit : mm (Inch)



# ■ PROGRAM PARAMETER TABLE

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

## ■ INTERNAL VIEW



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

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

## 1. Removal of Top Cover

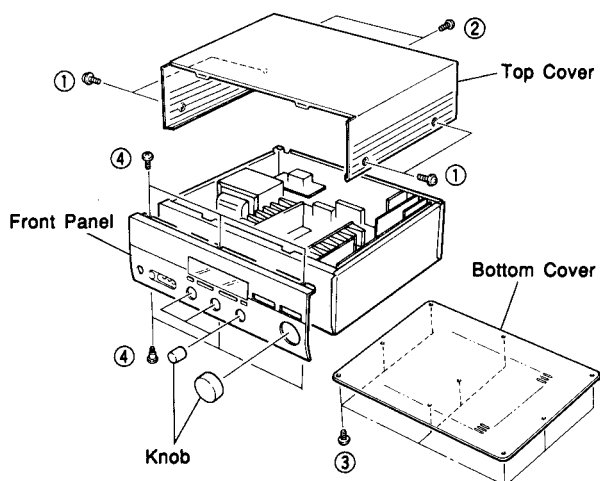
- a. Remove 4 screws ( ① ) and 2 screws ( ② ) in Fig. 1.

## 2. Removal of Bottom Cover

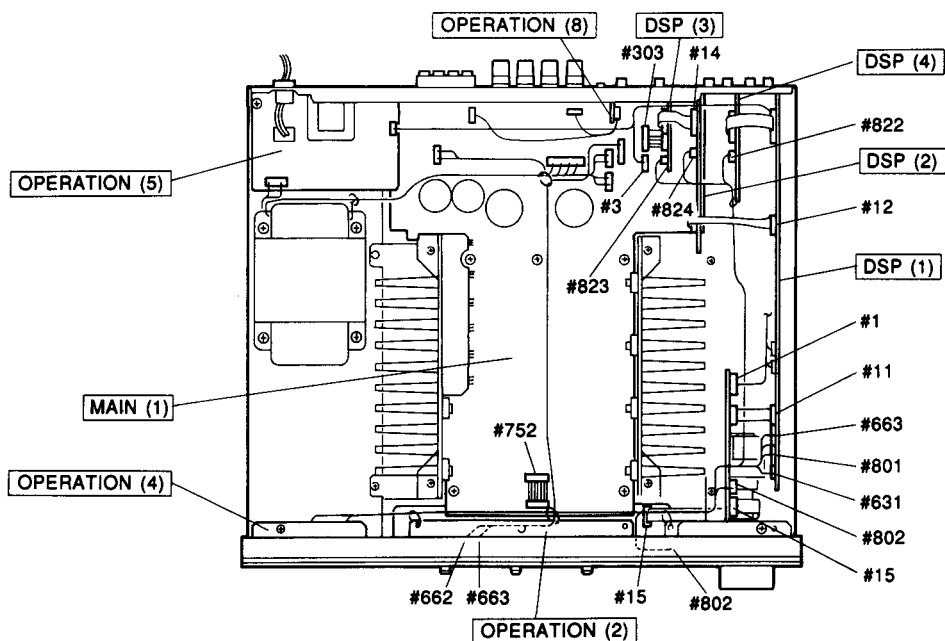
- a. Remove 9 screws ( ③ ) in Fig. 1.

### 3. Removal of Front Panel

- a. Remove 4 knobs.
- b. Remove 6 screws ( ④ ) in Fig. 1.



**Fig. 1**



**Fig. 2**

## ■ DIAGNOSTICS MODE

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

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

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

Example of display on Main Unit

1. RAM THR. BYPAS 

Monitor screen

DIAG. Ver. Z0.5

1. RAM THROUGH 1
2. RAM THROUGH 2
3. RAM THROUGH 3
4. EFCT OFF/DISP
5. MANUAL TEST
6. PRO LOGIC
7. FACTORY PRESET
8. MODE EXIT

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

### 2. Operation Procedure

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

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

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

### 3. Cancellation Procedure

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

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

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

### 4. Details of Diagnosis Content

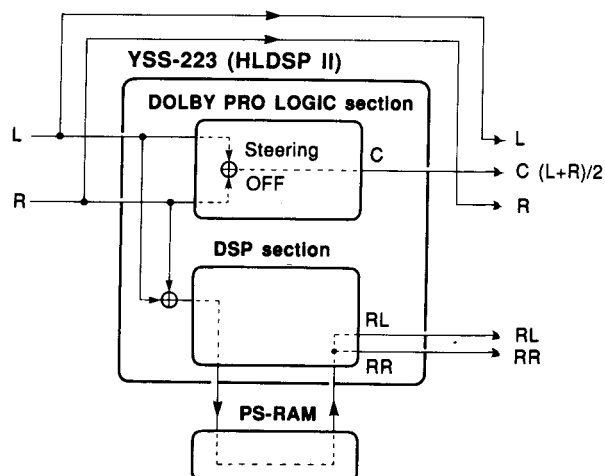
**DIAG No. 1 : RAM THROUGH 1**

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

Example of display on Main Unit

1. RAM THR. BYPAS 

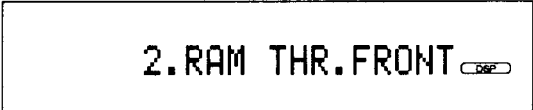
There is no sub-menu



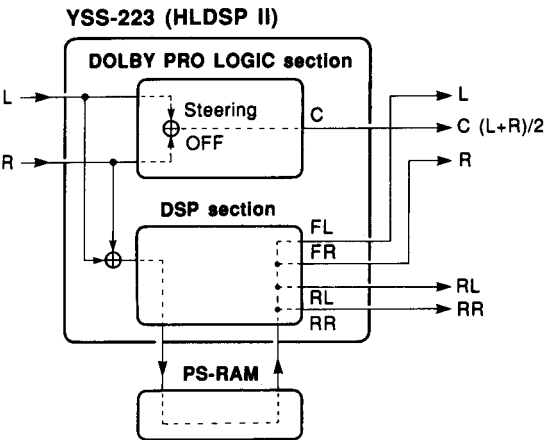
DIAG No. 2 : RAM THROUGH 2

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

Example of display on Main Unit



There is no sub-menu

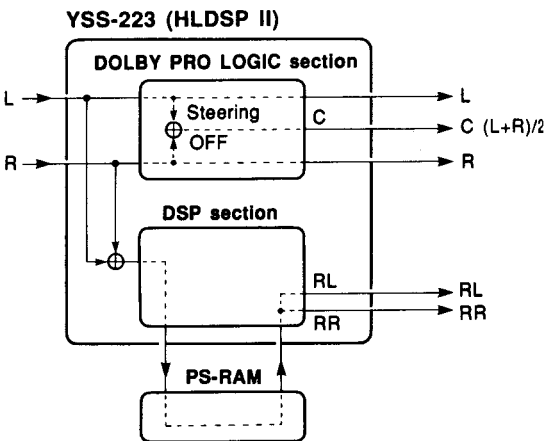
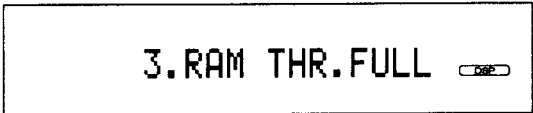


DIAG No. 3 : RAM THROUGH 3

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

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

Example of display on Main Unit



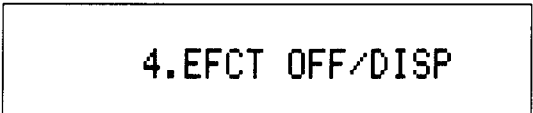
DIAG No. 4 : EFFECT OFF/DISPLAY CHECK

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

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

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

Example of display on Main Unit

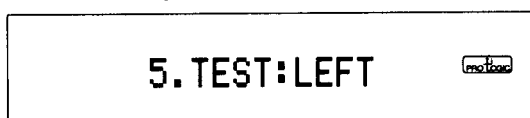


**DIAG No. 5 : MANUAL TEST**

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

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

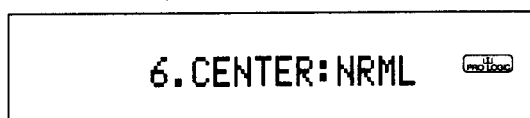
Example of display on Main Unit

**DIAG No. 6 : PRO LOGIC**

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

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

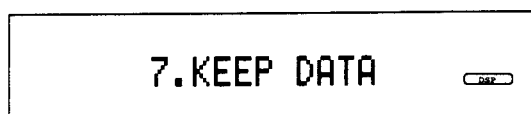
Example of display on Main Unit

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

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

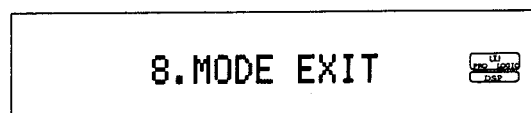
|   | Content of sub-menu | FL display     |
|---|---------------------|----------------|
| 1 | PRESET CONTENT KEPT | "7. KEEP DATA" |
| 2 | FACTORY PRESET      | "7. PRESET"    |

Example of display on Main Unit

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

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

Example of display on Main Unit



There is no sub-menu

**■ PROTECTION FUNCTION**

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

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

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

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

The function of each element is as follows.

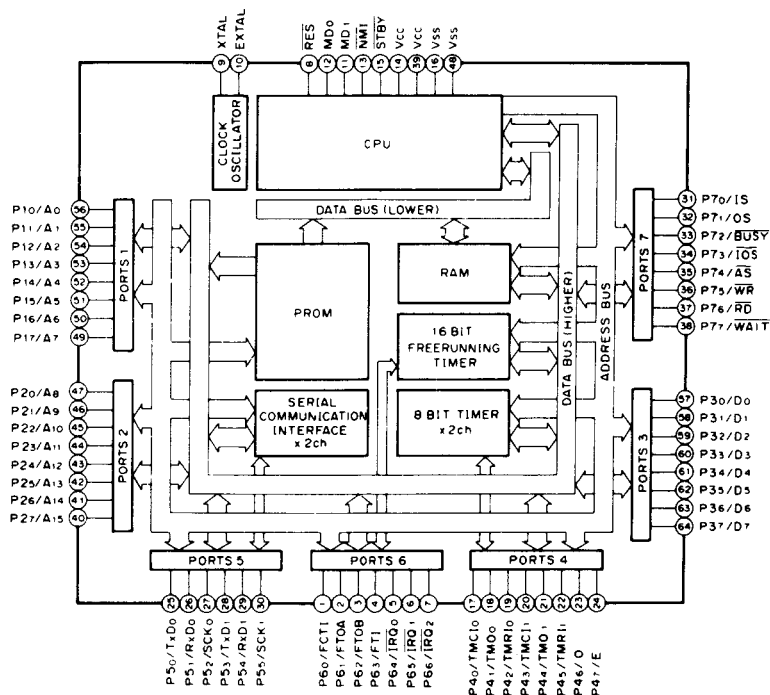
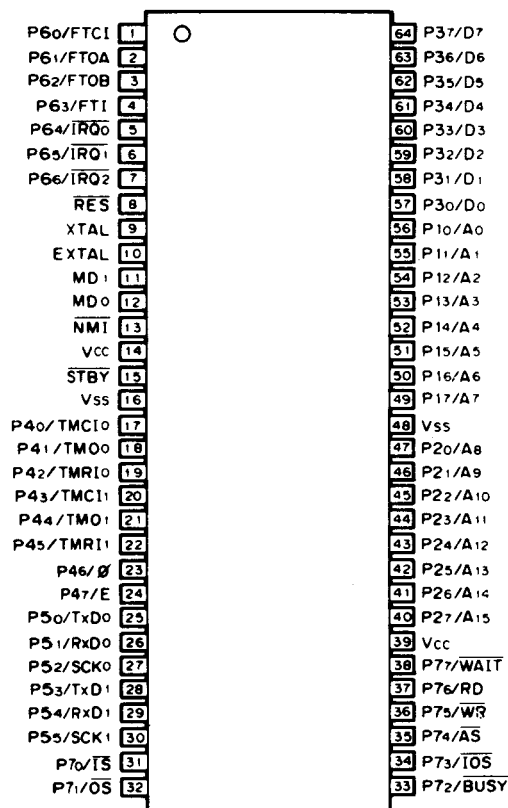
- a) IC18 :  
Detecting abnormality and sending that signal to the microcomputer (IC1)
- b) PRT (7) terminal of microcomputer (IC1):  
Input terminal of the signal from IC18
- c) PRY (41) terminal of microcomputer (IC1):  
Output terminal for the signal to the power ON/OFF relay
- d) SRY (20) terminal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

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

## ■ IC DATA

IC1 : HD6433238A47P

8 bit  $\mu$ -COM



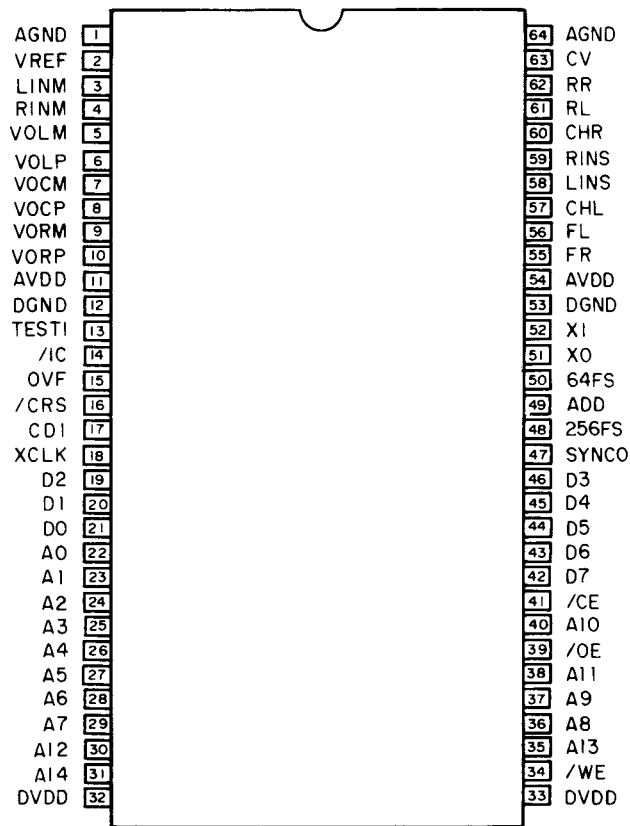
| No. | Name         | Function                       | POWER ON | POWER OFF | BACK UP |
|-----|--------------|--------------------------------|----------|-----------|---------|
| 1   | P60-INH2     | V-REC 2 inhibit (VCR 2)        | O        | OL        | →       |
| 2   | P61-INH1     | V-REC 1 inhibit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

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

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

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

IC2 : YSS223  
Digital Dolby Pro Logic Decoder with Auto Input Balance



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

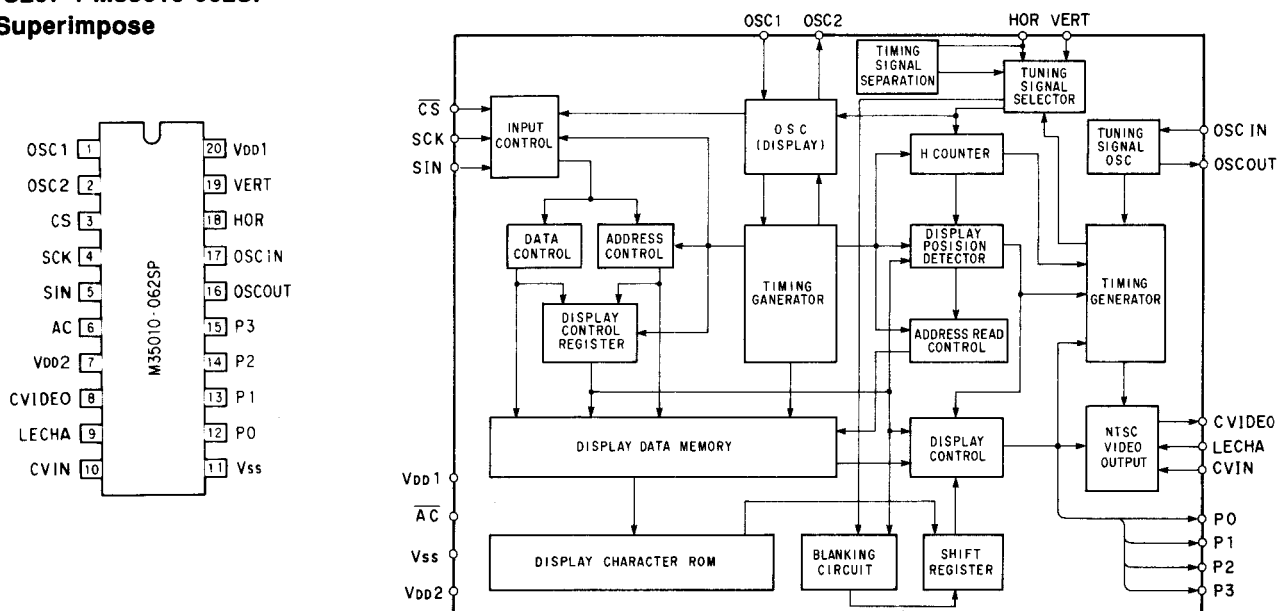


| Pin No. | Pin Name | I/O  | Function                                           |
|---------|----------|------|----------------------------------------------------|
| 22      | A0       | O    | External data RAM address terminal                 |
| 23      | A1       | O    | External data RAM address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

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

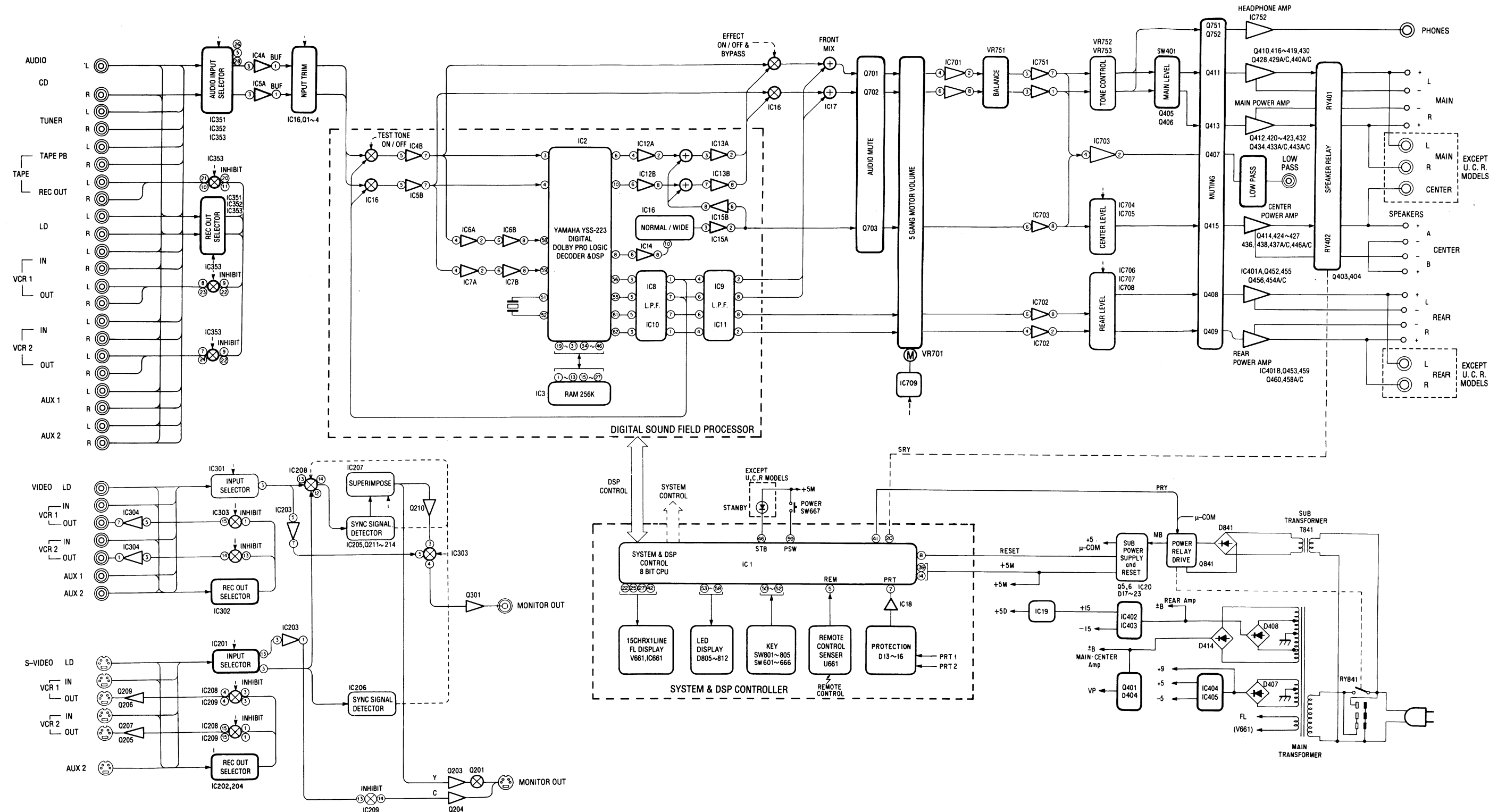
I : Input terminal    O : Output terminal    t : TTL level    C : CMOS level    S : Schmidt input    A : Analog

IC207 : M35010-062SP  
Superimpose



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

# ■ BLOCK DIAGRAM



PRINTED CIRCUIT BOARD (Foil side)

