

# PCM-F1

*US Model  
Canadian Model  
AEP Model  
UK Model*




## DIGITAL AUDIO PROCESSOR


### SPECIFICATIONS

Signal system	Conforms to EIA television standard, NTSC color (NTSC system) or Conforms to CCIR television standard, PAL/SECAM color (PAL/SECAM system)
Code format	Conforms to the technical specifications of the EIAJ (standard format using 14-bit quantization), or 16-bit quantization format
Number of audio channels	2 channels
Sampling frequency	44,056 Hz (NTSC system) or 44,100 Hz (PAL/SECAM system)
Quantization	14-bit linear quantizing, or 16-bit linear quantizing
Frequency response	10-20,000 Hz $\pm 0.5$ dB
Harmonic distortion	Less than 0.007% (14-bit format) Less than 0.005% (16-bit format)
Dynamic range	More than 86 dB (14-bit format) More than 90 dB (16-bit format)
Channel separation	More than 80 dB
Wow and flutter	Below measurable limit
Error correction	Error correction and concealment using CRCC and parity
Emphasis	Pre-emphasis (in recording): fixed at ON De-emphasis (in playback): automatically switched to ON or OFF (by detecting pre-emphasis identification code) Time-constant: 50 $\mu$ sec, 15 $\mu$ sec

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

### ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE  SUR LES DIAGRAMMES SCHEMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

— Continued on page 2 —



# SONY®

## SERVICE MANUAL

# PCM-F1

## Inputs

	Type	Reference input level	Impedance	Minimum input level
MIC	Phone	—	Accepts low impedance microphones.	0.435 mV (-65 dB)
LINE IN	Phono	-10 dB*	40 kilohms	95 mV (-18 dB)
VIDEO IN	Phono	1 Vp-p	75 ohms	—

## Outputs

	Type	Reference output level	Load impedance
LINE OUT	Phono	-10 dB**	More than 10 kilohms
VIDEO OUT	Phono	1 Vp-p	75 ohms
COPY OUT	Phono	1 Vp-p	75 ohms
HEADPHONES	Stereo phone	-24 to -48 dB Attenuation: 5 steps (24, 18, 12, 6 and 0 dB)	Accepts low impedance headphones.

\* Input level when the peak program meters deflect to -15 dB.

\*\* Output level when the playback level is -15 dB as shown by the peak program meters.

## General

**Power requirements** Operating voltage: 12 V dc  
 Usable power sources:  
 12 V dc with the Sony NP-1 rechargeable battery pack (optional)  
 US, Canadian model:  
 120 V ac, 60 Hz with the supplied AC-700 ac power adaptor  
 AEP model:  
 220 V ac (or 240 V ac adjustable by authorized Sony personnel), 50 Hz with the supplied AC-700 ac power adaptor  
 UK model:  
 240 V ac (or 220 V ac adjustable by authorized Sony personnel), 50 Hz with the supplied AC-700 ac power adaptor  
 US, Canadian model:  
 12 V car battery with the Sony DCC-2400B car battery cord (optional)  
 AEP, UK model:  
 12 V car battery with the Sony DCC-2500 car battery cord (optional)

**Power consumption** 17 watts dc  
**Dimensions** PCM-F1: Approx. 215 × 80 × 305 mm (w/h/d)  
 (8½ × 3¼ × 12⅛ inches)  
 AC-700: Approx. 107 × 80 × 305 mm (w/h/d)  
 (4¼ × 3¼ × 12⅛ inches)  
 not including projecting parts and controls  
**Weight** PCM-F1: Approx. 4 kg (8 lbs 13 oz) net  
 AC-700: Approx. 3.2 kg (7 lbs 1 oz) net  
**Total weight** Approx. 8.1 kg (17 lbs 14 oz) in shipping carton, including PCM-F1 and AC-700

**FEATURES**

In conventional analog recording systems, the quality of sound reproduction depends upon the properties of magnetic tape and heads, so that it is virtually impossible to bypass the inherent limitations of conventional analog recording, including its limited dynamic range and frequency response, and its associated distortion.

The Pulse Code Modulation (PCM) system points the way to a new era in sound reproduction. It can offer performance and fidelity far superior to any analog system.

In the PCM system, sound levels are converted to a series of binary codes. This information is recorded as digital pulses of equal amplitude. In playback, all that has to be done is to discriminate between the presence and absence of a pulse. The quality of recording and playback is thus not dependent on the characteristics of tape and heads.

The PCM-F1 is the newest addition to Sony's line of PCM digital audio processors for consumer applications. With the PCM-F1, hi-fi sound reproduction with wide dynamic range, minimal distortion, low wow and flutter (lower than the measurable limit), and flat frequency response is achieved. Listening to the reproduction of your PCM-F1 is just like being in the concert hall.

**Compact, lightweight PCM digital audio processor**

In conventional digital audio processors, several hundreds of ICs are employed in digital processing circuitry, which makes it difficult to make the unit compact and lightweight.

The three new LSIs for digital processing developed especially for digital audio processor use have successfully made the PCM-F1 compact and lightweight. The A/D (analog-to-digital) and D/A (digital-to-analog) converters, which are newly developed monolithic ICs, are especially adaptable to mass production. This results in the production of a PCM digital audio processor that is more affordable to a greater proportion of audio-philes.

**Resolution selector for recording and playback with wider dynamic range and less distortion**

The PCM-F1 was developed in accordance with the technical specifications of the Electronic Industries Association of Japan (EIAJ), which has adopted the 14-bit linear quantization format. In addition, the unit has the capability of recording and playing back in accordance with the 16-bit linear quantization format with wider dynamic range and less distortion than the 14-bit format. The 14-bit and 16-bit formats can be selected with the RES (resolution) selector.

**Three different power sources**

The unit can be operated on three different power sources: house current using the supplied ac power adaptor, optional rechargeable battery pack, and 12 V car battery using an optional car battery cord. When this compact, lightweight PCM-F1 is combined with the Sony SL-2000 or Sony SL-F1 series portable video cassette recorder, you can make a live field recording with wide dynamic range, minimal distortion, and flat frequency response.

**Stable power supply**

Two dc-to-dc converters incorporated in the unit—one ( $\pm 5$  V) for the digital circuitry and the other ( $\pm 15$  V) for the analog circuitry—assure stable power supply.

**Easy tracking adjustment of video heads**

Correct tracking adjustment of the video heads can be easily performed by observing a meter.

**Muting switch for continuous sound reproduction**

With the MUTING switch set to OFF, the reproduced sound is not cut off even if many dropouts occur, or if the tape is not being transported at the proper playback speed.

**Record muting function** allows you to easily insert a blank space between selections.

**Multi-generation digital-to-digital tape copy** can be performed with absolutely no deterioration in signal quality.

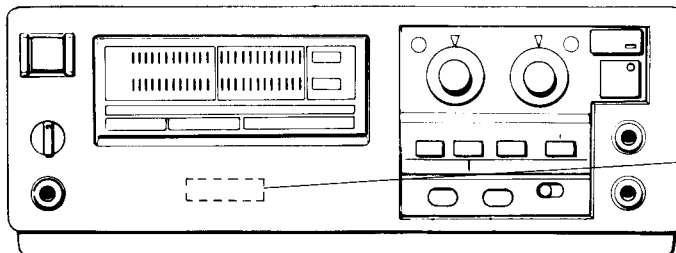
**With the highly perfected error detection and correction circuits incorporated**, the reproduced sound quality is not affected by dropout errors.

**You can choose either of two ways to have the peak level indicated on the LED peak program meters.**

**Microphone head amplifiers** are incorporated for recording directly from microphones and provide excellent sound quality.

**SIGNAL SYSTEM IDENTIFICATION**

*Front panel*

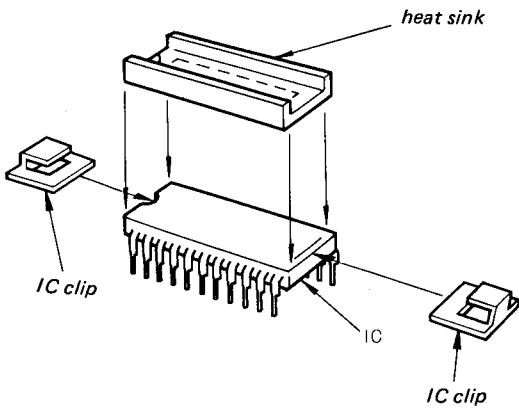


NTSC System: (no lettering)  
PAL/SECAM System: PAL/SECAM

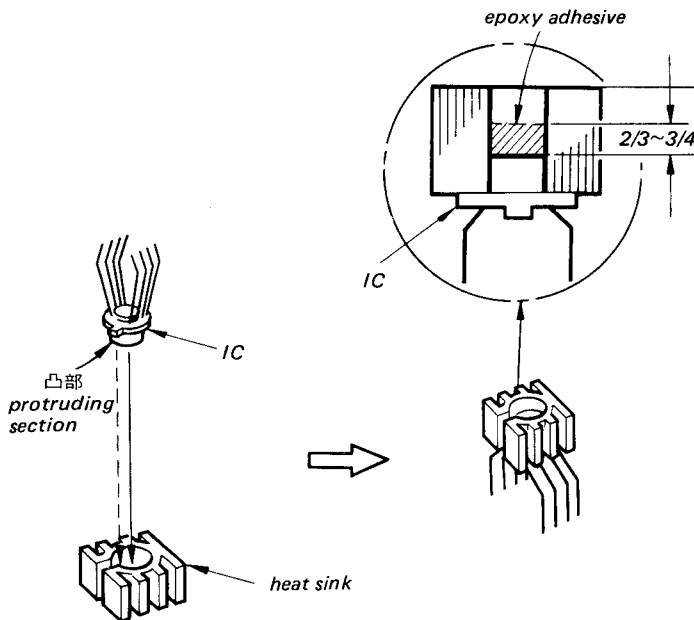
## SERVICING NOTE

### Notes on IC, Transistor Replacement

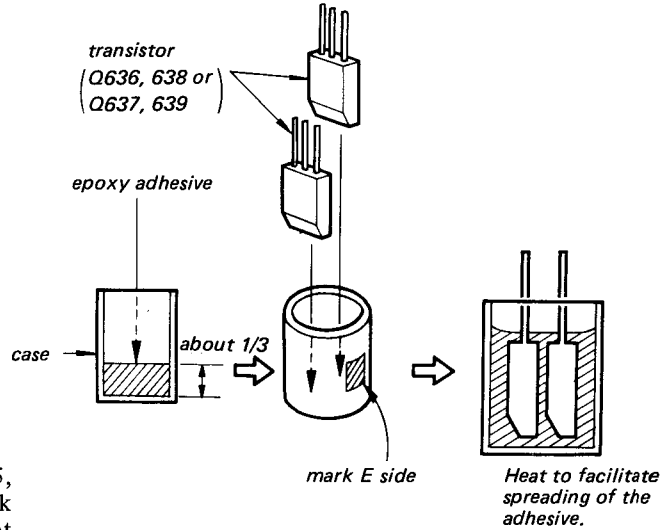
●When replacing IC104, 204, 304, 505, first clean the top of the IC and the bottom of the heat sink with alcohol, then apply an epoxy type adhesive\* to the heat sink with IC clip, as shown in the illustration below.



●When replacing IC102, 103, 105, 108, 202, 203, 205, 208, first clean the IC head and the inside of the heat sink with alcohol, then mount the heat sink and fill the heat sink indented portion with an epoxy type adhesive\*, as shown in the illustration below.



●When replacing Q636, 638, Q637, 639, fill the case as shown in the diagram with an epoxy type adhesive\* and insert the transistor.



\* Epoxy type adhesive: Sony bond SC1000 or other quick drying 2 liquid compound.

REPAIR METHOD FOR HYBRID CIRCUIT BLOCK

Using nippers, cut off the upper portion of the insulating cover about 1 mm, exposing the top of the connecting brackets.

Open insulating cover out to remove.

Cut off the lead of the defective part with nippers. Remove solder and take out the defective part.

Insert the new part on the board and solder the lead to the board. Cut off the lead on the connecting bracket side so that it overlaps by about 0.5 mm, and solder to the connecting bracket.

After soldering, cut off to match other leads.

Open the insulating cover groove about 0.7 mm and place over the connecting brackets, positioning one end first.

Insulating Cover Part No.:	
	3-677-012-01    3-677-012-11
A	3.4 mm    2.2 mm
B	2.6 mm    1.8 mm

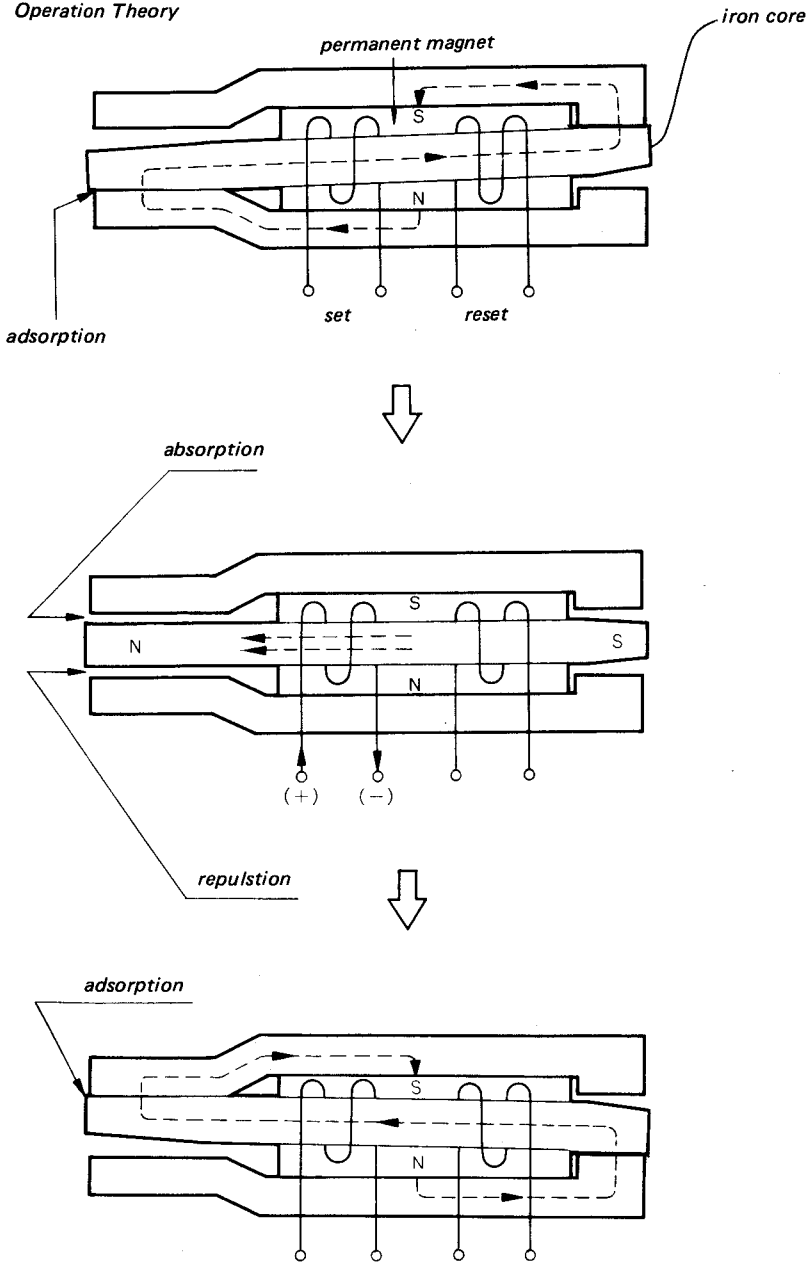
Open about 0.7 mm.

## Latching Type Relay

RL301, 601, 602 use a latching type relay. This relay has two exciting coils, set and reset, and a permanent magnet, so by exciting each coil momentarily, set or reset state is maintained.

A normal relay (hinge type) is driven only by the coil magnetomotive force, whereas the latching type relay uses the permanent magnet energy, resulting in low energy consumption and excellent anti-vibration and anti-shock characteristics.

### Operation Theory



Reset state is shown. The iron core adsorbs in order to form the permanent magnet magnetic circuit.

Set coil excited. Iron core operates by electromagnetic force.

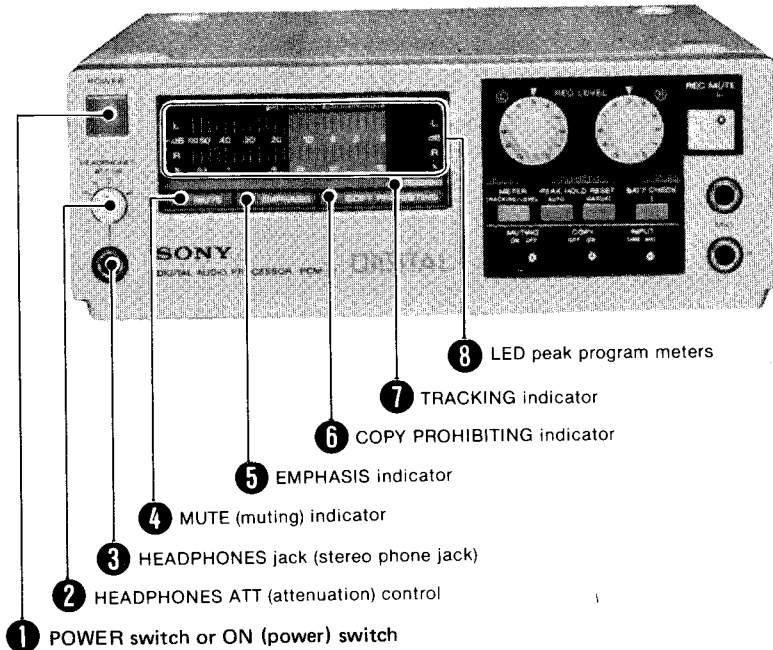
Set state is shown. The permanent magnet magnetic circuit is formed again, and iron core is adsorbed.

## SECTION 1 OUTLINE

### LOCATION AND FUNCTION OF CONTROLS

Before plugging in or attempting to operate the unit, we suggest that you familiarize yourself with all its switches and controls. Each number in the photo is keyed to the descriptive text.

#### FRONT PANEL



#### ❶ POWER switch or ON (power) switch

Press to turn on the power. The LED peak program meters will illuminate. To turn the power off, press the switch again.

#### ❷ HEADPHONES ATT (attenuation) control

This control adjusts the volume at the headphones. At the "0" position, the rated output is obtained. When this control is set to the "6" position, the level is reduced by 6 dB, and by setting it to "12", "18" or "24", the level is reduced by that amount of decibels from the rated output obtained at the "0" position.

#### ❸ HEADPHONES jack (stereo phone jack)

Headphones may be inserted either to monitor the input signals to be recorded or to listen to a recording in the playback mode.

#### ❹ MUTE (muting) indicator

If the video cassette recorder is not transporting tape at the proper playback speed (for example, when the tape first begins to move), or if many dropouts occur, this indicator will light up. When the indicator lights up with the MUTING switch set to ON, the muting circuit will activate.

#### ❺ EMPHASIS indicator

When recording and playback are made with this unit, the emphasis circuit incorporated in the unit activates during recording (pre-emphasis) and playback (de-emphasis) and the EMPHASIS indicator illuminates.

When a tape recorded without pre-emphasis with a PCM digital audio processor other than this unit is played back with this unit, the EMPHASIS indicator will not illuminate.

#### ❻ COPY PROHIBITING indicator

When a tape with a tape copy prohibiting code is played back, this indicator will light up to show that a digital tape copy cannot be made.

#### ❼ TRACKING indicator

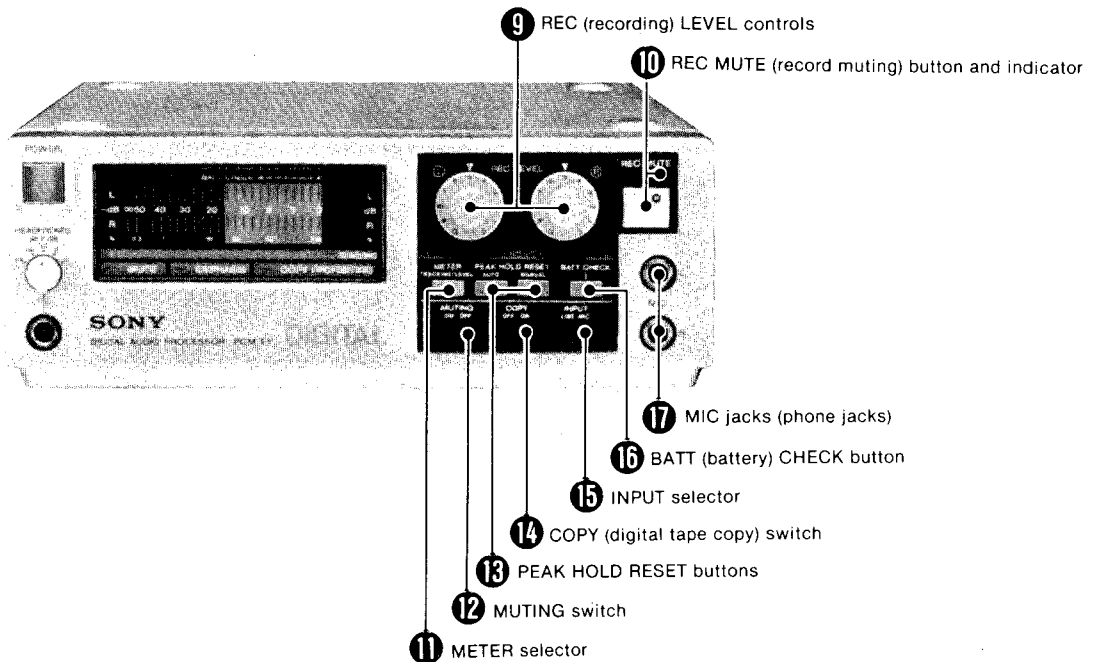
When you press the METER selector, the lower LED peak program meter will be changed to a tracking meter, and the TRACKING indicator will light up.

#### ❽ LED peak program meters

These meters show the peak input level of each channel during recording, and the recorded level during playback. They follow the transient peaks of high-level inputs that are too brief to be followed by conventional VU meters so that the optimum recording level can be accurately set. For easy reading, the meters hold the highest peak while indicating the varying levels lower than the peak.

While the BATT CHECK button is kept depressed, the upper meter for the left (L) channel shows the battery pack condition.

When the METER selector is pressed, the lower meter for the right (R) channel shows the tracking condition of the video cassette recorder.



## 9 REC (recording) LEVEL controls

These controls adjust the recording level. The left knob is for the left channel and the right knob for the right channel.

## 10 REC MUTE (record muting) button and indicator

Keep this button depressed to eliminate unwanted material and to insert a blank space during recording. While the button is kept depressed, the REC MUTE indicator will illuminate.

## 11 METER selector

Press to turn the LED peak program meters into a tracking meter. Each time the selector is pressed, the function of the meter will change.

## 12 MUTING switch

Normally set this switch to ON.

If the video cassette recorder is not transporting tape at the proper playback speed, or if many dropouts occur due to the mistracking of the video heads of the video cassette recorder, or due to scratches and dusts on the magnetic tape, the muting circuit will activate and the reproduced sound will be cut off.

If you do not want the reproduced sound to be cut off by the muting circuit, set the switch to OFF.

## 13 PEAK HOLD RESET buttons

You can choose either of two ways to have the peak level indicated: **When the AUTO button is pressed**, successive peaks are held for about 1.7 seconds, except when a higher peak occurs before 1.7 seconds have passed, in which case that peak is immediately indicated. **When the power is first turned on**, the AUTO peak indication mode will automatically operate.

**When the MANUAL button is pressed**, the peak level will be held on the scale until a higher peak occurs, and that peak will be held. To reset the peak held on the meter, just press this button. You will find this method of indicating the peak input useful when you want to know the highest peak of a tape or disc, or when you want to know both the highest peak as well as the intermittent input levels during live recording.

## 14 COPY (digital tape copy) switch

Set this switch to ON for digital-to-digital tape copy, with absolutely no deterioration in signal quality, using a pair of video cassette recorders and the COPY OUT jack at the rear.

**Be sure to set this switch to OFF except during digital tape copy.** With this switch set at the ON position, no signal is obtained at the VIDEO OUT jack.

## 15 INPUT selector

LINE: to record through the LINE IN jacks at the rear.

MIC: to record through the MIC jacks.

## 16 BATT (battery) CHECK button

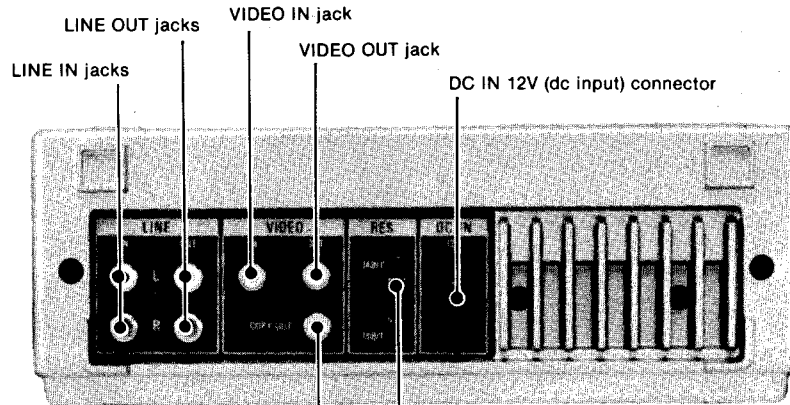
While this button is kept depressed, the upper meter shows the battery pack condition.

## 17 MIC jacks (phone jacks)

Any low-impedance microphone equipped with a phone plug may be used. If your microphone is equipped with a mini plug, you will need a plug adaptor.



REAR PANEL



**COPY OUT (tape copy output) jack**

To perform digital-to-digital tape copy, connect this jack with the video input jack of the video cassette recorder for recording so that when the COPY switch is set to ON, playback signals in which errors are corrected and/or concealed are obtained.

**Be sure not to use this jack except during digital tape copy.** Normal recording and playback cannot be performed using this jack.

**RES (resolution) selector**

Selects the resolution for recording.

**14 BIT:** for recording in accordance with the technical specifications of the Electronic Industries Association of Japan (EIAJ) which has adopted the 14-bit linear quantization format.

Set the selector to this position when the tape recorded with this unit is to be played back using another PCM digital audio processor which conforms to the 14-bit quantization format of the EIAJ.

**16 BIT:** for recording and playing back using this unit with a wider dynamic range and less distortion.

Normally set the selector to this position.

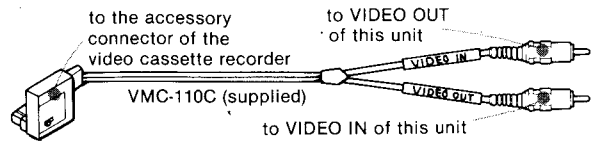
During playback, it is not necessary to select the position of this selector, since the 14-bit or 16-bit format used for recording is automatically selected.

## SYSTEM CONNECTIONS

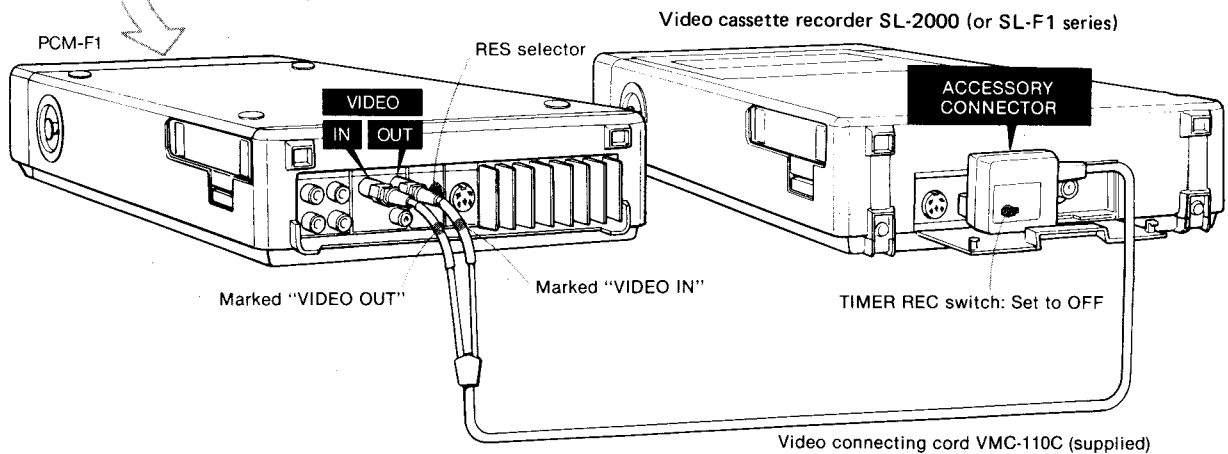
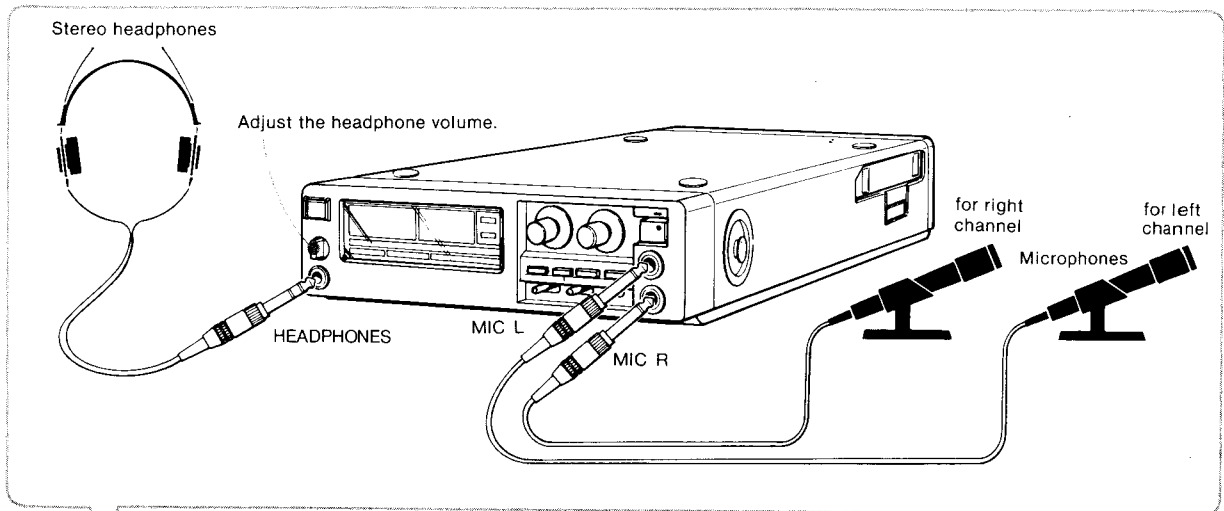
### CONNECTION NOTES

- Turn off the amplifier before making connections.
- The supplied connecting cords with red and white plugs are for audio signals, and those with yellow plugs are for video signals.
- Be sure to connect the red plug of the supplied audio connecting cord to the right-channel [R] jack and the white plug to the left-channel [L] jack.
- To connect the unit with the Sony SL-2000 (or SL-F1 series) video cassette recorder, use the supplied VMC-110C video connecting cord. To connect the unit with a video cassette recorder other than the SL-2000 (or SL-F1 series), use the supplied VMC-1S video connecting cords with phono plugs of the VMC-110C are labelled to with a BNC-type plug and phono plug).

The yellow plugs of the VMC-110C are labelled to indicate the signal flow. The plug labelled VIDEO IN should be connected to the VIDEO OUT jack of this unit and the one labelled VIDEO OUT to the VIDEO IN jack.



