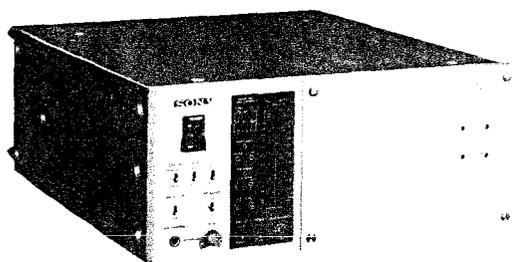


**SONY**

DIGITAL AUDIO PROCESSOR

# PCM-1630



**DIGITAL**

OPERATION AND MAINTENANCE MANUAL

1st Edition (Revised 7)

Serial No. 10001 and Higher

Before operating the unit, please read this manual thoroughly and retain it for future reference.

## OWNER'S RECORD

The model and serial numbers are located on the rear of the unit. Record the serial number in the space provided below.

Refer to them whenever you call upon an authorized Sony representative regarding this product.

Model No. PCM-1630      Serial No.

**Warning**—This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a computing device pursuant to Subpart J of Part 15 of FCC Rules.

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# SECTION 1

## OPERATION

The PCM-1630 is a digital audio processor for professional use, designed to be used with a Sony BVU-800DA/800DB videocassette recorder, a DMR-2000/4000 digital master recorder or any other Sony professional VTR to create a professional PCM recording and playback system.

### 1-1. FEATURES

#### High-performance recording and playback

The PCM recording and playback system, including the PCM-1630 and recorders such as a DMR-2000/4000 and a BVU-800DA/DB, gives high performance with the following characteristics:

Frequency response: 20 Hz to 20 kHz  $\begin{matrix} +0.5 \\ -1.0 \end{matrix}$  dB

Dynamic range: more than 90 dB

Distortion: less than 0.05%

Wow and flutter: below measurable limit

#### Digital dubbing with no deterioration

When the unit is connected to two recorders, sound can be dubbed digitally with no deterioration, due to the digital dubbing function of the unit.

#### Synchronization with video equipment

The unit can be synchronized with an NTSC composite sync signal from a VTR.

#### Electronic editing

When the unit is used with a DAE-1100/1100A digital audio editor and two recorders, a program can be automatically and electronically edited with precision, and the quality of the editing is more excellent than splice-editing of an analog tape.

#### Emphasis circuitry

The built-in emphasis circuit improves the signal-to-noise ratio of high frequencies by raising their recording level and lowering their playback level.

#### Serial data format and interchangeability

A serial data format is employed as a digital input/output format. Since this format is interchangeable with that of a PCM recording and playback system using a Sony PCM-1610 digital audio processor, it is possible to directly transmit and receive digital data between this unit and the PCM-1610 system. Tapes recorded with this unit can be played back with a PCM-1610, and vice versa.

This unit can be used instead of a PCM-1610 in a PCM recording and playback system using a PCM-1610. (The remarkable difference between two units is that the PCM-1630 does not incorporate a time code generator, while a PCM-1610 has a built-in time code generator.)

#### Two sampling rates selectable

A sampling rate is selectable for recording at either 44.056 kHz (corresponding to the NTSC TV system) or 44.1 kHz (for a compact disc and digital audio system). In an external sync mode, the unit is automatically synchronized with either frequency by synchronizing with an NTSC composite sync signal or a word sync signal.

#### Linear phase response

To improve the phase response, phase compensation filters are incorporated in the A/D section, and over-sampling FIR (finite impulse response) filters are incorporated in the D/A section.

Level meter for easy setting of a reference level

The level meter with a reference marker function provides two types of signal level indications for precise setting of recording and playback levels.

#### Two pairs of composite digital (video) signal inputs

The unit is equipped with two pairs of composite digital (video) signal inputs, to make it possible to select alternately composite digital (video) playback signals from two recorders.

#### Status connector

The status connector, which outputs error data of PCM recorded tapes, makes it possible to analyze tape errors when connected to a DTA-2000 digital tape analyzer.

#### Small power consumption

Newly developed LSIs incorporated in the logic circuitry reduce power consumption, which enables adoption of a linear power supply in the unit.

#### Optional printed circuit boards

Optional printed circuit boards make it possible to extend functions of the unit.

#### • RAR (Read After Read) function

When the unit with an optional RAR board (DABK-1630) installed is used with a digital audio recorder which has a read-after-read function (such as a Sony DMR-4000 digital master recorder), the playback has very high reliability. In addition, with the RAR board installed, a read-after-write function for dubbing and editing can be used with this unit.

#### • Digital I/O interface

When optional digital I/O boards (DABK-1631) are installed, the analog input/output connectors provide digital input/output data which conforms to the AES/EBU standards.

## 1-2. SPECIFICATIONS

Number of channels	2 channels
Modulation system	PCM system conforming to the NTSC standard television signal
Sampling frequency	44.1 kHz or 44.056 kHz
Transmission rate	3.5831 Mbit/sec. or 3.5795 Mbit/sec.
Code format	Equivalent to 6 words in 1 H of NTSC TV signal
Quantization	16-bit linear quantization
Dynamic range	More than 90 dB
Harmonic distortion	Less than 0.05% (at reference input level)
Wow and flutter	Below measurable limit
Frequency response	20 Hz to 20 kHz $\begin{matrix} +0.5 \\ -1.0 \end{matrix}$ dB
Signal delay time	DIGITAL IN (ENC IN) to DIGITAL OUT (DEC OUT): Approx. 9.7 msec ANALOG IN to ANALOG OUT: Approx. 10.5 msec (increasing by 4.8 msec in RAR mode)
Analog inputs	ANALOG INPUT CH-1(D-I)/CH-2: Cannon XLR-3-31 type, 40 k ohms balanced/20 k ohms unbalanced Reference input level: +4 dBs (to +14 dBs) Maximum input level: +24 dBs (0 dBs = 0.775 V rms)
Analog outputs	ANALOG OUTPUT CH-1(D-O)/CH-2: Cannon XLR-3-32 type, balanced/unbalanced Less than 50 ohms (600 ohm load permissible) Reference output level: +4 dBs (to +14 dBs) Maximum output level: +24 dBs (0 dBs = 0.775 V rms)

Composite digital (video) inputs	COMPOSITE DIGITAL INPUT A/B: BNC-R type, 75 ohms unbalanced 0.714 Vp-p (data level 60 IRE) $\pm 20\%$	Word sync input	WORD SYNC INPUT: BNC-R type, TTL compatible Input frequency range: 44.1 kHz $\pm 5$ Hz 44.056 kHz $\pm 5$ Hz
	COMPOSITE DIGITAL A/B: 8-pin multi- connectors, 75 ohms unbalanced 0.714 Vp-p (data level 60 IRE) $\pm 20\%$	Word sync output	WORD SYNC OUTPUT: BNC-R type, TTL compatible
Composite digital (video) outputs	COMPOSITE DIGITAL OUTPUT 1/2: BNC-R type, 75 ohms unbalanced 0.714 Vp-p (data level 60 IRE) $\pm 10\%$	Status output	STATUS: 25-pin D-sub type connector, RS-422 and TTL compatible
	COMPOSITE DIGITAL A/B: 8-pin multi- connectors, 75 ohms unbalanced 0.714 Vp-p (data level 60 IRE) $\pm 10\%$	Headphone output	HEADPHONES: Stereo phone jack (8 ohms)
Composite sync inputs	COMPOSITE SYNC INPUT 1/2: BNC-R type, 75 ohms unbalanced 4 Vp-p, composite sync negative	Connectable recorders	Sony DMR-2000, DMR-4000, BVU-800DA/DB, BVU-200B, BVH-2000, BVH-1100, BVH-1100A
Composite sync outputs	COMPOSITE SYNC OUTPUT 1/2: BNC-R type, 75 ohms unbalanced 4 Vp-p, composite sync negative	Recommended editing system	For elementary edit: PCM-1630 and two DMR-4000s For precise edit: PCM-1630, DAE-1100 or DAE-1100A, and two DMR-2000s, two DMR-4000s, two BVU-800DBs or one DMR-4000 and another recorder
Digital inputs	DIGITAL I/O: BNC-R type, TTL compatible, 32-slot serial format 1.4112 Mbit/sec. or 1.4098 Mbit/sec.	Operating temperature	0°C to 40°C (32°F to 104°F)
Digital outputs	DIGITAL I/O: BNC-R type, TTL compatible, 32-slot serial format 1.4112 Mbit/sec. or 1.4098 Mbit/sec.	Storage temperature	-20°C to +60°C (-4°F to +140°F)
		Power requirements	100/120/220/240 V ac $\pm 10\%$ , selectable 50/60 Hz
		Power consumption	90 W
		Dimensions	424 x 200 x 530 mm (w/h/d) (16 3/4 x 7 7/8 x 20 7/8 inches) including projecting parts
		Weight	26 kg (57 lb 5 oz)

OPERATION

Accessories supplied

- Extension board EX-71 (1)
- Rack mount adaptor (1 set)
- Connection cables with BNC connectors (2)
- 8-pin multi-cable VMC-3P (1)
- AC power cord (1)
- Operation and maintenance manual (1)

Design and specifications subject to change without notice.

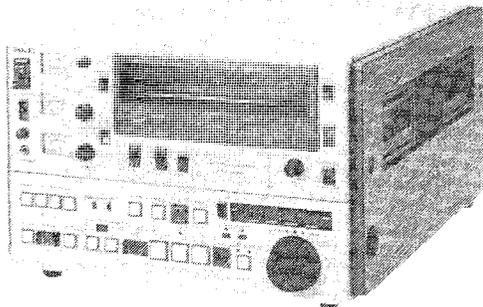
Optional accessories

- RAR board (RAR-1): DABK-1630
- Digital I/O boards (DI-5/DO-17): DABK-1631
- EI format boards (ENC-5/DEC-22/RAR-2): DABK-1632

1-3. RECOMMENDED EQUIPMENT

**BVU-800DA/DB U-matic videocassette recorder**

This unit can be used as a recorder and player in various systems, such as a recording/playback system with a PCM-1630 digital audio processor, or an editing system with a DAE-1100 digital audio editor. Using this unit, the SMPTE time code can be recorded on and read out from a tape's time code track. The unit also features a capstan servo, a framing servo and a logic control system.



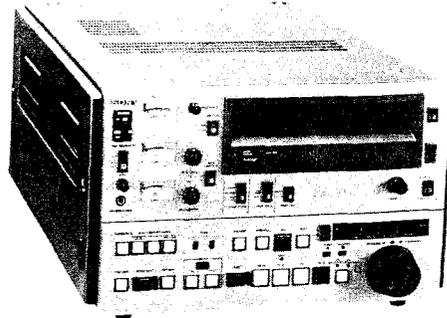
**DMR-2000 digital master recorder**

This unit is designed to be used with the PCM-1630 digital audio processor to record and play back digital-quality, high-fidelity sound. When a DAE-1100/1100A digital audio editor is used in the system, highly accurate digital editing is possible to produce master tapes, which can be used to produce compact discs.



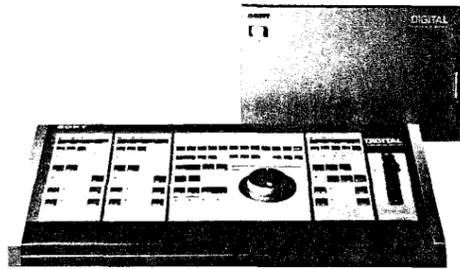
**DMR-4000 digital master recorder**

This unit is a recorder for the new generation of CD mastering equipment and features RAR (Read After Read) and RAW (Read After Write) functions. When the DMR-4000 is combined with the PCM-1630 and the DABK-1630, these functions will be activated giving the system a high level of reliability and efficiency.



#### DAE-1100/1100A digital audio editor

This unit is used with a PCM-1630 digital audio processor and a BVU-800DB or DMR-2000/4000 recorder, to provide fully automatic digital-to-digital, high-precision audio editing. The unit also features a search dial for quick access to an edit point, an edit rehearsal function and a review function.



#### DTA-2000 digital tape analyzer

This unit is designed to output error data of PCM recorded tapes to a printer according to the status signals from a PCM-1630 digital audio processor.

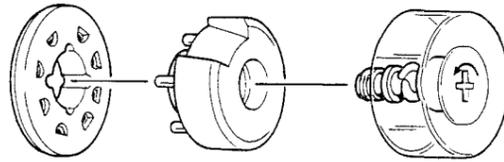


### 1-4. PRECAUTIONS

#### 1-4-1. On Power Supply

The unit is designed to operate on 100, 120, 220 or 240 V ac. Before connecting the unit to the power source, check to see that the unit's operating voltage is identical with the local power line voltage. The voltage selector is located on the rear panel. If the voltage selector must be reset, proceed as follows. Remove the voltage selector cover with a screwdriver, pull out the selector and re-insert it so that the correct voltage figure appears on the cutout of the selector.

VOLTAGE SELECTOR



#### 1-4-2. On Ventilation

Good air circulation is essential to prevent internal heat build-up in the unit. Place the unit in a location with adequate air circulation. The ventilation holes must be unobstructed to operate the unit properly and to prolong the life of its components.

#### 1-4-3. On Operating Temperature Range

Do not install the unit in a location near heat sources such as radiators or air ducts, or in a place subject to direct sunlight. The temperature range for correct operation of the unit is as follows.

Operating temperature: 0°C to 40°C (32°F to 104°F)

Temperature for which performance of the unit is assured: 5°C to 35°C (41°F to 95°F)

#### 1-4-4. On Warm-up Time of the Unit

After turning the power on, wait for more than 30 minutes to warm up the unit before operating it.

#### 1-4-5. On Analog Inputs and Outputs

When the ANALOG INPUT and OUTPUT connectors of the unit are to be used in an unbalanced connection, be sure to connect the "cold" pin with the "ground" pin. If the "hot" pin is connected with the "ground" pin, a dc electric potential may arise and affect the characteristics.

#### 1-4-6. On Composite Digital (Video) Inputs and Outputs

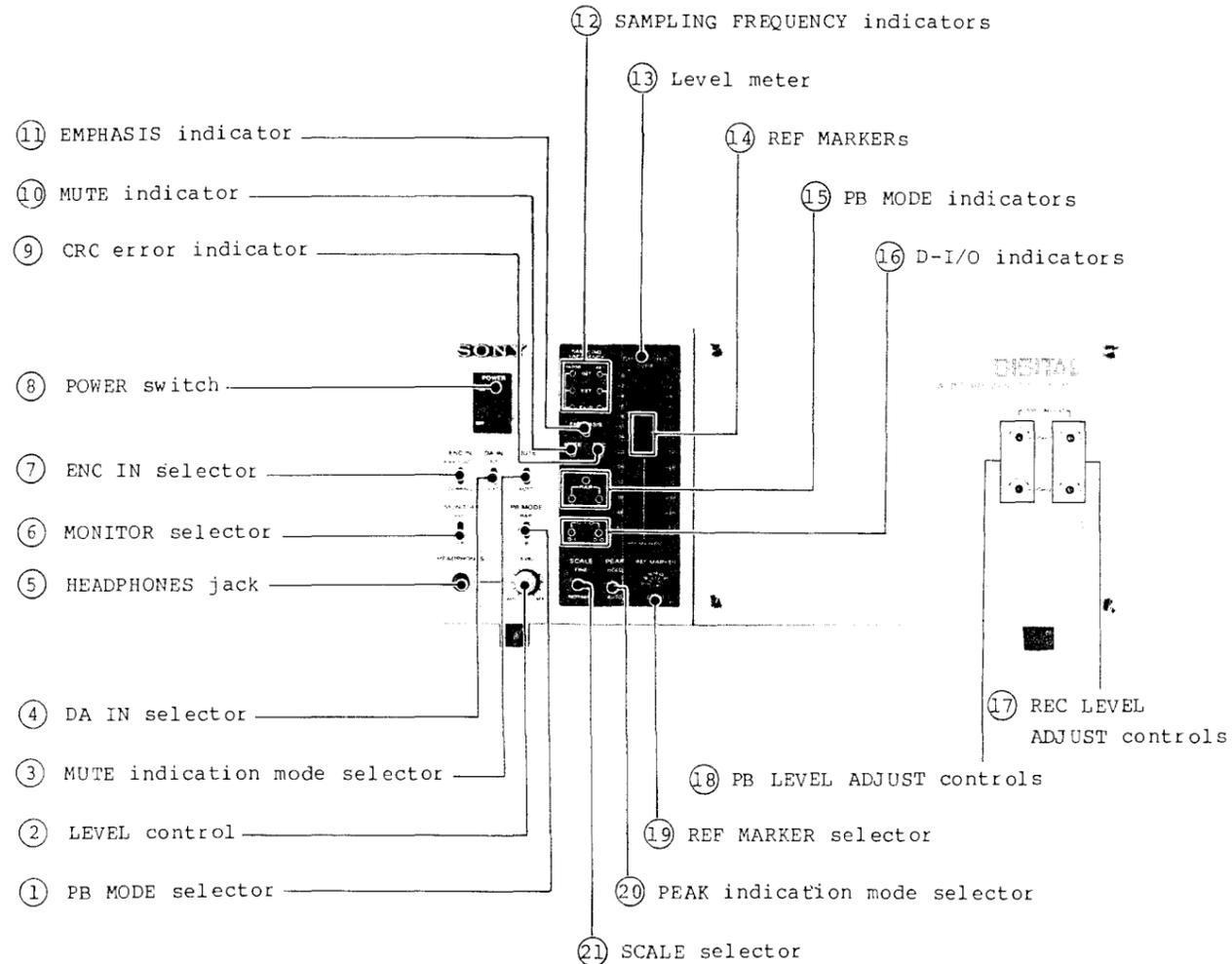
The unit is equipped with two types of composite digital inputs and outputs: BNC type connectors (COMPOSITE DIGITAL INPUT and OUTPUT) and 8-pin multi-connectors (COMPOSITE DIGITAL). For inputs, the COMPOSITE DIGITAL INPUT A connector and the COMPOSITE DIGITAL A connector are connected in parallel inside the unit, and the COMPOSITE DIGITAL INPUT B connector and the COMPOSITE DIGITAL B connector are connected in parallel. Be sure to use only one type of connector at a time. If both types of connectors are used at the same time and signals are input to these connectors simultaneously, the signals will interfere with each other. (The COMPOSITE DIGITAL INPUT A connector and the COMPOSITE DIGITAL B connector, or the COMPOSITE DIGITAL INPUT B connector and the COMPOSITE DIGITAL A connector can be used simultaneously.) For outputs, simultaneous use of a pair of BNC connectors and a pair of 8-pin multi-connectors is possible.

#### 1-4-7. On Short-circuit Protection

The circuit power supply section incorporates a short-circuit protection system which cuts off the output voltage when the power supply section is short-circuited. When the short-circuit protection activates, turn off the power immediately. Wait for more than 30 seconds, then turn the unit on. The output voltage will be restored to normal.

1-5. LOCATION AND FUNCTION OF PARTS AND CONTROLS

1-5-1. Front Panel



① **PB (playback) MODE selector**  
Used to select the playback signal(s). The PB MODE indicators illuminate in accordance with the setting of this selector.  
**RAR:** When an optional RAR-1 circuit board (DABK-1630) is installed in the unit, the RAR (Read After Read) function activates when signals are input simultaneously to the COMPOSITE DIGITAL INPUT A and B

connectors or to the COMPOSITE DIGITAL A and B connectors.  
When an RAR-1 circuit board is not installed, the unit operates the same as when this selector is set to "A" (the PB MODE "A" indicator illuminates).

**A:** The composite digital A input (input to the COMPOSITE DIGITAL INPUT A or COMPOSITE DIGITAL A connector) is selected as a playback signal. When an optional RAR-1 board is installed in the unit and the RAW (Read After Write) function of the board is to be used for dubbing or editing, set the selector to this position. For details, refer to the operation and maintenance manual of the RAR-1 board.

**B:** The composite digital B input (input to the COMPOSITE DIGITAL INPUT B or COMPOSITE DIGITAL B connector) is selected as a playback signal.

② **LEVEL control**  
Adjusts the volume of the headphones.

③ **MUTE indication mode selector**  
**HOLD:** Once the muting circuit activates, the MUTE indicator lights up and stays lit as long as the unit is turned on.  
**AUTO:** The MUTE indicator lights up only when the muting circuit activates.

④ **DA IN (digital-to-analog input) selector**  
Selects the source signal to be sent to the built-in D/A converter.  
**INT:** Signals input to the COMPOSITE DIGITAL INPUT connectors (BNC type) or the COMPOSITE DIGITAL connectors (8-pin) are selected.  
**EXT:** Signals input to the DA IN connectors (in the DIGITAL I/O connector section) are selected.

⑤ **HEADPHONES jack (stereo phone jack)**  
Connect stereo headphones with an 8-ohm impedance.

⑥ **MONITOR selector**  
**REC:** Selects the audio signals to be recorded for monitoring and level meter indication.  
**PB:** Selects the audio playback signals for monitoring and level meter indication.

⑦ **ENC IN (encoder input) selector**  
Selects a source signal to the built-in encoder.

**ANALOG (D-I):** Selects the signals input to the ANALOG INPUT connectors.

**DIGITAL:** Selects the signals input to the ENC IN connectors (in the DIGITAL I/O connector section).

**DUBBING:** Selects the signals input to the COMPOSITE DIGITAL INPUT or COMPOSITE DIGITAL connectors.

⑧ **POWER switch**  
Turns the power on and off.

⑨ **CRC (cyclic redundancy check code) error indicator**  
This indicator lights up when the unit detects a CRC error in the playback signal.

⑩ **MUTE indicator**  
This indicator lights up when the muting circuit activates, depending upon the setting of the MUTE indication mode selector.

⑪ **EMPHASIS indicator**  
This indicator lights up when input data contains a pre-emphasized signal, and the de-emphasis circuit of the unit activates to de-emphasize the detected pre-emphasized signal.

⑫ **SAMPLING FREQUENCY indicators**  
Each indicator lights up, depending upon the sampling frequency (44.056 or 44.1 kHz) of the internal sync signal (INT), external sync signal (EXT) or signal from the tape being played back (FsID).

⑬ **Level meter**  
The indicators on the level meter light up to indicate the input level of each channel during recording, and the recorded level during playback, depending upon the setting of the MONITOR selector and the PEAK

indication mode selector.

The scale of the level meter can be enlarged with the SCALE selector for easy and precise reading of the meter.

The OVER level indicators at the top of the indicator column for each channel light up to warn of an overload during recording.

**⑭ REF (reference) MARKERS**

The indicator corresponding to the reference level (-10 dB to -20 dB) set with the REF MARKER selector lights up so that the reference signal input level can be adjusted easily.

**⑮ PB (playback) MODE indicators**

These indicators light up in accordance with the setting (RAR, A or B) of the PB MODE selector.

The A indicator also lights up when the PB MODE selector is set to RAR, without an optional RAR-1 board installed in the unit.

**⑯ D-I/O (digital input/output) indicators**

The D-I or D-O indicator lights up, depending upon the installed digital input or output board.

**D-I:** Lights up when an optional DI-5 board is installed in the unit instead of the AD-23 board.

**D-O:** Lights up when an optional DO-17 board is installed in the unit instead of the DA-15 board.

**⑰ REC (recording) LEVEL ADJUST controls**

The recording level can be adjusted with these controls within a range of approximately 12 dB. Clockwise rotation raises the signal gain.

**⑱ PB (playback) LEVEL ADJUST controls**

The output level of the playback signal can be adjusted with these controls within a range of approximately 12 dB. Clockwise rotation raises the playback level.

**⑲ REF (reference) MARKER selector**

This selector sets the reference signal level within a range of -10 dB to -20 dB in 2-dB steps. The selected reference level is indicated by the illumination of the corresponding REF MARKER indicator.

**⑳ PEAK indication mode selector**

Selects the manner in which peaks are indicated on the level meter. This selector is effective when the PEAK HOLD switch (SW1) on the MT-16 board is set to ON.

**HOLD:** The level meter indicates the level of the highest peak while simultaneously following the level of transient peaks below the highest peak. The peak level will be held on the scale until a higher peak occurs, in which case the higher peak is held.

**AUTO:** Successive peaks are held on the scale for approximately 1.5 seconds, except when a higher peak occurs before 1.5 seconds have elapsed, in which case that peak is immediately indicated. (When the mode select switch (SW4) on the MT-16 board is set to ON, the peaks are held for approximately 4 seconds.)

When the PEAK HOLD switch on the MT-16 board is set to OFF, the level meter activates as a peak meter.

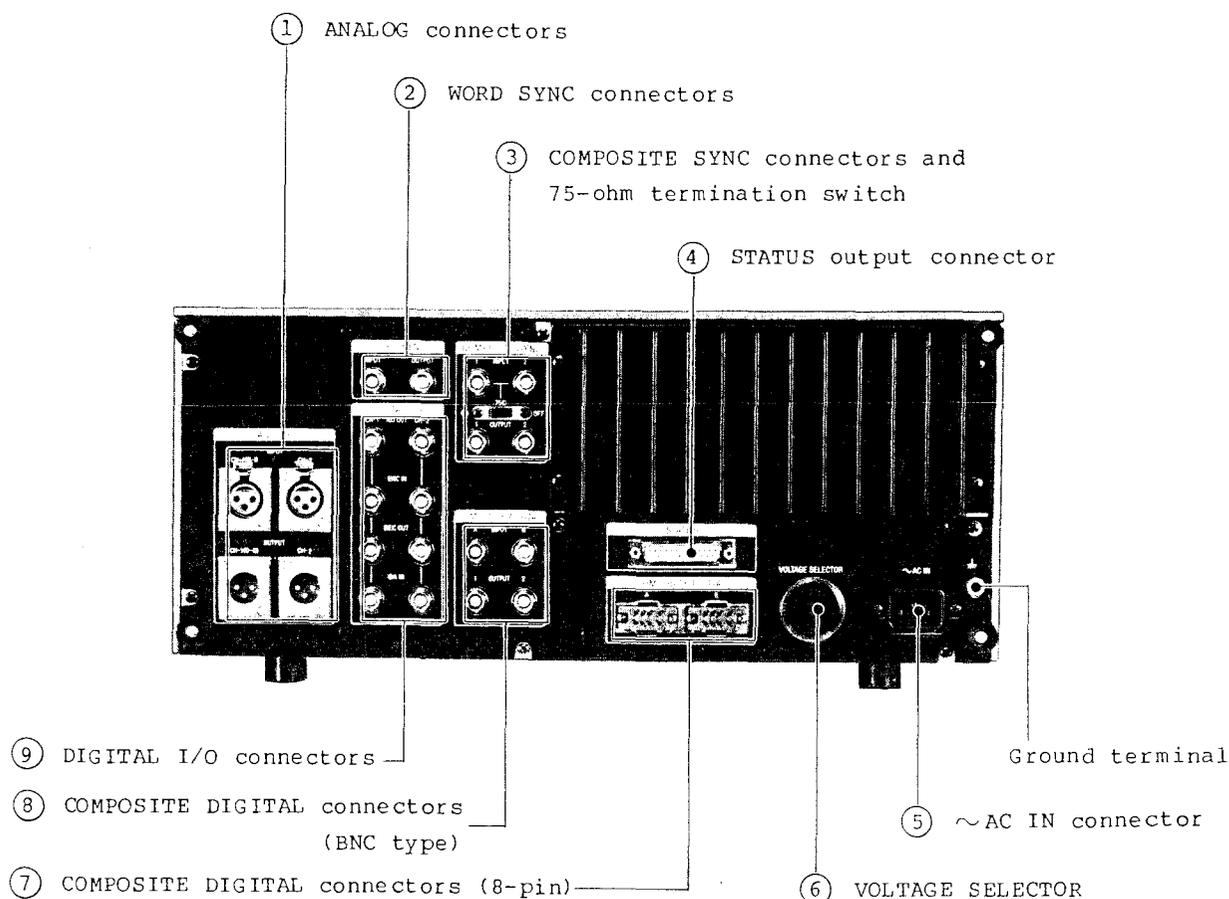
**㉑ SCALE selector**

This selector selects the scale of the level meter.

**FINE:** The level meter scale is enlarged, and the signal level is indicated in 0.2-dB steps. If the signal level is above the maximum level of the enlarged scale, the LED of 0 dB will blink, and if the signal level is below the minimum level, the LED of -60 dB will blink.

**NORMAL:** The level meter scale is as indicated on the front panel.

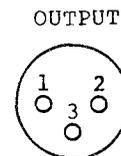
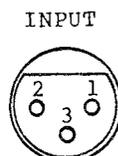
### 1-5-2. Connector Panel



① **ANALOG connectors** (equivalent to Cannon XLR type)  
 Analog audio signals are input to or output from these connectors.  
 When optional DABK-1631 digital I/O boards are installed, instead of using the AD-23 and DA-15 boards to provide the unit with a digital interface which conforms to the AES/EBU standards, supply a digital input signal to the INPUT CH-1 (D-I) connector. The unit's digital output signal is supplied from the OUTPUT CH-1 (D-O) connector.

#### Pin assignment of INPUT and OUTPUT connectors

For the models available in the United States, Canada and Japan	For the model available in European countries
1. Ground 2. Cold 3. Hot	1. Ground 2. Hot 3. Cold



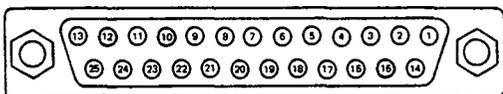
② **WORD SYNC connectors (BNC type)**  
 A word sync signal of 44.1 kHz or 44.056 kHz is input to the WORD SYNC INPUT connector or output from the WORD SYNC OUTPUT connector.

③ **COMPOSITE SYNC connectors (BNC type) and 75-ohm termination switch**  
 These connectors are input (COMPOSITE SYNC INPUT 1, 2) and output (COMPOSITE SYNC OUTPUT 1, 2) connectors for a composite sync signal. To terminate the INPUT connectors with 75 ohms, set the 75-ohm termination switch to ON. Set the termination switch to OFF to create a looping output (bridge connection).

④ **STATUS output connector (25-pin D-sub type)**  
 Signals containing status information, such as error flags, are output from this connector. The connector's output circuits except for the RS-422 circuits have open-collectors.

**Pin assignment**

Pin No.	Signal	Remarks		
1	GND	Ground for A/B		
2	A/B	A/B select		
3	REC/PB			
4	FG	Frame ground		
5	HLD	Hold		
6	GND	Ground for HLD		
7	GND	Ground for PAR		
8	---	N. C.		
9	AVE	Average		
10	GND	Ground for AVE		
11	CRC	CRC error		
12	GND	Ground for CRC		
13	FsID	44.056 kHz: 'H' 44.1 kHz: 'L'		
14	EMP	Emphasis ON: 'H'		
15	GND	Ground for MUTE		
16	MUTE	Muting		
17	WCLK	Word clock		
18	WCLK	} Bit clock (25-slot) RS-422		
19	BCLK		} CH-1 data (25-slot)	
20	BCLK			} CH-2 data (25-slot)
21	ME CH-1			
22	ME CH-1			
23	ME CH-2			
24	ME CH-2			
25	PAR			



⑤ **~ AC IN (input) connector**  
 Connect to an ac outlet using the supplied ac power cord.

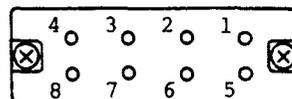
⑥ **VOLTAGE SELECTOR**  
 The operating voltage of the unit can be set to 100, 120, 220 or 240 V ac with this voltage selector. To reset the voltage selector, refer to 1-4-1.

⑦ **COMPOSITE DIGITAL (video) connectors (8-pin multi-connectors)**  
**COMPOSITE DIGITAL A:** Main composite digital input (connected in parallel with the COMPOSITE DIGITAL INPUT A connector ⑧ inside) and composite digital output.  
**COMPOSITE DIGITAL B:** Auxiliary composite digital input (connected in parallel with the COMPOSITE DIGITAL INPUT B connector ⑧ inside) and composite digital output.

**Pin assignment**

Pin No.	Signal	Remarks
1	---	N. C.
2	C. D. IN	Composite digital input
3	GND	Ground for C. D. OUT
4	C. D. OUT	Composite digital output
5	---	N. C.
6	GND	Ground for C. D. IN
7	SEL	Connect to ground
8	---	N. C.

**Note:** "SEL" is a signal for a DMR-2000 digital master recorder.



⑧ **COMPOSITE DIGITAL (video) connectors (BNC type)**  
**COMPOSITE DIGITAL INPUT A:** Main composite digital input.  
**COMPOSITE DIGITAL INPUT B:** Auxiliary composite digital input.  
**COMPOSITE DIGITAL OUTPUT 1 and 2:** Independent composite digital outputs.

⑨ DIGITAL I/O (input/output) connectors  
(BNC type)

**AD OUT (analog-to-digital output):** A/D converted signals are output from these connectors.

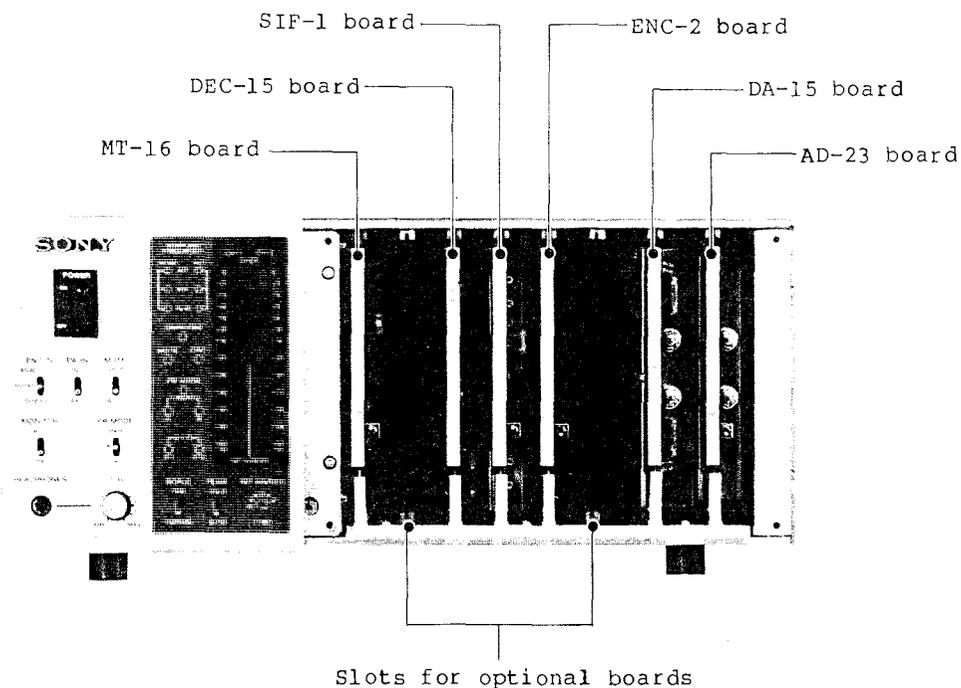
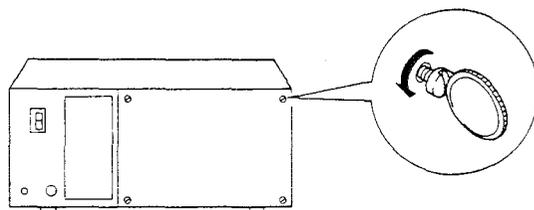
**ENC IN (encoder input):** Input signals to the built-in encoder are supplied to these connectors.

**DEC OUT (decoder output):** Signals from the built-in decoder are output from these connectors.

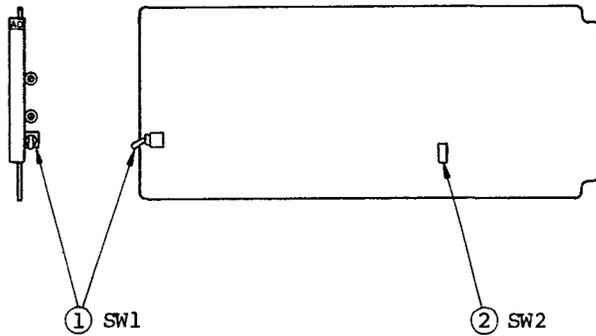
**DA IN (digital-to-analog input):** Digital signals to be D/A converted are supplied to these connectors.

1-5-3. Printed Circuit Boards

The printed circuit boards are installed behind the right front panel. To adjust the controls and switches on the printed circuit boards, take off the right front panel by removing the four screws with a coin or a large screwdriver.



**AD-23 board**



**① SW1: EMP (emphasis) switch**

This switch activates (ON) or deactivates (OFF) the emphasis circuitry during recording. When this switch is set to ON, the high-frequency response is boosted automatically during recording (pre-emphasis, with a time constant of 50  $\mu$ sec./15  $\mu$ sec.) to reduce the amount of noise and improve the signal-to-noise ratio (the boosted amount is detected and the response is lowered during playback). When this switch is set to OFF, a recording is made with the flat frequency response. The EMP switch is factory preset to OFF.

**② SW2: Dither switch**

This switch activates (ON) or deactivates (OFF) the dither generator circuit. When this switch is set to ON, the dither is mixed with a low level input signal in order to suppress audible noise. Although the dither level is set at less than 1 LSB the noise level will be raised somewhat when the switch is set to ON. This switch is factory preset to OFF.

**Emphasis identification bits**

The setting of the EMP switch does not affect the emphasis identification bits in the output signal data when the ENC IN selector on the front panel is set to a particular position, as shown in the following table. The relationships between the setting of the ENC IN selector and the emphasis identification bits are as follows.

Output signal ENC IN selector	AD OUT connector	COMPOSITE DIGITAL OUTPUT connector	DEC OUT connector
ANALOG	ON/OFF of the EMP switch on the AD board	ON/OFF of the EMP switch on the AD board	Irrelevant*
DIGITAL	ON/OFF of the EMP switch on the AD board	ON/OFF of the emphasis bits in the digital signal data input to the ENC IN connector	Irrelevant*
DUBBING	ON/OFF of the EMP switch on the AD board	ON/OFF of the emphasis bits in the signal data input to the COMPOSITE DIGITAL INPUT connector	ON/OFF of the emphasis bits in the signal data input to the COMPOSITE DIGITAL INPUT connector

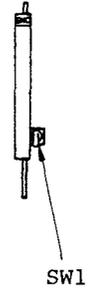
\* In the E-to-E or playback mode, the emphasis depends upon the ON/OFF status of the emphasis identification bits in the signal data input to the COMPOSITE DIGITAL INPUT connector(s).

The de-emphasis circuit for playback is activated (ON) or deactivated (OFF), depending upon the setting of the DA IN selector as shown below.

DA IN selector	ON/OFF status of the de-emphasis*
INT	ON/OFF status of the emphasis identification bits in the signal data input to the COMPOSITE DIGITAL INPUT connector
EXT	ON/OFF status of the emphasis identification bits in the signal data input to the DA IN connectors in the DIGITAL I/O connector section

\* The EMPHASIS indicator on the front panel lights up or goes off in accordance with the ON/OFF status of the de-emphasis circuit. The emphasis status signal output from the STATUS connector on the rear panel automatically matches the ON/OFF status of the de-emphasis circuit.

ENC-2 board



SW1: REC MUTE (record muting) switch

To record a muting signal (signal level is set to "0"), set the switch to ON. Signals output from the COMPOSITE DIGITAL OUTPUT or COMPOSITE DIGITAL connectors are changed into muting signals.

During normal operation, be sure to set the switch to OFF.

The switch is factory preset to OFF.

## SIF-1 board



### SW1: FS (sampling frequency) selector

This switch selects the sampling frequency when the unit operates in the internal sync mode:

44.1 kHz (upper position)

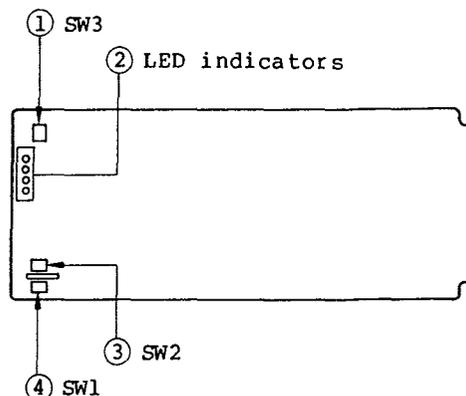
44.056 kHz (lower position)

The selected sampling frequency is indicated by the corresponding INT SAMPLING FREQUENCY indicator on the front panel.

When the unit operates in the external sync mode, the sampling frequency is determined by the frequency of the external sync signal input to the unit. Therefore, the setting of this selector has no effect upon the sampling frequency.

This selector is factory preset to 44.1 kHz.

## DEC-15 board



### ① SW3

This DIP switch is provided to check the functions of the unit.

The switch is factory preset as follows:

Switch No.			
1	2	3	4
ON	ON	OFF	OFF

Do not change the setting of the switches.

### ② LED indicators

The LED indicators indicate the status of the data being reproduced. The illumination of the indicators shows:

C (green): Correction

A (yellow): Average

H (red): Hold

P (red): Parity error

### ③ SW2: Muting time/muting ON/OFF switch

This DIP switch determines whether the muting circuit activates or not when an error occurs, and sets the activation time of the muting circuit.

Switch No. 4 activates (ON) or deactivates (OFF) the muting circuit. When switch No. 4 is set to ON, the setting of switches No. 1 to No. 3 determines the time for which the muting circuit activates. When switch No. 4 is set to OFF, the muting circuit does not function.

The muting time can be set with switches No. 1 to No. 3 as follows. The adjustable range is from 1/60 seconds to approximately 2 seconds.

Switch No.				Muting time
1	2	3	4	
x	x	x	OFF	Muting OFF
OFF	OFF	OFF	ON	1/60 sec.
ON	OFF	OFF	ON	1/30 sec.
OFF	ON	OFF	ON	1/15 sec.
ON	ON	OFF	ON	About 0.1 sec.
OFF	OFF	ON	ON	About 0.3 sec.
ON	OFF	ON	ON	About 0.5 sec.
OFF	ON	ON	ON	About 1 sec.
ON	ON	ON	ON	About 2 sec.

x = any position

When the muting circuit deactivates (OFF), slight noise will occur if the composite digital signals input to the COMPOSITE DIGITAL or COMPOSITE DIGITAL INPUT connectors have errors. Therefore, we recommend not setting the muting circuit to OFF during normal operation.

The muting time/muting ON/OFF switch is factory preset as follows:

Muting circuit: ON

Muting time: approx. 1 sec.

(switch No. 1: OFF,

switches No. 2 to 4: ON)

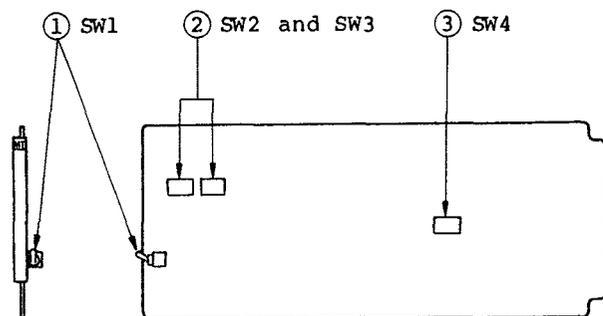
#### ④ SW1: M-SENS (muting sensitivity) switch

This DIP switch adjusts the sensitivity of the muting circuit. That is, it determines how quickly the muting circuit activates when errors occur during tape reproduction. When switch No. 1 only is set to ON, the muting circuit activates for the time set by the muting time/muting ON/OFF switch (SW2), if errors occur in succession for a period of approximately 20 H (TV H). When switch No. 2 only is set to ON, a succession of errors for approximately 10 H activates the muting circuit. Similarly, when switch No. 3 only is set to ON and when switch No. 4 only is set to ON, a succession of errors for the times shown below activates the circuit:

Switch No.				Succession of errors
1	2	3	4	
ON	OFF	OFF	OFF	20 H
OFF	ON	OFF	OFF	10 H
OFF	OFF	ON	OFF	5 H
OFF	OFF	OFF	ON	2 to 3 H

When any of or all of the switches are set to ON simultaneously, a succession of errors for the total time set with these switches activates the muting circuit. The minimum sensitivity is 32 H; the maximum sensitivity is 2 to 3 H. The muting sensitivity switch is factory preset to about 20 H (switch No. 1: ON, and switches No. 2 to 4 to OFF).

MT-16 board



① SW1: PEAK HOLD switch

This switch selects the function of the level meter -- as a peak hold meter or a peak meter.

**ON:** The level meter functions as a peak hold meter. The level of the highest peak is indicated and held on the scale for approximately 1.5 seconds when the PEAK indication mode selector on the front panel is set to AUTO, or until a higher peak occurs when the PEAK indication mode selector on the front panel is set to HOLD. This switch is factory preset to ON.

**OFF:** The level meter functions as a peak meter. When this switch is set to OFF, the setting of the PEAK indication mode selector on the front panel has no effect upon the level meter indication, and peak levels are not held on the scale even if the PEAK indication mode selector is set to HOLD.

② SW2 for channel 1 and SW3 for channel 2:

**Overload indication adjustment switches**

These DIP switches set the number of words of full-scale signals (overload signals) continuously input to the unit, which are indicated with the OVER level indicator on the level meter. Up to 8 words can be set for each channel with these switches.

Switch No.								Number of words
1	2	3	4	5	6	7	8	
ON	OFF	1						
ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	2
ON	ON	ON	OFF	OFF	OFF	OFF	OFF	3
ON	ON	ON	ON	OFF	OFF	OFF	OFF	4
ON	ON	ON	ON	ON	OFF	OFF	OFF	5
ON	ON	ON	ON	ON	ON	OFF	OFF	6
ON	ON	ON	ON	ON	ON	ON	OFF	7
ON	ON	ON	ON	ON	ON	ON	ON	8

These switches are factory preset to 3 words (Nos. 1 to 3 are set to ON, and Nos. 4 to 8 OFF.)

③ SW4: Mode select switch

This DIP switch selects the level meter indication modes. It sets the peak hold time and release time, and determines whether the overload indication is to be held or not.

Switch No.	Indication mode	Switch position	
		ON	OFF
1	Peak hold time	About 4 sec.	About 1.5 sec.
2	Release time	About 100 msec.	About 50 msec.
3	Overload level	Not held	Held
4 to 8		Not used	

All the switches are factory preset to OFF.

## 1-6. RECORDING LEVEL ADJUSTMENT

### 1-6-1. Reference Signal Level and Headroom

Headroom means the difference between the reference signal level and the full-scale level. The headroom can be adjusted within a range from 20 dB to 10 dB in 2-dB steps, which is determined by the adjustable range (about 12 dB) of the REC LEVEL ADJUST controls. The adjustable range of the headroom is widest when the reference signal level is +4 dBs (0 dBs = 0.775 Vrms). The maximum input level is +24 dBs. Since the REC LEVEL ADJUST controls do not reduce the gain, the headroom will be less than 20 dB when the reference signal level is above +4 dBs, while the headroom will be more than 10 dB when the reference signal level is less than +4 dBs.

The reference signal levels and their corresponding adjustable headroom ranges are shown below.

Reference signal level	Headroom range
-6 dBs	20 dB
-4 dBs	18 - 20 dB
-2 dBs	16 - 20 dB
0 dBs	14 - 20 dB
+2 dBs	12 - 20 dB
+4 dBs	10 - 20 dB
+6 dBs	10 - 18 dB
+8 dBs	10 - 16 dB
+10 dBs	10 - 14 dB
+12 dBs	10 - 12 dB
+14 dBs	10 dB

(0 dBs = 0.775 Vrms)

### 1-6-2. Level Meter

The level meter indicates the full-scale level of the A/D converted signal as 0 dB. For example, when the reference signal level is +4 dBs and the headroom is 20 dB, the level meter reads "-20 dB" for an input signal of +4 dBs, and "0 dB" for an input signal of +24 dBs.

### 1-6-3. Level Adjustment

While observing the level meter, adjust the signal level as follows. Be sure to set the PEAK indication mode selector to AUTO when adjusting the level.

- 1 Set the headroom with the REF MARKER selector. The LED of the REF MARKERS corresponding to the selected headroom will light up. For example, to set the headroom to 16 dB, set the REF MARKER selector to "16". The REF MARKER LED of -16 dB will illuminate. Note that the REF MARKER selector setting has no effect upon the gain, but only changes the REF MARKER indication.
- 2 Input a reference signal to the unit, and adjust the REC LEVEL ADJUST controls so that the level meter indicators corresponding to the selected REF MARKER LED light up.
- 3 Set the SCALE selector to FINE, and precisely adjust the REC LEVEL ADJUST controls. The level meter calibration changes to display in 0.2-dB steps above and below the illuminated REF MARKER LED. Only one LED for each channel on the level meter lights up. Adjust the REC LEVEL ADJUST controls so that the level meter matches the illuminated REF MARKER s level.
- 4 Set the SCALE selector to NORMAL.

## 1-7. CONNECTIONS AND OPERATION

### 1-7-1. Recording and Playback

An example of a basic connection for recording and playback is shown below.