Semiconductor Location

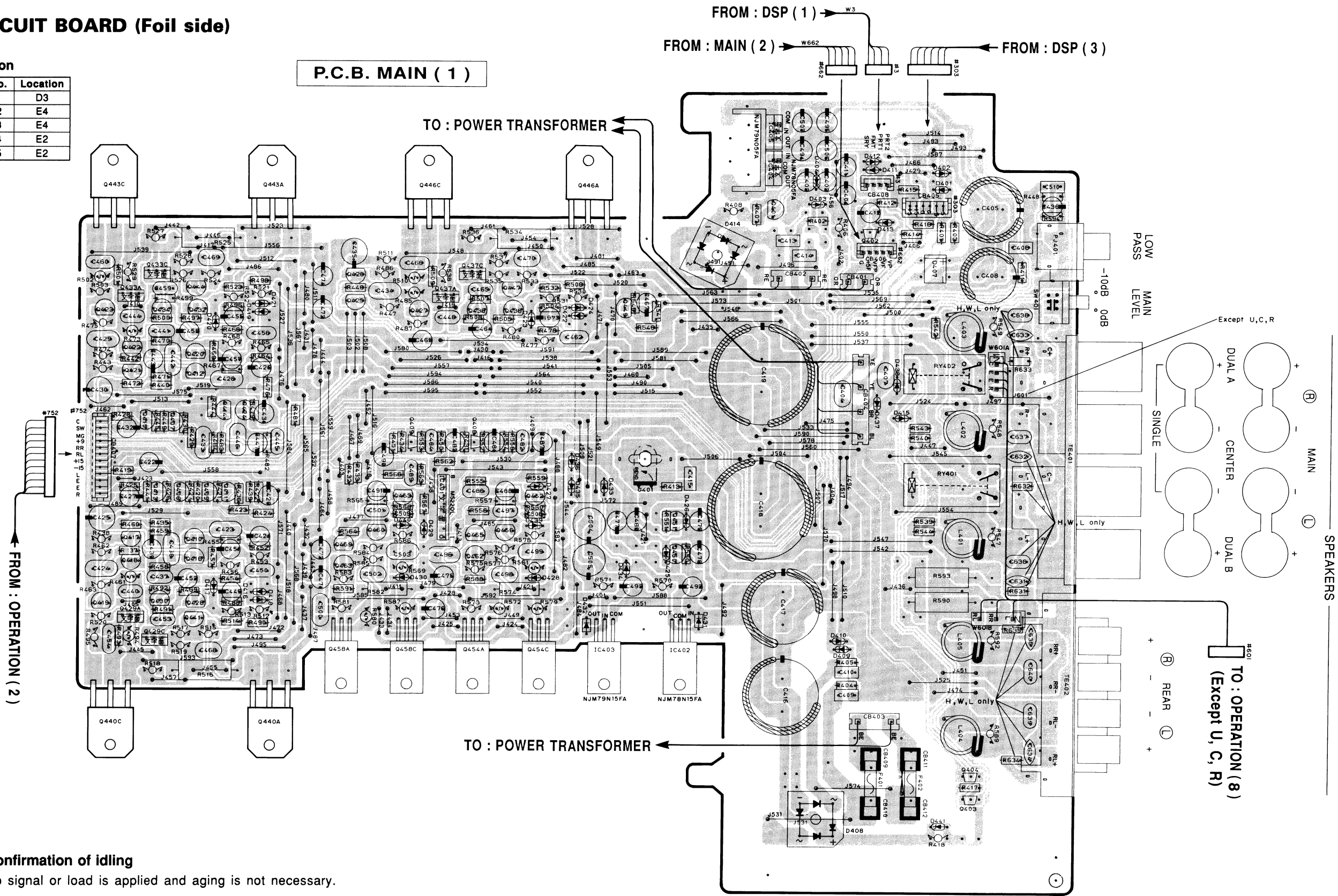
| Ref No. | Location | Ref No. | Location |
|---------|----------|---------|----------|
| Q401    | E2       | IC401   | D3       |
| Q402    | F2       | IC402   | E4       |
| Q403    | F5       | IC403   | E4       |
| Q404    | F5       | IC404   | E2       |
| Q405    | C3       | IC405   | E2 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

Confirmation of idling

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

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

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





## ■ PRINTED CIRCUIT BOARD (Foil side)

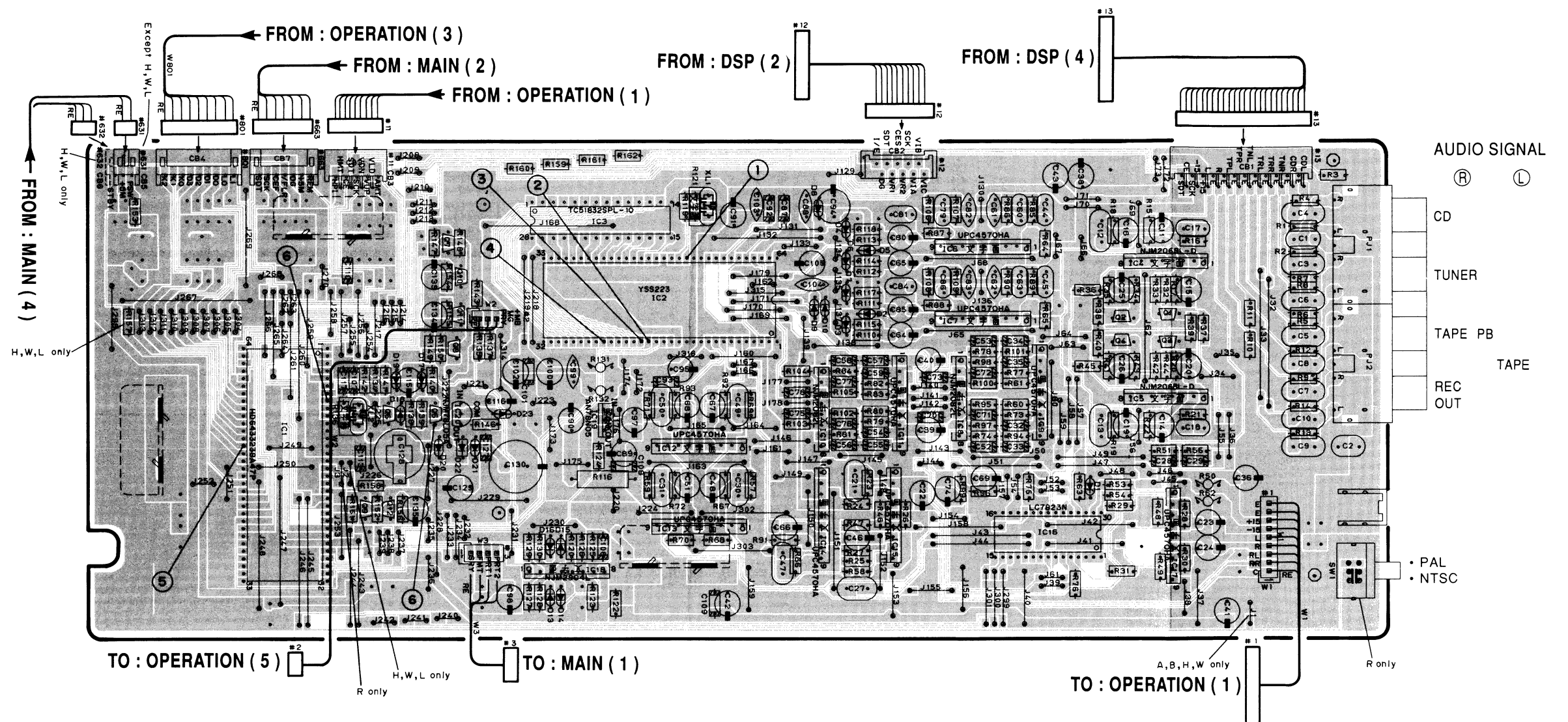
## ● Semiconductor Location

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

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

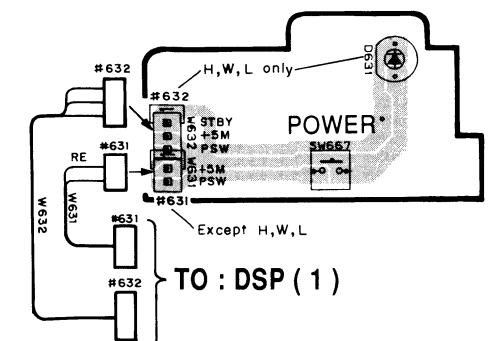
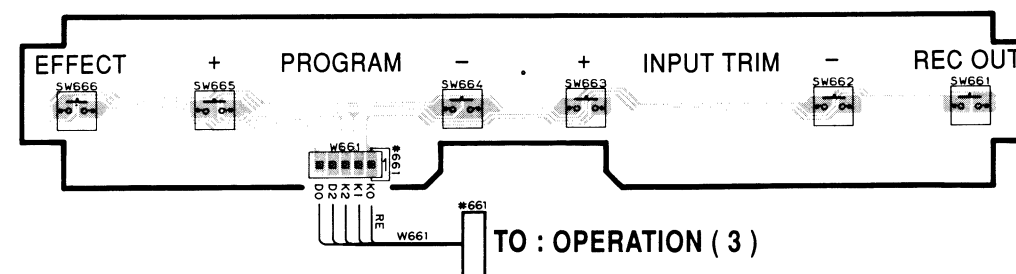
① to ⑥ : TEST POINT WAVEFORMS (See page 27)

P.C.B. DSP ( 1 )



P.C.B. MAIN ( 3 )

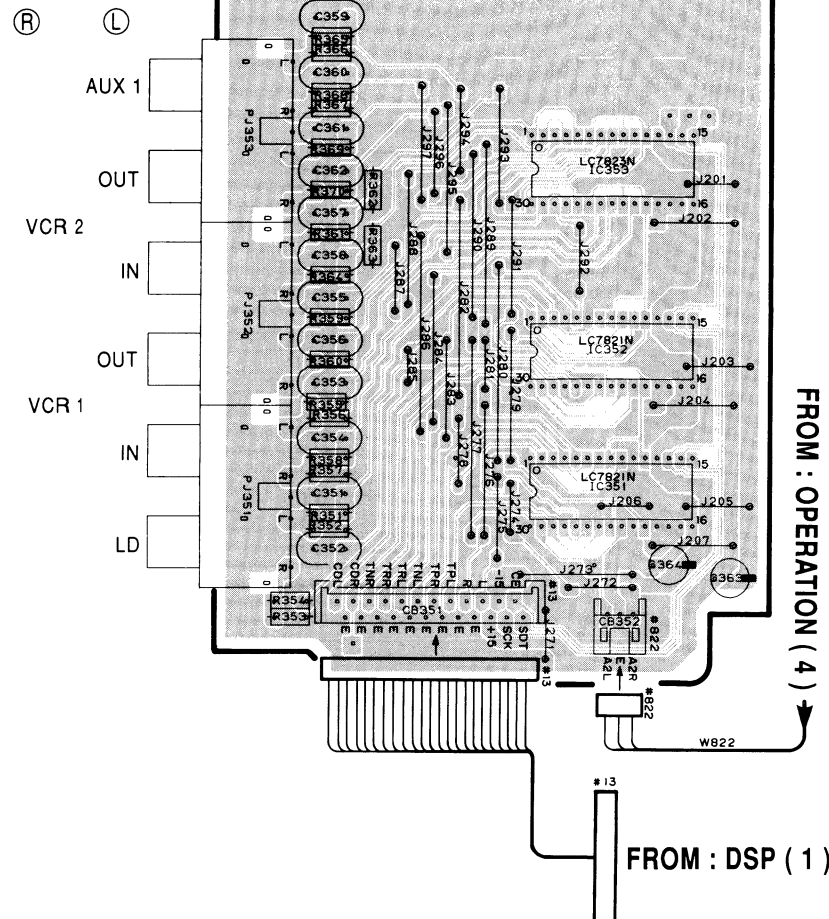
P.C.B. MAIN ( 4 )



■ PRINTED CIRCUIT BOARD (Foil side)

P.C.B. DSP ( 4 )

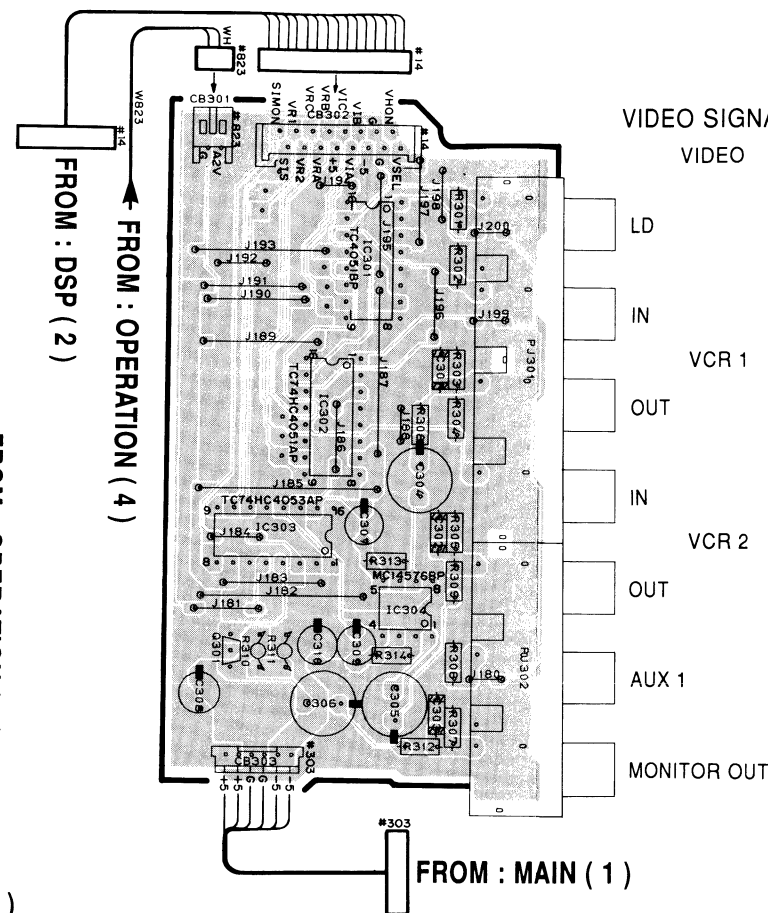
AUDIO SIGNAL



P.C.B. DSP ( 3 )

VIDEO SIGNAL

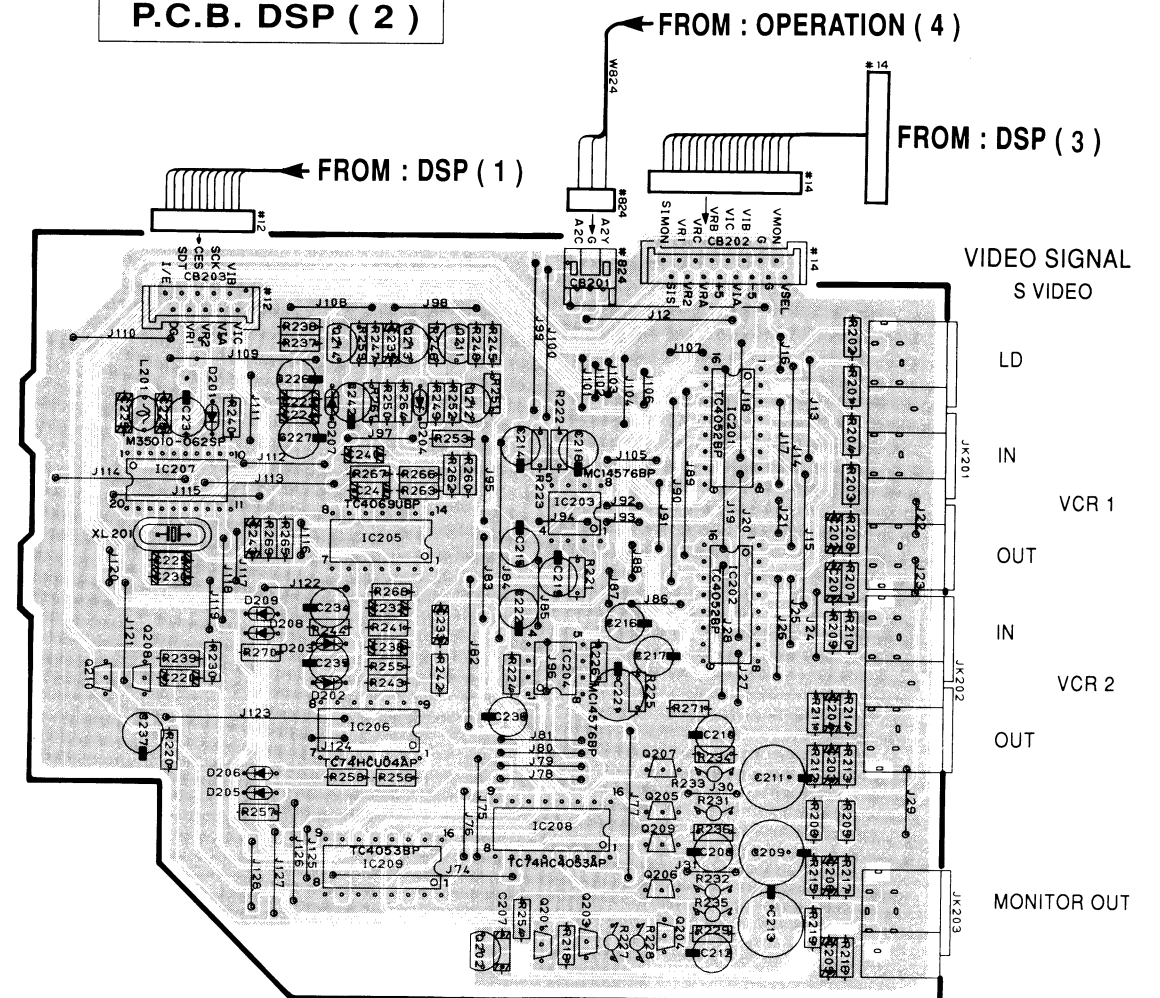
VIDEO



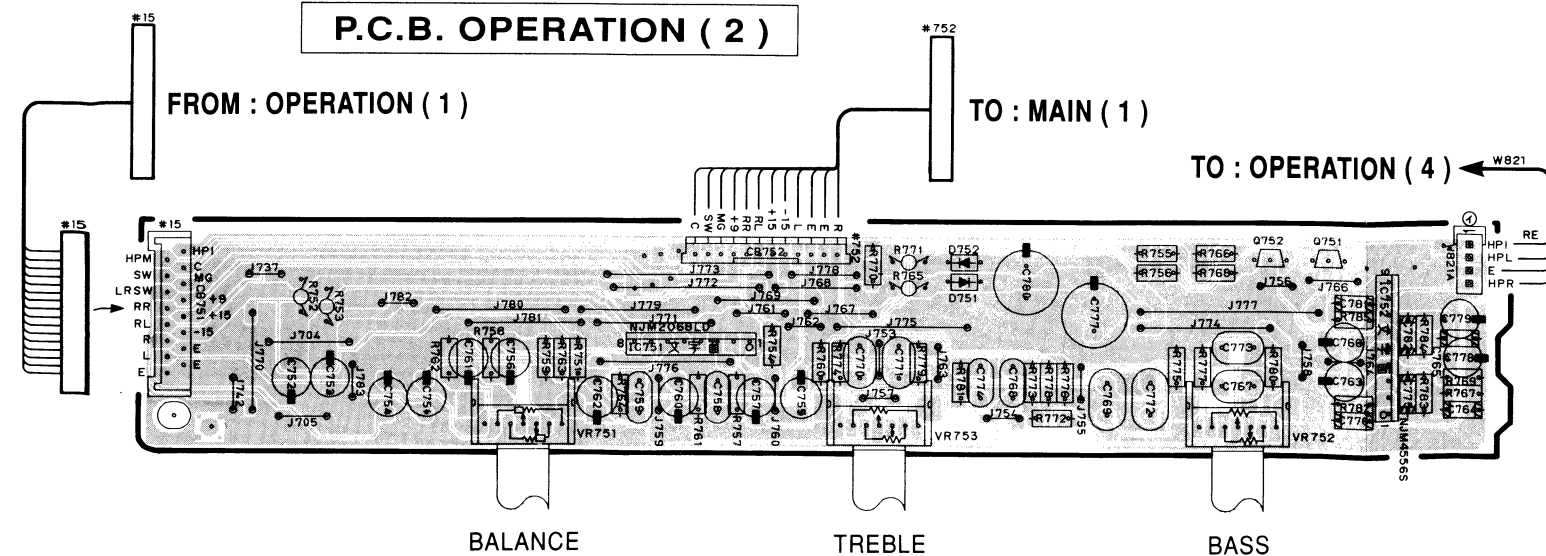
P.C.B. DSP ( 2 )

VIDEO SIGNAL

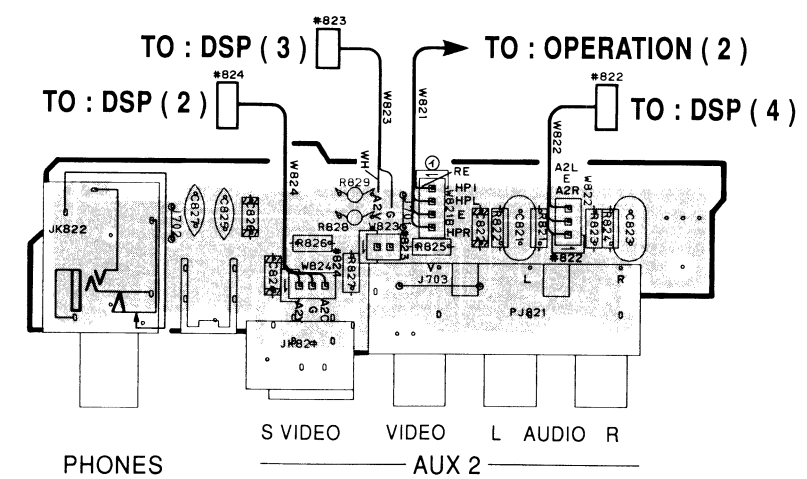
S VIDEO



P.C.B. OPERATION ( 2 )