### CONNECTION WITH THE SONY SL-2000 (or SL-F1 SERIES) VIDEO CASSETTE RECORDER (FOR OUTDOOR LIVE RECORDING)

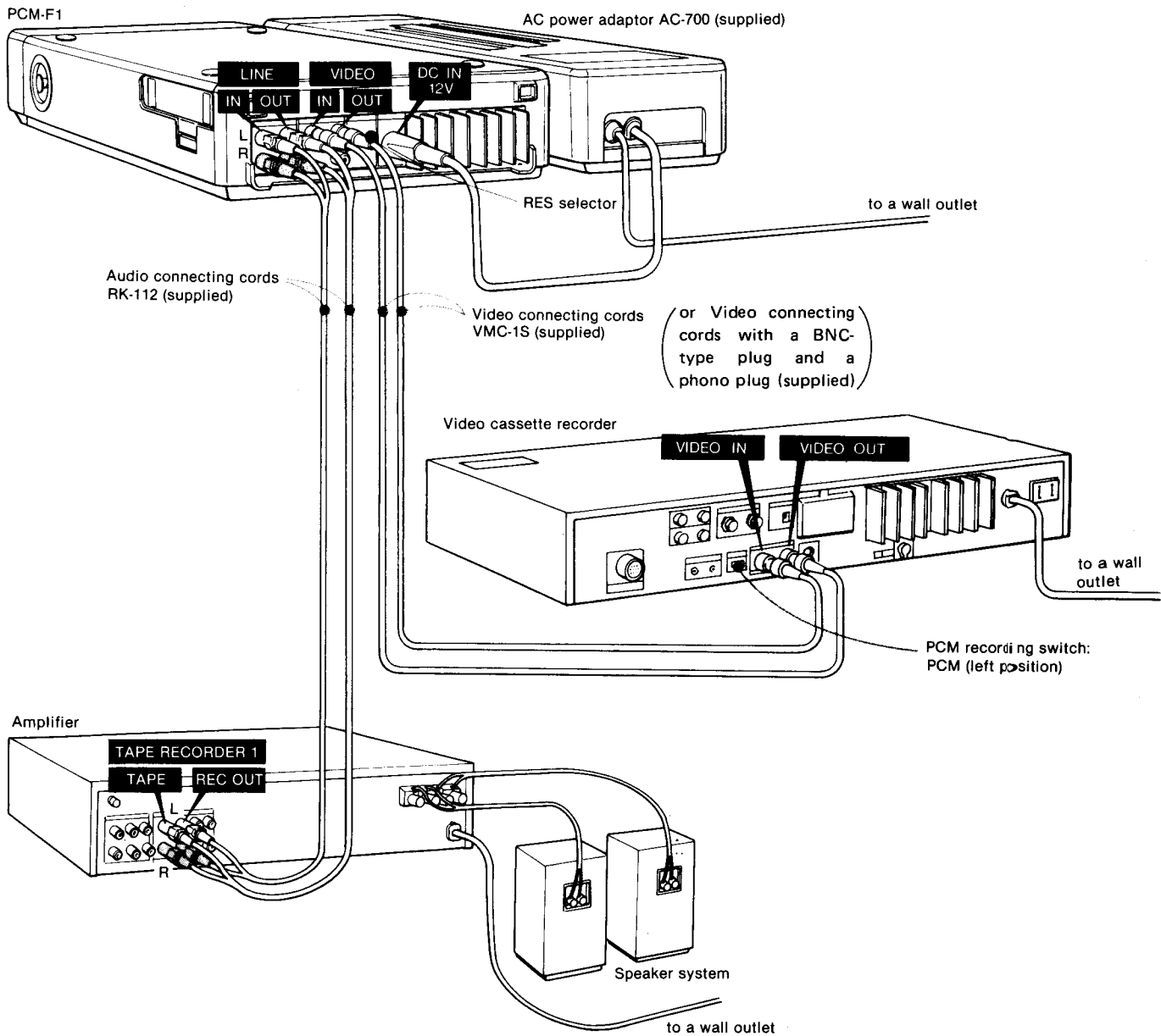


- Be sure to connect both the VIDEO IN and VIDEO OUT jacks to the video cassette recorder. If the VIDEO IN jack of this unit is not connected to the video output of the video cassette recorder, recording is possible but you cannot monitor the recording, and the peak program meters will not deflect.

- The cable connectors should be fully inserted into the jacks. A loose connection may cause hum and noise.
- Keep the connecting cords away from the power cords or speaker cords to avoid hum pick-up, and maintain a moderate separation between the connecting cords and any antenna lead-in to avoid possible noise pick-up. Keep the cables as short as practical.
- We recommend using the Sony SL-2000 (or SL-F1 series) portable video cassette recorder or any other Sony video cassette recorder.

- For detailed information about connections of the video cassette recorder and amplifier, refer to the instruction manual supplied with each unit.

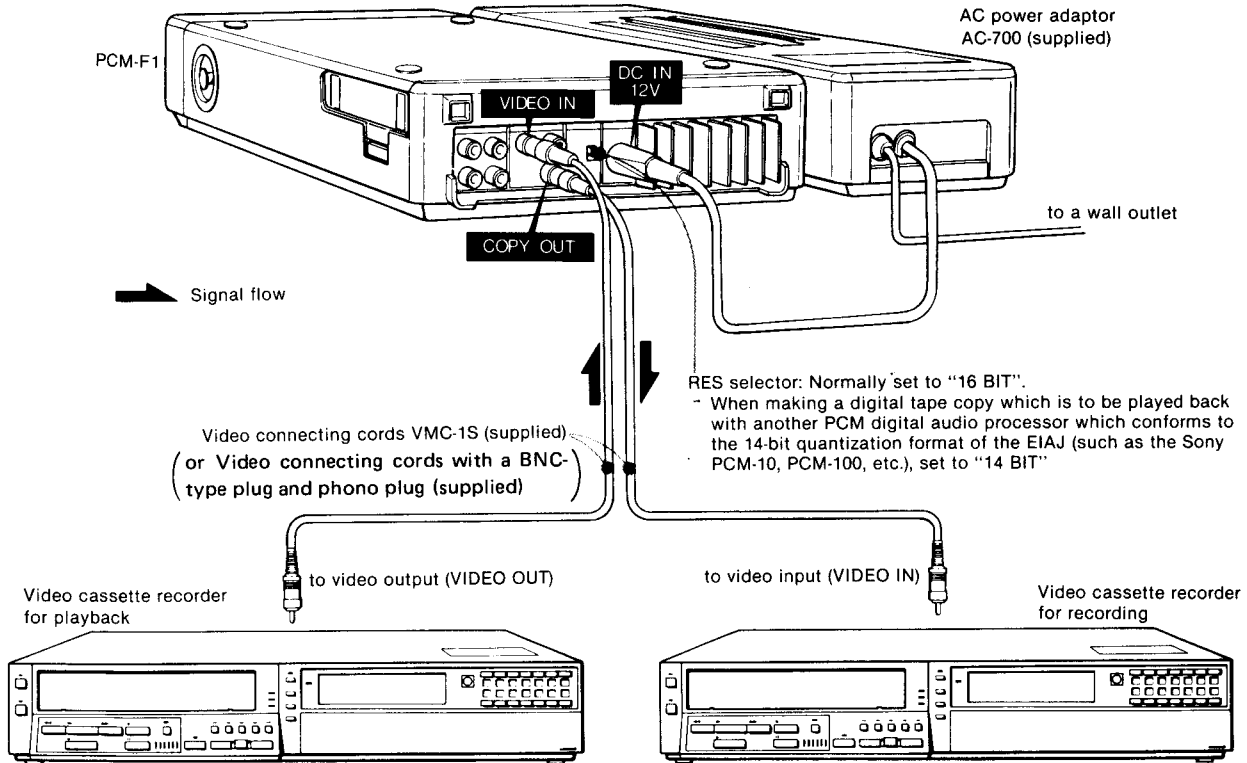
**CONNECTION WITH A VIDEO CASSETTE RECORDER OTHER THAN THE SL-2000 (or SL-F1 SERIES)**



## DIGITAL TAPE COPY

Using the COPY OUT jack of this unit and a pair of video cassette recorders, you can make digital-to-digital tape copy with absolutely no deterioration in signal quality.

### CONNECTION



### OPERATING PROCEDURE

- 1 Turn on the unit and video cassette recorders.
- 2 Insert a recorded tape into the video cassette recorder for playback and a blank tape into the video cassette recorder for recording.
- 3 Set the COPY switch of the PCM-F1 to ON.
- 4 Start the playback of the video cassette recorder for playback and the recording of the video cassette recorder for recording. Copying will begin.

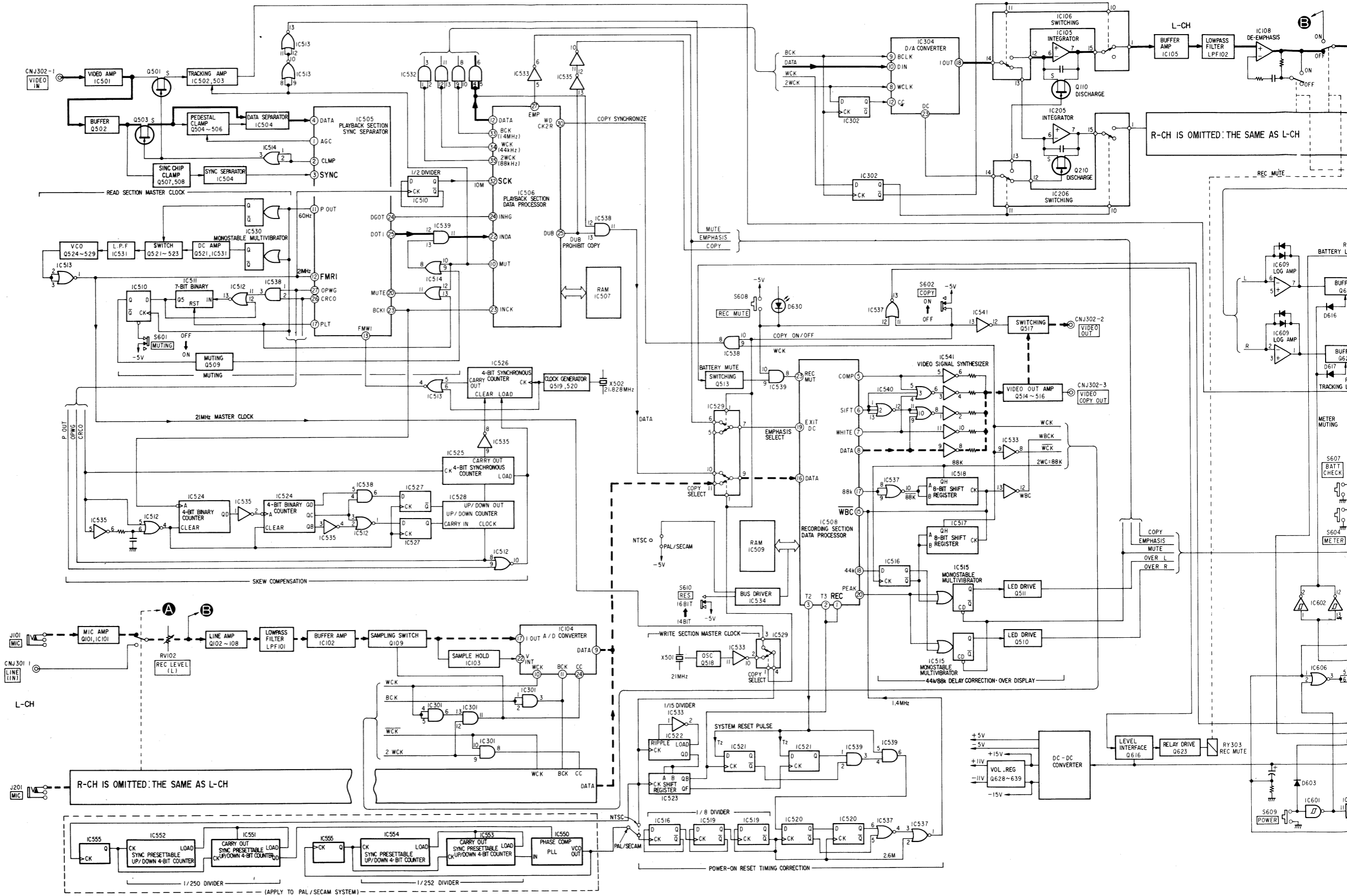
**After the tape copy has been completed, be sure to set the COPY switch to OFF.**

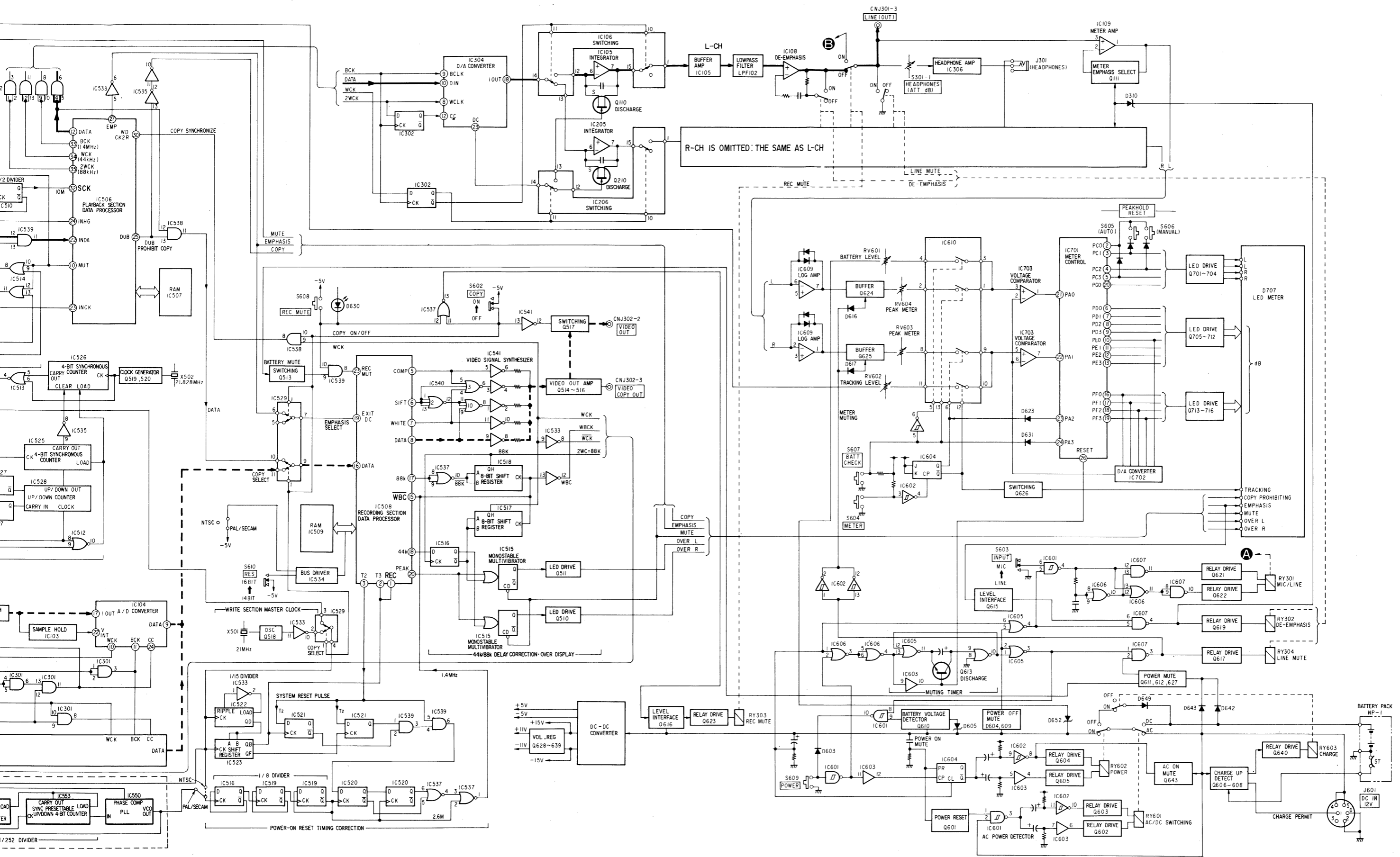
### Important points to remember

- The reproduced sound being monitored through the headphones or speakers with the COPY switch set to ON may be somewhat more distorted than when played back and monitored with the switch set to OFF. However, the tape will be copied with no deterioration in signal quality.
  - No recording level adjustment is necessary when making a digital-to-digital tape copy.
  - A tape on which the tape copy prohibiting code has been recorded cannot be duplicated. When such a tape is played back, the COPY PROHIBITING indicator will light up.
  - Be sure to set the COPY switch to ON for digital tape copy. Digital-to-digital tape copy cannot be performed with the COPY switch set to OFF.
- Do not move the COPY switch during tape copy or during normal recording and playback.

# PCM-F1 PCM-F1

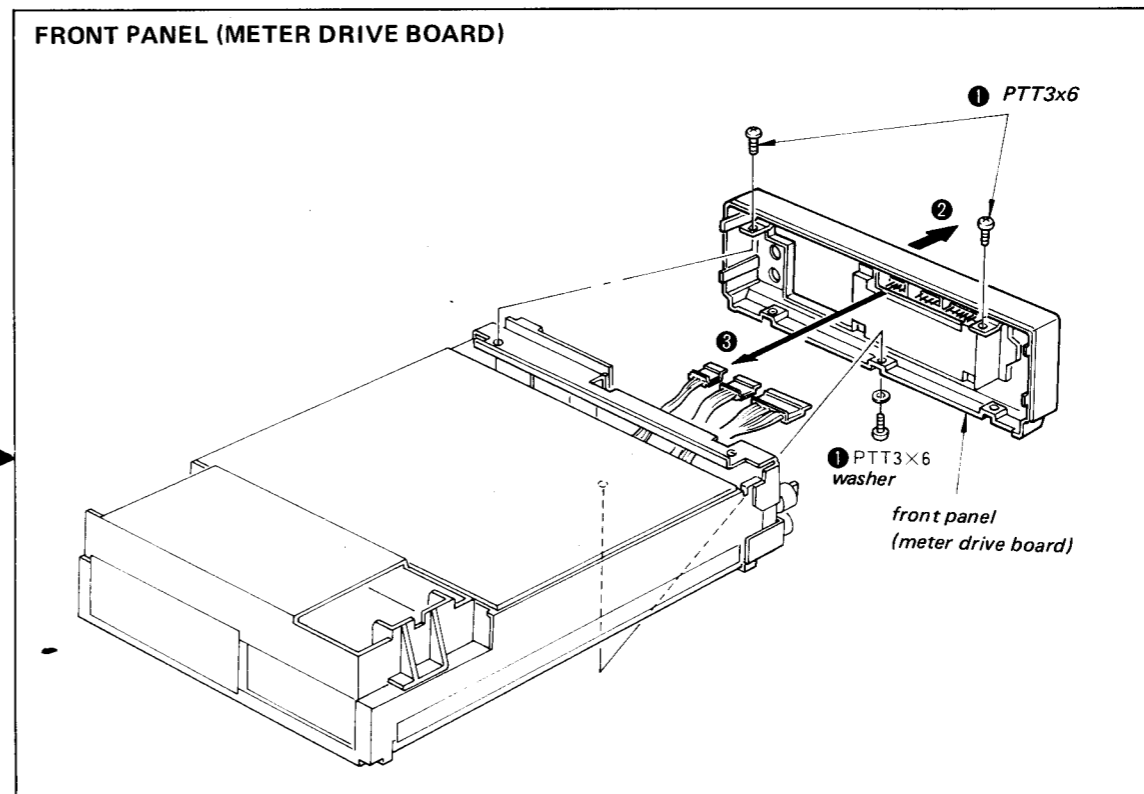
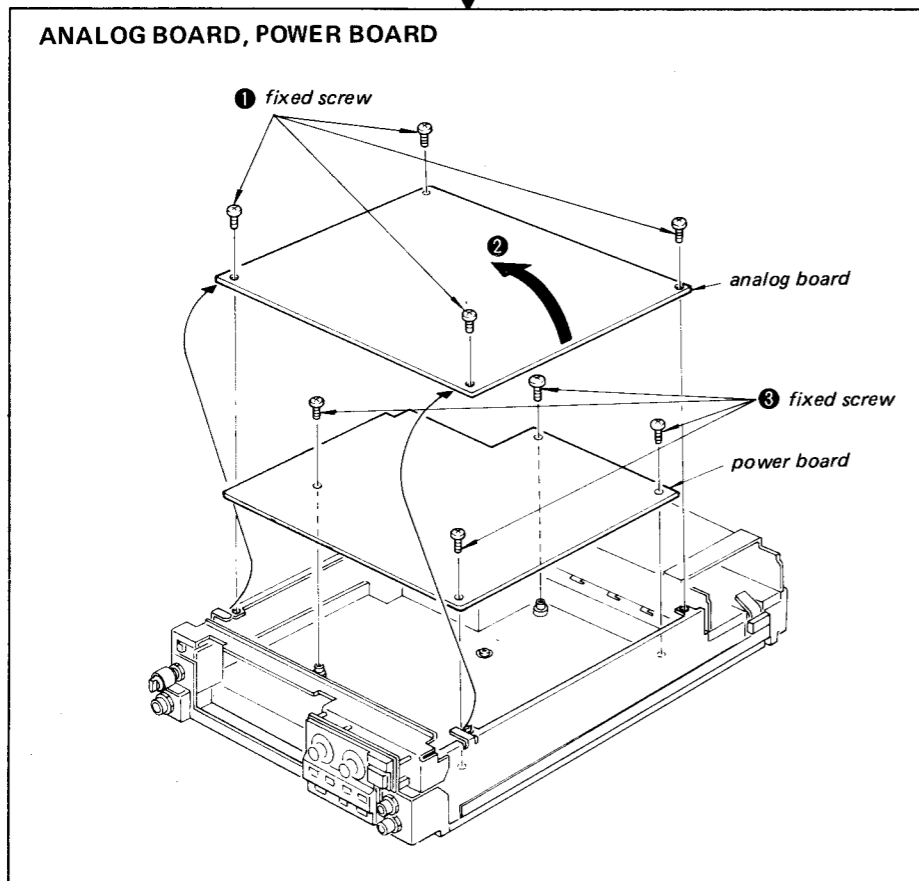
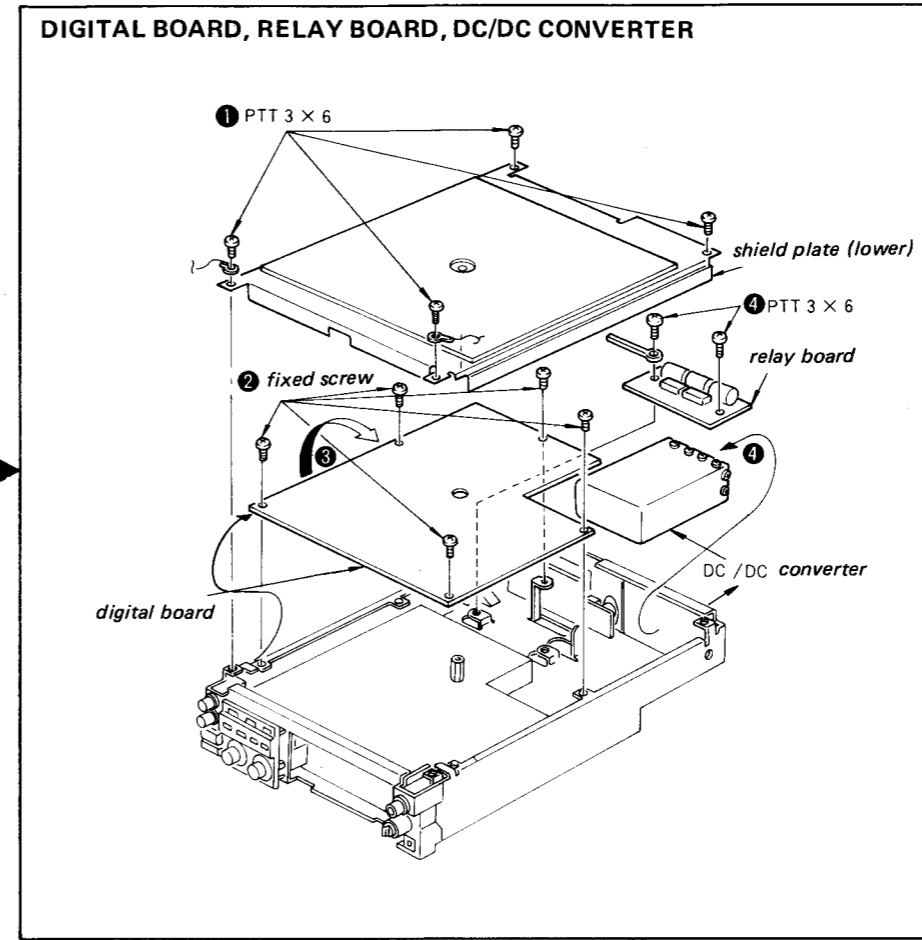
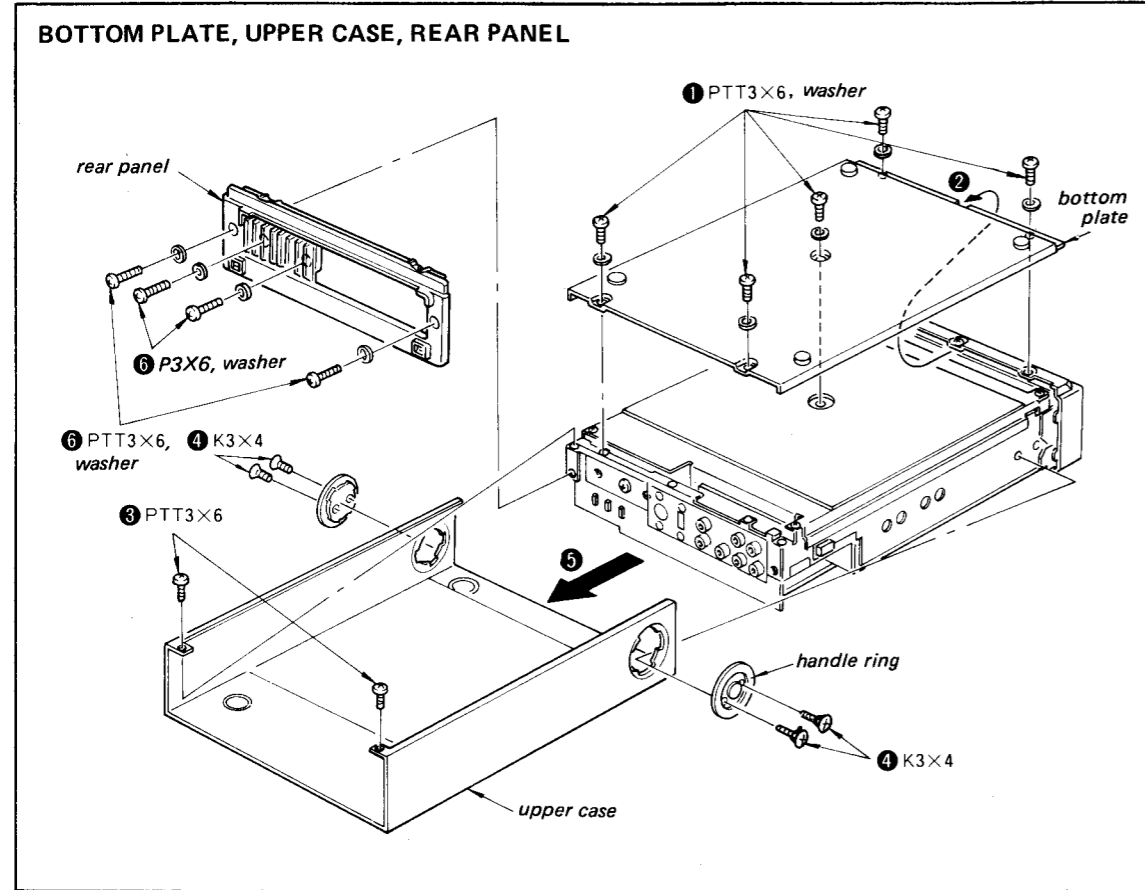
## BLOCK DIAGRAMS



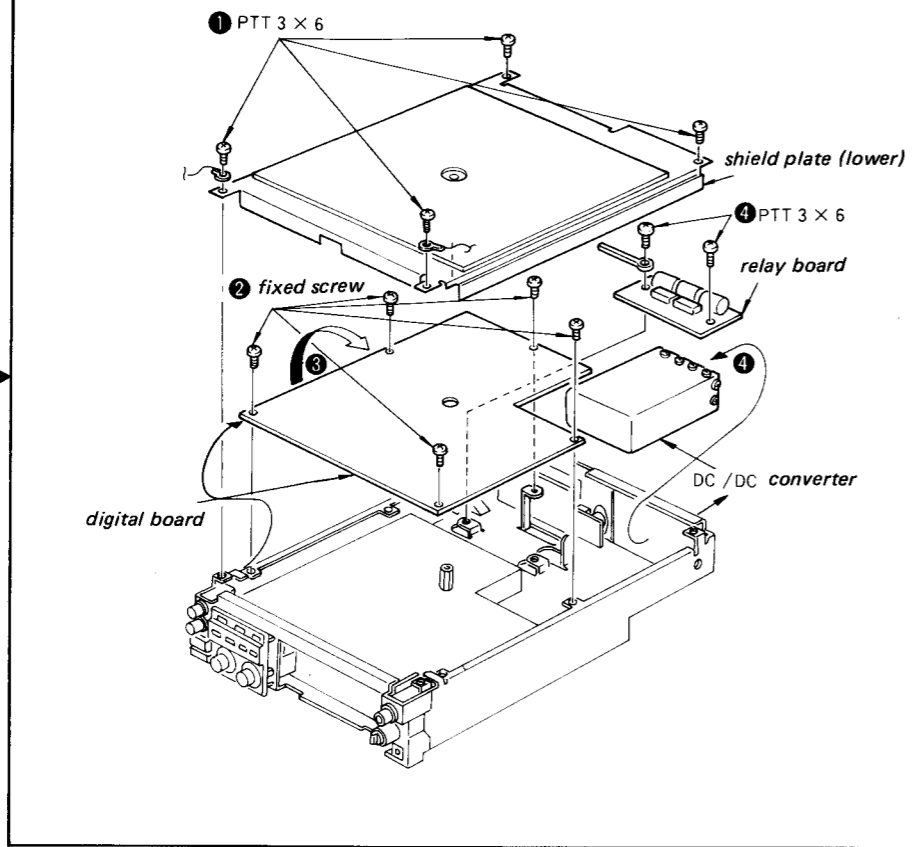


### SECTION 2 DISASSEMBLY

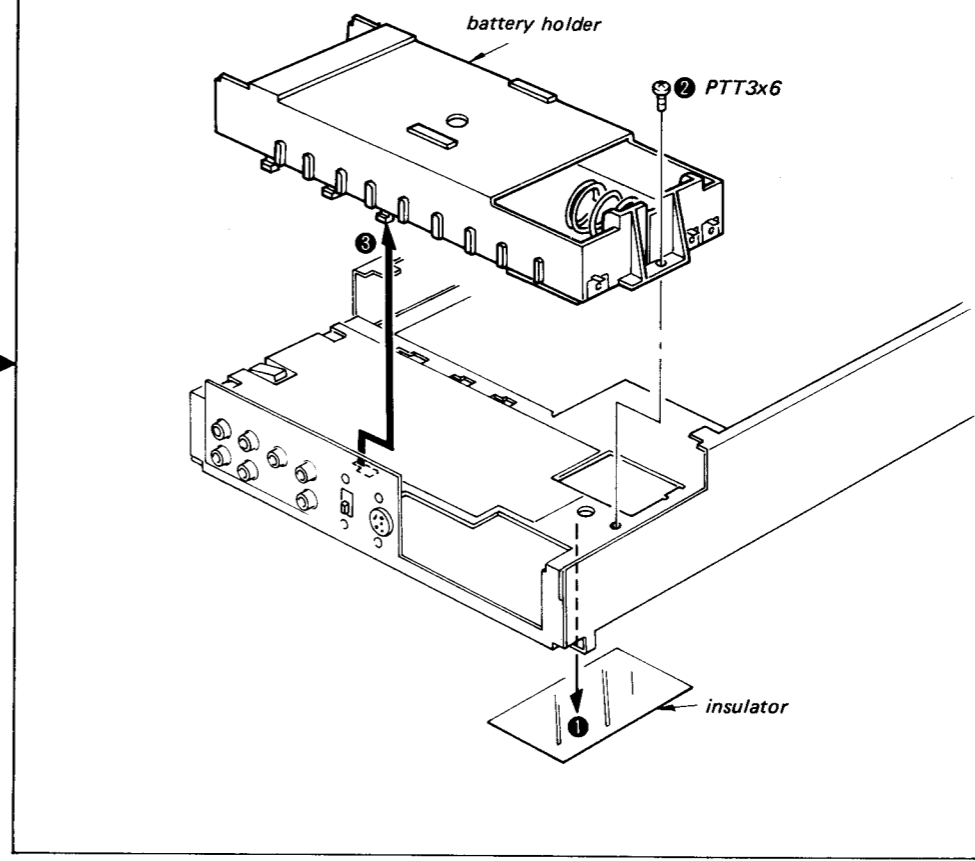
Note: Follow the disassembly procedure in the numerical order given.