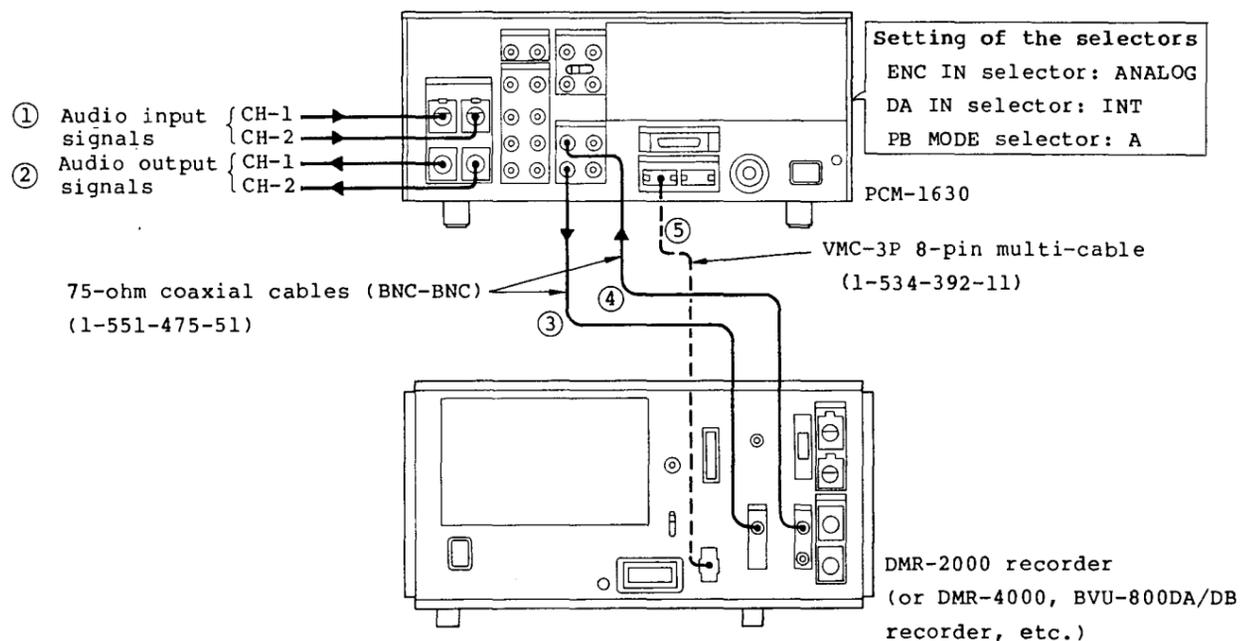
**For a recording signal connection:** Connect the COMPOSITE DIGITAL OUTPUT connector of the PCM-1630 to the composite digital (video) input connector of recorders such as the DMR-2000/4000, BVU-800DB (③).

**For a playback signal connection or connection for monitoring in the E-to-E mode:** Connect the composite digital (video) output connector of the recorder to the COMPOSITE DIGITAL INPUT A connector of the PCM-1630 (set the PB MODE selector of the PCM-1630 to A) (④).

When a DMR-2000 or DMR-4000 recorder is used in the system, connections ③ and ④ can be replaced with a single connection with an 8-pin multi-cable (⑤). In this case, **do not make connections ④ and ⑤ simultaneously.**

#### Notes

- Since the recorder's servo must be locked to the sync signal from the PCM-1630 during playback, supply a composite digital signal or a composite sync signal from the PCM-1630 to the recorder.
- The recording and playback modes can be alternated by pressing the appropriate buttons on the recorder. When a BVU-800DA/DB recorder is used, always set the recorder's dropout compensator circuit to OFF and its framing servo to ON.



### 1-7-2. Digital Dubbing

When two recorders (a recorder for playback and a recorder for recording) are used in the system, a tape can be duplicated without degrading the sound quality. Make the following connections.

**For a connection with a player:** For a playback signal connection, make connection ③ shown below between the PCM-1630 and the player. For a reference signal connection for the servo, make connection ② or ⑥. **For a connection with a recorder:** For a recording signal connection, connect the PCM-1630 and the recorder as shown with ④. For playback after digital dubbing, connect the COMPOSITE DIGITAL INPUT B connector of the PCM-1630 to the video output connector of the recorder as shown with ⑤.

#### To duplicate

Set the selectors on the PCM-1630 as follows:

- ENC IN selector: DUBBING
- DA IN selector: INT
- PB MODE selector: A

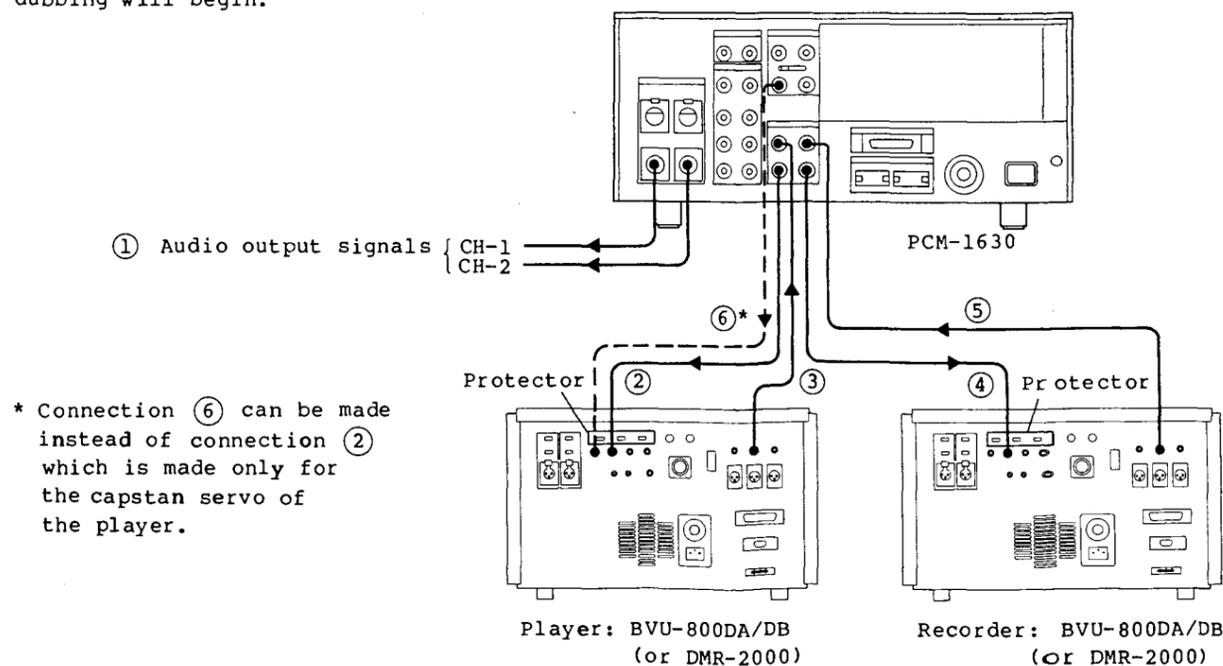
Set the player to the playback mode and the recorder to the record mode. Digital dubbing will begin.

#### To play back the duplicated tape

It is possible to play back the duplicated tape simply by setting the PB MODE selector on the PCM-1630 to B, without changing the connections. (Setting the ENC IN selector on the PCM-1630 to ANALOG or DIGITAL is recommended.)

#### Notes

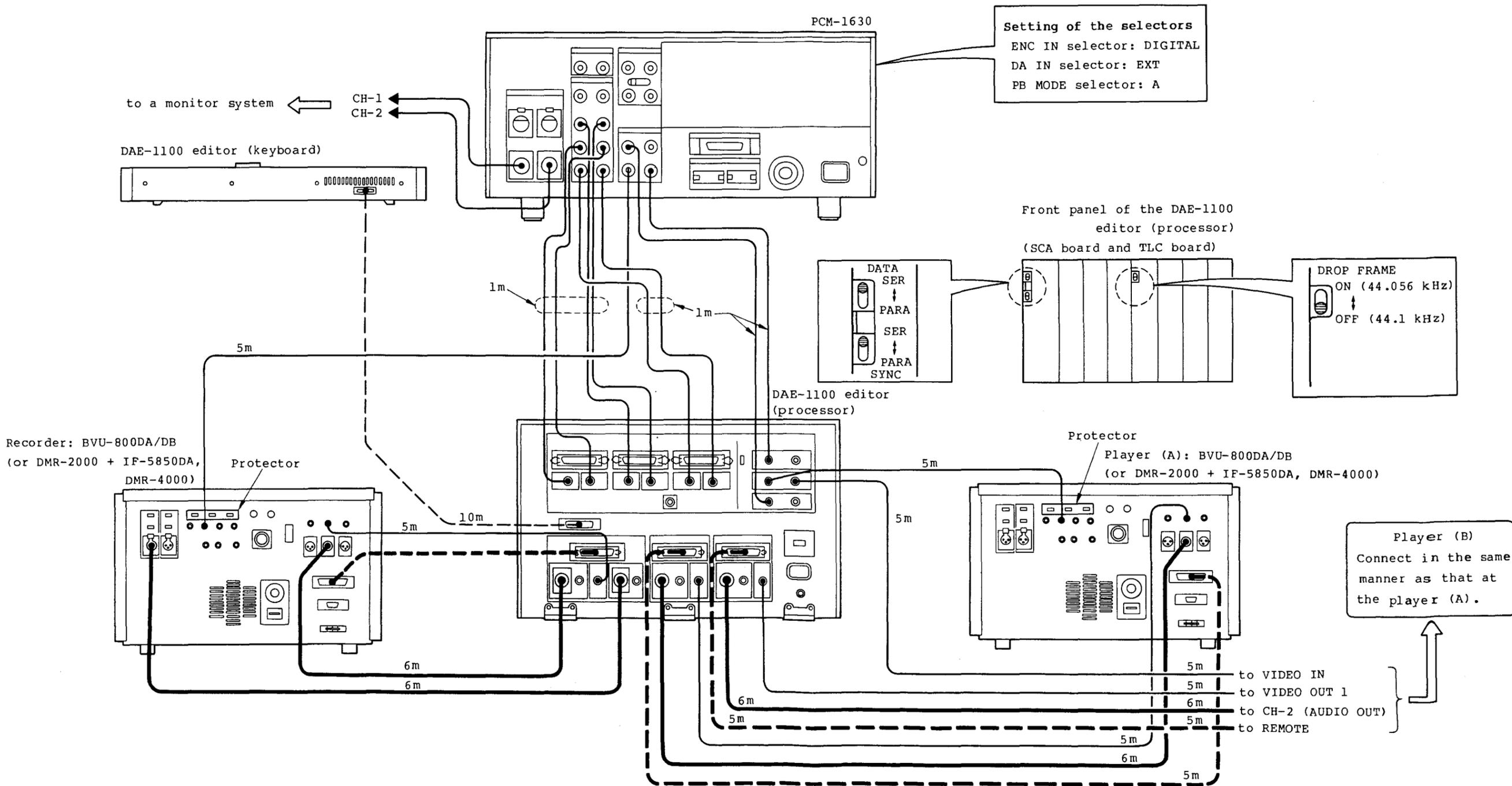
- For digital dubbing, set the FS selector (SW1) on the SIF-1 board of the PCM-1630 to the appropriate position, in accordance with the sampling frequency (indicated by the FSID indicator on the front panel of the PCM-1630) of the tape on the player.
- The emphasis identification bits on the tape being played back are recorded on the tape in the recorder. The setting of the EMP switch (SW1) on the AD-23 board of the PCM-1630 does not affect digital dubbing.
- When the recorder is in the E-to-E mode (the stop mode) during the digital dubbing operation, a loop of the recording signal and the playback signal may oscillate noise. This is not a malfunction. When this occurs, turn down the volume to avoid speaker damage.



1-7-3. Editing with a DAE-1100 Digital Audio Editor

Using a DAE-1100 digital audio editor in the system, fully automatic high-precision and high-speed digital-to-digital editing is possible. For details, refer to the operation and maintenance manual of the DAE-1100.

- Connecting cables
- 25-pin to 25-pin
  - 36-pin to 36-pin
  - Cannon XLR type to Cannon XLR type
  - BNC type to BNC type



1-7-4. Editing with a DAE-1100A Digital Audio Editor

Connection example

This is an example of an editing system featuring the editing RAW mode with the DMR-4000 digital master recorder. For details, refer to the operation and maintenance manuals of the connected equipment.

Connecting cables

- 25-pin to 25-pin
- 36-pin to 36-pin
- 8-pin to 8-pin
- Cannon XLR type to Cannon XLR type
- BNC type to BNC type

Setting of the selectors  
 ENC IN selector: DIGITAL  
 MONITOR selector: PB  
 DA IN selector: EXT  
 PB MODE selector: A  
 RAW switch (on the DABK-1630): EDT

PCM-1630 + DABK-1630

DTA-2000 digital tape analyzer → to a printer

DAE-1100A (keyboard)

Setting of the selectors  
 REMOTE/LOCAL selector: REMOTE  
 REMOTE-1/REMOTE-2 selector: REMOTE-2(36P)  
 AUX CH-2 selector: TIME CODE  
 TIME CODE selector: REGEN  
 RAW OUT selector: SUB

Recorder: DMR-4000

Interface box

DAE-1100A (processor)

Player: DMR-4000 (or DMR-2000, BVU-800DB)

1-7-5. Synchronization with Two PCM-1630s

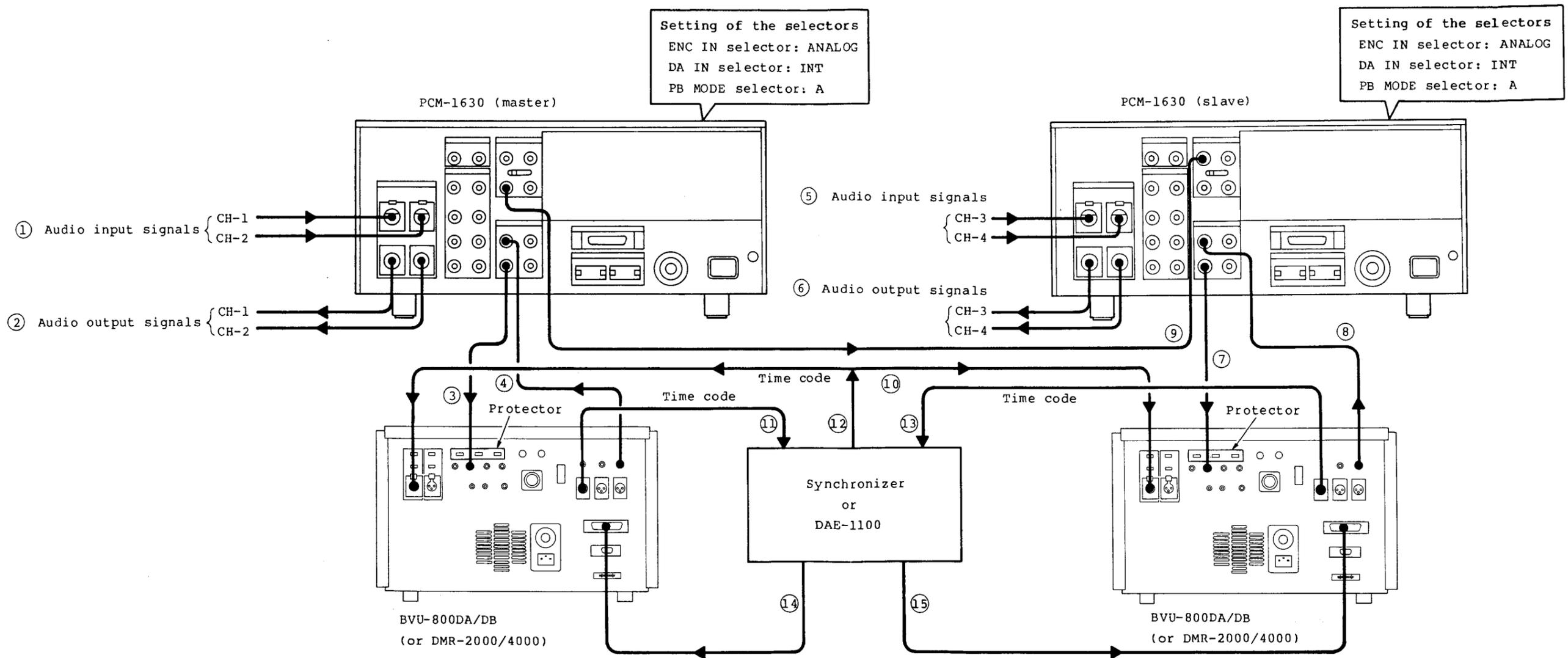
Four-channel recording and playback is possible using two recorders and two PCM-1630s.

Make connections for recording and playback between each recorder and PCM-1630 pair (connections ① to ⑧). To synchronize the two PCM-1630s with each other, connect the COMPOSITE SYNC OUTPUT connector of one

PCM-1630 to the COMPOSITE SYNC INPUT connector of the other (connection ⑨).

For synchronized playback, record the time code on audio channel-2 track of the tape on both recorders.

If the two recorders must be synchronized precisely in frame units during playback, a synchronizer or a DAE-1100 editor is required in the system (connections ⑩ to ⑮).



### 1-7-6. Recording and Playback of the SMPTE Time Code

If a PCM recorded tape has the time code recorded on it, an edit point can be located easily, and precise editing is possible.

When a DMR-2000/4000 recorder which incorporates a time code generator is used for recording, the time code is automatically recorded on the tape's audio channel-2 track simply by connecting the COMPOSITE DIGITAL OUTPUT connector of the PCM-1630 to the COMPOSITE DIGITAL (VIDEO) IN connector of the recorder (connection ①).

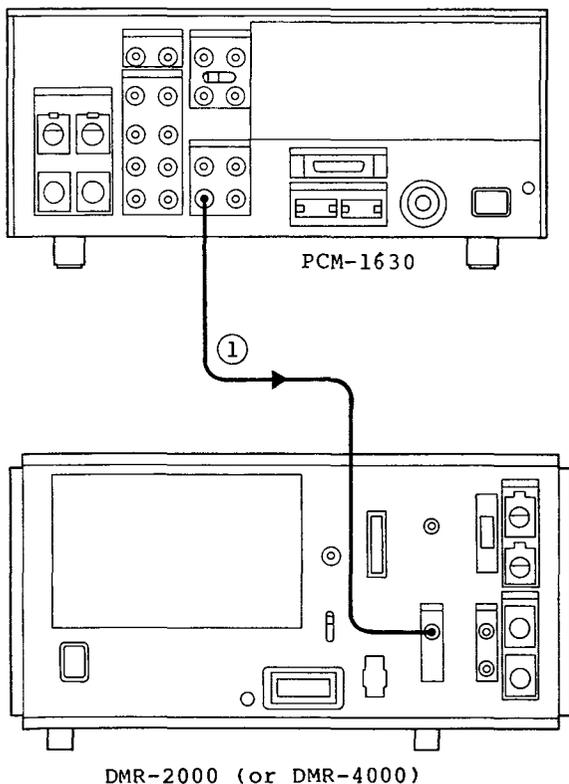
Connection ① supplies a reference signal for the servo lock, as well as a recording signal to the recorder.

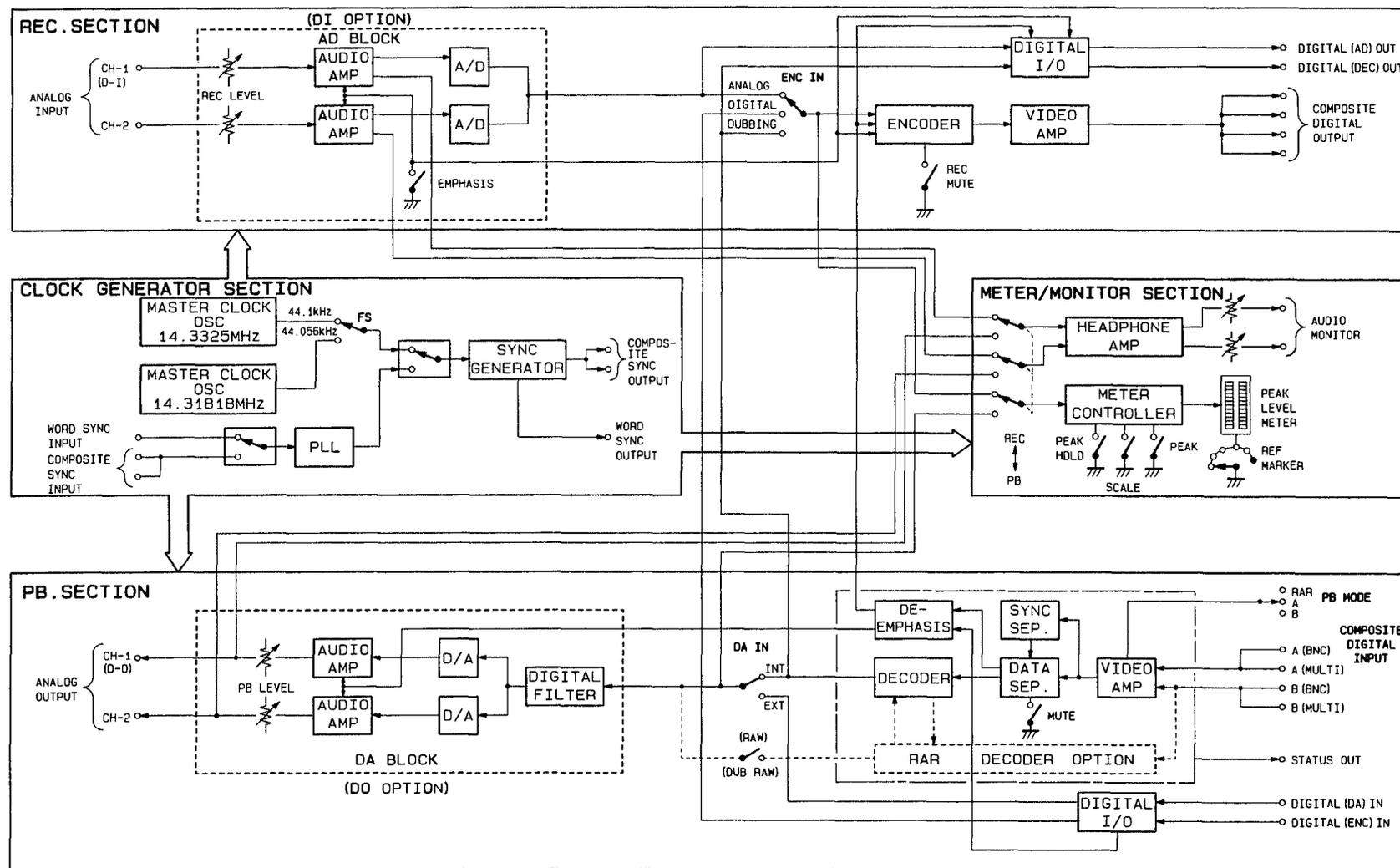
When a VTR other than the DMR-2000/4000 is used for recording, a time code generator such as the Sony BVG-1600 and a time code reader such as the Sony BVG-1500 are required in the system. In this case, a composite sync signal must be supplied from the PCM-1630 to the time code generator in order to synchronize the time code generator with the PCM-1630.

To record the time code on a blank tape  
When a time code is to be recorded on a blank tape before recording or editing, it is recommended that a muting signal be recorded on the PCM signal track (video track) simultaneously. To record a muting signal, set the ENC IN selector of the PCM-1630 to ANALOG and the REC MUTE switch on the ENC-2 board of the PCM-1630 to ON. A muting signal containing sampling frequency information and emphasis information is output from the COMPOSITE DIGITAL OUTPUT connector of the PCM-1630. Connect the PCM-1630 and the recorder in the same manner as that used to make the connection for time code recording/playback.

#### Note

After completing the time code recording, be sure to return the REC MUTE switch of the PCM-1630 to OFF. If the switch remains ON, a recording cannot be made.

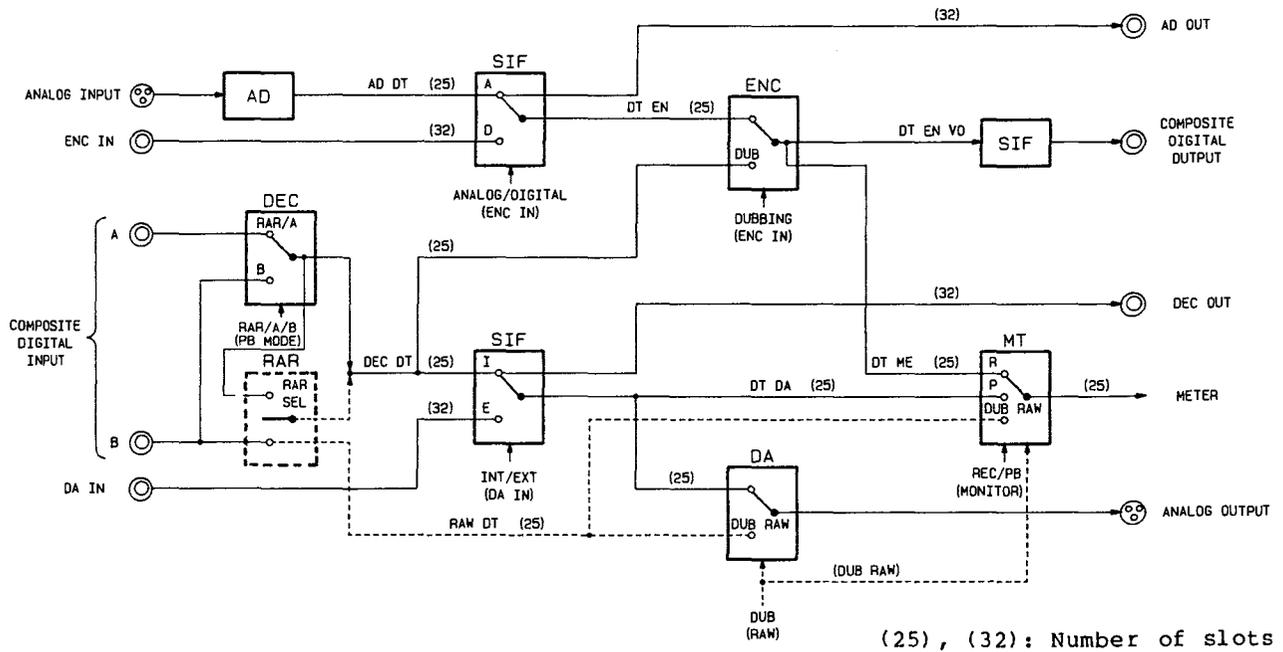




1-28 (E)

## 1-9. SIGNAL FLOW

### 1-9-1. Data Flow



#### Switches

ENC IN selector: ANALOG/DIGITAL/DUBBING

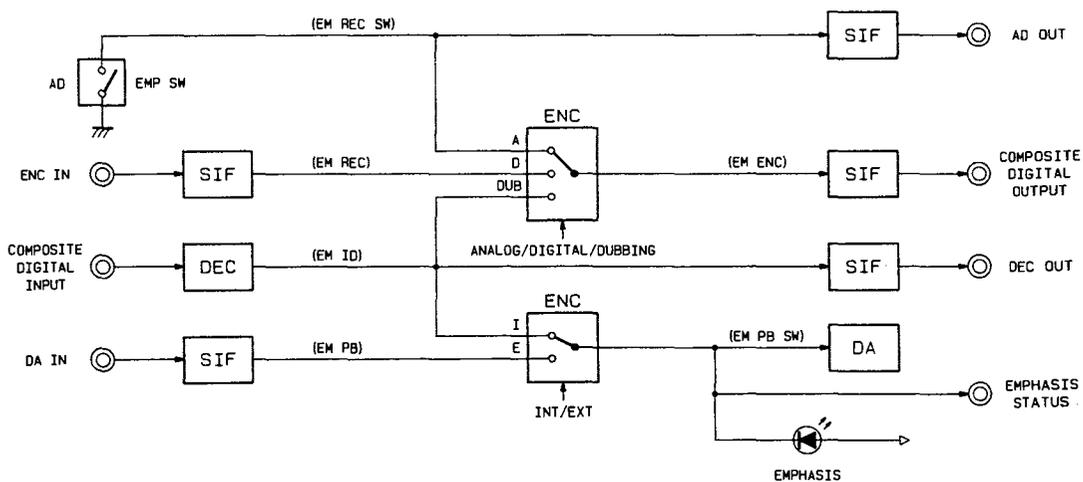
DA IN selector: INT/EXT

MONITOR selector: REC/PB

PB MODE selector: RAR/A/B

RAW selector (on the optional RAR-1 board): EDT/OFF/DUB

### 1-9-2. Emphasis Data Flow



#### Switches

ENC IN selector: ANALOG/DIGITAL/DUBBING

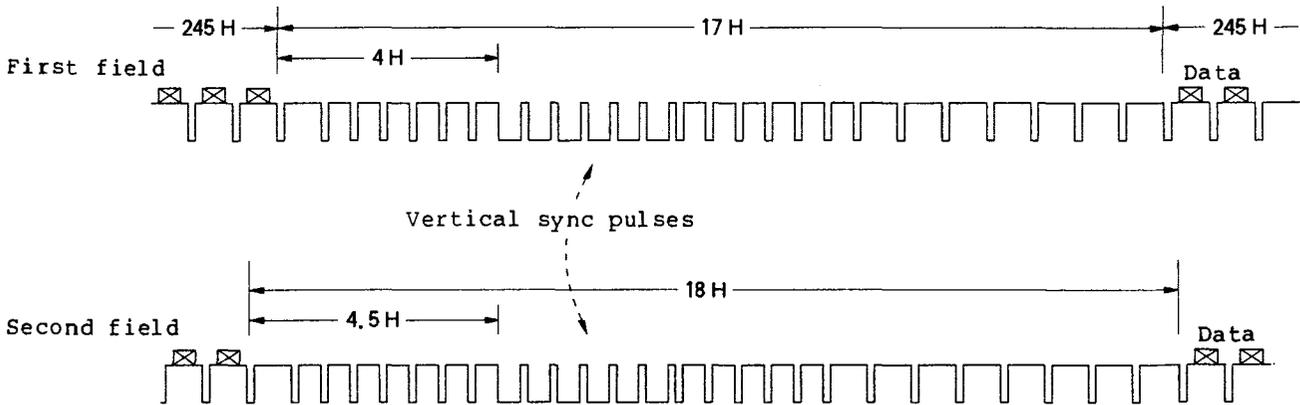
DA IN selector: INT/EXT

EMP switch (on the AD-23 board): ON/OFF

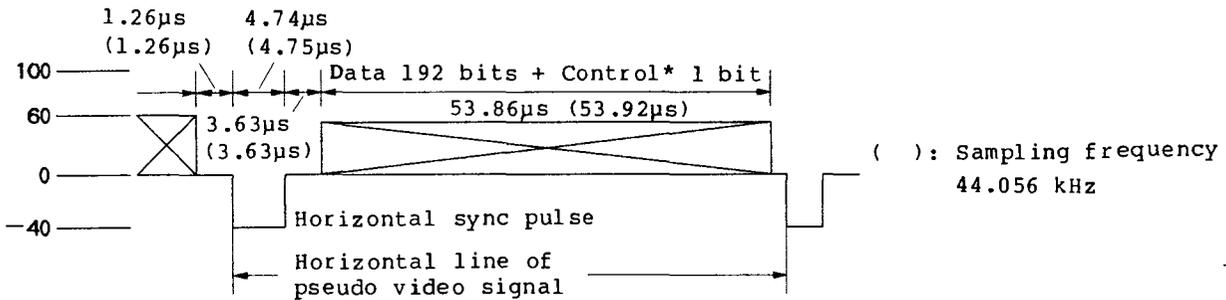
## 1-10. SIGNAL FORMAT

### 1-10-1. Composite Digital (Video) Input/Output Signals

#### Data configuration



#### Composite digital (video) waveforms



#### \* Control bit (the 129th bit)

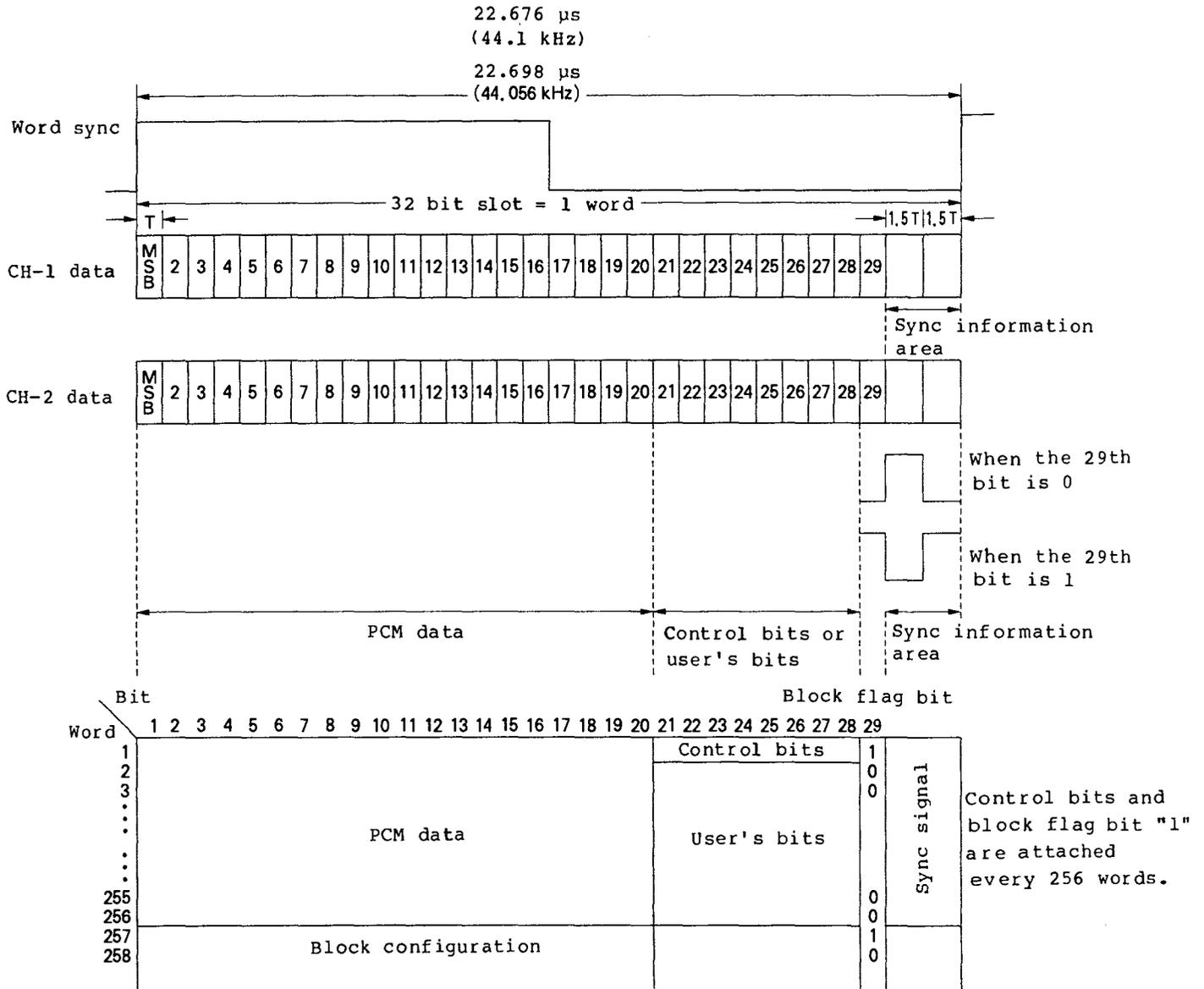
1 field = 7 blocks

1 block = 35 H

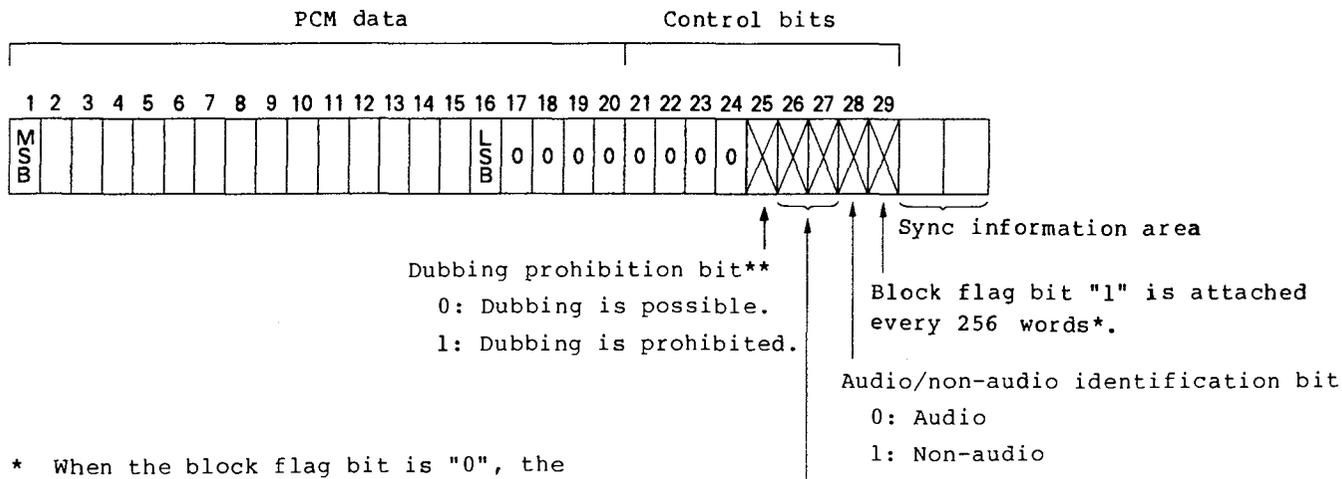
- **Emphasis** (the 1st H of each block)
  - ON: Data "0" (black on a monitor TV)
  - OFF: Data "1" (white on a monitor TV)
- **Sampling frequency** (the 2nd H of each block)
  - 44.1 kHz: Data "0" (black on a monitor TV)
  - 44.056 kHz: Data "1" (white on a monitor TV)
- **Mode** (the 3rd H of each block)
  - SI format: Data "1" (white on a monitor TV)
  - EI format: Data "0" (black on a monitor TV)
- **Audio/code** (the 4th H of each block)
  - Audio: Data "1" (white on a monitor TV)
  - Code: Data "0" (black on a monitor TV)

1-10-2. Digital Input/Output and Control Signals

Digital input/output format



**Control signal block structure**



Dubbing prohibition bit\*\*  
 0: Dubbing is possible.  
 1: Dubbing is prohibited.

Block flag bit "1" is attached every 256 words\*.

Audio/non-audio identification bit  
 0: Audio  
 1: Non-audio

Emphasis identification bits\*\*\*  
 00: Emphasis is not used.  
 01: Emphasis is used.  
 (50  $\mu$ sec., 15  $\mu$ sec.)

\* When the block flag bit is "0", the audio/non-audio identification bit, dubbing prohibition bit and emphasis identification bits are also "0".

\*\* In the PCM-1630, the dubbing prohibition bit is always "0".

\*\*\* For interface (signal: DA IN CH-1) between the DAE-1100A with serial No. 10601 and higher and the PCM-1630 with serial No. 11301 and higher, the 26th bit is used independently as the EDIT signal bit. Therefore, only the 27th bit is used as the emphasis identification bit.

26th bit  
 0: Normal  
 1: Automatic editing

**1-11. SYNCHRONIZATION**

The capstan servo of the recorder for recording and playing back the digital audio signals must be locked to the sync signal of the PCM-1630. In addition, when a recording/playback system consisting of a PCM-1630 and a recorder is to be synchronized with other equipment (such as a VTR for recording/playing back video signals, or audio equipment), the system and equipment must be synchronized by means of an external sync signal. The following synchronization method is recommended:

1) When a PCM signal is directly supplied from the PCM-1630 to a recorder:

A sync signal from the COMPOSITE DIGITAL OUT connector or the COMPOSITE SYNC OUTPUT connector of the PCM-1630 is supplied to the recorder. (Refer to Figs. 1 and 2, (A).)

2) To synchronize systems including a PCM-1630 with each other, or to synchronize a system including a PCM-1630 with another system:

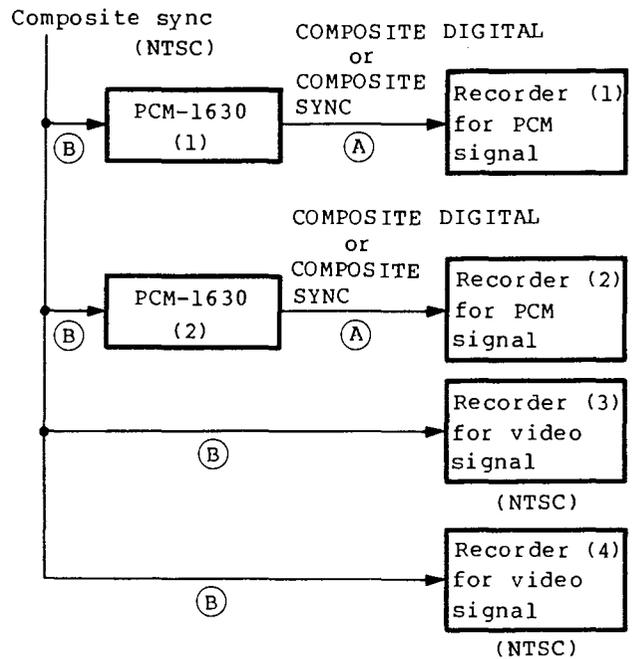
A sync signal can be supplied from an external sync generator or one PCM-1630. A sync signal or several kinds of sync signals which are locked to each other can be used in the system. It is recommended that the sync signal from the COMPOSITE SYNC OUTPUT connector or the WORD SYNC OUTPUT connector of one PCM-1630 be supplied as shown. (Refer to Figs. 1 and 2, (B) and (C).)

When both the composite sync signal and the word sync signal are supplied, the composite sync signal will have priority.

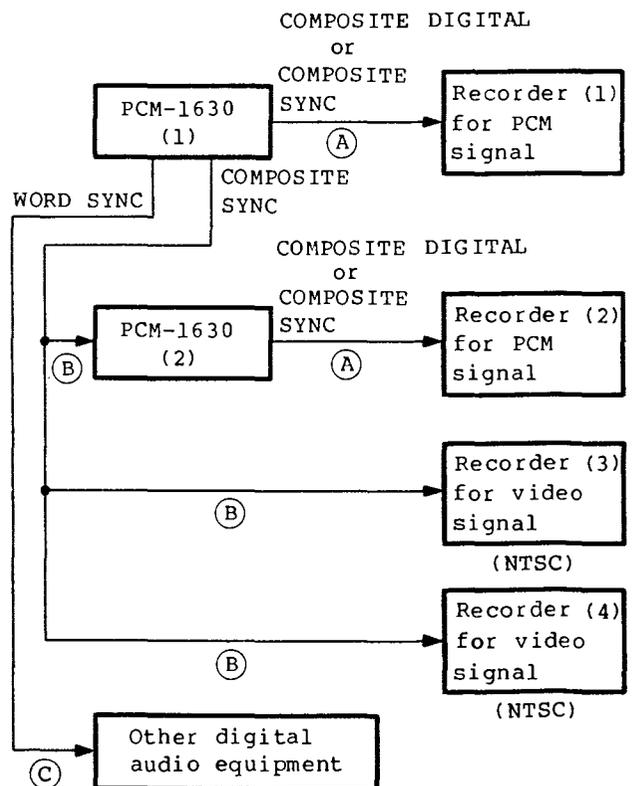
**Sync signal priority**

1. composite sync signal
2. word sync signal
3. DI sync signal (from the optional digital I/O board)

**Fig. 1 Synchronization using an external composite sync signal**

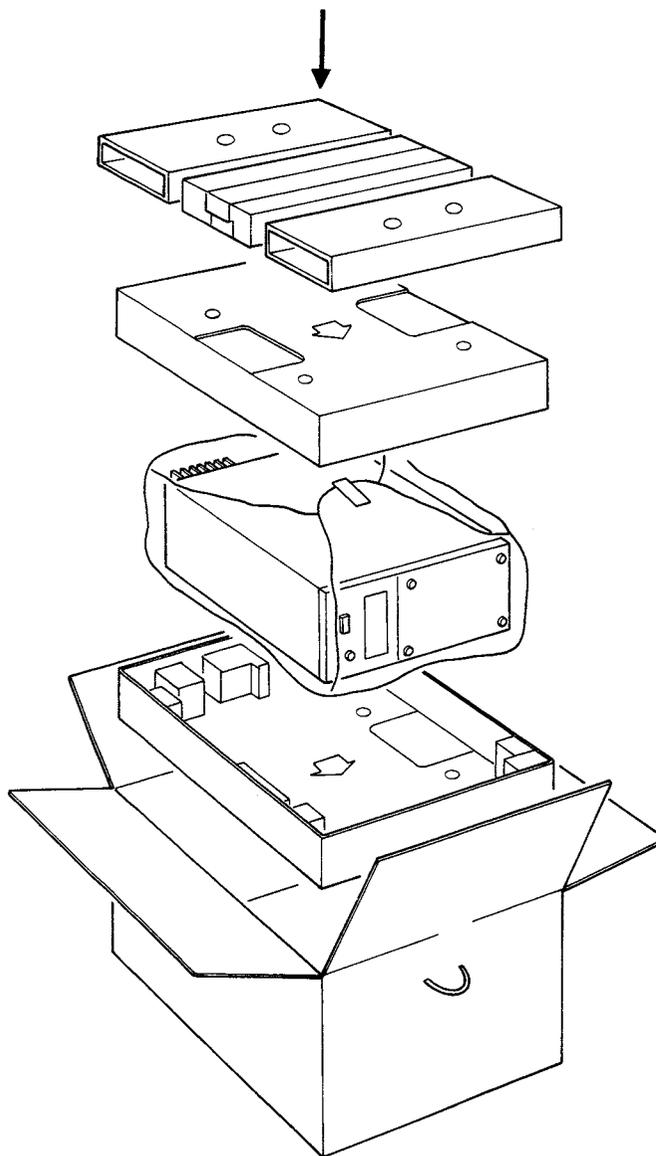
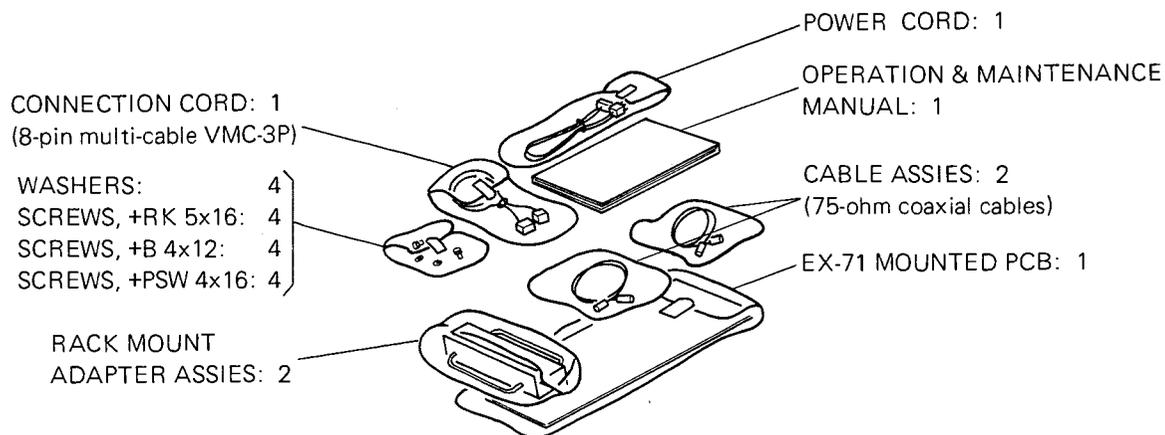


**Fig. 2 Synchronization using the composite sync output signal and the word sync output signal from the PCM-1630 (1)**



## SECTION 2 SERVICE INFORMATION

### 2-1. REPACKING



## 2-2. RACK MOUNTING

### Parts required

**Slide Rails for Rack Mounting** **1 set**  
 (Includes two inner members and two outer members.)  
 ACCURIDE Model 203, length 26" (660 mm)

**Brackets (ACCURIDE #5355):** **4**

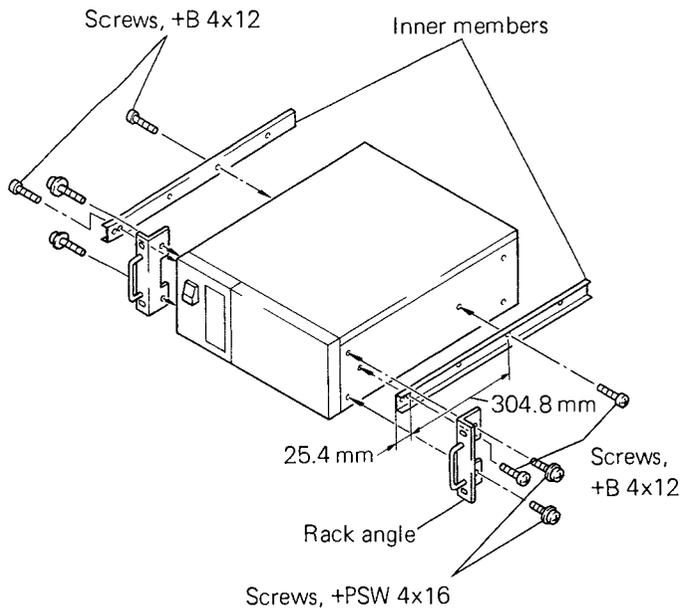
**Bracket mounting screws and outer member mounting screws:** **1 set**

### Accessories Supplied

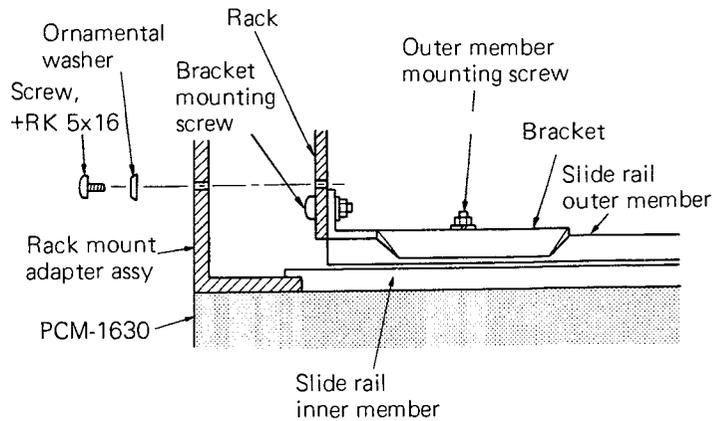
Rack mount Adapter Assy (A-7810-169-A): 2  
 Ornamental Washer (3-703-064-00): 4  
 Screw +RK 5x16 (7-682-378-04): 4  
 Screw +B 4x12 (7-682-563-04): 4  
 Screw +PSW 4x16 (7-682-965-01): 4

### Rack Mounting Procedure

1)



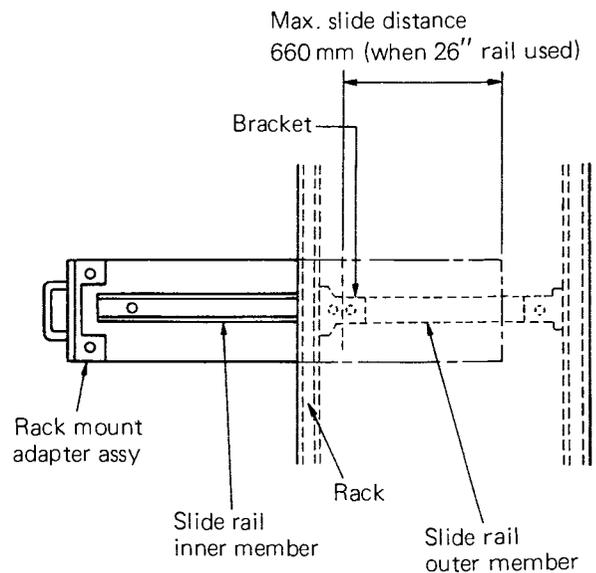
2) Fix the bracket to the outer member and mount the bracket to the rack as follows.