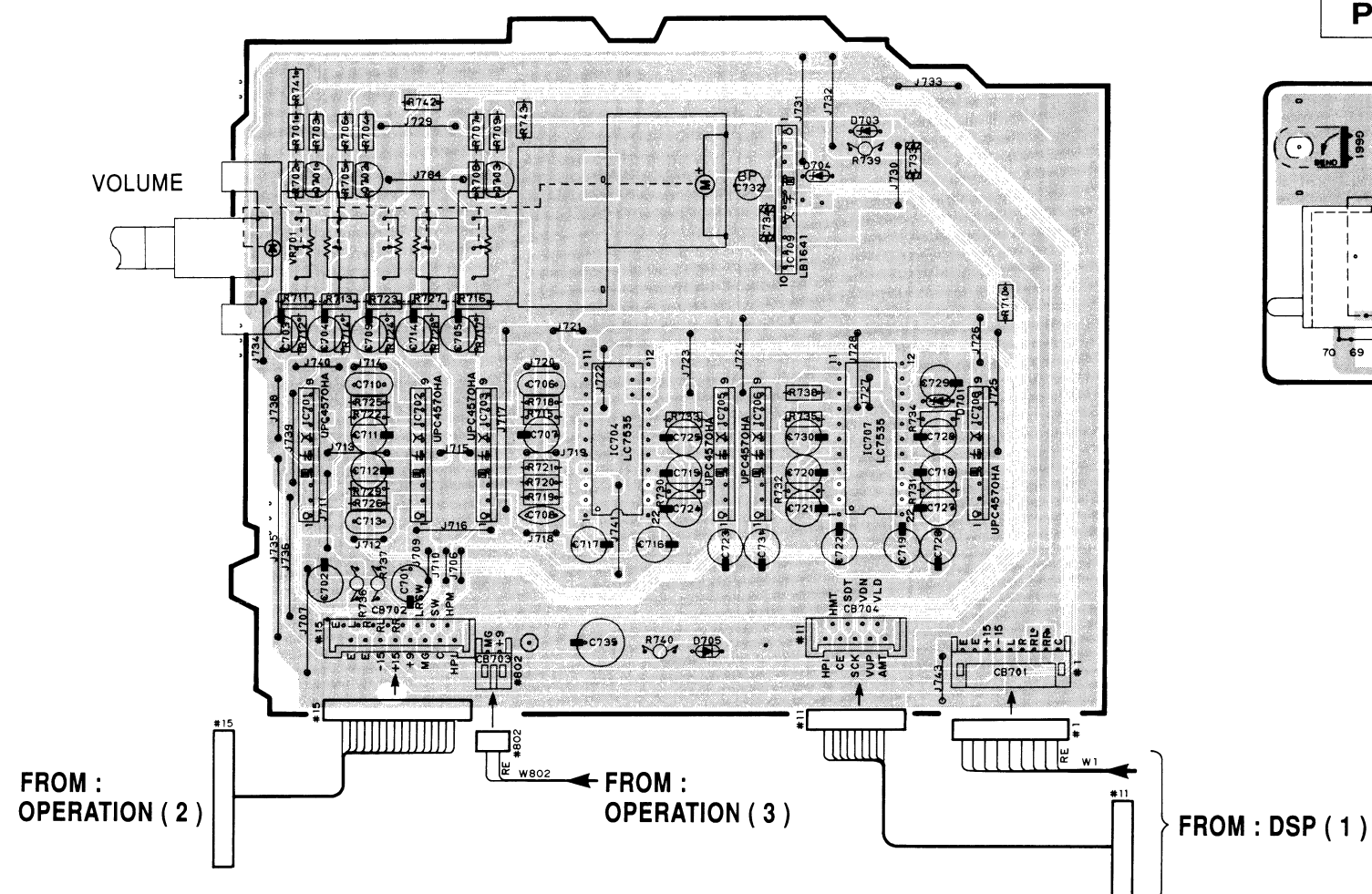
P.C.B. OPERATION ( 4 )



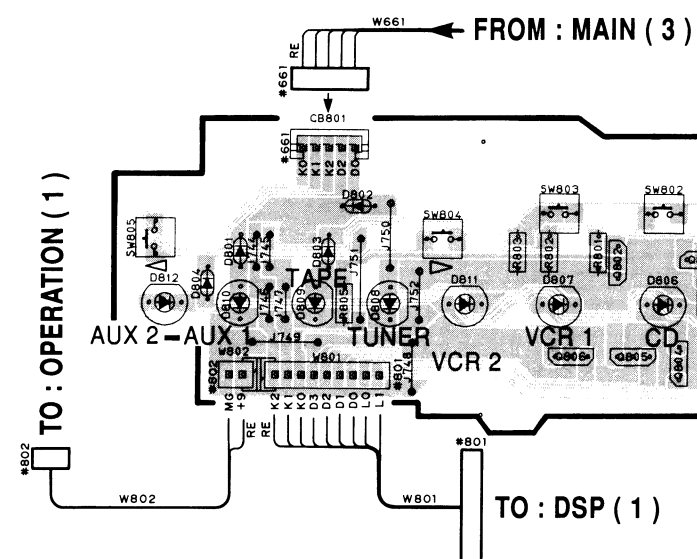


# **PRINTED CIRCUIT BOARD (Foil side)**

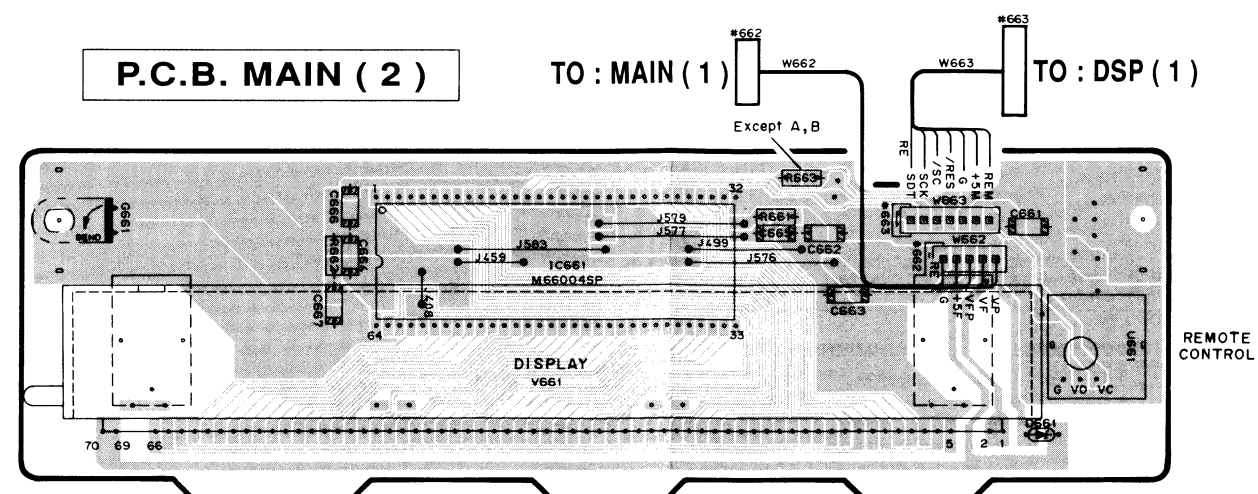
**P.C.B. OPERATION ( 1 )**



**P.C.B. OPERATION ( 3 )**

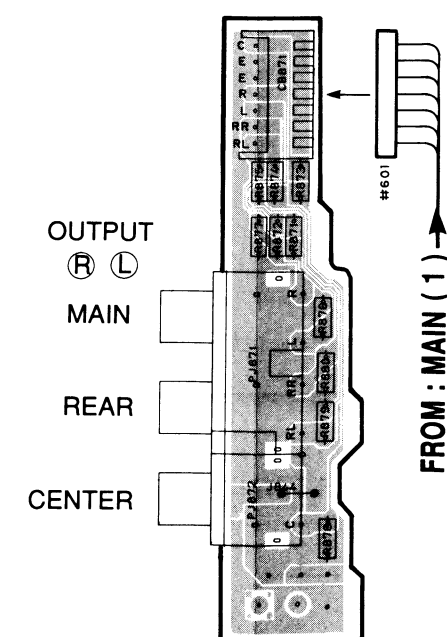


**P.C.B. MAIN ( 2 )**



● Except U, C, R

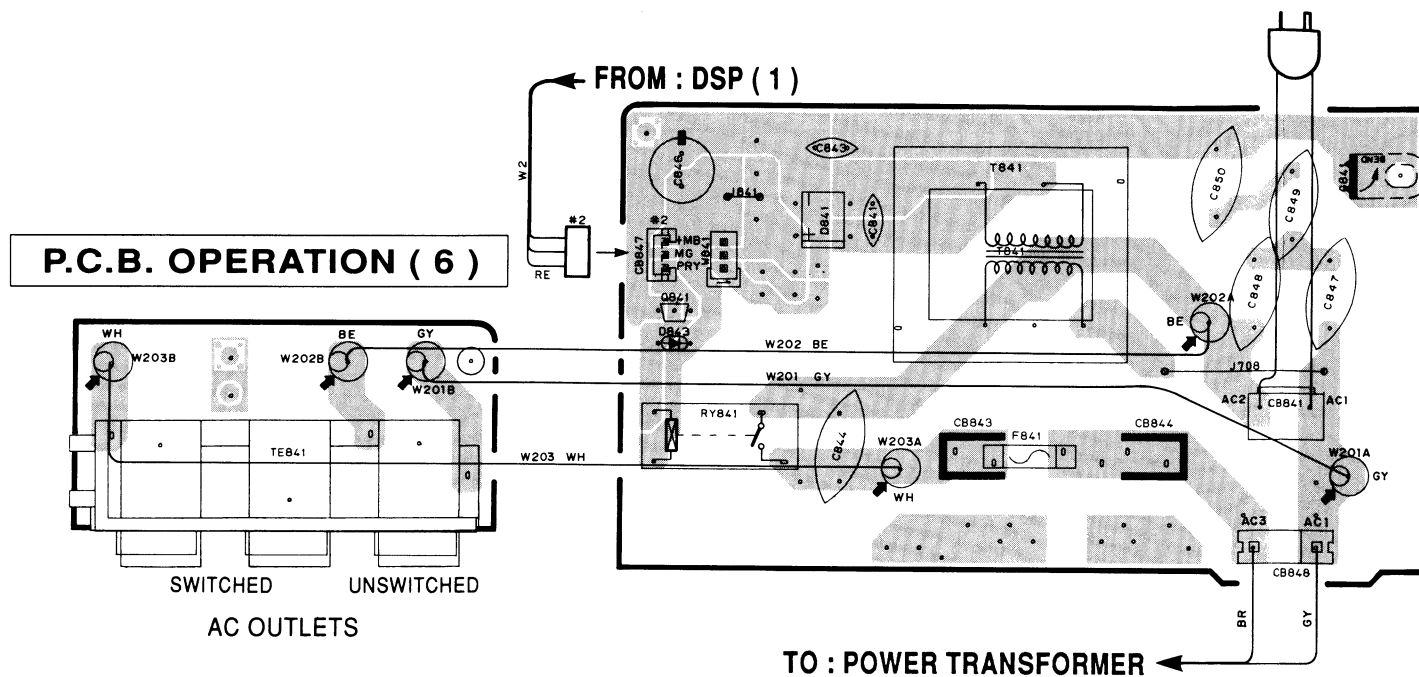
**P.C.B. OPERATION ( 8 )**



■ PRINTED CIRCUIT BOARD (Foil side)

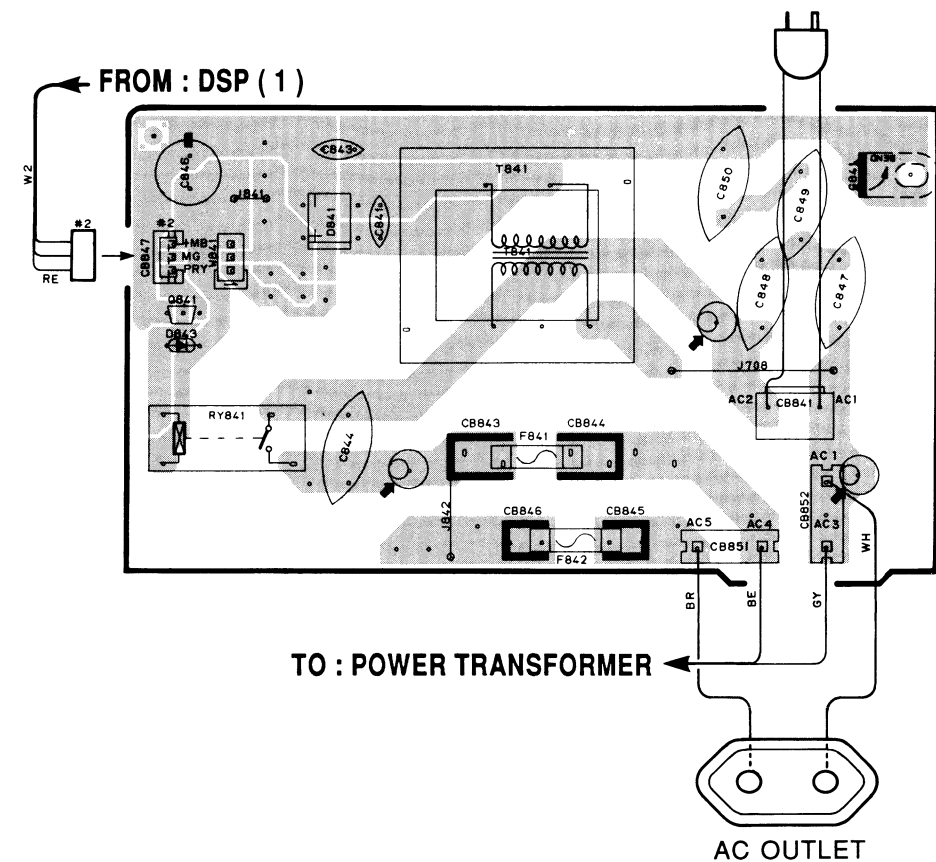
● U, C models

P.C.B. OPERATION ( 5 )



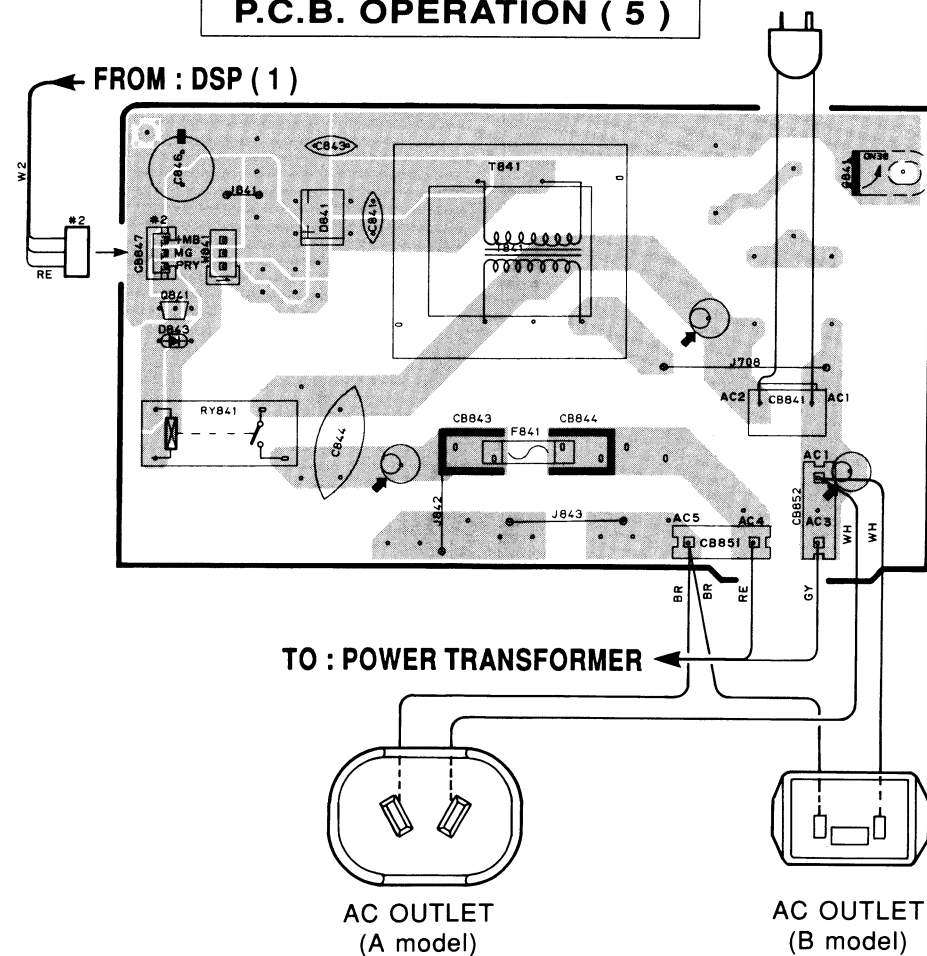
● H, W, L models

P.C.B. OPERATION ( 5 )



● A, B models

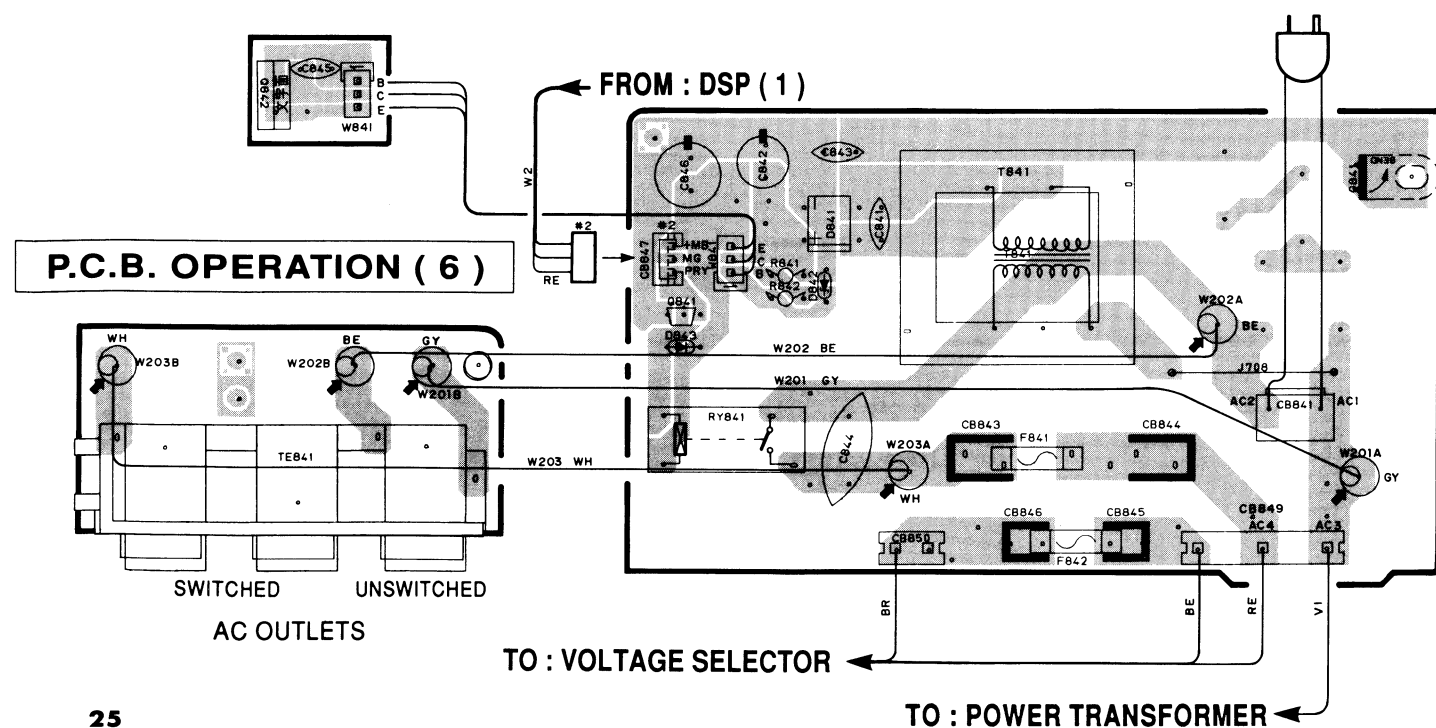
P.C.B. OPERATION ( 5 )



● R model

P.C.B. OPERATION ( 7 )

P.C.B. OPERATION ( 5 )





# ■ DISPLAY DATA (VQ905900)

● V661 : 17-BT-05GK

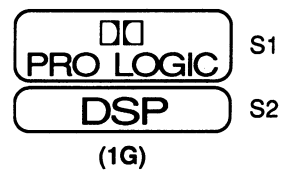
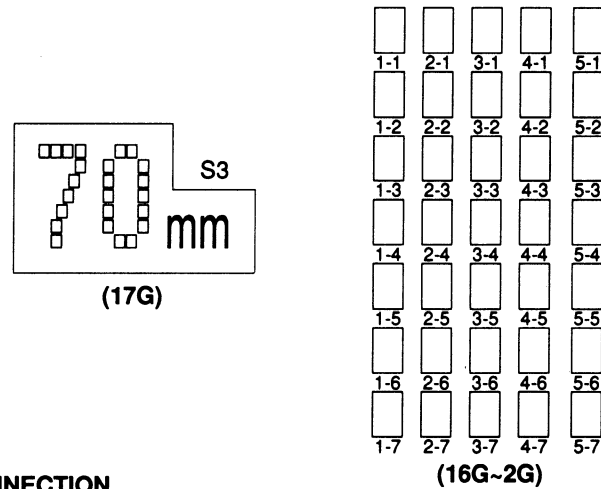
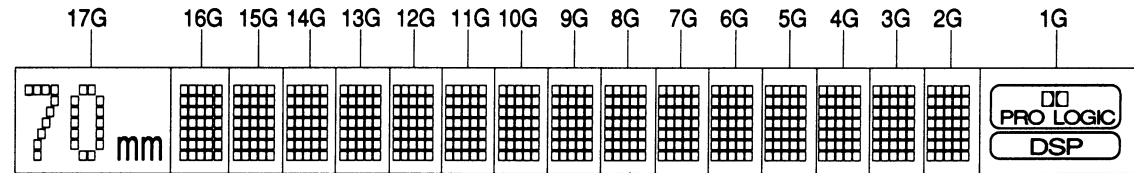


## PIN CONNECTION

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

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

## GRID ASSIGNMENT



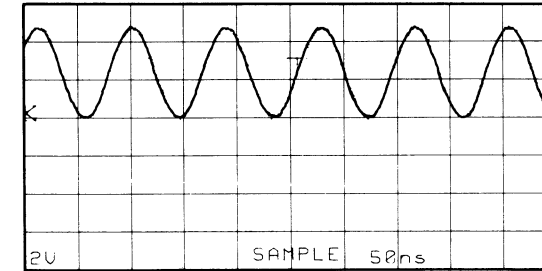
## ANODE CONNECTION

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

# ■ TEST POINT WAVEFORMS

Point ① (Pin 52 of IC2)

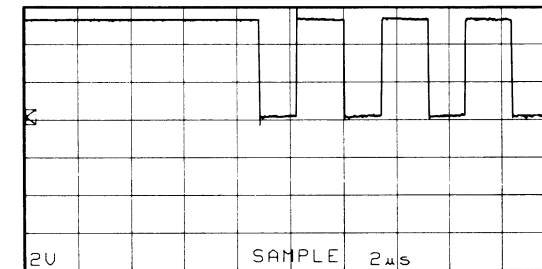
V : 2V/div H : 50nsec/div  
DC range 1 : 1 probe



Point ② (Pin 18 of IC2)

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

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



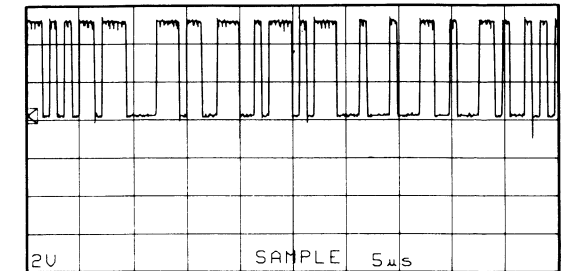
Point ③ (Pin 19 of IC2)

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



Point ④ (Pin 24 of IC2)

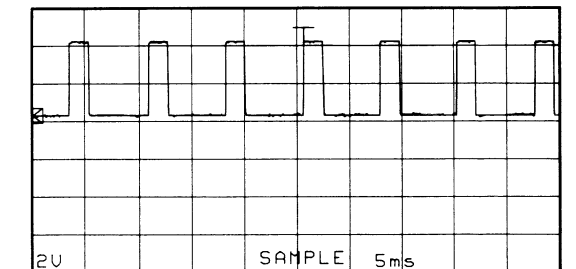
V : 2V/div H : 5μsec/div  
DC range 1 : 1 probe



Point ⑤ (Pin 51 of IC1)

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

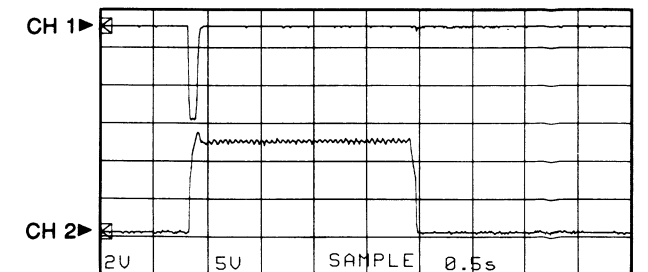
V : 2V/div H : 0.1sec/div  
DC range 1 : 1 probe



Point ⑥

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

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

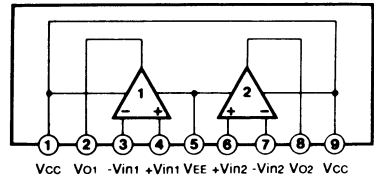


With the POWER switch turned ON, connect the power cord to the AC outlet. Disconnect the power cord from the AC outlet.