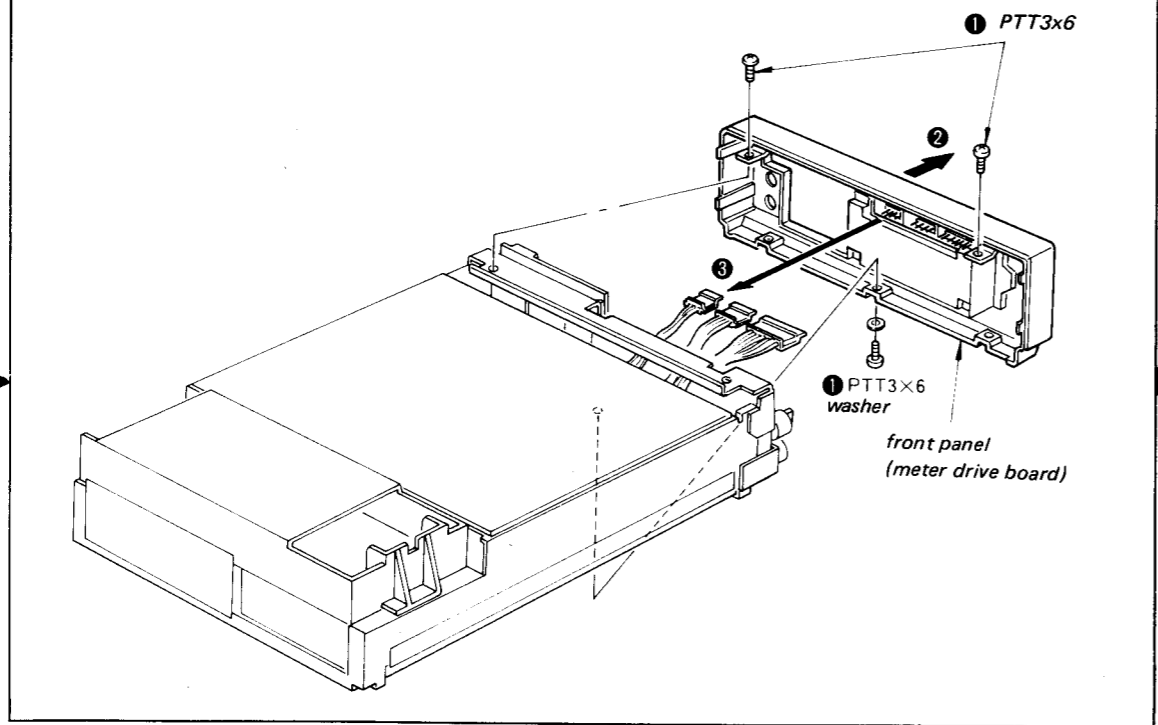
DIGITAL BOARD, RELAY BOARD, DC/DC CONVERTER



BATTERY HOLDER



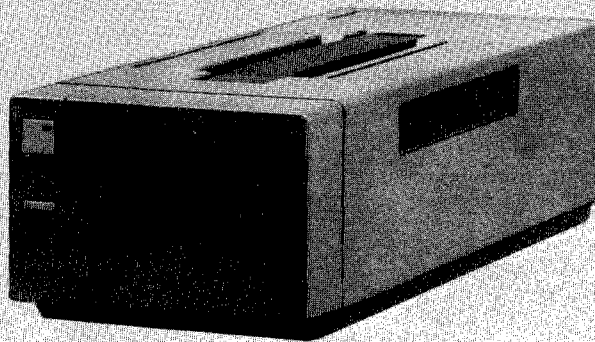
FRONT PANEL (METER DRIVE BOARD)





# AC-700

*US Model  
Canadian Model  
AEP Model  
UK Model*



## AC POWER ADAPTOR

### SPECIFICATIONS

<b>Power Requirements:</b>	US, Canadian Model ---- AC 120V ac, 60Hz AEP Model ----- AC 220V ac, 50/60Hz UK Model ----- 240V ac, 50/60Hz
<b>Rated Power:</b>	79W
<b>Output Voltage:</b> (with AC Power Adaptor)	DC 14V $\pm$ 5% (with rated power $\pm$ 10% input, 1.6A dc load)
<b>Output Current:</b> (at Charging mode)	DC 2.1A $\pm$ 10% (at battery voltage 10–16.5V)
<b>Dimensions:</b>	Approx. 107x80x305 mm (w/h/d) (4 $\frac{1}{4}$ x3 $\frac{1}{4}$ x12 $\frac{1}{8}$ inches)
<b>Weight:</b>	Approx. 3.2kg (7 lbs 1oz) net

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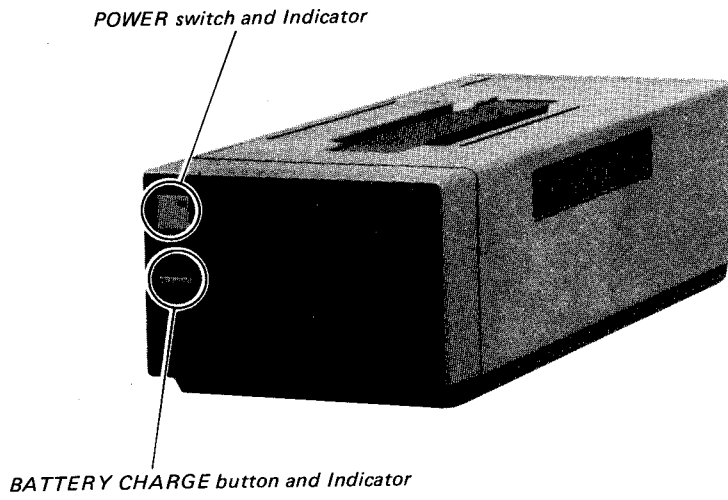
# SONY®

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# SERVICE MANUAL

# AC-700

## LOCATION



## SECTION 1 CIRCUIT DESCRIPTION

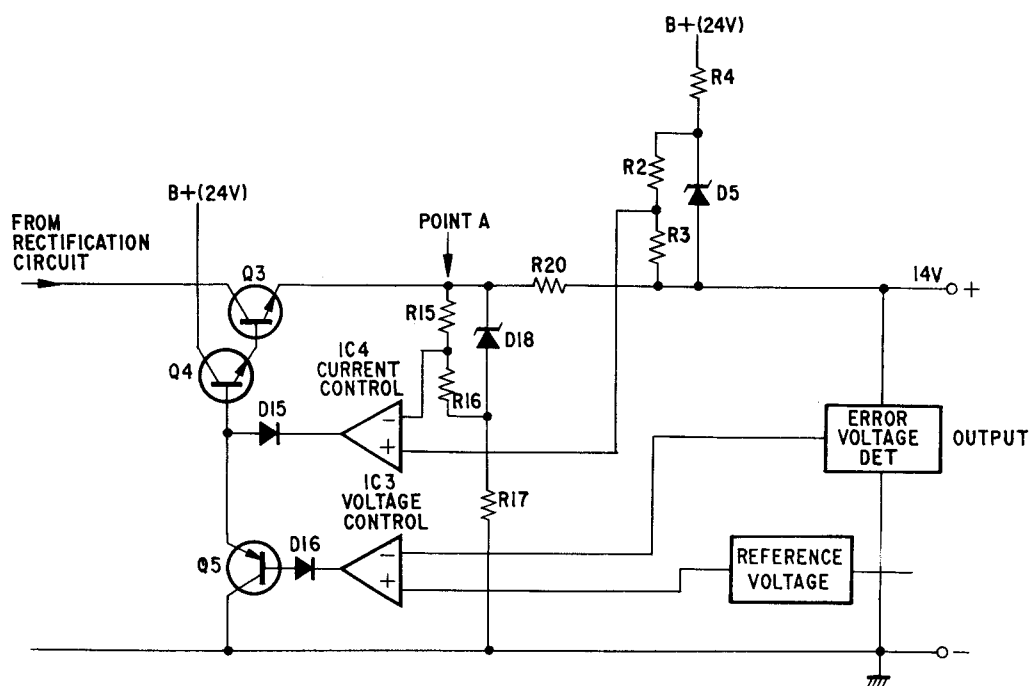
AC-700 is the ac power adaptor for PCM-F1 (digital audio processor). It also has the capability to charge the NP-1 rechargeable battery pack for PCM-F1.

### – AC Power Adaptor

Figure 1 is the voltage, current and control section circuit diagram for AC-700. When PCM-F1 is connected to AC-700 operating as an AC power adaptor, reference voltage and load voltage are compared by the voltage control op amp (IC3), which controls series transistor Q3 so that the load voltage becomes 14V regulated voltage.

If load current is less than 2.1A (1.6A is normal) the current control op amp IC4 uses point A as the reference, and because the noninverted input terminal is biased to the positive side and the inverted input terminal to the negative side, the output terminal goes high and D15 cuts off.

Therefore, IC4 does not affect the operation of series transistor Q3.



(Figure 1)

### – Charging

Figure 2 is a circuit diagram of the charging control section prepared for charging. When the BATTERY CHARGE button (SW2) is pushed, the charging control IC (IC2) trigger terminal is grounded, flip-flop is set and the output terminal goes high.

Then the CHARGE lamp (LED2) lights up, Q2 goes on and Q6 goes off.

There are two zener diodes, D20 (for AC power adaptor) and D21 (for charging) in the reference voltage circuit, which are switched by Q6.

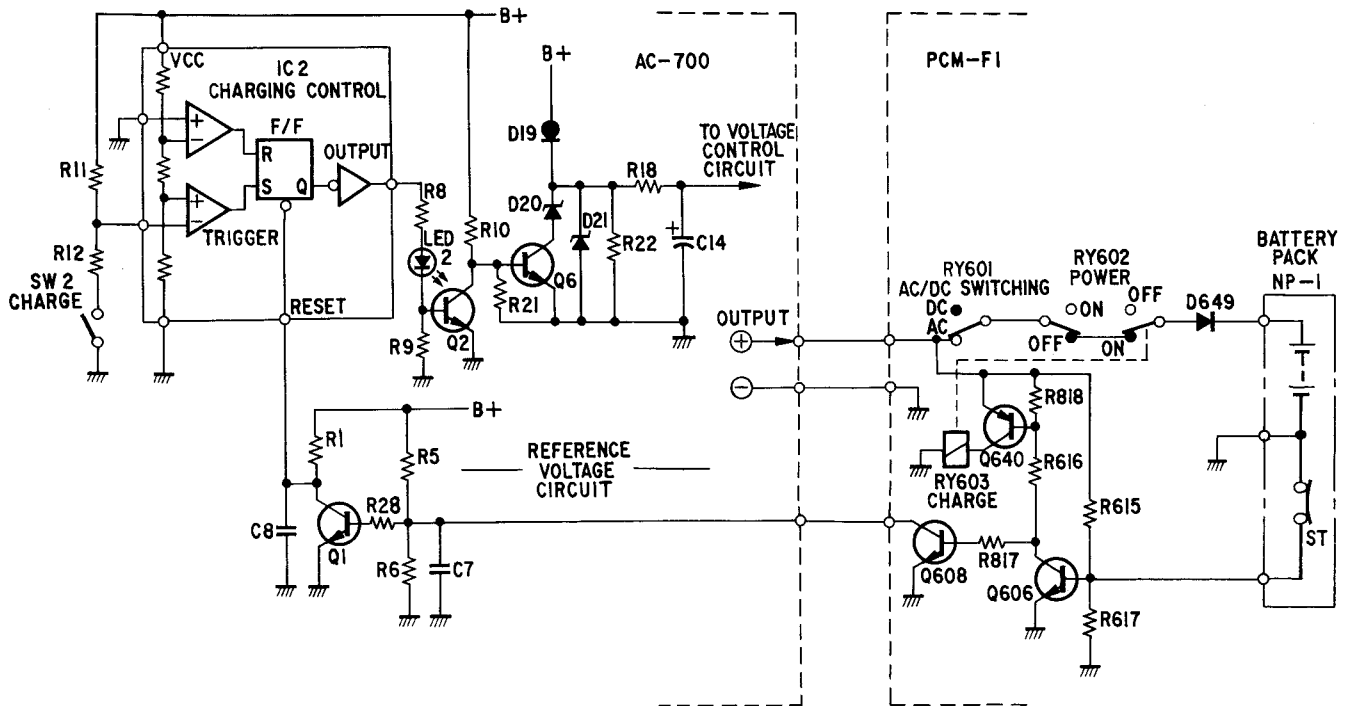
The zener voltage for D20 is lower than that of D21. When Q6 is on, D20 and D21 are connected parallel, but because D20 zener voltage is lower, D21 does not operate.

When Q6 is off (during charging), D20 is cut off and D21 generates reference voltage. Therefore, during charging, higher output voltage than for when operating as an AC power adaptor is supplied to the battery pack (NP-1) which is the load. However, when charging current goes over 2.1A,

the voltage drop generated at current detection resistor R20 (see Fig. 1) is applied to the current control op amp's (IC4) noninverted input terminal and the output terminal shifts to low level. Then D15 turns on, series transistor Q3 VCE gets larger and output voltage drops. As a result, charging current does not go over 2.1A but becomes 2.1A regulated current. When charging current is below 2.1A the load voltage becomes 17V regulated voltage because of the voltage control circuit.

When charging is completed, the internal temperature of battery pack NP-1 rises, the built-in thermostat ST operates and turns off.

When ST goes off, the PCM-F1 Q606 (see Fig. 2) goes on, Q640 goes on, RY603 is set and the charging circuit is interrupted. Then Q608 goes off, AC-700, Q1 goes on, IC2 reset terminal becomes 0V (low level), the output terminal becomes 0V (low level) and LED2 goes out to indicate charging completed.

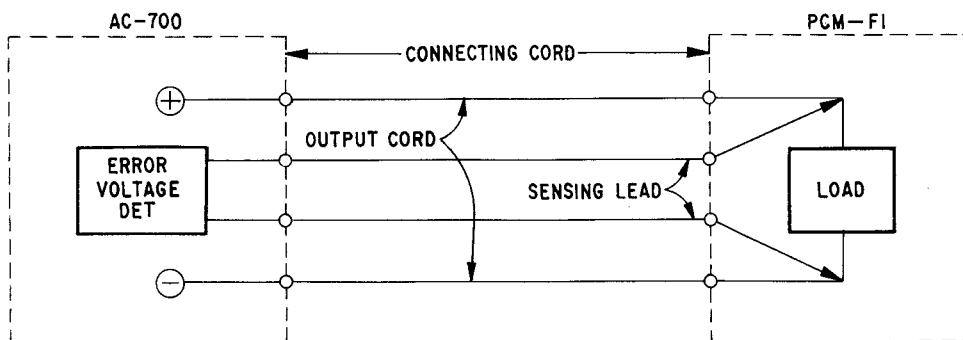


(Figure 2)

### Remote Sensing

AC-700 utilizes remote sensing in the voltage control section error voltage detection circuit. When the load current for the output cord connecting the regulated voltage power supply output terminal and the load is large, an exceptionally large voltage drop results, adversely affecting the load side.

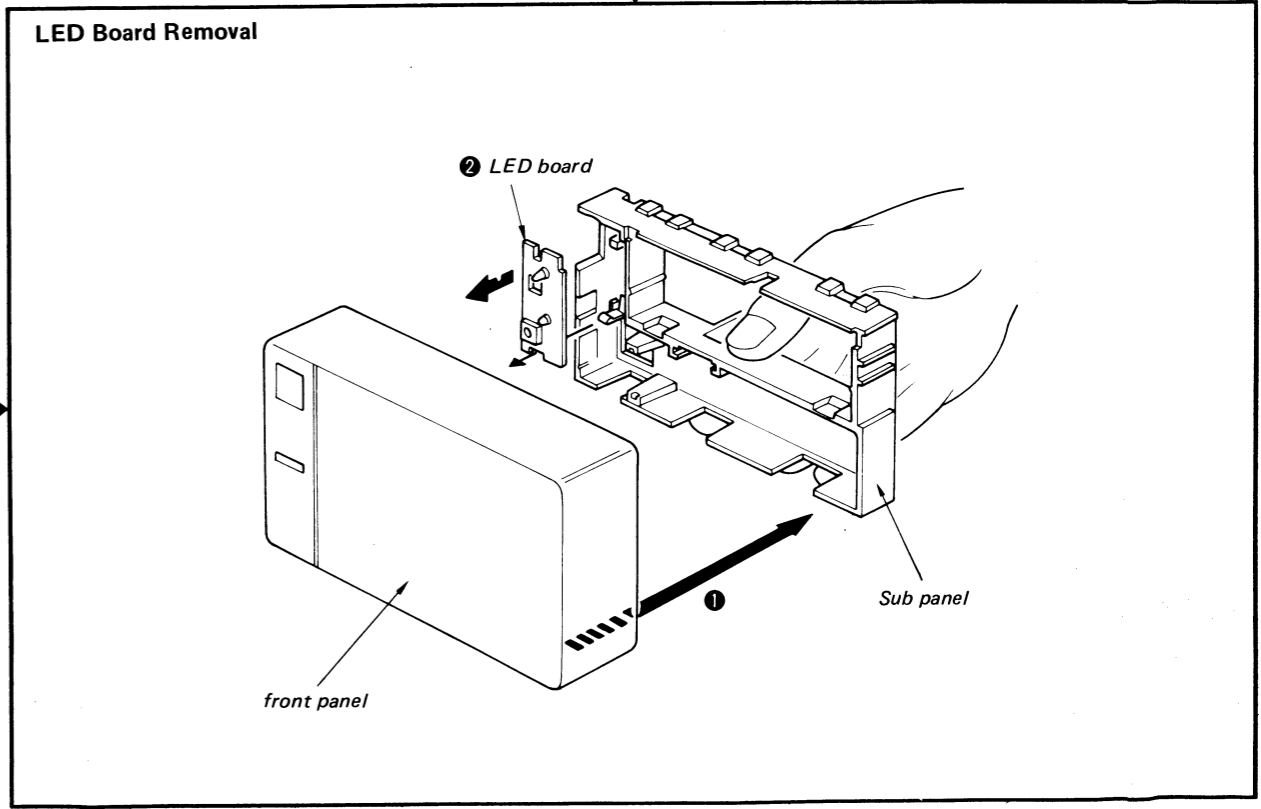
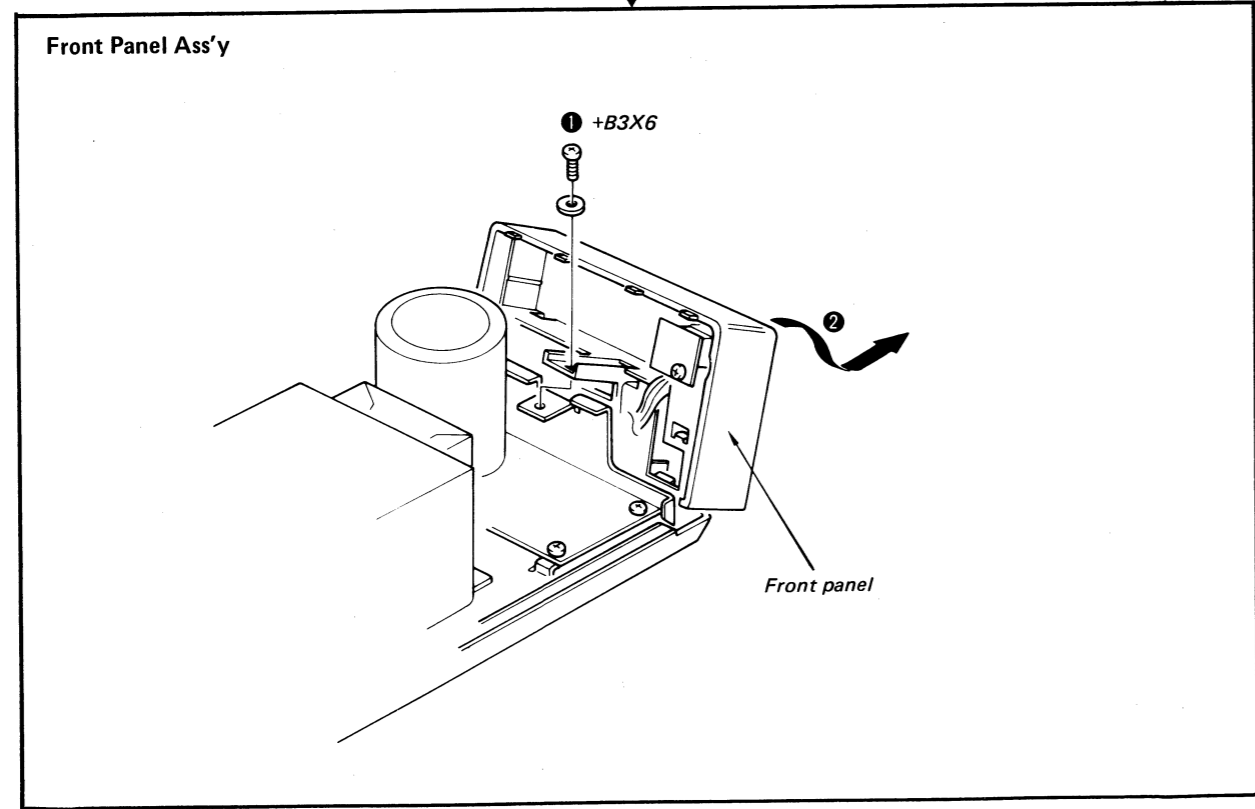
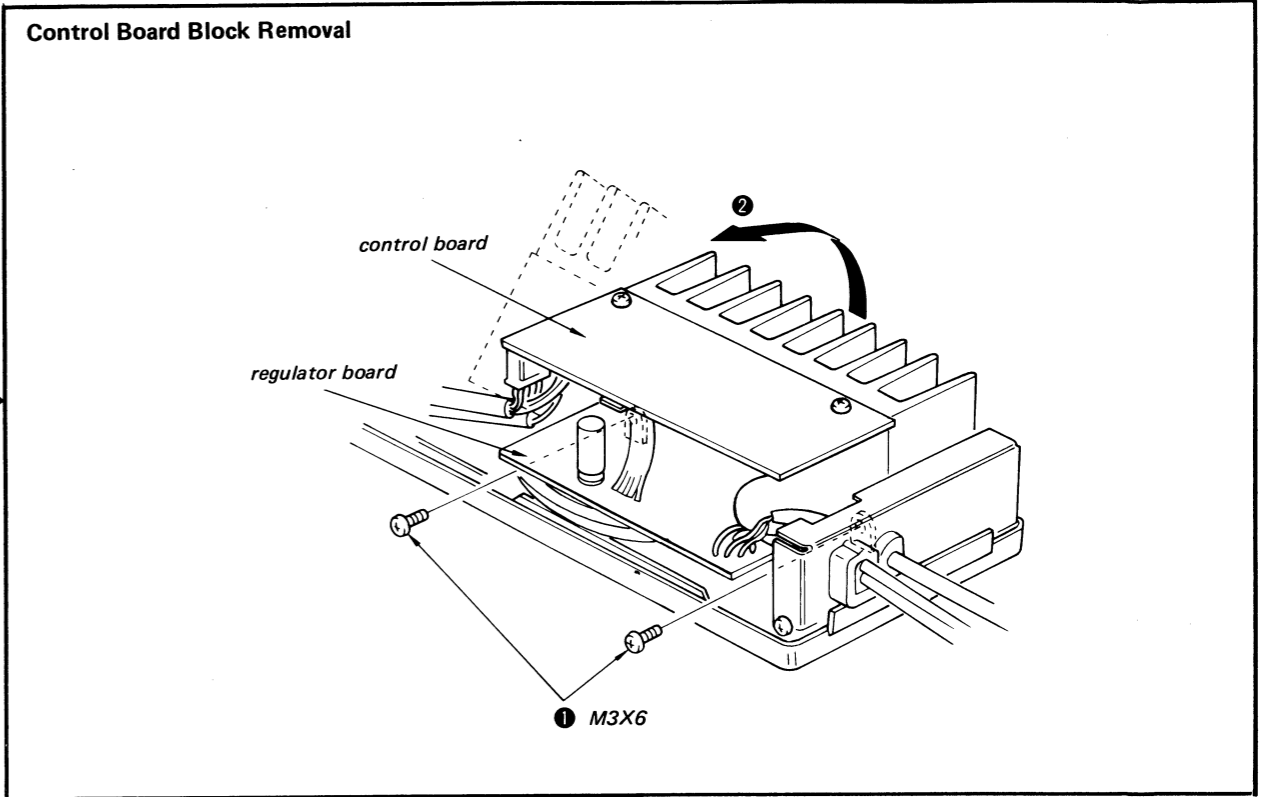
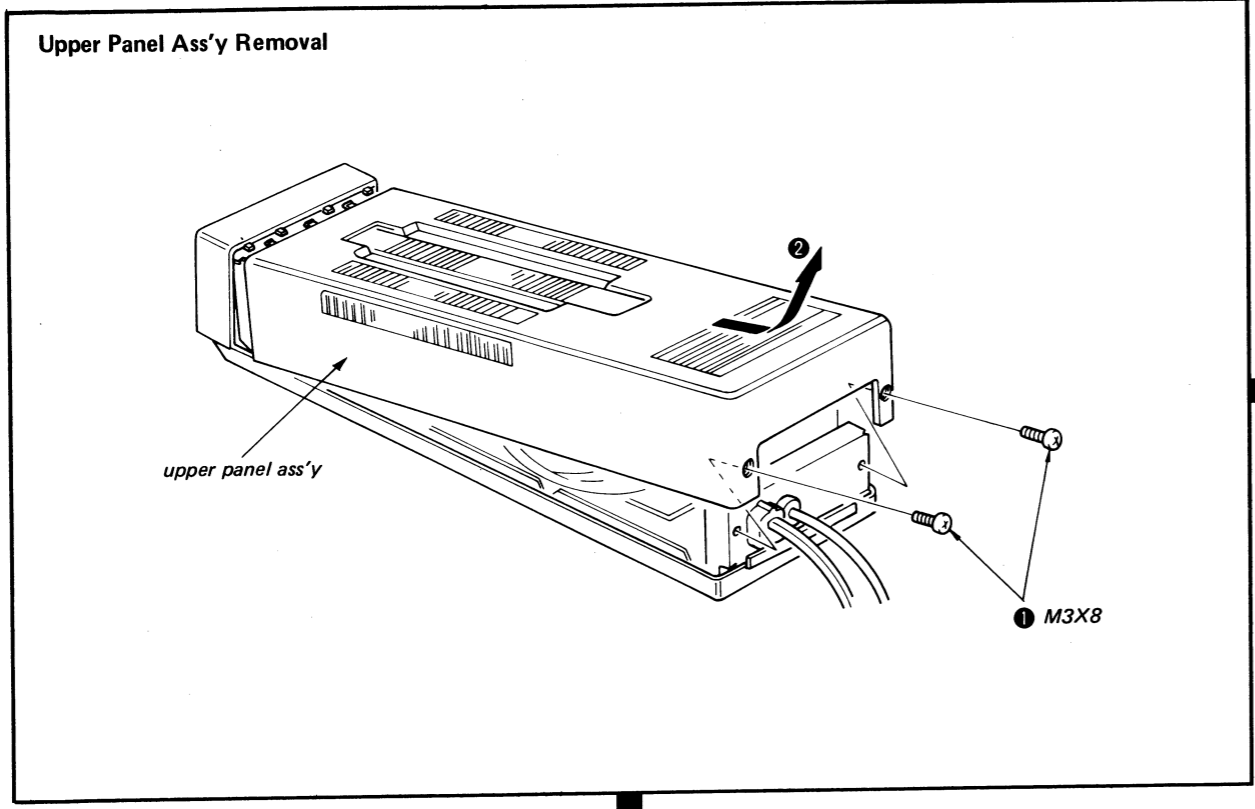
On AC-700, the error voltage detection is led not from the output terminal but through the connecting cord sensing lead directly from the PCM-F1 power supply input terminal, so the voltage drop because of the output cord and connector contact resistance is compensated for.



(Figure 3)

SECTION 2  
DISASSEMBLY

• Remove the parts in the numerical order.