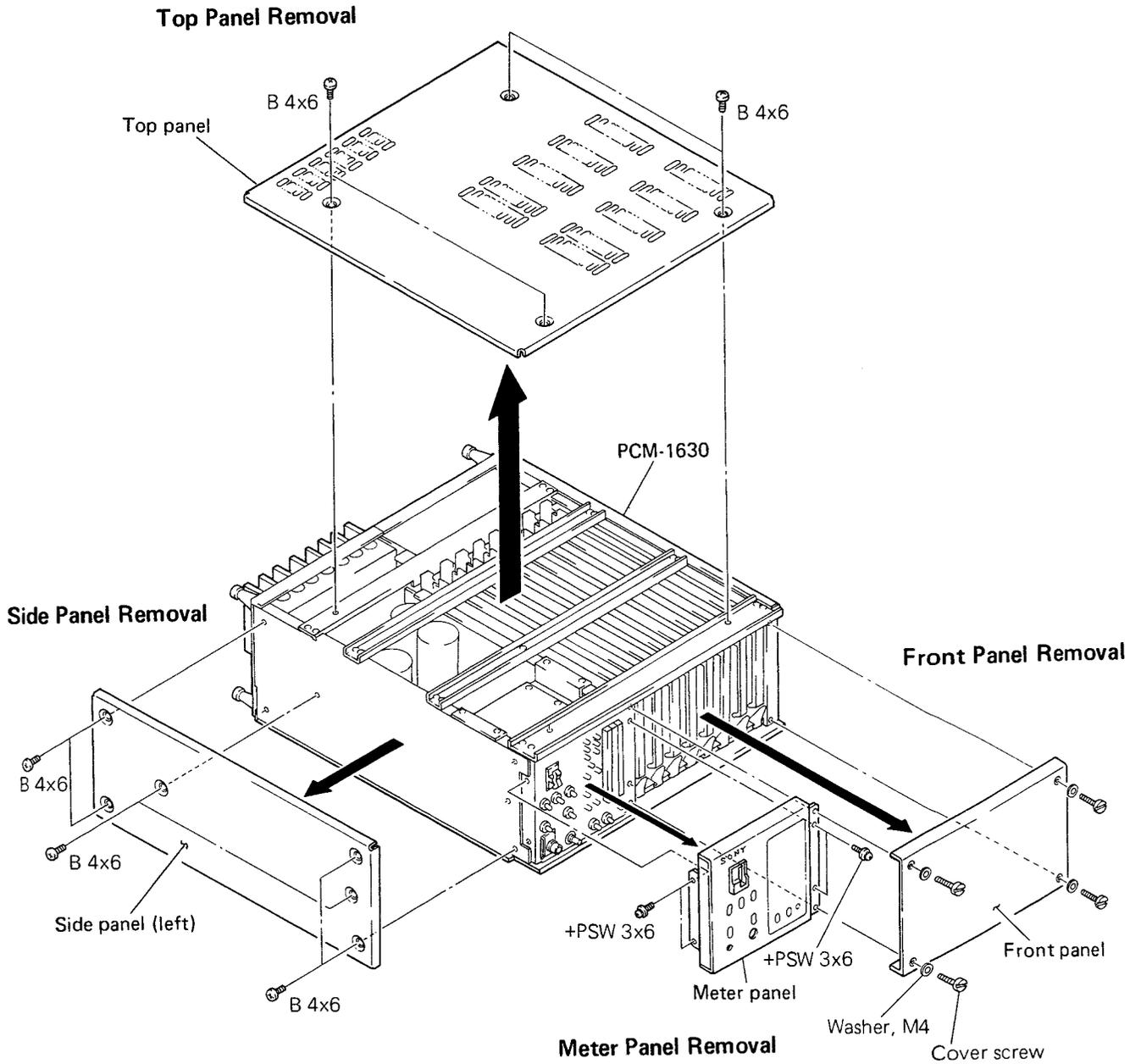
### Note:

For the brackets, outer member mounting screws and bracket mounting screws, use the ones recommended by the slide rail manufacturer.

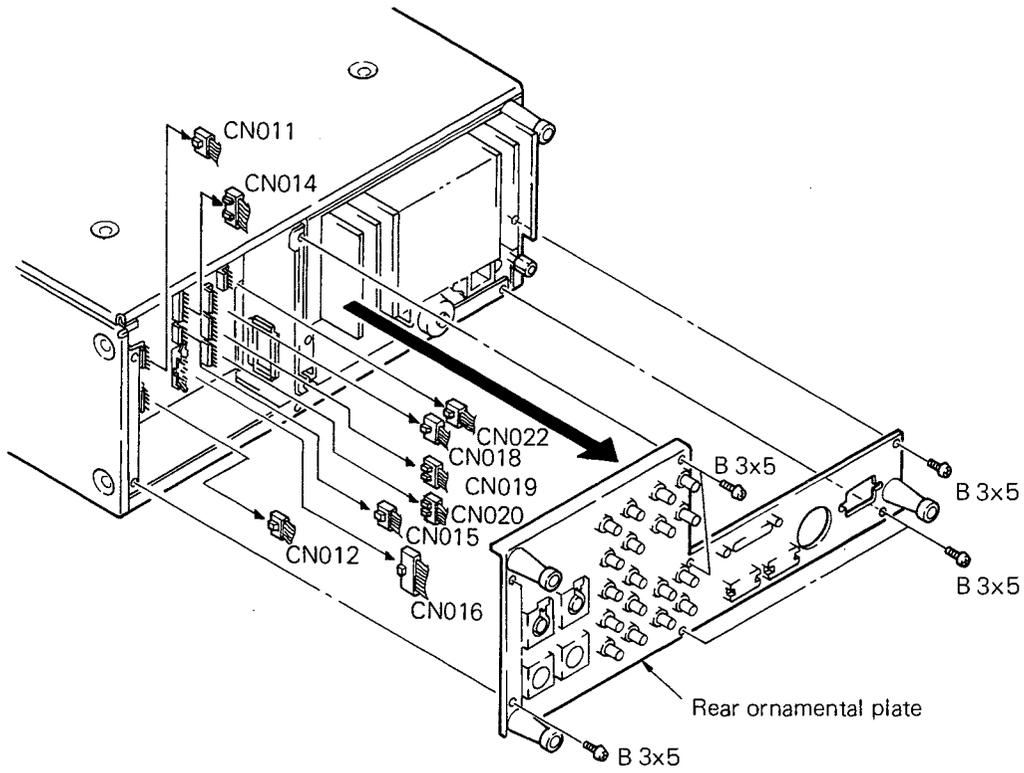
3) Push the PCM-1630 into the rack and secure it to the rack with +RK 5x16 screws and ornamental washers.



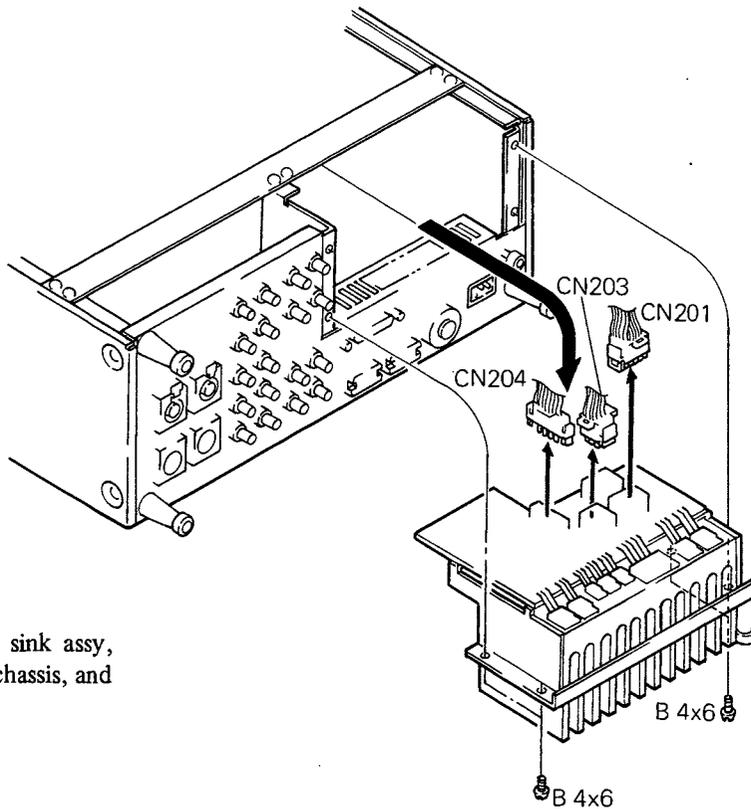
## 2-3. CASE REMOVAL



### Rear Ornamental Plate Removal



### 2-4. HEAT SINK ASSY REMOVAL



**Caution:**

When reinstalling the heat sink assy, first put the harness in the chassis, and then install the heat sink.

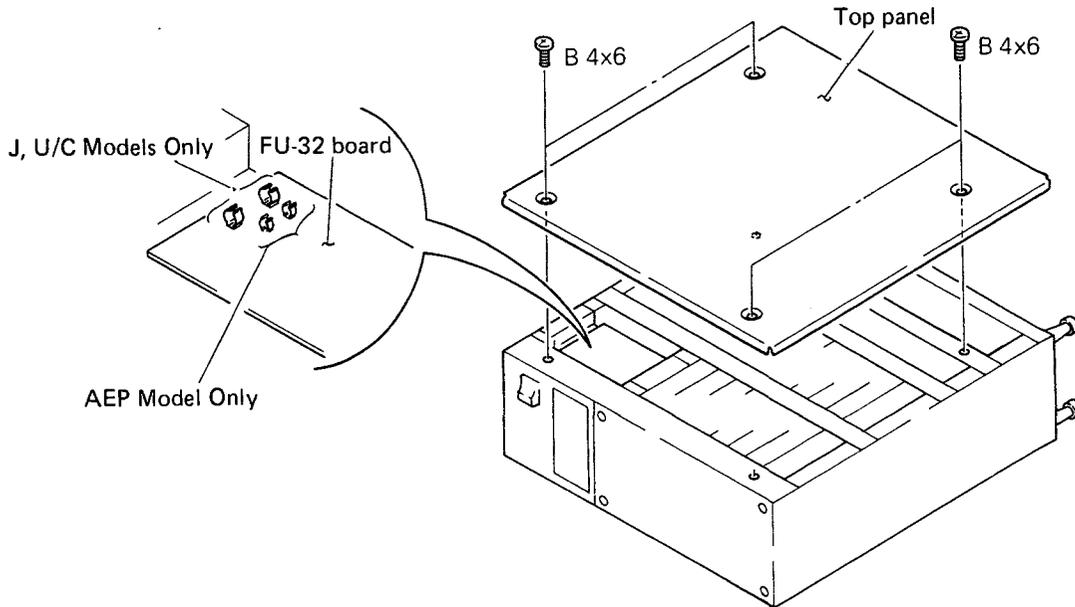
## 2-5. CAUTION FOR PS-81 BOARD AND FUSE REPLACEMENT

### Fuse Replacement

- 1) Turn off the power switch.
- 2) Remove the top panel.
- 3) Replace the fuse on the FU-32 board.

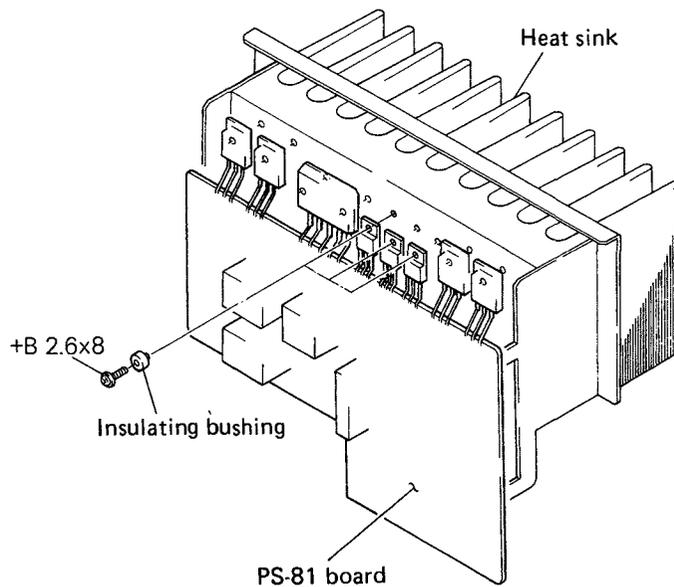
#### Caution:

The fuse for J and U/C Models differs from that for AEP Model in the location.



### PS-81 Board Replacement

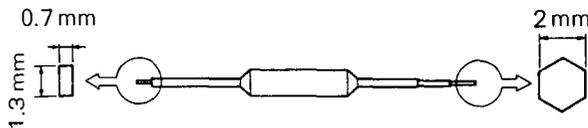
When installing the regulators of PS-81 board on the heat sink, do not forget to use an insulating bushing to prevent short circuit between the radiator fins of three regulators (Q4, Q5 and Q6) and the heat sink.



## SECTION 3 ELECTRICAL ADJUSTMENTS

### 3-1. EQUIPMENTS REQUIRED

- (1) **DIGITAL DC VOLTMETER**  
Effective digits; more than 4½ digits  
Accuracy; less than 0.02% ±1 count
- (2) **STANDARD SIGNAL GENERATOR**  
Hewlett-Packard Model 3325A
- (3) **NTSC TEST SIGNAL GENERATOR**  
Tektronix 1410  
Plug in Unit; SYNC GENERATOR SPG1/2
- (4) **AF OSCILLATOR**  
Tektronix Model SG505
- (5) **DISTORTION METER**  
Tektronix Model AA501
- (6) **FREQUENCY COUNTER**  
Hewlett-Packard Model 5315A/OPT003
- (7) **OSCILLOSCOPE**  
Tektronix Model 475A
- (8) **EX-71 EXTENSION BOARD**  
Sony Part No. A-7850-303-A  
One EX-71 board is supplied with PCM-1630.
- (9) **ADJUSTMENT SCREWDRIVER**  
Sony Part No. 7-700-733-01



### 3-2. +5V·±22V VOLTAGE ADJUSTMENT (PS-81 BOARD)

**Equipment:** Digital DC Voltmeter  
EX-71 Extension Board

**Connection:** Apply the line voltage set by the voltage selector to the unit.

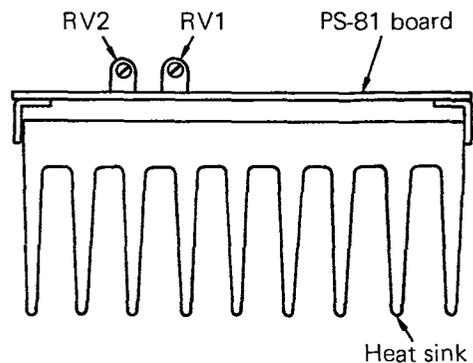
#### Adjustment

1. Insert the EX-71 extension board into the AD-23 board slot in the card rack.
2. Put the AD-23 board on the extension board.
3. Measure the following check points.

Voltage	Check Points (AD-23)		Adjustment (PS-81)	Specifications
	+	GND		
+5 V	A47·48 B47·48	A49·50 B49·50	RV1	+5 V ± 0.05 V
+22 V	A3·B3	A1·2 B1·2	RV2	+22 V ± 0.2 V
-22 V	A4·B4	A1·2 B1·2	-	-22 V ± 0.3 V

**Note:** -22 V must be checked only because it is linked with +22 V.

#### Adjustment Location



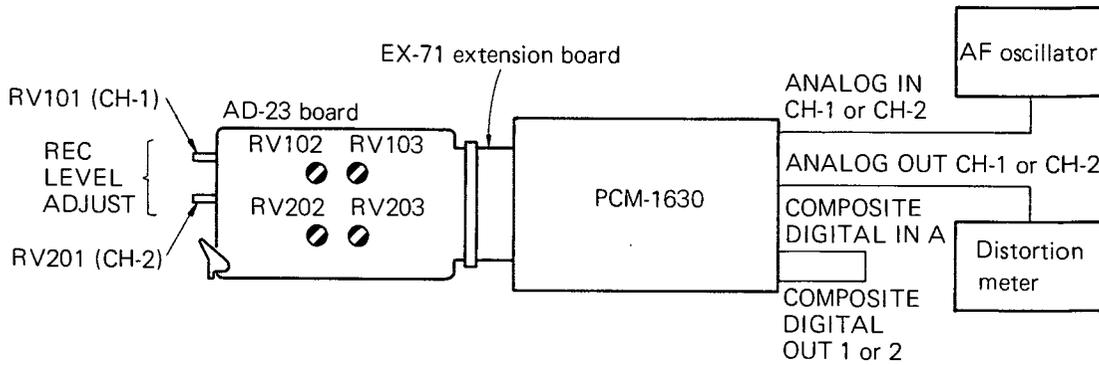
4. Insert the EX-71 extension board into each AD-23, DEC-15 and MT-16 board slot.
5. Put each AD-23, DEC-15 and MT-16 board on the extension board and check the following voltages.

Voltage	Check Points			Specifications
	Board Name	+	GND	
-8 V	AD-23	A6·B6	A5·B5	-8 V ± 0.3 V
+12 V	DEC-15	A3·B3	A1·2 B1·2	+12 V ± 0.5 V
-12 V	DEC-15	A4·B4	A1·2 B1·2	-12 V ± 0.5 V
+5 V	MT-16	A46·B46	A49·50 B49·50	+5 V ± 0.2 V

### 3-3. AD CONVERSION LEVEL ADJUSTMENT (AD-23 BOARD)

**Equipment:** Distorsion Meter  
 AF Oscillator  
 Oscilloscope  
 EX-71 Extension Board  
 75Ω BNC Cable

**Connection:**



**Condition:**

REFERENCE level 4 dBs (0 dBs = 0.775 Vrms),  
 Head room 20 dB

**Switch Settings:**

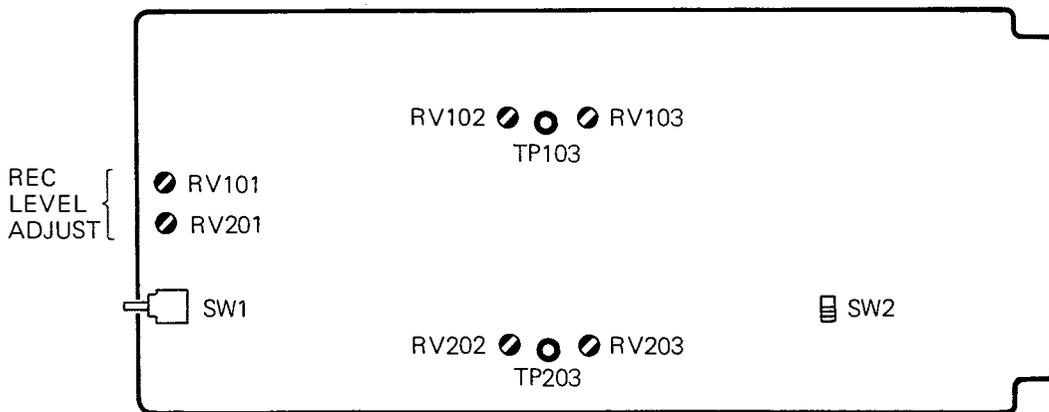
Front Panel SW

ENC IN SW: ANALOG  
 DA IN SW: INT  
 PB MODE: A  
 REF MARKER: -20 dB

AD-23 Board SW

EMP SW (SW1): OFF  
 DITHER SW (SW2): OFF

**Adjustment Location**



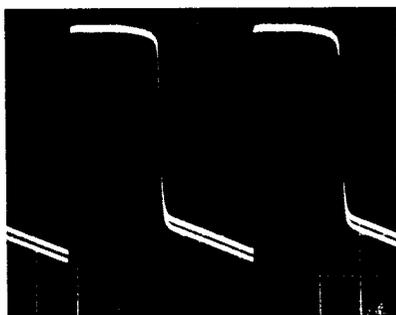
AD-23 BOARD – component side –

### Adjustment

1. Input 1 kHz, 4 dBs signal to the ANALOG INPUT CH-1 (CH-2) connector.
2. Set the scale of the level meter to NORMAL and adjust RV101 (RV201) so that the signal level as indicated on the level meter coincides with REF MARKER.
3. Set the scale of the level meter to FINE.
4. Adjust RV103 (RV203) to obtain the minimum distortion (less than 0.04%).
5. Adjust RV102 (RV202) to obtain the minimum offset (the lowest point when the scale of the level meter set to FINE).
6. Disconnect the input signal.
7. Using the oscilloscope connected to TP103 (TP203), observe the waveform as shown below.
9. Turn RV103 (RV203) clockwise slowly. The above double base disappears and single base appears. Turning it furthermore, the double base appears again. This is called as 2nd double base. Turning furthermore, 3rd double base appears.
10. Set RV103 (RV203) to the middle point between 2nd and 3rd double bases.
11. Input 1 kHz, 4 dBs signal to the ANALOG INPUT CH-1 (CH-2) connector, and adjust RV102 (RV202) to obtain the minimum offset.
12. Adjust RV101 (RV201) so that the signal level as indicated on the level meter coincides with REF MARKER.
13. Check the distortion.  
Spec.; Less than 0.04%



8. Turn RV103 (RV203) fully counterclockwise. The base of the waveform at TP103 (TP203) becomes doubly as shown below. This is called as 1st double base.

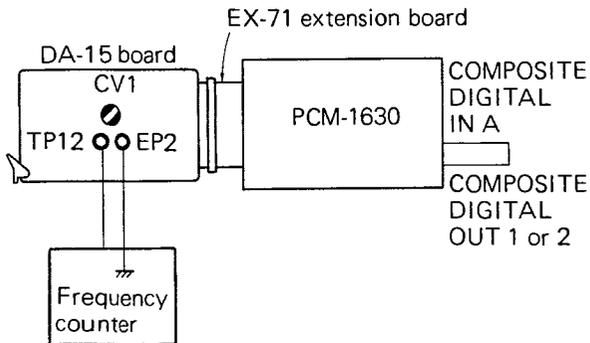


### 3-4. DA CONVERSION AND ANALOG OUTPUT ADJUSTMENTS (DA-15 BOARD)

#### 3-4-1. Oscillator Frequency Adjustment

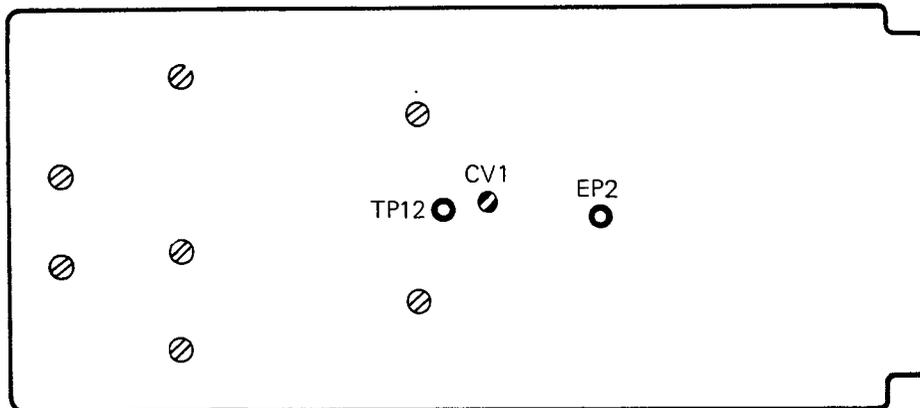
**Equipment:** Frequency Counter  
EX-71 Extension Board  
75Ω BNC Cable

**Connection:**



#### Adjustment

1. Connect the frequency counter to TP12 on the DA-15 board.
2. Adjust CV1 to obtain the following specification.  
Spec.;  $39933.10 \pm 0.02$  kHz
3. If the beat grates on the ear when the signal is not inputted, finely adjust CV1.

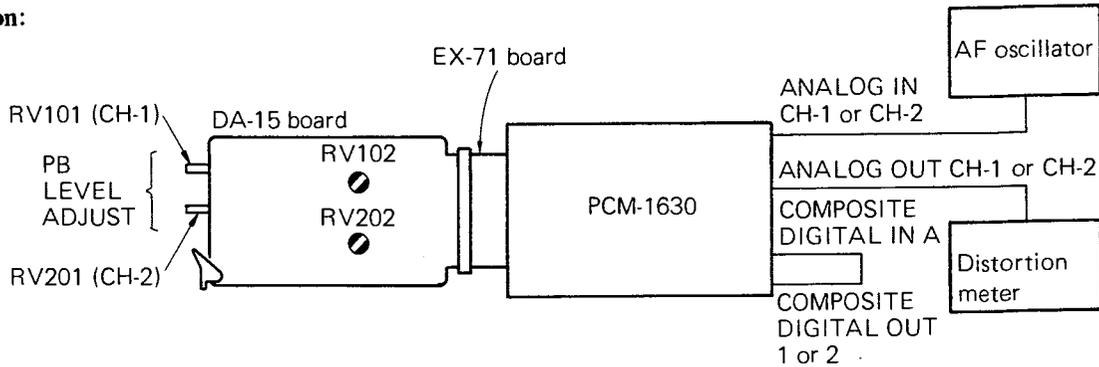


DA-15 BOARD — component side —

### 3-4-2. Level Adjustment

**Equipment:** Distortion Meter  
 AF Oscillator  
 EX-71 Extension Board  
 75Ω BNC Cable

**Connection:**



**Condition:**

REFERENCE level 4 dBs (0 dBs = 0.775 Vrms)  
 Head room 20 dB

**Switch Settings:**

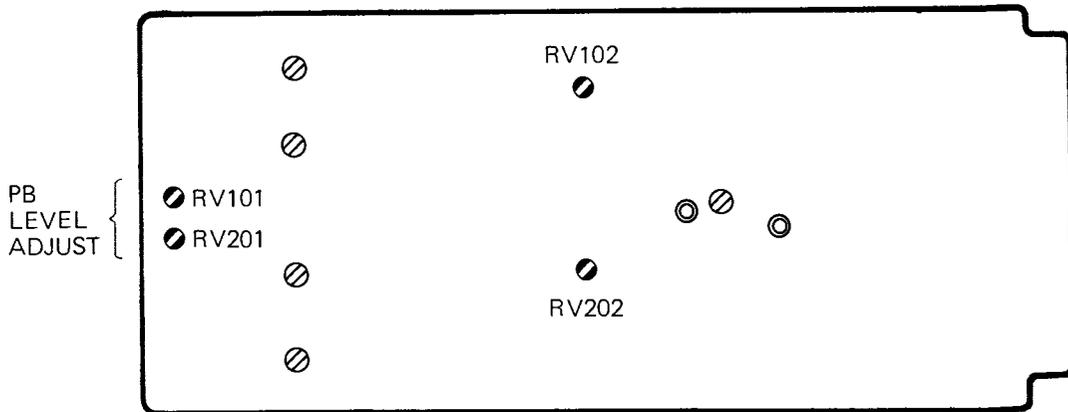
Front panel SW  
 ENC IN SW: ANALOG  
 DA IN SW: INT  
 PB MODE: A  
 REF MARKER: -20 dB  
 AD-23 Board SW  
 EMP SW (SW1); OFF  
 DITHER SW (SW2): OFF

**Adjustment (1)**

1. Input 1 kHz, 4 dBs signal to the ANALOG INPUT CH-1 (CH-2) connector.
2. Set the scale of the level meter to NORMAL and confirm that the signal level as indicated on the level meter coincides with REF MARKER. If necessary, perform "3-3. AD Conversion Level Adjustment" again.
3. Adjust RV101 (RV201) to obtain the following specification.  
 Spec.; Output Level 4 dBs ± 0.1 dBs

**Adjustment (2)**

1. Input 16 kHz, 14 dBs signal to the ANALOG INPUT CH-1 (CH-2) connector.
2. Adjust RV102 (RV202) to obtain the following specification.  
 Spec.; Distortion Less than 0.03%

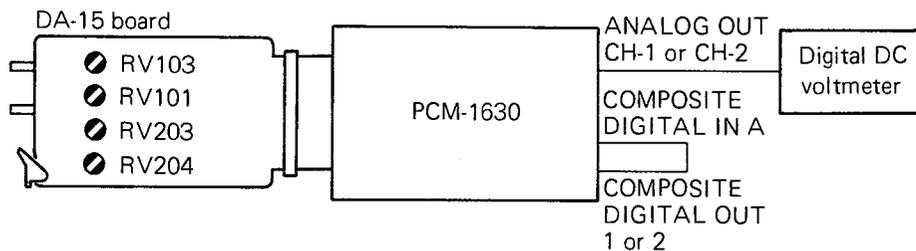


DA-15 BOARD — component side —

### 3-4-3. Output Offset Adjustment

**Equipment:** Digital DC Voltmeter  
EX-71 Extension Board

**Connection:**



**Switch Settings:**

Front Panel SW

ENC IN SW: ANALOG  
DA IN SW: INT  
PB MODE: A

AD-23 Board SW

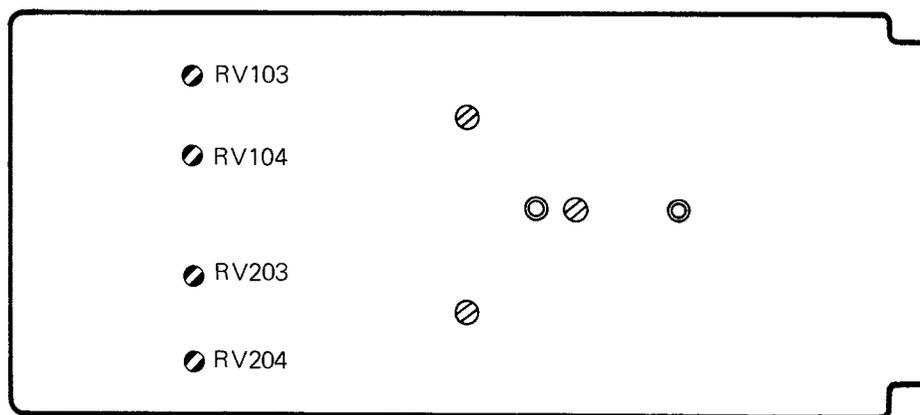
EMP SW (SW1): OFF  
DITHER SW (SW2): OFF

**Adjustment (2)**

1. Remove the short circuit between COLD and GND described on step 2 of Adjustment (1) and measure the DC voltage between HOT and GND.  
Spec.;  $\pm 20$  mV  
Adjust; RV103 (RV203)

**Adjustment (1)**

1. Turn on the power and perform aging for five minutes.
2. Short-circuit between COLD and GND of the ANALOG OUTPUT CH-1 (CH-2) connector.
3. Check the DC voltage between the above HOT and GND.
4. Adjust RV104 (RV204) to obtain the following specification.  
Spec.;  $\pm 20$  mV

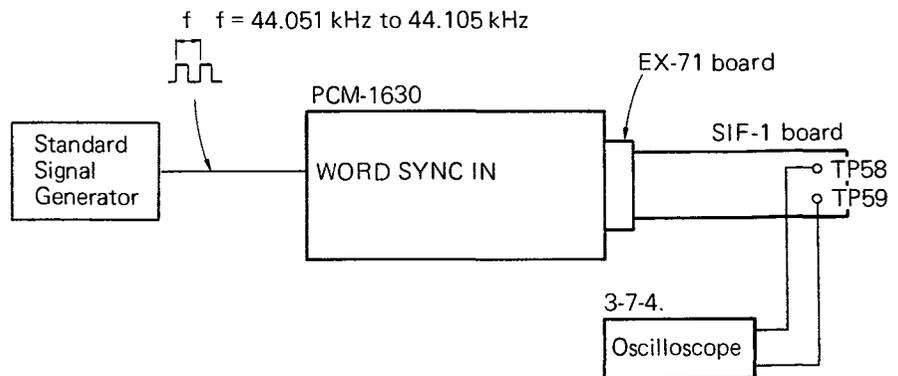
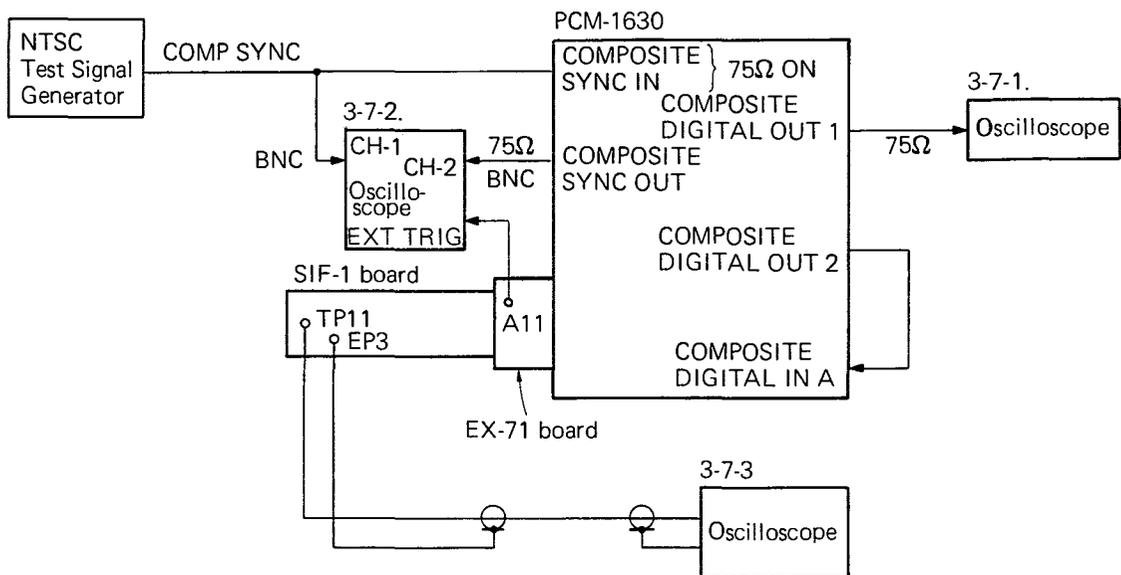


DA-15 BOARD — component side —

### 3.5. COMPOSITE DIGITAL OUTPUT AND CLOCK ADJUSTMENTS (SIF-1 BOARD)

**Equipment:** NTSC Test Signal Generator  
 Standard Signal Generator  
 Oscilloscope  
 EX-71 Extension Board

**Connection:**



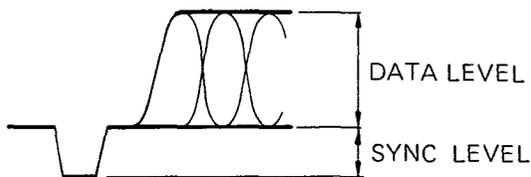
**Switch Settings:** Free

### 3-5-1. Composite Digital Output Level Adjustment

Adjust RV4 to obtain the following specification, and then adjust RV3.

SYNC LEVEL: 0.29 Vp-p  
 Ⓞ RV4

DATA LEVEL: 0.43 Vp-p  
 Ⓞ RV3



COMPOSITE DIGITAL OUTPUT WAVEFORM

### 3-5-2. Composite Sync Phase Adjustment

Adjust RV2 so that the phase of COMPOSITE SYNC IN (Board Connector No. A-10) coincides with that of the COMPOSITE SYNC OUT (Board Connector No. A-8).

### 3-5-3. Master Clock Duty Adjustment

Adjust RV1 so that the Duty Factor of the waveform at TP11 comes to 50% as far as possible.

### 3-5-4. External Synchronization Adjustment

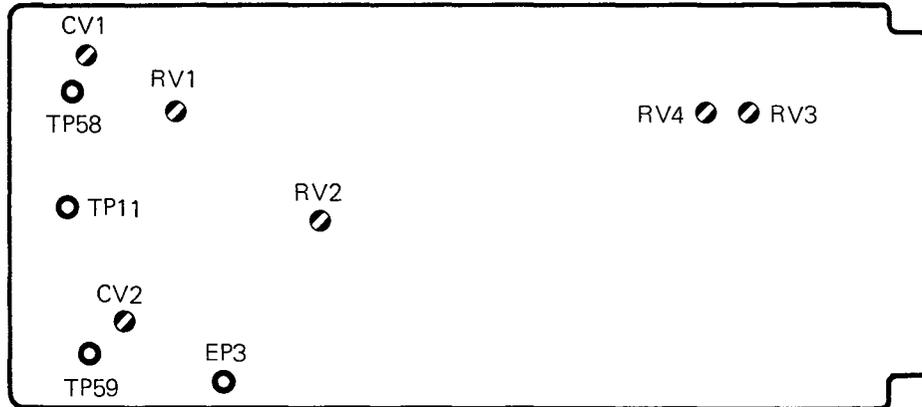
Sweep the 44.051 kHz to 44.105 kHz square wave (DUTY 50% TTL level) with standard signal generator and adjust CV1 and CV2 to obtain the following specification.

Spec.; Voltage at TP58

Within the range of 0.6 V to 5.7 V  
 Ⓞ CV1

Voltage at TP59

Within the range of 0.6 V to 5.7 V  
 Ⓞ CV2

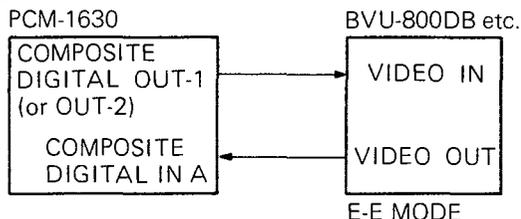


SIF-1 BOARD — component side —

### 3-6. SYNC AND DATA EXTRACTION LEVEL ADJUSTMENT (DEC-15 BOARD)

Equipment: Oscilloscope

Connection:



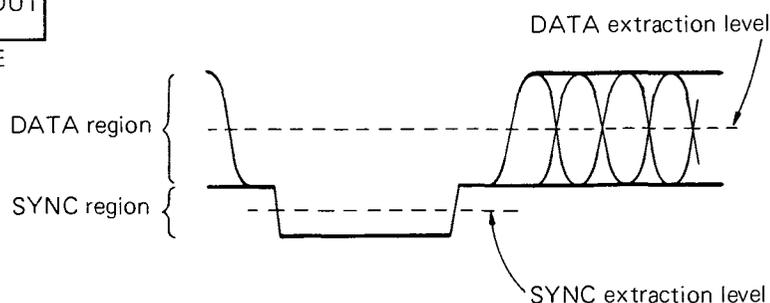
Switch Settings:

Front Panel SW

PB MODE: A

DEC-1 Board SW

SW3: ① ON ② ON ③ OFF ④ OFF

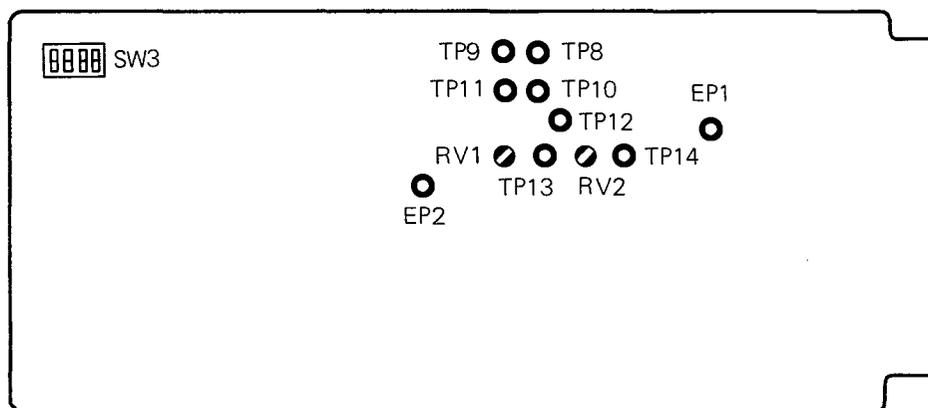


Waveform on the oscilloscope

#### Adjustment and Confirmation

1. Set both CH-1 and CH-2 of the oscilloscope to 0.5 V/DIV and 20  $\mu$ s/DIV ranges, and adjust so that the GND levels are at the center of the graticule lines.
2. Connect CH-1 to TP12 (VIDEO signal), CH-2 to TP13 (SYNC extraction level) and trigger with CH-1.
3. Turn RV1 and set the SYNC extraction level to the center (approx. +0.45V) of the SYNC region.
4. Connect CH-2 to TP14 (DATA extraction level).
5. Turn RV2 and set the DATA extraction level to the center (approx. +1.2 V) of the DATA region.
6. Connect CH-1 to TP8 (VIDEO signal), and CH-2 to TP9 (SYNC extraction level).
7. Check that the SYNC extraction level is at the approximate center of the SYNC region.
8. Connect CH-1 to TP10 (VIDEO signal) and CH-2 to TP11 (DATA extraction level).
9. Check that the DATA extraction level is at the approximate center of the DATA region.

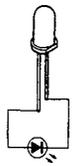
For all of the above, connect the GND of CH-1 to EP1, and the GND of CH-2 to EP2.



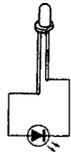
DEC-15 BOARD – component side –

# SECTION A SEMICONDUCTOR PIN ASSIGNMENTS

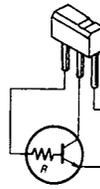
ICs, transistors and diodes whoses functions are equivalent are described here. Therefore, incompatible device names may be described together. For parts replacement, refer to the Replaceable Parts section in this manual.