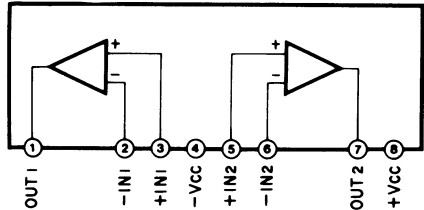
\* This waveform is not available by pushing the power switch ON and OFF.

■ IC BLOCKS (DSP & MAIN)

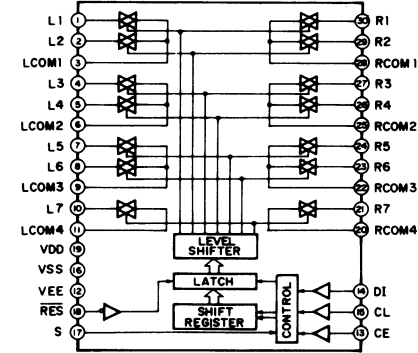
IC6, 7, 9, 11~15, 17 :  $\mu$ PC4570HA  
Dual OP-Amp



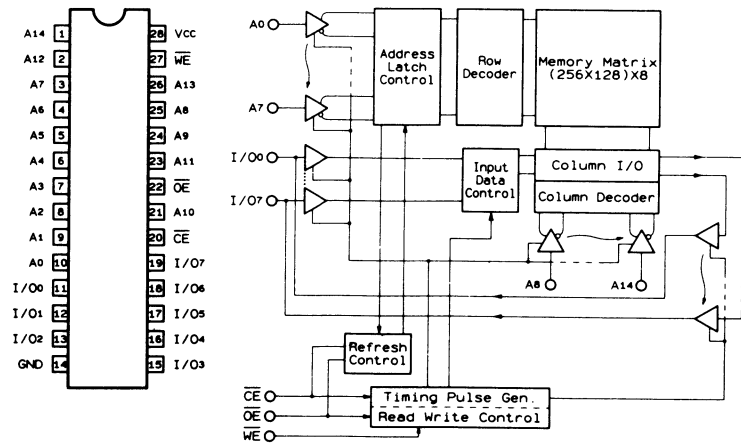
IC18 : NJM2904L  
IC4, 5 : NJM2068L-D  
IC8, 10 : NJM2082L  
IC401 : M5220L  
Dual OP-Amp



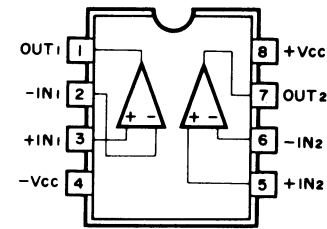
IC16, 353 : LC7823N  
Analog Function Switch



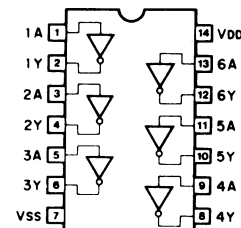
IC3 : TC51832SPL-10  
32768-word x 8 bit High Speed Pseudo Static RAM



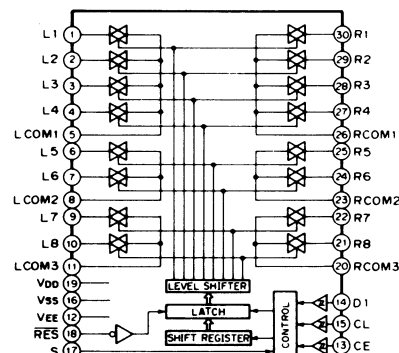
IC203, 204, 304 : MC14576BP  
Dual Video Amp



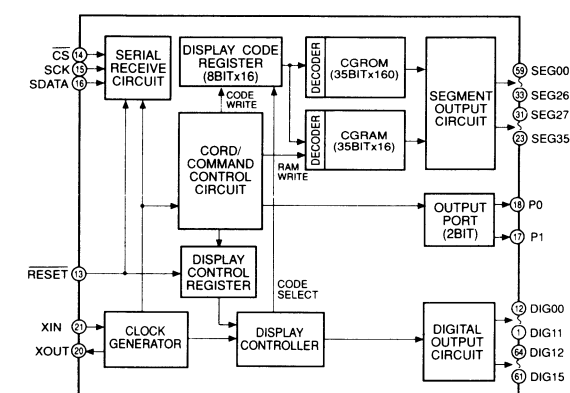
IC205 : TC4069UBP  
IC206 : TC74HCU04AP  
Hex Inverters



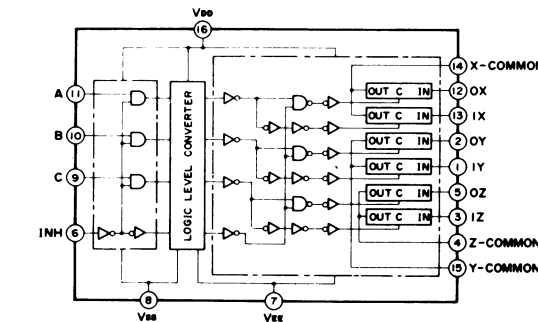
IC351, 352 : LC7821N  
Analog Function Switch



IC661 : M66004SP  
16 Digit 5 x 7 Segment VFD Controller



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

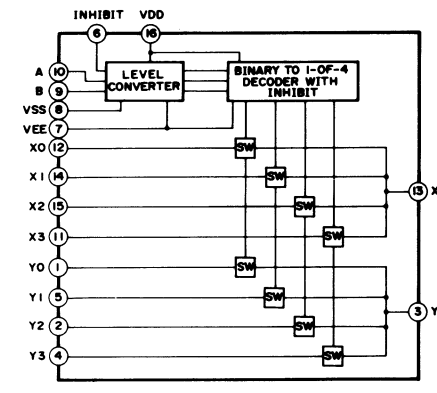


| CONTROL INPUTS    |              |               |               | "ON" CHANNEL                        |                                     |
|-------------------|--------------|---------------|---------------|-------------------------------------|-------------------------------------|
| INHBIT<br>(Pin 6) | C<br>(Pin 9) | B<br>(Pin 10) | A<br>(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                          | 1X, OY, OZ                          |
| L                 | L            | L             | H             | OX, OY, OZ                          | OX, 1Y, OZ                          |
| L                 | L            | H             | L             | OX, OY, OZ                          | 1X, 1Y, OZ                          |
| L                 | L            | H             | H             | OX, OY, OZ                          | 1X, OY, 1Z                          |
| L                 | H            | L             | L             | OX, OY, 1Z                          | OX, OY, 1Z                          |
| L                 | H            | L             | H             | OX, OY, 1Z                          | 1X, OY, 1Z                          |
| L                 | H            | H             | L             | OX, OY, 1Z                          | OX, 1Y, 1Z                          |
| L                 | H            | H             | H             | OX, OY, 1Z                          | 1X, 1Y, 1Z                          |
| H                 | *            | *             | *             | NONE                                | NONE                                |

Other IC's

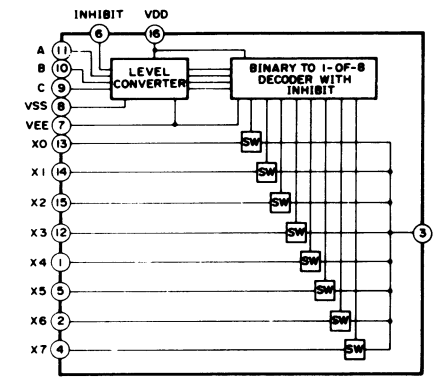
- IC1 : HD6433238A47P→See page 9
- IC2 : YSS223→See page 11
- IC207 : M35010-062SP→See page 13

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



| INHBIT | B | A | OX, OY |
|--------|---|---|--------|
| O      | O | O | OX, OY |
| O      | O | 1 | 1X, 1Y |
| O      | 1 | O | 2X, 2Y |
| O      | 1 | 1 | 3X, 3Y |
| 1      | X | X | NONE   |

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



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

1

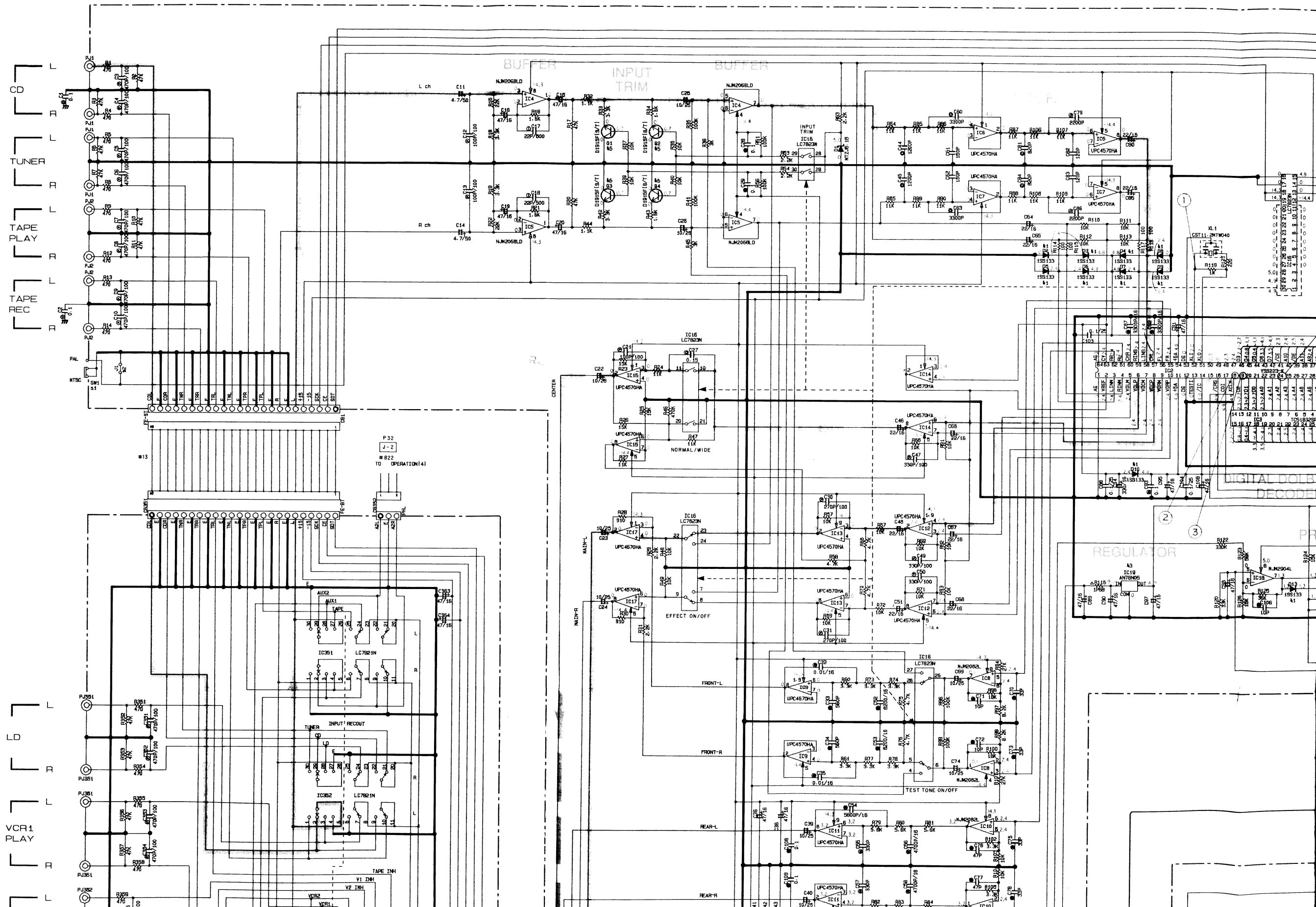
2

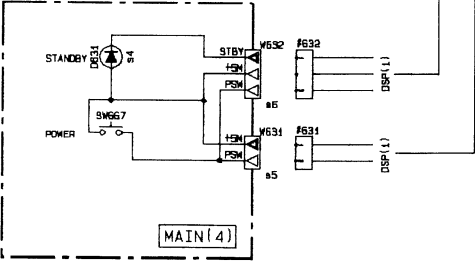
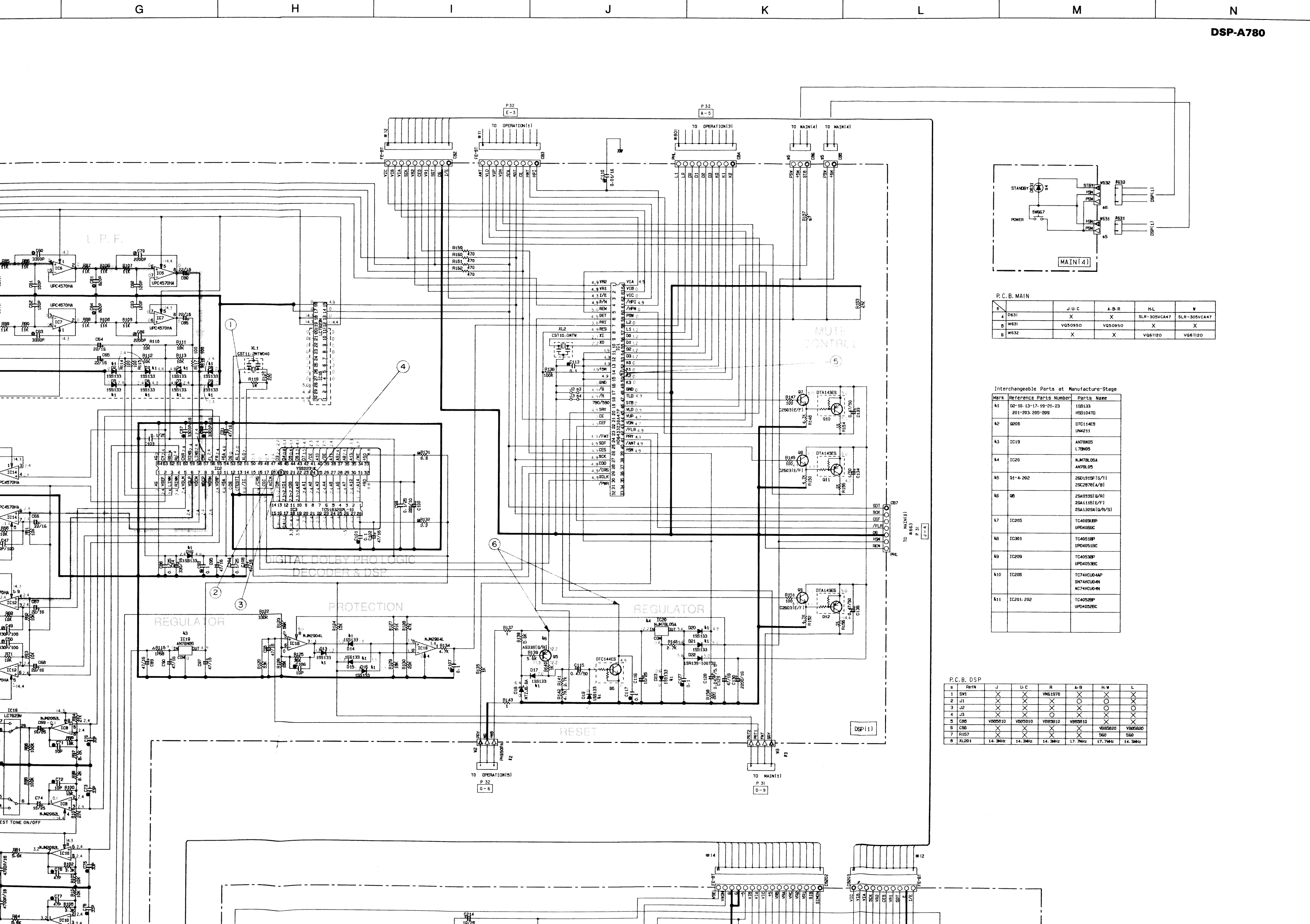
3

4

5

6





P.C.B. MAIN

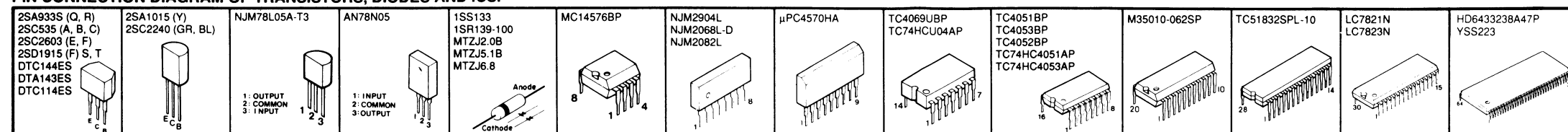
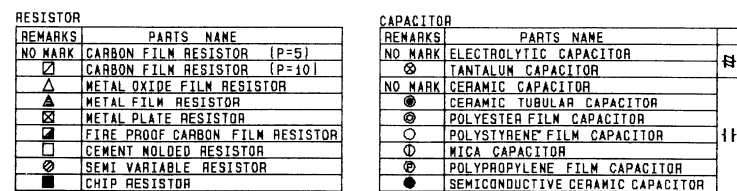
| B |      | J-U-C   | A-B-R   | H-L          | V            |
|---|------|---------|---------|--------------|--------------|
| 4 | D631 | X       | X       | SLR-305VCA47 | SLR-305VCA47 |
| 5 | W631 | VQ50950 | VQ50950 | X            | X            |
| 6 | W632 | X       | X       | VQ61120      | VQ61120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