SECTION 3  
DIAGRAMS  
B

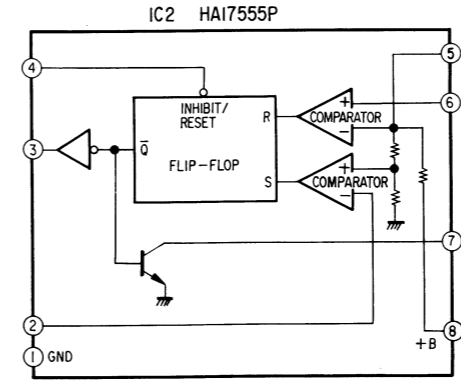
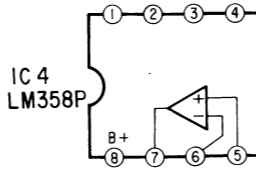
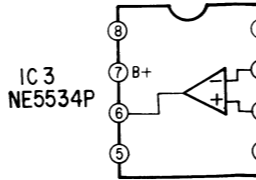
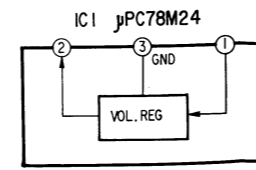
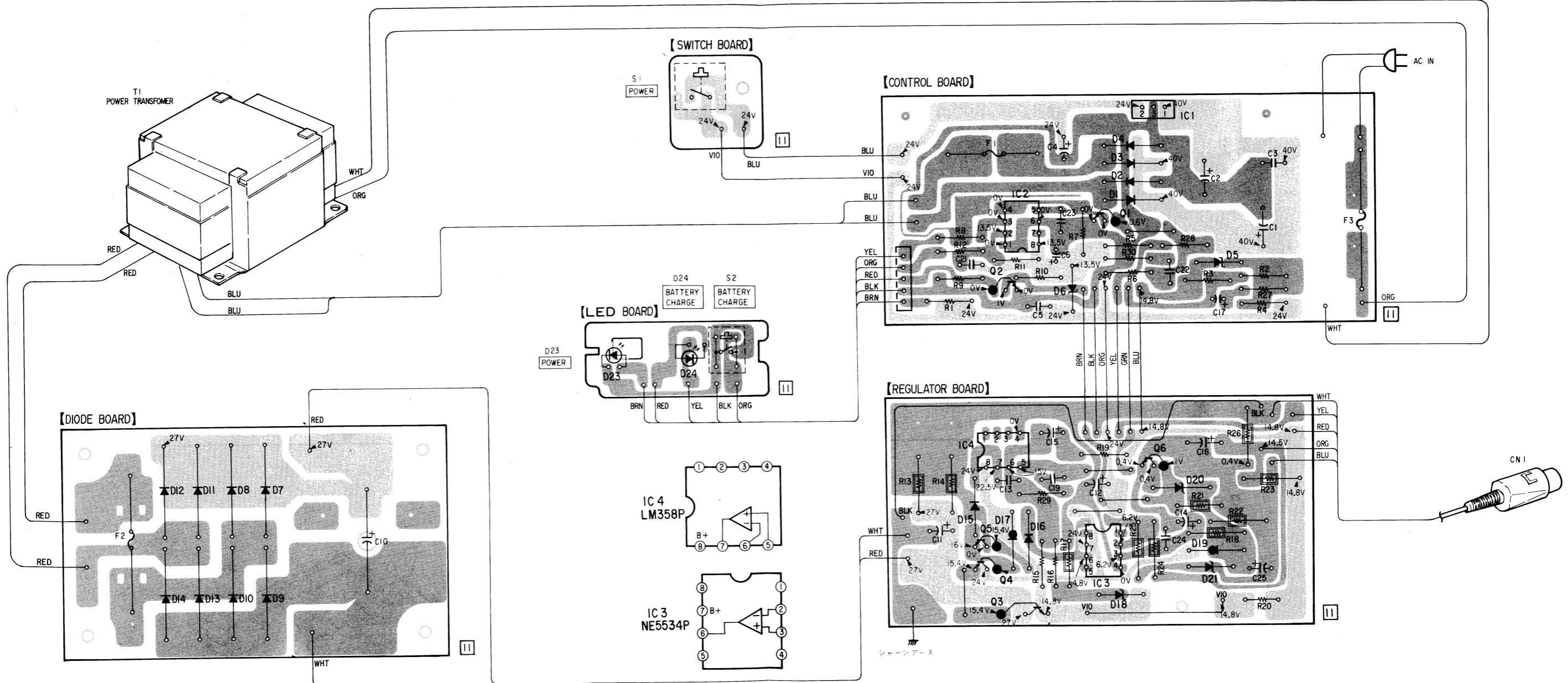
US Model  
Canadian Model

AC-700 AC-700

US Model  
Canadian Model

3-1. MOUNTING DIAGRAM

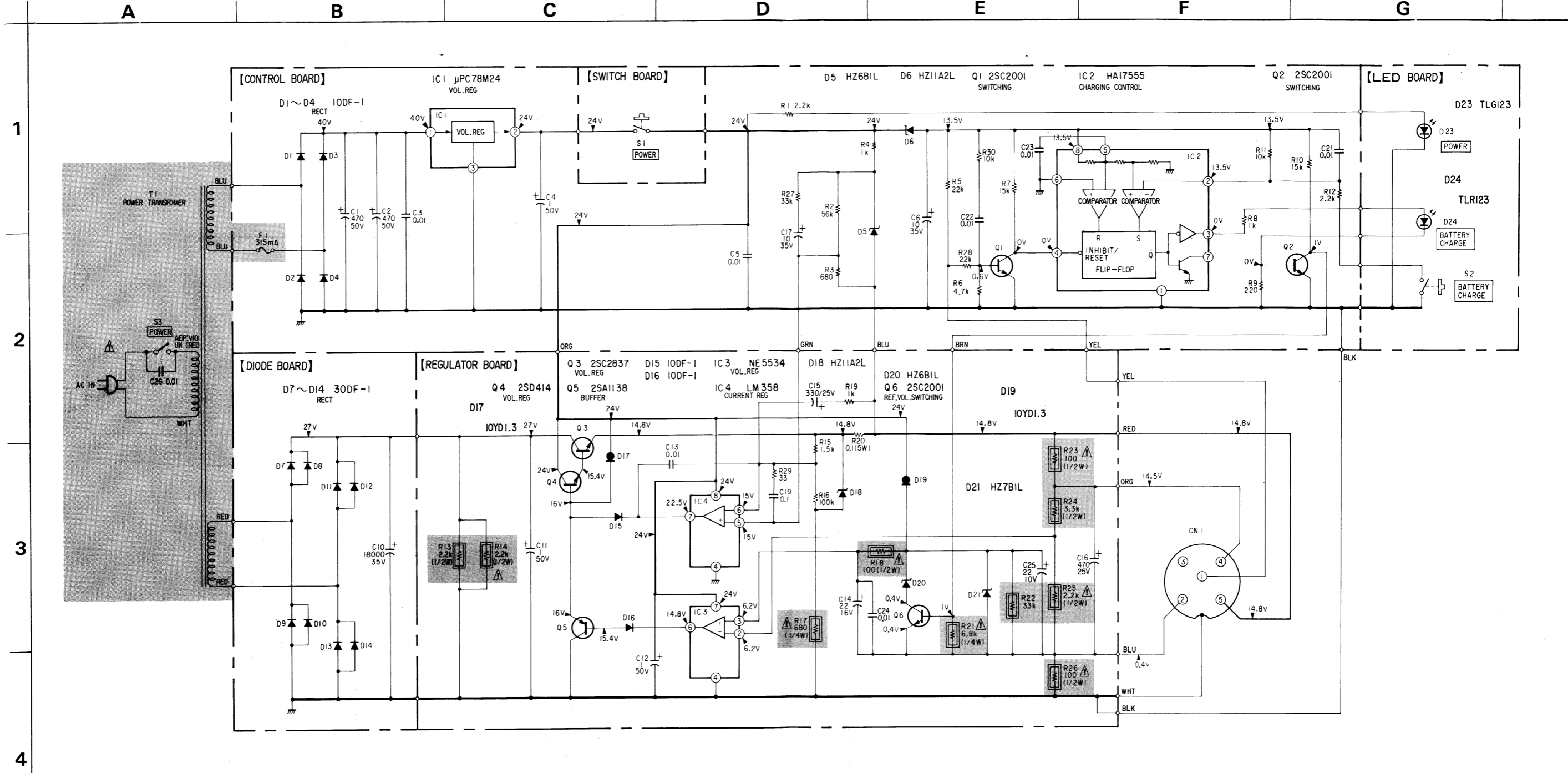
Q IC	12	11	8	7	23	24	15	17	16	6	3	2	4	1	6	IC1	Q IC
D	14	13	10	9								1	18	20	5	19	D



- — : parts extracted from the component side.
- : part mounted on the conductor side.
- : B+ pattern

3-2. SCHEMATIC DIAGRAM

US Model AC-700 Canadian Model AC-700 US Model AC-700 Canadian Model



Note: The components identified by shading and mark are critical for safety. Replace only with part number specified.

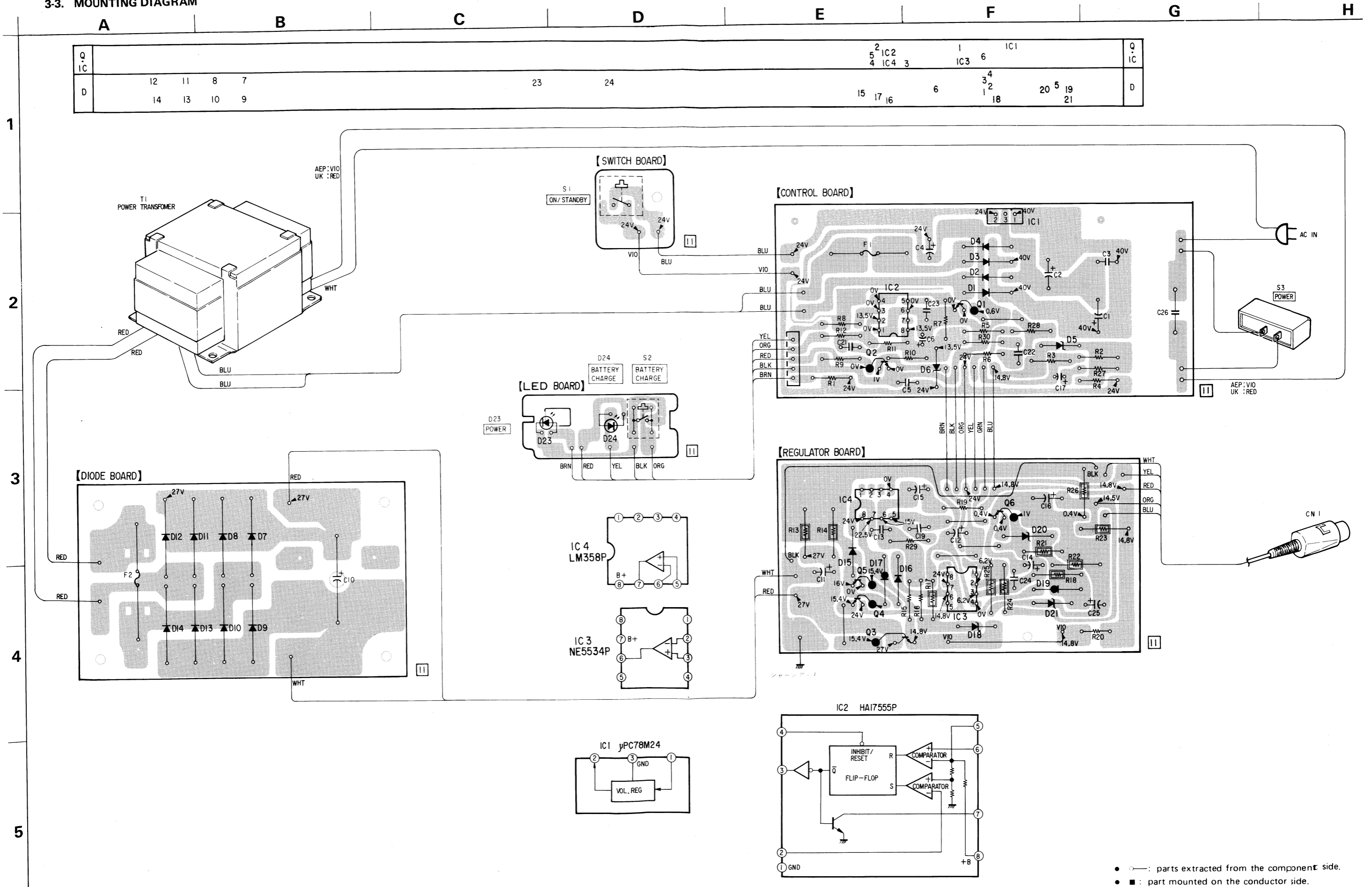
Note: Les composants identifiés par une trame et une marque sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: Voltage are measured with a VOM (50kΩ/V)

- All resistors are in ohms, 1/4W unless otherwise noted. kΩ : 1000 Ω, MΩ : 1000 kΩ
- : nonflammable resistor.
- : panel designation.
- : B+ bus.
- Switch

Ref. No.	Switch	Position
S1	POWER	OFF
S2	BATTERY CHARGE	OFF

3-3. MOUNTING DIAGRAM

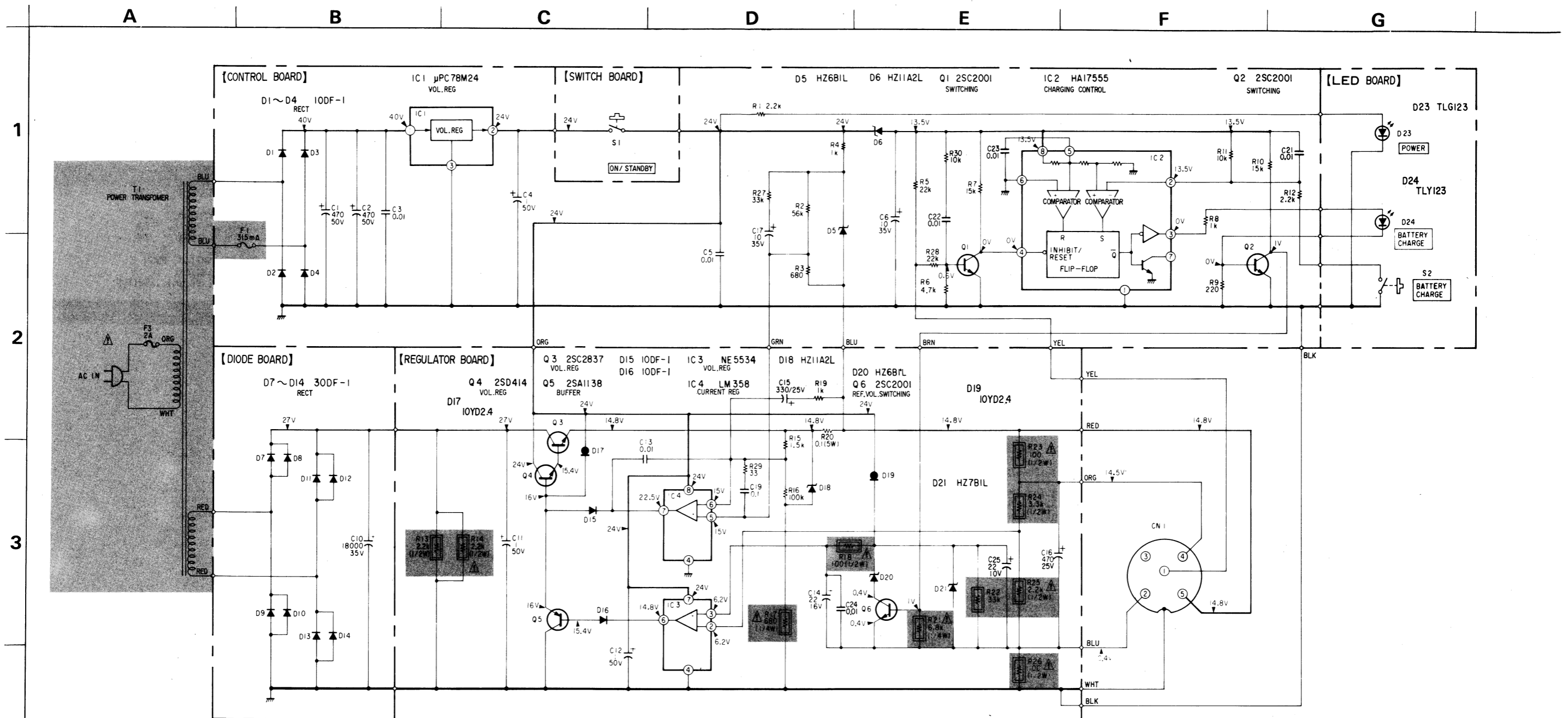


Q													2	1	6	IC1	Q						
IC													5	IC2	3	IC3	6	IC					
D	12	11	8	7					23	24			15	17	16	6	3	2	4	20	5	19	D
	14	13	10	9									1	18			1	18	20	5	19	21	

- : parts extracted from the component E side.
- : part mounted on the conductor side.
- : B+ pattern



3-4. SCHEMATIC DIAGRAM



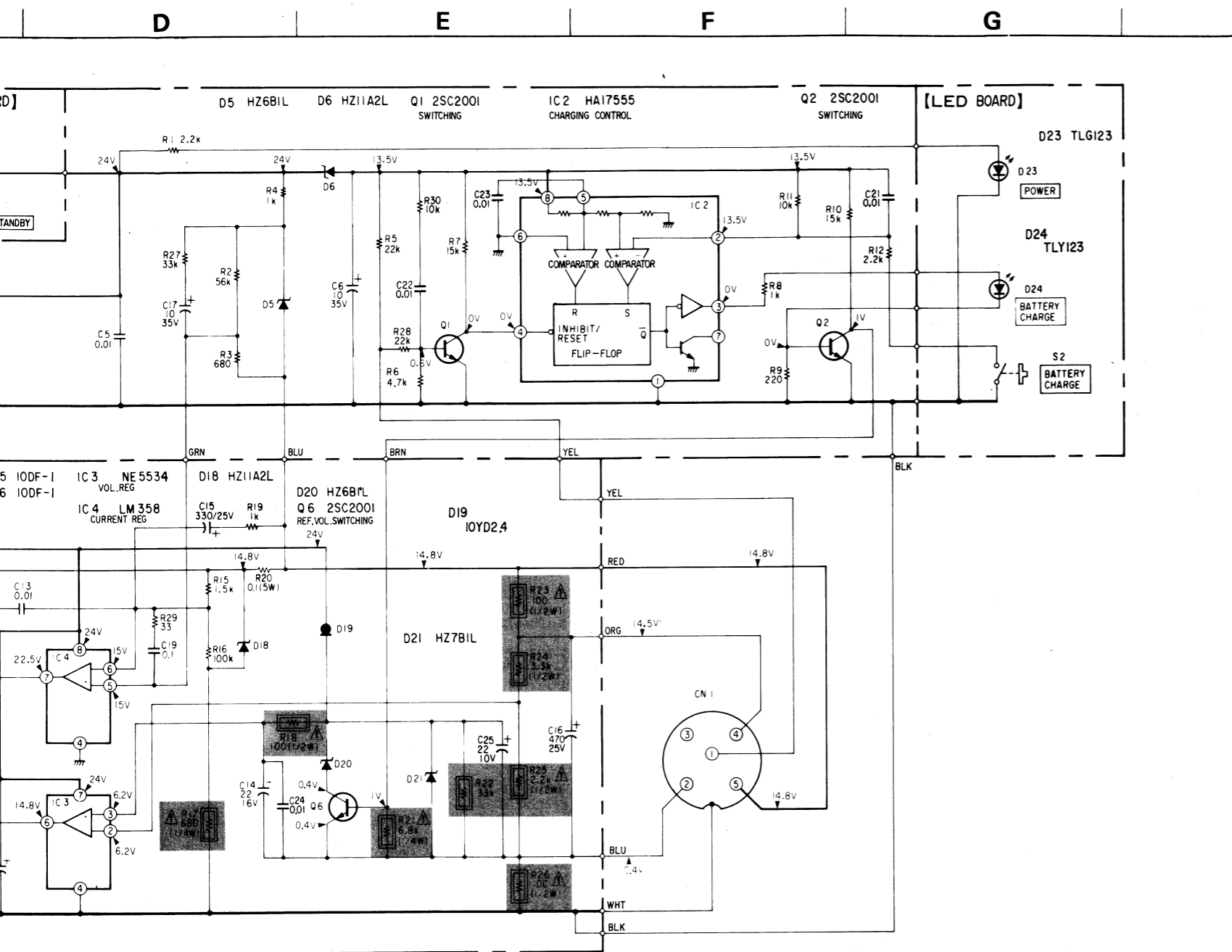
Note: The components identified by shading and mark are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: Voltage are measured with a VOM (50kΩ/V)

- All resistors are in ohms, 1/4 W unless otherwise noted. kΩ : 1000 Ω, MΩ : 1000 kΩ
- : nonflammable resistor.
- : panel designation.
- : B+ bus.
- Switch

Ref. No.	Switch	Position
S1	POWER	OFF
S2	BATTERY CHARGE	OFF



Note: The components identified by shading and mark are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: Voltage are measured with a VOM (50kΩ/V)

- All resistors are in ohms, 1/4 W unless otherwise noted. kΩ : 1000 Ω, MΩ : 1000 kΩ
- : nonflammable resistor.
- : panel designation.
- : B+ bus.
- Switch

Ref. No.	Switch	Position
S1	POWER	OFF
S2	BATTERY CHARGE	OFF

• Semiconductor Lead Layouts

10DF1, 30DF1  
10DF2, 30DF2  
10YD2.4  
10YG1.1  
HZ6B1L  
HZ11A2L  
HZ11A3L  
HZ7B1L  
HZ7B2L

LM358P  
NE555N  
NE5534P  
NE5534AN  
μPC358C

TLG123  
TLR123

2SC2001

μA78M24UC

2SC2837

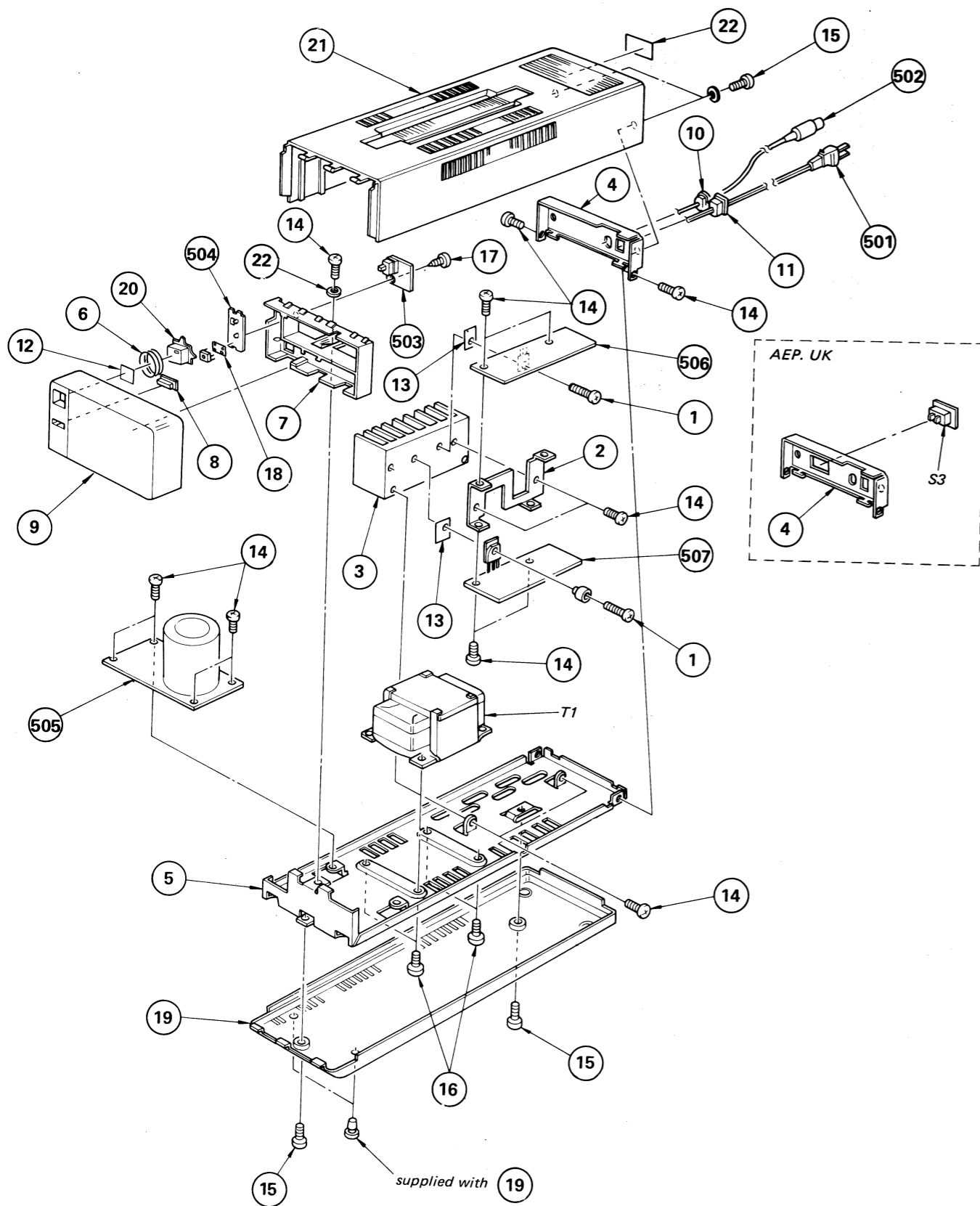
μPC78M24

2SD414

2SA1138

SECTION 4  
EXPLODED VIEW AND PARTS LIST

A B C D



GENERAL SECTION

No.	Part No.	Description
1	2-259-121-00	SCREW M3X10
2	2-362-366-00	BRACKET, PC BOARD
3	2-362-367-00	HEAT SINK
4	2-362-388-00	(US, CND).....PANEL, REAR
5	2-362-369-00	CHASSIS
6	2-291-509-00	SPRING
7	2-291-527-00	PANEL, SUB
8	2-291-502-00	BUTTON (B)
9	2-362-357-00	(US, CND).....PANEL, FRONT
9	2-362-357-11	(AEP, UK).....PANEL, FRONT
10	3-005-073-00	BUSHING, CORD
11	3-703-244-00	BUSHING, CORD
12	3-831-441-11	CUSHION
13	4-857-833-00	SHEET
14	7-682-547-09	SCREW +B 3X6
15	7-682-548-09	SCREW +B M3X8
16	7-682-560-04	SCREW M4X6
17	7-685-145-21	SCREW +PTP M3X6
18	9-911-863-XX	SPACER
19	A-6703-160-A	PANEL ASSY, LOWER
20	X-2291-502-0	BUTTON (A)
21	X-2291-504-0	PANEL ASSY, UPPER
22	7-688-003-02	WASHER
23	4-026-252-00	BUSHING, INSULATING

ELECTRICAL PARTS

Ref.No.	Part No.	Description	Ref.No.	Part
501	1-555-795-00	(AEP).....CORD, POWER	D13	8-719
501	1-556-036-00	(UK).....CORD, POWER	D14	8-719
501	1-555-701-00	(US, Canadian)....CORD, POWER	D15	8-719
			D16	8-719
502	1-556-379-00	CORD, OUTPUT, DC		
503	1-608-159-00	PC BOARD, SWITCH	D17	8-719
504	1-608-160-00	PC BOARD, LED	D17	8-719
505	1-608-161-00	PC BOARD, DIODE	D18	8-719
506	1-608-162-00	PC BOARD, CONTROL	D19	8-719
507	1-608-163-00	PC BOARD, REGULATOR	D19	8-719
C1	1-123-363-00	ELECT 470MF 50V	D20	8-719
C2	1-123-363-00	ELECT 470MF 50V	D21	8-719
C3	1-130-297-00	FILM 0.01MF 100V	D23	8-719
C4	1-131-450-00	TANTAL 1MF 50V	D24	8-719
C5	1-130-297-00	FILM 0.01MF 100V	D24	8-719
C6	1-123-356-00	ELECT 10MF 50V		
C7	1-108-579-00	FILM 0.01MF	F1	.1-53
C8	1-108-579-00	FILM 0.01MF	F2	.1-53
C10	1-125-312-00	ELECT 18000MF 35V	F3	.1-53
C11	1-131-450-00	TANTAL 1MF 50V	IC1	8-75
C12	1-131-450-00	TANTAL 1MF 50V	IC2	8-75
C13	1-130-297-00	FILM 0.01MF 100V	IC3	8-75
			IC4	8-75
C14	1-123-520-00	TANTAL 22MF 16V	Q1	8-72
C15	1-123-335-00	ELECT 330MF 25V	Q2	8-72
C16	1-123-696-00	ELECT 470MF 25V	Q3	8-72
C17	1-123-356-00	ELECT 10MF 35V	Q4	8-72
C19	1-161-773-00	CERAMIC 0.01MF 25V	Q5	8-72
C21	1-108-579-00	FILM 0.01MF	Q6	8-72
C22	1-108-579-00	FILM 0.01MF	R1	1-24
C23	1-108-579-00	FILM 0.01MF	R2	1-24
C24	1-130-297-00	FILM 0.01MF 100V	R3	1-24
C25	1-131-520-00	TANTAL 22MF 16V	R4	1-24
C26	1-161-744-00	(AEP, UK)....CERAMIC 0.01MF 400V	R5	1-24
			R6	1-24
CN1	1-508-743-00	CONNECTOR 5P	R7	1-24
D1	8-719-210-12	DIODE 10DF2	R8	1-24
D2	8-719-210-12	DIODE 10DF2	R9	1-24
D3	8-719-210-12	DIODE 10DF2		
D4	8-719-210-12	DIODE 10DF2	R10	1-24
D5	8-719-910-64	DIODE HZ6B1L	R11	1-24
D6	8-719-910-13	DIODE HZ11A3L	R12	1-24
D7	8-719-230-02	DIODE 30DF2	R13	.1-21
D8	8-719-230-02	DIODE 30DF2	R14	.1-21
D9	8-719-230-02	DIODE 30DF2	R15	1-21
D10	8-719-230-02	DIODE 30DF2	R16	1-21
D11	8-719-230-02	DIODE 30DF2	R17	.1-21
D12	8-719-230-02	DIODE 30DF2	R18	.1-21

NOTE:  
 \* Items with no part number and no description are not stocked because they are seldom required for routine service.  
 \* Items marked "▲" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.  
 \* Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:  
 \* All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.  
 RESISTORS  
 \* All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.  
 \* F : nonflammable  
 COILS  
 \* MMH : mH, UH : μH

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.  
 Les composants identifiés par une trame et une marque ▲ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

NOTE:  
 \* Items with no part number and no description are not stocked because they are seldom required for routine service. Some delay should be anticipated when ordering these items.  
 \* Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

GENERAL SECTION

Table with 3 columns: No., Part No., Description. Lists various components like screws, brackets, panels, buttons, bushings, sheets, washers, and insulating parts.

ELECTRICAL PARTS

Table with 3 columns: Ref.No., Part No., Description. Lists electrical components such as capacitors (C1-C26), diodes (D1-D16), transistors (Q1-Q6), fuses (F1-F3), resistors (R1-R12), and other electronic parts.

ELECTRICAL PARTS

Table with 3 columns: Ref.No., Part No., Description. Lists electrical components including diodes (D13-D19), fuses (F1-F3), integrated circuits (IC1-IC4), transistors (Q1-Q6), and resistors (R1-R18).

ELECTRICAL PARTS

Table with 3 columns: Ref.No., Part No., Description. Lists electrical components including resistors (R19-R30), capacitors (C1-C6), and transformers (T1).

NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
Items marked with a diamond symbol are not stocked since they are seldom required for routine service.
Due to standardization, parts with part numbers (delta-delta-delta-delta-XX or delta-delta-delta-delta-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in microfarads. Common capacitors are omitted. Refer to the following lists for their part numbers. MF: microfarad, PF: picofarad.
RESISTORS: All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
F: nonflammable
COILS: MMH: millihenry, UH: microhenry

The components identified by shading and a triangle symbol are critical for safety. Replace only with part number specified.
Les composants identifiés par une trame et une marque triangle sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
Items marked with a diamond symbol are not stocked since they are seldom required for routine service.
Due to standardization, parts with part numbers (delta-delta-delta-delta-XX or delta-delta-delta-delta-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in microfarads. Common capacitors are omitted. Refer to the following lists for their part numbers. MF: microfarad, PF: picofarad.
RESISTORS: All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
F: nonflammable
COILS: MMH: millihenry, UH: microhenry

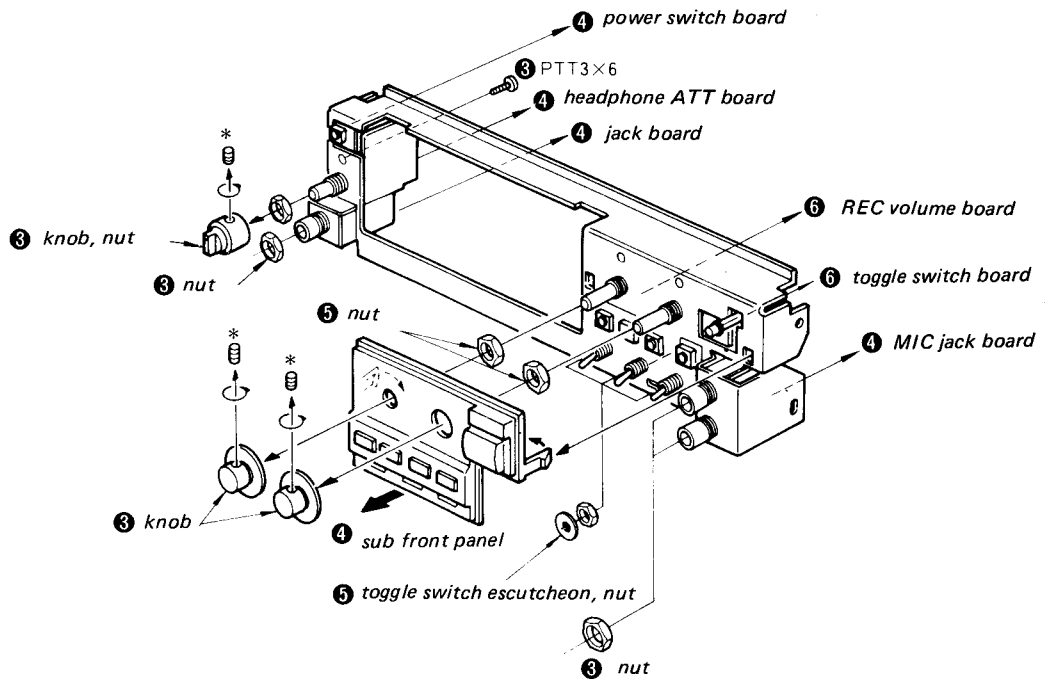
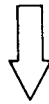
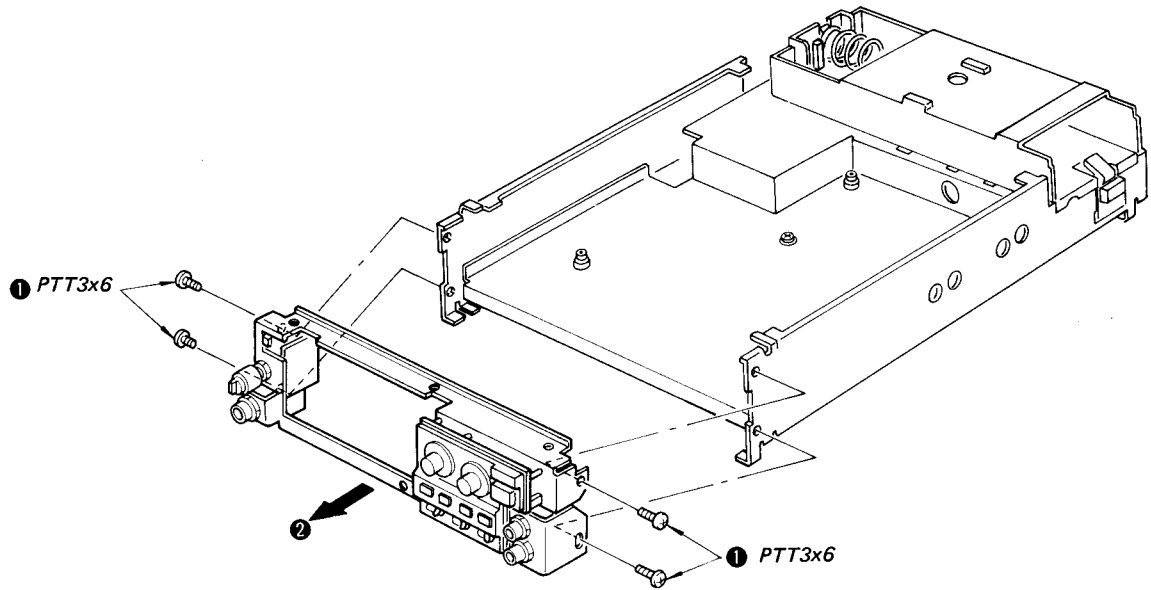
The components identified by shading and a triangle symbol are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque triangle sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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English
82102154-1
Printed in Japan

POWER SWITCH BOARD, HEADPHONE ATT BOARD, JACK BOARD  
 REC VOLUME BOARD, MIC JACK BOARD, TOGGLE SWITCH BOARD



\* Use L-shaped wrench 1.27 mm.

**SECTION 3  
ELECTRICAL ADJUSTMENTS**

- Switch position (Except other notice)
- MUTING ..... OFF
- COPY ..... OFF
- INPUT ..... LINE
- RES ..... 16BIT
- HEADPHONES ATT ..... 0 dB
- E-E mode : VIDEO-IN and VIDEO-OUT terminals are connected.



Power supply : Use AC POWER ADAPTOR-AC-700  
Reference input level

Input terminal	MIC	LINE IN	VIDEO IN
Source impedance	300Ω	10kΩ	75Ω
Signal input level	0.77mV(-60dB)	0.25V(-10dB)	1 V

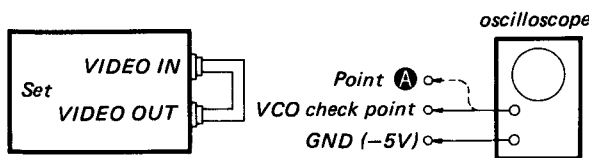
Reference output level

Output terminal	HEADPHONES	LINE OUT	VIDEO OUT
Load impedance	8 Ω	47kΩ	75Ω
Signal output level	49mV(-24dB)	0.25V(-10dB)	1 V

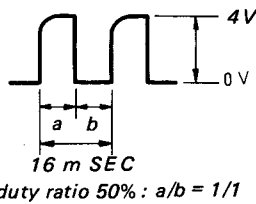
Make an adjustment after turning POWER ON more than half an hour so that the drift by temperature rise is avoided.

**VCO ADJUSTMENT**

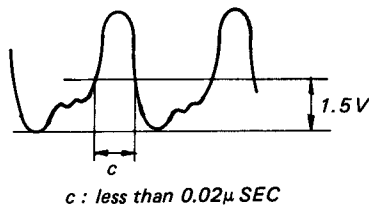
Procedure:



1. Connect VIDEO IN and VIDEO terminals (E-E mode).
2. Connect the oscilloscope to the VCO check point and GND point.
3. Adjust L505 so that duty ratio is 50%.



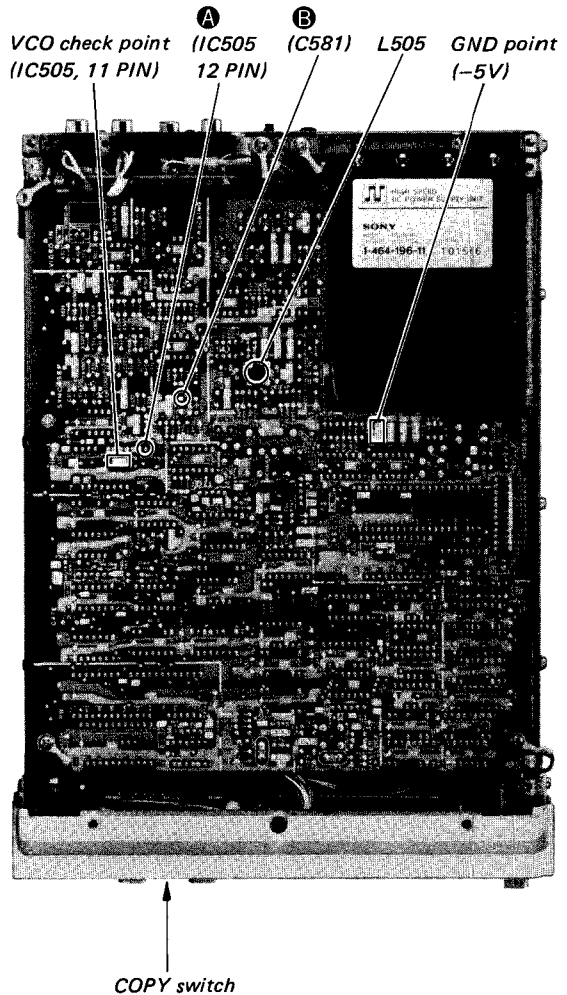
4. Turn the COPY switch to OFF→ON→OFF and then confirm the duty ratio is 50%.
5. Connect the oscilloscope to the point A and GND point.
6. Confirm the duty ratio is as shown below.



7. If c is 0.02 μ Sec or more, solder the point B (C581 is connected).

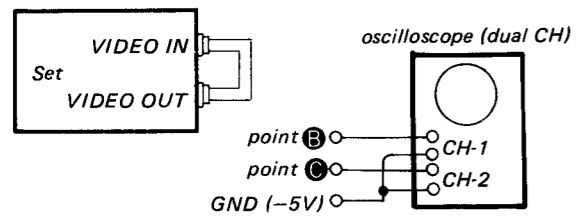
**Adjustment Location:**

- DIGITAL board -

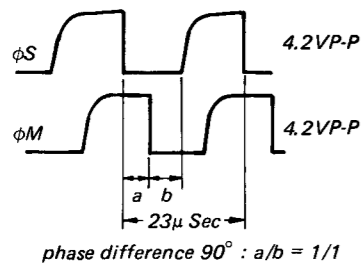


**PAL CLOCK ADJUSTMENT (Only PAL/SECAM system)**

Procedure :

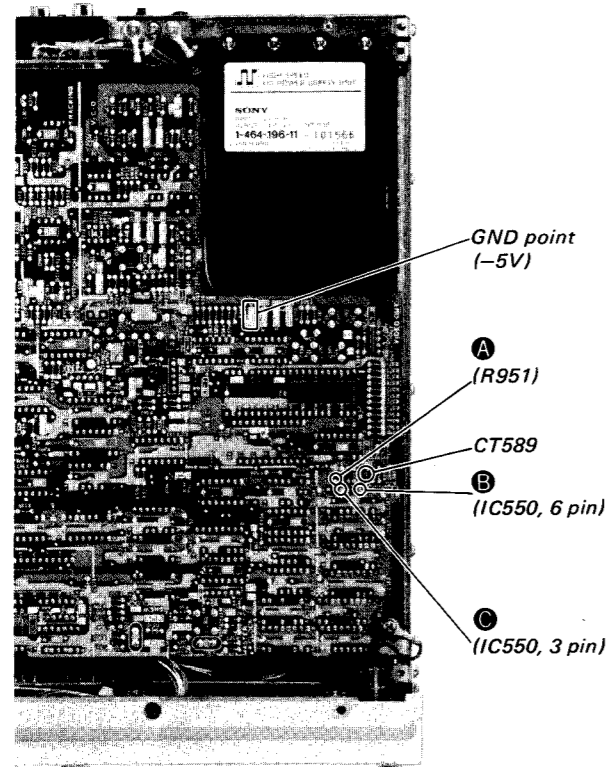


1. Connect VIDEO IN and VIDEO OUT terminals (E-E mode).
2. Solder the point A (R951 is connected).
3. Connect the oscilloscope to the point B (IC550, 6 pin) and point C (IC550, 3 pin).
4. Adjust CT589 so that the phase difference is 90°.



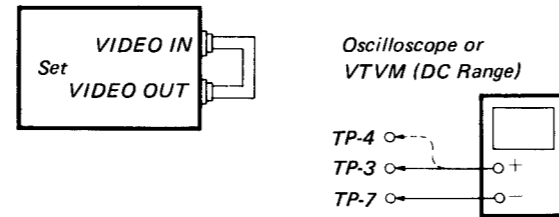
5. Unsolder the point A (R951)

Adjustment Location :  
- DIGITAL board -



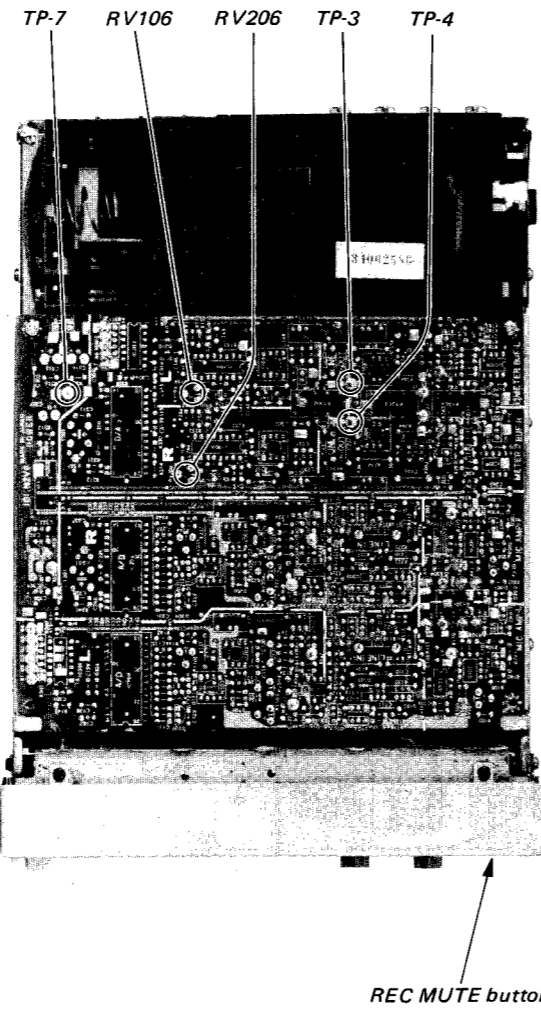
**D/A OFFSET ADJUSTMENT**

Procedure :



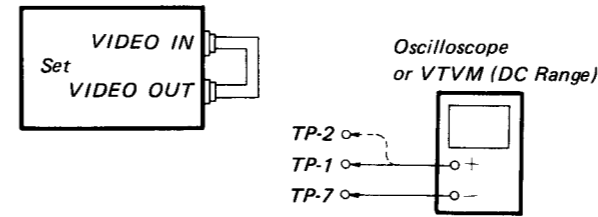
1. Connect VIDEO-IN and VIDEO-OUT terminals (E-E MODE).
2. Connect the oscilloscope or VTVM (DC Range) to the test point TP-3 (L-CH)/TP-4 (R-CH) and TP-7 (ground point).
3. Adjust RV106 (L-CH)/RV206 (R-CH) with pressing the REC MUTE button for 0±10 mV (DC) reading on oscilloscope or VTVM.

Adjustment Location :  
- ANALOG board -



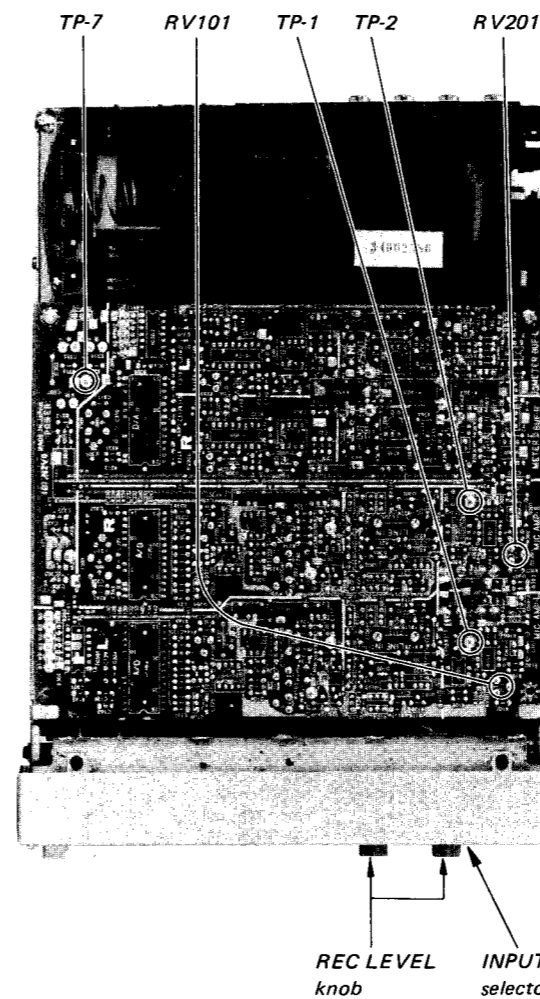
**MIC AMP OFFSET ADJUSTMENT**

Procedure :



1. Connect the oscilloscope or VTVM (DC Range) to the test point TP-1 (L-CH)/TP-2 (R-CH) and TP-7 (ground point).
2. Turn the INPUT selector to MIC and the REC LEVEL knobs to the minimum (0).
3. Adjust RV101 (L-CH) / RV206 (R-CH) for 0±50 mV (DC) reading on oscilloscope or VTVM.

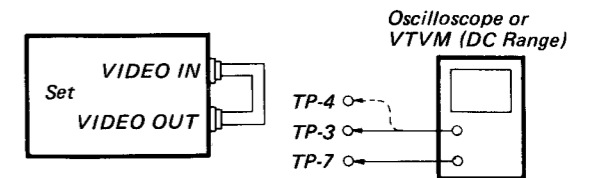
Adjustment Location :  
- ANALOG board -



**A/D OFFSET ADJUSTMENT**

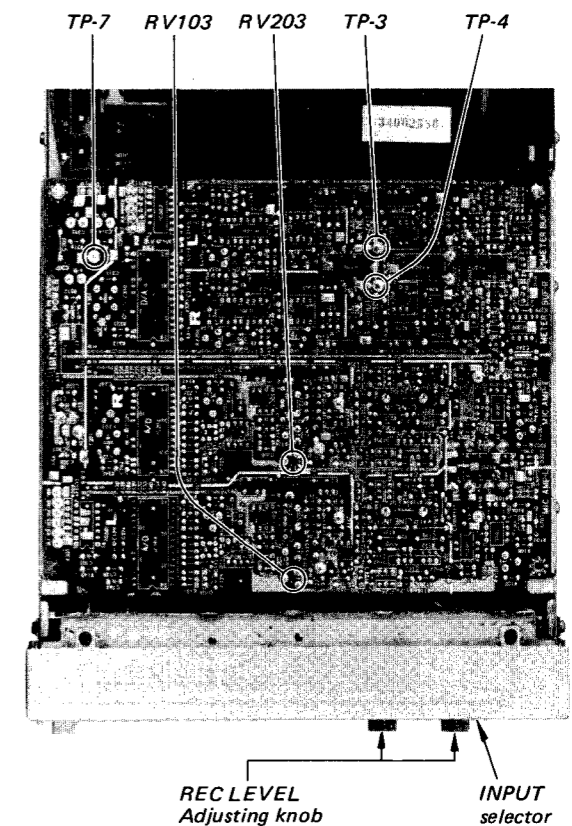
A/D OFFSET ADJUSTMENT should be made later than that of D/A OFFSET

Procedure :



1. Connect VIDEO-IN and VIDEO-OUT TERMINALS (E-E MODE).
2. Connect the oscilloscope or VTVM (DC Range) to the test point TP-3 (L-CH), TP-4 (R-CH), and TP-7 (ground point).
3. Turn the INPUT selector to the LINE and the REC LEVEL knobs to the minimum (0).
4. Adjust RV103(L-CH)/RV203(R-CH) for 0±10mV (DC) reading on oscilloscope or VTVM.

Adjustment Location :  
- ANALOG board -



be made

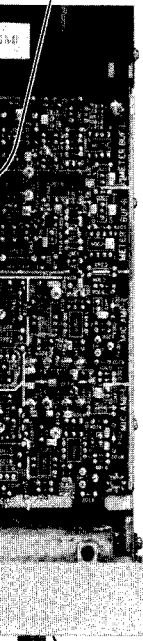
illoscope or VM (DC Range)

OUT TERMI-

VM (DC Range) P-4 (R-CH), and

LINE and the am (0). -CH) for 0± ope or VTVM.

TP-4

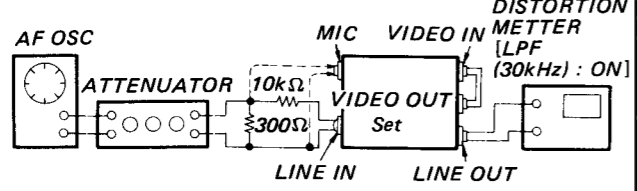


INPUT selector

**A/D DISTORTION ADJUSTMENT**

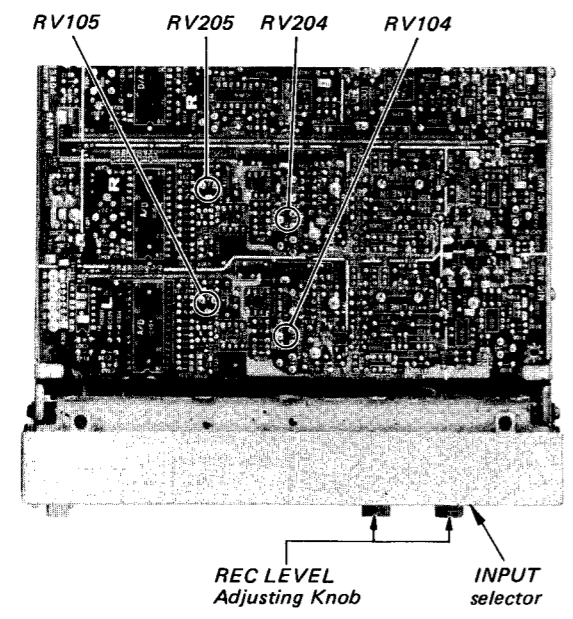
The low distortion AF OSC and the low distortion measurement equipment are needed to make this adjustment.

**Procedure:**



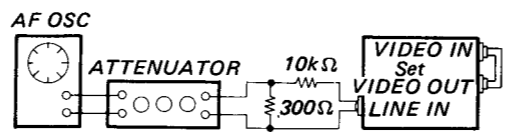
1. Connect VIDEO-IN and VIDEO-OUT terminals (E-E mode).
  2. Apply a 1 kHz, 0 dB (0.775V) to the LINE IN terminals.
  3. Adjust the REC LEVEL knobs so that OVER of the LED peak program meters just light up.
  4. Decrease the input signal level from 0.5 to 1 dB with the attenuator, and confirm OVER of that goes out.
  5. Adjust RV104, 105(L-CH)/RV204, 205(R-CH) for minimum reading on distortion meter.
  6. And then apply a 1 kHz, -20dB (0.775V) to the MIC terminals.
  7. Confirm the distortion similarly.
- reference data  
distortion LINE IN . . . . . less than -84dB  
MIC . . . . . less than -80dB

**Adjustment Location:**  
- ANALOG board -



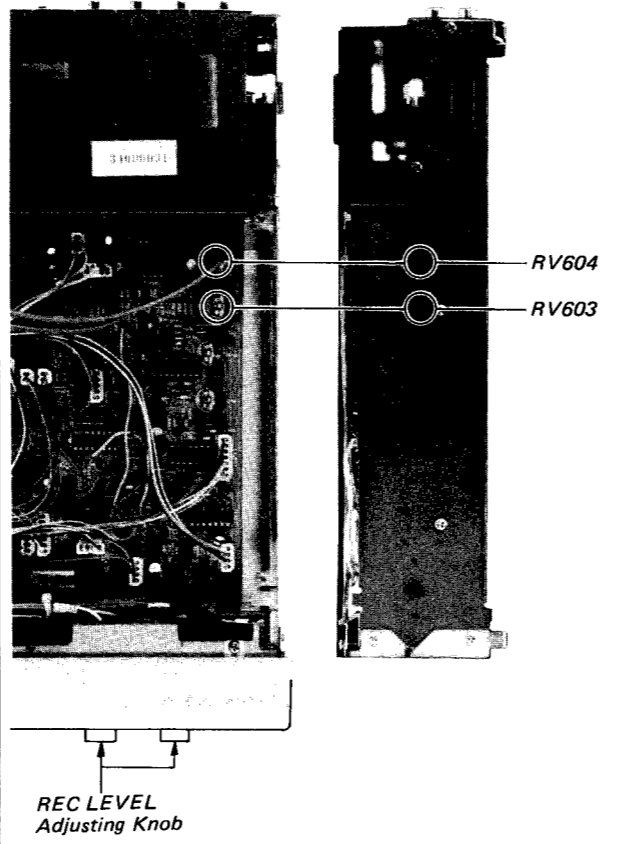
**PEAK METER ADJUSTMENT**

**Procedure:**



1. Connect VIDEO IN and VIDEO OUT terminals (E-E mode).
2. Apply a 1kHz, 0dB (0.775V) to the LINE IN terminals.
3. Adjust the REC LEVEL knobs so that OVER of the LED peak program meters just light up.
4. Decrease the input signal level from 0.5 to 1dB with the attenuator, and confirm OVER of that goes out.
5. Adjust RV604(L-CH)/RV603(R-CH) so that the LED peak program meters just illuminate 0dB.

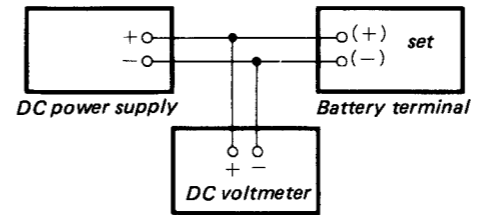
**Adjustment Location:**  
- POWER SUPPLY board -



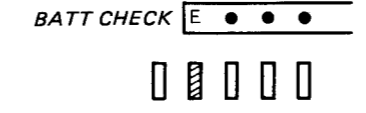
**BATT LEVEL ADJUSTMENT**

Remove the AC power adapter during this adjustment.

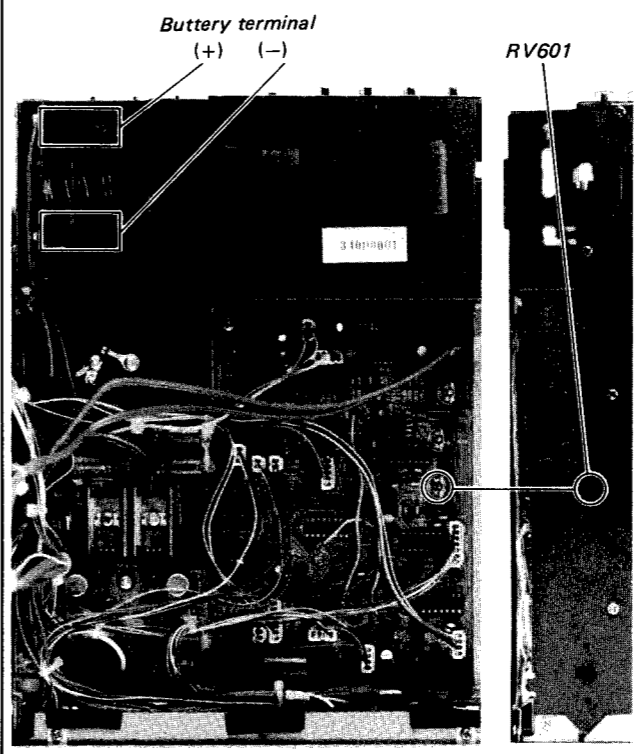
**Procedure:**



1. Adjust the output voltage of the DC power supply to 11<sup>+0</sup><sub>-0.1</sub> V and connect to the battery terminals of the set.
2. Turn the POWER switch to on and press the BATT CHECK button.
3. Confirm the LED peak program meter illuminats only L-CH.
4. Adjust RV601 with pressing the BATT CHECK button so that the LED meter illuminats shown as below.



**Adjustment Location:**  
- POWER SUPPLY board -

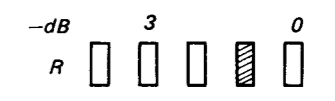


**TRACKING LEVEL ADJUSTMENT**

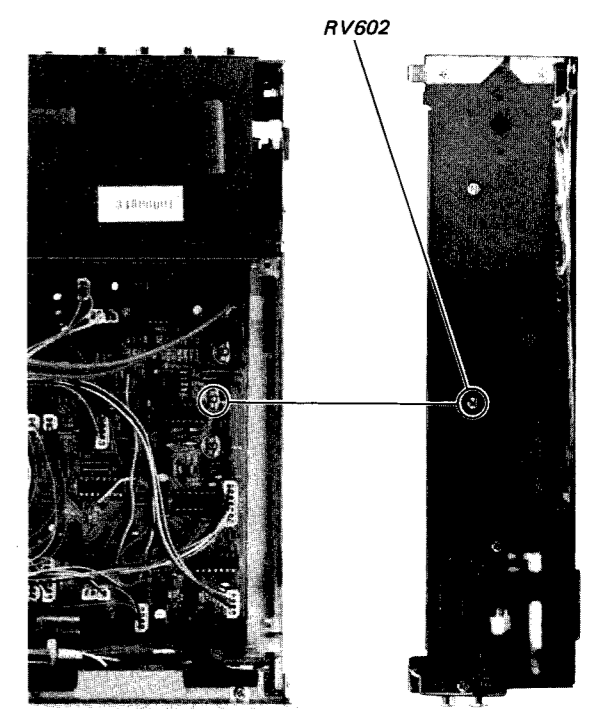
**Procedure:**



1. Connect VIDEO IN and VIDEO OUT terminal (E-E mode).
2. Press the METER selector button.
3. Confirm the TRACKING indicator illuminats and the LED peak program meter illuminats only R-CH.
4. Adjust RV602 so that the LED meter illuminats shown as below.