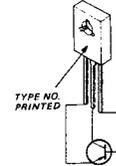
BG5534S  
PR5534S  
PY5534S



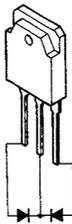
PR3432S  
PG3432S  
PY3432S



DTC143TF (R = 4.7k)



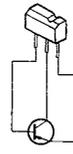
2SA1220A  
2SB649A



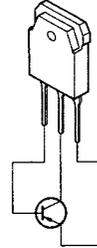
CTB-34  
CTG-32S



PG5531KX  
PY5531K  
PR5531K



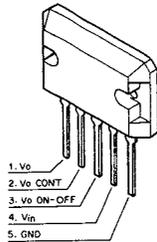
2SA874  
2SA937  
2SB822



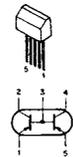
2SB757



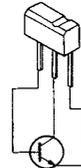
CTG-32R



STR9005



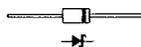
2SA995



2SC1652  
2SC2021



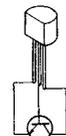
FC52M  
FC53M  
FC54M



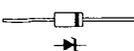
1SS97



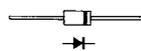
2SA1048L



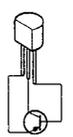
2SC2901



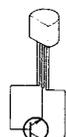
HZ ? ?LL  
RD ? ?E  
RD ? ?EB  
RD ? ?EB2



10E-2  
1SS119  
30DF2

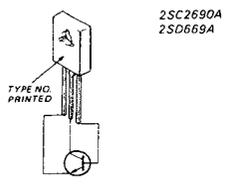


2SA1190

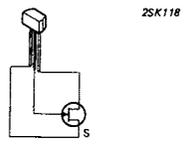


2SC2408

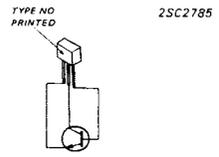
# TRANSISTOR



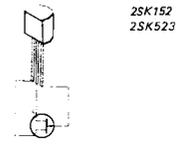
2SC2690A  
2SD669A



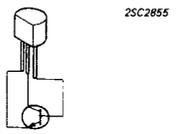
2SK118



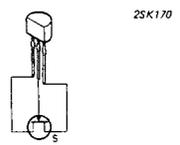
2SC2785



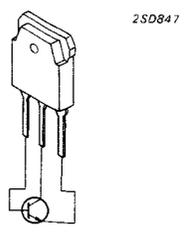
2SK152  
2SK523



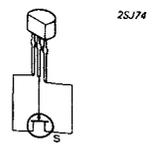
2SC2855



2SK170

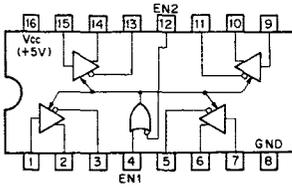


2SD847



2SJ74

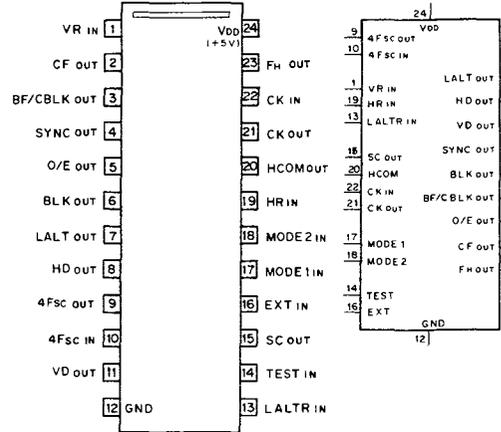
AM26LS31PC (ADVANCED MICRO DEVICE)  
HIGH SPEED DIFFERENTIAL LINE DRIVER  
— TOP VIEW —



EN2	EN1	OUTPUT
0	0	ENABLE
0	1	ENABLE
1	0	HI-Z
1	1	ENABLE

0; LOW LEVEL  
1; HIGH LEVEL  
HI-Z; HIGH IMPEDANCE

CX-773B (SONY)  
C-MOS SYNC GENERATOR (NTSC)  
— TOP VIEW —



O/E : ODD/EVEN FIELD  
CF : CDLOR FRAME PULSE  
HCOM : H COMPARATOR

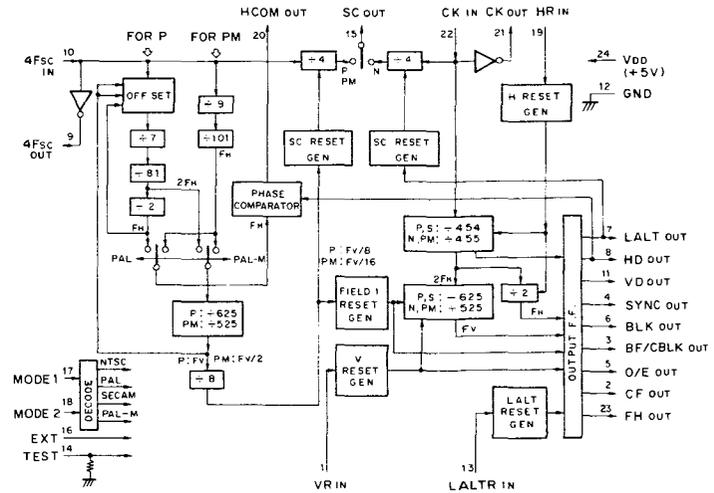
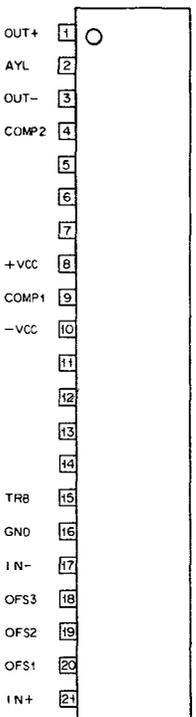
SYSTEM	4Fsc	CLOCK
NTSC	910 Fh	910 Fh
PAL	1135 Fh + 2 Fv	908 Fh
PALM	909 Fh	910 Fh
SECAM		908 Fh

INPUTS		SYSTEM
MODE 1	MODE 2	
0	0	NTSC
0	1	SECAM
1	0	PALM
1	1	PAL

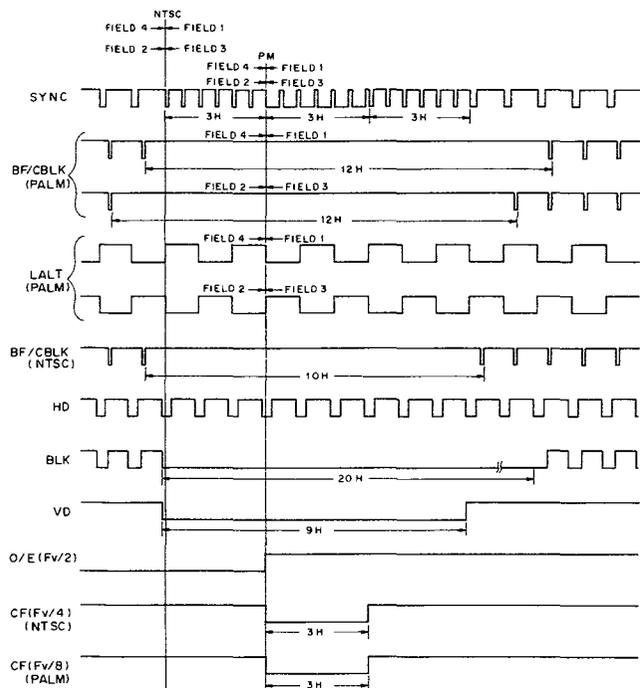
INPUTS		FUNCTION
EXT	TEST	
0	0	INTERNAL
0	1	INVALID
1	0	EXT
1	1	TEST

0; LOW LEVEL (GND)  
1; HIGH LEVEL (VDD)  
TEST '0' OPEN (INTERNALLY PULLED DOWN)

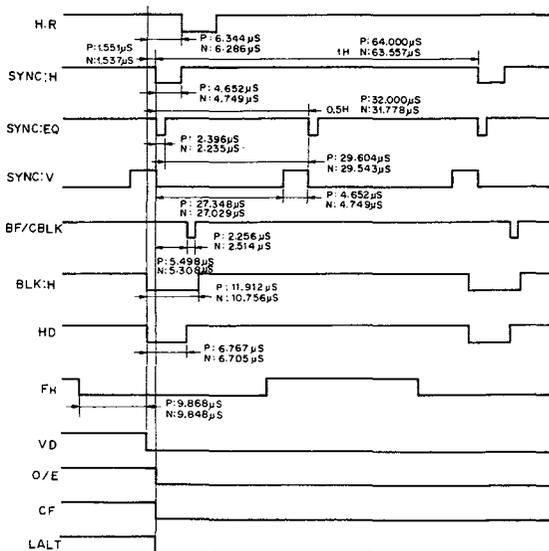
BX1367 (SONY)  
BX1391 (SONY)  
AUDIO LINE AMPLIFIER  
— SIDE VIEW —



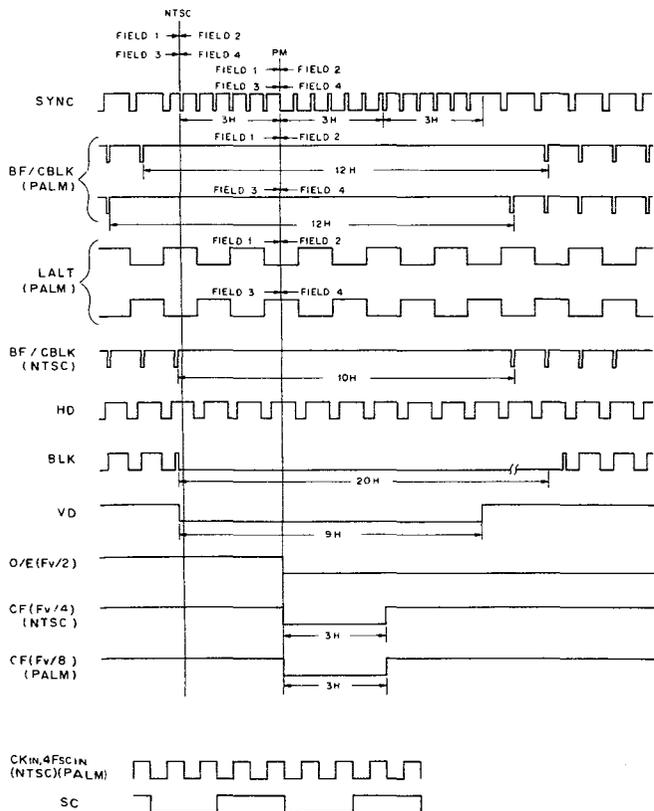
NTSC (FIELD 1,3)



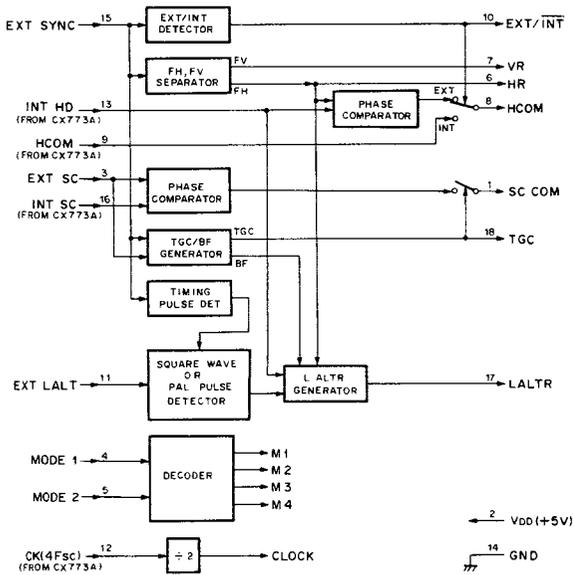
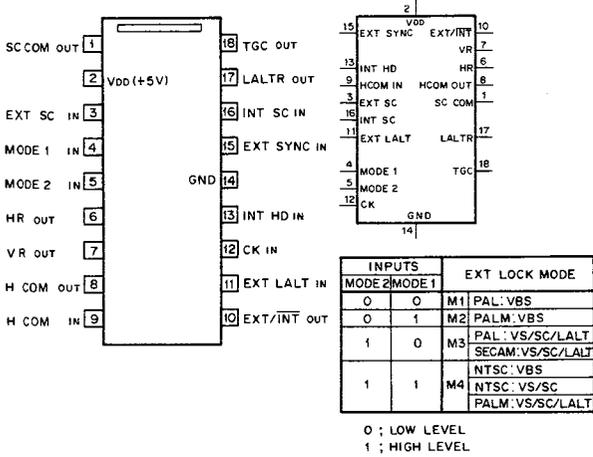
P: PAL, SECAM  
N: NTSC, PALM



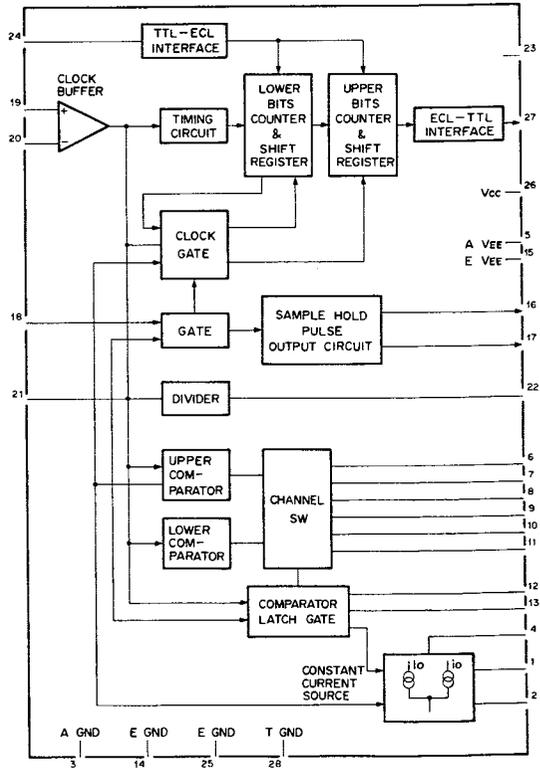
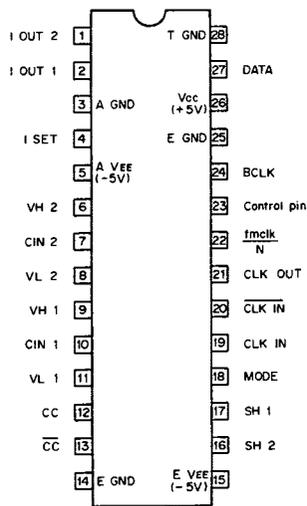
NTSC (FIELD 2,4)



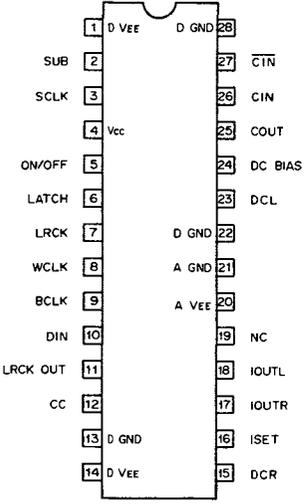
CX7903 (SONY)  
C-MOS GENLOCK DRIVER FOR CX773A  
— TOP VIEW —



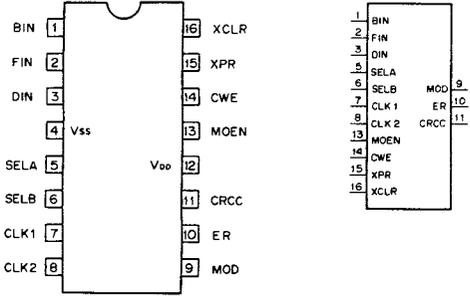
CX20018 (SONY)  
16-BIT A/D CONVERTER  
— TOP VIEW —



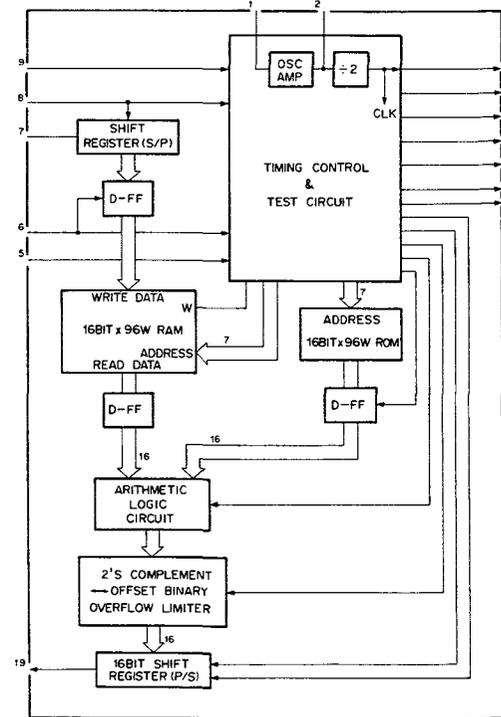
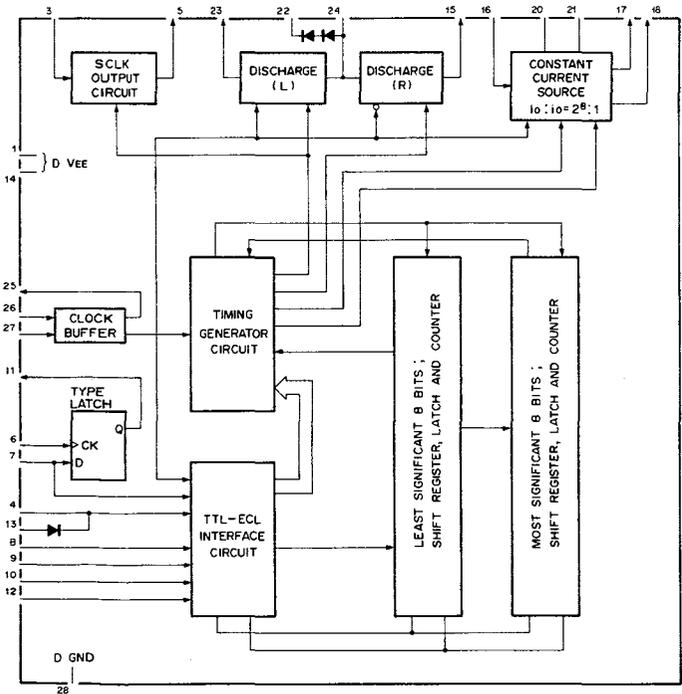
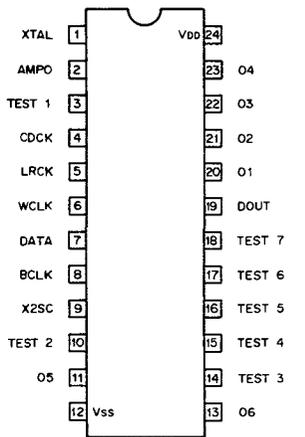
**CX20152 (SONY)**  
16-BIT D/A CONVERTER  
- TOP VIEW -



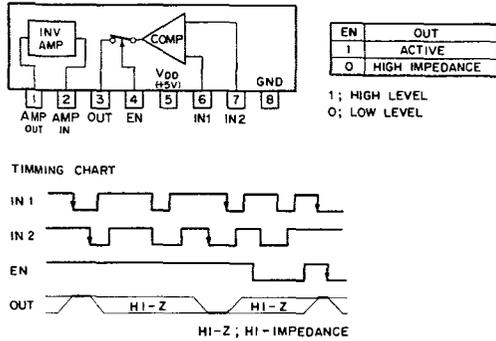
**CX23021 (SONY)**  
C-MOS HDM1 MODULATOR (CRCC GENERATOR)  
- TOP VIEW -



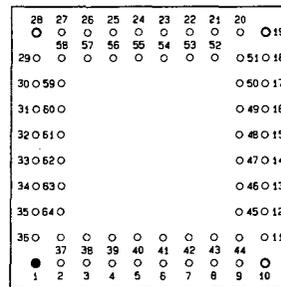
**CX23034 (SONY)**  
C-MOS DIGITAL FILTER FOR OVER-SAMPLING  
- TOP VIEW -



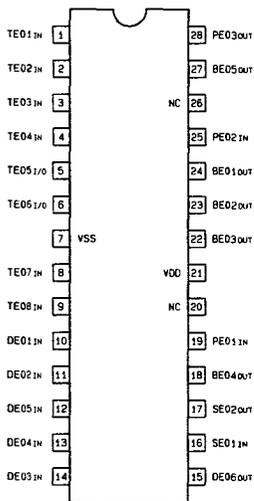
CX23065 (SONY)  
N-MOS PHASE COMPARATOR WITH INVERSION AMPLIFIER  
— PRINTED SIDE VIEW —



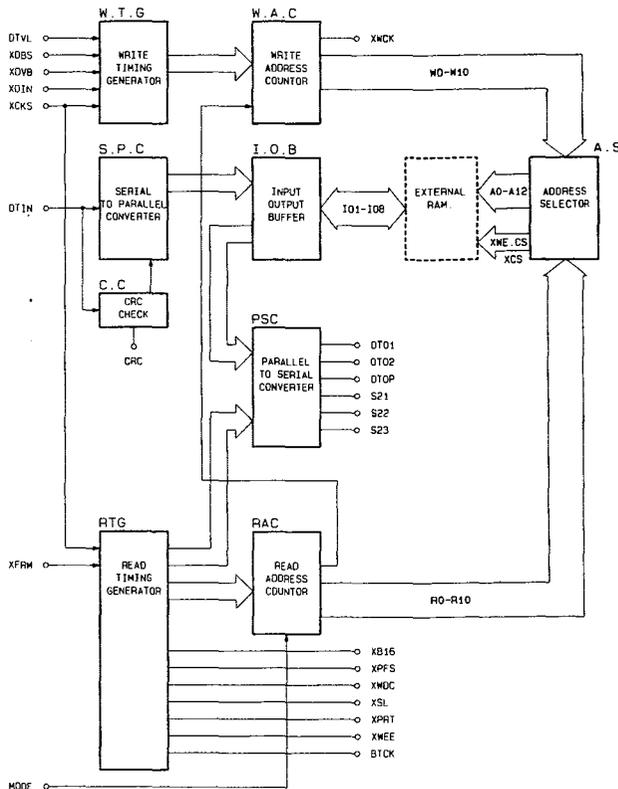
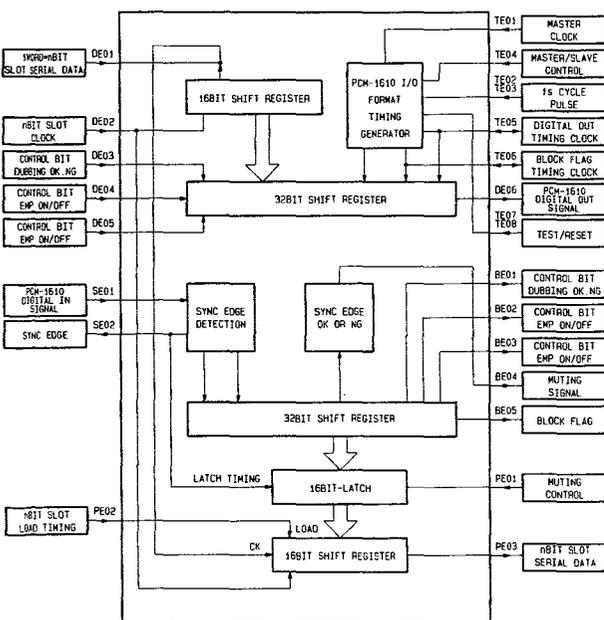
CX23071 (SONY)  
C-MOS DECODER-A  
— TOP VIEW —



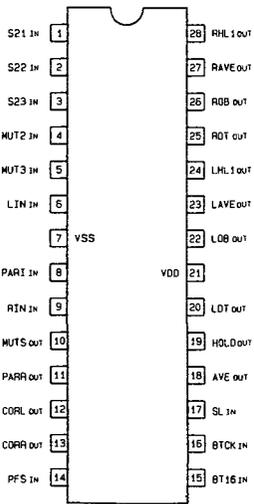
CX23070 (SONY)  
C-MOS DIGITAL I/O  
— TOP VIEW —



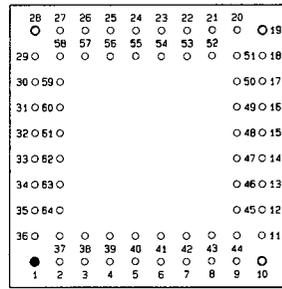
PIN NO.	I/O	SYMBOL									
1	I/O	IO2	17	O	OT02	33	I	TE05	49	O	S21
2	I/O	IO4	18	O	OT0P	34	I	TE03	50	O	S22
3	I/O	IO6	19	O	BTCK	35	I	TE01	51	O	S23
4	I/O	IO8	20	O	XB16	36	I/O	IO1	52	O	XMDC
5	O	A0	21	O	XPFS	37	I/O	IO3	53	O	XSL
6	O	A2	22	O	XPRT	38	I/O	IO5	54	-	VSS
7	O	A4	23	-	N.C	39	I/O	IO7	55	I	XCKS
8	O	A6	24	-	N.C	40	-	VSS	56	-	N.C
9	O	A8	25	I	XFRM	41	O	A1	57	-	N.C
10	O	A10	26	I	XOIN	42	O	A3	58	I	XDBS
11	O	A9	27	I	DTIN	43	O	A5	59	O	XMCK
12	O	XME	28	I	DTVL	44	O	A7	60	-	N.C
13	O	CS	29	I	XDVB	45	O	XCS	61	-	VDD
14	-	N.C	30	O	CRCC	46	-	N.C	62	-	N.C
15	O	XWEE	31	I	MODE	47	-	VDD	63	I	TE04
16	O	DT01	32	-	N.C	48	-	N.C	64	I	TE02



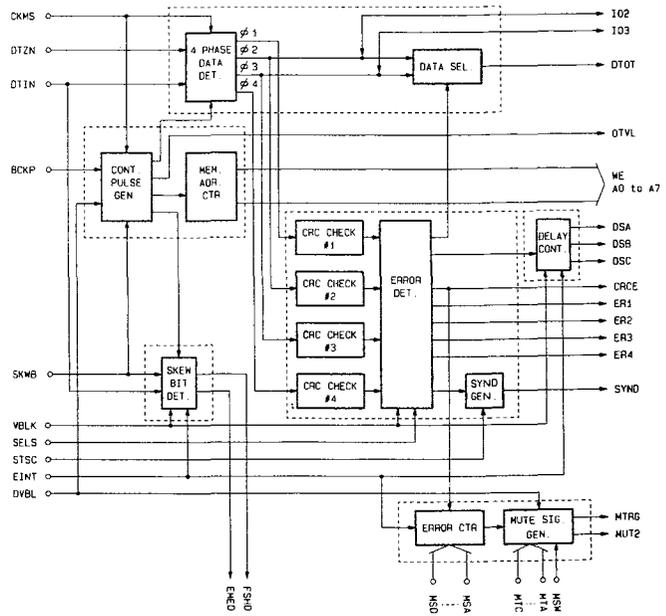
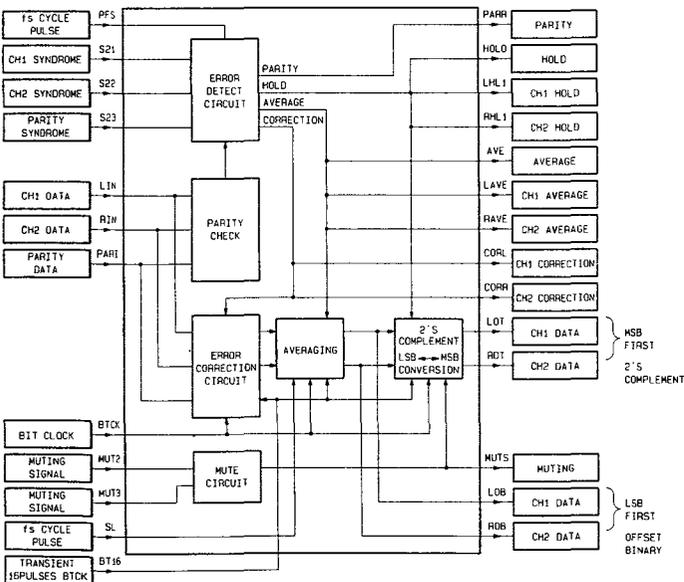
CX23072 (SONY)  
C-MDS DECODER-B  
— TOP VIEW —



CX23073A (SONY)  
C-MDS DATA SEPARATOR  
— TOP VIEW —

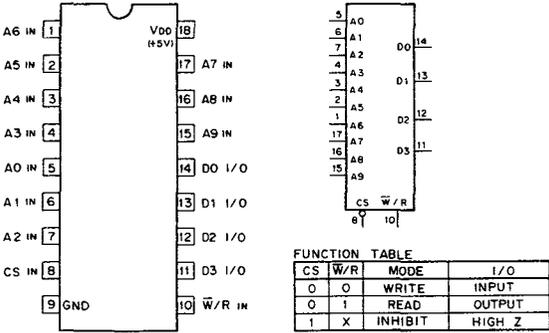


PIN NO.	I/O	SYMBOL									
1	I/O	I03	17	0	ER3	33	I	MSEL	49	0	DTCK
2	I/O	I02	18	0	ER2	34	I	MTA	50	0	SELO
3	0	A0	19	0	ER1	35	I	MTB	51	I	SELS
4	0	A1	20	0	DSC	36	I	MTC	52	0	MTRG
5	-	N.C.	21	0	DSB	37	I	MSD	53	0	MUT2
6	0	A2	22	0	DSA	38	I	MSA	54	-	VSS
7	0	A3	23	I	CKMS	39	I	MSB	55	0	CRCK
8	0	A4	24	I	DTIN	40	-	VSS	56	0	DTAD
9	0	A5	25	I	DTZN	41	I	MSC	57	0	DTDL
10	0	A6	26	I	BCKP	42	I	MSW	58	0	SKMC
11	0	A7	27	I	SKMB	43	0	EMPH	59	0	SYND
12	0	WE	28	I	STSC	44	0	FSDI	60	I	MIN
13	0	DTOT	29	I	VBLK	45	0	SKM3	61	-	VDD
14	0	DTVL	30	I	EINT	46	0	SKM4	62	-	N.C.
15	0	CRCE	31	I	OVBL	47	-	VDD	63	I	RSET
16	0	ER4	32	-	N.C.	48	0	FSDH	64	I	TEST



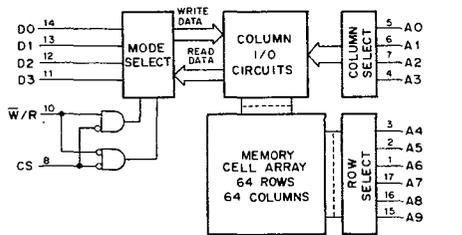


**HM6148HP-45 (HITACHI)**  
 C-MOS 4096-BIT (1024x4) STATIC RAM WITH 3-STATE OUTPUT  
 - TOP VIEW -



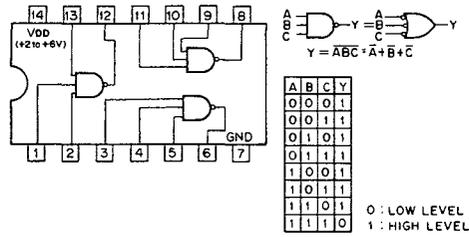
A0 - A9 ; ADDRESS INPUTS  
 CS ; CHIP SELECT INPUT  
 D0 - D3 ; DATA INPUT/OUTPUT (3-STATE)  
 W/R ; WRITE/READ ENABLE INPUT

0 ; LOW LEVEL  
 1 ; HIGH LEVEL  
 X ; DON'T CARE  
 HIGH Z ; HIGH IMPEDANCE

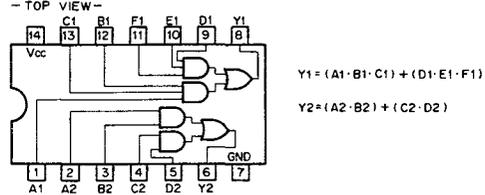


TYPE	-45	-55	-70	L-55	L-70	HP-45
ADDRESS ACCESS TIME (MAX)	45nS	55nS	70nS	55nS	70nS	45nS
CHIP SELECT ACCESS TIME (MAX)	20nS	25nS	30nS	25nS	30nS	45nS
I <sub>cc</sub> (MAX)	180mA	180mA	180mA	125mA	125mA	80mA

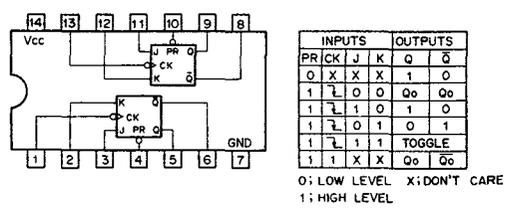
**MC74HC10N (MOTOROLA)**  
 C-MOS 3-INPUT NAND GATE  
 - TOP VIEW -



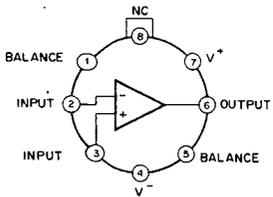
**MC74HC58 (MOTOROLA)**  
 C-MOS 2-WIDE 2-INPUT / 2-WIDE 3-INPUT AND-OR GATE  
 - TOP VIEW -



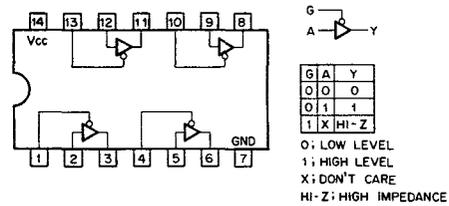
**MC74HC113N (MOTOROLA)**  
 C-MOS DUAL J-K FLIP FLOP WITH PRESET  
 - TOP VIEW -



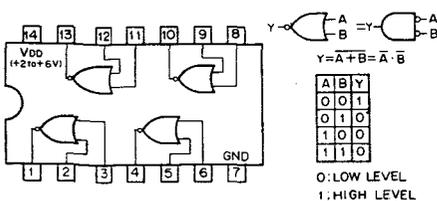
**LF356H (N.S.)**  
 OPERATIONAL AMPLIFIER  
 - TOP VIEW -



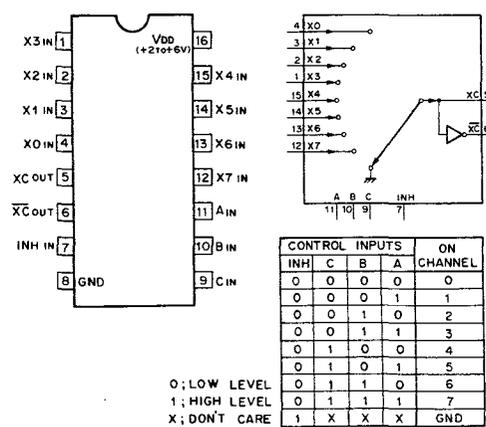
**MC74HC125N (MOTOROLA)**  
 C-MOS BUS BUFFER GATES WITH 3-STATE OUTPUT  
 - TOP VIEW -



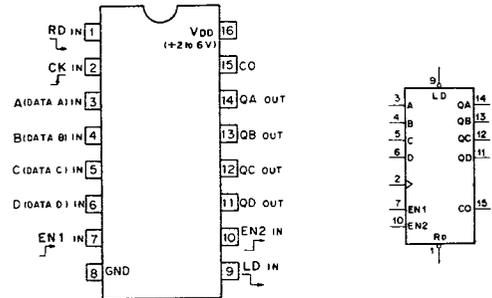
**MC74HC02N (MOTOROLA)**  
 C-MOS 2-INPUT POSITIVE-NOR GATE  
 - TOP VIEW -



**MC74HC151N (MOTOROLA)**  
 C-MOS 8-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER  
 - TOP VIEW -



MC74HC163N (MOTOROLA)  
C-MOS PRESETTABLE SYNCHRONOUS 4-BIT BINARY COUNTER  
— TOP VIEW —



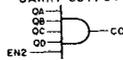
MODE SELECTION

CONTROL	INPUTS	MODE
Rd	LD EN1 EN2	RESET (SYNCHRONOUS)
1	0 X X	PRESET (SYNCHRONOUS)
1	1 0 X	NO COUNT
1	1 X 0	NO COUNT
1	1 1 1	COUNT

COUNT SEQUENCE

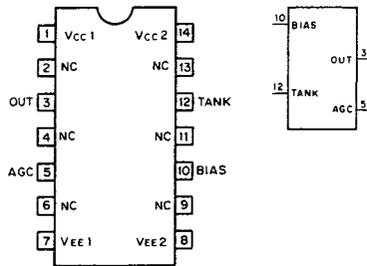
COUNT	OUTPUTS			
	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

CARRY OUTPUT "CO"



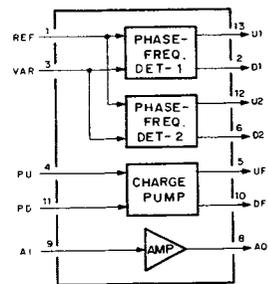
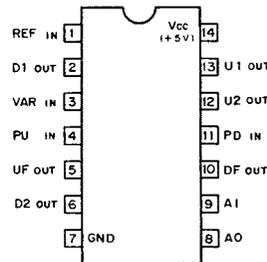
CO IS HIGH WHEN EN2 INPUT IS HIGH AND COUNT IS "15".

MC1648P (MOTOROLA)  
ECL VOLTAGE CONTROLLED OSCILLATOR  
— TOP VIEW —



Supply Voltage	Supply Pins	GND Pins
+5.0Vdc	1,14	7,8
-5.2Vdc	7,8	1,14

MC4044P (MOTOROLA)  
PHASE-FREQUENCY DETECTOR  
— TOP VIEW —



- REF : REFERENCE IN
- VAR : VARIABLE IN
- U1 : UP OUT 1
- D1 : DOWN OUT 1
- U2 : UP OUT 2
- D2 : DOWN OUT 2
- PU : CHARGE PUMP UP IN
- PD : CHARGE PUMP DOWN IN
- UF : CHARGE PUMP UP OUT
- DF : CHARGE PUMP DOWN OUT
- A1 : FILTER AMP IN
- AO : FILTER AMP OUT

PHASE FREQ. DET-1  
FALLING EDGE SENSING TYPE

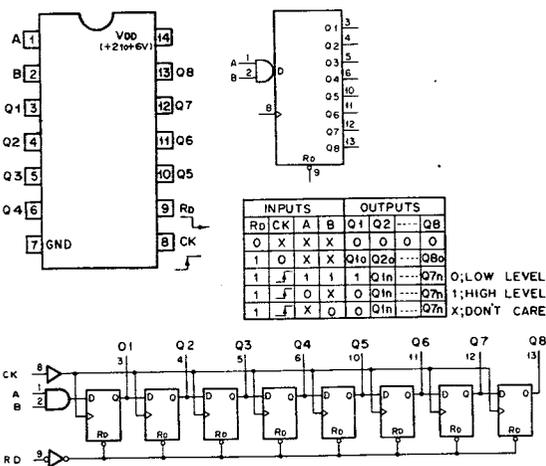
INPUTS	OUTPUTS
REF VAR U1 D1	U2 D2
$f_v = f_R$	1 1
$\phi_v = \phi_R$	0 1
$f_v < f_R$	0 1
$\phi_v$ lags $\phi_R$	1 0
$f_v > f_R$	1 0
$\phi_v$ leads $\phi_R$	1 0

PHASE FREQ. DET-2  
FOR 50% DUTY CYCLES

INPUTS	OUTPUTS
REF VAR U2 D2	U1 D1
0 0	1 1
0 1	1 1
1 0	0 1
1 1	1 0

0 ; LOW LEVEL  
1 ; HIGH LEVEL

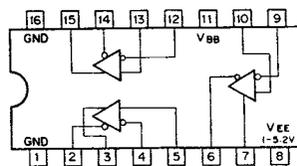
MC74HC164N (MOTOROLA)  
C-MOS 8-BIT SERIAL-IN/PARALLEL-OUT SHIFT REGISTER  
— TOP VIEW —



INPUTS	OUTPUTS
Rd CK A B Q1 Q2 ... Q8	Q1 Q2 ... Q8
0 X X X	0 0 0 0 0 0 0 0
1 0 X X	Q1 Q2 ... Q8
1 1 1 1	0 7n ... 0 7n
1 1 1 0	0 7n ... 0 7n
1 1 1 X	0 7n ... 0 7n

0 ; LOW LEVEL  
1 ; HIGH LEVEL  
X ; DON'T CARE

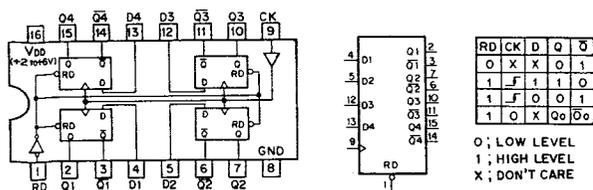
MC10116L (MOTOROLA)  
ECL DIFFERENTIAL OR/NOR LINE RECEIVER  
— TOP VIEW —



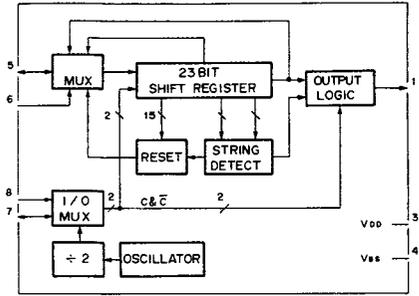
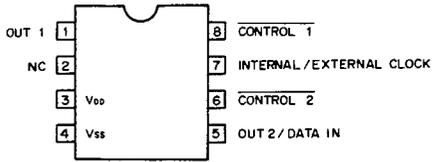
RD CK D Q O
0 X X 0 1
1 1 1 1 0
1 1 0 0 1
1 0 X 0 0

0 ; LOW LEVEL  
1 ; HIGH LEVEL  
X ; DON'T CARE

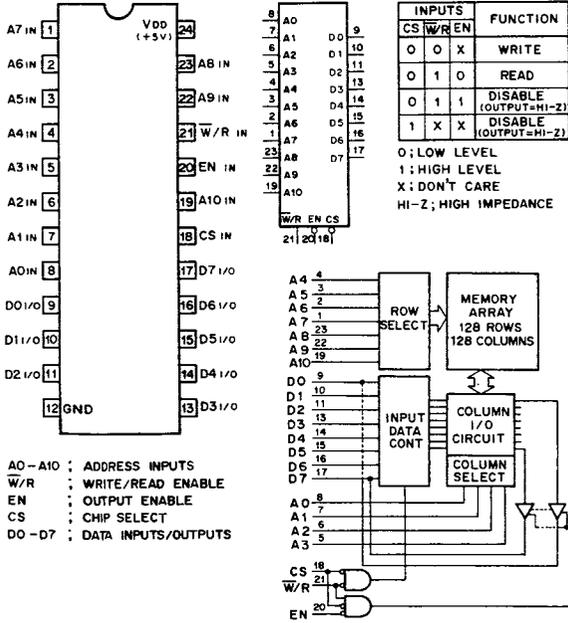
MC74HC175N (MOTOROLA)  
C-MOS D-TYPE FLIP-FLOP WITH RESET  
— TOP VIEW —



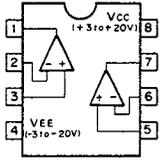
MM5437N (N.S.)  
DIGITAL NOISE SOURCE  
— TOP VIEW —



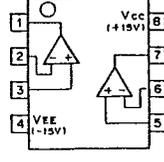
MSM5128-15RS (DKI) (ACCESS TIME = 150 nS)  
C-MOS 16384(2048x8)-BIT HIGH SPEED STATIC RAM  
— TOP VIEW —



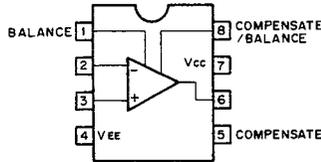
NE5532P (TI)  
LOW NOISE OPERATIONAL AMPLIFIER  
— TOP VIEW —



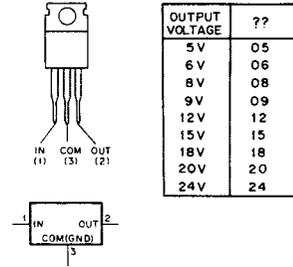
NJM4560DX (JRC)  
OPERATIONAL AMPLIFIER  
— TOP VIEW —



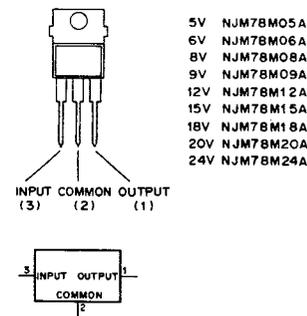
NE5534P (TI)  
OPERATIONAL AMPLIFIER  
— TOP VIEW —



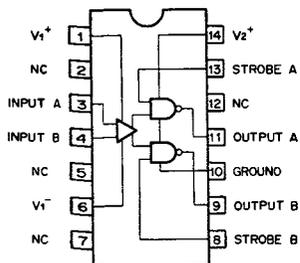
NJM78 ? 7A (JRC)  
POSITIVE VOLTAGE REGULATOR (1A)  
— SIDE VIEW —



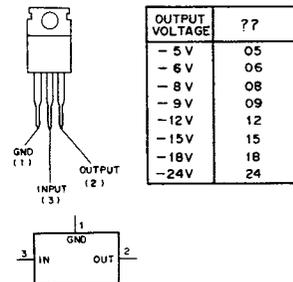
NJM78M ? 7A (JRC)  
POSITIVE VOLTAGE REGULATOR (500 mA)  
— FRONT VIEW —



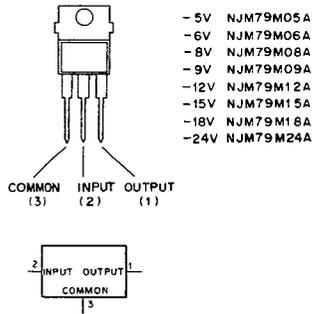
NE529N (SIGNETICS)  
VOLTAGE COMPARATOR  
— TOP VIEW —



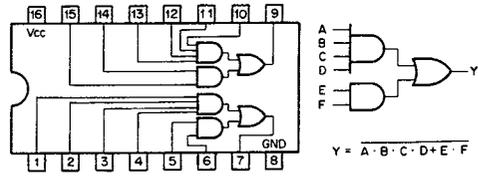
NJM79 ? 7A (JRC)  
NEGATIVE VOLTAGE REGULATOR (1A)  
— SIDE VIEW —



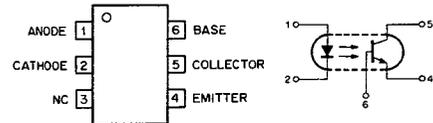
NJM79M ? A (JRC)  
NEGATIVE VOLTAGE REGULATOR (500mA)  
— FRONT VIEW —



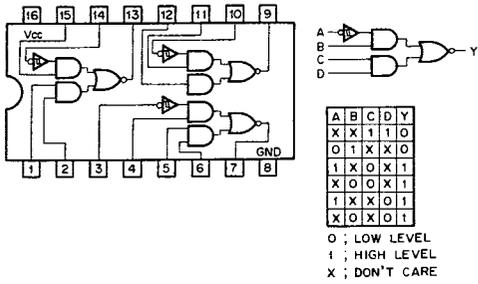
SN75121 (TI)  
DUAL LINE DRIVER AND TRIPLE LINE RECEIVER  
— TOP VIEW —



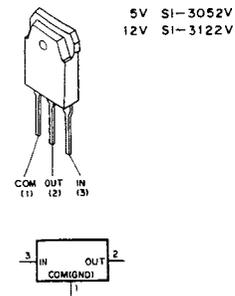
PS2003B (NEC)  
PHOTO COUPLER  
— TOP VIEW —



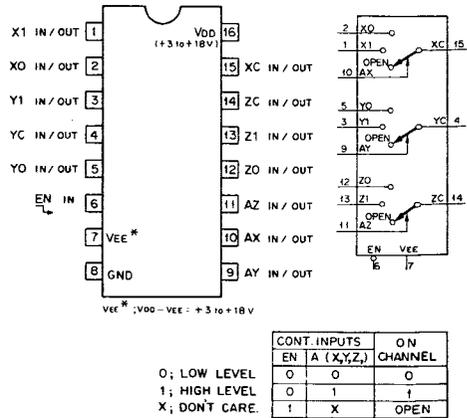
SN75124 (TI)  
DUAL LINE DRIVER AND TRIPLE LINE RECEIVER  
— TOP VIEW —



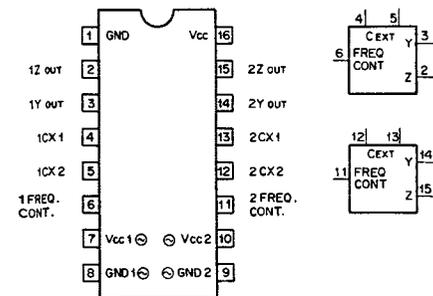
SI-3052V (SANKEN)  
POSITIVE VOLTAGE REGULATOR (2A)



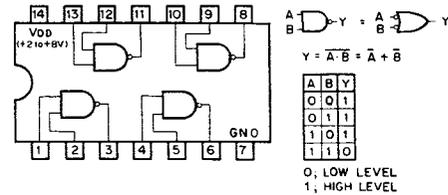
TC4053BP (TOSHIBA)  
C-MOS 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER  
— TOP VIEW —



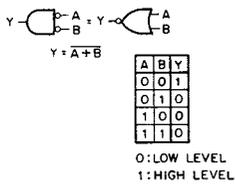
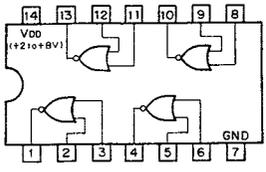
SN74LS625 (TI)  
TTL DUAL VOLTAGE-CONTROLLED OSCILLATORS  
— TOP VIEW —



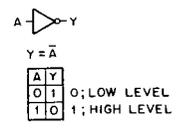
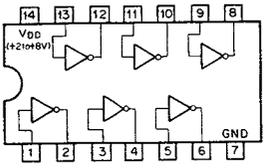
TC40H00P (TOSHIBA)  
C-MOS 2-INPUT NAND GATE  
— TOP VIEW —



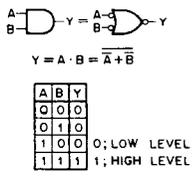
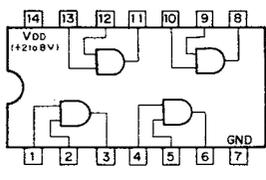
TC40H002P (TOSHIBA)  
C-MOS 2-INPUT NOR GATE  
— TOP VIEW —



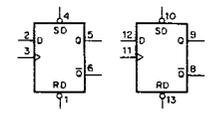
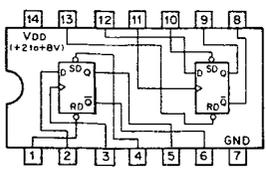
TC40H004P (TOSHIBA)  
C-MOS INVERTER  
— TOP VIEW —



TC40H008P (TOSHIBA)  
C-MOS 2-INPUT POSITIVE-AND GATE  
— TOP VIEW —



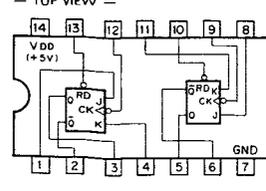
TC40H074P (TOSHIBA)  
C-MOS HIGH SPEED D-TYPE FLIP-FLOP WITH DIRECT SET/RESET  
— TOP VIEW —



D - MODE		R - S MODE	
D	RD	RD	SD
0	0	0	0
0	0	0	1
0	1	0	1
1	1	0	1
1	1	1	1

0: LOW LEVEL  
1: HIGH LEVEL

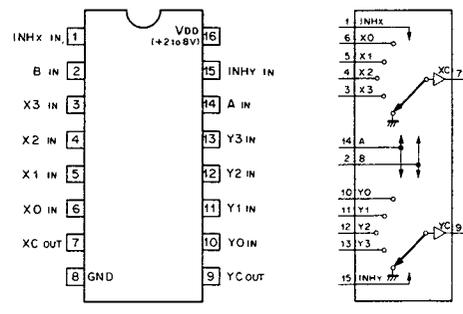
TC40H107AP (TOSHIBA)  
C-MOS DUAL J-K FLIP-FLOPS  
— TOP VIEW —



INPUT		OUTPUT
RD	CK	Q
0	X	X
0	X	X
1	0	0
1	1	0
1	0	1
1	1	0
1	1	1

0: LOW LEVEL  
1: HIGH LEVEL  
X: DON'T CARE

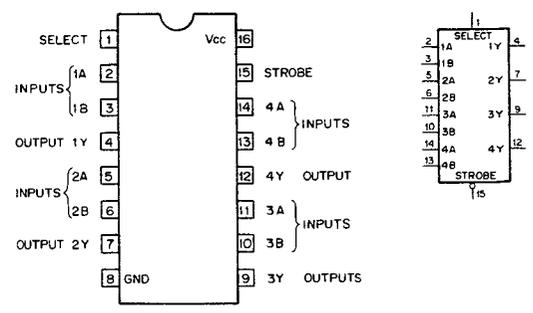
TC40H153P (TOSHIBA)  
C-MOS 4-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER  
— TOP VIEW —



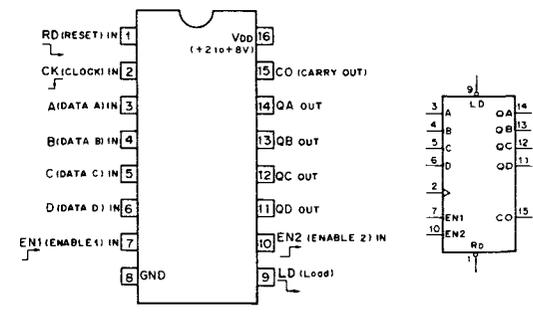
CONTROL IN			ON CHANNEL
INH	B	A	
0	0	0	0
0	0	1	1
0	1	0	2
0	1	1	3
1	X	X	GND

0: LOW LEVEL  
1: HIGH LEVEL  
X: DON'T CARE

TC40H158P (TOSHIBA)  
C-MOS QUAD 2-TO-1-LINE DATA SELECTORS / MULTIPLEXERS  
— TOP VIEW —



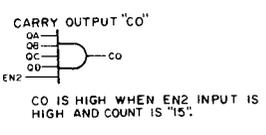
TC40H161P (TOSHIBA)  
C-MOS PRESETTABLE SYNCHRONOUS 4-BIT BINARY COUNTER  
— TOP VIEW —



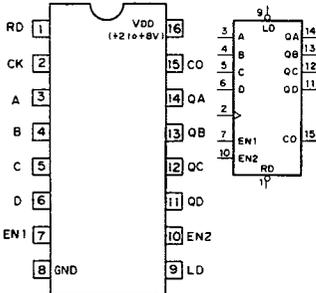
MODE SELECTION				
CONTROL		INPUTS		MODE
RD	LD	EN1	EN2	
0	X	X	X	RESET (ASYNCHRONOUS)
1	0	X	X	PRESET (SYNCHRONOUS)
1	1	0	X	NO COUNT
1	1	X	0	NO COUNT
1	1	1	1	COUNT

0: LOW LEVEL  
1: HIGH LEVEL  
X: DON'T CARE

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



TC40H163P (TOSHIBA)  
C-MOS PRESETTABLE SYNCHRONOUS 4-BIT BINARY COUNTER  
— TOP VIEW —



MODE SELECTION

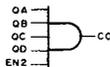
CONT. INPUTS				MODE
RD	LD	EN1	EN2	
0	X	X	X	RESET (SYNCHRONOUS)
1	0	X	X	PRESET (SYNCHRONOUS)
1	1	0	X	NO COUNT
1	1	X	0	NO COUNT
1	1	1	1	COUNT

COUNT SEQUENCE

COUNT	OUTPUTS			
	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
...	...	...	...	...
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

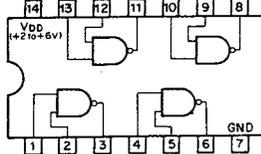
0: LOW LEVEL  
1: HIGH LEVEL  
X: DON'T CARE

CARRY OUTPUT "CO"



CO GOES HIGH WHEN EN2 IS HIGH AND COUNT IS "15"

TC74HC00P (TOSHIBA)  
C-MOS 2-INPUT NAND GATE  
— TOP VIEW —



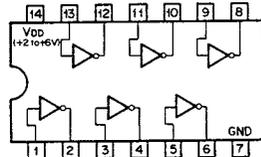
$A \text{ NAND } B = Y = \overline{A \cdot B} = \overline{A} + \overline{B}$