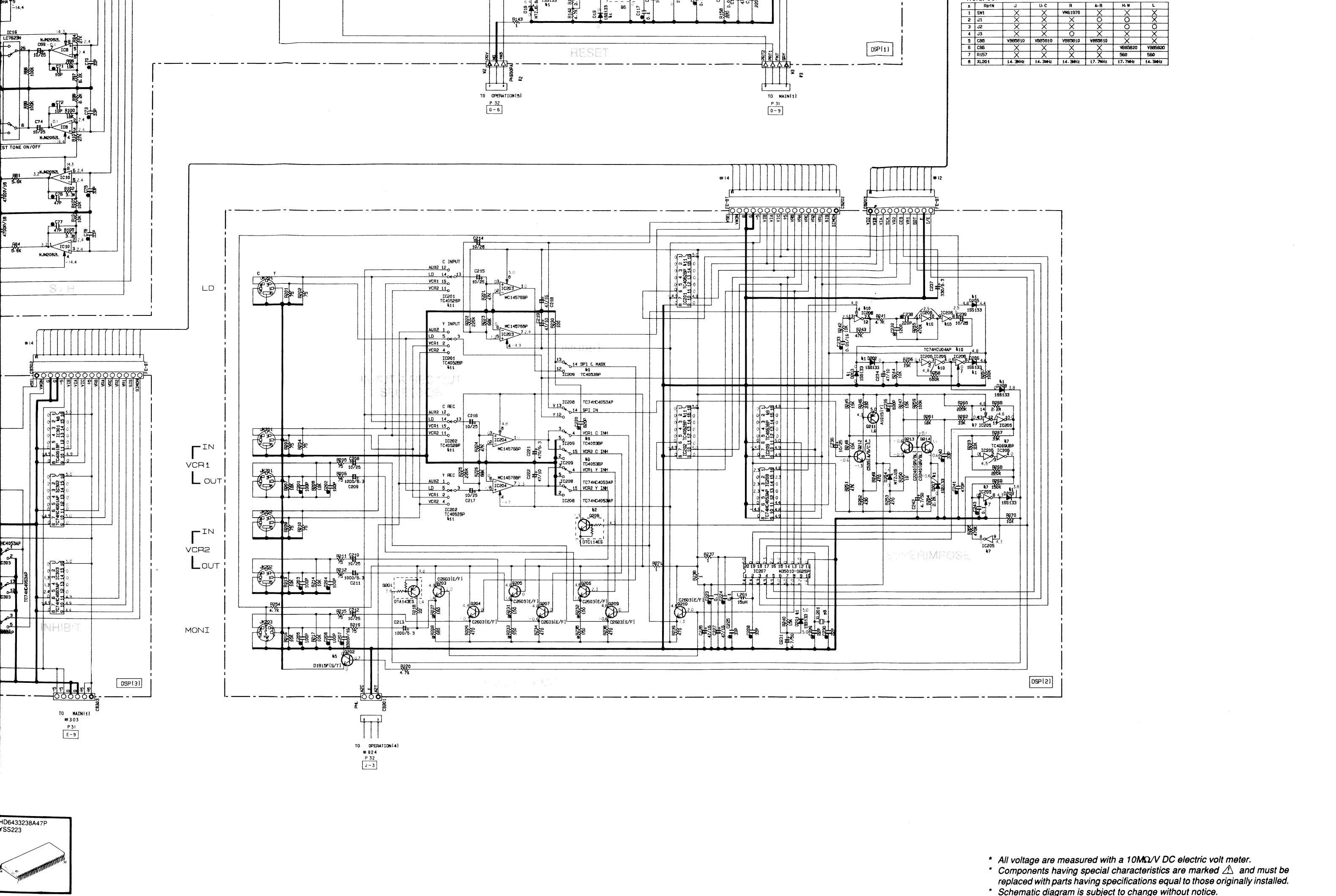
Interchangeable Parts at Manufacture-Stage

| Mark | Reference Parts Number                     | Parts Name                                      |
|------|--------------------------------------------|-------------------------------------------------|
| A1   | 02-10, 13-17, 19-21-23<br>201-203, 205-209 | ISS133<br>HSS104TD                              |
| A2   | 0208                                       | DTC144ES<br>UN4211                              |
| A3   | IC19                                       | AN78M05<br>L78M05                               |
| A4   | IC20                                       | NM78L05A<br>AN78L05                             |
| A5   | 01-A-202                                   | 26D1915F16/T1<br>2SC28761A/B1                   |
| A6   | 00                                         | 2SA933S1Q/R1<br>2SA11151E/F1<br>2SA1309A1Q/R/S1 |
| A7   | IC205                                      | TC4059BP<br>UPD4059C                            |
| A8   | IC301                                      | TC4051BP<br>UPD4051BC                           |
| A9   | IC209                                      | TC4053BP<br>UPD4053BC                           |
| A10  | IC206                                      | TC74HC04-4AP<br>SN74HC04-4N<br>NC74HC04-4N      |
| A11  | IC201, 202                                 | TC4052BP<br>UPD4052BC                           |

P.C.B. DSP

|   | J     | U-C     | R       | A-B     | H-W     | L       |
|---|-------|---------|---------|---------|---------|---------|
| 1 | SW1   | X       | X       | VMS1970 | X       | X       |
| 2 | J1    | X       | X       | X       | X       | X       |
| 3 | J2    | X       | X       | X       | X       | X       |
| 4 | J3    | X       | X       | X       | X       | X       |
| 5 | C85   | VMS0010 | VMS0010 | VMS0010 | X       | X       |
| 6 | C86   | VMS0010 | VMS0010 | VMS0010 | X       | X       |
| 7 | R157  | X       | X       | X       | 560     | 560     |
| 8 | XL201 | 14.3MHz | 14.3MHz | 14.3MHz | 17.7MHz | 14.3MHz |

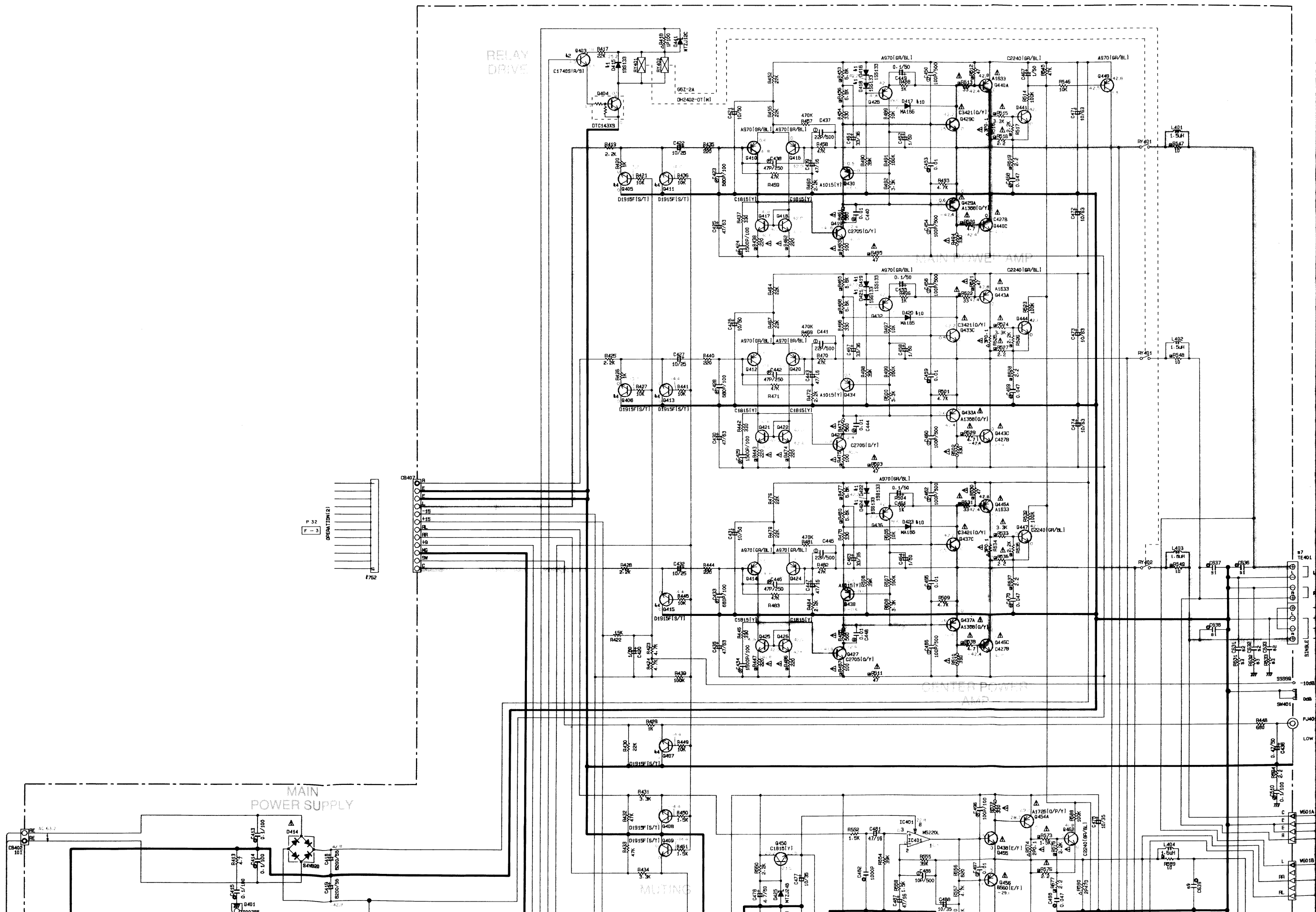




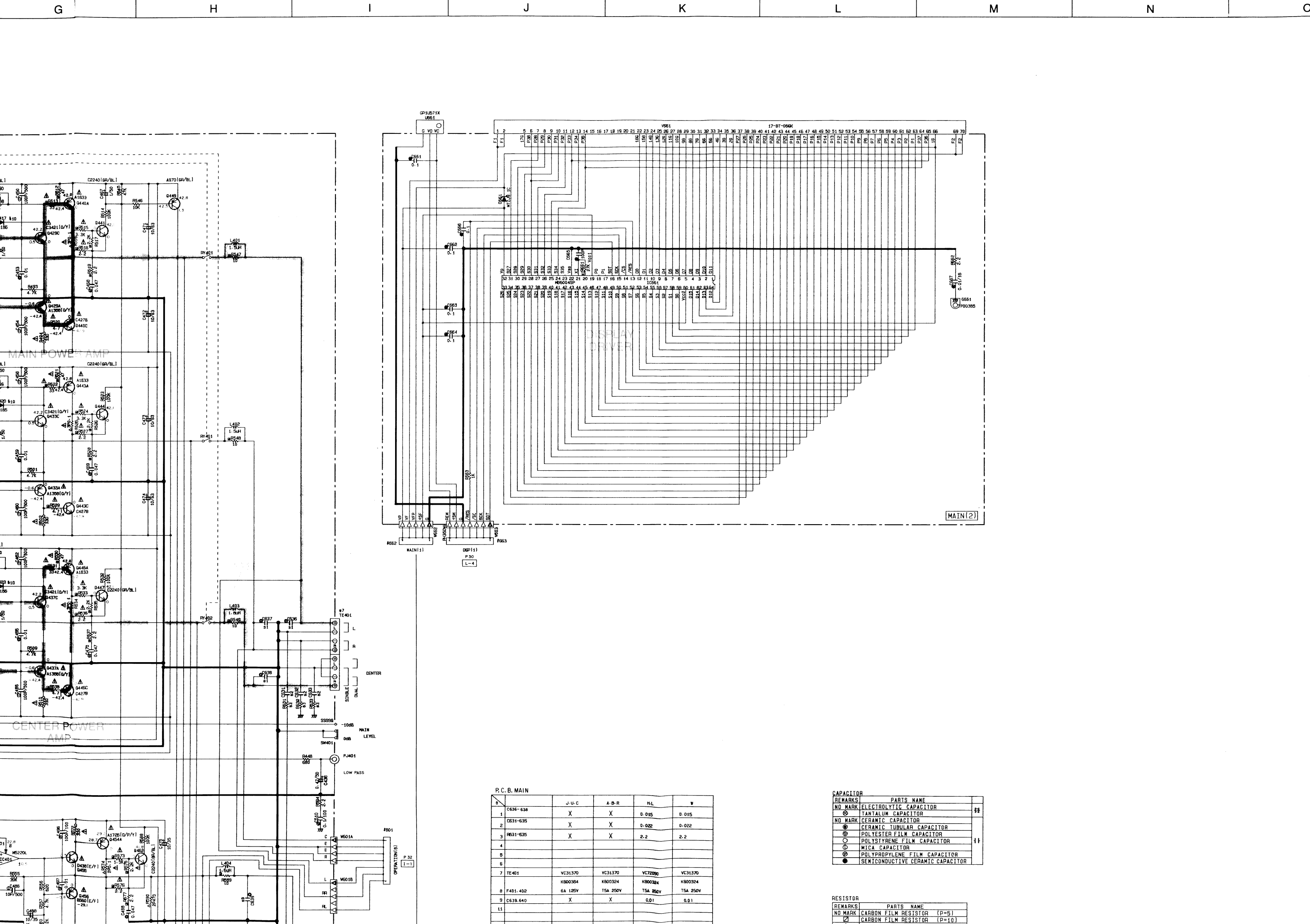
\* All voltage are measured with a 10MΩ/V DC electric volt meter.  
 \* Components having special characteristics are marked Δ and must be replaced with parts having specifications equal to those originally installed.  
 \* Schematic diagram is subject to change without notice.



■ SCHEMATIC DIAGRAM (MAIN)





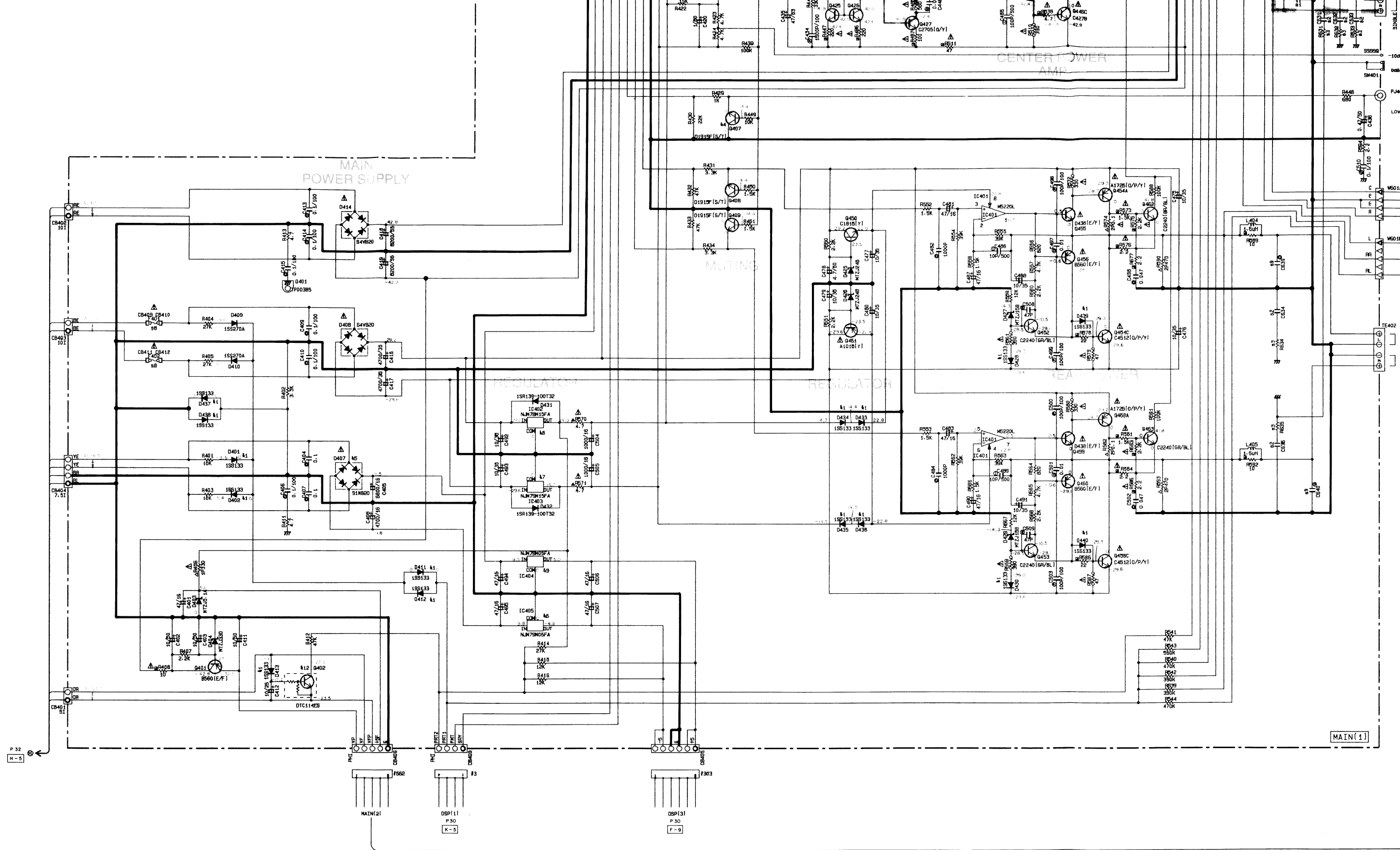


| P.C.B. MAIN |          |         |          |          |
|-------------|----------|---------|----------|----------|
|             | J.U.C.   | A.B.R.  | H.L.     | W        |
| 1           | X        | X       | 0.015    | 0.015    |
| 2           | X        | X       | 0.022    | 0.022    |
| 3           | X        | X       | 2.2      | 2.2      |
| 4           |          |         |          |          |
| 5           |          |         |          |          |
| 6           |          |         |          |          |
| 7           | VC31370  | VC31370 | VC72090  | VC31370  |
| 8           | F401.402 | 6A 125V | T5A 250V | T5A 250V |
| 9           | C639.640 | X       | X        | 0.01     |
| 11          |          |         |          |          |

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

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

5  
6  
7  
8  
9  
10



PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICS.

|                                                             |                                                                                                                       |                                        |                                        |                                  |                          |                          |                                                                                                         |        |        |        |          |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------|----------------------------------|--------------------------|--------------------------|---------------------------------------------------------------------------------------------------------|--------|--------|--------|----------|
| 2SC1740S (R, S)<br>2SD1915 (F) S, T<br>DTC143XS<br>DTC114ES | 2SA970 (GR, BL)<br>2SA1015 (Y)<br>2SB560 (E, F)<br>2SC1815 (Y)<br>2SC2240 (GR, BL)<br>2SC2705 (O, Y)<br>2SD438 (E, F) | 2SA1726 (O, P, Y)<br>2SC4512 (O, P, Y) | 2SA1633 (D, E, F)<br>2SC4278 (D, E, F) | 2SA1358 (O, Y)<br>2SC3421 (O, Y) | NJM79M05FA<br>NJM79M15FA | NJM78M15FA<br>NJM78M05FA | 1SS133<br>MA185<br>1SR139-100<br>1SS270A<br>MTZJ5.1A<br>MTZJ9.1C<br>MTZJ15.0B<br>MTZJ24.0B<br>MTZJ33.0D | S4VB20 | S1NB20 | M5220L | M66004SP |
|                                                             |                                                                                                                       |                                        |                                        |                                  |                          |                          |                                                                                                         |        |        |        |          |

CAPACITORRESISTORNOTICE

NOTICE

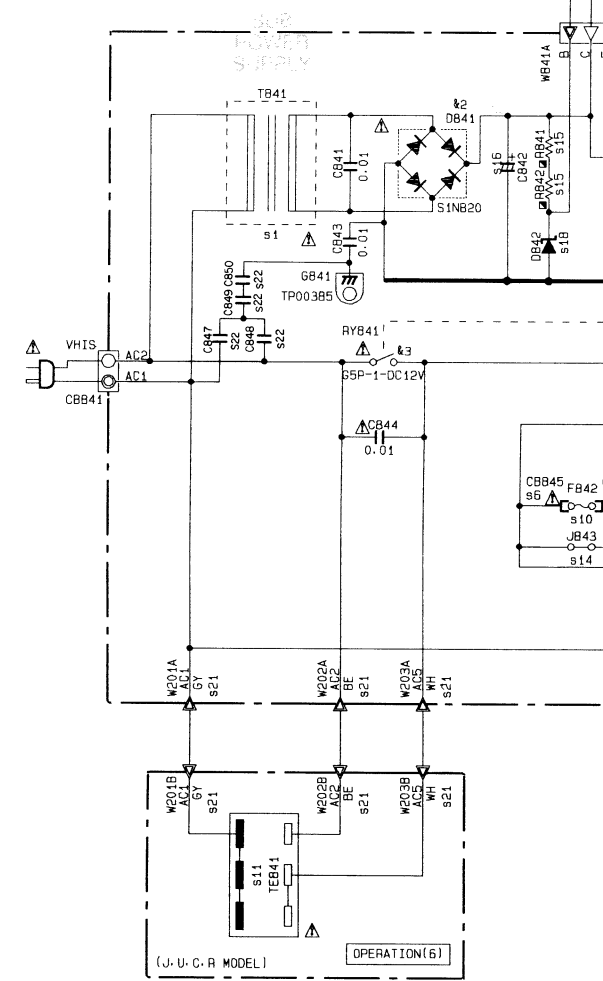
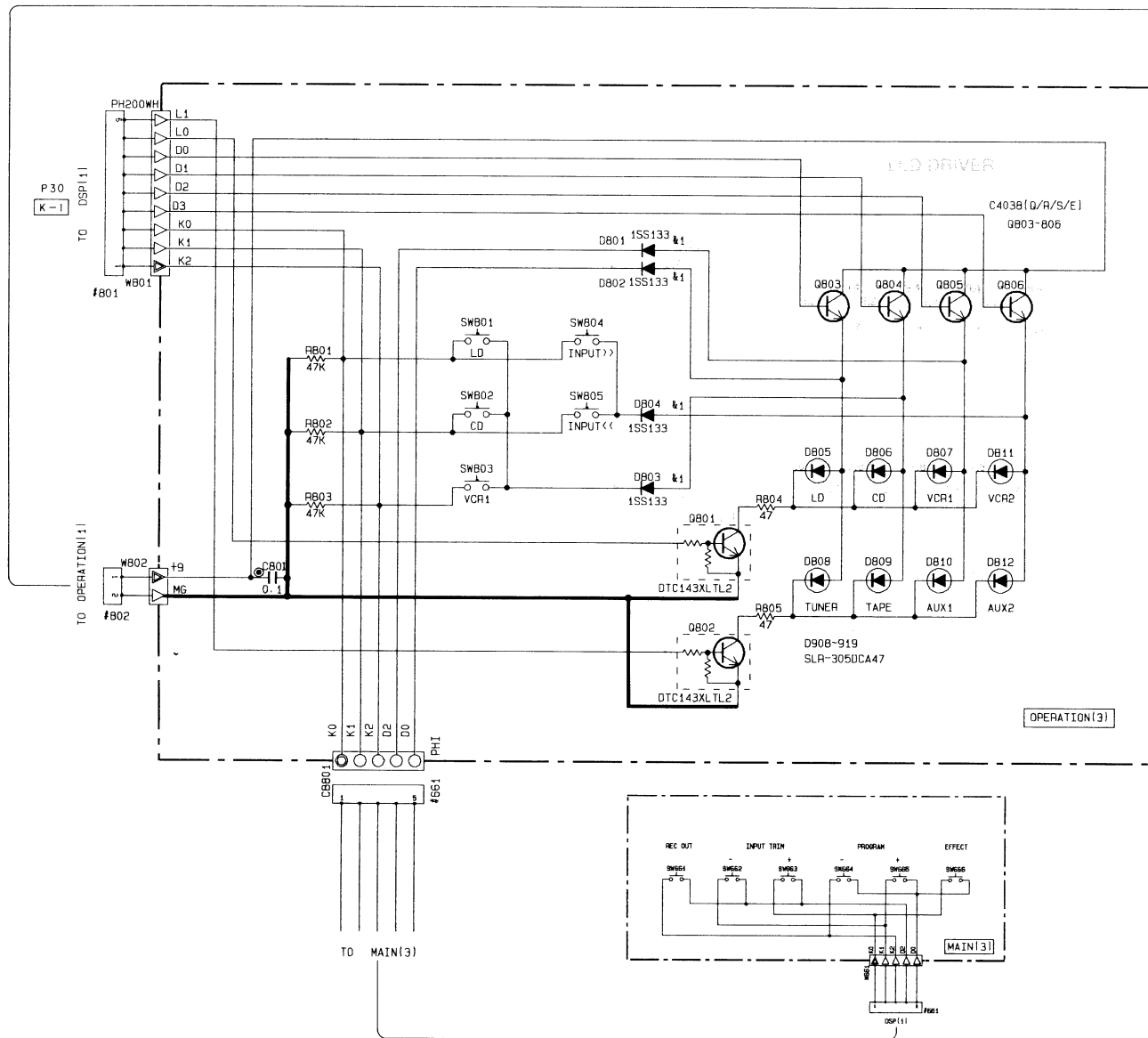
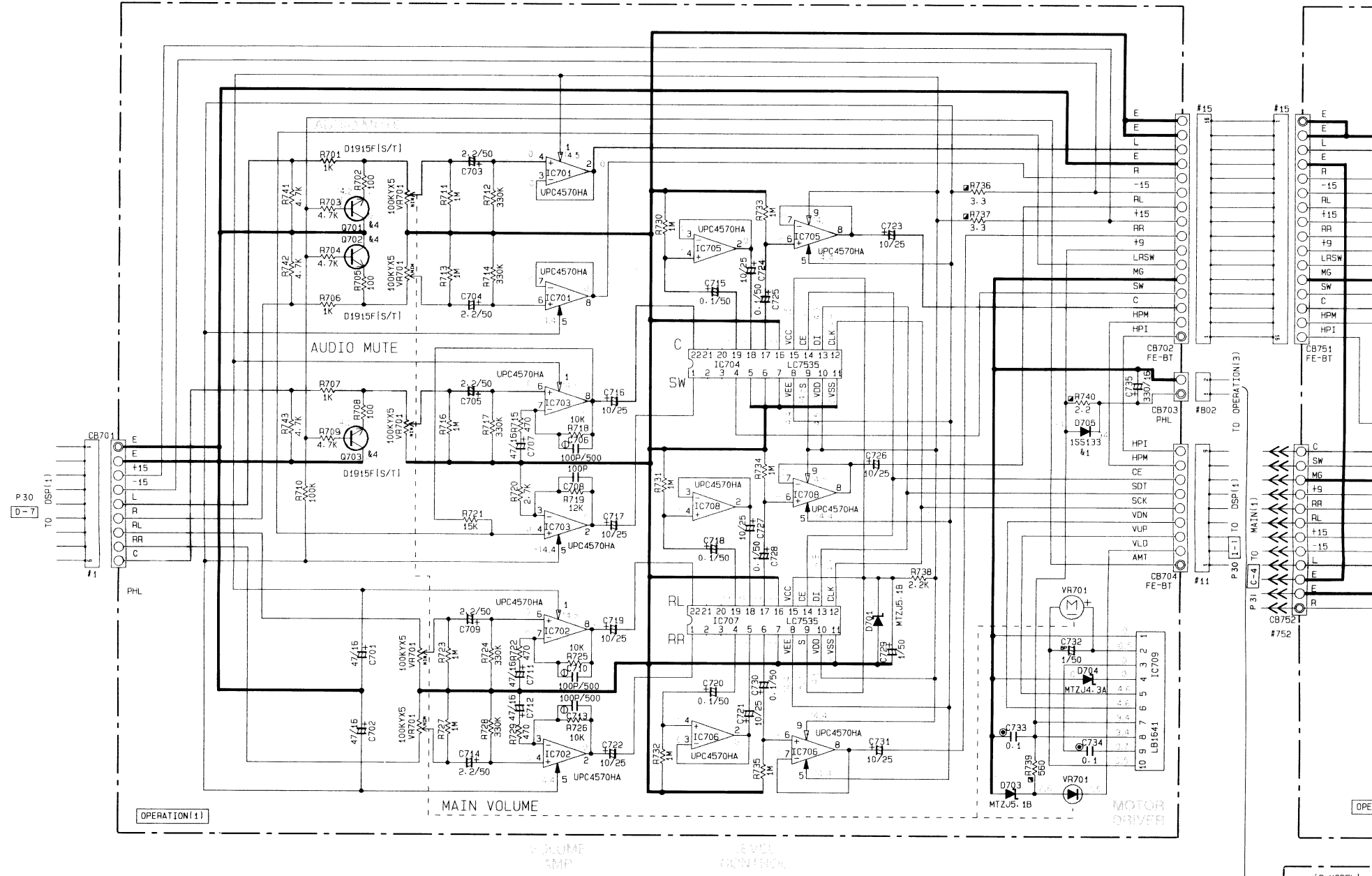
- (J).... Japanese model
- (U).... U.S.A model
- (C).... Canadian model
- (A).... Australian model
- (H).... European model
- (B).... British model
- (R).... General model
- (P).... RP model
- (W).... Germany model
- (L).... Singapore model