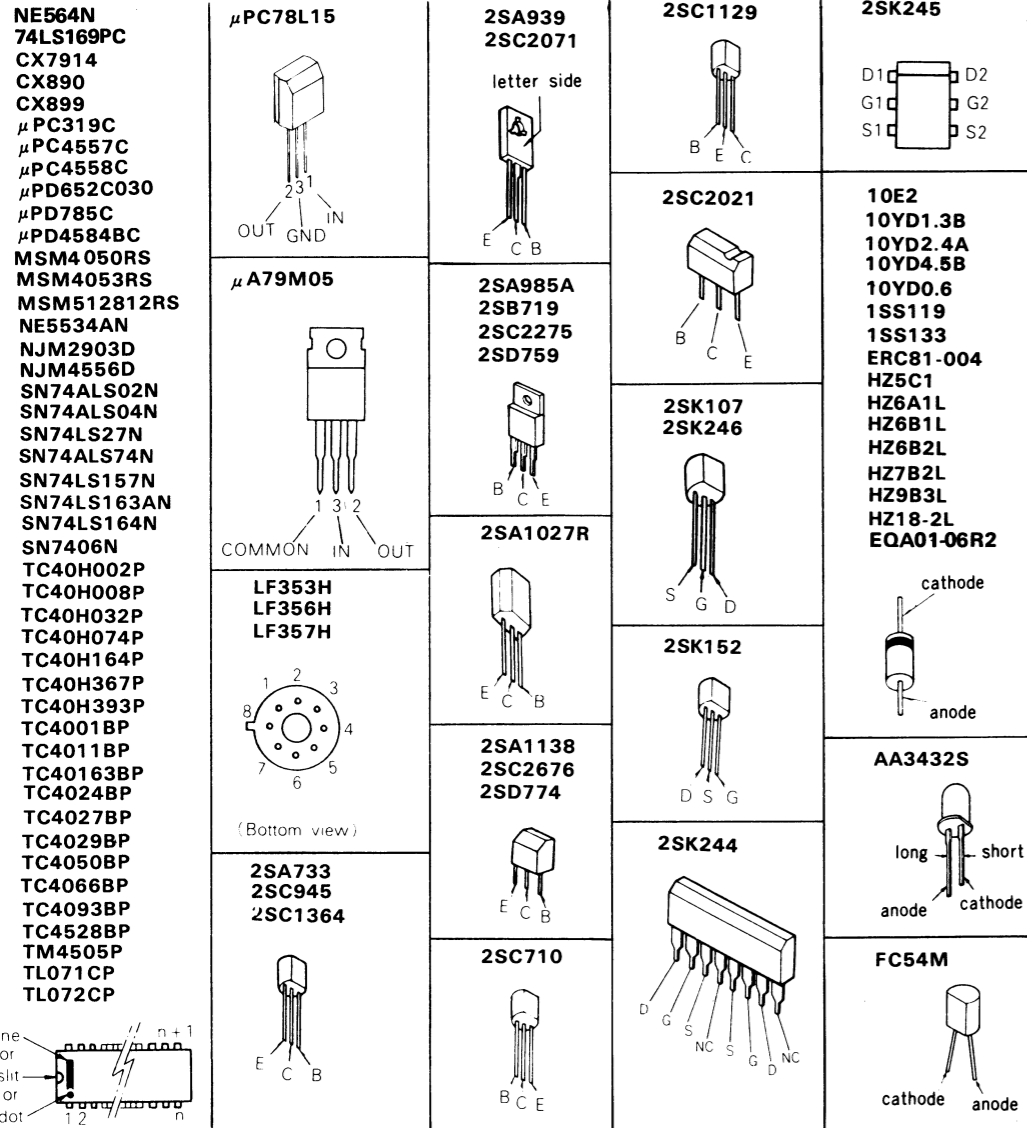
**Adjustment Location:**  
- POWER SUPPLY board -



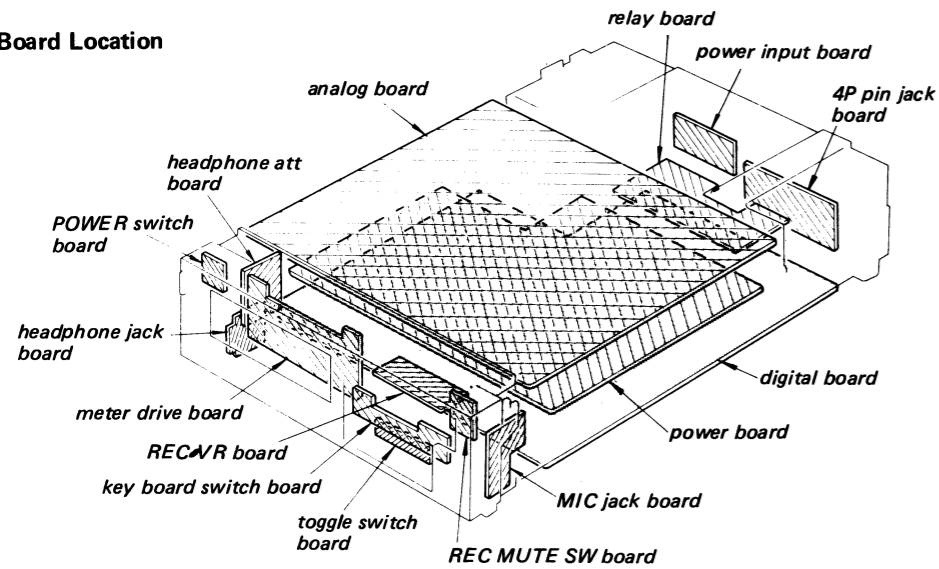


SECTION 4  
DIAGRAMS

Semiconductor Lead Layouts



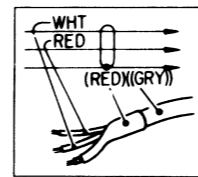
Circuit Board Location



4-1. MOUNTING DIAGRAM  
—Conductor Side—

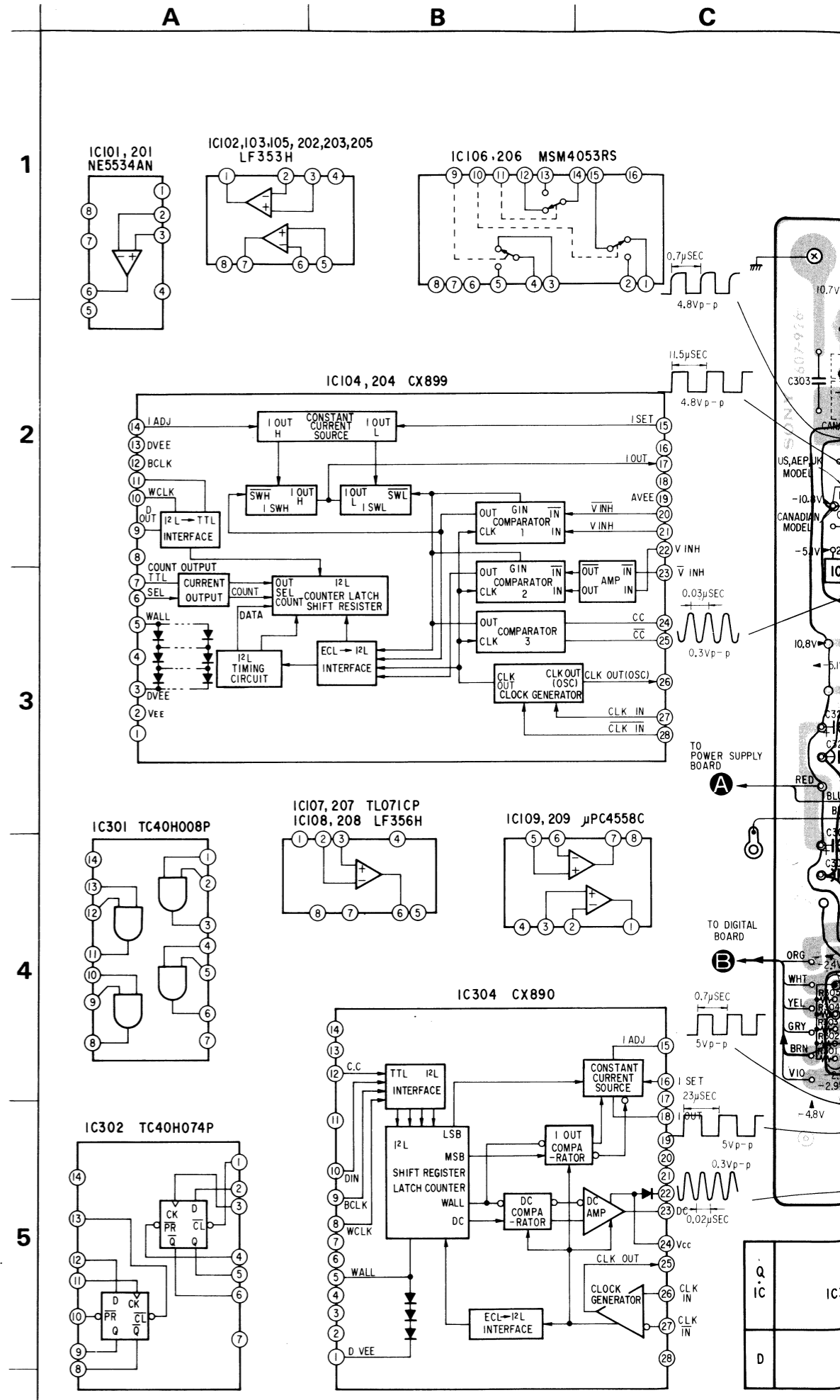
Note:

- Color code of sleeving over the end of the jacket.



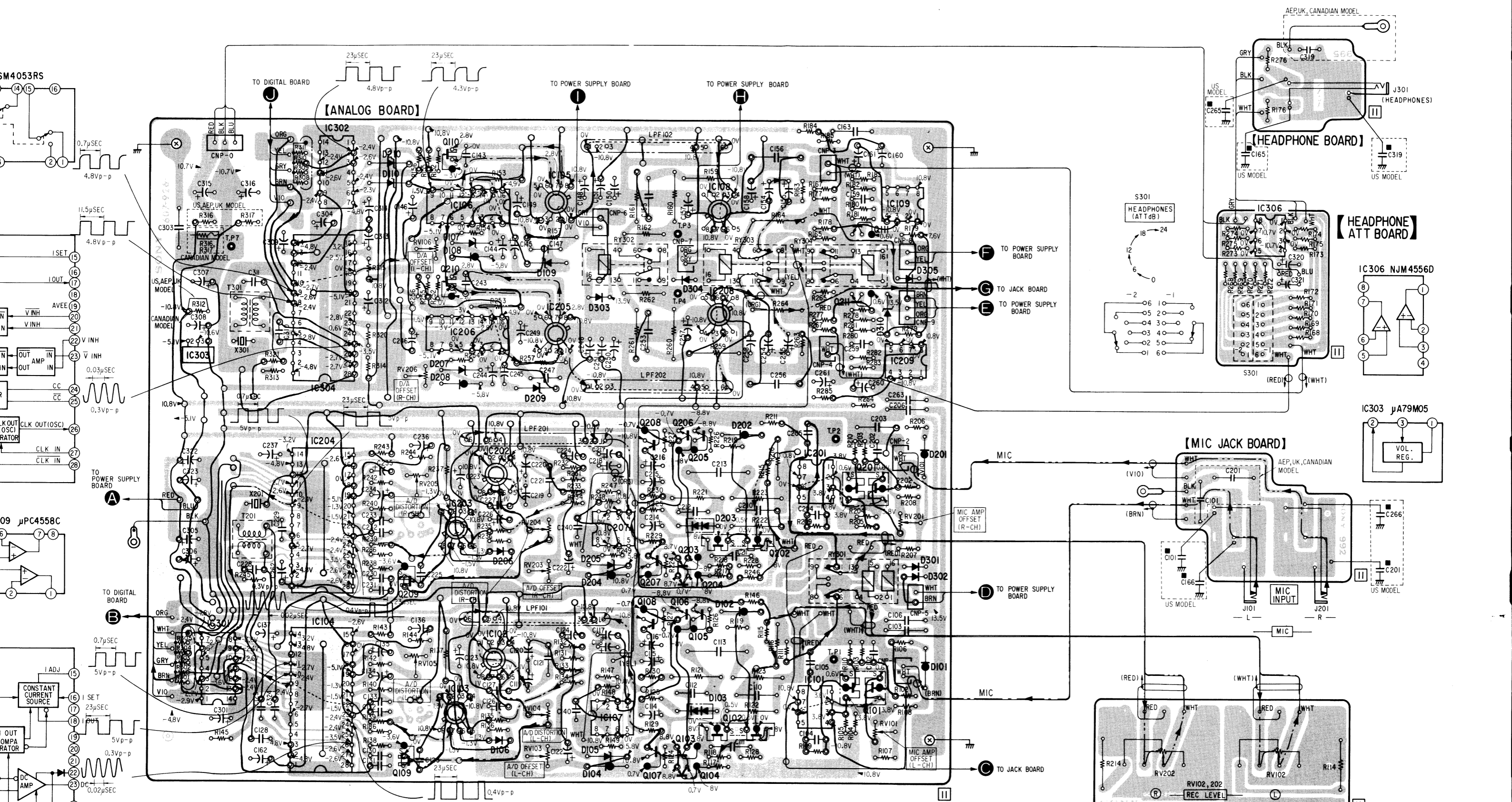
- — : parts extracted from the component side.
- — : parts extracted from the conductor side.
- : part mounted on the conductor side.
- ○ : pattern connection on the component side.
- ■ : B + pattern

- : signal path
- : L-CH signal path
- : R-CH signal path



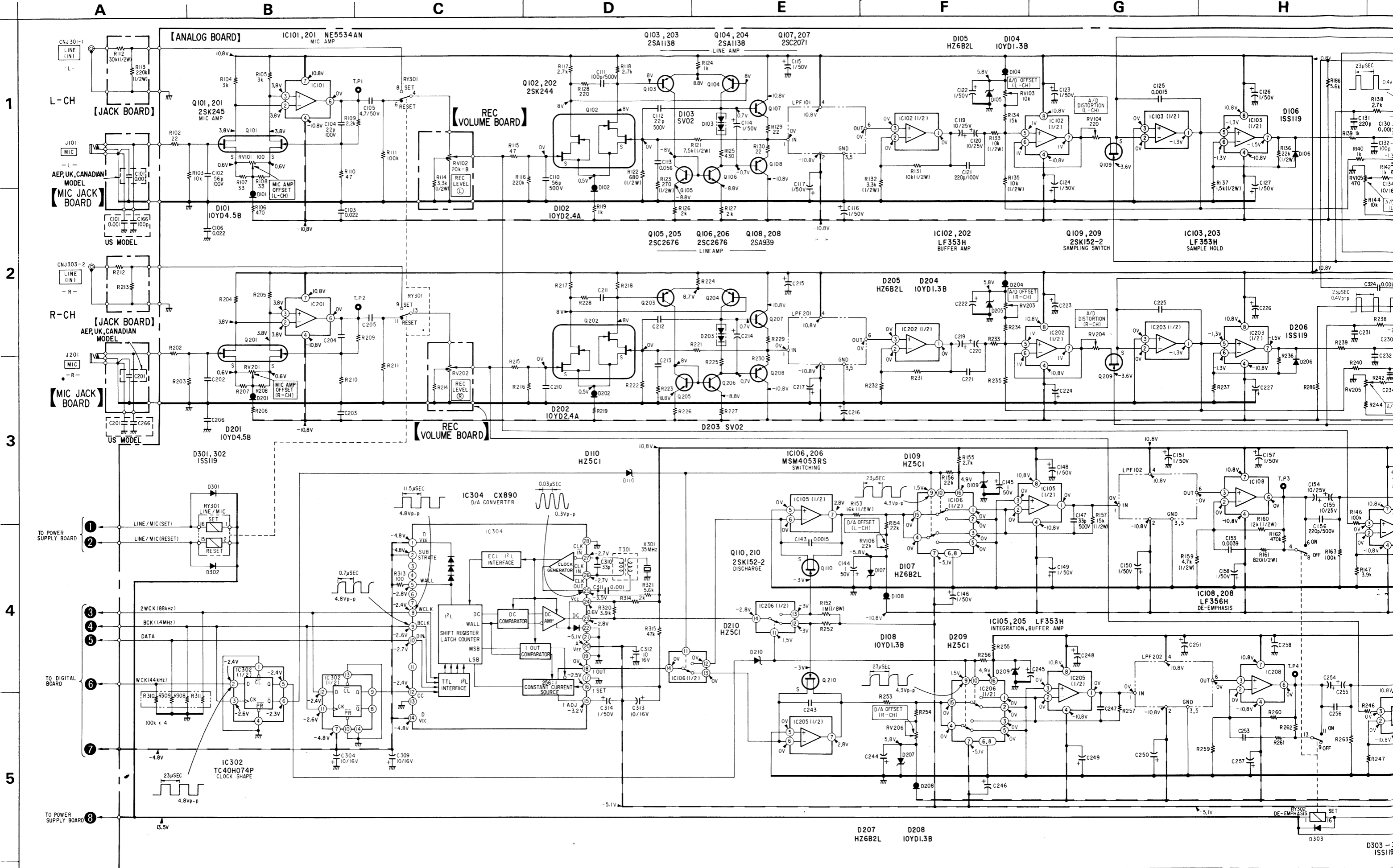
# PCM-F1 PCM-F1

C D E F G H I J

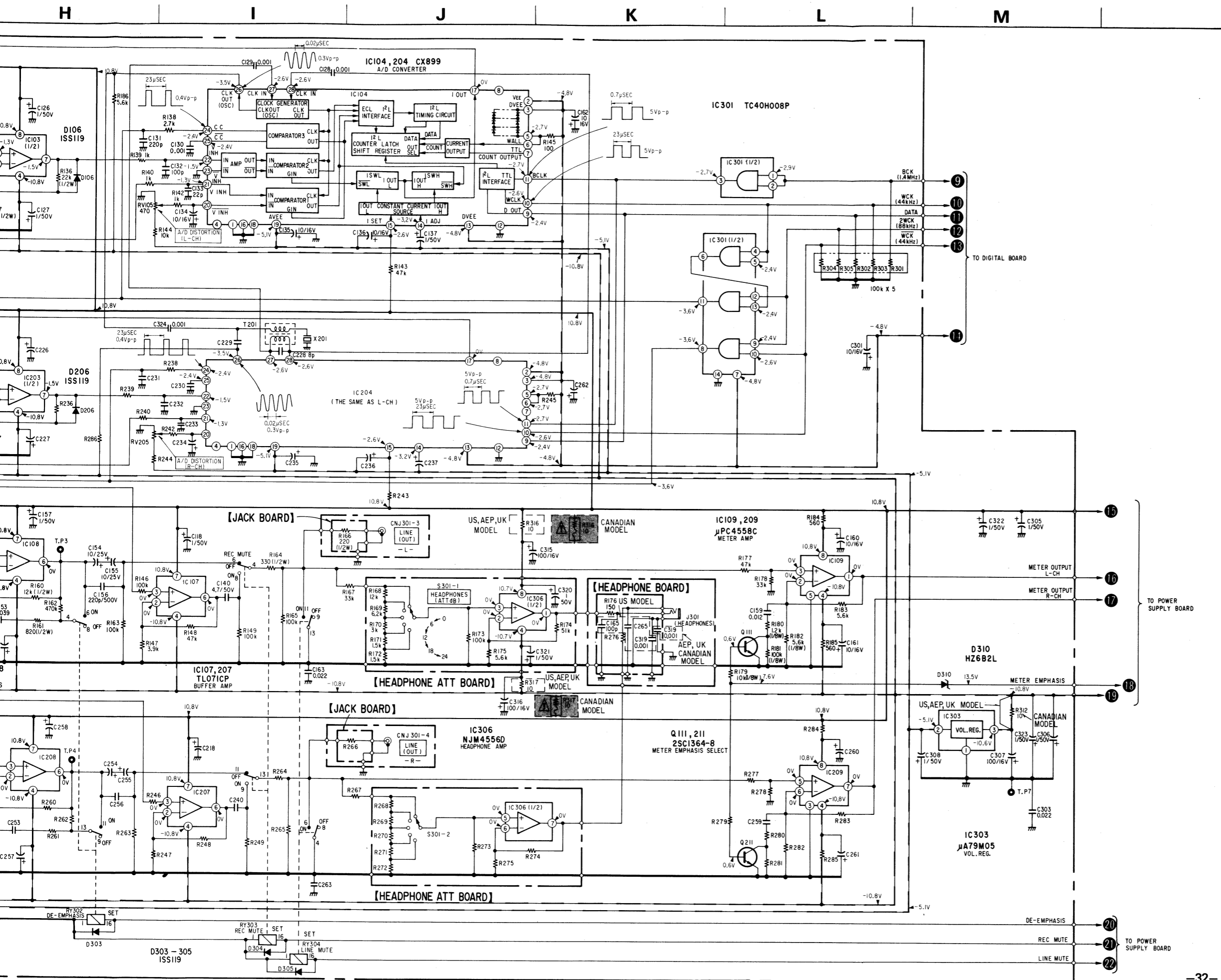


	IC302	110	IC106	IC202	IC205	208	206, 205	IC108			
Q		210	IC206	IC203		207	204	IC208	III	IC109	
IC	IC303	209	IC102			108	106, 105	IC201	2II	IC209	
	IC301	109	IC103		IC107	107	103	IC101	201		
D		210	107			303, 205	304			305	201
		110	108			207	203			301	
			207		109	105	102			302	
			208		209	104	103			101	
			106								

4-2. SCHEMATIC DIAGRAM



# PCM-F1 PCM-F1



## Note:

• Switch, relay

Ref. No.	Switch	Position
S301	HEADPHONES ATTdB	0
S601	MUTING	OFF
S602	COPY	OFF
S603	INPUT	MIC
S604	METER	OFF
S605	PEAK HOLD	
	RESET/AUTO	OFF
S606	PEAK HOLD	
	RESET/MANUAL	OFF
S607	BATT CHECK	OFF
S608	REC MUTE	OFF
S609	POWER	OFF
S600	RES	14BIT
RY301	LINE/MIC	MIC
RY303	De-emphasis	OFF
RY303	REC MUTE	OFF
RY304	Line mute	OFF
RY601	AC/DC	AC
RY602	POWER	ON
RY603	Charge	ON

- : panel designation.
- All resistors are in ohms, 1/8W unless otherwise noted. kΩ : 1000 Ω, MΩ : 1000 kΩ
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- : fusible resistor.
- : adjustment for repair.
- : B+ bus.
- : B- bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under E-E mode, no-signal conditions with a VOM (50 kΩ/V).
- Voltage/waveforms are measured with a wide-band oscilloscope.

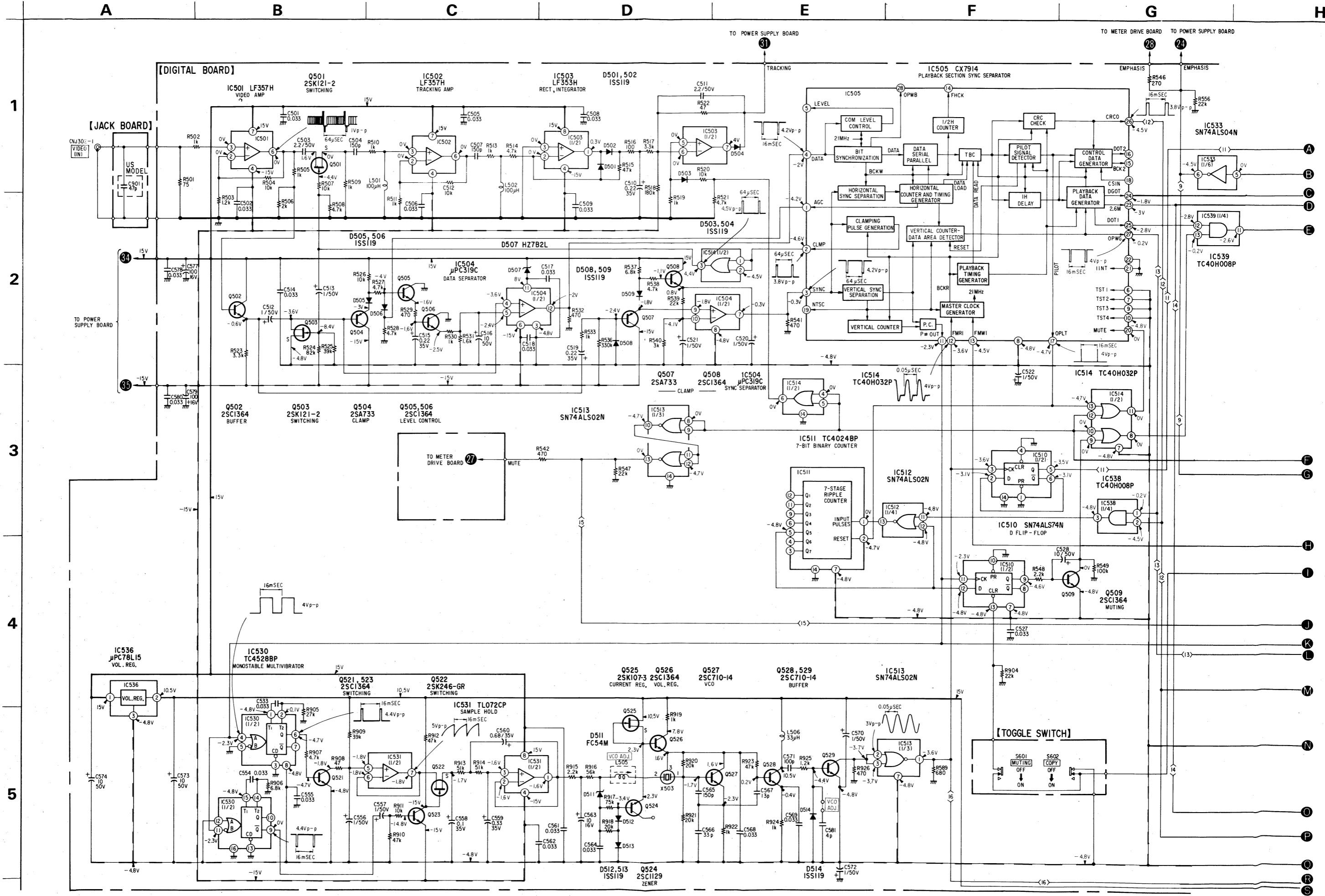
Note: The components identified by shading and mark are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

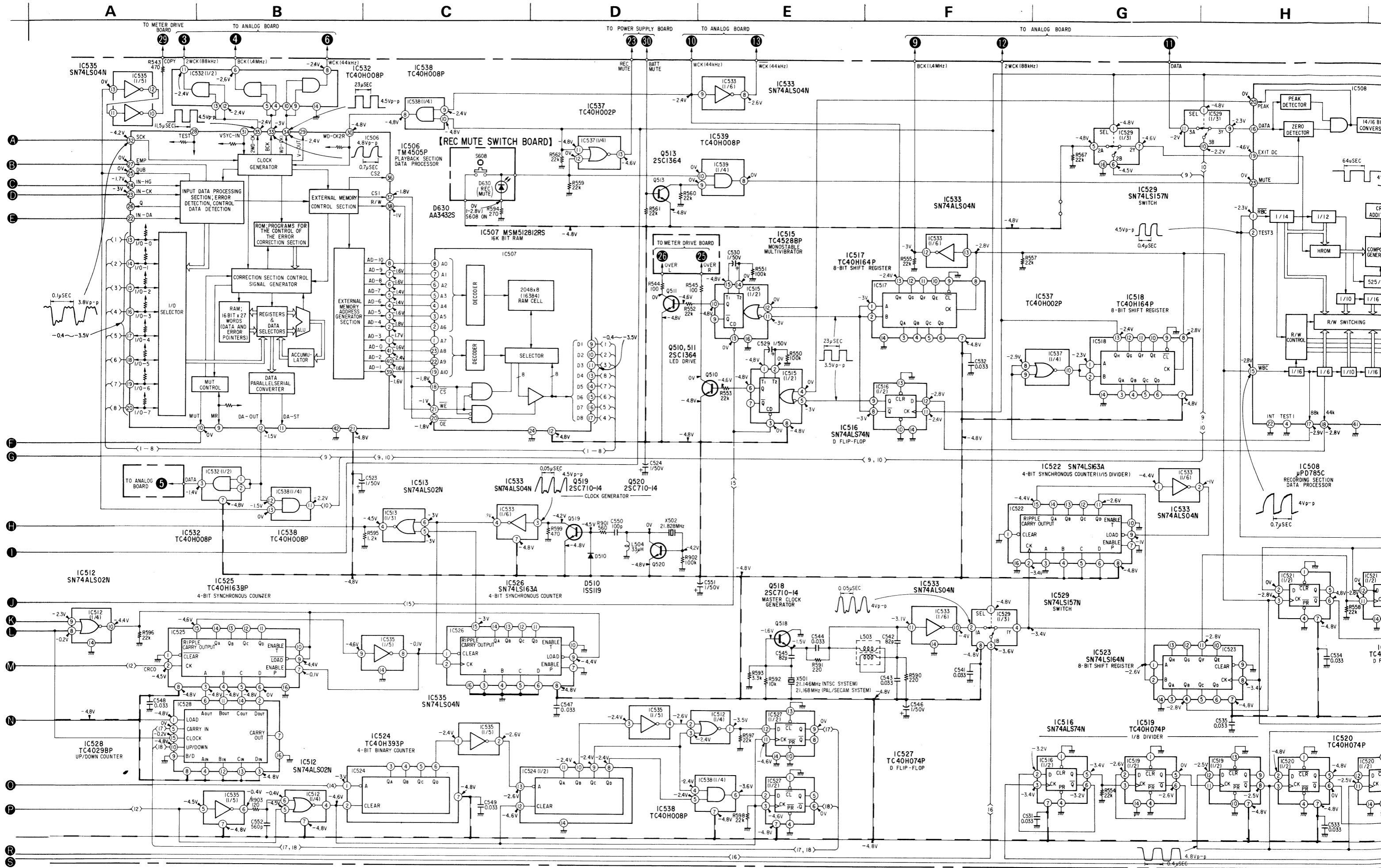
2.4. SCHEMATIC DIAGRAM

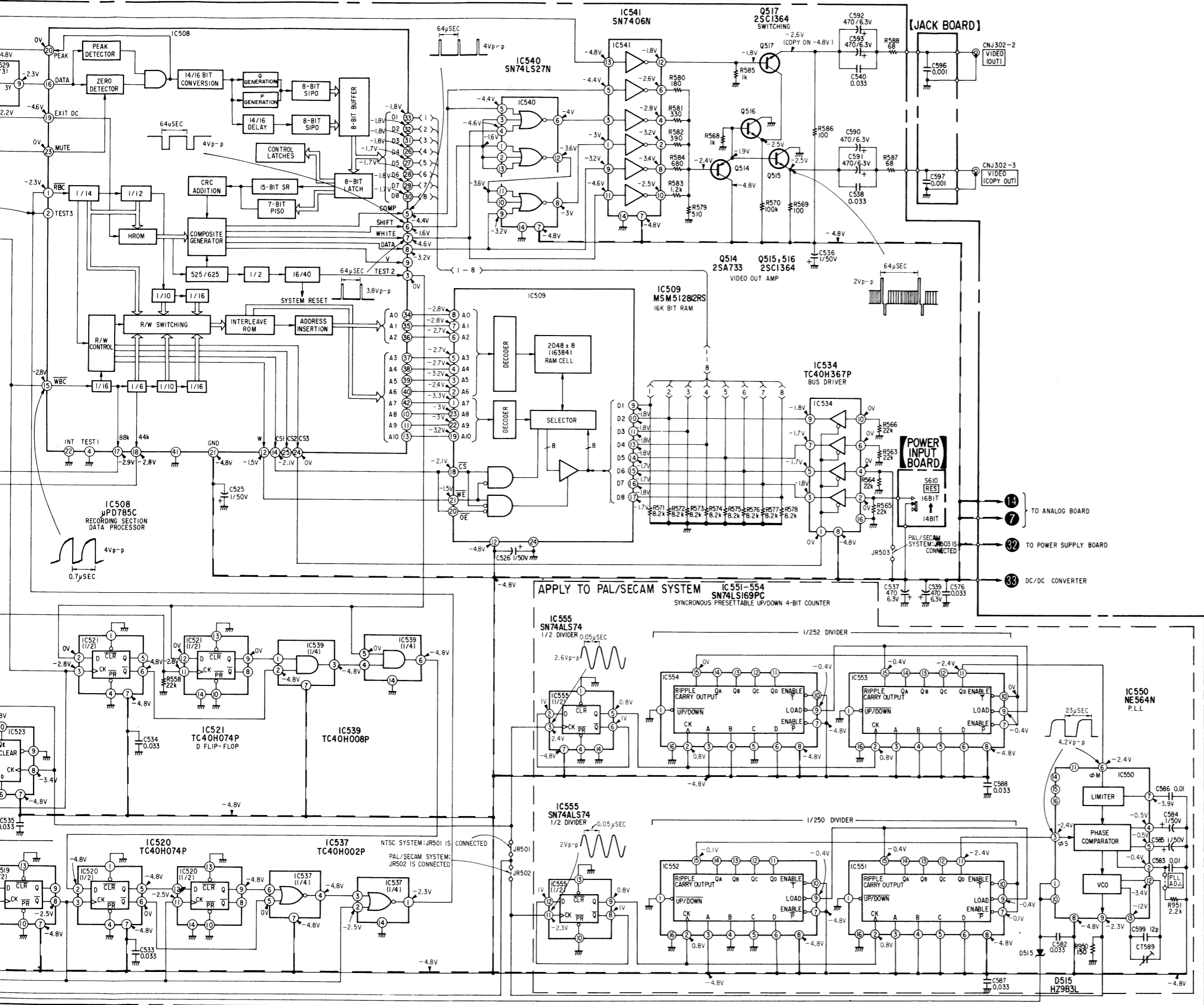
Semiconductor Lead Layouts: See Page 25.  
Circuit Board Location: See page 25.

PCM-F1 PCM-F1



# PCM-F1 PCM-F1





1

2

3

4

5

**Note:**

- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$  :  $\mu\mu\text{F}$  50VV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms,  $\frac{1}{8}\text{W}$  unless otherwise noted.  $\text{k}\Omega$  :  $1000\Omega$ ,  $\text{M}\Omega$  :  $1000\text{k}\Omega$
- : panel designation.
- : adjustment for repair.
- — : B+ bus.
- — : B- bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under E-E mode, no-signal conditions with a VOM (50  $\text{k}\Omega/\text{V}$ ).
- Voltage/waveforms are measured with a wide-band oscilloscope.