$Y = A \cdot B = \overline{\overline{A} + \overline{B}}$

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0: LOW LEVEL  
1: HIGH LEVEL

TC74HC04P (TOSHIBA)  
C-MOS INVERTER  
— TOP VIEW —

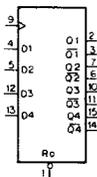
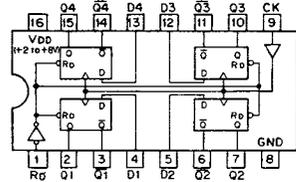


$A \text{ INVERTER } = Y = \overline{A}$

A	Y
0	1
1	0

0: LOW LEVEL  
1: HIGH LEVEL

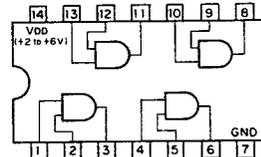
TC40H175P (TOSHIBA)  
C-MOS D-TYPE FLIP-FLOP WITH CLEAR  
— TOP VIEW —



R0	CK	D	D-bar	Q	Q-bar
0	X	X	0	1	0
1	↑	1	1	0	1
1	↓	0	0	1	0
1	0	X	0	0	0

0: LOW LEVEL  
1: HIGH LEVEL  
X: DON'T CARE

TC74HC08P (TOSHIBA)  
C-MOS 2-INPUT AND GATE  
— TOP VIEW —

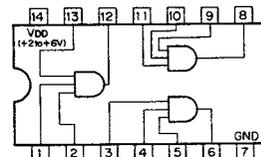


$A \text{ AND } B = Y = \overline{\overline{A \cdot B}} = \overline{\overline{A} + \overline{B}}$

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

0: LOW LEVEL  
1: HIGH LEVEL

TC74HC11P (TOSHIBA)  
C-MOS 3-INPUT AND GATE  
— TOP VIEW —

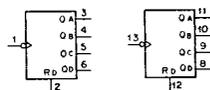
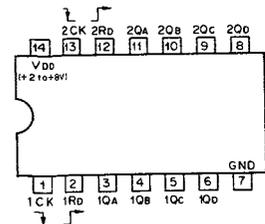


$A \text{ AND } B \text{ AND } C = Y = \overline{\overline{A \cdot B \cdot C}} = \overline{\overline{A} + \overline{B} + \overline{C}}$

A	B	C	Y
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

0: LOW LEVEL  
1: HIGH LEVEL

TC40H393P (TOSHIBA)  
C-MOS 4-BIT BINARY COUNTER  
— TOP VIEW —



COUNT SEQUENCE

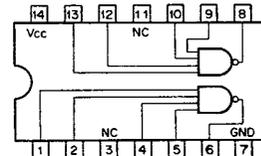
COUNT	Qd	Qc	Qb	Qa
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

RESET/COUNT FUNCTION

R0	Qd	Qc	Qb	Qa
1	0	0	0	0
0	COUNT			

0: LOW LEVEL  
1: HIGH LEVEL

TC74HC20P (TOSHIBA)  
C-MOS 4-INPUT POSITIVE-NAND GATE  
— TOP VIEW —

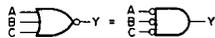
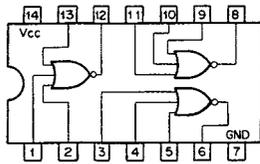


$A \text{ AND } B \text{ AND } C \text{ AND } D = Y = \overline{\overline{A \cdot B \cdot C \cdot D}} = \overline{\overline{A} + \overline{B} + \overline{C} + \overline{D}}$

A	B	C	D	Y
0	0	0	0	1
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	1
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

0: LOW LEVEL  
1: HIGH LEVEL

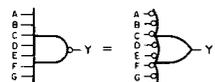
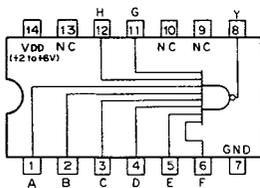
**TC74HC27P (TOSHIBA)**  
C-MOS 3-INPUT POSITIVE-NOR GATE  
- TOP VIEW -



$$Y = \overline{A+B+C} = \overline{A} \cdot \overline{B} \cdot \overline{C}$$

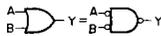
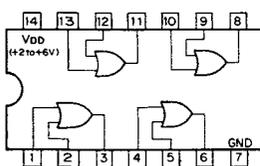
A	B	C	Y
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	0

**TC74HC30P (TOSHIBA)**  
C-MOS 8-INPUT NAND GATE  
- TOP VIEW -



$$Y = \overline{A \cdot B \cdot C \cdot D \cdot E \cdot F \cdot G \cdot H} = \overline{A+B+C+D+E+F+G+H}$$

**TC74HC32P (TOSHIBA)**  
C-MOS 2-INPUT OR GATE  
- TOP VIEW -

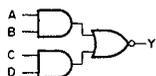
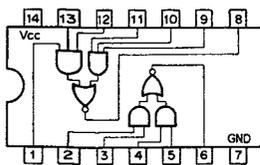


$$Y = A+B = \overline{\overline{A} \cdot \overline{B}}$$

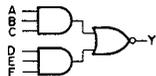
A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

0: LOW LEVEL  
1: HIGH LEVEL

**TC74HC51P (TOSHIBA)**  
C-MOS 2-WIDE 2-INPUT/3-INPUT AND-OR-INVERT GATE  
- TOP VIEW -

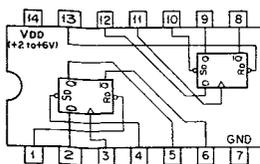


$$Y = \overline{(A \cdot B) + (C \cdot D)}$$



$$Y = \overline{(A \cdot B \cdot C) + (D \cdot E \cdot F)}$$

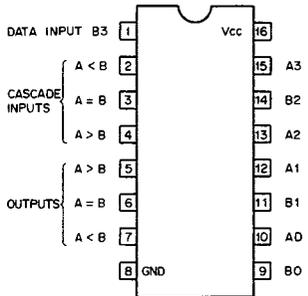
**TC74HC74P (TOSHIBA)**  
C-MOS D-TYPE FLIP FLOP WITH DIRECT SET/RESET  
- TOP VIEW -



INPUTS		OUTPUTS	
So	Rd	Qn+1	Qn
0	1	X	1
1	0	X	0
0	0	X	1*
1	1	1	0
1	1	0	1
1	1	0	X

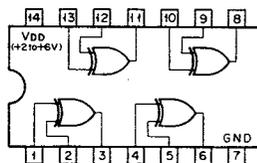
0: LOW LEVEL  
1: HIGH LEVEL  
X: DON'T CARE  
1\*: NONSTABLE

**TC74HC85P (TOSHIBA)**  
C-MOS 4-BIT MAGNITUDE COMPARATOR  
- TOP VIEW -



CASCADE INPUTS		DATA INPUTS	
A < B	A > B	A0	A1
2	3	10	11
3	4	12	13
4	5	14	15
5	6	16	17
6	7	18	19
7	8	20	21
8	9	22	23
9	10	24	25
10	11	26	27
11	12	28	29
12	13	30	31
13	14	32	33
14	15	34	35
15	16	36	37
16	17	38	39
17	18	40	41
18	19	42	43
19	20	44	45
20	21	46	47
21	22	48	49
22	23	50	51
23	24	52	53
24	25	54	55
25	26	56	57
26	27	58	59
27	28	60	61
28	29	62	63
29	30	64	65
30	31	66	67
31	32	68	69
32	33	70	71
33	34	72	73
34	35	74	75
35	36	76	77
36	37	78	79
37	38	80	81
38	39	82	83
39	40	84	85
40	41	86	87
41	42	88	89
42	43	90	91
43	44	92	93
44	45	94	95
45	46	96	97
46	47	98	99
47	48	100	101
48	49	102	103
49	50	104	105
50	51	106	107
51	52	108	109
52	53	110	111
53	54	112	113
54	55	114	115
55	56	116	117
56	57	118	119
57	58	120	121
58	59	122	123
59	60	124	125
60	61	126	127
61	62	128	129
62	63	130	131
63	64	132	133
64	65	134	135
65	66	136	137
66	67	138	139
67	68	140	141
68	69	142	143
69	70	144	145
70	71	146	147
71	72	148	149
72	73	150	151
73	74	152	153
74	75	154	155
75	76	156	157
76	77	158	159
77	78	160	161
78	79	162	163
79	80	164	165
80	81	166	167
81	82	168	169
82	83	170	171
83	84	172	173
84	85	174	175
85	86	176	177
86	87	178	179
87	88	180	181
88	89	182	183
89	90	184	185
90	91	186	187
91	92	188	189
92	93	190	191
93	94	192	193
94	95	194	195
95	96	196	197
96	97	198	199
97	98	200	201
98	99	202	203
99	100	204	205
100	101	206	207
101	102	208	209
102	103	210	211
103	104	212	213
104	105	214	215
105	106	216	217
106	107	218	219
107	108	220	221
108	109	222	223
109	110	224	225
110	111	226	227
111	112	228	229
112	113	230	231
113	114	232	233
114	115	234	235
115	116	236	237
116	117	238	239
117	118	240	241
118	119	242	243
119	120	244	245
120	121	246	247
121	122	248	249
122	123	250	251
123	124	252	253
124	125	254	255

**TC74HC86P (TOSHIBA)**  
C-MOS EXCLUSIVE OR GATE  
- TOP VIEW -

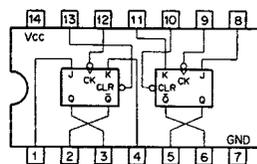


$$Y = \overline{A} \cdot B + A \cdot \overline{B}$$

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

0: LOW LEVEL  
1: HIGH LEVEL

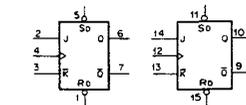
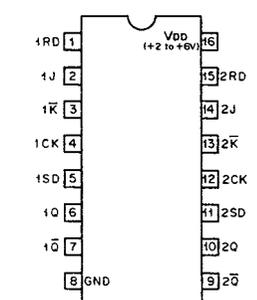
**TC74HC107P (TOSHIBA)**  
C-MOS DUAL J-K FLIP FLOP WITH CLEAR  
- TOP VIEW -



INPUTS		OUTPUTS	
CLR	CK	J	K
0	X	X	X
1	0	0	0
1	1	0	1
1	1	1	0
1	1	1	1
1	1	X	X

0: LOW LEVEL X: DON'T CARE  
1: HIGH LEVEL

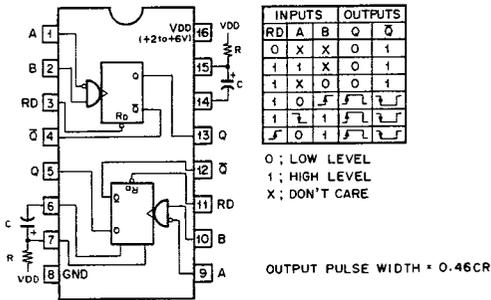
**TC74HC109P (TOSHIBA)**  
C-MOS J-K FLIP-FLOP WITH DIRECT SET/RESET  
- TOP VIEW -



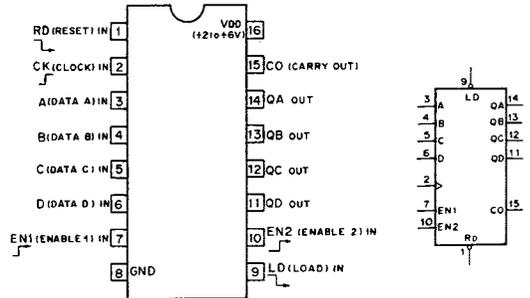
INPUTS		OUTPUTS	
So	Rd	Qn+1	Qn
0	1	X	X
1	0	X	X
0	0	X	X
1	1	0	1
1	1	1	0
1	1	0	0
1	1	1	1
1	1	0	X

0: LOW LEVEL  
1: HIGH LEVEL  
X: DON'T CARE  
\*: NONSTABLE

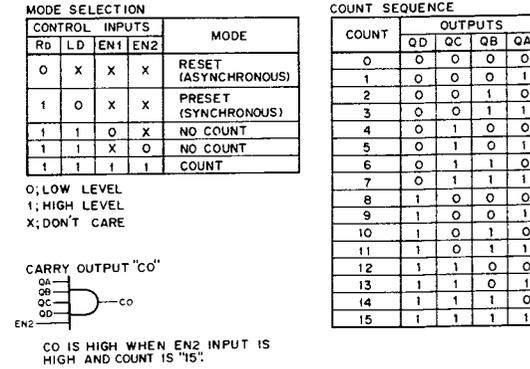
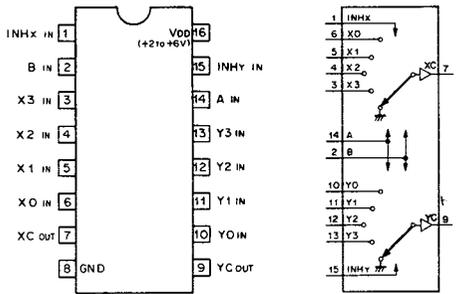
TC74HC123P (TOSHIBA)  
C-MOS RETRIGGERABLE MONOSTABLE MULTIVIBRATOR  
— TOP VIEW —



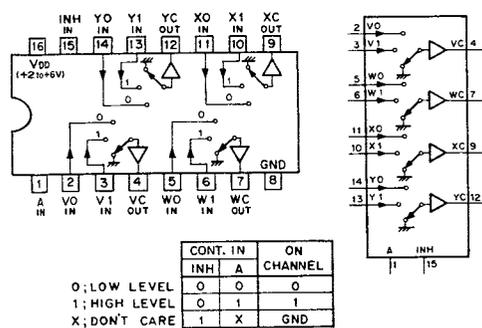
TC74HC161P (TOSHIBA)  
C-MOS SYNCHRONOUS PRESETTABLE 4-BIT BINARY COUNTER  
— TOP VIEW —



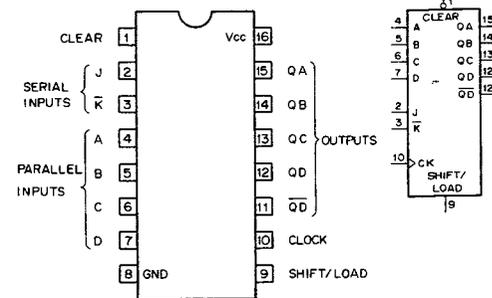
TC74HC153P (TOSHIBA)  
C-MOS 4-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER  
— TOP VIEW —



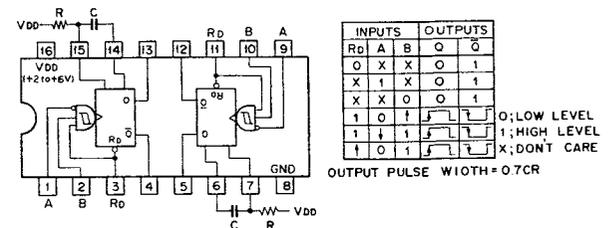
TC74HC157P (TOSHIBA)  
C-MOS 2-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER  
— TOP VIEW —



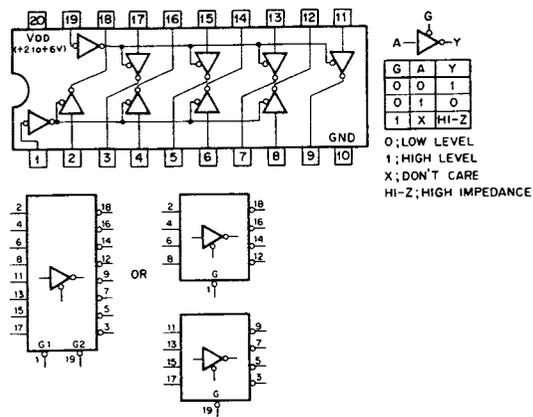
TC74HC195P (TOSHIBA)  
C-MOS 4-BIT PARALLEL ACCESS SHIFT REGISTER  
— TOP VIEW —



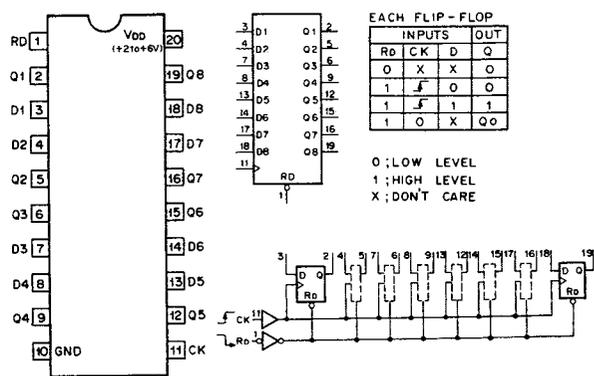
TC74HC221P (TOSHIBA)  
C-MOS MONOSTABLE MULTIVIBRATOR WITH SCHMITT TRIGGER INPUT  
— TOP VIEW —



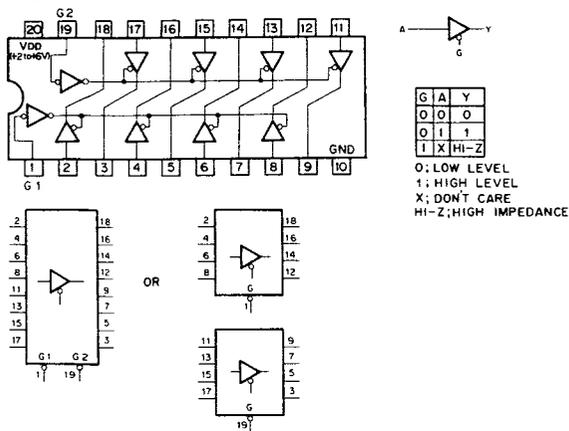
**TC74HC240P (TOSHIBA)**  
C-MOS 3-STATE INVERTER/LINE DRIVER  
- TOP VIEW -



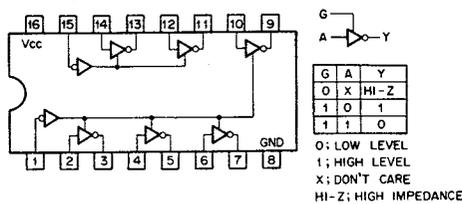
**TC74HC273P (TOSHIBA)**  
C-MOS D-TYPE FLIP-FLOP WITH RESET  
- TOP VIEW -



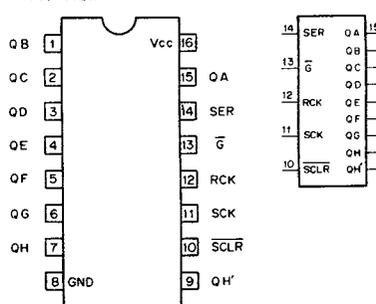
**TC74HC244P (TOSHIBA)**  
C-MOS BUS BUFFER WITH 3-STATE OUTPUT  
- TOP VIEW -



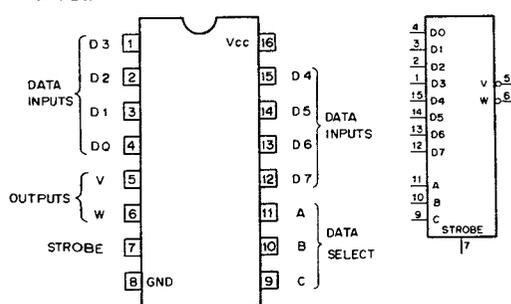
**TC74HC368P (TOSHIBA)**  
C-MOS HEX BUS DRIVER WITH 3-STATE OUTPUTS  
- TOP VIEW -



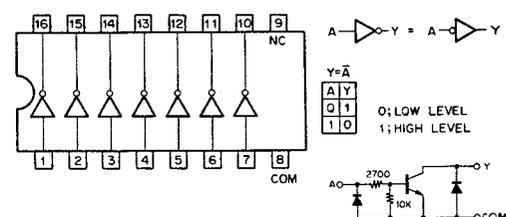
**TC74HC595P (TOSHIBA)**  
C-MOS 8-BIT SHIFT REGISTER/LATCHES  
- TOP VIEW -



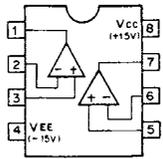
**TC74HC251P (TOSHIBA)**  
C-MOS DATA SELECTOR/MULTIPLEXER  
- TOP VIEW -



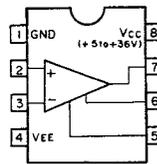
**TD62503P (TOSHIBA)**  
DRIVER  
- TOP VIEW -



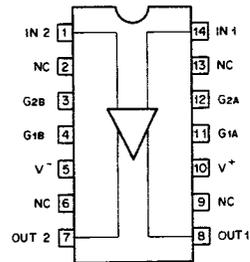
**TL072ACP (TI)**  
**OPERATIONAL AMPLIFIER**  
 (LOW-NOISE, JFET-INPUT)  
 — TOP VIEW —



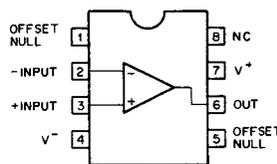
**μPC311C (NEC)**  
**VOLTAGE COMPARATOR**  
 — TOP VIEW —



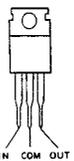
**μA733DC (FSC)**  
**DIFFERENTIAL VIDEO AMPLIFIER**  
 — TOP VIEW —



**μPC741C (NEC)**  
**OPERATIONAL AMPLIFIER**  
 — TOP VIEW —



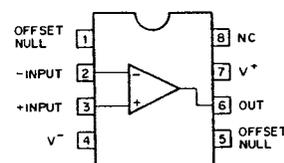
**μA78?7UC (FSC)**  
**POSITIVE VOLTAGE REGULATOR (1A)**



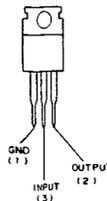
5V	μA7805UC	FS7805	μPC14305H	μPC7805H	HA17805P
6V	μA7806UC				HA17806P
7V	μA7807UC				HA17807P
8V	μA7808UC		μPC14308H	μPC7808H	HA17808P
8.5V	μA7885UC				
9V					
12V	μA7812UC	FS7812	μPC14312H	μPC7812H	HA17812P
15V	μA7815UC	FS7815	μPC14315H	μPC7815H	HA17815P
18V	μA7818UC		μPC14318H	μPC7818H	HA17818P
24V	μA7824UC	FS7824	μPC14324H	μPC7824H	HA17824P



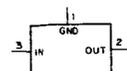
**μPC811C (NEC)**  
**HIGH STABILITY OPERATIONAL AMPLIFIER**



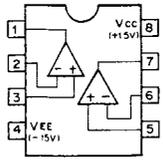
**μA79?7UC (FSC)**  
**NEGATIVE VOLTAGE REGULATOR (1A)**



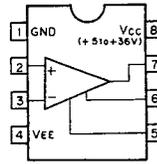
- 5V	μA7905UC	FS7905	μPC7905H
- 6V	μA7906UC		
- 8V	μA7908UC		μPC7908H
-12V	μA7912UC		μPC7912H
-15V	μA7915UC		μPC7915H
-18V	μA7918UC		μPC7918H
-24V	μA7924UC		μPC7924H



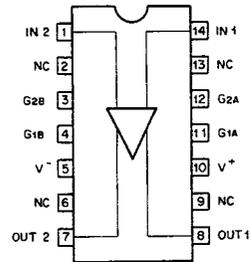
TLO72ACP (TI)  
OPERATIONAL AMPLIFIER  
(LOW-NOISE, JFET-INPUT)  
— TOP VIEW —



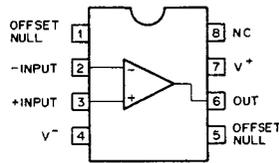
μPC311C (NEC)  
VOLTAGE COMPARATOR  
— TOP VIEW —



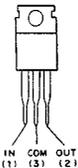
μA733DC (FSC)  
DIFFERENTIAL VIDEO AMPLIFIER  
— TOP VIEW —



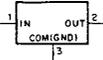
μPC741C (NEC)  
OPERATIONAL AMPLIFIER  
— TOP VIEW —



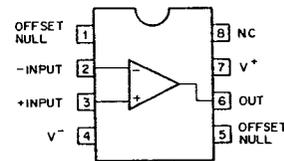
μA78 ? ?UC (FSC)  
POSITIVE VOLTAGE REGULATOR (1A)



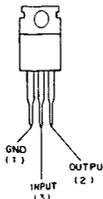
5V	μA7805UC	FS7805	μPC14305H	μPC7805H	HA17805P
6V	μA7806UC				HA17806P
7V					HA17807P
8V	μA7808UC		μPC14308H	μPC7808H	HA17808P
8.5V	μA7885UC				
9V					
12V	μA7812UC	FS7812	μPC14312H	μPC7812H	HA17812P
15V	μA7815UC	FS7815	μPC14315H	μPC7815H	HA17815P
18V	μA7818UC		μPC14318H	μPC7818H	HA17818P
24V	μA7824UC	FS7824	μPC14324H	μPC7824H	HA17824P



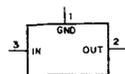
μPC811C (NEC)  
HIGH STABILITY OPERATIONAL AMPLIFIER



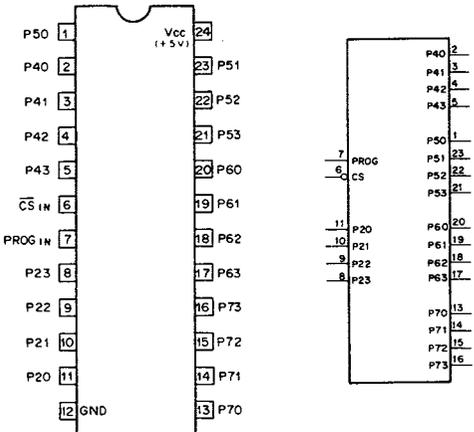
μA79 ? ?UC (FSC)  
NEGATIVE VOLTAGE REGULATOR (1A)



- 5V	μA7905UC	FS7905	μPC7905H
- 6V	μA7906UC		
- 8V	μA7908UC		μPC7908H
-12V	μA7912UC		μPC7912H
-15V	μA7915UC		μPC7915H
-18V	μA7918UC		μPC7918H
-24V	μA7924UC		μPC7924H



μPD8243C (NEC)  
N-MOS I/O PORT EXPANDER  
— TOP VIEW —

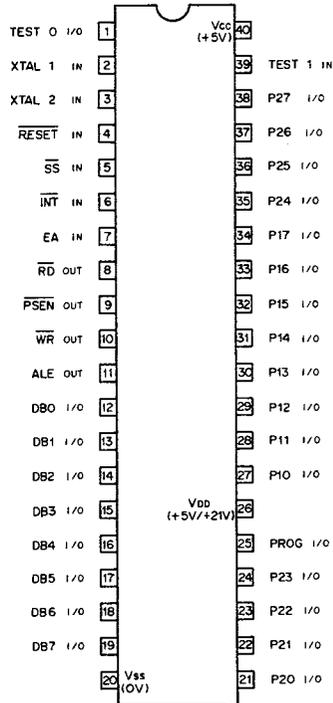


CONTROL AND PORT ADDRESSING

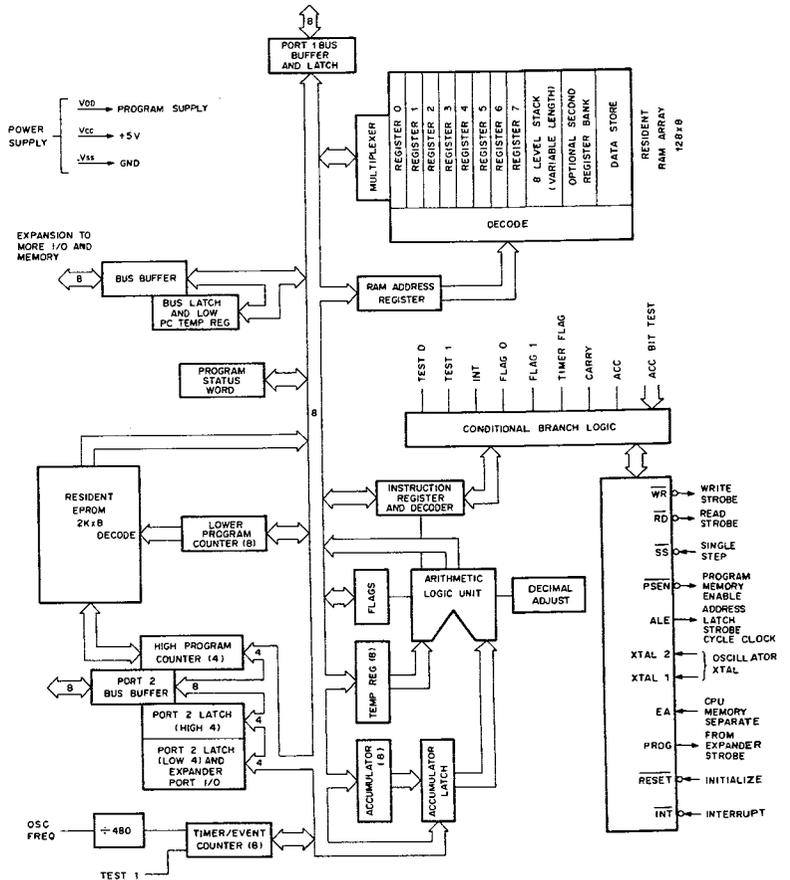
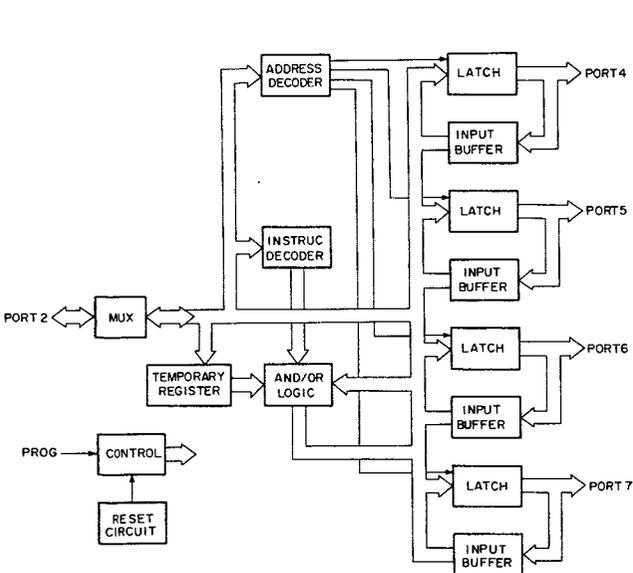
P23	P22	P21	P20	PORT	CONTROL
0	0	0	0	4	READ
0	0	0	1	5	
0	0	1	0	6	
0	0	1	1	7	
0	1	0	0	4	WRITE
0	1	0	1	5	
0	1	1	0	6	
0	1	1	1	7	
1	0	0	0	4	OR
1	0	0	1	5	
1	0	1	0	6	
1	0	1	1	7	
1	1	0	0	4	AND
1	1	0	1	5	
1	1	1	0	6	
1	1	1	1	7	

PROG; PROGRAM PULSE INPUT  
CS; CHIP SELECT INPUT  
P20~P23; I/O PORT 2 (FOR CPU)  
P40~P43; I/O PORT 4  
P50~P53; I/O PORT 5  
P60~P63; I/O PORT 6  
P70~P73; I/O PORT 7

μPD8749HD (NEC)  
N-MOS 8-BIT MICROCOMPUTER  
— TOP VIEW —



P10~P17; I/O PORT 1  
P20~P27; I/O PORT 2  
DB0~DB7; DATA BUS  
INT; INTERRUPT  
RD; READ  
WR; WRITE  
ALE; ADDRESS LATCH ENABLE  
PSEN; PROGRAM STORE ENABLE  
SS; SINGLE STEP  
EA; EXTERNAL ACCESS  
PROG; PROGRAM PULSE  
XTAL 1,2; CRYSTAL



SECTION B  
BLOCK DIAGRAMS AND CIRCUIT DESCRIPTION

## AD-23 基板

AD-23 基板は外部からの2チャンネルのアナログ信号をデジタル信号に変換して、SIF-1 基板へ出力する。AD-23 基板の特徴は、ローパスフィルタに位相補償回路を内蔵させて、16 kHzまでの群遅延を10  $\mu$ sec以内に押えていることである。これにより、実用上、線形位相と呼べる特性を得ている。

アナログ部はINPUT AMP, EMPHASIS AMP, DITHER AMP, LPF, HEADPHONES AMPで構成される。EMPHASISとDITHERのON/OFFスイッチはAD基板上にあり、それぞれ、SW1とSW2である。SW2をONにするとNOISE SOURCE回路から、サンプリング間隔に同期したDITHER信号が出力され、DITHER AMPで、アナログ信号と加算される。

デジタル部ではDEC-15基板からのタイミングクロックをAD変換に必要なタイミングに作り変えている。CC CONTROL回路ではWDCK1よりも1 BITCK分だけ先行するタイミングのCCクロックを作っている。

AD変換部ではデジタル部で作られたCCクロックに合わせてAD変換を行っている。AD変換部は、AD CONVERTER, OSCILLATOR, SAMPLE HOLD, LIMITER, CURRENT SOURCE, AD OFFSET FEEDBACKで構成される。CCがHIGHのときにSAMPLE HOLD回路は入力信号をつかまえて、CCがLOWになったときに変換を行う。

ヘッドホン用のモニター信号はATT及びHEADPHONES AMPを通してDA-15基板へ行く。

## AD-23 BOARD

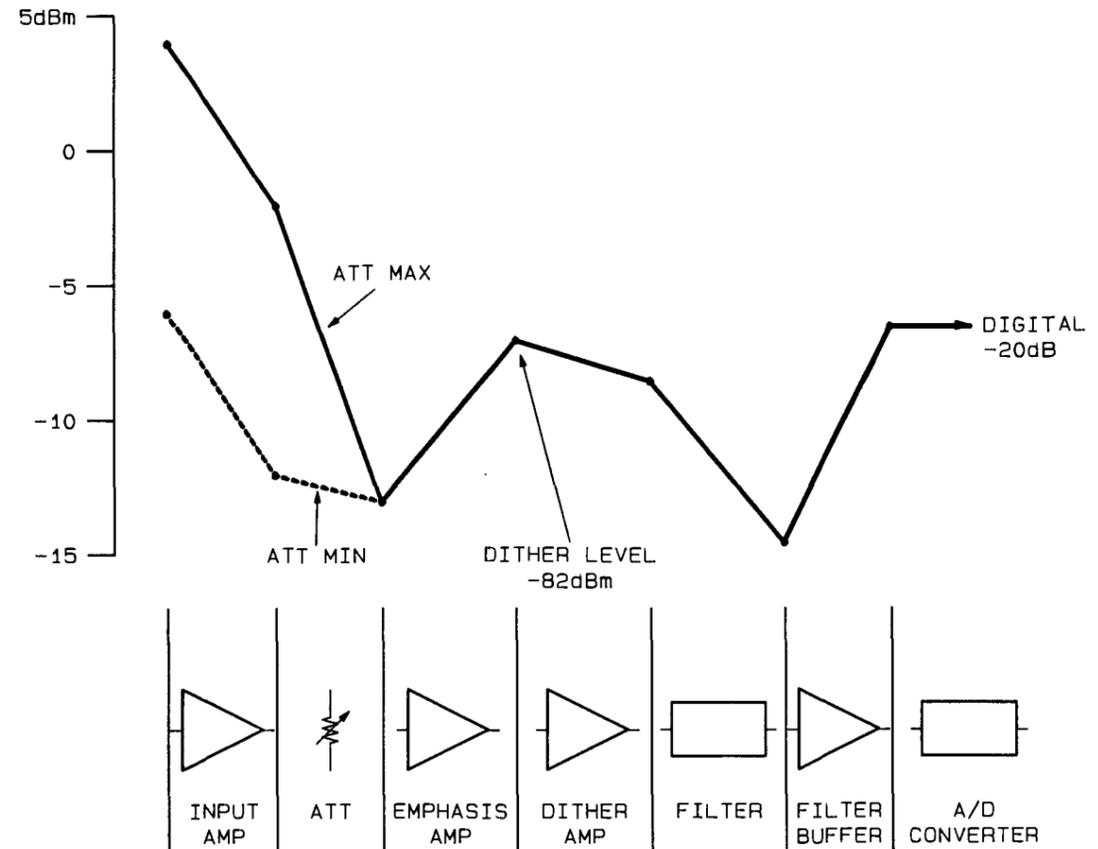
The AD-23 board converts analog signals of two channels to digital signals, which are then outputted to the SIF-1 board. The AD-23 board features a low pass filter containing a phase compensation circuit whose group delay to 16 kHz is within 10  $\mu$ sec. This enables so called linear phase characteristics to be obtained in practice.

The analog section consists of an input amplifier, emphasis amplifier, dither amplifier, LPF and a headphones amplifier. The ON/OFF switches for the EMPHASIS and DITHER are on the AD board, and are SW1 and SW2 respectively. When SW2 is turned ON, dither signals of each channel synchronized to the sampling interval are generated at the noise source circuit, and these are added to the analog signal in the dither amplifier.

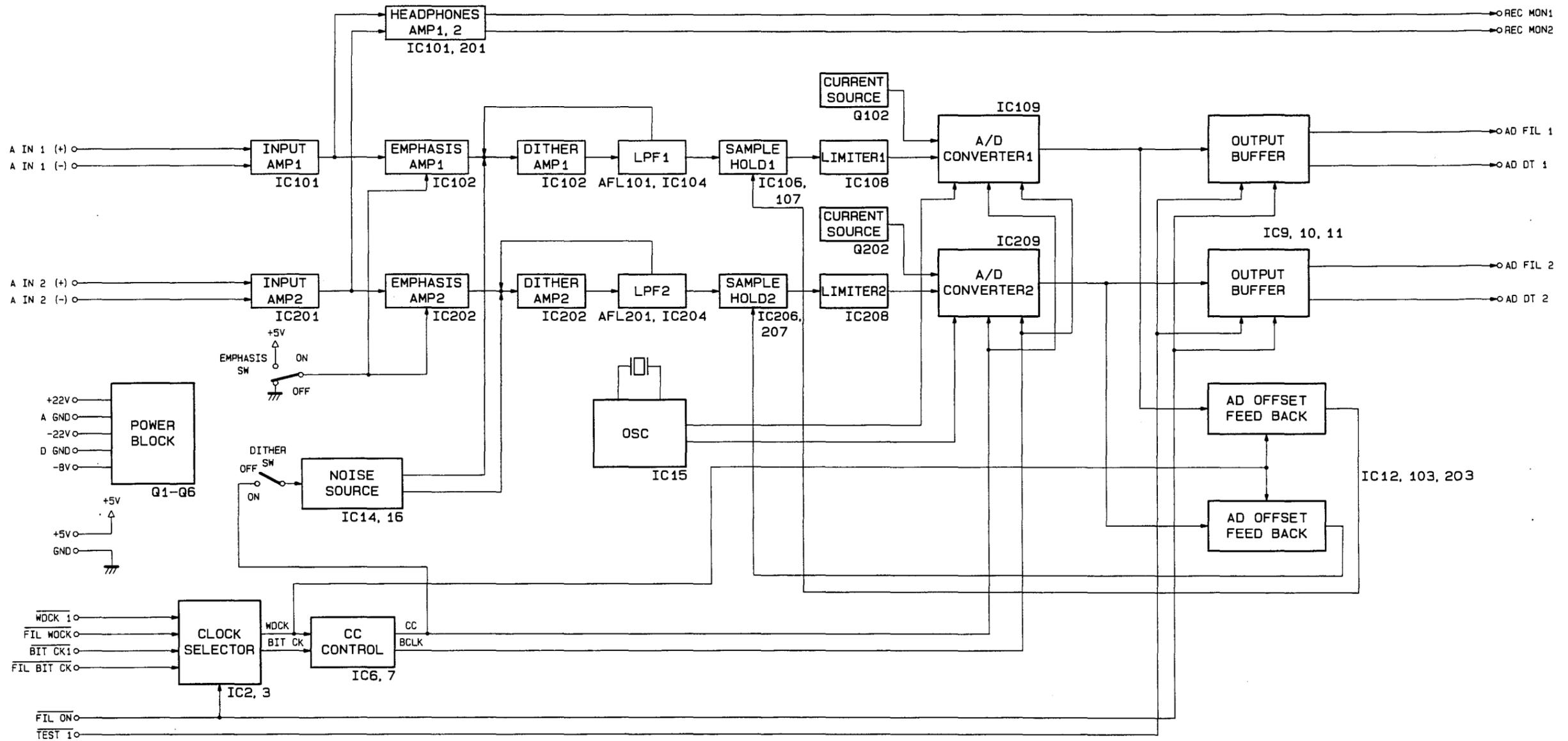
In the digital section, the timing clock from the DEC-15 board is modified to make the timing suitable for AD conversion. In the CC control circuit, a CC clock is produced which is one BITCK ahead of WDCK1.

In the AD conversion section, AD conversion is carried out in accordance with the CC clock produced in the digital section. The AD conversion section consists of AD converter, oscillator, sample and hold, limiter, current source, and AD offset feedback circuits. When the CC clock is high level, the sample-and-hold circuit samples the input signal, and when the CC clock goes low level, conversion starts.

The monitor signals for headphones go to DA-15 board through attenuators and headphones amplifiers.



AD-23 BOARD LEVEL DIAGRAM



AD-23 BOARD BLOCK DIAGRAM

DA-15 基板

DA-15 基板は2チャンネルのデジタル信号をアナログ信号に復元する。DA-15 基板の特徴は、デジタルフィルターを用いてサンプリング周波数を2倍にし、可聴帯域内の量子化ノイズを減らし、さらにローパスフィルターの遮断特性をゆるやかにして可聴帯域内の位相を直線にしていることである。

デジタル部はREFERENCE CLOCK, DATA SELECTOR, DIVIDER, TIMING CONTROL, PHASE COMP & VCO, DIGITAL FILTERで構成される。DIGITAL FILTERに必要なクロックはPHASE COMP & VCOによるPLLで作られている。2チャンネルのデジタルデータはDATA SELECTOR回路で1本のシリアルデータに並べかえられて、DIGITAL FILTER回路へ入力する。DIGITAL FILTER回路からは、データとタイミングクロックがすべて2倍のサンプリング周波数に対応して出力される。

DA変換部ではDIGITAL FILTER回路からのタイミングクロックとデータを受けてアナログ信号に変換する。DAコンバーターのIC101, 201はそれぞれ1個で2チャンネル分の変換を行っており、2倍のサンプリング周波数に対応している。

アナログ部は、LPF, DE-EMPHASIS AMP, LEVEL ADJUST, LINE AMP, HEADPHONES AMP, MONITOR SELECTORで構成される。LPF回路のローパスフィルターは通過域内にリップルを持たない9次のバターワース型で、遮断特性は24 kHzで-3 dB, 64 kHzで-86 dBとなっている。MONITOR SELECTORは、AD-23 基板からのモニター信号と DA-15 基板のモニター信号を切り換えている。

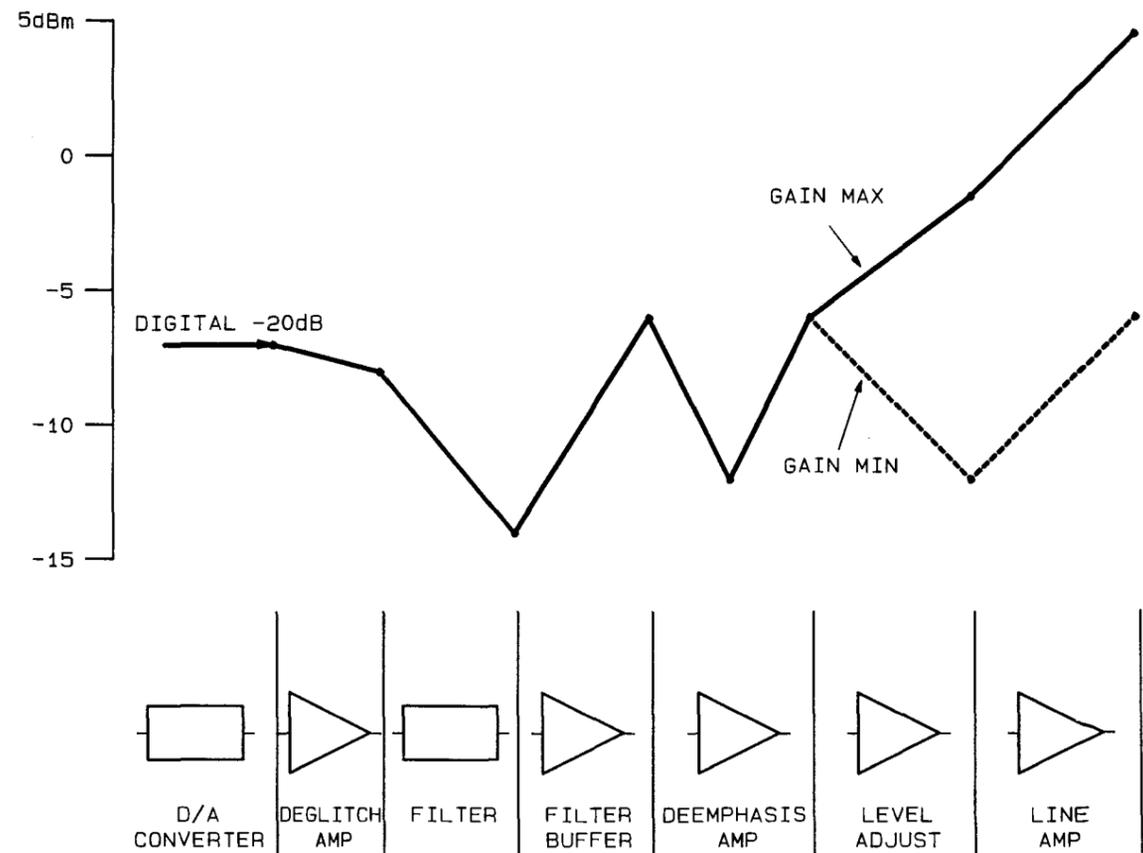
DA-15 BOARD

The DA-15 board restores digital signals of two channels to analog signals. The DA-15 board features a digital filter which doubles the sampling frequency to reduce quantization noise in the audio frequency range, and a low pass filter with moderate cut off characteristics which allows linear phase characteristics in the audio frequency range.

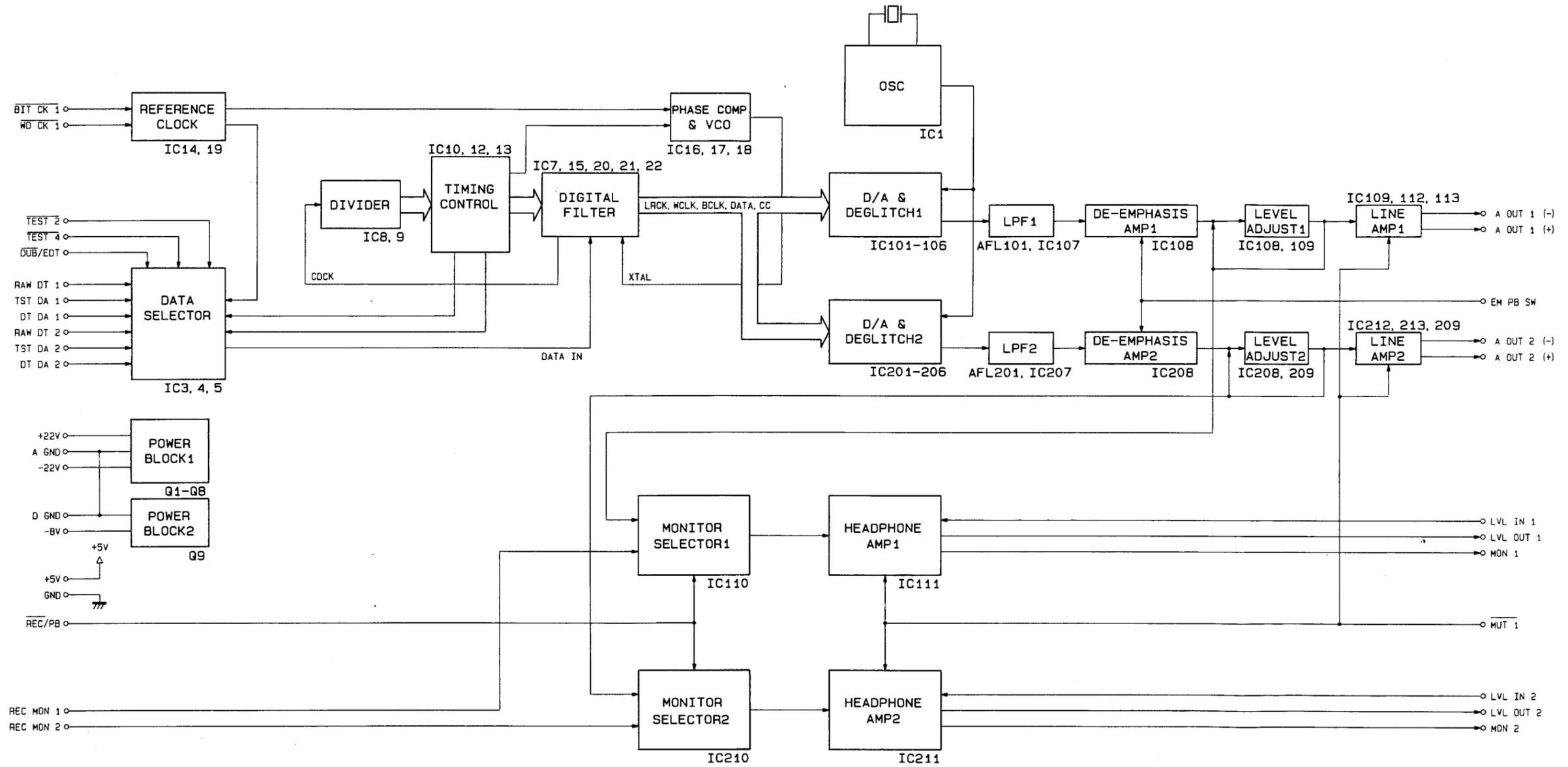
The digital section consists of reference clock, data selector, divider, timing control, phase comparator & VCO, and digital filter circuits. The clock required for the digital filter is generated by the phase comparator and VCO circuit using a PLL. The digital data of two channels are converted to a single stream of serial data by the data selector circuit, which is then fed to the digital filter circuit. The processed data and timing clock are outputted from the digital filter circuit to the DA converter in accordance with the double sampling frequency.