### Interchangeable Parts at Manufacture-Stage

| Mark | Reference Parts Number                                                         | Parts Name                                         |
|------|--------------------------------------------------------------------------------|----------------------------------------------------|
| k1   | D401, 402, 411-413<br>415, 416, 418, 419, 421<br>422, 424, 426, 430<br>433-440 | 15S133<br>H5S104TD                                 |
| k2   | Q403                                                                           | 2SC17409I(R/S)<br>2SC2603(E/F)<br>2SC331A(I/G/R/S) |
| k3   |                                                                                |                                                    |
| k4   | Q405-407, 411, 413, 415                                                        | 2SD1915F(S/T)<br>2SC2876(A/B)                      |
| k5   | D407                                                                           | S1N820<br>DF92M                                    |
| k6   | IC406                                                                          | NJM79M02FA<br>AN79M02F                             |
| k7   | IC403                                                                          | NJM79M10FA<br>AN79M10F                             |
| k8   | IC402                                                                          | NJM79M15FA<br>AN79M15F                             |
| k9   | IC404                                                                          | NJM79M02FA<br>AN79M02F                             |
| k10  | D417, 420, 423                                                                 | NA1B5<br>1B514B                                    |
|      |                                                                                |                                                    |
| k12  | Q402                                                                           | DT114ES<br>UN4211                                  |

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

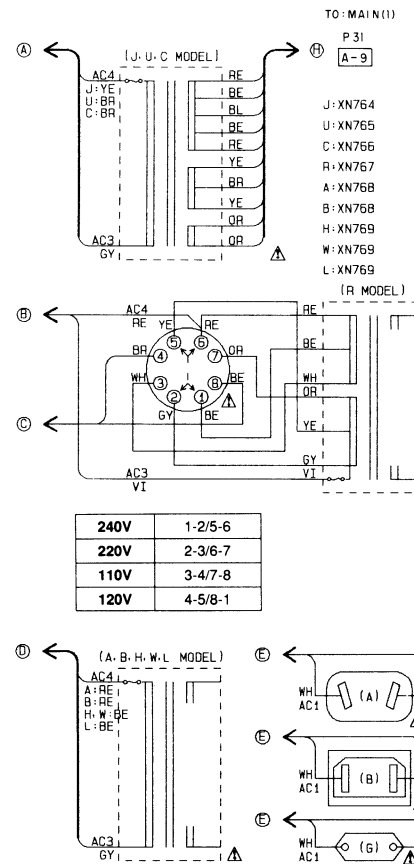
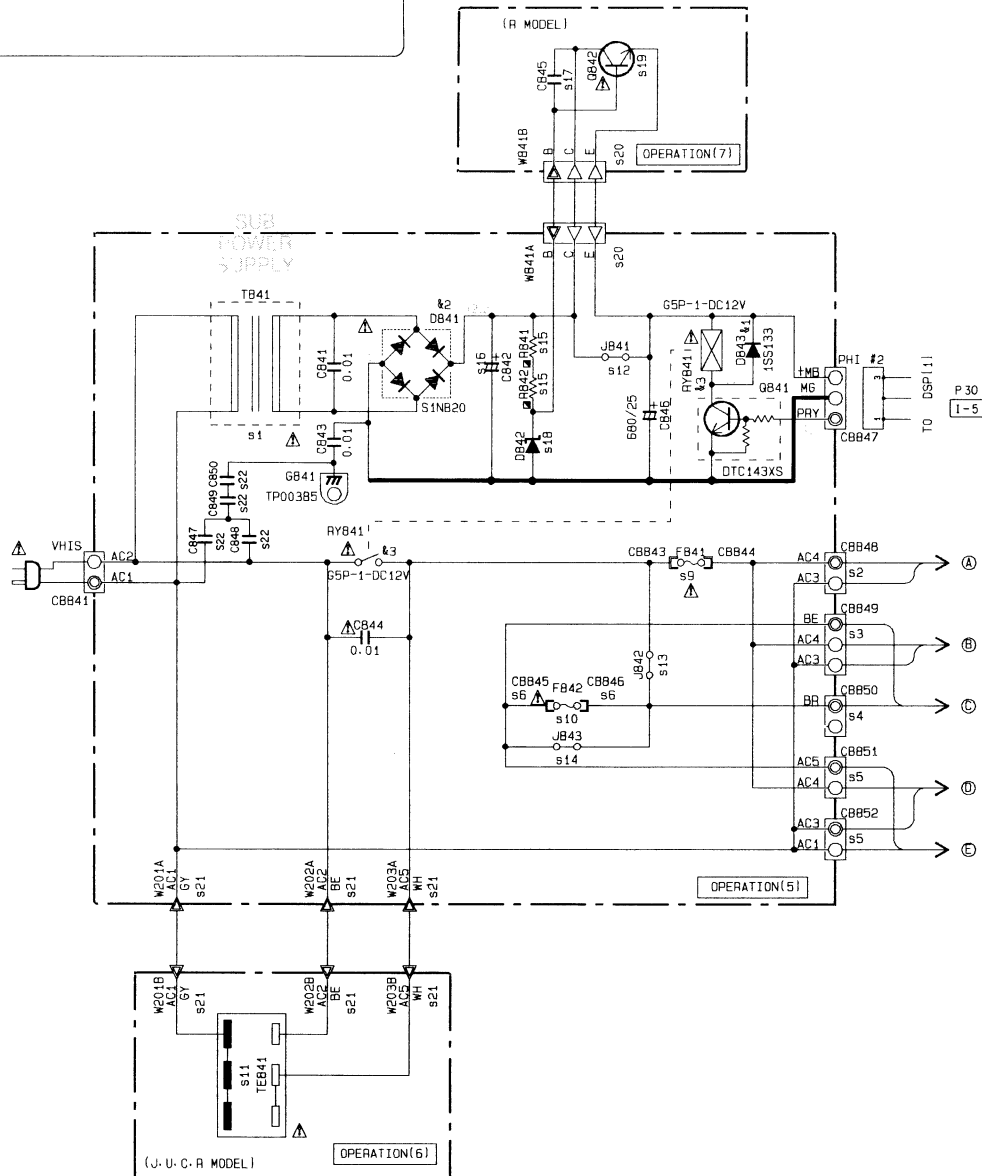
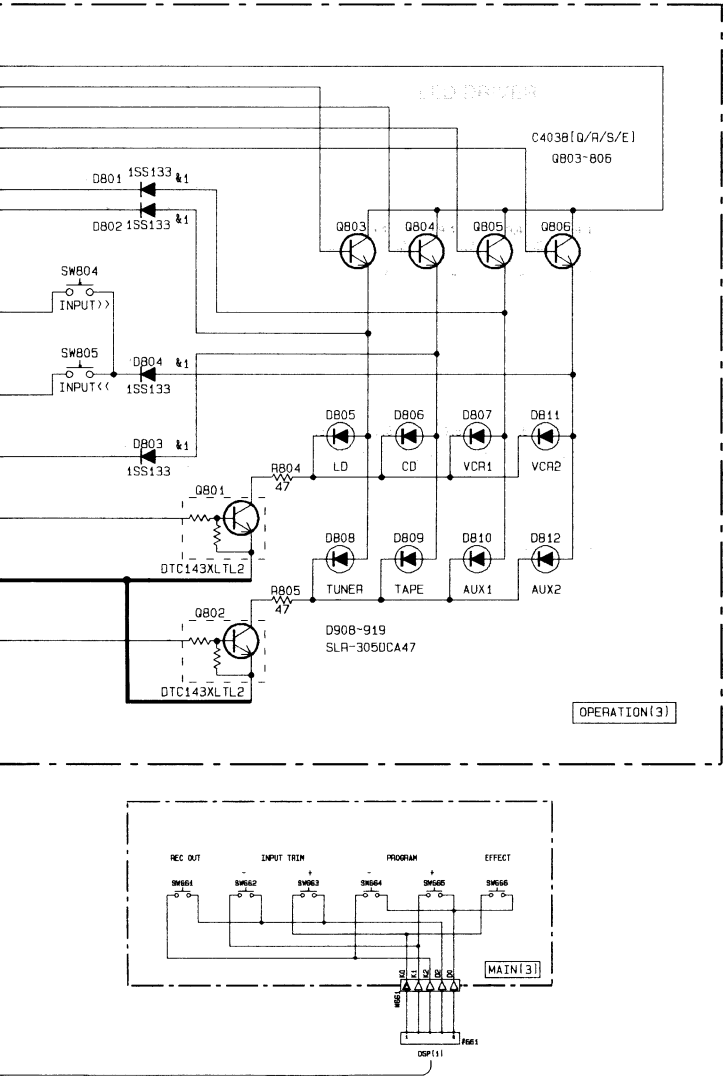
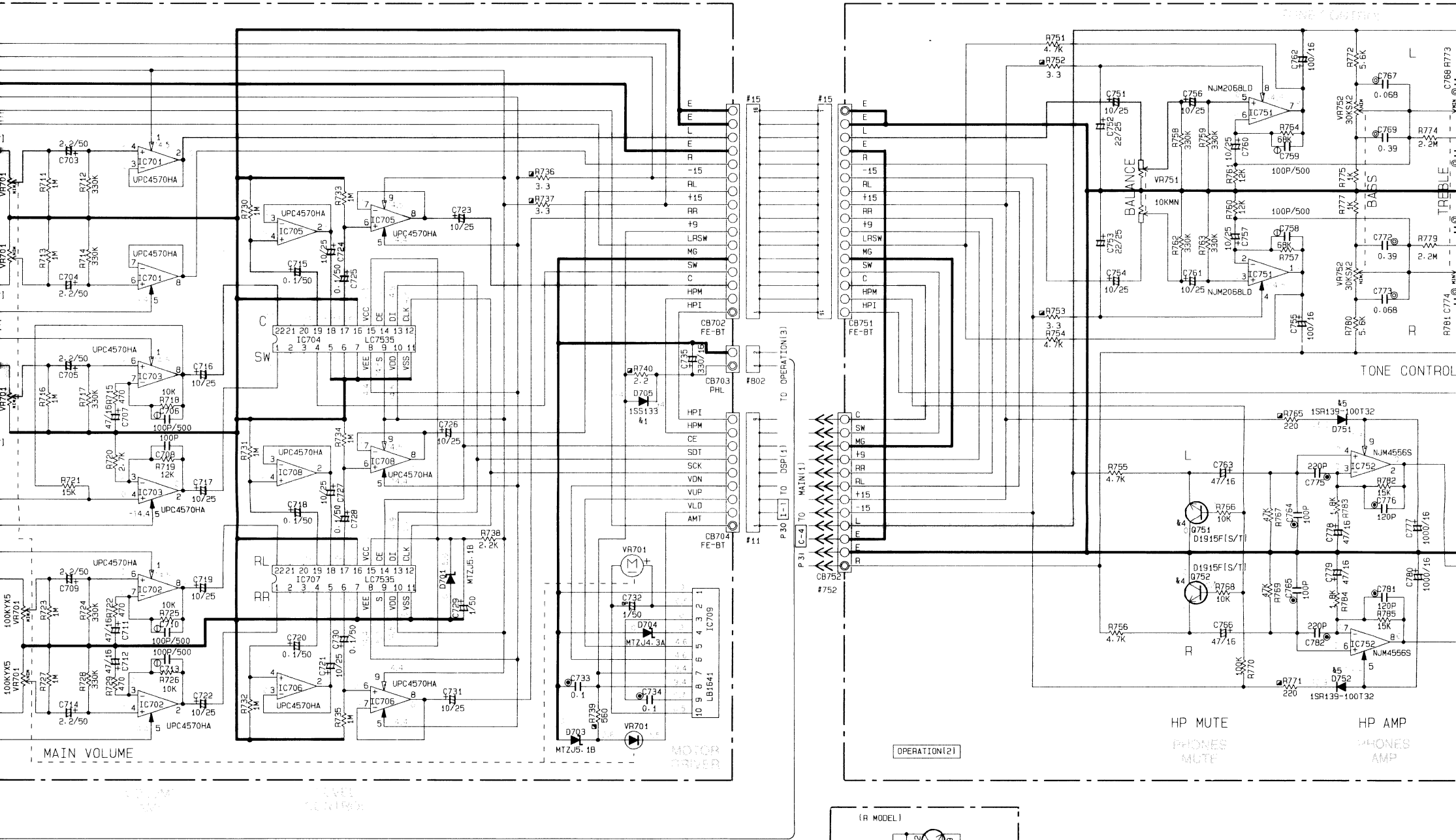
# ■ SCHEMATIC DIAGRAM (OPERATION)



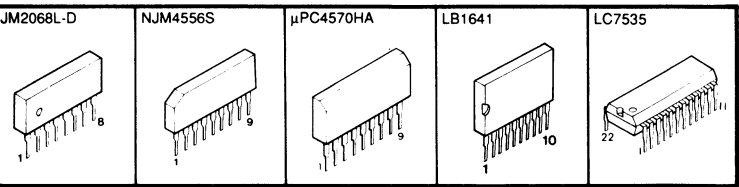
## PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICs.

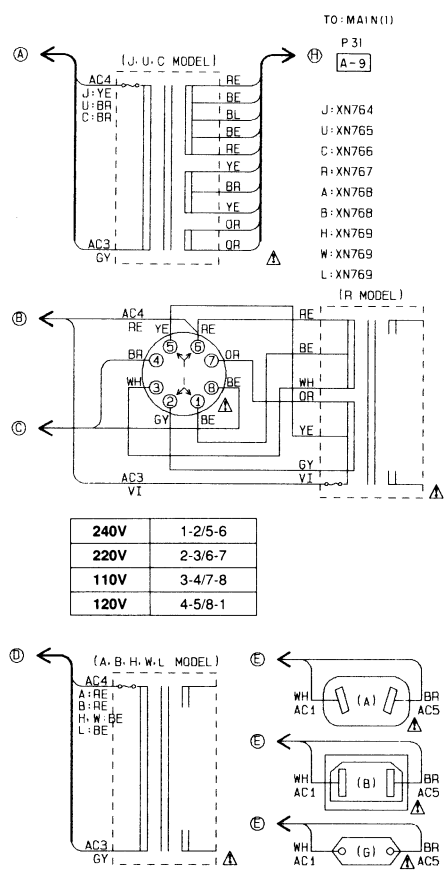
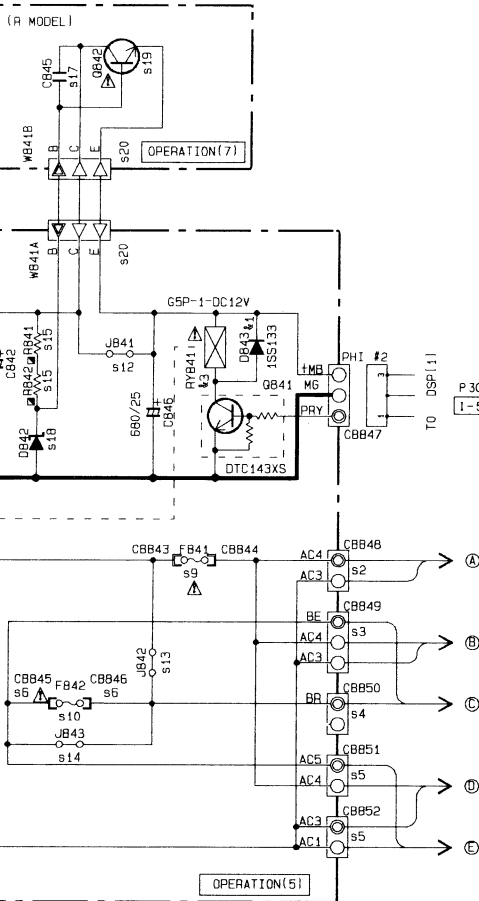
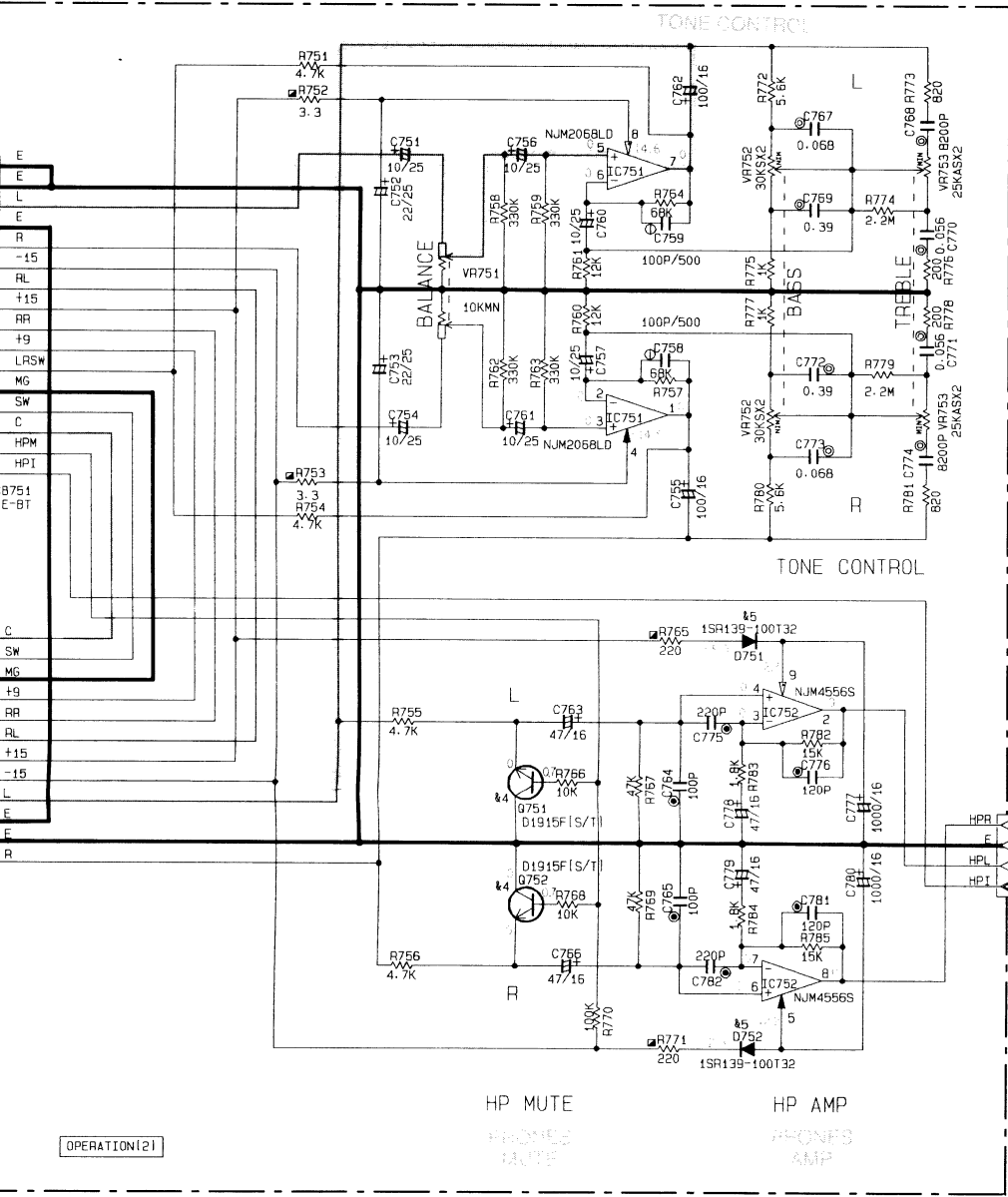
|                                      |                                            |                                                                      |               |                   |                 |                  |               |               |
|--------------------------------------|--------------------------------------------|----------------------------------------------------------------------|---------------|-------------------|-----------------|------------------|---------------|---------------|
| <p>2SD1915 (F) S, T<br/>DTC143XS</p> | <p>DTC143XLT2<br/>2SC4038 (Q, R, S, E)</p> | <p>1SS133<br/>1SR139-100<br/>MTZJ4.3A<br/>MTZJ5.1B<br/>MTZJ13.0A</p> | <p>SINB20</p> | <p>NUM2068L-D</p> | <p>NUM4556S</p> | <p>μPC4570HA</p> | <p>LB1641</p> | <p>LC7535</p> |
|--------------------------------------|--------------------------------------------|----------------------------------------------------------------------|---------------|-------------------|-----------------|------------------|---------------|---------------|

ATION)



ICS.