A B C D E F G H

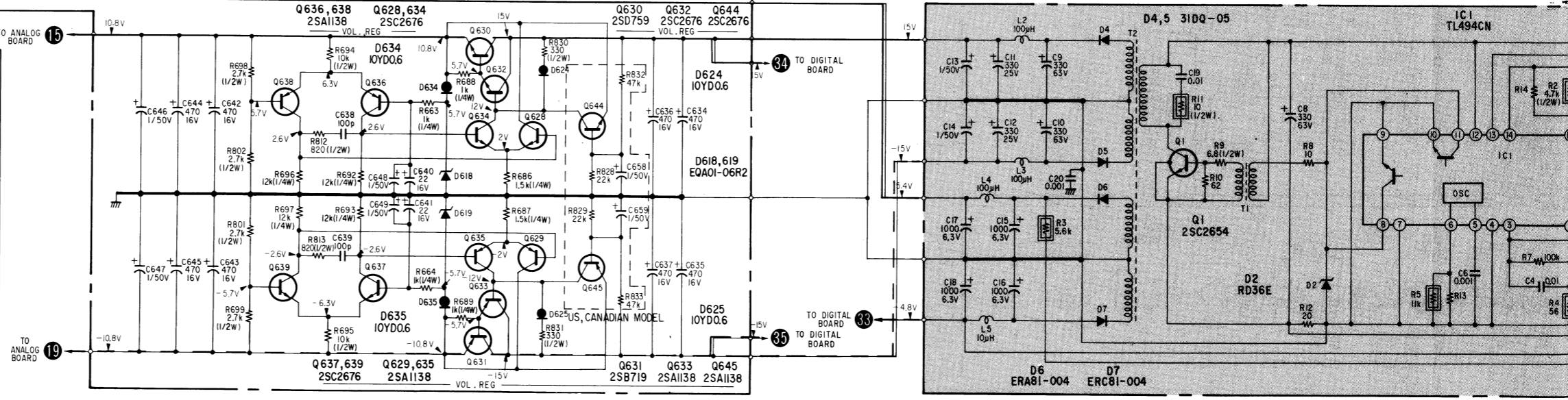
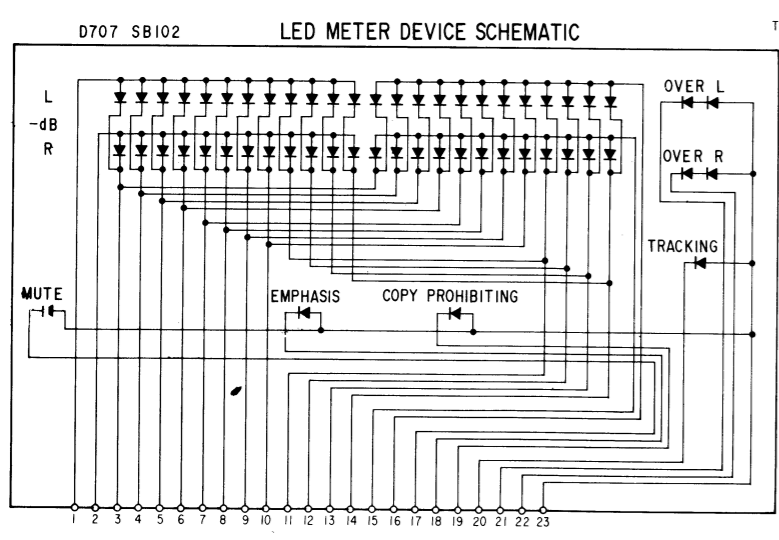
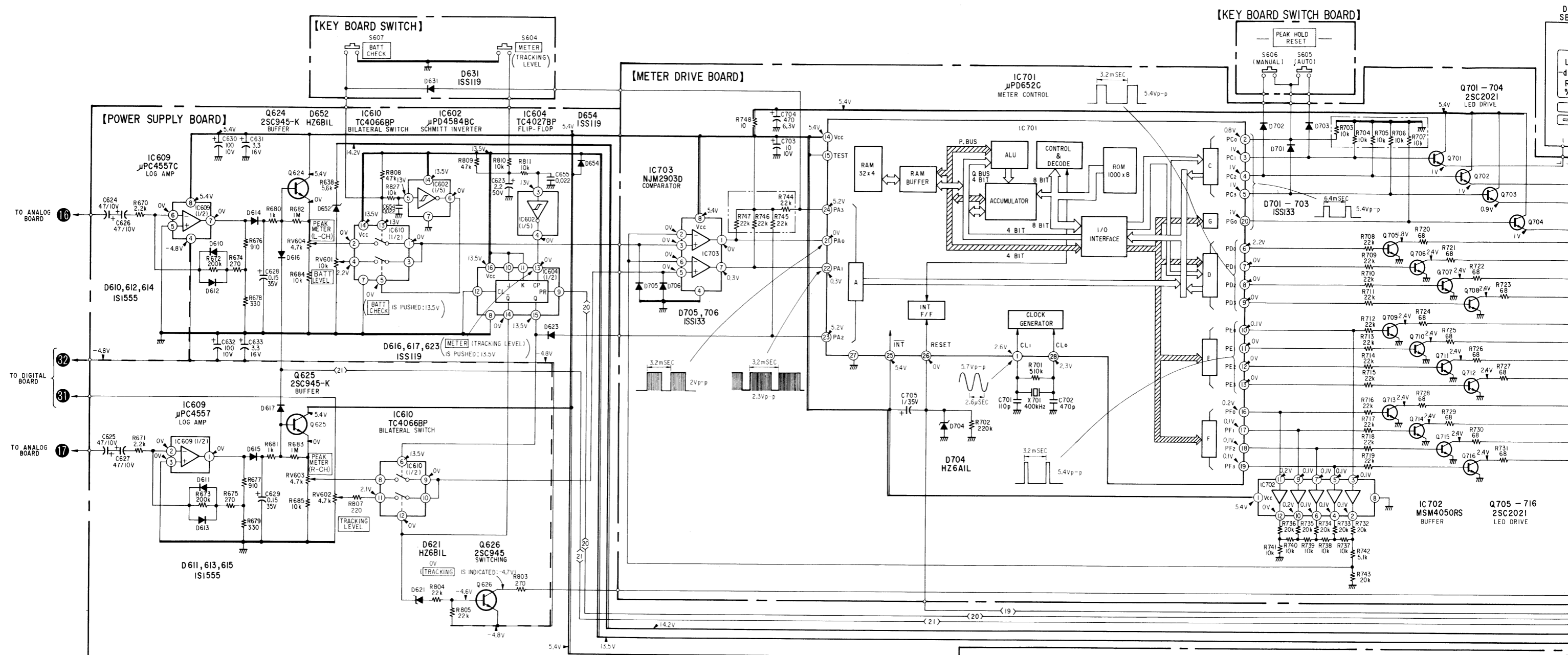
1

2

3

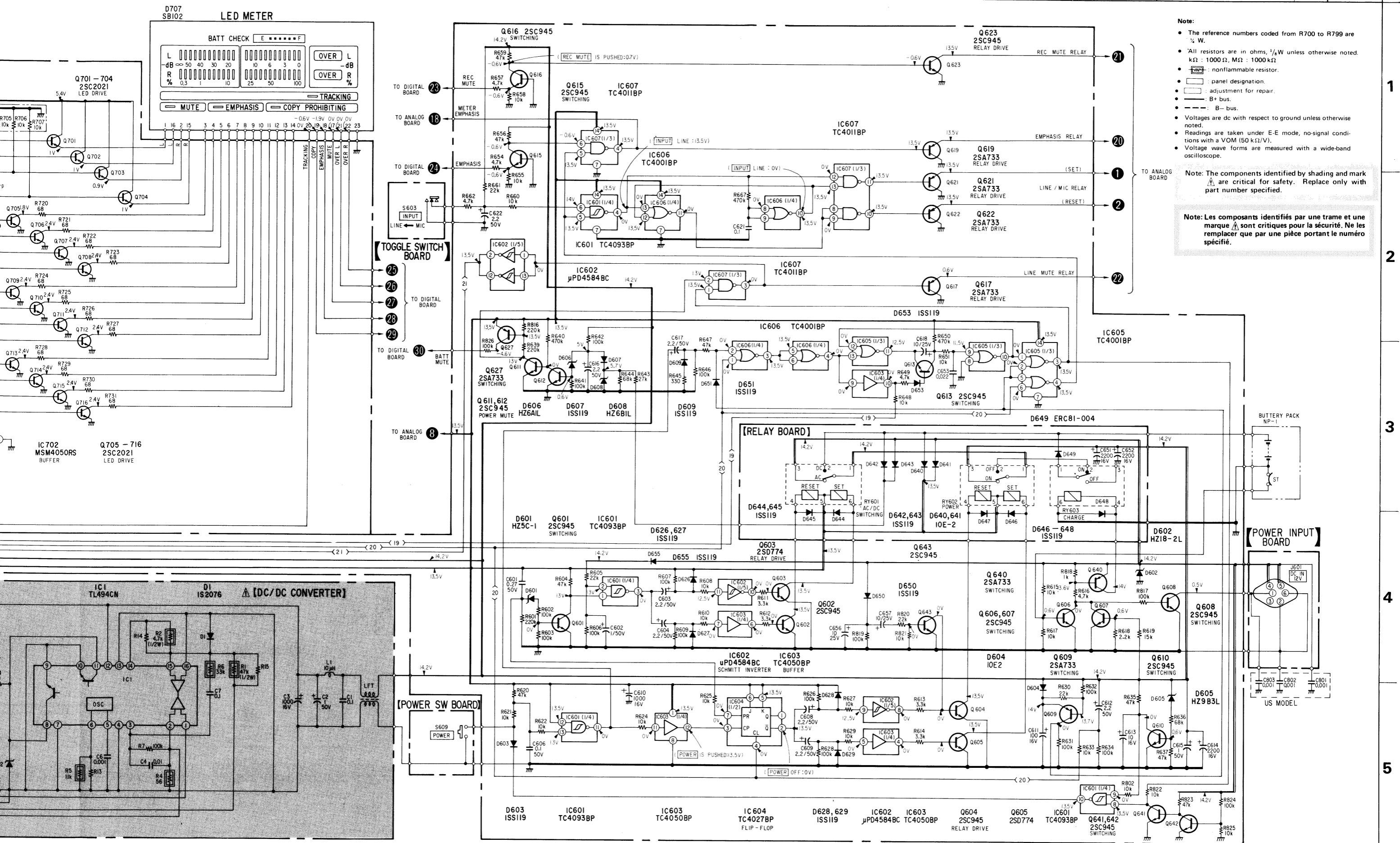
4

5





# PCM-F1 PCM-F1



**Note:**

- The reference numbers coded from R700 to R799 are 1/2 W.
- All resistors are in ohms, 1/4W unless otherwise noted. kΩ : 1000 Ω, MΩ : 1000 kΩ
- : nonflammable resistor.
- : panel designation.
- : adjustment for repair.
- : B+ bus.
- : B- bus.
- Voltagages are dc with respect to ground unless otherwise noted.
- Readings are taken under E-E mode, no-signal conditions with a VOM (50 kΩ/V).
- Voltage wave forms are measured with a wide-band oscilloscope.

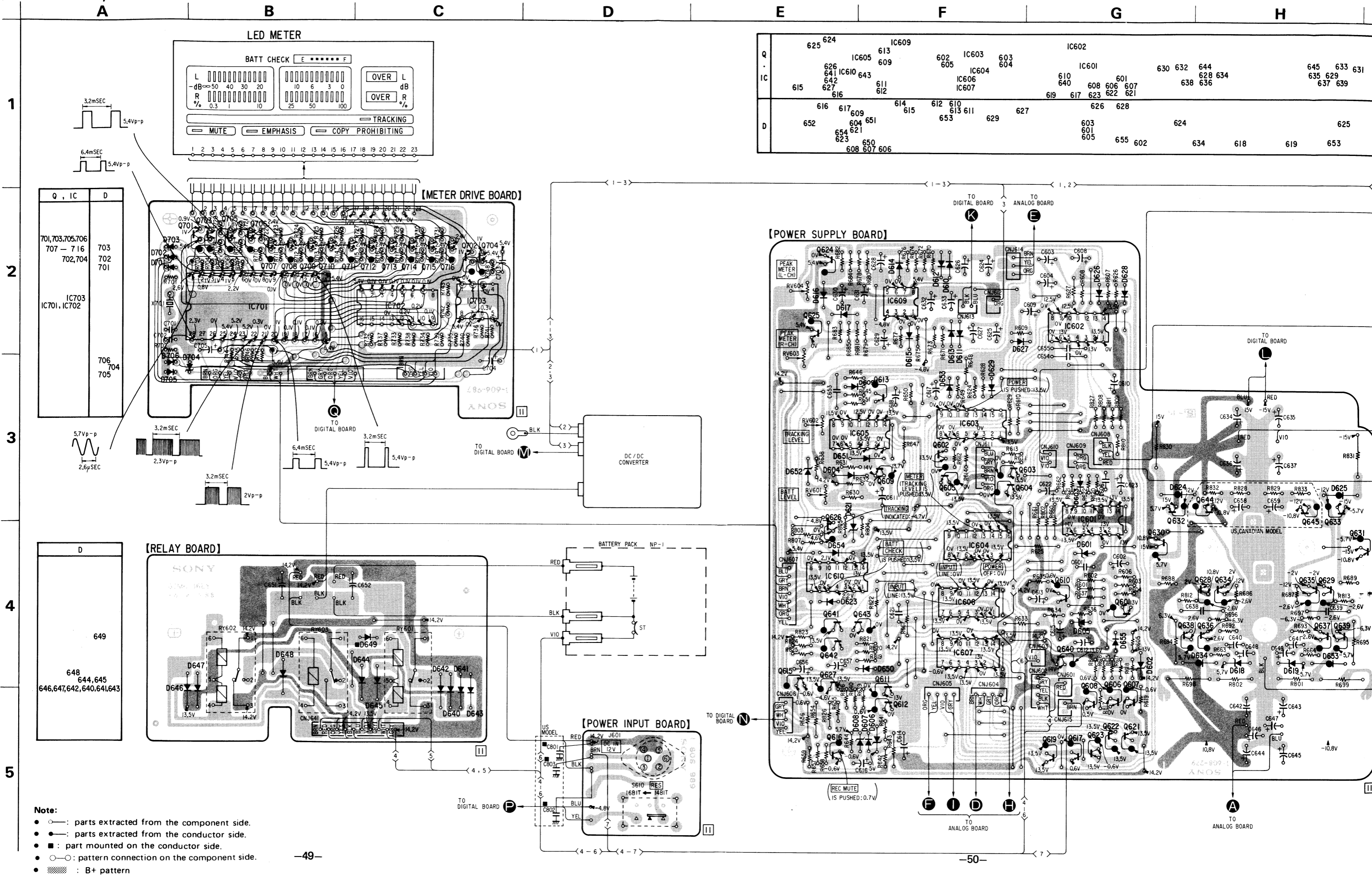
**Note:** The components identified by shading and mark **A** are critical for safety. Replace only with part number specified.

**Note:** Les composants identifiés par une trame et une marque **A** sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

4-6. MOUNTING DIAGRAM  
—Component Side—

Semiconductor Lead Layouts: See Page 25.  
Circuit Board Location: See page 25.

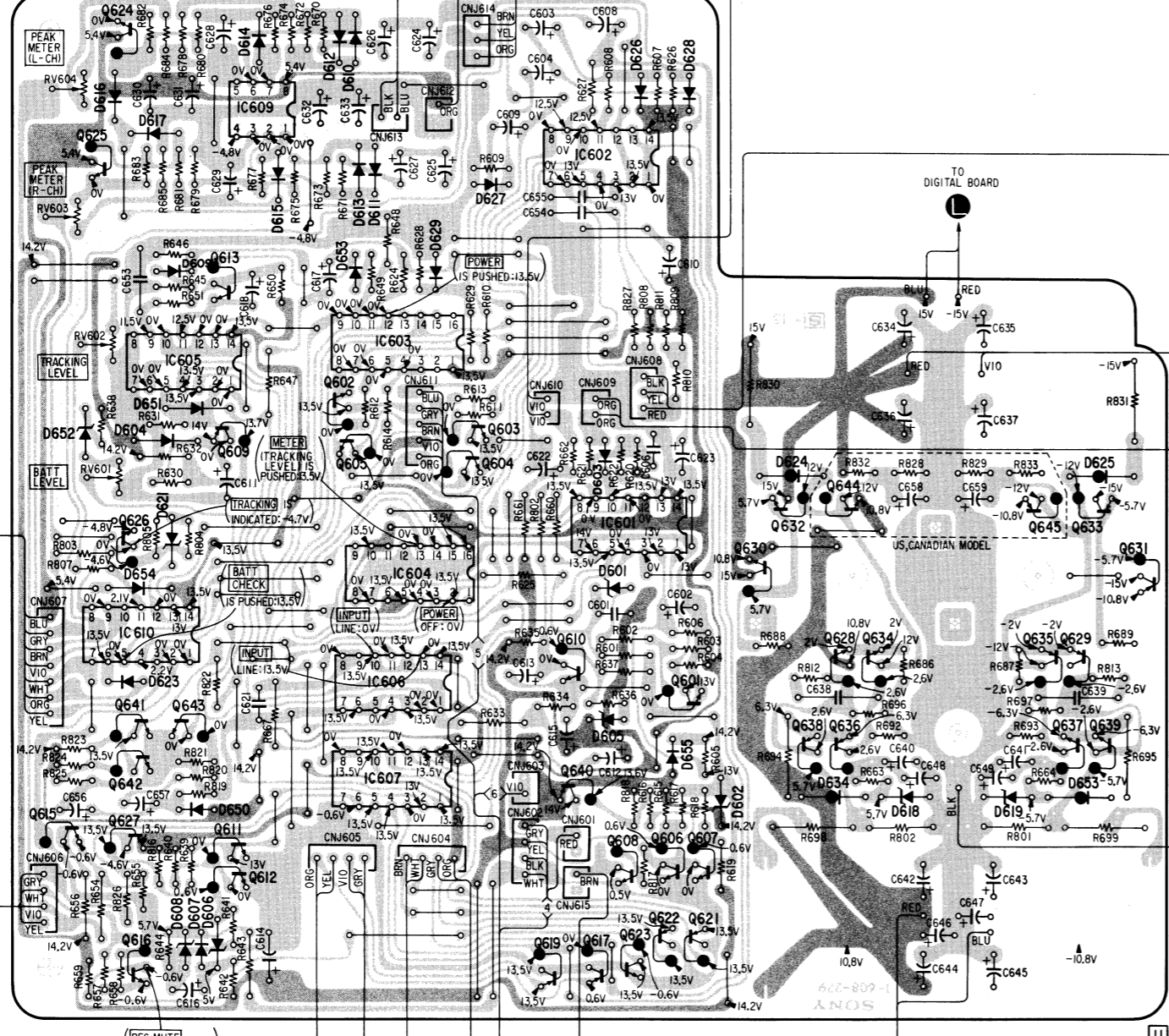
PCM-F1 PCM-F1



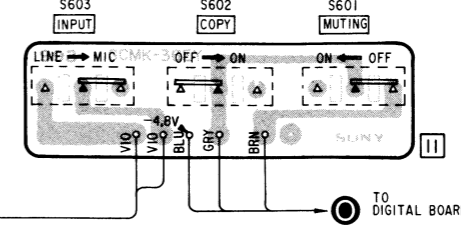
- Note:**
- : parts extracted from the component side.
  - : parts extracted from the conductor side.
  - : part mounted on the conductor side.
  - : pattern connection on the component side.
  - : B+ pattern

	625	624	IC609	613	IC603	603	IC602	630	632	644	645	633	631
Q													
IC	626	IC605	609	602	IC604	604	IC601	638	636	628	635	629	639
	641	IC610	643	IC606	IC607		610	608	606	607	637		
D	615	627	616	611	612		619	617	623	622	621		
	616	617	609	614	615	612	610	608	606	607	626	628	
	652		604	651	653	613	611				625		
			654	621									
			623										
			650	608	607	606							

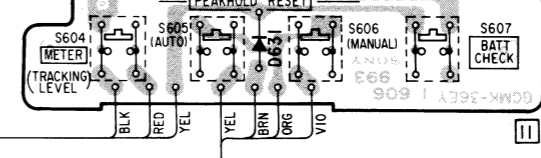
[POWER SUPPLY BOARD]



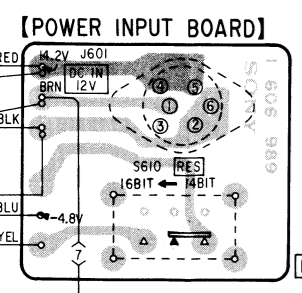
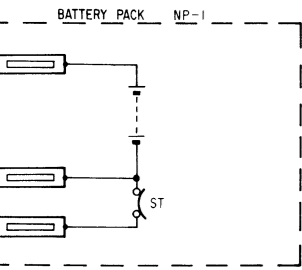
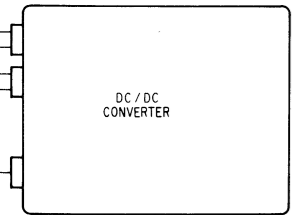
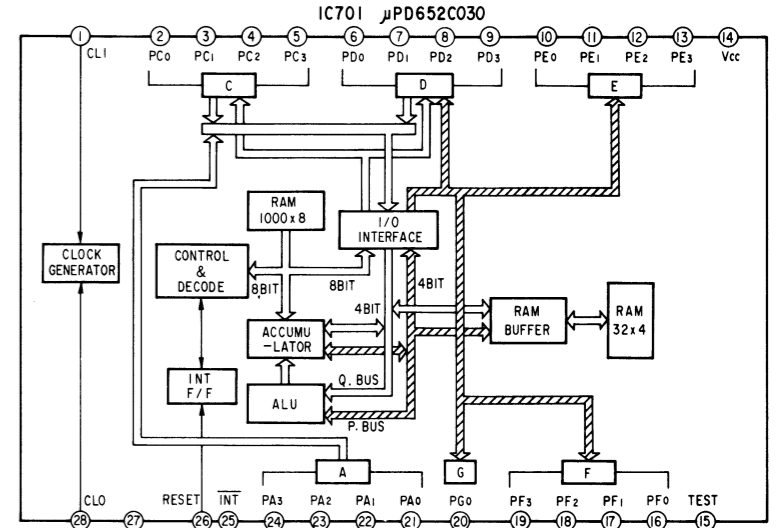
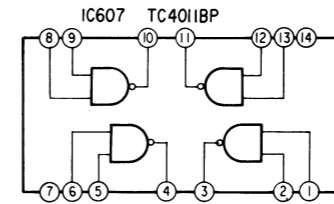
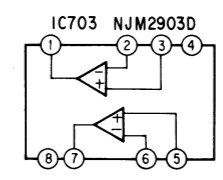
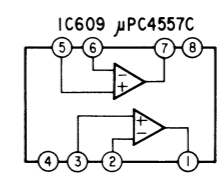
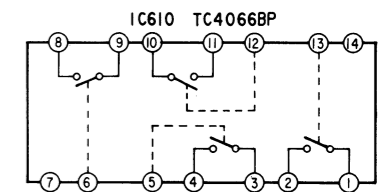
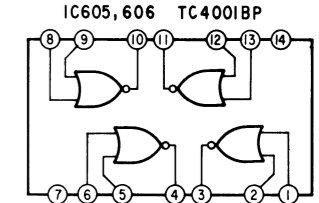
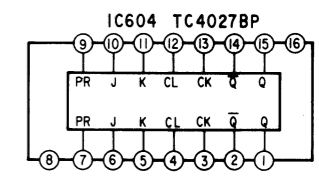
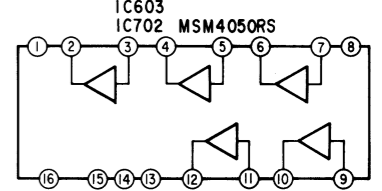
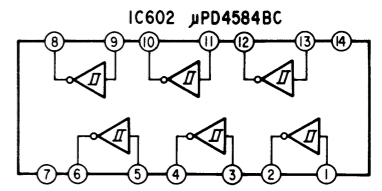
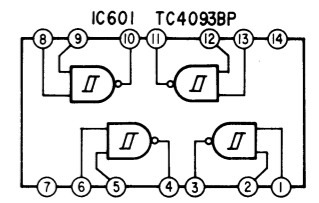
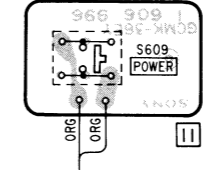
[TOGGLE SWITCH BOARD]



[KEY BOARD SWITCH BOARD]

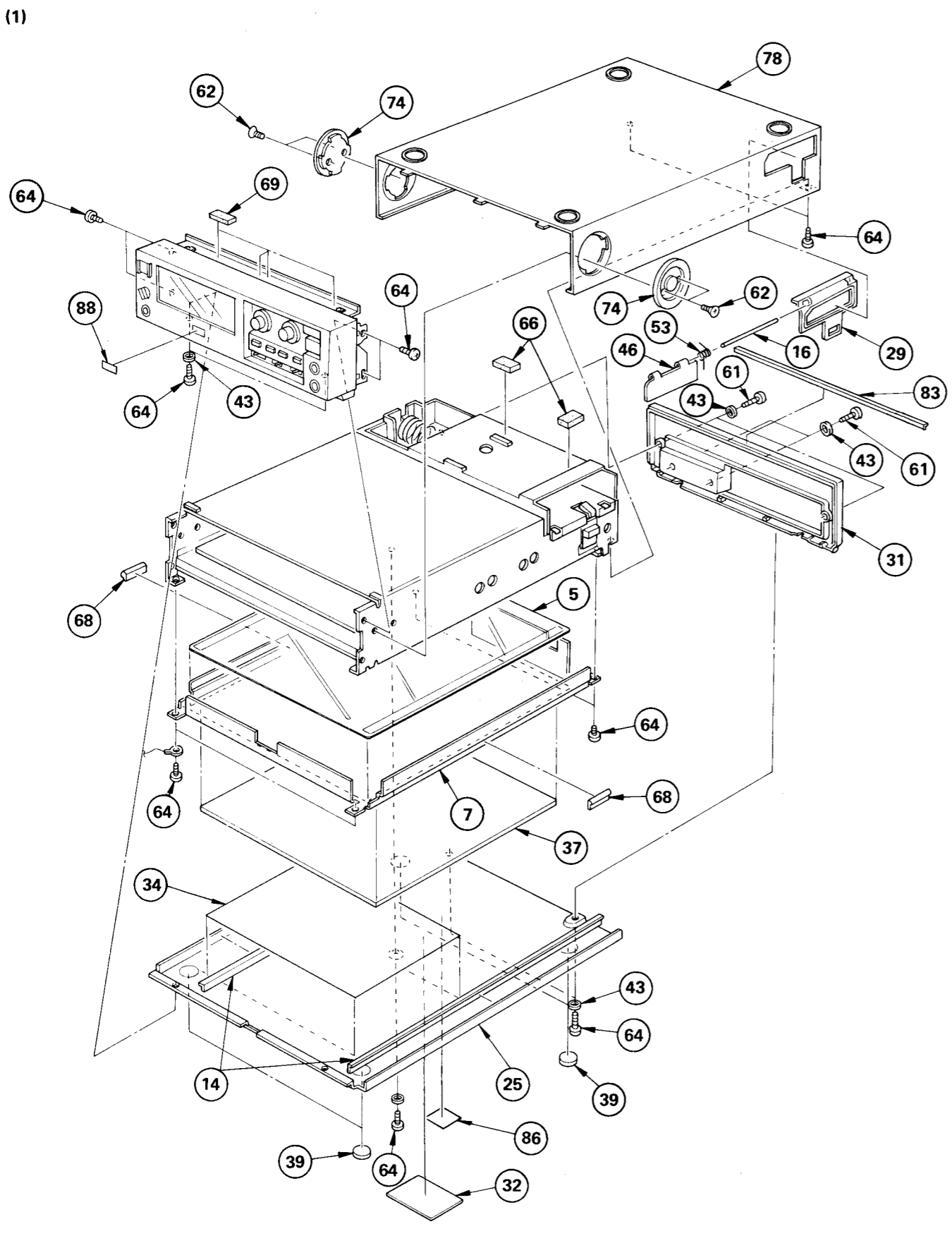


[POWER SW BOARD]