In the DA converter, the data received from the digital filter circuit are converted to analog signals. The DA converter (IC101 and IC201) is capable of processing the data of two channels at the same time, and therefore DA conversion can be carried out at the double sampling frequency.

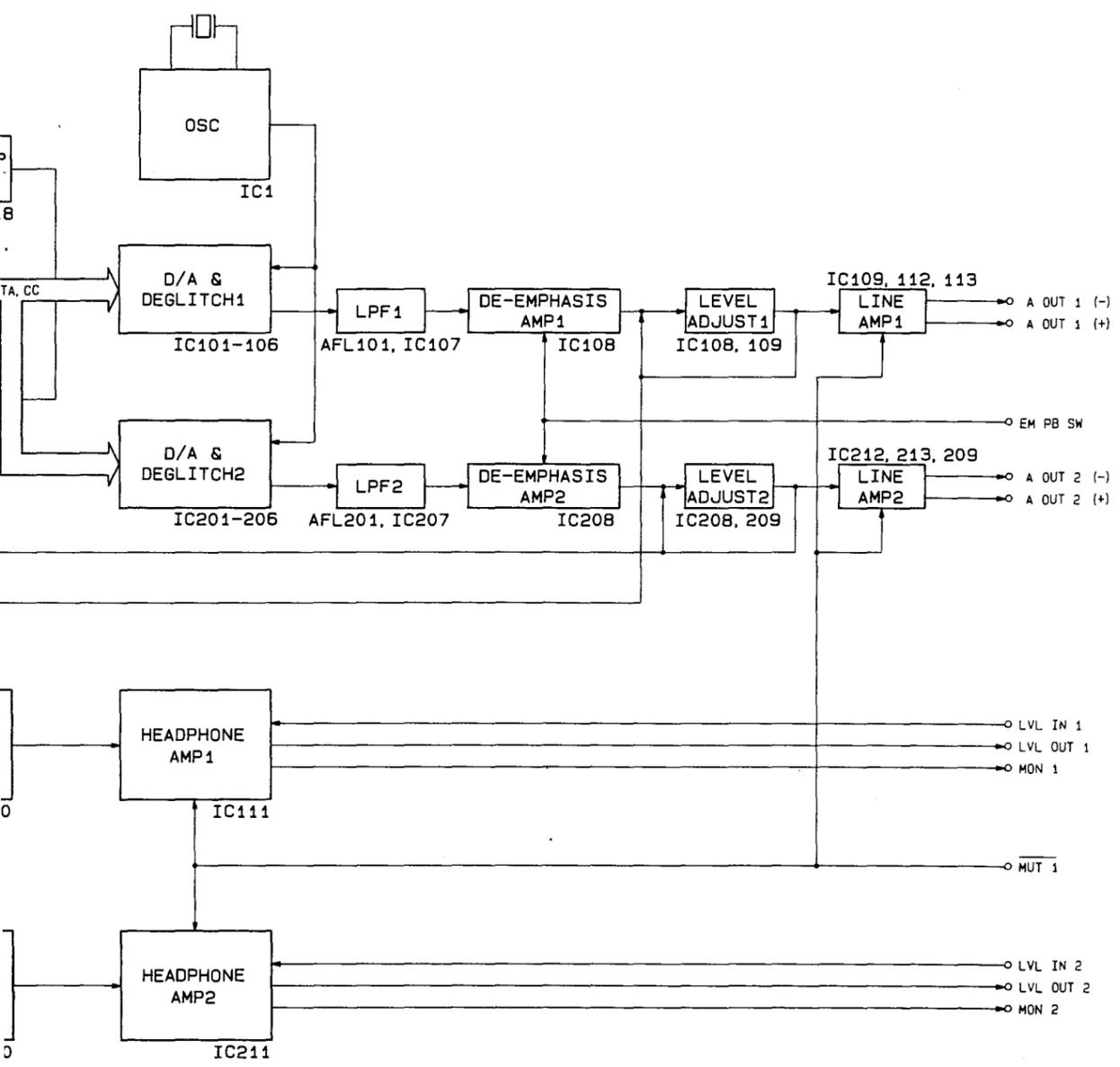
The analog section consists of LPF, de-emphasis amplifier, level adjustment, line amplifier, headphones amplifier, and monitor selector circuits. The low pass filter used in the LPF circuit is a 9 stage butterworth type which does not have ripple in the passband. The cutoff characteristics are -3 dB at 24 kHz, and -86 dB at 64 kHz. The monitor selector switches between a recording monitor signal from the AD-23 board and a playback monitor signal from this DA-15 board.



DA-15 BOARD LEVEL DIAGRAM



DA-15 BOARD BLOCK DIAGRAM



BOARD BLOCK DIAGRAM

## ENC-2 基板

2 CHの25スロット16ビットデジタル信号を、時分割多重化してクロスワード符号化し、35H (H; 水平TVライン)のインターリーブをかけてVIDEO信号にのせるためのデータ圧縮を行ない、EMPHASIS BIT・FS ID BITを付加してSIF-1基板へ送出することが主機能である。

SIF-1基板からの2種類の25スロット16ビットデジタル信号(DT EN, DEC DT)をENC INセレクターSWによって選択(ANALOG・DIGITAL時DT EN, DUBBING時DEC DT)受信し、直/並列変換してRAM(HM6116P)に書き込む。RAMへのデータの書き込み、読み出しは、RAM CONTROL回路によって制御されるWRITE ADDRESS COUNTER及びREAD ADDRESS COUNTERからのアドレス情報をW/R ADDRESS SELECTORで選択し、RAM CONTROL回路からのENABLE信号(OE, WE)によって行なっている。書き込みは1アドレスで各CH 4ビットずつ行ない、4アドレスで各CHの1ワードが書き込まれる。読み出しは書き込みの3倍の速度で行ない、各CH当り105ワードを単位とすることによって35Hのインターリーブがかけられ、VIDEO信号に重畳するためのデータ圧縮が行なわれる。読み出されたデータは、各CH毎に直/並列変換され、誤り訂正ビットとしてPARITYが作成(PARITY GEN)付加され、また誤り検出ビットとしてCRCが作成(CRC GEN)付加されて、35Hのインターリーブのかかったクロスワード符号となる。さらにSKEW BIT位置(各Hの第129ビット)にコントロールビットとしてエンファシス情報(EM ID)及びサンプリング周波数情報(FS ID)を付加する。EM ID及びFS IDは各インターリーブブロック(35H単位)の各々第1H及び第2HのSKEW BIT位置に付加される。これらがMUX部で時分割多重化されてDT EN VOという一本の信号となり、COMPOSITE SYNCとミキシングしてCOMPOSITE DIGITAL (VIDEO)信号にするために、SIF-1基板へ送出される。

MUTE GEN回路は、REC MUTE SWオン時に入力データを切断して出力を無信号(ミュート信号)にする機能の他に、ENC INセレクターSWの切換え時にノイズが出力されることを防止する機能も持っている。

また、REC EMPH SEL及びPB EMPH SELは各々録音側及び再生側のエンファシス情報の選択回路である。その他、DI-5基板・DO-17基板(共にオプション: DABK-1631の構成基板)の使用の有無を示すDI EN・DO EN信号もこの基板を通過する。

## ENC-2 BOARD

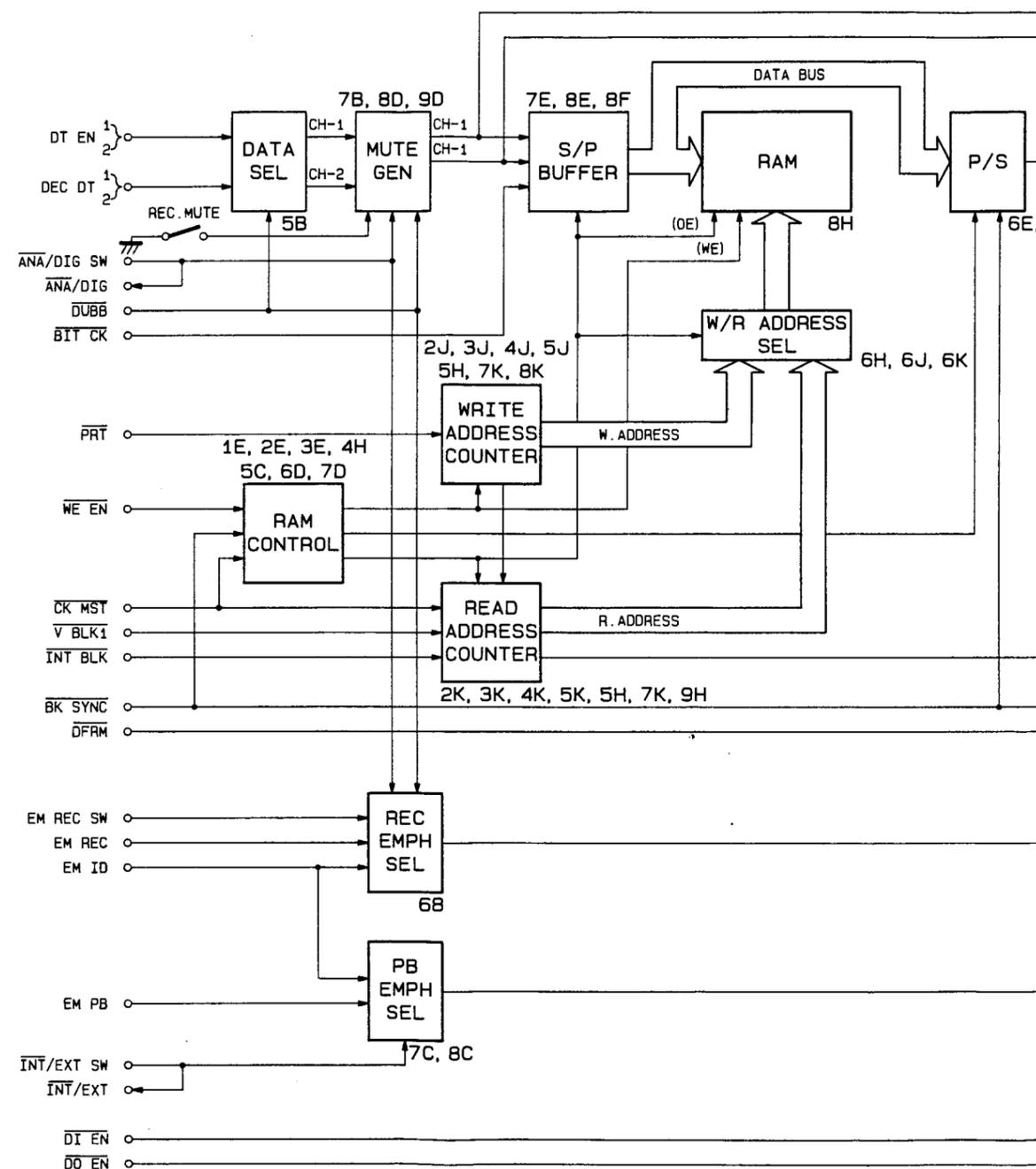
On the ENC-2 board 2 channel 25 slot 16 bit digital signals are subjected to time division multiplexing and crossword coding, and are then subjected to data compression to enable them to be placed on the video signal by means of 35H interleaving (H means a horizontal TV line). EMPHASIS BIT and FS ID BIT are also added and the signals are then fed to the SIF-1 board. These are the main functions of the ENC-2 board.

From the SIF-1 board two types of 25 slot 16 bit digital signals (DT EN and DEC DT) are selected by the ENC IN selector switch (ANALOG/DIGITAL: DT EN, DUBBING: DEC DT) and one is received. The signals are then subjected to serial/parallel conversion and written into RAM (HM6116P). Writing and reading of data to and from RAM is controlled by the RAM control circuit, and address information from the Write Address Counter and Read Address Counter is selected with the W/R Address Selector, in accordance with ENABLE signals (OE, WE) from the RAM CONTROL circuit. When writing, 4 bits for each channel are stored at a single address, so a word for each channel can be stored at four addresses. Read operations are carried out at three times the speed of write operations, and reading in units of 105 words per channel allows 35H interleaving and data compression for superposition on the VIDEO signal. Data which is read out is subjected to parallel to serial conversion alternately for each channel. Parity bits generated by a parity generator are added to the signal as error correction bits, and CRC bits generated by a CRC generator are added to the signal as error detection bits and the signal is converted to a 35H interleaved crossword code. Furthermore, at the SKEW BIT position (the 129th bit for each horizontal line), EMPHASIS information (EM ID) and sampling frequency information (FS ID) are added as control bits. The EM ID and FS ID bits are respectively added at the 1st H and 2nd H SKEW BIT positions of each interleave block (35H units). The above are subjected to time division multiplexing in the MUX section so as to form a single DT EN VO signal, which is fed to the SIF-1 board to be formed into a COMPOSITE DIGITAL (VIDEO) signal after mixing with COMPOSITE SYNC.

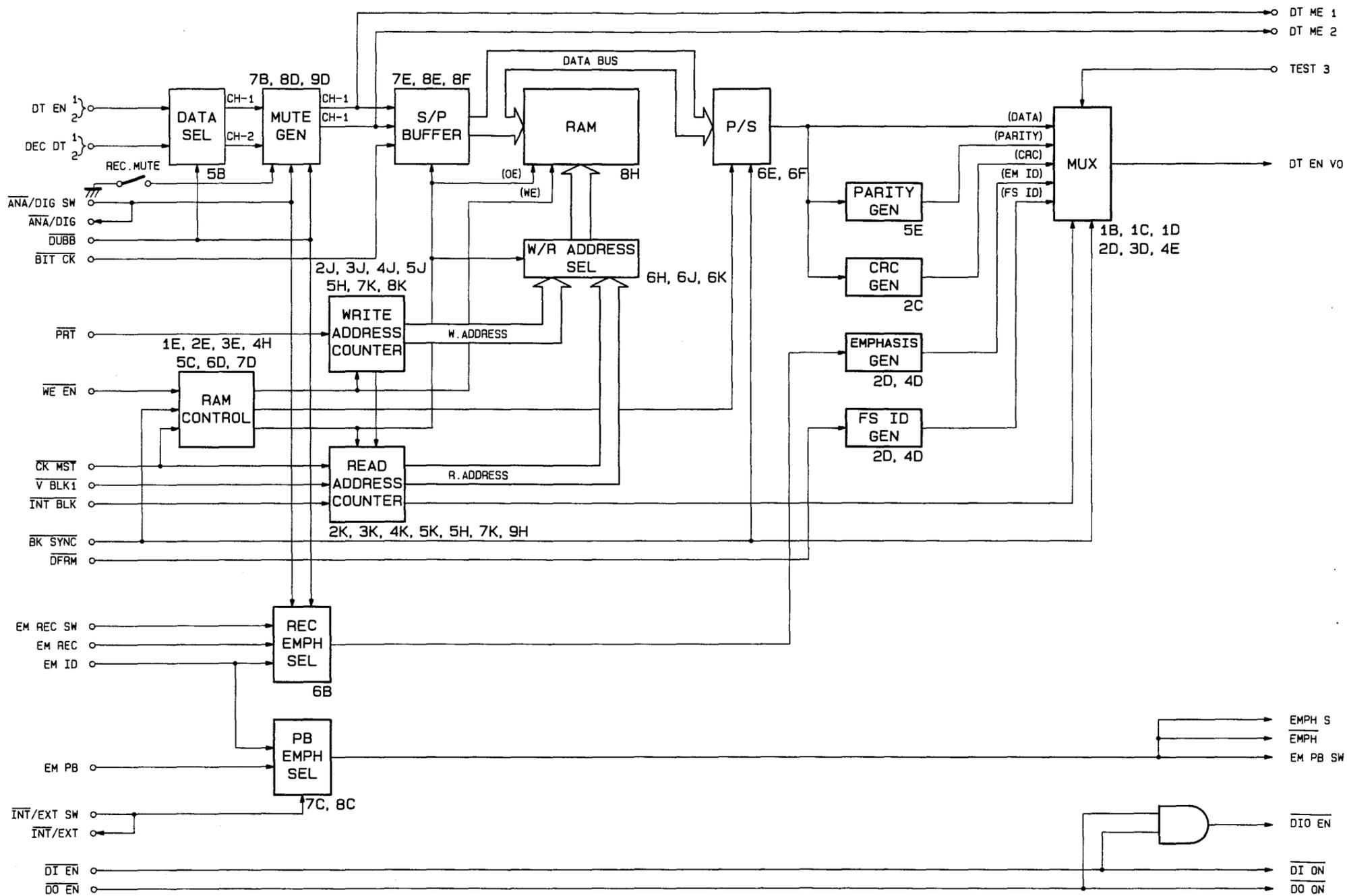
The MUTE GENERATOR circuit not only has a function which cuts off input data and produces a "no signal" (muting signal) output when the REC MUTE switch is ON, but also has a function which prevents output of noise when selection is made with the ENC IN selector switch.

Furthermore, REC EMPH SEL and PB EMPH SEL are selection circuits for emphasis information for the record and playback sides respectively.

In addition, the DI EN and DO EN signals which indicate the use or non use of DI-5 board and DO-17 board (both options: DABK-1631), also pass through the ENC-2 board.



ENC-2 BOARD BLOCK D



ENC-2 BOARD BLOCK DIAGRAM

## SIF-1 基板

PCM-1630内のシステムインターフェイスを行なう。他に MASTER CLOCK (MCK), WORD (WD) SYNC, COMPOSITE SYNC, COMPOSITE DIGITAL, SONY FORMAT (32ビットスロットシリアルI/O)のDIGITAL I/O等の生成, 入出力を行なう。具体的には, 以下の7つの機能がある。

1. MASTER CLOCK発振回路 (X' TAL OSC)
2. EXTERNAL SYNC回路
3. COMPOSITE SYNC GENERATORおよびENC-2基板用TIMING GENERATOR
4. DIGITAL I/O用PLLおよびWD SYNC GENERATOR
5. SONY FORMAT DIGITAL I/O回路およびLINE DRIVER
6. COMPOSITE SYNCおよびCOMPOSITE DIGITAL出力回路
7. SYSTEM INTERFACE

以下に順を追って1~7項について説明する。

1.  $f_s$ の325倍(14.31818 MHzまたは14.3325 MHz)のMCKを発振させる。SW1により,  $f_s$ (44.056 kHzまたは44.1 kHz)の選択可能。
2. COMPOSITE SYNC > WD SYNC > AES/EBU DI SYNCという優先順位で外部同期がかけられる。それぞれのSYNCでPLLをロックさせ, 同期したMCKを生成する。またEXTERNAL SYNCの幅をカウントして $f_s$ を44.056 kHzか44.1 kHzか判別する。COMPOSITE SYNCが入力した場合, 特にGEN LOCKがかかる。外部同期がロックしない場合はMUTINGをかける。
3. COMPOSITE SYNC GENERATORによりH SYNC, V SYNCを生成する。COMPOSITE SYNCで同期がかけられた場合はGEN LOCKがかかる。またENC-2で使われる $\overline{HD}$ ,  $\overline{VD}$ ,  $O/\overline{E}$ , V BLK1, INT BLK, BK SYNCをH SYNC, V SYNCから生成する。
4.  $f_s$ の256倍を発振させるPLL。32ビットスロット系のマスタークロックとなる。またWD SYNCを生成する。
5. 背面パネルのDA INから入力したDIGITAL IN DATAをCX23070(7F, 9F)により32→25ビットスロット変換する。またDEC-15基板からの再生DIGITAL信号を25→32ビットスロット変換し, DEC OUTとして出力する。

背面パネルのENC INから入力したDIGITAL IN DATAをCX23070(7D, 9D)により32→25ビットスロット変換する。またAD-23基板からのDIGITAL信号を25→32ビットスロット変換し, AD OUTとして出力する。

6. ENC-2基板から送られてきた符号化されたDIGITAL信号をCOMPOSITE SYNCにのせて, COMPOSITE DIGITAL信号として出力する。また3で作られたCOMPOSITE SYNCをレベル変換して出力する。
7. 前面パネルのSWに連動して信号の流れを下記のようにコントロールする。

スイッチの位置		信号の切換え (信号名称)	
DA IN	INT	DEC-15 (DEC DT) →	DA-15 (DT DA)
	EXT	DIGITAL IN (DA IN) →	DA-15 (DT DA)
ENC IN	ANALOG	AD-23 (AD DT) →	ENC-2 (DT EN)
	DIGITAL/ DUBBING	DIGITAL IN (ENC IN) →	ENC-2 (DT EN)

SIF-1 BOARD

The SIF-1 board handles the PCM-1630's internal system interfacing as well as generation and input/output of the master clock (MCK), word (WD) sync, composite sync, composite digital signal, Sony format digital I/O (32-bit slot serial I/O) signals, etc. Stated specifically, it has the following seven functions:

1. Master clock generator circuit (X'tal oscillator)
2. External sync circuit
3. Timing generator for ENC-2 board and composite sync generator
4. PLL for digital I/O and word sync generator
5. Sony format digital I/O circuit and line driver
6. Composite sync and composite digital output circuits
7. System interface

Each of these seven functions will be explained in detail below.

1. Master Clock Generator Circuit

Oscillates a master clock of 325 times the sampling frequency (14.31818 MHz or 14.3325 MHz). Sampling frequency of either 44.056 kHz or 44.1 kHz can be selected with SW1.

2. External Sync Circuit

External synchronization is applied in the following order of precedence.

Composite sync > Word sync > AES/EBU DI sync

The PLL is locked to the respective sync signals and a synchronized master clock (MCK) is generated. Also the width of the external sync is counted, and a judgement made of whether the sampling frequency is 44.056 kHz or 44.1 kHz. When composite sync has been input, the GEN LOCK is engaged. When locking to external sync does not occur, unlock signal to mute data is generated.

3. Timing Generator for ENC-2 Board and Composite Sync Generator

Both H and V sync signals are generated by composite sync generator. When synchronized with the composite sync, GEN LOCK will be engaged.

The HD, VD, O/E, V BLK1, INT BLK, and BK SYNC signals used at the ENC-2 board are also generated from the H and V sync signals.

4. PLL for Digital I/O and Word Sync Generator

The PLL generates a frequency of 256 times the sampling frequency, to be used as the master clock for the 32-bit slot data. The word sync signal is also generated.

5. Sony Format Digital I/O Circuit and Line Driver

The digital data from the DA IN connector on the rear panel are converted from a 32-bit to 25-bit slot data by CX23070 (7F and 9F). The playback digital data from the DEC-15 board are also converted from a 25-bit to 32-bit slot data and outputted from the DEC OUT connector.

Similarly, the digital data from the ENC IN connector on the rear panel are converted from a 32-bit to 25-bit slot data, but this time, by CX23070 (7D and 9D). The data from the AD-23 board are converted from a 25-bit to 32-bit slot data and outputted from the AD OUT connector.

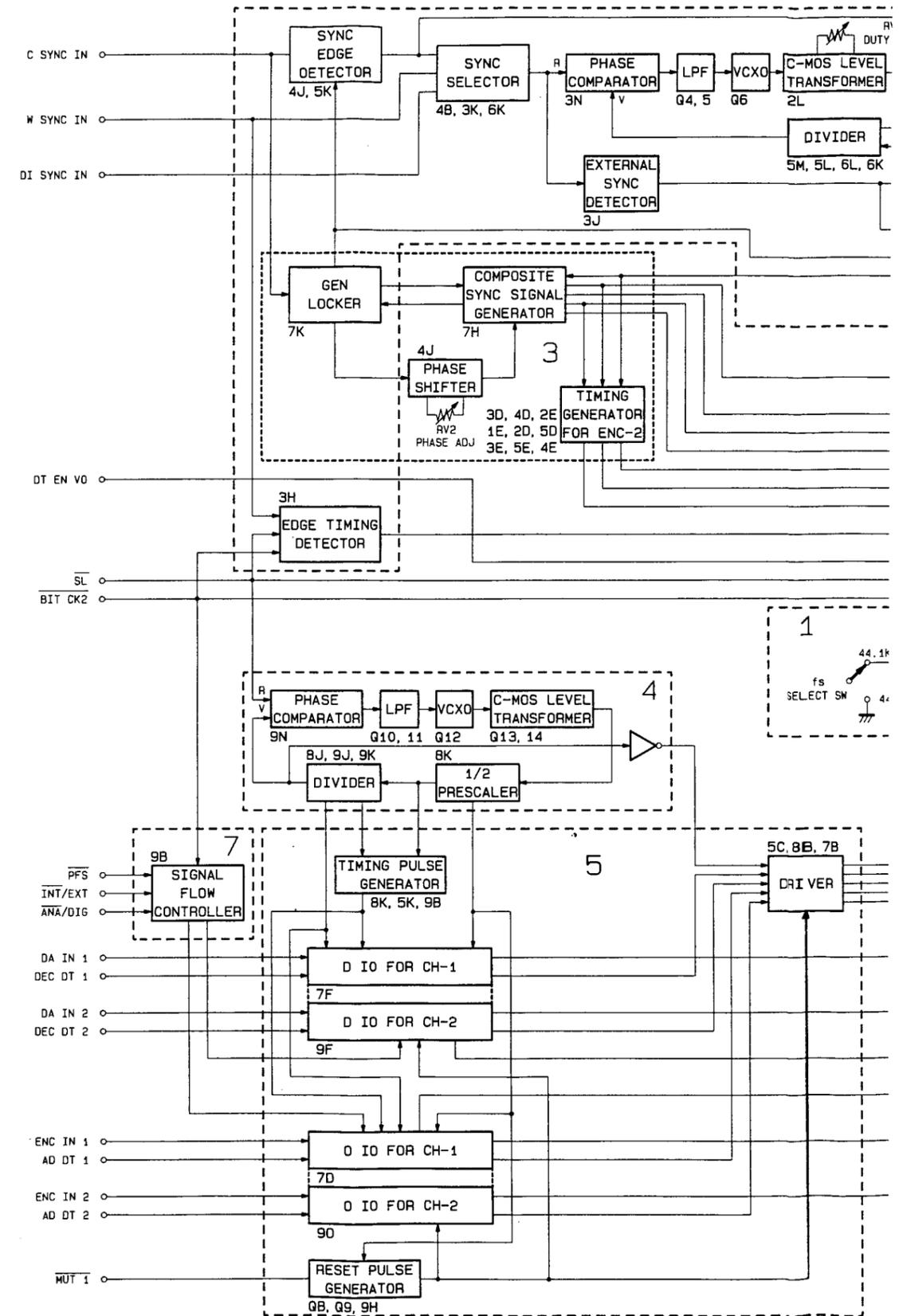
6. Composite Sync and Composite Digital Output Circuits

The composite sync signal is added to the encoded digital signal from the ENC-2 board, to be outputted as the composite digital signal. It also converts the level of the composite sync signal generated by the composite sync generator described in the above "3" and outputs it.

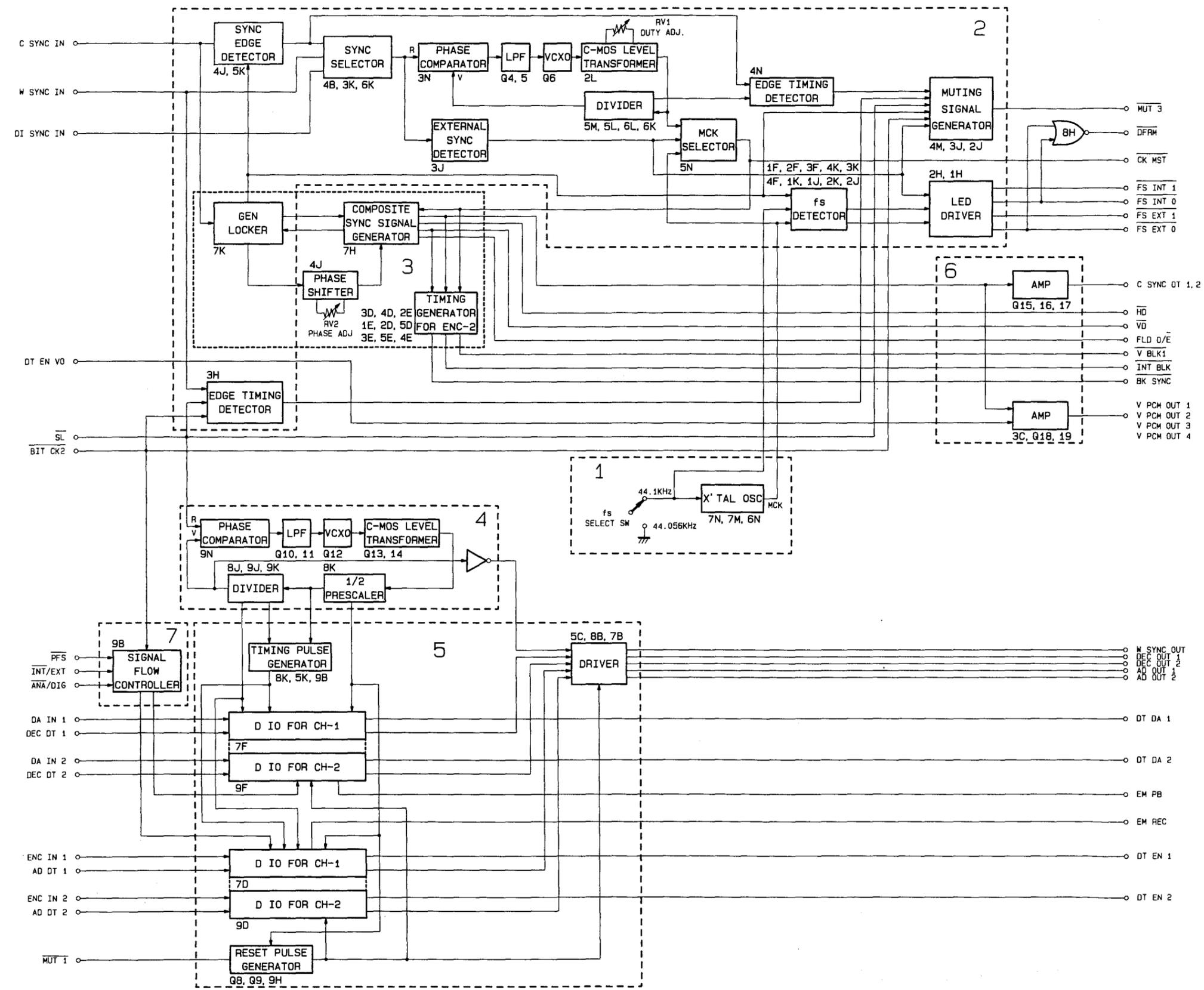
7. System Interface

The signal flow can be changed as follows, using the DA IN and ENC IN selectors on the front panel.

Selector Position		Signal Flow (Signal Name)	
DA IN	INT	DEC-15 (DEC DT)	DA-15 (DT DA)
	EXT	DIGITAL IN (DA IN)	DA-15 (DT DA)
ENC IN	ANALOG	AD-23 (AD DT)	ENC-2 (DT EN)
	DIGITAL/DUBBING	DIGITAL IN (ENC IN)	ENC-2 (DT EN)



SIF-1 BOARD BLC



SIF-1 BOARD BLOCK DIAGRAM

## DEC-15

デジタルオーディオレコーダーからの COMPOSITE DIGITAL (VIDEO) 信号を受信して、SYNC 及び DATA 分離を行ない、エラーチェックして再生復号データを出力する機能をもっている。

デジタルオーディオレコーダーからの2つの COMPOSITE DIGITAL 信号 (V PCM IN A 及び B) は、PB MODE セレクター及び RAR-1 基板 (オプション) 上の RAW スイッチの状態を監視している PB MODE DECODER からの制御信号により一方が選択受信 (A または RAR: IN A, B: IN B) され、クランプがかけられた後コンパレーターで同期信号とデータに分離される (VIDEO CLAMPER および COMPARATOR)。コンパレーターに必要な比較電圧は、AUTO THRESHOLD CONTROL 回路によって発生され、入力信号レベルに応じて自動的に制御される。

分離された同期信号とデータは SYNC SEP LSI (CX23074) に入力され、ここで再生系に必要なクロックが作成される。またデータは遅延回路を経由して DATA SEP LSI (CX23073A) に入力される。ここでは入力されたデータに対して、CRC エラーチェックおよび同期化を行なってデータ及びエンファシス情報・サンプリング周波数情報を抽出するとともに、エラー信号・ミュート信号を発生する。さらにエラー状態にもとづいて、データが最適抽出できるように遅延回路を制御する。DATA SEP からのデータは次に DEC-A LSI (CX23071) に入力される。ここでは、インターリーブがかけられて圧縮されている入力データを、デインターリーブしてサンプリング間隔に伸長し、CH-1・CH-2 ごとに時間配列の正しい信号として出力 (LSB フェースト) すると共に、入力データのエラー状態にもとづいてシンドローム S21, S22, S23 を発生する。また各基板に必要な 25 スロット系のビットクロック (BIT CK) ・ワードクロック (WDCK) 等も発生する。

DEC-A からの信号を受信する DEC-B LSI (CX23072) では、シンドロームにもとづいてエラー訂正・補正を行ない、また DATA SEP 等からのミュート信号によりデータにミュートをかけて、復号データとして出力する。また復号データの状態を示す訂正 (C: CORRECTION), 平均値補間 (A: AVERAGE), 前値補間 (H: HOLD), ミュート (M: MUTE) の各信号及びパリティエラー (P: PARITY) 信号も出力する。

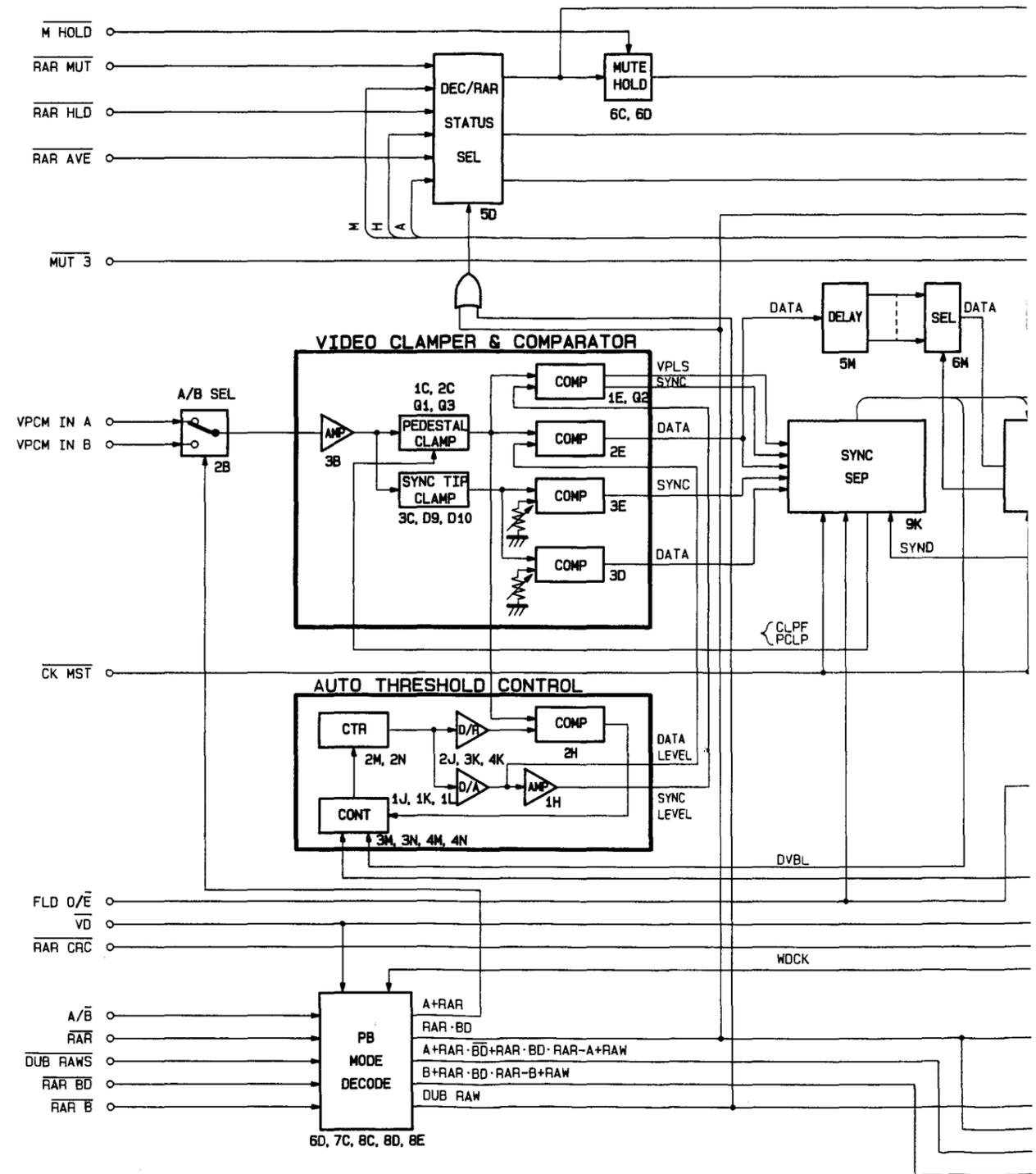
また、RAR-1 基板 (オプション) がある場合には、PB MODE DECODER によってステータス情報 (MUTE, HOLD, AVERAGE 等) の出力を選択制御 (RAR または RAW モード: RAR 信号を選択) する (DEC/RAR STATUS SELECTOR)。

## DEC-15 BOARD

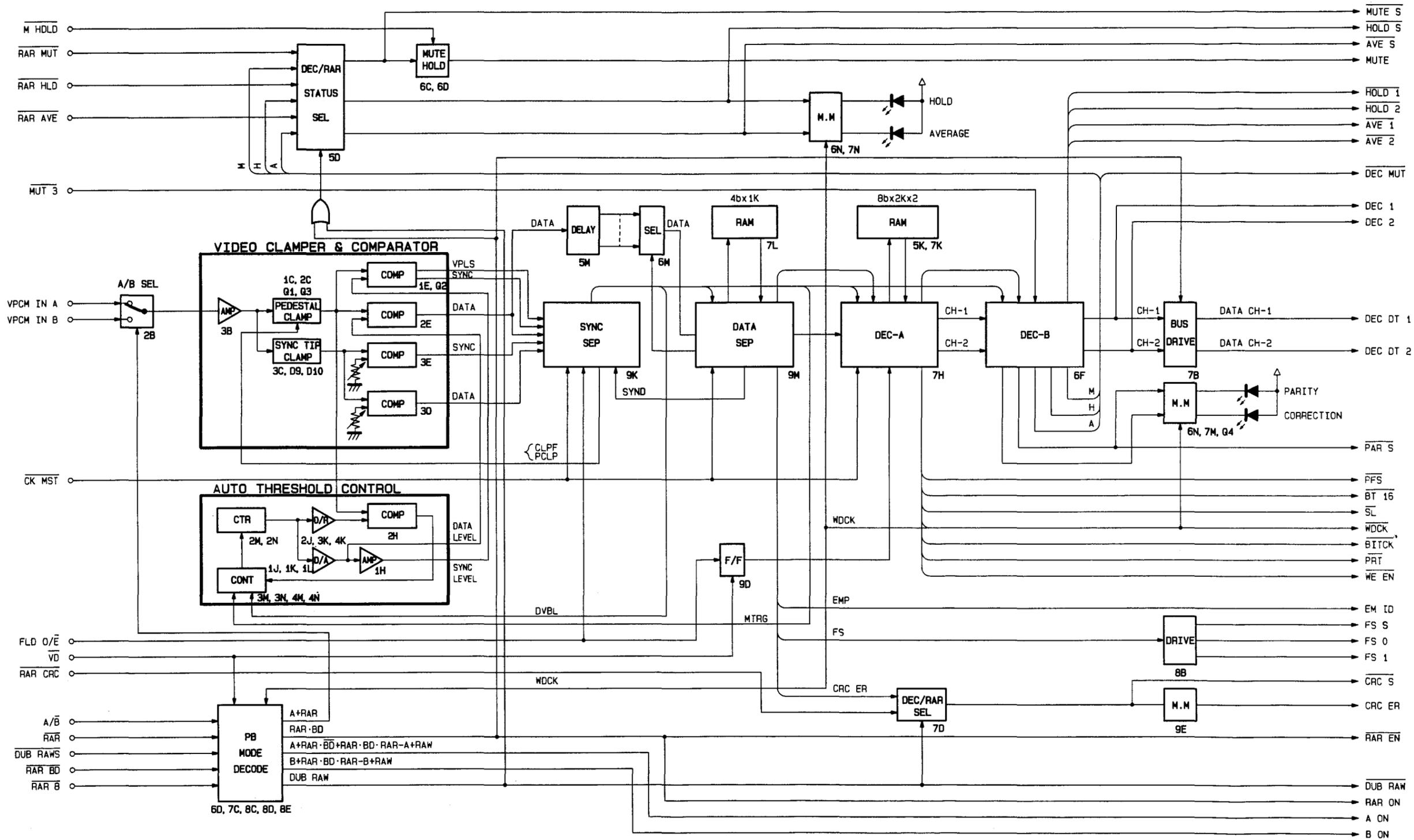
Receiving the composite digital (video) signal from the digital audio recorder, the DEC-15 circuit separates the sync signal from the digital data, performs an error check, and feeds out decoded playback data.

One of the two composite digital signals (V PCM IN A and B) from the digital audio recorder is selected (A or RAR: IN A, B: IN B) by the control signal from the PB mode decoder, which monitors the condition of the RAW switch on the RAR-1 board (optional) and the PB mode selector. It is then clamped, and sent to the comparator for separating the sync signal from the digital data (video clamper and comparator). The comparison voltage required by the comparator is generated by the auto threshold control circuit and controlled automatically in accordance with the input signal levels. The separated data and sync signal are sent to the SYNC SEP LSI (CX23074) where the clocks necessary for playback are generated. The data then go into the DATA SEP LSI (CX23073A) via the delay circuit. In this LSI, they are first subjected to CRC error checks and synchronization, followed by extraction of the audio data as well as emphasis and sampling frequency information. Error and muting signals are thus produced as the result of this operation. Based on the error condition, the DATA SEP LSI also controls the delay circuit to ensure optimum data extraction. The data from the DATA SEP LSI is next fed to the DEC-A LSI (CX23071). Here the data which has been subjected to interleaving and compression is deinterleaved and expanded to the sampling interval and outputted in CH-1 and CH-2, with LSB first, in the correct time sequence. At the same time, syndromes S21, S22 and S23 are generated according to the input data error status. The 25-bit slot bit clock (BITCK) and word clock (WDCK), etc., required by other boards are also generated. In the DEC-B LSI (CX23072) that receives signals from the DEC-A LSI, error correction and compensation are carried out in accordance with the syndromes. Muting is also applied to the data in accordance with the muting signal from DATA SEP etc. and the decoded data is outputted. The DEC-B LSI also feeds out the signals such as correction (C: CORRECTION), mean-value interpolation (A: AVERAGE), previous value holding (H: HOLD) and muting (M: MUTE) that indicate the state of the decoded data, and a parity error signal (P: PARITY).

In addition, when the optional RAR-1 board is used, it is possible to select and control the output of status information (MUTE, HOLD, AVERAGE etc.) by the PB mode decoder (RAR or RAW mode; RAR signal).



DEC-15 BOARD BLC



DEC-15 BOARD BLOCK DIAGRAM

## MT-16

入力デジタルデータのレベルに対応したレベルメーター表示をするための制御回路であり、動作は、CPU ( $\mu$ PD8749HD) に内蔵されているプログラムの手順に従って行なわれる。

3種類の入力データ (DT DA, DT ME, RAW DT) は DATA SELECTOR で選択される。この DATA SELECTOR はモニター切換えスイッチ (REC/PB) と RAR-1基板 (オプション) の RAW SW (DUB/OFF/EDT) によって制御され、DUBモード (DUB/EDT=0) ではRAW DTが、それ以外ではRECモード (REC/PB=0) でDT MEが、PBモード (REC/PB=1) ではDT DAが各々選択される。

選択されたデータは CONTROL CLOCK GENERATOR によって制御される処理過程を経て CPU ( $\mu$ PD8749HD) に取り込まれる。まず S/P 変換回路で両 CHとも 16ビットパラレル信号に変換され、絶対値回路 (ABSOLUTE VALUE CONVERTER) で2の補数から絶対値に変換される。次に COMPARATOR でこの後にある LATCH 回路の出力データ (COMPARISON DATA) と比較され、入力データレベルがこの比較データレベルと等しいか大きいならば、LATCH 回路に取り込まれる。この後は約 11 MHz のクロックで動作する CPU の制御に委ねられ、BUS BUFFER を経て 8ビットずつ CPU に取り込まれる。いったんデータが取り込まれると RESET PULSE 回路からリセット信号が出され、LATCH 回路をクリアして COMPARISON DATA をゼロにする。CPU へのデータの取り込みは 3 msec 周期であるので LATCH 回路をクリアする (即ち CPU にデータを取り込む) 前に、LATCH 回路のデータより大きなレベルの入力データが来ると、LATCH 回路はその入力データに置き換えられる。CPU は外部スイッチ情報 (SCALE, PEAK, HR1~6) を SW ENCODER から、また内部スイッチ情報を MODE SELECT から取り込み、それらに基づいてデータ処理を行なう。CPU に制御されるメーターの LED は各 CHとも 32個あるが、これらを 16個ずつの 4セグメントに分けてダイナミック点灯する (6 msec 周期) ために、CPU からの処理データは SEGMENT DRIVER により各セグメントの LED のアノードを制御する MA1~4, I/O EXPANDER PORT を経て DIGIT DRIVER により各セグメント内の 16個の LED のカソードを制御する MD0~15 として出力される。

また、OVER LEVEL DETECTOR はフルスケールレベルのデータが何ワード連続して入力してきたかの検出回路であり、この検出出力があると OVER 表示を行なう。なお、25スロット系のワードクロック・ビットクロック及びデータは、RS-422 DRIVER よりリモート信号 (R WDCK, R BIT CK, R DT1, R DT2) として STATUS コネクターに送られる。

## MT-16 BOARD

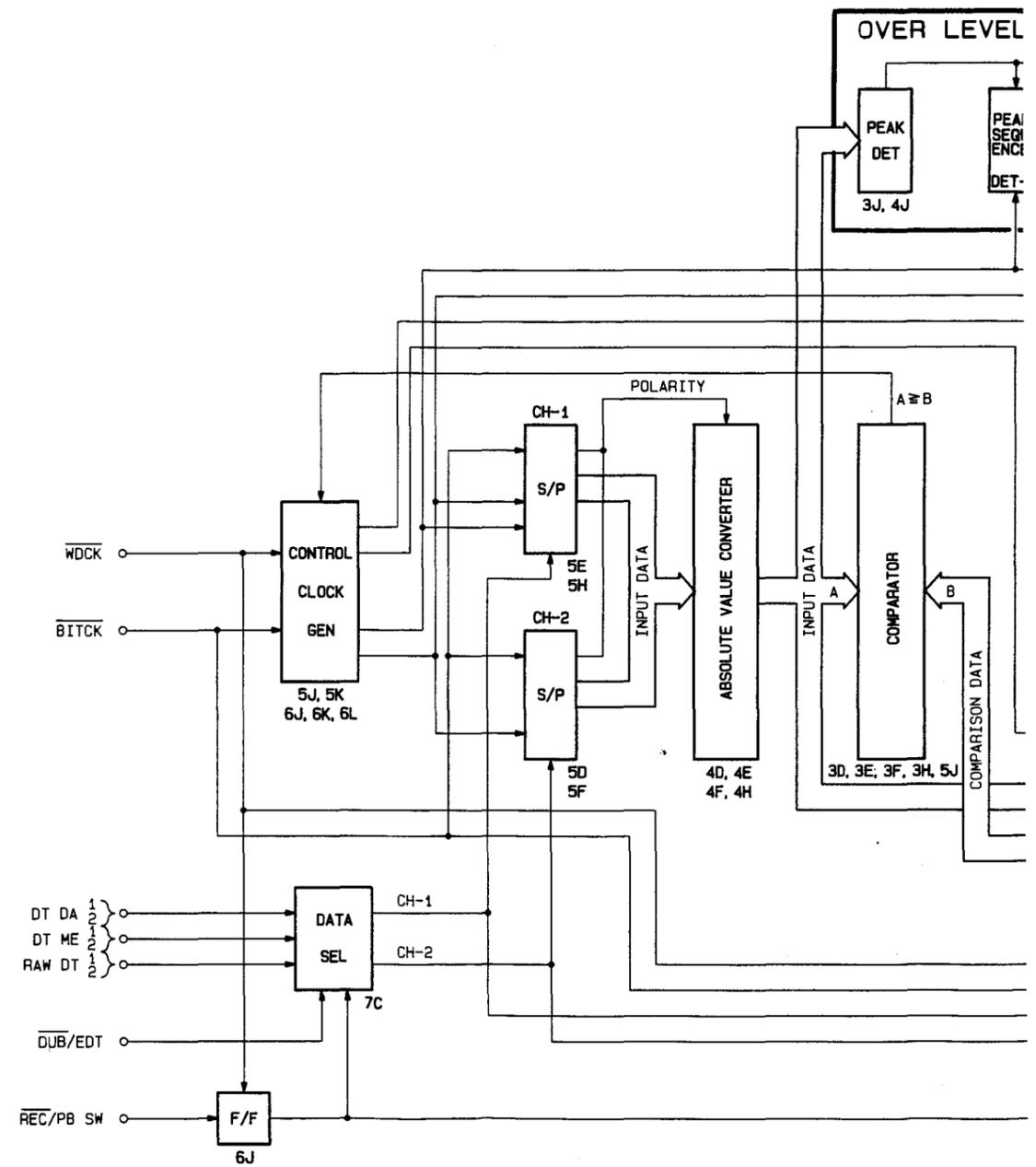
The MT-16 board is a control circuit to enable level meter indication corresponding to the level of input digital data.