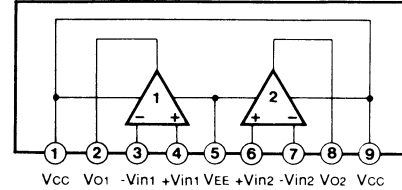
P.C.B. OPERATION

| s   | RefN      | J                | U.C              | R                | A.B                   | H.W.L                 |
|-----|-----------|------------------|------------------|------------------|-----------------------|-----------------------|
| 1   | T841      | XC332            | XC116            | XC115            | XC117                 | XK354                 |
| 2   | CB84B     | LA00214          | LA00214          | x                | x                     | x                     |
| 3   | CB849     | x                | x                | LA00215          | x                     | x                     |
| 4   | CB850     | x                | x                | LA00211          | x                     | x                     |
| 5   | CB851-852 | x                | x                | x                | LA00214               | LA00214               |
| 6   | CB845-846 | x                | x                | VP20650          | x                     | VP20650               |
| 7   |           |                  |                  |                  |                       |                       |
| 8   |           |                  |                  |                  |                       |                       |
| 9   | F841      | {KB00128} 6A250V | {KB00125} 6A250V | {KB00128} 6A250V | {KB00076} T3. 15A250V | {KB00076} T3. 15A250V |
| 10  | F842      | x                | x                | T3. 15A250V      | x                     | T2. 5A250V            |
| 11  | TE841     | VP92400          | VP92400          | VP92400          | x                     | x                     |
| 12  | JB41      | O                | O                | x                | O                     | O                     |
| 13  | JB42      | x                | x                | x                | O                     | O                     |
| 14  | JB43      | x                | x                | x                | O                     | x                     |
| 15  | RB41-842  | x                | x                | 5.6K             | x                     | x                     |
| 16  | CB42      | x                | x                | 47/63            | x                     | x                     |
| 17  | CB45      | x                | x                | 1000P            | x                     | x                     |
| 18  | DB42      | x                | x                | MTZJ13A          | x                     | x                     |
| 19  | QB42      | x                | x                | D2396(J/K)       | x                     | x                     |
| 20  | WB41      | x                | x                | O                | x                     | x                     |
| 21  | W201-203  | O                | O                | O                | x                     | x                     |
| 22  | CB47-850  | x                | 4700P/400        | x                | x                     | 4700/400              |
| 23  | CB25,827  | 1000P            | 1000P            | 1000P            | 1000P                 | 4700P                 |
| PWB |           | XN657            | XN658            | XN659            | XN660                 | XN661                 |
| PCB |           | VR39350          | VR39360          | VR39370          | VR39380               | VR39390               |

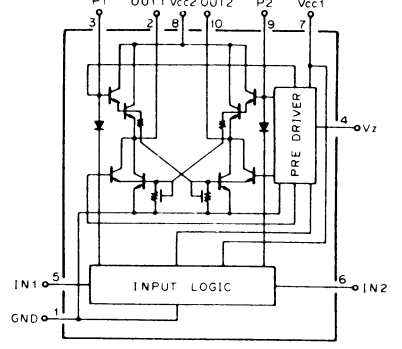
Interchangeable Parts at Manufacture-Stage

| Mark | Reference Parts Number | Parts Name                 |
|------|------------------------|----------------------------|
| k1   | 0705-801-804-843       | 1SR133 HSS104TD            |
| k2   | DB41                   | SINB20 DF02M               |
| k3   | RY841                  | G5P-1-DC12V DG1201-01W     |
| k4   | Q701-703, 751-752      | 2SC2878(A/B) 2SD1915F(S/T) |
| k5   | D751-752               | 1SR139-100T32 11ES4 TE1    |

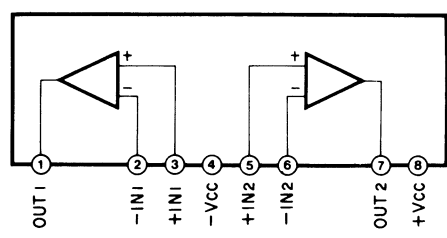
IC752 : NJM4558S  
IC701~703, 705, 706, 708 :  $\mu$ PC4570HA  
Dual OP-Amp



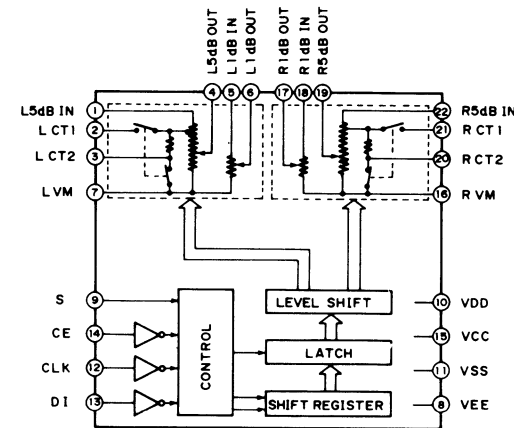
IC709 : LB1641  
Motor Driver



IC751 : NJM2068L-D  
Dual OP-Amp



IC704, 707 : LC7535  
Electric Controlled Volume



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



# PARTS LIST

## ELECTRICAL PARTS

### WARNING

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

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

### ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS :

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

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



P. C. B. DSP

| Schm Ref.  | PART NO. | Description  |          |        |
|------------|----------|--------------|----------|--------|
| * VR396000 | P. C. B. | DSP (UC)     |          |        |
| * VR396100 | P. C. B. | DSP (R)      |          |        |
| * VR396200 | P. C. B. | DSP (AB)     |          |        |
| * VR396300 | P. C. B. | DSP (HW)     |          |        |
| * VR909300 | P. C. B. | DSP (L)      |          |        |
| * CB1      | VP361600 | CN. BS. PIN  | 24P      |        |
| CB2        | VN923100 | CN           | FE       | 10P TE |
| * CB3      | VP360100 | CN. BS. PIN  | 9P       |        |
| CB4        | VB858800 | CN. BS. PIN  | 9P       |        |
| CB5        | VB858100 | CN. BS. PIN  | 2P (RAB) |        |
| CB6        | VB858200 | CN. BS. PIN  | 3P (HWL) |        |
| CB7        | VB858600 | CN. BS. PIN  | 7P       |        |
| CB201      | VB858200 | CN. BS. PIN  | 3P       |        |
| CB202      | VN923700 | CN           | FE       | 16P TE |
| CB203      | VN923100 | CN           | FE       | 10P TE |
| CB301      | VB858100 | CN. BS. PIN  | 2P       |        |
| CB302      | VN923700 | CN           | FE       | 16P TE |
| * CB351    | VN924500 | CN           | 24P      |        |
| CB352      | VB858200 | CN. BS. PIN  | 3P       |        |
| C1         | UA655100 | C. MYLAR     | 0.1uF    | 50V    |
| C2         | UA655100 | C. MYLAR     | 0.1uF    | 50V    |
| C3         | UT452470 | C. PP        | 470pF    | 100V   |
| C4         | UT452470 | C. PP        | 470pF    | 100V   |
| C5         | UT452470 | C. PP        | 470pF    | 100V   |
| C6         | UT452470 | C. PP        | 470pF    | 100V   |
| C7         | UT452470 | C. PP        | 470pF    | 100V   |
| C8         | UT452470 | C. PP        | 470pF    | 100V   |
| C9         | UT452470 | C. PP        | 470pF    | 100V   |
| C10        | UT452470 | C. PP        | 470pF    | 100V   |
| C11        | Vi845200 | C. EL        | 4.7uF    | 50V    |
| C12        | UT452100 | C. PP        | 100pF    | 100V   |
| C13        | UT452100 | C. PP        | 100pF    | 100V   |
| C14        | Vi845200 | C. EL        | 4.7uF    | 50V    |
| C15        | VH620800 | C. EL        | 47uF     | 25V    |
| C16        | Vi845600 | C. EL        | 47uF     | 50V    |
| C17        | FU351220 | C. MICA      | 22pF     | 500V   |
| C18        | FU351220 | C. MICA      | 22pF     | 500V   |
| C19        | Vi845600 | C. EL        | 47uF     | 50V    |
| C20        | VH620800 | C. EL        | 47uF     | 25V    |
| C21        | UT452100 | C. PP        | 100pF    | 100V   |
| C22        | Vi845900 | C. EL        | 10uF     | 63V    |
| C23        | Vi845900 | C. EL        | 10uF     | 63V    |
| C24        | Vi845900 | C. EL        | 10uF     | 63V    |
| C25        | Vi845900 | C. EL        | 10uF     | 63V    |
| C26        | Vi845900 | C. EL        | 10uF     | 63V    |
| C27        | UA655150 | C. MYLAR     | 0.15uF   | 50V    |
| C28        | VH053100 | C. CE. TUBLR | 0.1uF    | 50V    |
| C29        | VH053100 | C. CE. TUBLR | 0.1uF    | 50V    |
| C30        | UT452270 | C. PP        | 270pF    | 100V   |
| C31        | UT452270 | C. PP        | 270pF    | 100V   |
| C32        | VF467300 | C. CE. TUBLR | 0.01uF   | 16V    |
| C33        | VG278800 | C. CE. TUBLR | 560pF    | 50V    |
| C34        | VG278800 | C. CE. TUBLR | 560pF    | 50V    |

\* New Parts

| Schm Ref. | PART NO. | Description  |        |      |
|-----------|----------|--------------|--------|------|
| C35       | VF467300 | C. CE. TUBLR | 0.01uF | 16V  |
| C36       | Vi845600 | C. EL        | 47uF   | 50V  |
| C38       | Vi845600 | C. EL        | 47uF   | 50V  |
| C39       | Vi845900 | C. EL        | 10uF   | 63V  |
| C40       | Vi845900 | C. EL        | 10uF   | 63V  |
| C41       | Vi845600 | C. EL        | 47uF   | 50V  |
| C42       | Vi845600 | C. EL        | 47uF   | 50V  |
| C43       | Vi845600 | C. EL        | 47uF   | 50V  |
| C44       | UA653120 | C. MYLAR     | 1200pF | 50V  |
| C45       | UA653120 | C. MYLAR     | 1200pF | 50V  |
| C46       | Vi846000 | C. EL        | 22uF   | 63V  |
| C47       | UT452330 | C. PP        | 330pF  | 100V |
| C48       | Vi846000 | C. EL        | 22uF   | 63V  |
| C49       | UT452330 | C. PP        | 330pF  | 100V |
| C50       | UT452330 | C. PP        | 330pF  | 100V |
| C51       | Vi846000 | C. EL        | 22uF   | 63V  |
| C52       | VG280000 | C. CE. TUBLR | 8200pF | 16V  |
| C53       | VG280000 | C. CE. TUBLR | 8200pF | 16V  |
| C54       | VG279800 | C. CE. TUBLR | 5600pF | 16V  |
| C55       | VG278600 | C. CE. TUBLR | 330pF  | 50V  |
| C56       | VF467100 | C. CE. TUBLR | 4700pF | 16V  |
| C57       | VG278600 | C. CE. TUBLR | 330pF  | 50V  |
| C58       | VF467100 | C. CE. TUBLR | 4700pF | 16V  |
| C59       | VG279800 | C. CE. TUBLR | 5600pF | 16V  |
| C60       | UA653330 | C. MYLAR     | 3300pF | 50V  |
| C61       | FG212150 | C. CE        | 150pF  | 50V  |
| C62       | FG212150 | C. CE        | 150pF  | 50V  |
| C63       | UA653330 | C. MYLAR     | 3300pF | 50V  |
| C64       | Vi846000 | C. EL        | 22uF   | 63V  |
| C65       | Vi846000 | C. EL        | 22uF   | 63V  |
| C66       | Vi846000 | C. EL        | 22uF   | 63V  |
| C67       | Vi846000 | C. EL        | 22uF   | 63V  |
| C68       | Vi846000 | C. EL        | 22uF   | 63V  |
| C69       | Vi845900 | C. EL        | 10uF   | 63V  |
| C70       | VG277000 | C. CE. TUBLR | 33pF   | 50V  |
| C71       | VF466600 | C. CE. TUBLR | 10pF   | 50V  |
| C72       | VF466600 | C. CE. TUBLR | 10pF   | 50V  |
| C73       | VG277000 | C. CE. TUBLR | 33pF   | 50V  |
| C74       | Vi845900 | C. EL        | 10uF   | 63V  |
| C75       | VG277000 | C. CE. TUBLR | 33pF   | 50V  |
| C76       | VF466700 | C. CE. TUBLR | 47pF   | 50V  |
| C77       | VF466700 | C. CE. TUBLR | 47pF   | 50V  |
| C78       | VG277000 | C. CE. TUBLR | 33pF   | 50V  |
| C79       | UA653220 | C. MYLAR     | 2200pF | 50V  |
| C80       | Vi846000 | C. EL        | 22uF   | 63V  |
| C81       | UA652820 | C. MYLAR     | 820pF  | 50V  |
| C82       | FG212120 | C. CE        | 120pF  | 50V  |
| C83       | FG212120 | C. CE        | 120pF  | 50V  |
| C84       | UA652820 | C. MYLAR     | 820pF  | 50V  |
| C85       | Vi846000 | C. EL        | 22uF   | 63V  |
| C86       | UA653220 | C. MYLAR     | 2200pF | 50V  |
| C87       | VG279600 | C. CE. TUBLR | 3300pF | 16V  |
| C88       | FZ005880 | C. CE. ML    | 0.1uF  | 25V  |

\* New Parts

## P. C. B. DSP

| Schm Ref. | PART NO. | Description  |        |      |
|-----------|----------|--------------|--------|------|
| C89       | Vi845600 | C. EL        | 47uF   | 50V  |
| C90       | Vi845600 | C. EL        | 47uF   | 50V  |
| C91       | Vi845600 | C. EL        | 47uF   | 50V  |
| C92       | VG279600 | C. CE. TUBLR | 3300pF | 16V  |
| C93       | VH053100 | C. CE. TUBLR | 0.1uF  | 50V  |
| C94       | Vi842800 | C. EL        | 330uF  | 16V  |
| C95       | Vi845600 | C. EL        | 47uF   | 50V  |
| C97       | Vi845600 | C. EL        | 47uF   | 50V  |
| C98       | Vi845600 | C. EL        | 47uF   | 50V  |
| C99       | FZ005880 | C. CE. ML    | 0.1uF  | 25V  |
| C100      | Vi841900 | C. EL        | 220uF  | 10V  |
| C101      | VH053100 | C. CE. TUBLR | 0.1uF  | 50V  |
| C102      | Vi845600 | C. EL        | 47uF   | 50V  |
| C103      | FZ005880 | C. CE. ML    | 0.1uF  | 25V  |
| C104      | FZ005880 | C. CE. ML    | 0.1uF  | 25V  |
| C105      | Vi845600 | C. EL        | 47uF   | 50V  |
| C106      | VF466600 | C. CE. TUBLR | 10pF   | 50V  |
| C107      | VH053100 | C. CE. TUBLR | 0.1uF  | 50V  |
| C108      | VH053100 | C. CE. TUBLR | 0.1uF  | 50V  |
| C109      | VH053100 | C. CE. TUBLR | 0.1uF  | 50V  |
| C110      | VF467300 | C. CE. TUBLR | 0.01uF | 16V  |
| C113      | VH053100 | C. CE. TUBLR | 0.1uF  | 50V  |
| C115      | Vi844800 | C. EL        | 0.47uF | 50V  |
| C116      | Vi845900 | C. EL        | 10uF   | 63V  |
| C117      | VH053100 | C. CE. TUBLR | 0.1uF  | 50V  |
| C127      | VH053100 | C. CE. TUBLR | 0.1uF  | 50V  |
| C128      | VE632800 | C. EL        | 0.047F | 5.5V |
| C129      | Vi845600 | C. EL        | 47uF   | 50V  |
| C130      | VK180500 | C. EL        | 2200uF | 16V  |
| C133      | Vi844800 | C. EL        | 0.47uF | 50V  |
| C134      | Vi844900 | C. EL        | 1uF    | 50V  |
| C135      | Vi844800 | C. EL        | 0.47uF | 50V  |
| C201      | VF466800 | C. CE. TUBLR | 100pF  | 50V  |
| C202      | VF466800 | C. CE. TUBLR | 100pF  | 50V  |
| C203      | VF466800 | C. CE. TUBLR | 100pF  | 50V  |
| C204      | VF466800 | C. CE. TUBLR | 100pF  | 50V  |
| C205      | VF466800 | C. CE. TUBLR | 100pF  | 50V  |
| C206      | VF466800 | C. CE. TUBLR | 100pF  | 50V  |
| C207      | VG279600 | C. CE. TUBLR | 3300pF | 16V  |
| C208      | Vi845900 | C. EL        | 10uF   | 63V  |
| C209      | Vi841400 | C. EL        | 1000uF | 6.3V |
| C210      | Vi845900 | C. EL        | 10uF   | 63V  |
| C211      | Vi841400 | C. EL        | 1000uF | 6.3V |
| C212      | Vi845900 | C. EL        | 10uF   | 63V  |
| C213      | Vi841400 | C. EL        | 1000uF | 6.3V |
| C214      | Vi845900 | C. EL        | 10uF   | 63V  |
| C215      | Vi845900 | C. EL        | 10uF   | 63V  |
| C216      | Vi845900 | C. EL        | 10uF   | 63V  |
| C217      | Vi845900 | C. EL        | 10uF   | 63V  |
| C218      | Vi845600 | C. EL        | 47uF   | 50V  |
| C219      | Vi845600 | C. EL        | 47uF   | 50V  |
| C220      | VG279000 | C. CE. TUBLR | 820pF  | 50V  |
| C221      | Vi841300 | C. EL        | 470uF  | 6.3V |