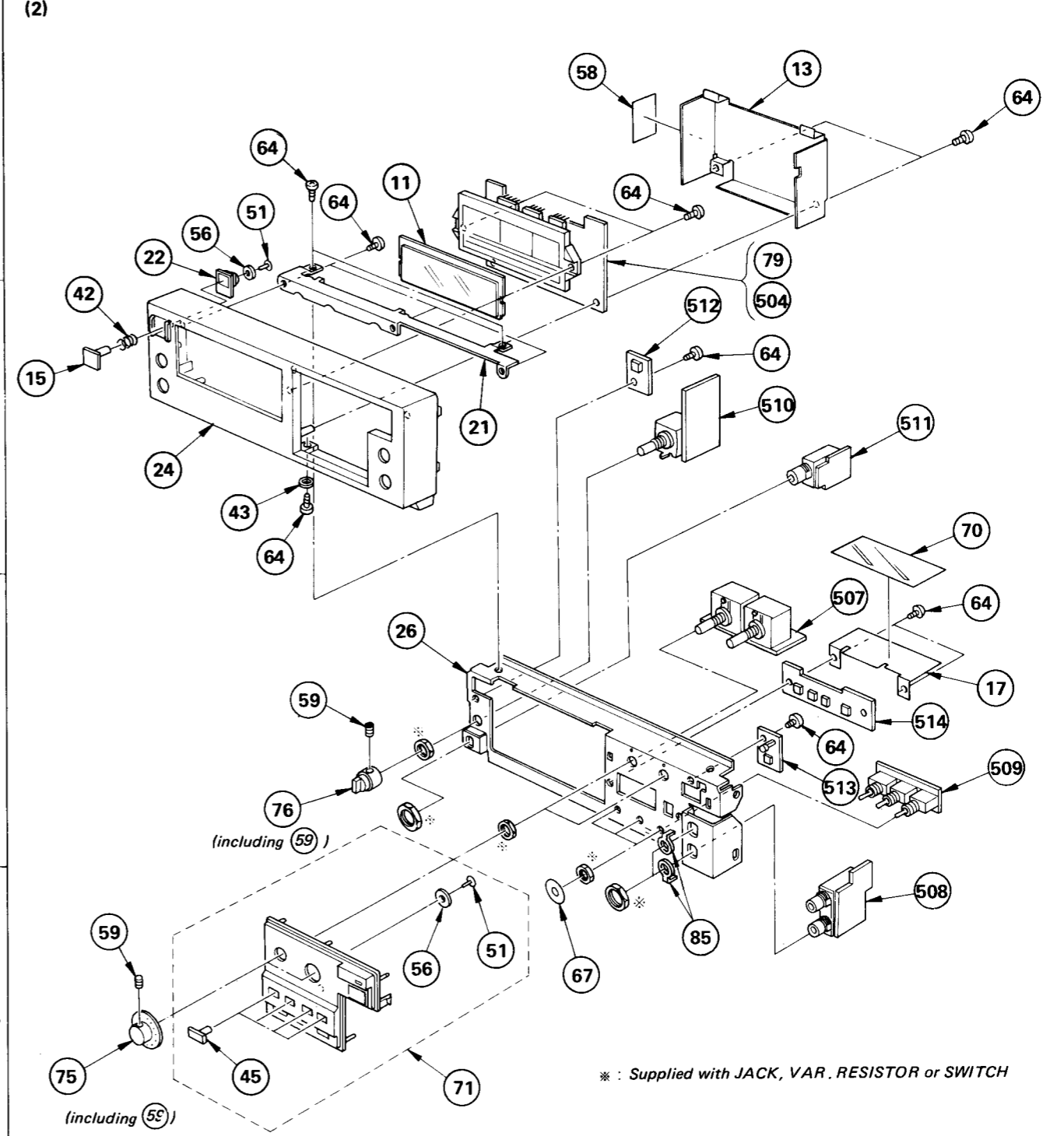


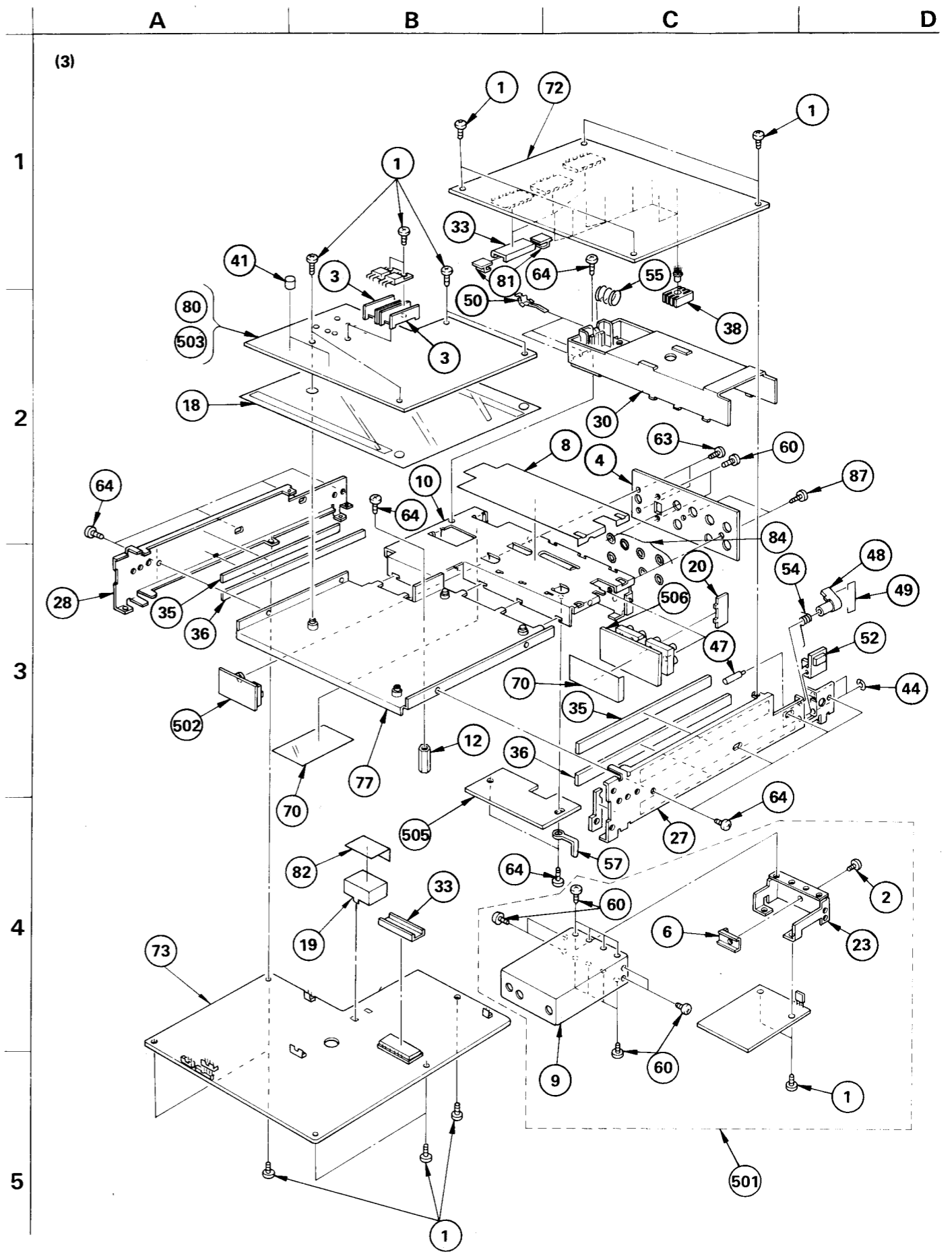
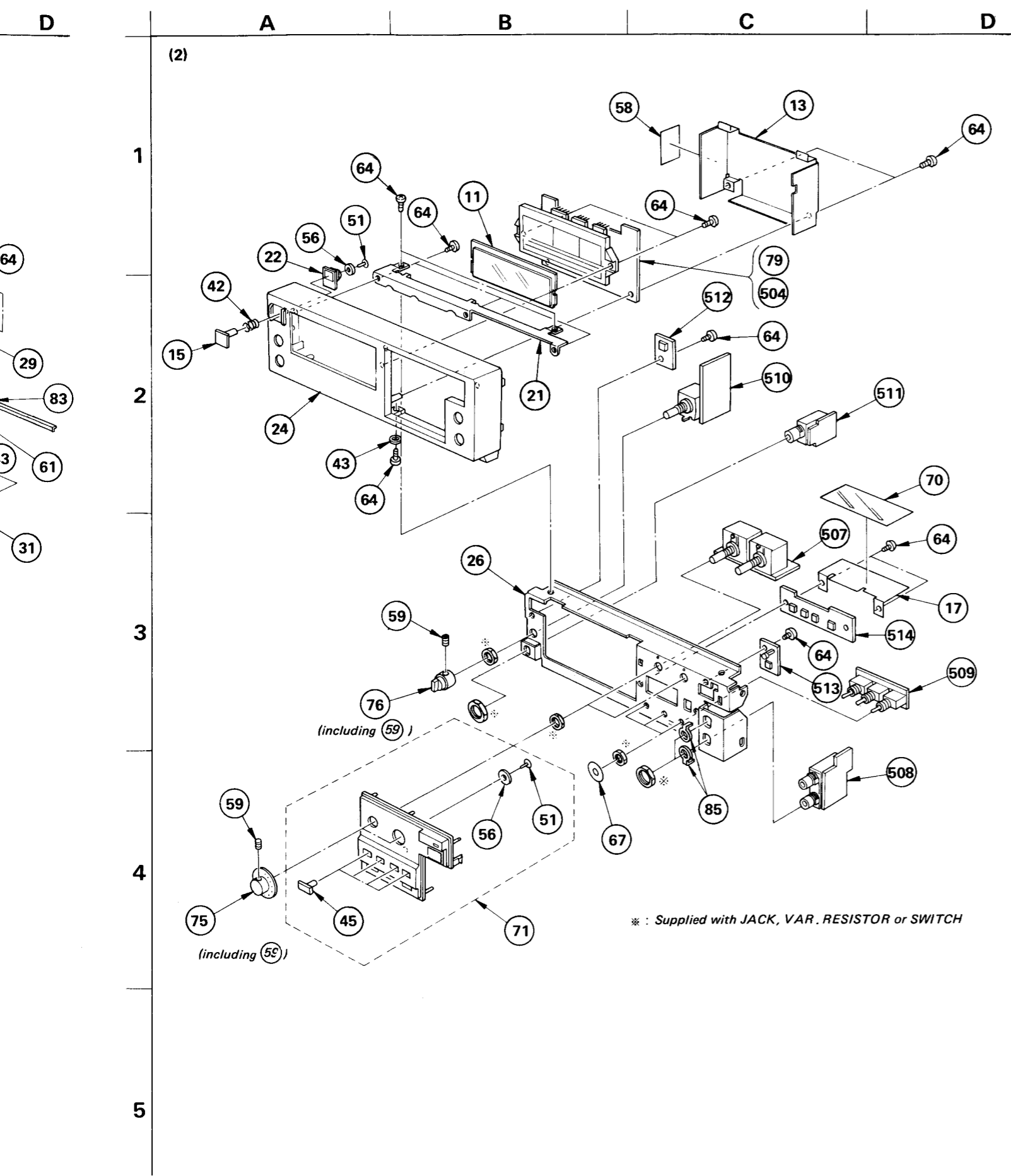
SECTION 5  
EXPLODED VIEWS AND PARTS LIST

A B C D



A B C D















ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R247	1-214-146-00	METAL	3.9K	1%	1/4W
R248	1-214-172-00	METAL	47K	1%	1/4W
R249	1-214-180-00	METAL	100K	1%	1/4W
R253	1-214-893-00	METAL	16K	1%	1/2W
R254	1-214-164-00	METAL	22K	1%	1/4W
R255	1-214-142-00	METAL	2.7K	1%	1/4W
R256	1-214-164-00	METAL	22K	1%	1/4W
R257	1-214-892-00	METAL	15K	1%	1/2W
R259	1-214-880-61	METAL	4.7K	1%	1/2W
R260	1-214-890-61	METAL	12K	1%	1/2W
R261	1-214-862-00	METAL	820	1%	1/2W
R262	1-214-956-00	METAL	470K	1%	1/4W
R263	1-214-180-00	METAL	100K	1%	1/4W
R264	1-214-852-61	METAL	330	1%	1/2W
R265	1-214-180-00	METAL	100K	1%	1/4W
R266	1-214-848-00	METAL	220	1%	1/2W
R267	1-214-168-00	METAL	33K	1%	1/4W
R268	1-214-158-00	METAL	12K	1%	1/4W
R269	1-214-151-00	METAL	6.2K	1%	1/4W
R270	1-214-143-00	METAL	3K	1%	1/4W
R271	1-214-136-00	METAL	1.5K	1%	1/4W
R272	1-214-136-00	METAL	1.5K	1%	1/4W
R273	1-214-180-00	METAL	100K	1%	1/4W
R274	1-214-173-00	METAL	51K	1%	1/4W
R275	1-214-150-00	METAL	5.6K	1%	1/4W
R276	1-214-112-00	METAL	150	1%	1/4W
R277	1-214-172-00	METAL	47K	1%	1/4W
R278	1-214-168-00	METAL	33K	1%	1/4W
R284	1-214-126-00	METAL	560	1%	1/4W
R285	1-214-126-00	METAL	560	1%	1/4W
R286	1-214-150-00	METAL	5.6K	1%	1/4W
R312	1-214-084-00	METAL	10	1%	1/4W
R313	1-214-108-00	METAL	100	1%	1/4W
R314	1-214-139-00	METAL	2K	1%	1/4W
R315	1-214-172-00	METAL	47K	1%	1/4W
R316	A 1-212-857-00	(Canadian)...RES, FUSE	10	5%	1/4W F
R316	1-214-084-00	(US,AEP,UK)...METAL	10	1%	1/4W
R317	A 1-212-857-00	(Canadian)...RES, FUSE	10	5%	1/4W F
R317	1-214-084-00	(US,AEP,UK)...METAL	10	1%	1/4W
R320	1-214-146-00	METAL	3.9K	1%	1/4W
R321	1-214-150-00	METAL	5.6K	1%	1/4W
R589	1-214-128-00	METAL	680	1%	1/4W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R663	1-214-132-00	METAL	1K	1%	1/4W
R664	1-214-132-00	METAL	1K	1%	1/4W
R686	1-214-136-00	METAL	1.5K	1%	1/4W
R687	1-214-136-00	METAL	1.5K	1%	1/4W
R688	1-214-132-00	METAL	1K	1%	1/4W
R689	1-214-132-00	METAL	1K	1%	1/4W
R692	1-214-158-00	METAL	12K	1%	1/4W
R693	1-214-158-00	METAL	12K	1%	1/4W
R694	1-214-888-00	METAL	10K	1%	1/2W
R695	1-214-888-00	METAL	10K	1%	1/2W
R696	1-214-158-00	METAL	12K	1%	1/4W
R697	1-214-158-00	METAL	12K	1%	1/4W
R698	1-214-874-00	METAL	2.7K	1%	1/2W
R699	1-214-874-00	METAL	2.7K	1%	1/2W
R732	1-214-760-00	METAL	20K	1%	1/4W
R733	1-214-760-00	METAL	20K	1%	1/4W
R734	1-214-760-00	METAL	20K	1%	1/4W
R735	1-214-760-00	METAL	20K	1%	1/4W
R736	1-214-760-00	METAL	20K	1%	1/4W
R737	1-214-753-00	METAL	10K	1%	1/4W
R738	1-214-753-00	METAL	10K	1%	1/4W
R739	1-214-753-00	METAL	10K	1%	1/4W
R740	1-214-753-00	METAL	10K	1%	1/4W
R741	1-214-753-00	METAL	10K	1%	1/4W
R742	1-214-746-00	METAL	5.1K	1%	1/4W
R743	1-214-760-00	METAL	20K	1%	1/4W
R744	1-231-569-00	COMPOSITION CIRCUIT BLOCK			
R745	1-231-569-00	COMPOSITION CIRCUIT BLOCK			
R746	1-231-569-00	COMPOSITION CIRCUIT BLOCK			
R747	1-231-569-00	COMPOSITION CIRCUIT BLOCK			
R801	1-214-874-00	METAL	2.7K	1%	1/2W
R802	1-214-874-00	METAL	2.7K	1%	1/2W
R812	1-214-862-00	METAL	820	1%	1/2W
R813	1-214-862-00	METAL	820	1%	1/2W
R830	1-214-852-61	METAL	330	1%	1/2W
R831	1-214-852-61	METAL	330	1%	1/2W
R909	1-214-170-00	METAL	39K	1%	1/4W
R913	1-214-173-00	METAL	51K	1%	1/4W
R914	1-214-173-00	METAL	51K	1%	1/4W
R915	1-214-140-00	METAL	2.2K	1%	1/4W
R916	1-214-174-00	METAL	56K	1%	1/4W
R917	1-214-177-00	METAL	75K	1%	1/4W
R918	1-214-163-00	METAL	20K	1%	1/4W
R925	1-214-134-00	METAL	1.2K	1%	1/4W
R926	1-214-124-00	METAL	470	1%	1/4W
R950	1-214-112-00	METAL	150	1%	1/4W

NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked "♦" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μF.

RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.

- F : nonflammable

COILS

- MMH : mH, UH : μH

The components identified by shading and mark Δ are critical for safety. Replace only with part number specified.

SEMICONDUCTORS

In each case, U : μ, for example: UA... : μA..., UPA... : μPA..., UPC... : μPC, UPD... : μPD...

## ELECTRICAL PARTS

Ref.No.	Part No.	Description
RV101	1-224-247-XX	RES, ADJ, METAL GLAZE 100
RV102	1-228-508-12	RES, VAR, CARBON 20K
RV103	1-224-252-31	RES, ADJ, METAL GLAZE 10K
RV104	1-224-550-31	RES, ADJ, METAL GLAZE 220
RV105	1-224-248-31	RES, ADJ, METAL GLAZE 470
RV106	1-224-253-31	RES, ADJ, METAL GLAZE 22K
RV201	1-224-247-XX	RES, ADJ, METAL GLAZE 100
RV202	1-228-508-12	RES, VAR, CARBON 20K
RV203	1-224-252-31	RES, ADJ, METAL GLAZE 10K
RV204	1-224-550-31	RES, ADJ, METAL GLAZE 220
RV205	1-224-248-31	RES, ADJ, METAL GLAZE 470
RV206	1-224-253-31	RES, ADJ, METAL GLAZE 22K
RV601	1-224-493-00	RES, ADJ, METAL FILM 10K
RV602	1-224-490-00	RES, ADJ, METAL FILM 4.7K
RV603	1-224-490-00	RES, ADJ, METAL FILM 4.7K
RV604	1-224-490-00	RES, ADJ, METAL FILM 4.7K
RY301	1-515-445-00	RELAY
RY302	1-515-448-00	RELAY
RY303	1-515-448-00	RELAY
RY304	1-515-448-00	RELAY
RY601	1-515-446-00	RELAY
RY602	1-515-446-00	RELAY
RY603	1-515-460-00	RELAY
S301	1-553-254-00	SWITCH, ROTARY
S601	1-553-967-00	SWITCH, TOGGLE
S602	1-553-967-00	SWITCH, TOGGLE
S603	1-553-967-00	SWITCH, TOGGLE
S604	1-553-856-00	SWITCH, KEY BOARD
S605	1-553-856-00	SWITCH, KEY BOARD
S606	1-553-856-00	SWITCH, KEY BOARD
S607	1-553-856-00	SWITCH, KEY BOARD
S608	1-553-856-00	SWITCH, KEY BOARD
S609	1-553-856-00	SWITCH, KEY BOARD
S610	1-552-972-21	SWITCH, SLIDE
T201	1-426-106-00	TRANSFORMER, RF
T301	1-426-106-00	TRANSFORMER, RF
X201	1-527-952-00	VIBRATOR, CRYSTAL
X301	1-527-948-12	VIBRATOR, CRYSTAL
X501	1-527-583-00	(NTSC).....OSCILLATOR, CRYSTAL
X501	1-527-788-00	(PAL/SECAM)...OSCILLATOR, CRYSTAL
X502	1-527-949-00	VIBRATOR, CRYSTAL
X503	1-527-871-00	OSCILLATOR, LITHIUM TANTALATE
X701	1-527-532-00	OSCILLATOR, CERAMIC

### NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked "▲" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

### CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers.  
MF: μF, PF: μμF.

### RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.

- F : nonflammable

### COILS

- MMH : mH, UH : μH

### SEMICONDUCTORS

- In each case, U : μ, for example:  
 UA... : μA..., UPA... : μPA..., UPC... : μPC,  
 UPD... : μPD...

**ELECTROLYTIC CAPACITORS**

CAP. (μF)	RATING → : Use the high voltage rated one.					
	6.3 VOLT.	10 VOLT.	16 VOLT.	25 VOLT.	35 VOLT.	50 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.47					→	1-121-726-00
1.0					→	1-121-391-00
2.2					→	1-121-450-00
3.3	→		→	1-121-392-00	→	1-121-393-00
4.7	→		→	1-121-395-00	→	1-121-396-00
10	→		1-121-651-00	1-121-398-00	→	1-121-738-00
22	→		1-121-479-00	1-121-480-00	1-121-662-00	1-121-152-00
33	→		1-121-403-00	1-121-404-00	1-121-652-00	1-121-405-00
47	→	1-121-352-00	1-121-409-00	1-121-410-00	1-121-653-00	1-121-411-00
100	→	1-121-414-00	1-121-415-00	1-121-416-00	1-121-357-00	1-121-417-00
220	1-121-419-00	1-121-420-00	1-121-421-00	1-121-422-00	1-121-261-00	1-121-423-00
330	1-121-751-00	1-121-805-00	1-121-521-00	1-121-654-00	1-121-655-00	1-121-656-00
470	1-121-424-00	1-121-425-00	1-121-426-00	1-121-733-00	1-121-361-00	1-121-810-00
1000	-	1-121-736-00	1-121-245-00	1-121-657-00	1-121-388-00	1-123-061-00
2200	1-121-658-00	1-121-659-00	1-121-660-00	1-123-067-00	1-121-984-00	-
3300	1-121-661-00	1-123-075-00	1-123-071-00	-	-	-

CAP. (μF)	100 VOLT.	160 VOLT.	250 VOLT.	350 VOLT.
	PART No.	PART No.	PART No.	PART No.
0.47	-	-	-	-
1.0	1-123-249-00	1-123-252-00	1-123-003-00	1-121-168-00
2.2	1-123-250-00	1-123-026-00	-	1-123-028-00
3.3	1-121-995-00	-	1-123-004-00	1-123-006-00
4.7	1-123-255-00	1-121-246-00	1-121-759-00	1-123-007-00
10	1-121-126-00	1-121-999-00	1-123-254-00	1-123-008-00
22	1-121-996-00	1-123-253-00	1-123-005-00	1-123-022-00
33	1-121-997-00	1-121-757-00	-	-
47	1-123-251-00	1-121-919-00	-	-
100	1-123-084-00	-	-	-

**CERAMIC CAPACITORS**

CAP. (pF)	RATING						
	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (μF)	50 VOLT.
	PART No.		PART No.		PART No.		PART No.
0.5	1-101-837-00	22	1-102-959-00	150	1-101-361-00	0.001	1-102-074-00
0.75	1-101-586-00	24	1-102-960-00	160	1-101-367-00	0.0012	1-102-118-00
1.0	1-102-934-00	27	1-102-961-00	180	1-102-976-00	0.0015	1-102-119-00
1.5	1-101-576-00	30	1-102-962-00	200	1-102-977-00	0.0018	1-102-120-00
2.0	1-102-935-00	33	1-102-963-00	220	1-102-978-00	0.0022	1-102-121-00
3	1-102-936-00	36	1-102-964-00	240	1-102-979-00	0.0027	1-102-122-00
4	1-102-937-00	39	1-102-965-00	270	1-102-980-00	0.0033	1-102-123-00
5	1-102-942-00	43	1-102-966-00	300	1-102-981-00	0.0039	1-102-124-00
6	1-102-943-00	47	1-101-880-00	330	1-102-820-00	0.0047	1-102-125-00
7	1-102-944-00	51	1-101-882-00	360	1-102-821-00	0.0056	1-102-126-00
8	1-102-945-00	56	1-101-884-00	390	1-102-822-00	0.0068	1-102-127-00
9	1-102-946-00	62	1-101-886-00	430	1-102-823-00	0.0082	1-102-128-00
10	1-102-947-00	68	1-101-888-00	470	1-102-824-00	0.01	1-102-129-00
11	1-102-948-00	75	1-101-890-00	510	1-101-059-00	0.022	1-101-005-00
12	1-102-949-00	82	1-102-971-00	560	1-102-115-00	0.047	1-101-006-00
13	1-102-950-00	91	1-102-972-00	680	1-102-116-00		
15	1-102-951-00	100	1-102-973-00	820	1-102-117-00		
16	1-102-952-00	110	1-102-815-00				
18	1-102-953-00	120	1-102-816-00				
20	1-102-958-00	130	1-101-081-00				

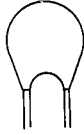
0.001μF = 1,000pF

**CERAMIC (SEMICONDUCTOR) CAPACITORS**

CAP. (μF)	RATING → : Use the high voltage rated one.				
	25 VOLT.	50 VOLT.	CAP. (μF)	25 VOLT.	50 VOLT.
	PART No.	PART No.		PART No.	PART No.
0.001	→	1-161-039-00	0.018	1-161-016-00	1-161-054-00
0.0012	→	1-161-040-00	0.022	1-161-017-00	1-161-055-00
0.0015		1-161-041-00	0.027	1-161-018-00	1-161-056-00
0.0018		1-161-042-00	0.033	1-161-019-00	1-161-057-00
0.0022		1-161-043-00	0.039	1-161-010-00	1-161-058-00
0.0027	→	1-161-044-00	0.047	1-161-021-00	1-161-059-00
0.0033	→	1-161-045-00	0.056	→	1-161-060-00
0.0039	→	1-161-046-00	0.068	→	1-161-061-00
0.0047	→	1-161-047-00	0.082	1-161-024-00	1-161-062-00
0.0056	→	1-161-048-00	0.1	1-161-025-00	1-161-063-00
0.0068	→	1-161-049-00			
0.0082	1-161-012-00	1-161-050-00			
0.01	1-161-013-00	1-161-051-00			
0.012	→	1-161-052-00			
0.015	1-161-015-00	1-161-053-00			

## MYLAR CAPACITORS

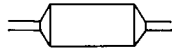
CAP. (μF)	RATING																		
	50 VOLT.			100 VOLT.			200 VOLT.			CAP. (μF)	50 VOLT.			100 VOLT.			200 VOLT.		
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.		PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	
0.001	1-108-227-00	1-108-365-00	1-108-409-00	0.01	1-108-239-00	1-108-377-00	1-108-421-00	0.1	1-108-251-00	1-108-389-00	1-108-433-00								
0.0012	1-108-351-00	1-108-366-00	1-108-410-00	0.012	1-108-357-00	1-108-378-00	1-108-422-00	0.12	1-108-363-00	1-108-390-00	1-108-434-00								
0.0015	1-108-228-00	1-108-367-00	1-108-411-00	0.015	1-108-240-00	1-108-379-00	1-108-423-00	0.15	1-108-252-00	1-108-391-00	1-108-435-00								
0.0018	1-108-352-00	1-108-368-00	1-108-412-00	0.018	1-108-358-00	1-108-380-00	1-108-424-00	0.18	1-108-364-00	1-108-392-00	1-108-436-00								
0.0022	1-108-230-00	1-108-369-00	1-108-413-00	0.022	1-108-242-00	1-108-381-00	1-108-425-00	0.22	1-108-254-00	1-108-393-00	1-108-437-00								
0.0027	1-108-353-00	1-108-370-00	1-108-414-00	0.027	1-108-359-00	1-108-382-00	1-108-426-00	0.27	1-108-854-00	-	-								
0.0033	1-108-232-00	1-108-371-00	1-108-415-00	0.033	1-108-244-00	1-108-383-00	1-108-427-00	0.33	1-108-855-00	-	-								
0.0039	1-108-354-00	1-108-372-00	1-108-416-00	0.039	1-108-360-00	1-108-384-00	1-108-428-00	0.39	1-108-856-00	-	-								
0.0047	1-108-234-00	1-108-373-00	1-108-417-00	0.047	1-108-246-00	1-108-385-00	1-108-429-00	0.47	1-108-857-00	-	-								
0.0056	1-108-355-00	1-108-374-00	1-108-418-00	0.056	1-108-361-00	1-108-386-00	1-108-430-00	-	-	-	-								
0.0068	1-108-237-00	1-108-375-00	1-108-419-00	0.068	1-108-249-00	1-108-387-00	1-108-431-00	-	-	-	-								
0.0082	1-108-356-00	1-108-376-00	1-108-420-00	0.082	1-108-362-00	1-108-388-00	1-108-432-00	-	-	-	-								



## TANTALUM CAPACITORS

CAP. (μF)	RATING						
	→ : Use the high voltage rated one.						
	3.15 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	25 VOLT.	35 VOLT.
PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.01	-	-	-	-	→	→	1-131-396-00
0.015	-	-	-	-	→	→	1-131-397-00
0.022	-	-	-	-	→	→	1-131-398-00
0.033	-	-	-	-	→	→	1-131-399-00
0.047	-	-	-	-	→	→	1-131-400-00
0.068	-	-	-	-	→	→	1-131-401-00
0.1	-	-	-	-	→	→	1-131-402-00
0.15	-	-	-	-	→	→	1-131-403-00
0.22	-	-	-	-	→	→	1-131-404-00
0.33	-	-	-	-	→	→	1-131-405-00
0.47	-	-	-	-	1-131-412-00	→	1-131-406-00
0.68	-	-	-	1-131-415-00	→	1-131-410-00	1-131-407-00
1.0	-	-	1-131-418-00	-	1-131-413-00	→	1-131-408-00
1.5	-	1-131-421-00	-	1-131-416-00	→	1-131-411-00	1-131-348-00
2.2	1-131-424-00	-	1-131-419-00	-	1-131-414-00	1-131-355-00	1-131-349-00
3.3	-	1-131-422-00	-	1-131-417-00	1-131-362-00	1-131-356-00	1-131-350-00
4.7	1-131-425-00	-	1-131-420-00	1-131-369-00	1-131-363-00	1-131-357-00	1-131-351-00
6.8	-	1-131-423-00	1-131-376-00	1-131-370-00	1-131-364-00	1-131-358-00	1-131-352-00
10	1-131-426-00	1-131-383-00	1-131-377-00	1-131-371-00	1-131-365-00	1-131-359-00	1-131-353-00
15	1-131-390-00	1-131-384-00	1-131-378-00	1-131-372-00	1-131-366-00	1-131-360-00	-
22	1-131-391-00	1-131-385-00	1-131-379-00	1-131-373-00	1-131-367-00	-	-
33	1-131-392-00	1-131-386-00	1-131-380-00	1-131-374-00	-	-	-
47	1-131-393-00	1-131-387-00	1-131-381-00	-	-	-	-
68	1-131-394-00	1-131-388-00	-	-	-	-	-
100	1-131-395-00	-	-	-	-	-	-

## TANTALUM CAPACITORS



CAP. (μF)	RATING					
	3 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	35 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.033	-	-	-	-	-	1-131-273-00
0.047	-	-	-	-	-	1-131-274-00
0.068	-	-	-	-	-	1-131-275-00
0.1	-	-	-	-	-	1-131-276-00
0.15	-	-	-	-	-	1-131-277-00
0.22	-	-	-	-	1-131-262-00	1-131-278-00
0.33	-	-	-	-	1-131-263-00	1-131-279-00
0.47	-	-	1-131-169-00	-	1-131-264-00	1-131-280-00
0.68	-	-	-	1-131-258-00	1-131-265-00	1-131-281-00
1.0	-	-	1-131-254-00	-	1-131-266-00	1-131-282-00
1.5	-	1-131-250-00	-	-	1-131-267-00	1-131-283-00
2.2	-	-	-	1-131-259-00	1-131-268-00	1-131-284-00
3.3	-	-	1-131-255-00	-	1-131-269-00	-
4.7	-	1-131-251-00	1-131-171-00	-	1-131-270-00	-
6.8	-	-	-	1-131-260-00	1-131-271-00	-
10	-	-	1-131-256-00	-	1-131-272-00	-
15	-	1-131-252-00	-	1-131-261-00	-	-
22	-	-	1-131-257-00	-	-	-
33	1-131-176-00	1-131-253-00	1-131-173-00	-	-	-
47	1-131-288-00	1-131-174-00	-	-	-	-
100	1-131-177-00	-	-	-	-	-

## 1/4 WATT CARBON RESISTORS

$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-476-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-477-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-478-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-479-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-480-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-481-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-482-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-483-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-484-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-485-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-486-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-487-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

## 1/8 WATT CARBON RESISTOR

$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.	$\Omega$	Part No.
2.0	—	13	1-246-821-00	91	1-246-831-00	620	1-246-841-00	4.3k	1-246-851-00	30k	1-246-861-00	200k	1-246-871-00
2.2	1-246-751-00	15	1-246-761-00	100	1-246-771-00	680	1-246-781-00	4.7k	1-246-791-00	33k	1-246-801-00	220k	1-246-811-00
2.4	—	16	1-246-822-00	110	1-246-832-00	750	1-246-842-00	5.1k	1-246-852-00	36k	1-246-862-00	240k	1-247-054-00
2.7	1-246-752-00	18	1-246-762-00	120	1-246-772-00	820	1-246-782-00	5.6k	1-246-792-00	39k	1-246-802-00	270k	1-247-046-00
3.0	—	20	1-246-823-00	130	1-246-833-33	910	1-246-843-00	6.2k	1-246-853-00	43k	1-246-863-00	300k	1-247-055-00
3.3	1-246-753-00	22	1-246-763-00	150	1-246-773-00	1.0k	1-246-783-00	6.8k	1-246-793-00	47k	1-246-803-00	330k	1-247-047-00
3.6	—	24	1-246-824-00	160	1-246-834-00	1.1k	1-246-844-00	7.5k	1-246-854-00	51k	1-246-864-00	360k	1-247-056-00
3.9	1-246-754-00	27	1-246-764-00	180	1-246-774-00	1.2k	1-246-784-00	8.2k	1-246-794-00	56k	1-246-804-00	390k	1-247-048-00
4.3	—	30	1-246-825-00	200	1-246-835-00	1.3k	1-246-845-00	9.1k	1-246-855-00	62k	1-246-865-00	430k	1-247-057-00
4.7	1-246-755-00	33	1-246-765-00	220	1-246-775-00	1.5k	1-246-785-00	10k	1-246-795-00	68k	1-246-805-00	470k	1-247-049-00
5.1	—	36	1-246-826-00	240	1-246-836-00	1.6k	1-246-846-00	11k	1-246-856-00	75k	1-246-866-00	510k	1-247-058-00
5.6	1-246-756-00	39	1-246-766-00	270	1-246-776-00	1.8k	1-246-786-00	12k	1-246-796-00	82k	1-246-806-00	560k	1-247-050-00
6.2	—	43	1-246-827-00	300	1-246-837-00	2.0k	1-246-847-00	13k	1-246-857-00	91k	1-246-867-00	620k	1-247-059-00
6.8	1-246-757-00	47	1-246-767-00	330	1-246-777-00	2.2k	1-246-787-00	15k	1-246-797-00	100k	1-246-807-00	680k	1-247-051-00
7.5	1-246-818-00	51	1-246-828-00	360	1-246-838-00	2.4k	1-246-848-00	16k	1-246-858-00	110k	1-246-868-00	750k	1-247-060-00
8.2	1-246-758-00	56	1-246-768-00	390	1-246-778-00	2.7k	1-246-788-00	18k	1-246-798-00	120k	1-246-808-00	820k	1-247-052-00
9.1	1-246-819-00	62	1-246-829-00	430	1-246-839-00	3.0k	1-246-849-00	20k	1-246-859-00	130k	1-246-869-00	910k	1-247-061-00
10	1-246-759-00	68	1-246-769-00	470	1-246-779-00	3.3k	1-246-789-00	22k	1-246-799-00	150k	1-246-809-00	1M	1-247-053-00
11	1-246-820-00	75	1-246-830-00	510	1-246-840-00	3.6k	1-246-850-00	24k	1-246-860-00	160k	1-246-870-00		
12	1-246-760-00	82	1-246-770-00	560	1-246-780-00	3.9k	1-246-790-00	27k	1-246-800-00	180k	1-246-810-00		