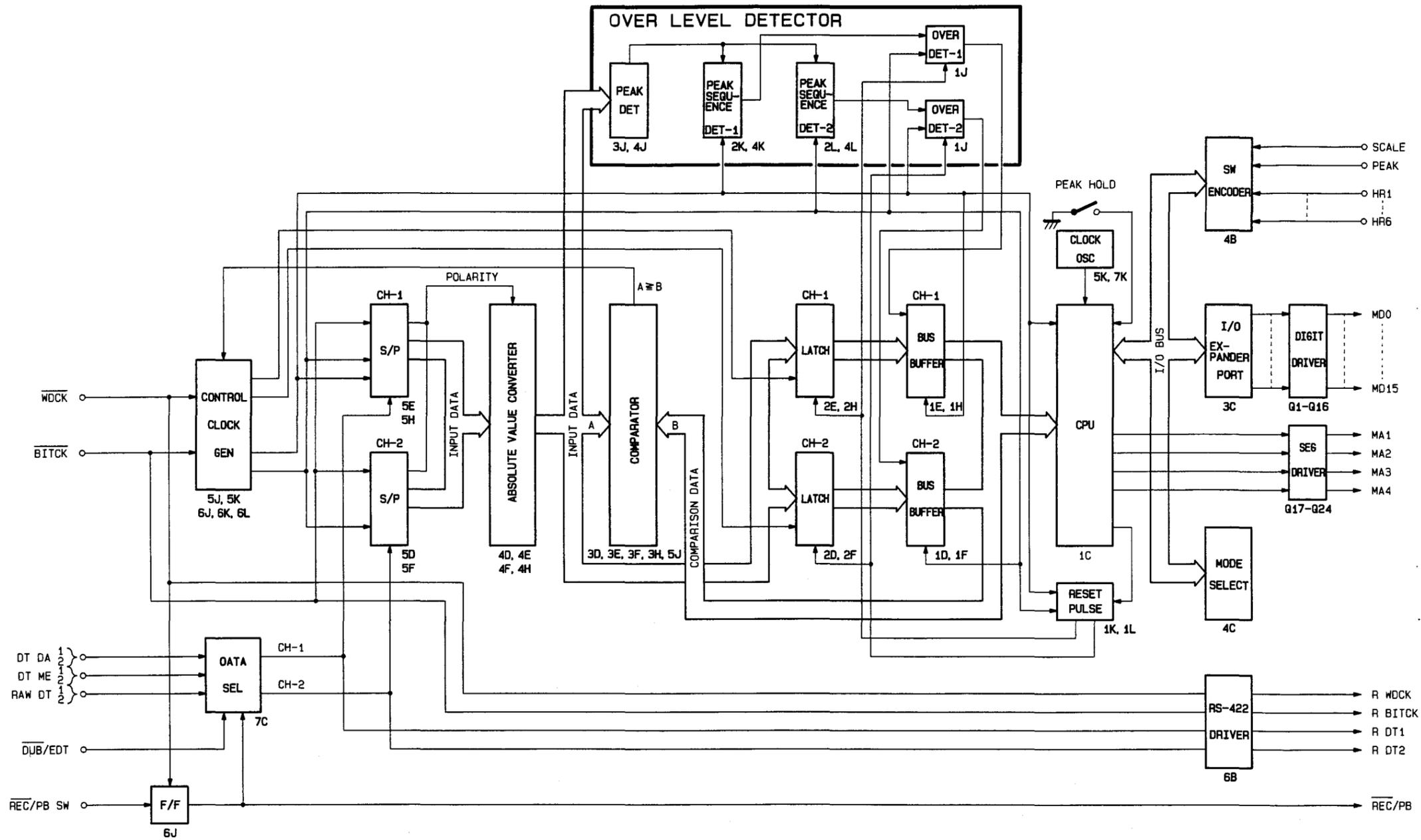
Operation of this circuit is based on a program contained in a CPU ( $\mu$ PD8749HD).

Three types of input data (DT DA, DT ME, and RAW DT) are selected by the data selector. The data selector is controlled by the monitor select switch (REC/PB) and the RAW switch (DUB/OFF/EDT) on the optional RAR-1 board. In DUB mode (DUB/EDT=0), RAW DT is selected. In other cases, DT ME is selected in REC mode (REC/PB=0), and DT DA in PB mode (REC/PB=1), respectively.

The selected data undergo the processing procedure, which is controlled by the control clock generator, and then go into the CPU ( $\mu$ PD8749HD). In more detail, both channels of data are first converted into 16-bit parallel signals in the serial/parallel (S/P) conversion circuit, and are converted from 2's complement to absolute values by the absolute value converter. Next, at the comparator, these data are compared with the output data (comparison data) from the following latch circuit, and if the level of input data is equal to or higher than the level of the comparison data, they are latched into the latch circuit. After then, these data are placed under the control of the CPU operating with a clock of about 11 MHz, and these are read into the CPU via bus buffers, with 8 bits at a time. Once data has been read in, a reset signal is outputted from the reset pulse circuit, clearing the latch circuit and resetting the COMPARISON DATA to zero. Since data is read into the CPU with a 3 msec. cycle, if input data having a greater level than the level of the output data from the latch circuit arrive before the latch circuit has been cleared (i.e. before the output data from the latch circuit have been read into the CPU), the data from the latch circuit will be replaced by the input data. External switch information (SCALE, PEAK, HR1-6) and internal switch information are read into the CPU from the switch encoder and the mode selector respectively. The CPU processes data based on the information obtained from these sources. The meter which the CPU controls has 32 LEDs for each channel. These are divided into 4 segments, each consisting of 16 LEDs. In order to make them light up dynamically at 6 msec. intervals, processed data from the CPU are outputted from the segment driver as MA1-4 (designed to control the anodes for the 4 segments) and also outputted from the digit driver, after passing through the I/O expander port, as MD0-15 for controlling the cathodes of the 16 LEDs within each segment.

There is also an over level detector circuit which counts how many full-scale data have been input in succession. The OVER display is activated by the output from this detector circuit. Furthermore, the 25-slot word clock, bit clock and data are sent by the RS-422 driver as remote signals (R WDCK, R BITCK, R DT1 and R DT2), to the STATUS connector.

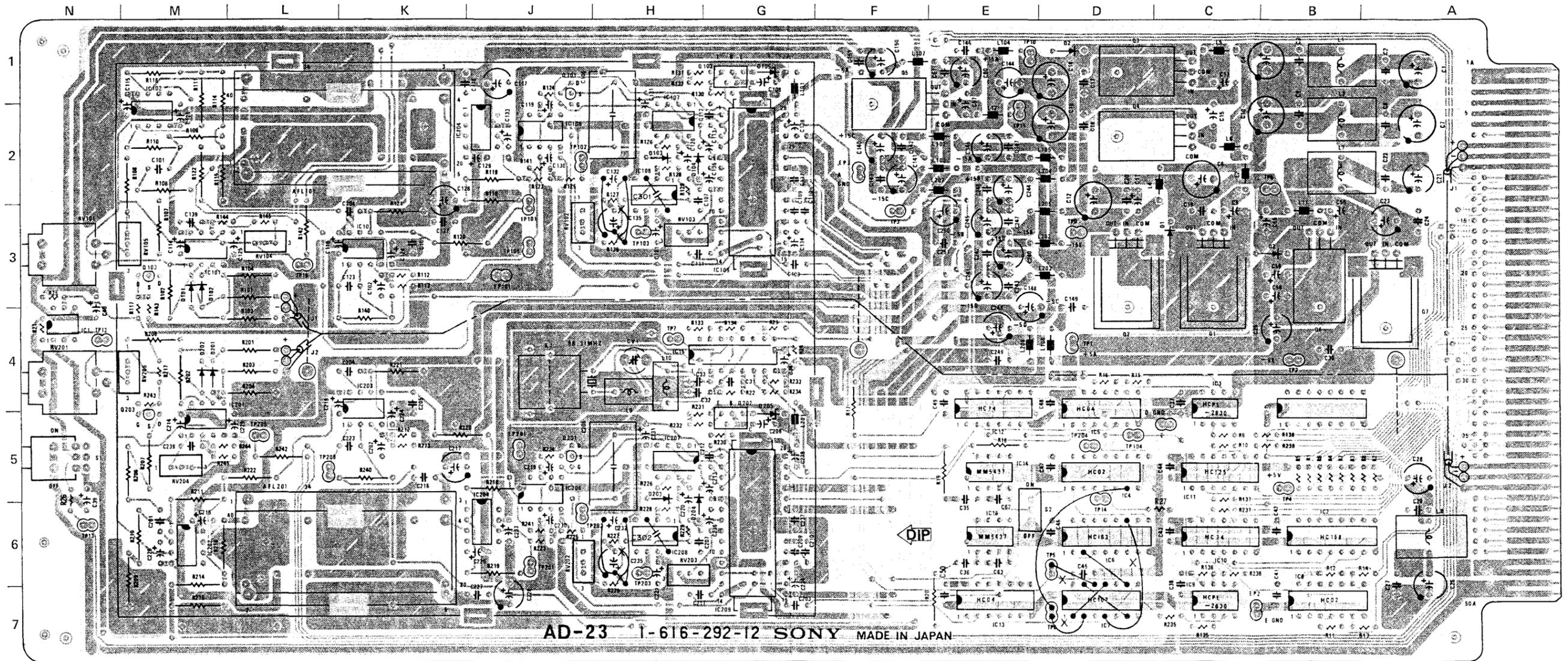




MT-16 BOARD BLOCK DIAGRAM

# SECTION C SCHEMATIC AND CIRCUIT BOARD DIAGRAMS

AD-23 BOARD (1-616-292-12) S/N: 10001 TO 10800  
Component Side



AD-23 1-616-292-12 SONY MADE IN JAPAN

■ SOLDER SIDE PATTERN 1-616-292-12  
 ■ CUT-TRACE PATTERN 1-616-292-12

Note: TP16 on the AD-23 board has been misprinted.  
Please read TP16 as TP106.

Traces that have been cut.

- C132----C135
- C135----R139
- TP5 ----IC7-9
- TP6 ----IC7-5
- C232----C235
- C235----R239
- IC4-6 ----IC7-5

Jumpers that have been soldered.

- C132---- C135
- C132---- R139
- C232---- C235
- C232---- R239
- IC4-6 ---- TP6
- IC7-2 ---- TP6
- IC7-4 ---- IC6-11
- IC7-1 ---- IC7-11
- IC7-6 ---- IC7-13
- IC7-12 ---- TP5
- IC7-9 ---- IC6-2

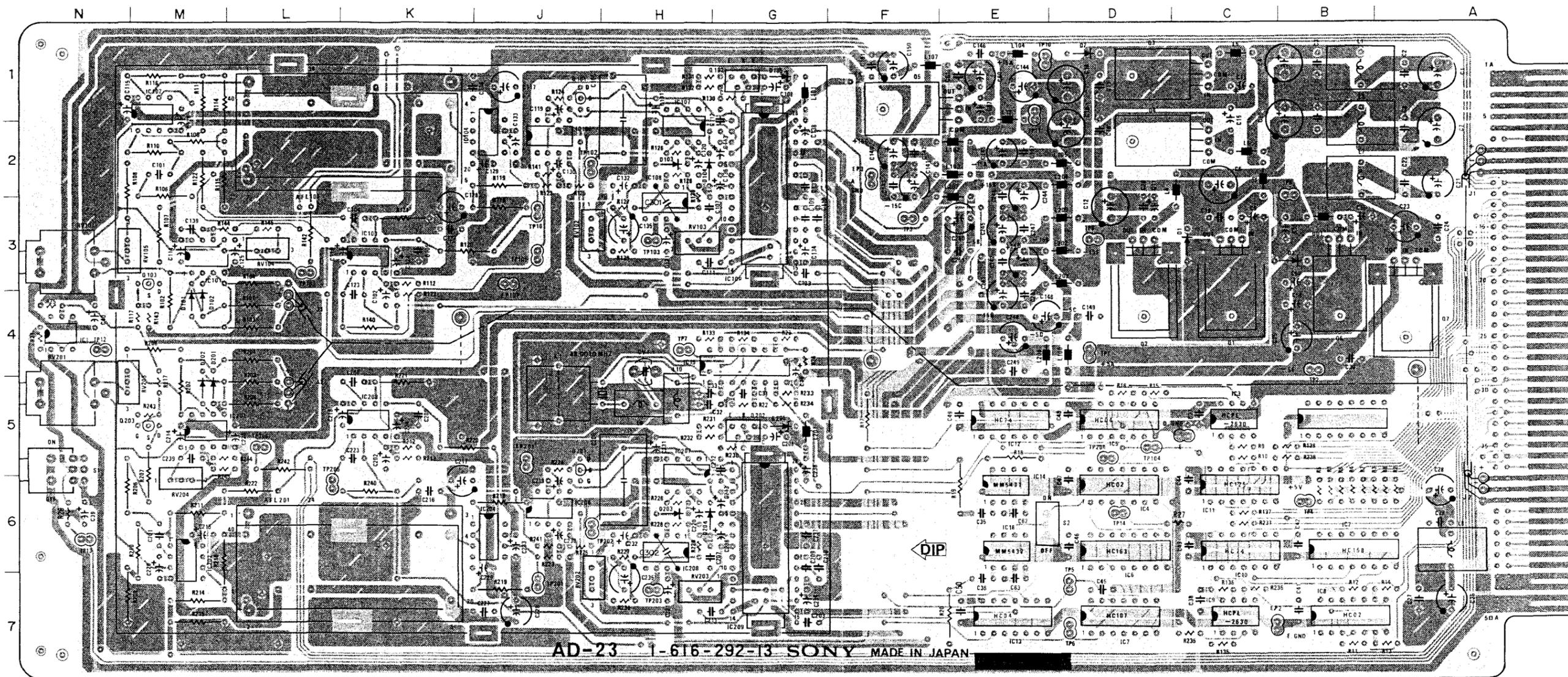
Parts that have been added.

- C301
- C302
- \*C135
- \*C235

\* Only C135 and C235 have been reversely installed against the polarity printed on the board.

AD-23 BOARD (1-616-292-13)  
Component Side

S/N: 10801 AND HIGHER



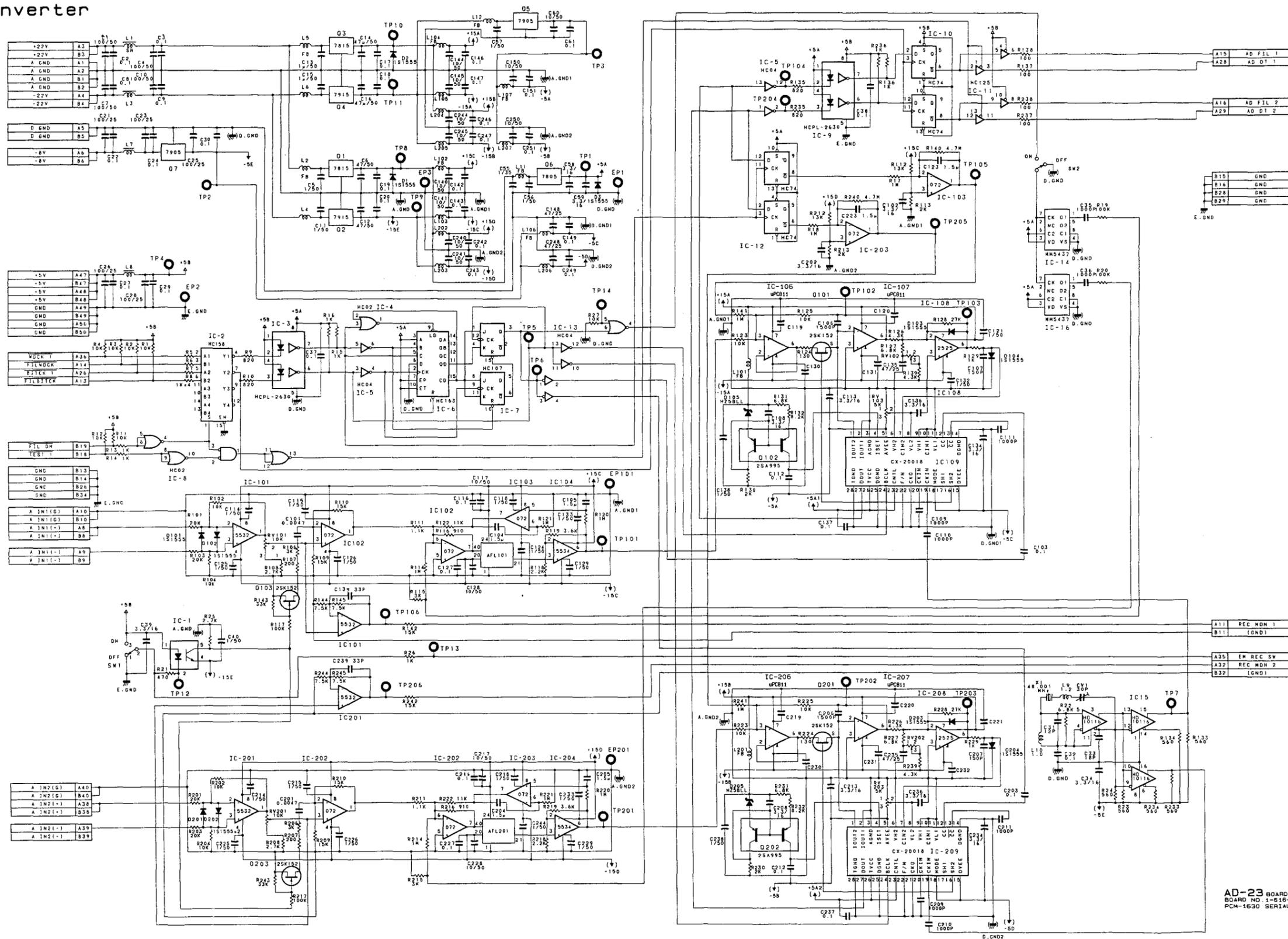
■ SOLDER SIDE PATTERN 1-616-292-13  
□ COMPONENT SIDE PATTERN 1-616-292-13

Note: TP16 on the AD-23 board has been misprinted.  
Please read TP16 as TP106.

Parts that have been added.

C301  
C302

AD-23 BOARD  
Rec Audio  
A/D Converter

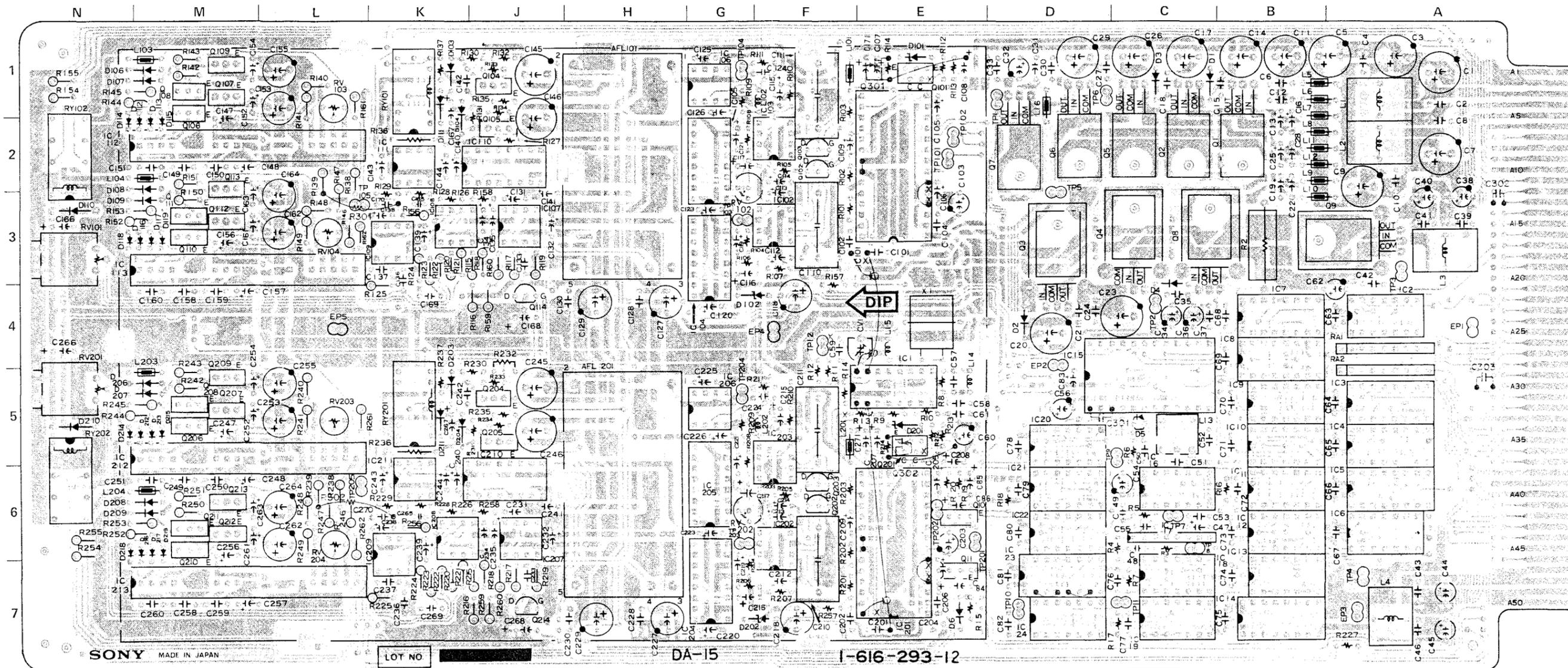


AD-23 BOARD  
BOARD NO. 1-616-292-11 & HIGHER  
PCM-1630 SERIAL NO. 10001 and higher



DA-15 BOARD (1-616-293-12)  
Component Side

S/N; J, U/C 10205 TO 10800  
S/N; AEP 10127 TO 10800

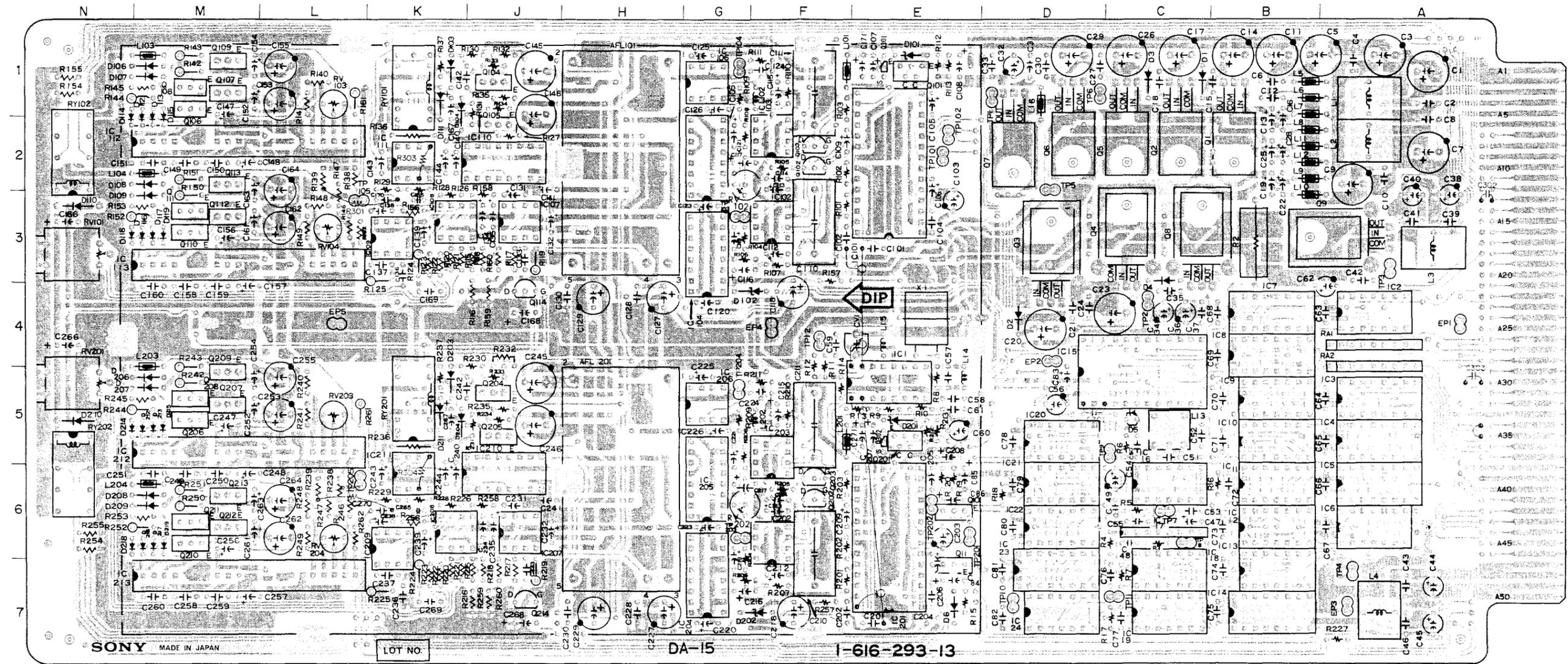


✳ BOLDER SIDE PATTERN 1-616-293-12  
DA-15 BOARD (1-616-293-12) COMPONENT SIDE

- | Traces that have been cut.      | Jumper that have been soldered. | Parts that have been added. |
|---------------------------------|---------------------------------|-----------------------------|
| Q101-C ---- C108                | R114 ---- C108                  | R301                        |
| IC105-4 ---- IC105-5            | IC105-21 ---- IC105-22          | R302                        |
| IC105-5 ---- IC105-6            | IC105-4 ---- IC105-6            | C301                        |
| TP12 ---- Thru hold near X1     | R214 ---- C208                  | C302                        |
| IC1-3 ---- C201                 | IC201-21 ---- IC201-22          | C303                        |
| C101 ---- Thru hold near R157   | IC201-4 ---- IC201-6            | Q301                        |
| Q201-C ---- Thru hold near Q201 | C201 ---- IC1-2                 | Q302                        |
| C201 ---- Thru hold near IC1    | IC23-2 ---- IC23-4              |                             |
| IC201-4 ---- IC201-5            | IC23-5 ---- IC23-7              |                             |
| IC201-5 ---- IC201-6            | C101 ---- IC1-15                |                             |

DA-15 BOARD (1-616-293-13)  
Component Side

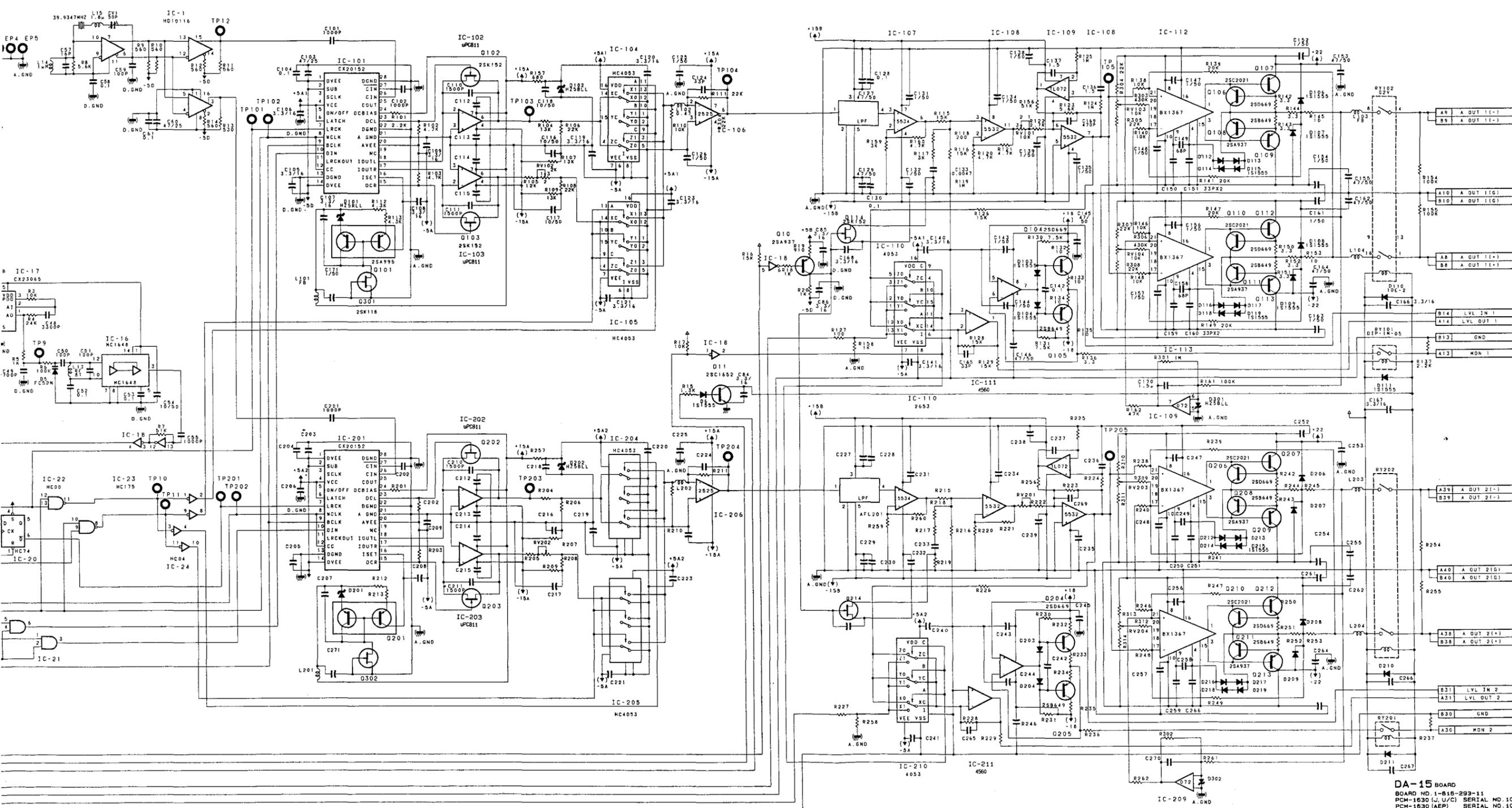
S/N: 10801 AND HIGHER



SOLDER SIDE PATTERN 1-616-293-13

Applicable Serial NO.	Jumpers that have been soldered.	Parts that have been added.
10801 and higher	C201 ---- IC1-2 C101 ---- IC1-15	R301 R302 R303 R304 C301 C302 C303
11301 and higher	A34 ---- A35	—





DA-15 BOARD  
 BOARD NO. 1-616-293-11  
 PCM-1630 (J, U/C) SERIAL NO. 10001 to 10204  
 PCM-1630 (AEP) SERIAL NO. 10001 to 10126

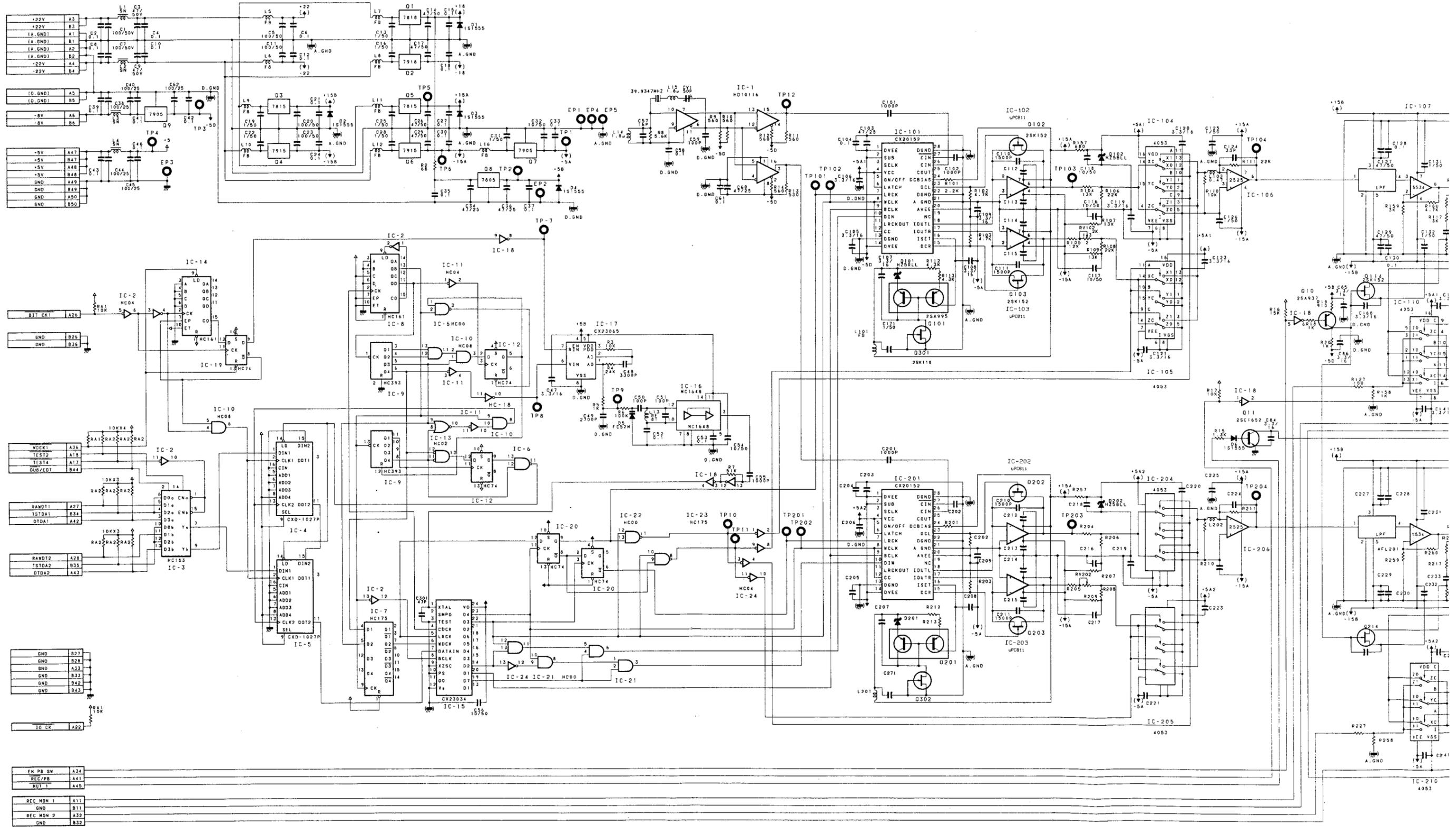
\* THE CIRCUIT DIAGRAM OF CH2 IS THE SAME AS CH1

C-10 (a)

C-11 (a)

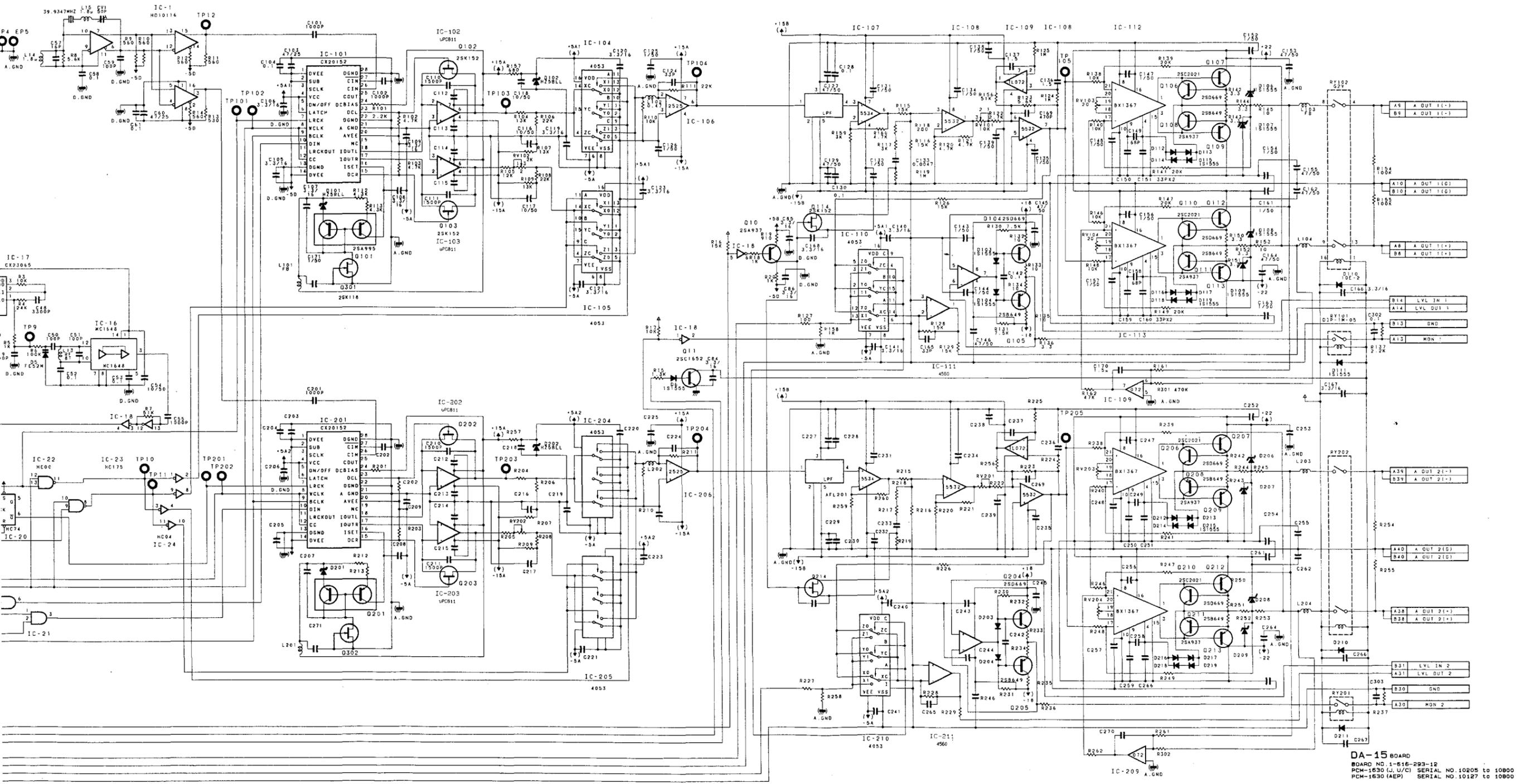
DA-15 BOARD  
D/A Converter  
PB Audio

S/N; J, U/C 10205 TO 10800  
S/N; AEP 10127 TO 10800



C-9 (b)

C-10 (b)



DA-15 BOARD  
 BOARD NO. 1-616-293-12  
 PCM-1630 (L, U/C) SERIAL NO. 10205 to 10800  
 PCM-1630 (AEP) SERIAL NO. 10127 to 10800

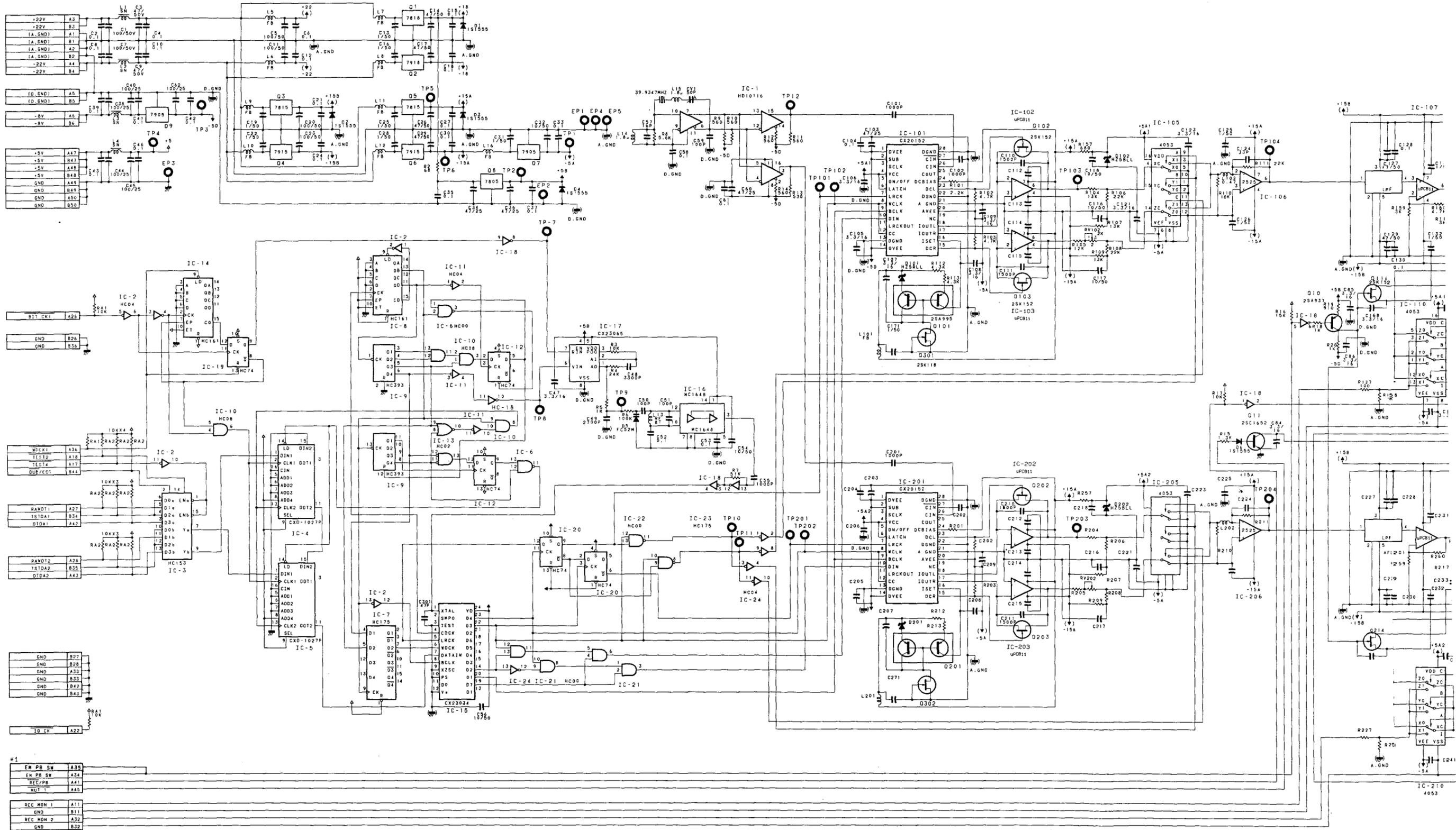
\* THE CIRCUIT DIAGRAM OF CH2 IS THE SAME AS CH1

C-10 (b)

C-11 (b)

DA-15 BOARD  
D/A Converter  
PB Audio

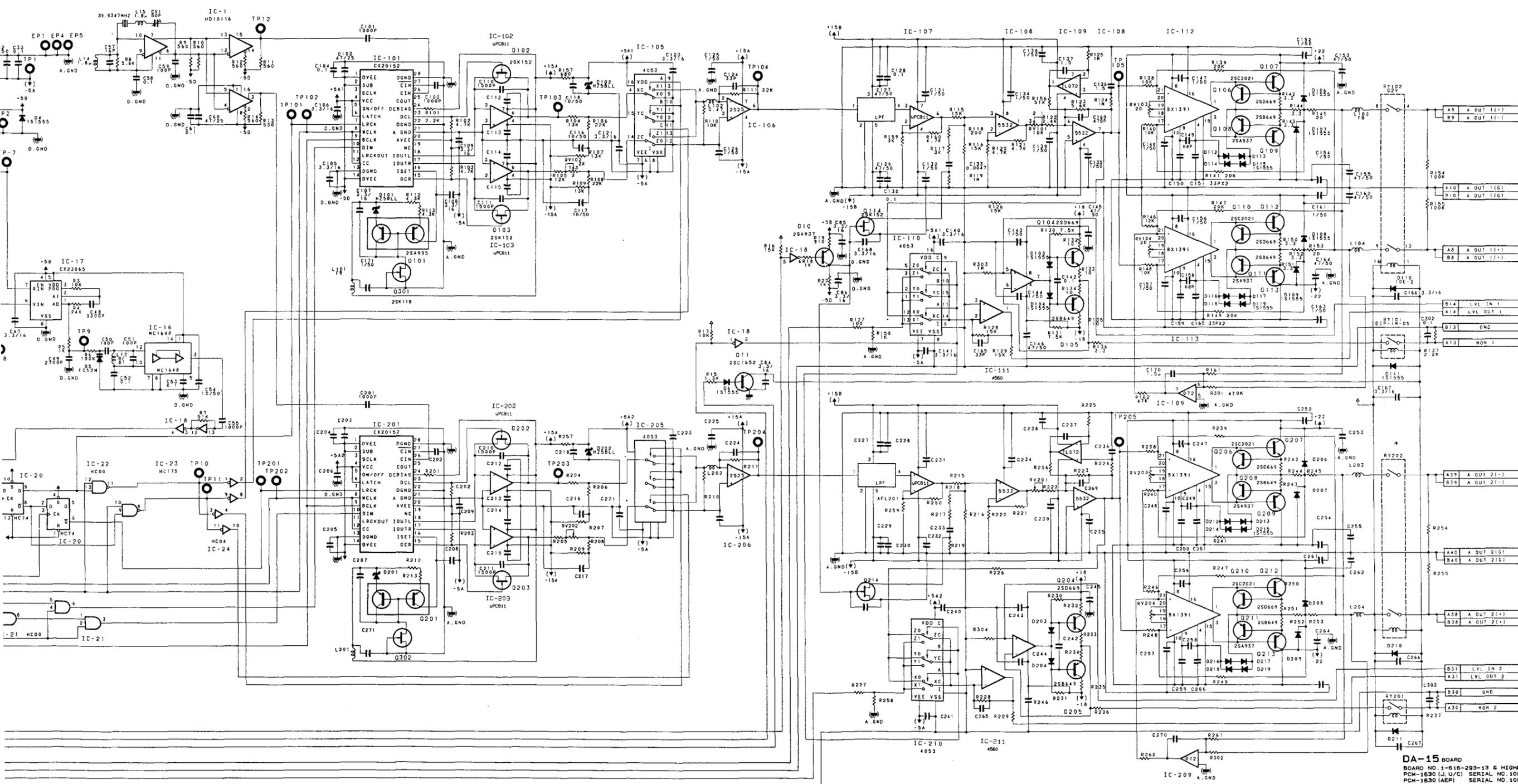
S/N: 10801 AND HIGHER



Note: #1  
This signal (A35) is added from the units with Serial No. 11301 and higher.

C-9 (c)

C-10 (c)



**DA-15 BOARD**  
 BOARD NO. 1-616-293-13 & HIGHER  
 PCM-1630 (U, U/C) SERIAL NO. 10801 and higher  
 PCM-1630 (AEP) SERIAL NO. 10801 and higher

THE CIRCUIT DIAGRAM OF CH2 IS THE SAME AS CH1

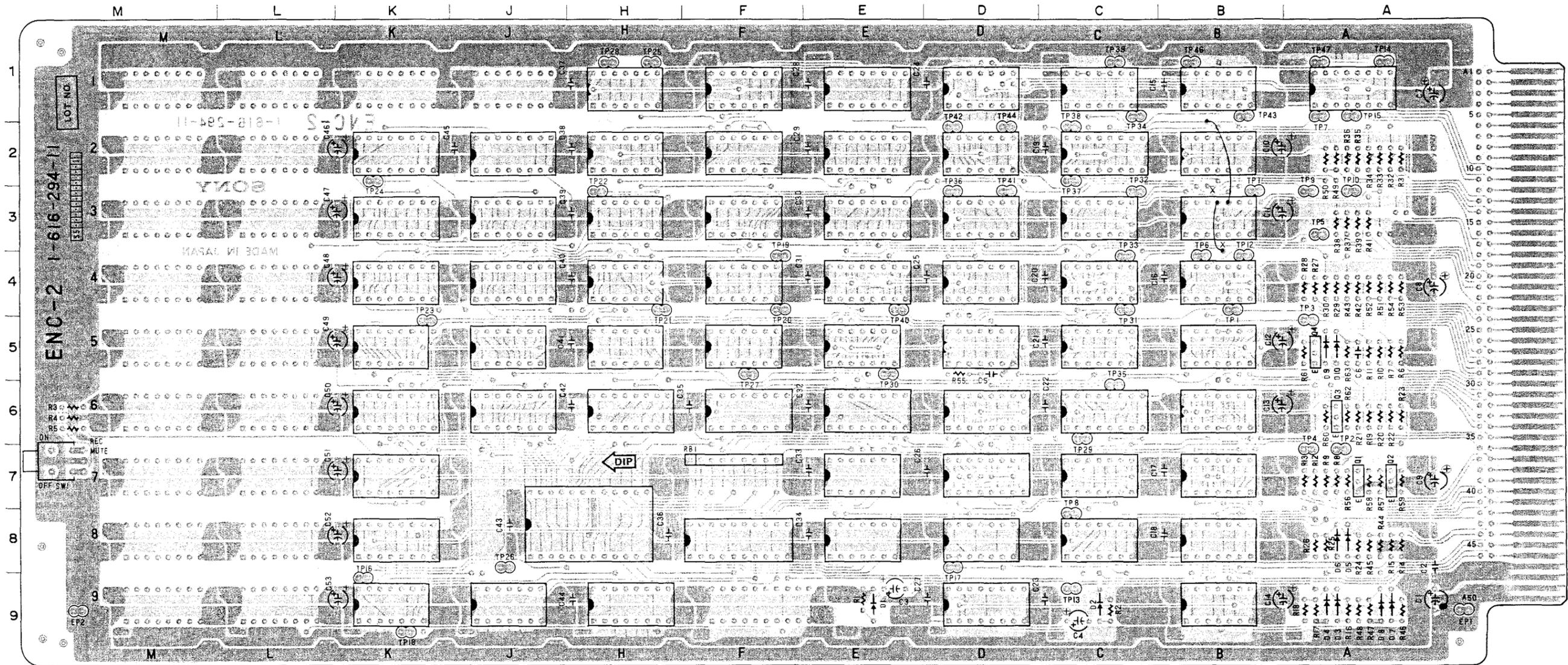
igher.