\* New Parts

| Schm Ref. | PART NO. | Description  |          |      |
|-----------|----------|--------------|----------|------|
| C222      | Vi845600 | C. EL        | 47uF     | 50V  |
| C223      | VH053100 | C. CE. TUBLR | 0.1uF    | 50V  |
| C224      | VH053100 | C. CE. TUBLR | 0.1uF    | 50V  |
| C225      | VG277000 | C. CE. TUBLR | 33pF     | 50V  |
| C226      | VH620800 | C. EL        | 47uF     | 25V  |
| C227      | VH620800 | C. EL        | 47uF     | 25V  |
| C228      | VG277000 | C. CE. TUBLR | 33pF     | 50V  |
| C229      | VG276600 | C. CE. TUBLR | 22pF     | 50V  |
| C230      | VG276600 | C. CE. TUBLR | 22pF     | 50V  |
| C231      | Vi845200 | C. EL        | 4.7uF    | 50V  |
| C232      | VG278100 | C. CE. TUBLR | 120pF    | 50V  |
| C233      | VF467300 | C. CE. TUBLR | 0.01uF   | 16V  |
| C234      | Vi845600 | C. EL        | 47uF     | 50V  |
| C235      | VG279000 | C. CE. TUBLR | 820pF    | 50V  |
| C236      | Vi845900 | C. EL        | 10uF     | 63V  |
| C237      | Vi841200 | C. EL        | 330uF    | 6.3V |
| C238      | VG278400 | C. CE. TUBLR | 220pF    | 50V  |
| C239      | Vi845900 | C. EL        | 10uF     | 63V  |
| C240      | VG277000 | C. CE. TUBLR | 33pF     | 50V  |
| C241      | VF466900 | C. CE. TUBLR | 470pF    | 50V  |
| C242      | Vi845200 | C. EL        | 4.7uF    | 50V  |
| C243      | VH053100 | C. CE. TUBLR | 0.1uF    | 50V  |
| C301      | VF466800 | C. CE. TUBLR | 100pF    | 50V  |
| C302      | VF466800 | C. CE. TUBLR | 100pF    | 50V  |
| C303      | VF466800 | C. CE. TUBLR | 100pF    | 50V  |
| C304      | Vi841400 | C. EL        | 1000uF   | 6.3V |
| C305      | Vi841400 | C. EL        | 1000uF   | 6.3V |
| C306      | Vi841400 | C. EL        | 1000uF   | 6.3V |
| C307      | Vi845900 | C. EL        | 10uF     | 63V  |
| C308      | Vi845600 | C. EL        | 47uF     | 50V  |
| C309      | Vi845900 | C. EL        | 10uF     | 63V  |
| C310      | Vi845600 | C. EL        | 47uF     | 50V  |
| C351      | UT452470 | C. PP        | 470pF    | 100V |
| C352      | UT452470 | C. PP        | 470pF    | 100V |
| C353      | UT452470 | C. PP        | 470pF    | 100V |
| C354      | UT452470 | C. PP        | 470pF    | 100V |
| C355      | UT452470 | C. PP        | 470pF    | 100V |
| C356      | UT452470 | C. PP        | 470pF    | 100V |
| C357      | UT452470 | C. PP        | 470pF    | 100V |
| C358      | UT452470 | C. PP        | 470pF    | 100V |
| C359      | UT452470 | C. PP        | 470pF    | 100V |
| C360      | UT452470 | C. PP        | 470pF    | 100V |
| C361      | UT452470 | C. PP        | 470pF    | 100V |
| C362      | UT452470 | C. PP        | 470pF    | 100V |
| C363      | Vi845600 | C. EL        | 47uF     | 50V  |
| C364      | Vi845600 | C. EL        | 47uF     | 50V  |
| D1        | VG437400 | DIODE. ZENR  | MTZJ5.1B | 5.1V |
| D2        | iF004600 | DIODE        | 1SS133   |      |
| D3        | iF004600 | DIODE        | 1SS133   |      |
| D4        | iF004600 | DIODE        | 1SS133   |      |
| D5        | iF004600 | DIODE        | 1SS133   |      |
| D6        | iF004600 | DIODE        | 1SS133   |      |
| D7        | iF004600 | DIODE        | 1SS133   |      |

\* New Parts

## P. C. B. DSP

| Schm Ref. | PART NO. | Description               |
|-----------|----------|---------------------------|
| D8        | iF004600 | DIODE 1SS133              |
| D9        | iF004600 | DIODE 1SS133              |
| D10       | iF004600 | DIODE 1SS133              |
| D13       | iF004600 | DIODE 1SS133              |
| D14       | iF004600 | DIODE 1SS133              |
| D15       | iF004600 | DIODE 1SS133              |
| D16       | iF004600 | DIODE 1SS133              |
| D17       | iF004600 | DIODE 1SS133              |
| D18       | VG438200 | DIODE. ZENR MTZJ6.8A 6.8V |
| D19       | iF004600 | DIODE 1SS133              |
| D20       | iF004600 | DIODE 1SS133              |
| D21       | iF004600 | DIODE 1SS133              |
| D22       | VH770800 | DIODE 1SR139-100          |
| D23       | iF004600 | DIODE 1SS133              |
| D201      | iF004600 | DIODE 1SS133              |
| D202      | iF004600 | DIODE 1SS133              |
| D203      | iF004600 | DIODE 1SS133              |
| D204      | VG435100 | DIODE. ZENR MTZJ2B 2.0V   |
| D205      | iF004600 | DIODE 1SS133              |
| D206      | iF004600 | DIODE 1SS133              |
| D207      | iF004600 | DIODE 1SS133              |
| D208      | iF004600 | DIODE 1SS133              |
| D209      | iF004600 | DIODE 1SS133              |
| * IC1     | KN493A00 | IC HD6433238              |
| IC2       | XL816A00 | IC YSS223-K               |
| * IC3     | KN667A00 | IC TC51832SPL-10 PS-R     |
| IC4       | XM356A00 | IC NJM2068LD              |
| IC5       | XM356A00 | IC NJM2068LD              |
| IC6       | XB247301 | IC uPC4570HA              |
| IC7       | XB247301 | IC uPC4570HA              |
| * IC8     | KN796A00 | IC NJM2082L               |
| IC9       | XB247301 | IC uPC4570HA              |
| * IC10    | KN796A00 | IC NJM2082L               |
| IC11      | XB247301 | IC uPC4570HA              |
| IC12      | XB247301 | IC uPC4570HA              |
| IC13      | XB247301 | IC uPC4570HA              |
| IC14      | XB247301 | IC uPC4570HA              |
| IC15      | XB247301 | IC uPC4570HA              |
| IC16      | KG758A00 | IC LC7823N                |
| IC17      | XB247301 | IC uPC4570HA              |
| * IC18    | Xi358A00 | IC NJM2904L               |
| IC19      | XA507A00 | IC AN78N05                |
| IC20      | XJ757A00 | IC NJM78L05A-T3           |
| IC201     | XA053A00 | IC TC4052BP               |
| IC202     | XA053A00 | IC TC4052BP               |
| IC203     | Xi109C00 | IC MC14576BP              |
| IC204     | Xi109C00 | IC MC14576BP              |
| IC205     | iG001720 | IC TC4069UBP              |
| IC206     | iG142200 | IC TC74HCU04AP            |
| IC207     | XL314A00 | IC M35010-062SP           |
| IC208     | iR405300 | IC TC74HC4053AP           |
| IC209     | iG055100 | IC TC4053BP               |
| IC301     | iG001770 | IC TC4051BP               |

\* New Parts

| Schm Ref. | PART NO. | Description           |
|-----------|----------|-----------------------|
| IC302     | XL493A00 | IC TC74HC4051AP       |
| IC303     | iR405300 | IC TC74HC4053AP       |
| IC304     | Xi109C00 | IC MC14576BP          |
| IC351     | KG732A00 | IC LC7821N            |
| IC352     | KG732A00 | IC LC7821N            |
| IC353     | KG758A00 | IC LC7823N            |
| JK201     | VN938100 | CN. DIN 3P S          |
| JK202     | VP113600 | CN. DIN 2P YKF51-5510 |
| * JK203   | VQ960400 | JACK. DIN 1P          |
| L201      | VM703900 | COIL 15uH             |
| PJ1       | VJ696300 | JACK. PIN 4P          |
| PJ2       | VJ696300 | JACK. PIN 4P          |
| PJ301     | VM750500 | JACK. PIN 4P          |
| PJ302     | VJ695900 | JACK. PIN 3P          |
| PJ351     | VJ696300 | JACK. PIN 4P          |
| PJ352     | VJ696300 | JACK. PIN 4P          |
| PJ353     | VJ696300 | JACK. PIN 4P          |
| Q1        | VK432900 | TR 2SD1915F S, T      |
| Q2        | VK432900 | TR 2SD1915F S, T      |
| Q3        | VK432900 | TR 2SD1915F S, T      |
| Q4        | VK432900 | TR 2SD1915F S, T      |
| Q5        | iA093320 | TR 2SA933S Q, R       |
| Q6        | VG722000 | TR. DGT DTC144ES      |
| Q7        | iC260320 | TR 2SC2603 E, F       |
| Q8        | iC260320 | TR 2SC2603 E, F       |
| Q9        | iC260320 | TR 2SC2603 E, F       |
| Q10       | VH964100 | TR. DGT DTA143ES      |
| Q11       | VH964100 | TR. DGT DTA143ES      |
| Q12       | VH964100 | TR. DGT DTA143ES      |
| Q201      | VH964100 | TR. DGT DTA143ES      |
| Q202      | VK432900 | TR 2SD1915F S, T      |
| Q203      | iC260320 | TR 2SC2603 E, F       |
| Q204      | iC260320 | TR 2SC2603 E, F       |
| Q205      | iC260320 | TR 2SC2603 E, F       |
| Q206      | iC260320 | TR 2SC2603 E, F       |
| Q207      | iC260320 | TR 2SC2603 E, F       |
| Q208      | VD678700 | TR. DGT DTC114ES      |
| Q209      | iC260320 | TR 2SC2603 E, F       |
| Q210      | iC260320 | TR 2SC2603 E, F       |
| Q211      | iA101521 | TR 2SA1015 Y          |
| Q212      | iC053540 | TR 2SC535 A, B, C     |
| Q213      | iC224030 | TR 2SC2240 GR, BL     |
| Q214      | iC224030 | TR 2SC2240 GR, BL     |
| Q301      | iC260320 | TR 2SC2603 E, F       |
| R50       | HV453220 | R. CAR. FP 2.2Ω 1/4W  |
| R62       | HV453220 | R. CAR. FP 2.2Ω 1/4W  |
| R116      | HL314680 | R. MTL. OXD 68Ω 1W    |
| R131      | HV453680 | R. CAR. FP 6.8Ω 1/4W  |
| R132      | HV453220 | R. CAR. FP 2.2Ω 1/4W  |
| R227      | HV455180 | R. CAR. FP 180Ω 1/4W  |
| R228      | HV455180 | R. CAR. FP 180Ω 1/4W  |
| R231      | HV455150 | R. CAR. FP 150Ω 1/4W  |
| R232      | HV455150 | R. CAR. FP 150Ω 1/4W  |

\* New Parts

## P. C. B. DSP &amp; MAIN

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

\* New Parts

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

\* New Parts

## P. C. B. MAIN

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

\* New Parts

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

\* New Parts

## P. C. B. MAIN

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

\* New Parts

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

\* New Parts

## P. C. B. MAIN

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

\* New Parts

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

\* New Parts



## P. C. B. OPERATION

| Schm Ref.  | PART NO. | Description                |
|------------|----------|----------------------------|
| * VR393600 | P. C. B. | OPERATION(UC)              |
| * VR393700 | P. C. B. | OPERATION(R)               |
| * VR393800 | P. C. B. | OPERATION(AB)              |
| * VR393900 | P. C. B. | OPERATION(HWL)             |
| CB701      | VB858800 | CN. BS. PIN 9P             |
| CB702      | VN923700 | CN FE 16P TE               |
| CB703      | VB858100 | CN. BS. PIN 2P             |
| * CB704    | VN923000 | CN 9P                      |
| CB751      | VN923700 | CN FE 16P TE               |
| CB801      | VD004800 | CN. BS. PIN 5P             |
| CB841      | VG879900 | CN. BS. PIN 2P             |
| CB843      | LB201880 | HOLDER. FUS PC-FH1         |
| CB844      | LB201880 | HOLDER. FUS PC-FH1         |
| CB845      | VP206500 | HOLDER. FUS EYF-52BC(RHWL) |
| CB846      | VP206500 | HOLDER. FUS EYF-52BC(RHWL) |
| CB847      | VD004600 | CN. BS. PIN 3P             |
| CB848      | LA002140 | TERM. WRAP 2P(UC)          |
| CB849      | LA002150 | TERM. WRAP 3P(R)           |
| CB850      | LA002110 | TERM. WRAP 2P(R)           |
| CB851      | LA002140 | TERM. WRAP 2P(ABHWL)       |
| CB852      | LA002140 | TERM. WRAP 2P(ABHWL)       |
| CB871      | LB919070 | CN. BS. PIN 7P(ABHWL)      |
| C701       | VH620800 | C. EL 47uF 25V             |
| C702       | VH620800 | C. EL 47uF 25V             |
| C703       | Vi845000 | C. EL 2.2uF 50V            |
| C704       | Vi845000 | C. EL 2.2uF 50V            |
| C705       | Vi845000 | C. EL 2.2uF 50V            |
| C706       | FU452100 | C. MICA 100pF 500V         |
| C707       | Vi845600 | C. EL 47uF 50V             |
| C708       | FG212100 | C. CE 100pF 50V            |
| C709       | Vi845000 | C. EL 2.2uF 50V            |
| C710       | FU452100 | C. MICA 100pF 500V         |
| C711       | Vi845600 | C. EL 47uF 50V             |
| C712       | Vi845600 | C. EL 47uF 50V             |
| C713       | FU452100 | C. MICA 100pF 500V         |
| C714       | Vi845000 | C. EL 2.2uF 50V            |
| C715       | Vi844500 | C. EL 0.1uF 50V            |
| C716       | Vi845900 | C. EL 10uF 63V             |
| C717       | Vi845900 | C. EL 10uF 63V             |
| C718       | Vi844500 | C. EL 0.1uF 50V            |
| C719       | Vi845900 | C. EL 10uF 63V             |
| C720       | Vi844500 | C. EL 0.1uF 50V            |
| C721       | Vi845900 | C. EL 10uF 63V             |
| C722       | Vi845900 | C. EL 10uF 63V             |
| C723       | Vi845900 | C. EL 10uF 63V             |
| C724       | Vi845900 | C. EL 10uF 63V             |
| C725       | Vi844500 | C. EL 0.1uF 50V            |
| C726       | Vi845900 | C. EL 10uF 63V             |
| C727       | Vi845900 | C. EL 10uF 63V             |
| C728       | Vi844500 | C. EL 0.1uF 50V            |
| C729       | Vi844900 | C. EL 1uF 50V              |
| C730       | Vi844500 | C. EL 0.1uF 50V            |
| C731       | Vi845900 | C. EL 10uF 63V             |

\* New Parts

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

\* New Parts

## P. C. B. OPERATION

| Schm Ref. | PART NO. | Description                     |
|-----------|----------|---------------------------------|
| C848      | Fi383470 | C. CE. SAFTY 4700pF 400V(UCHWL) |
| C849      | Fi383470 | C. CE. SAFTY 4700pF 400V(UCHWL) |
| C850      | Fi383470 | C. CE. SAFTY 4700pF 400V(UCHWL) |
| C871      | VF467000 | C. CE. TUBLR 1000pF 50V(ABHWL)  |
| D701      | VG437400 | DIODE. ZENR MTZJ5.1B 5.1V       |
| D703      | VG437400 | DIODE. ZENR MTZJ5.1B 5.1V       |
| D704      | VG436700 | DIODE. ZENR MTZJ4.3A 4.3V       |
| D705      | iF004600 | DIODE 1SS133                    |
| D751      | VH770800 | DIODE 1SR139-100                |
| D752      | VH770800 | DIODE 1SR139-100                |
| D801      | iF004600 | DIODE 1SS133                    |
| D802      | iF004600 | DIODE 1SS133                    |
| D803      | iF004600 | DIODE 1SS133                    |
| D804      | iF004600 | DIODE 1SS133                    |
| D805      | VP593800 | LED(or) SLR-305DCA47            |
| D806      | VP593800 | LED(or) SLR-305DCA47            |
| D807      | VP593800 | LED(or) SLR-305DCA47            |
| D808      | VP593800 | LED(or) SLR-305DCA47            |
| D809      | VP593800 | LED(or) SLR-305DCA47            |
| D810      | VP593800 | LED(or) SLR-305DCA47            |
| D811      | VP593800 | LED(or) SLR-305DCA47            |
| D812      | VP593800 | LED(or) SLR-305DCA47            |
| * D841    | VR253700 | DIODE. BRG SINB20 1.0A 200V     |
| D842      | VG440400 | DIODE. ZENR MTZJ13A 13V(R)      |
| D843      | iF004600 | DIODE 1SS133                    |
| * F841    | KB000760 | FUSE T3.15A 250V(ABHWL)         |
| * F841    | KB001250 | FUSE 6.0A 250V(UC)              |
| * F841    | KB001280 | FUSE 6.0A 250V(R)               |
| * F842    | KB000760 | FUSE T3.15A 250V(R)             |
| * F842    | KB002980 | FUSE T2.5A 250V(HWL)            |
| * G841    | VR463400 | TERM. GND $\phi$ 3.5 TP00385    |
| IC701     | XB247301 | IC $\mu$ PC4570HA               |
| IC702     | XB247301 | IC $\mu$ PC4570HA               |
| IC703     | XB247301 | IC $\mu$ PC4570HA               |
| IC704     | XE536001 | IC LC7535                       |
| IC705     | XB247301 | IC $\mu$ PC4570HA               |
| IC706     | XB247301 | IC $\mu$ PC4570HA               |
| IC707     | XE536001 | IC LC7535                       |
| IC708     | XB247301 | IC $\mu$ PC4570HA               |
| IC709     | XF494A00 | IC LB1641                       |
| IC751     | XM356A00 | IC NJM2068LD                    |
| IC752     | iG077400 | IC NJM4556S                     |
| * JK821   | VR406200 | JACK. DIN 1P                    |
| * JK822   | VR406100 | JACK. PHONE                     |
| * PJ821   | VR406000 | JACK. PIN 3P                    |
| PJ871     | VM725800 | JACK. PIN 4P(ABHWL)             |
| PJ872     | VK437600 | JACK. PIN 1P(ABHWL)             |
| Q701      | VK432900 | TR 2SD1915F S,T                 |
| Q702      | VK432900 | TR 2SD1915F S,T                 |
| Q703      | VK432900 | TR 2SD1915F S,T                 |
| Q751      | VK432900 | TR 2SD1915F S,T                 |
| Q752      | VK432900 | TR 2SD1915F S,T                 |
| Q801      | VP602500 | TR. DGT DTC143XL                |

\* New Parts

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

\* New Parts

- 1
- 2
- 3
- 4
- 5
- 6



■ MECHANICAL PARTS

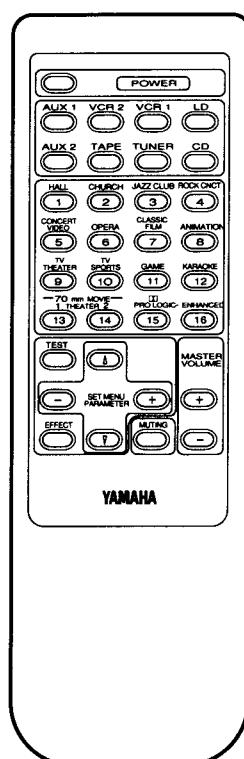
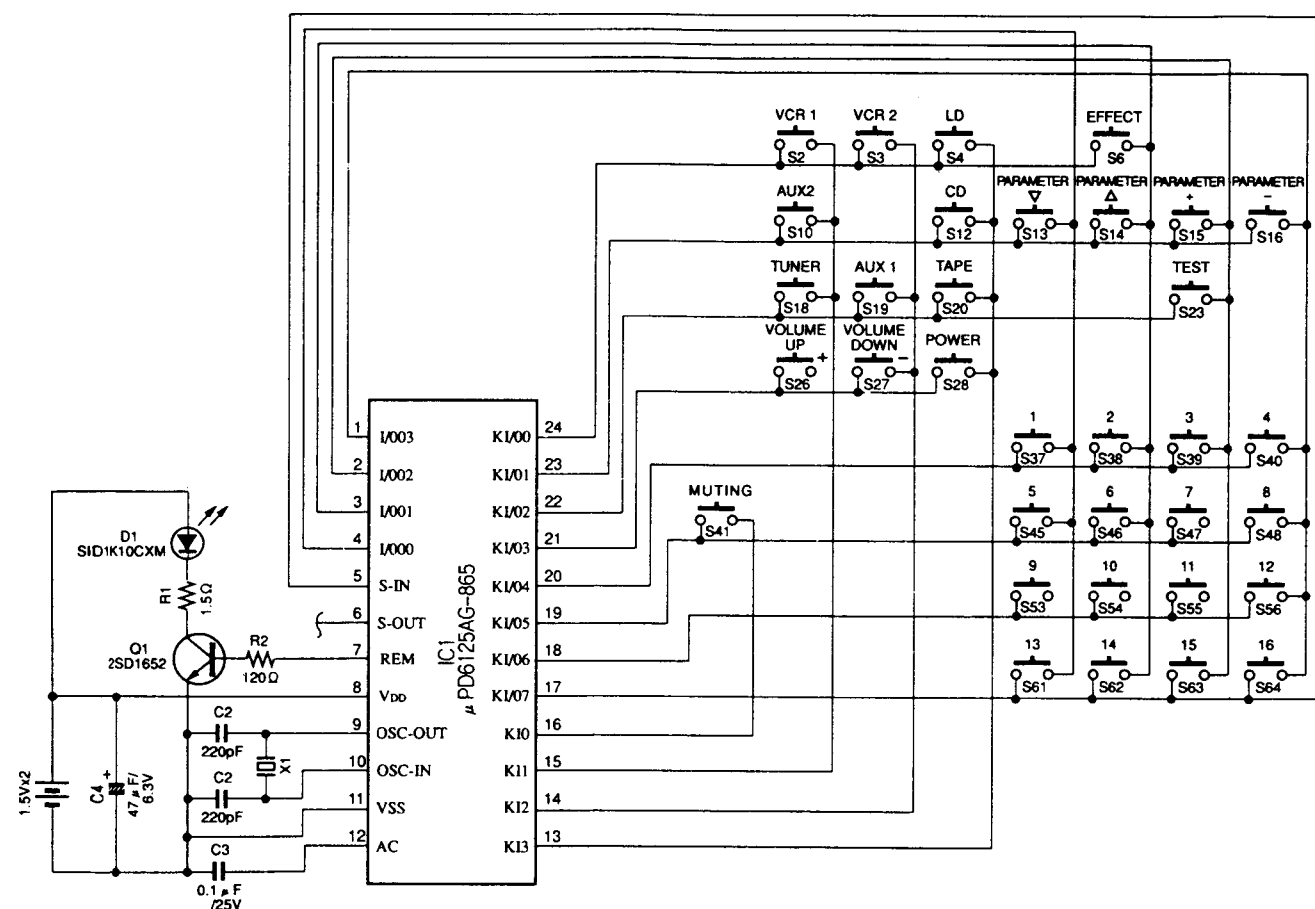
| Ref. No. | PART NO. | Description                  | Remarks        | Markets           |
|----------|----------|------------------------------|----------------|-------------------|
| * 1- 1   | VR057200 | FRONT PANEL                  |                | (HWL)             |
| * 1- 1   | VR071500 | FRONT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

\* New Parts

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

\* New Parts

### ■ SCHEMATIC DIAGRAM



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

## Parts List for Carbon Resistors

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

**1/4W Type**

HJ35 ○○○○

← 10mm →

**1/6W Type**

HF85 ○○○○

← 5mm →