C-10 (c)

C-11 (c)

ENC-2 BOARD (1-616-294-11)  
Component Side

S/N; J, U/C 10001 TO 10204  
S/N; AEP 10001 TO 10126



□ SOLDER SIDE PATTERN 1-616-294-11

Traces that have been cut.

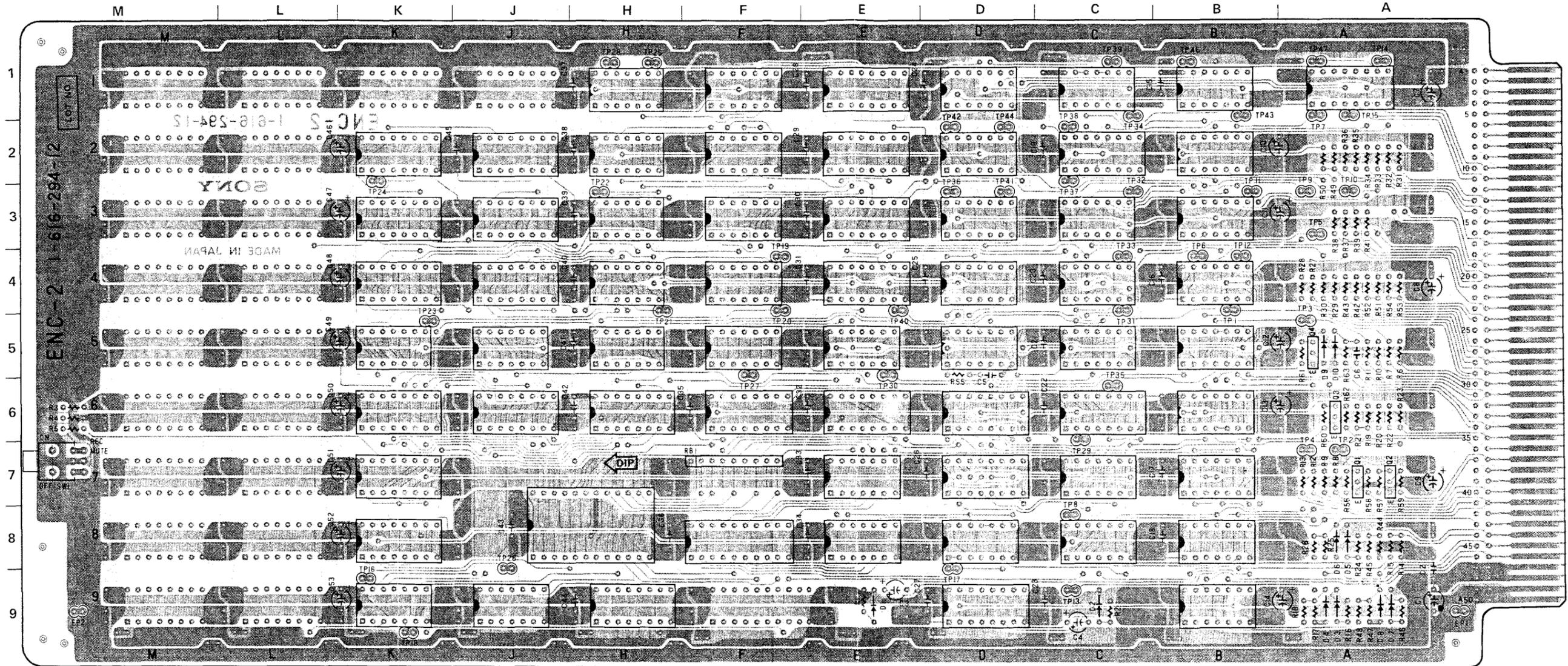
IC1C-3 ---- IC3B-11  
IC3B-10 ---- IC4C-9

Jumpers that have been soldered.

IC1C-3 ---- IC3B-10  
IC3B-11 ---- IC4C-9

ENC-2 BOARD (1-616-294-12)  
Component Side

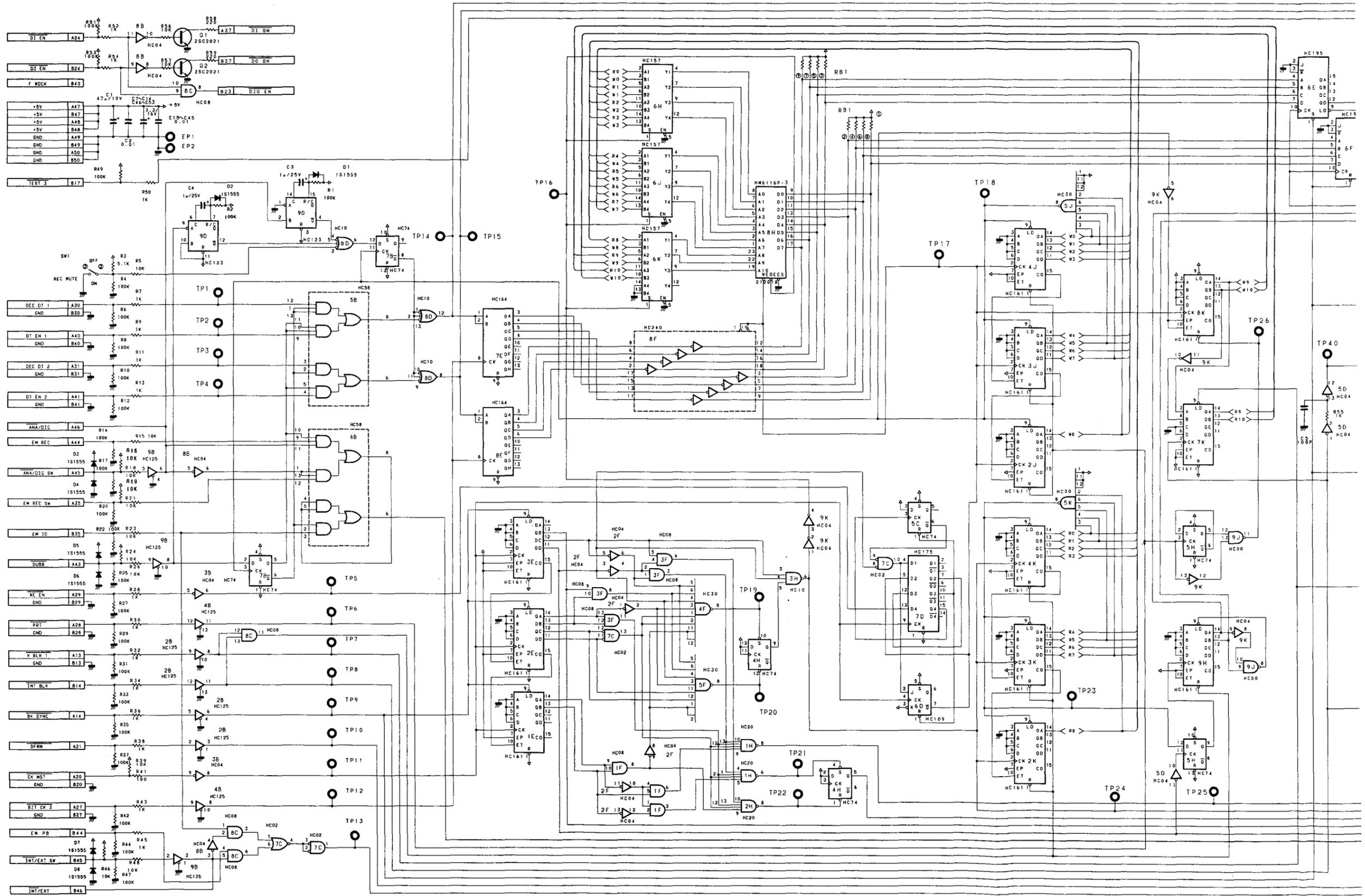
S/N; J, U/C 10205 AND HIGHER  
S/N; AEP 10127 AND HIGHER

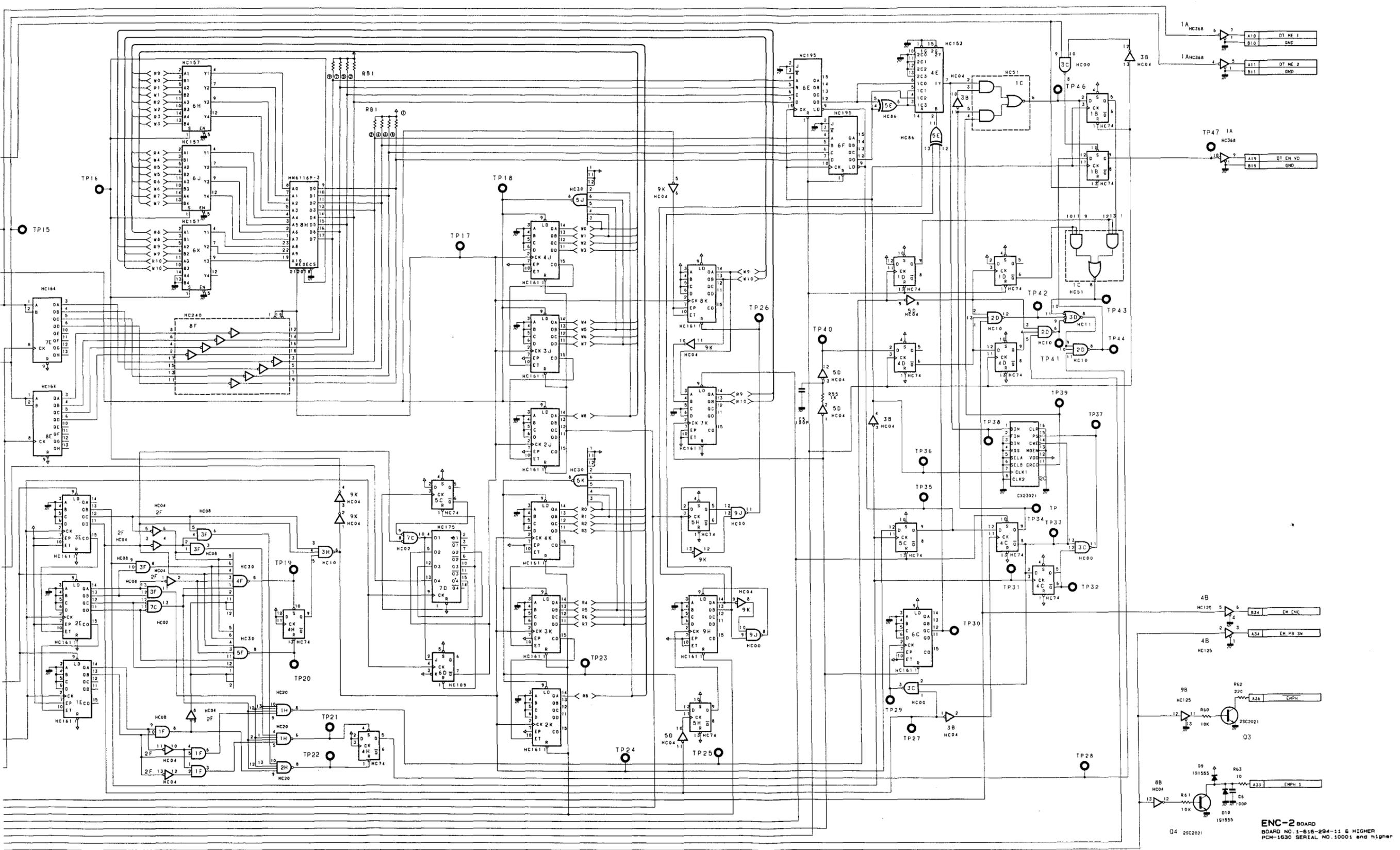


ENC-2 SOLDER SIDE PATTERN 1-616-294-12  
ENC-2 COMPONENT SIDE PATTERN 1-616-294-12

ENC-2 BOARD  
Encoder

ENC-2 ENC-2

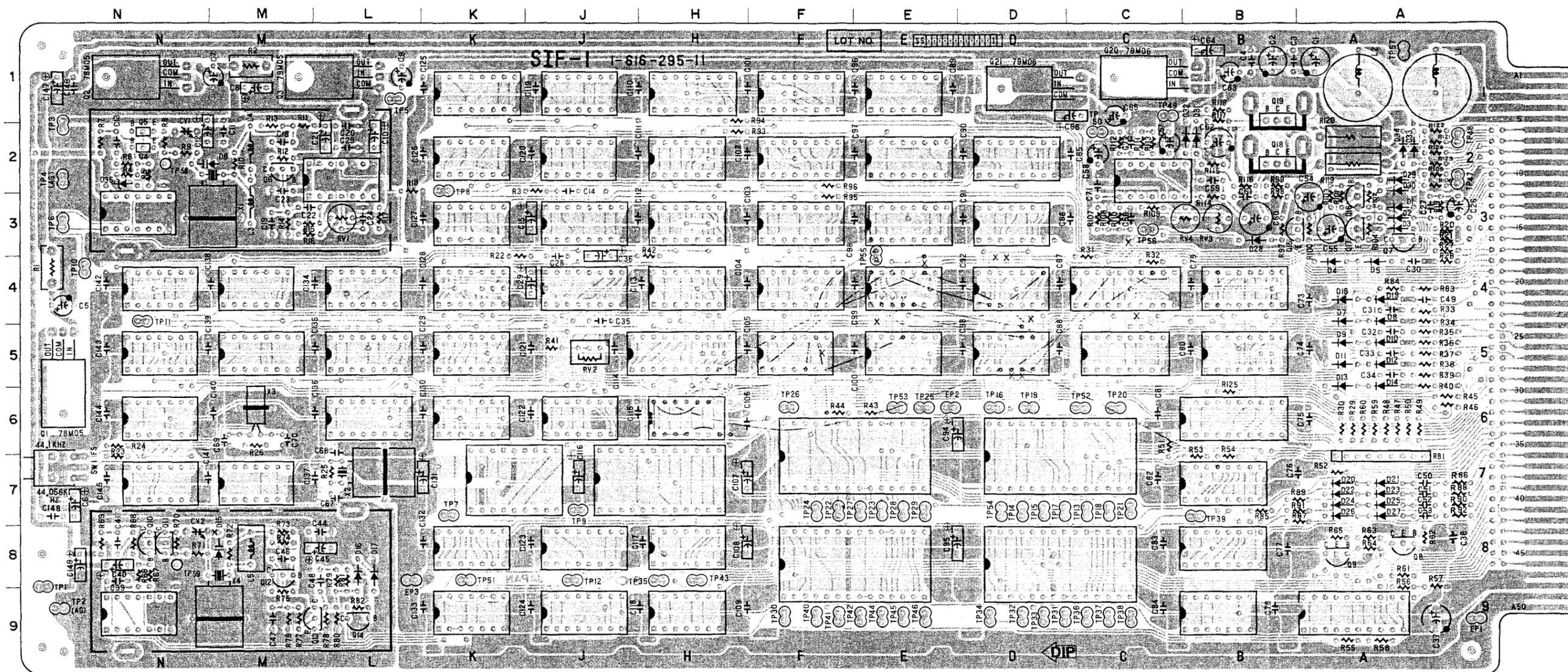




ENC-2 BOARD  
 BOARD NO. 1-616-294-11 & HIGHER  
 PCM-1630 SERIAL NO. 10001 and higher

SIF-1 BOARD (1-616-295-11)  
Component Side

S/N; J, U/C 10001 TO 10204  
S/N; AEP 10001 TO 10126



© SOLDER SIDE PATTERN 1-616-295-11

Traces that have been cut.

- IC4E-2----GND
- IC4E-3----GND
- IC4E-4----GND
- IC4C-7----TP56
- IC4C-15----IC5D-9
- IC4C-15----IC4E-9
- IC3D-12----IC4D-2
- IC2D-1----IC4D-3
- IC5F-7----IC5F-9
- TP55----Thru hold near IC5E
- IC4D-8----IC5D-12
- IC5D-4----IC5D-5
- IC5D-5----IC5D-7

Jumpers that have been soldered.

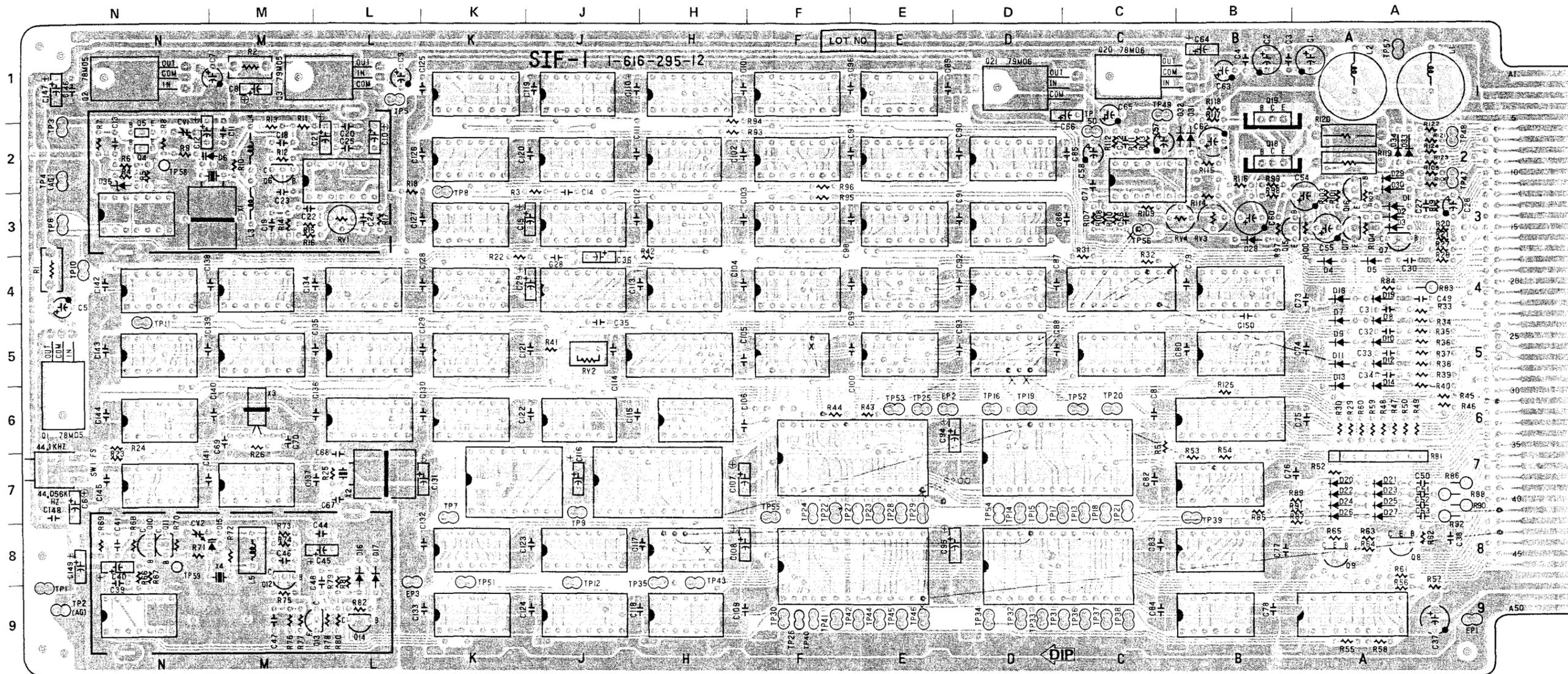
- IC5F-9----R44
- IC2E-1----IC3E-1
- TP56----IC5D-6
- IC4C-13----IC5D-4
- IC5D-5----IC7B-13
- IC4E-2----IC4D-8
- IC4E-3----IC5D-10
- IC4E-4----IC4E-14
- IC4E-5----IC5D-12
- IC5D-9----IC4E-9
- TP55----IC5F-5
- TP55----IC4D-2

Parts that have been added.

- IC6H-1----IC6H-14
- IC6H-2----IC6H-3
- IC6H-3----IC6H-4
- IC6H-4----IC6H-7
- IC6H-7----GND
- IC6H-9----IC4C-15
- IC6H-10----IC4C-14
- IC6H-11----IC5E-11
- IC6H-12----IC4E-9
- IC6H-13----IC5D-3
- C150
- IC6H

SIF-1 BOARD (1-616-295-12)  
Component Side

S/N; J, U/C 10205 AND HIGHER  
S/N; AEP 10127 AND HIGHER



30 SOLDER SIDE PATTERN 1-616-295-12

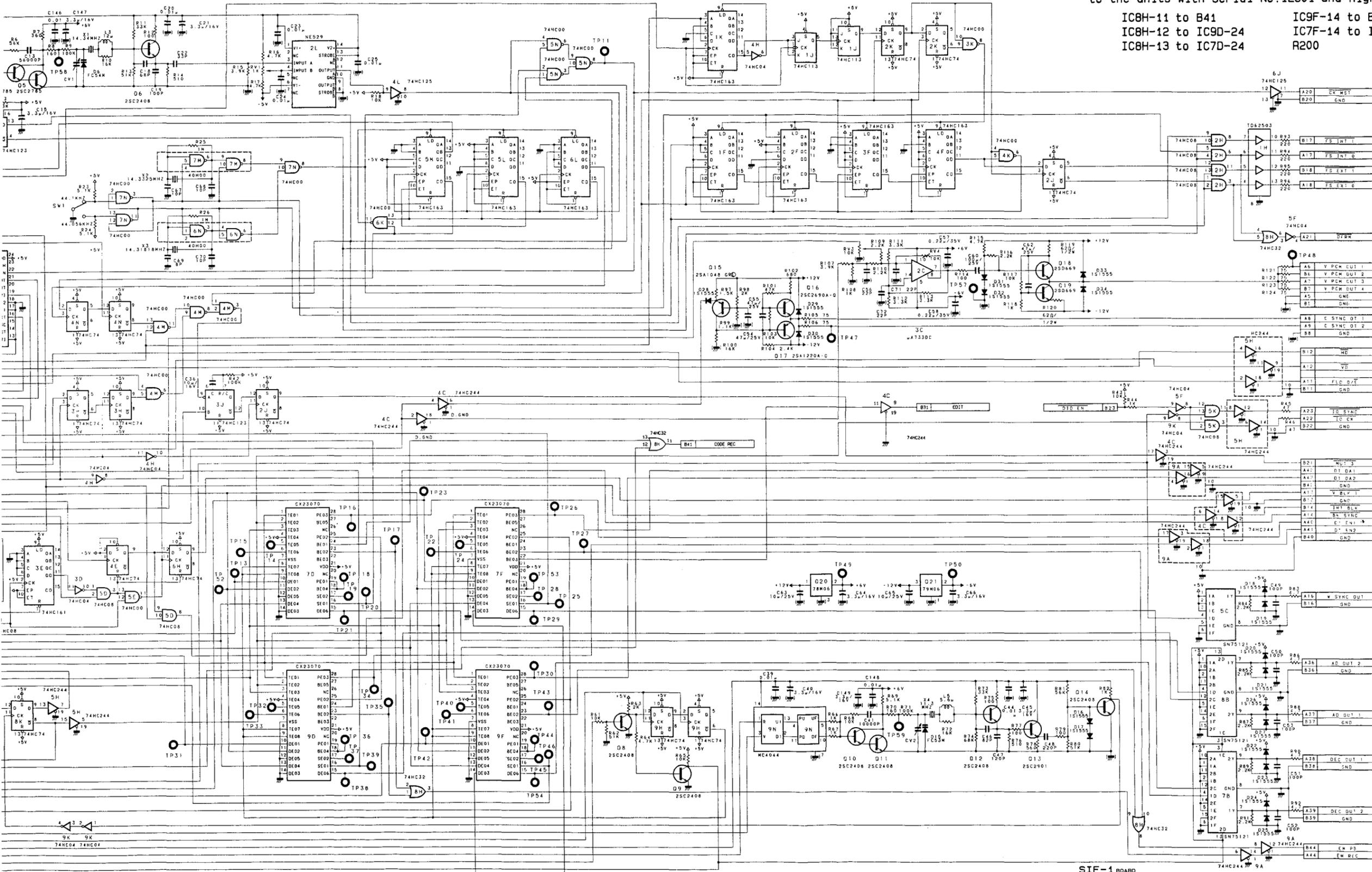
Applicable Serial No.	Traces that have been cut.	Jumpers that have been soldered.	A part that has been added.
J, U/C: 10205 and higher AEP : 10127 and higher	TP56 ---- IC4C-7 IC5D-4 ---- IC5D-5 IC5D-5 ---- IC5D-7 IC5F-7 ---- IC5F-9	IC5F-9 ---- R44 IC5D-6 ---- TP56 IC4C-13 ---- IC5D-4 IC5D-5 ---- IC7B-13	_____
J, U/C, AEP: 11301 and higher	IC4C-11 ---- GND	IC7F-22 ---- IC4C-11 IC4C-9 ---- B31	_____
J, U/C, AEP: 12801 and higher	IC7F-14 ---- GND IC9F-14 ---- GND IC8H-12 ---- IC6H-9	IC8H-11 ---- B41 IC9F-14 ---- B43 IC7D-24 ---- IC8H-13 IC7F-14 ---- IC9F-14 IC9D-24 ---- IC8H-12	R200



NOTE:  
 • The signal line (IC7F-22 to IC4C-11) is applicable to the units with Serial No.11301 and higher.  
 • The following signal lines and a resistor are applicable to the units with Serial No.12801 and higher.

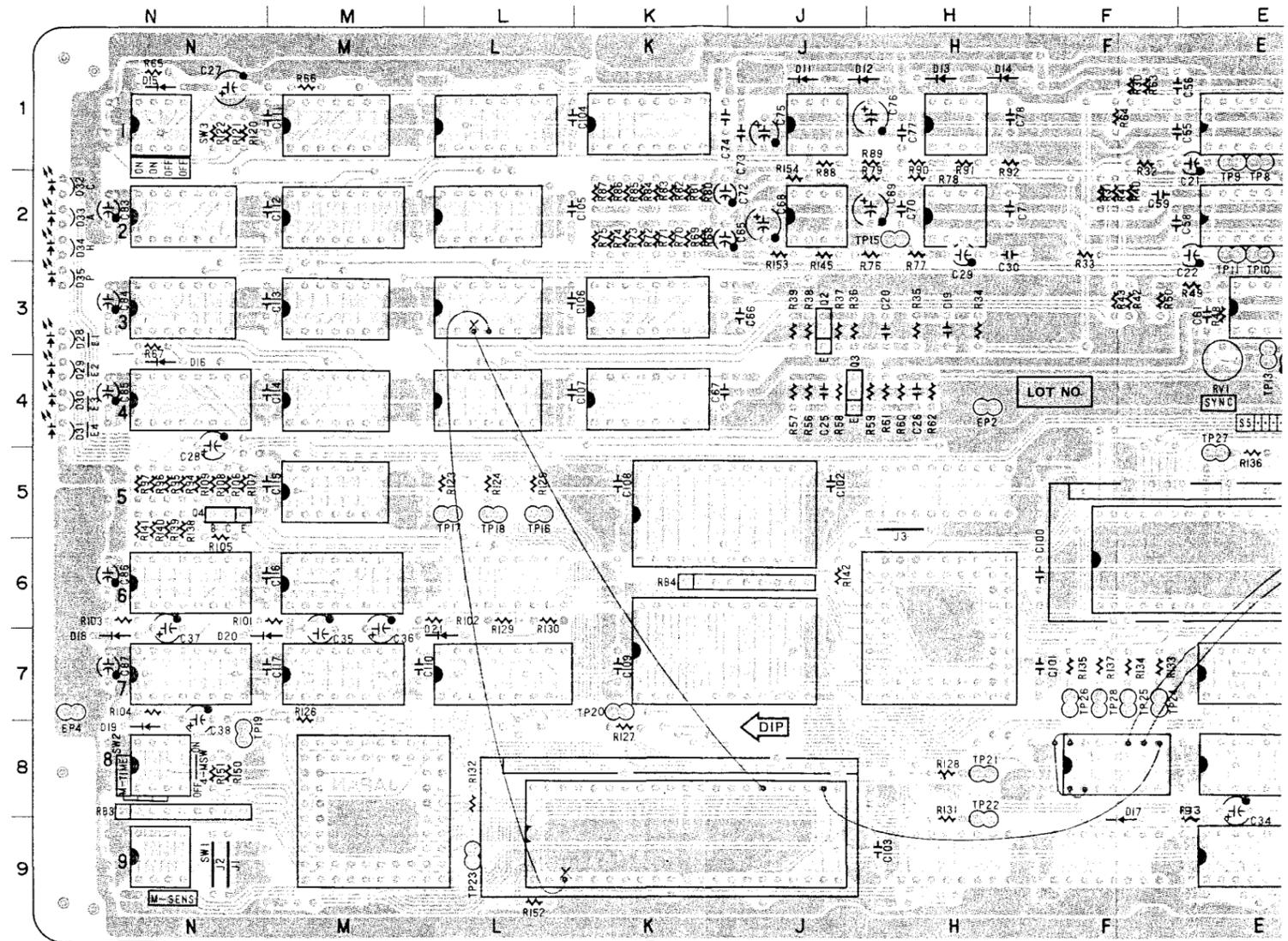
IC8H-11 to B41  
 IC8H-12 to IC9D-24  
 IC8H-13 to IC7D-24

IC9F-14 to B43  
 IC7F-14 to IC9F-14  
 R200



SIF-1 BOARD  
 BOARD NO. 1-1530-295-11 & HIGHER  
 PCM-1530 SERIAL NO. 10001 and higher

DEC-15 BOARD (1-616-296-11)  
Component Side

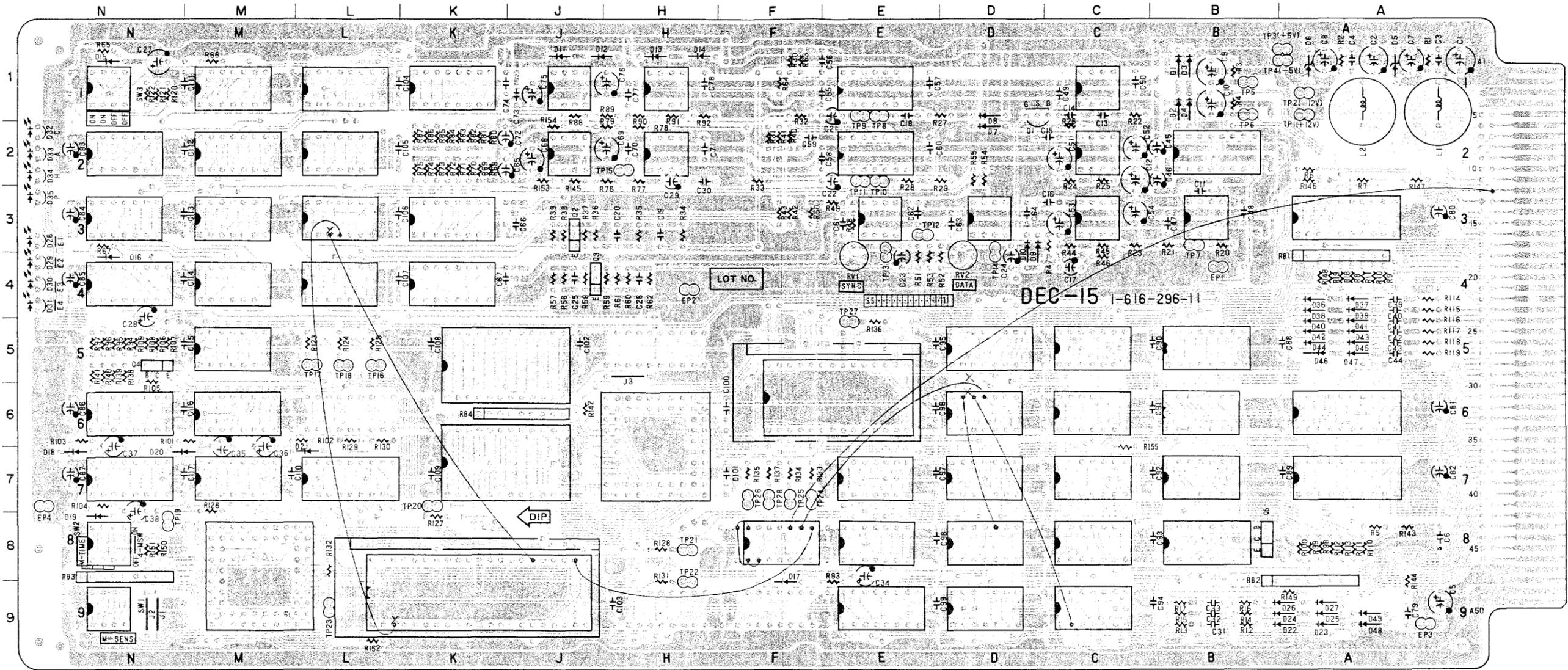


● SOLDER SIDE PATTERN 1-616-296-11

Applicable Serial NO.	Pa
10205 and higher	
12201 and higher	

C-24

DEC-15 BOARD (1-616-296-11)  
Component Side

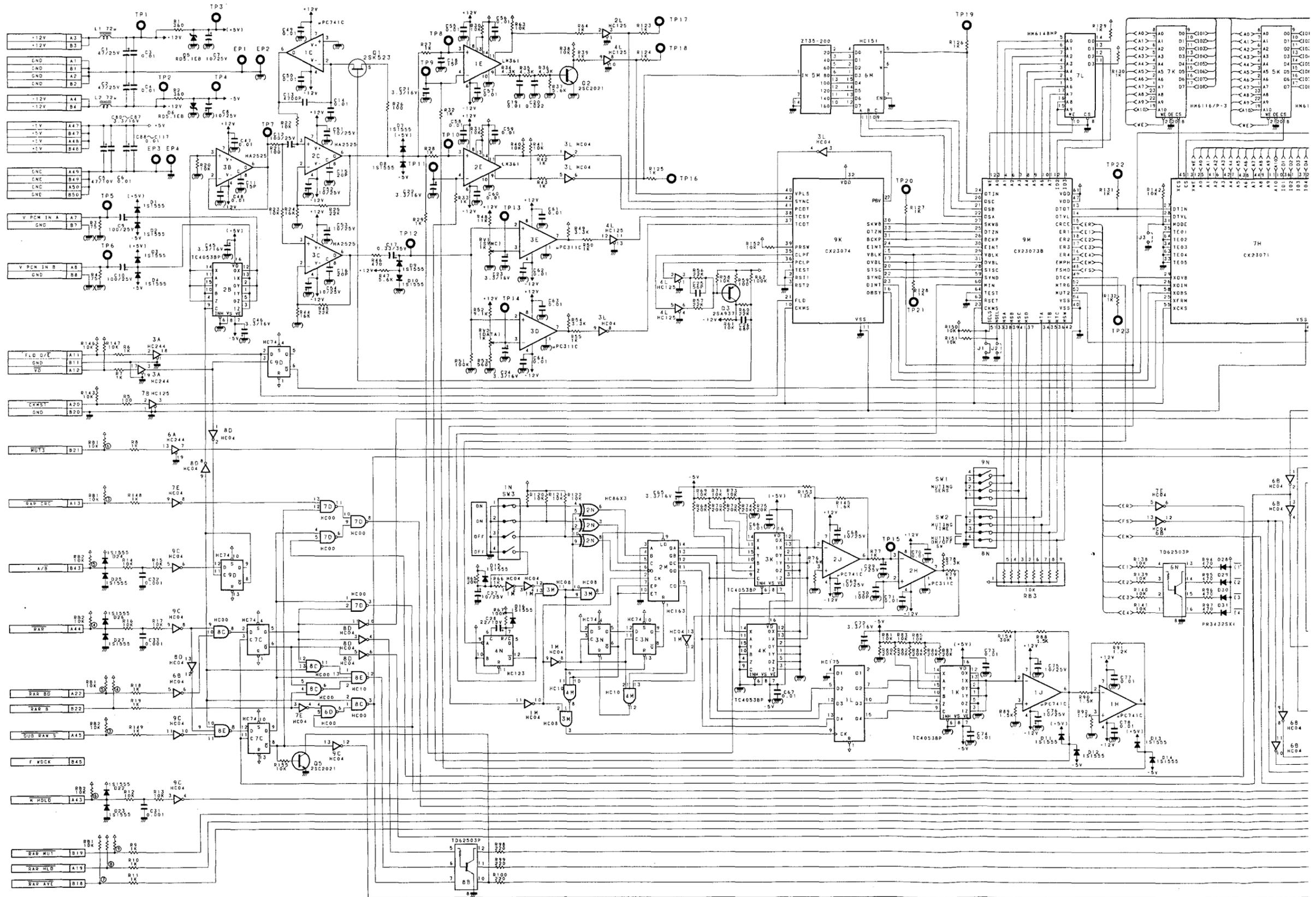


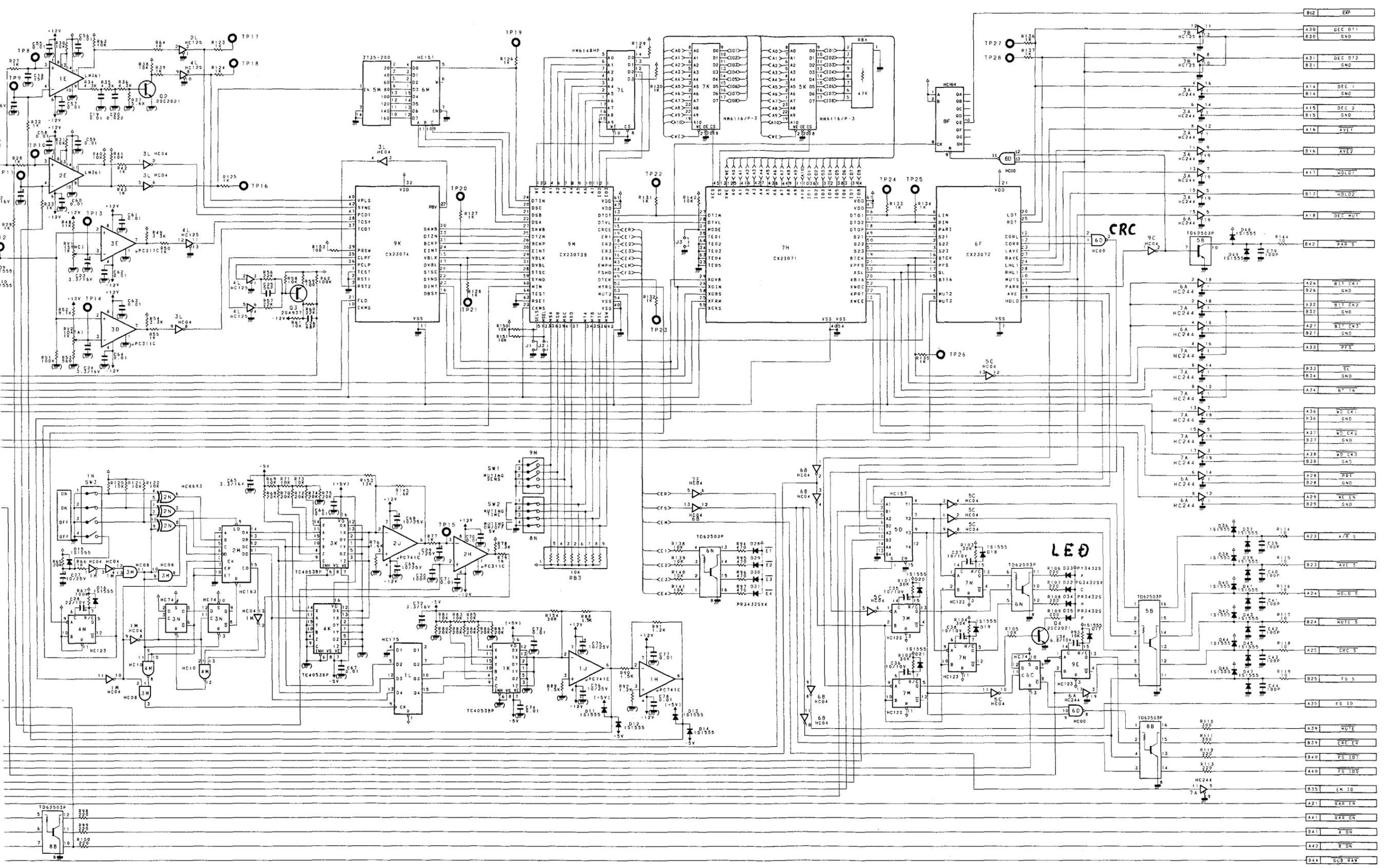
SOLDER SIDE PATTERN 1-616-296-11

Applicable Serial NO.	Part that has been added.	Traces that have been cut.	Jumpers that have been soldered.
10205 and higher	_____	IC3L-3-----GND IC9K-3-----GND	<del>IC3L-3-----IC9K-25</del> IC3L-4-----IC9K-3
12201 and higher	IC8F----MC74HC164N	IC6D-12----GND IC6D-12----IC6D-13	IC3L-3-----IC9K-27 IC8F-1, 2, 14 --- +5V IC8D-10-----IC6D-13 IC8F-8-----IC9K-23 IC8F-9-----IC6D-11 IC8F-10-----CNB12 IC9C-2-----IC6D-12

DEC-15 BOARD Decoder

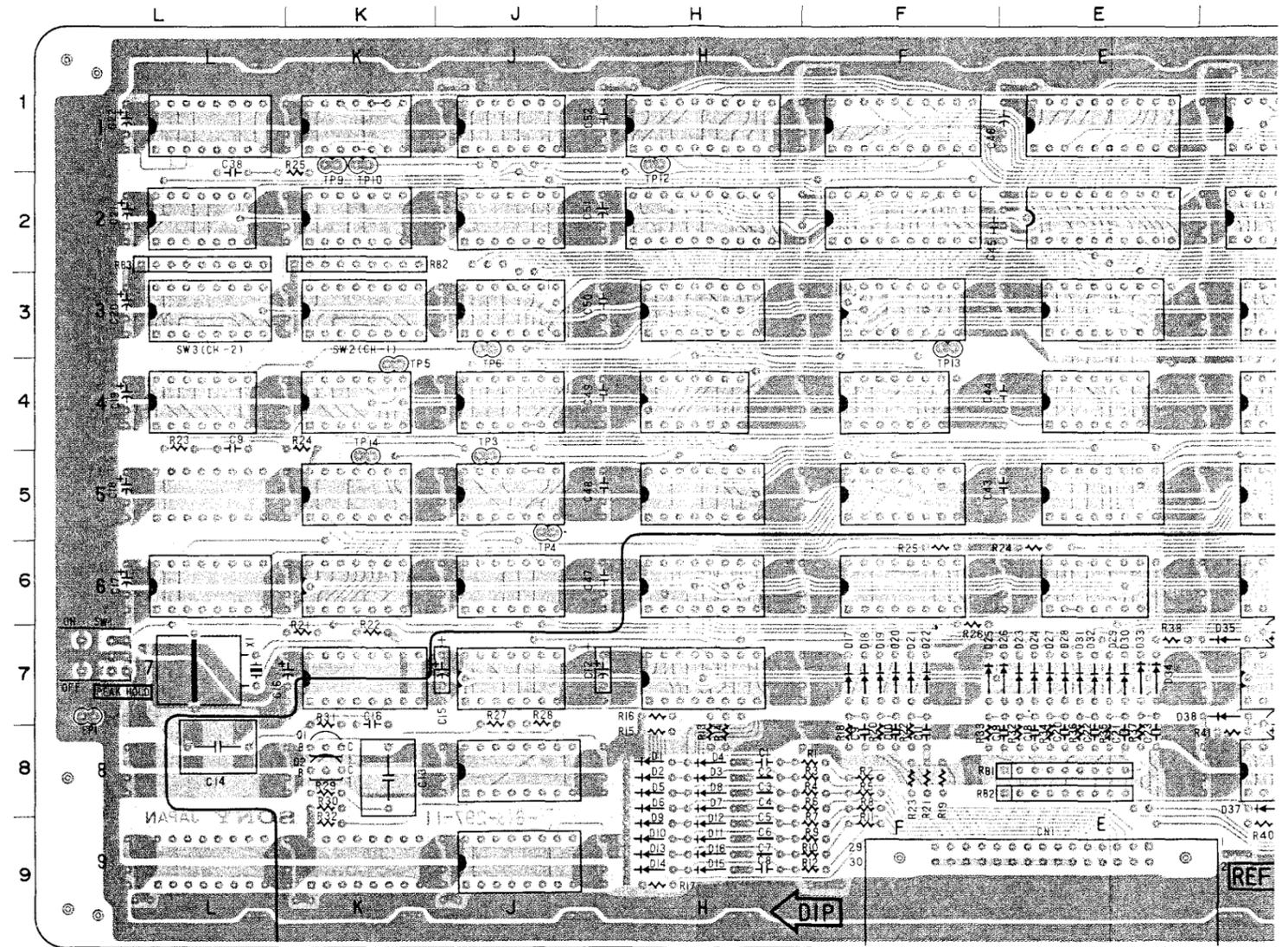
Sync Separator  
Data Separator  
Decoder





DEC-15 BOARD  
 BOARD NO. 1-616-286-11 & HIGHER  
 PCM-1530 SERIAL NO. 10001 AND HIGHER

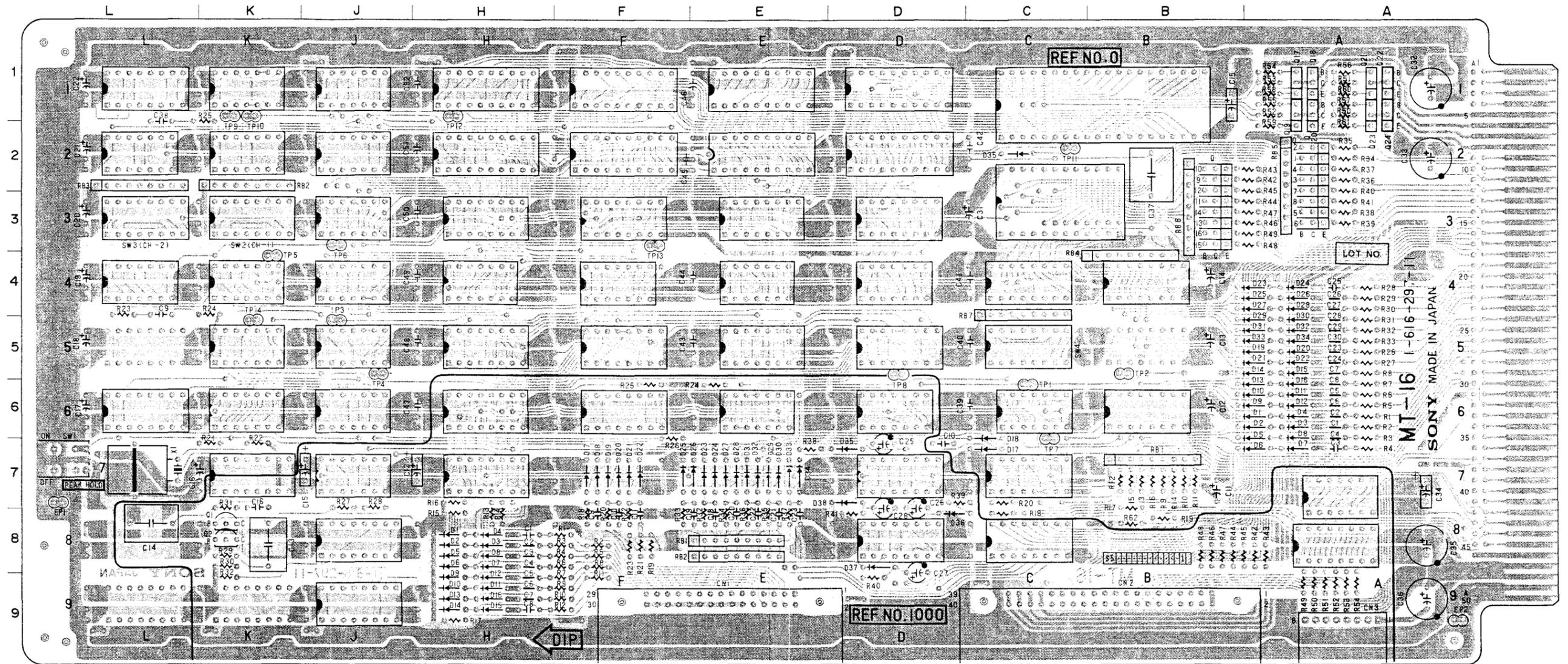
MT-16 BOARD (1-616-297-11)  
Component Side



■ SOLDER SIDE PATTERN 1-616-297-11  
\* SOLID LINE COMPONENT PATTERN (1-616-297-11)

C-30

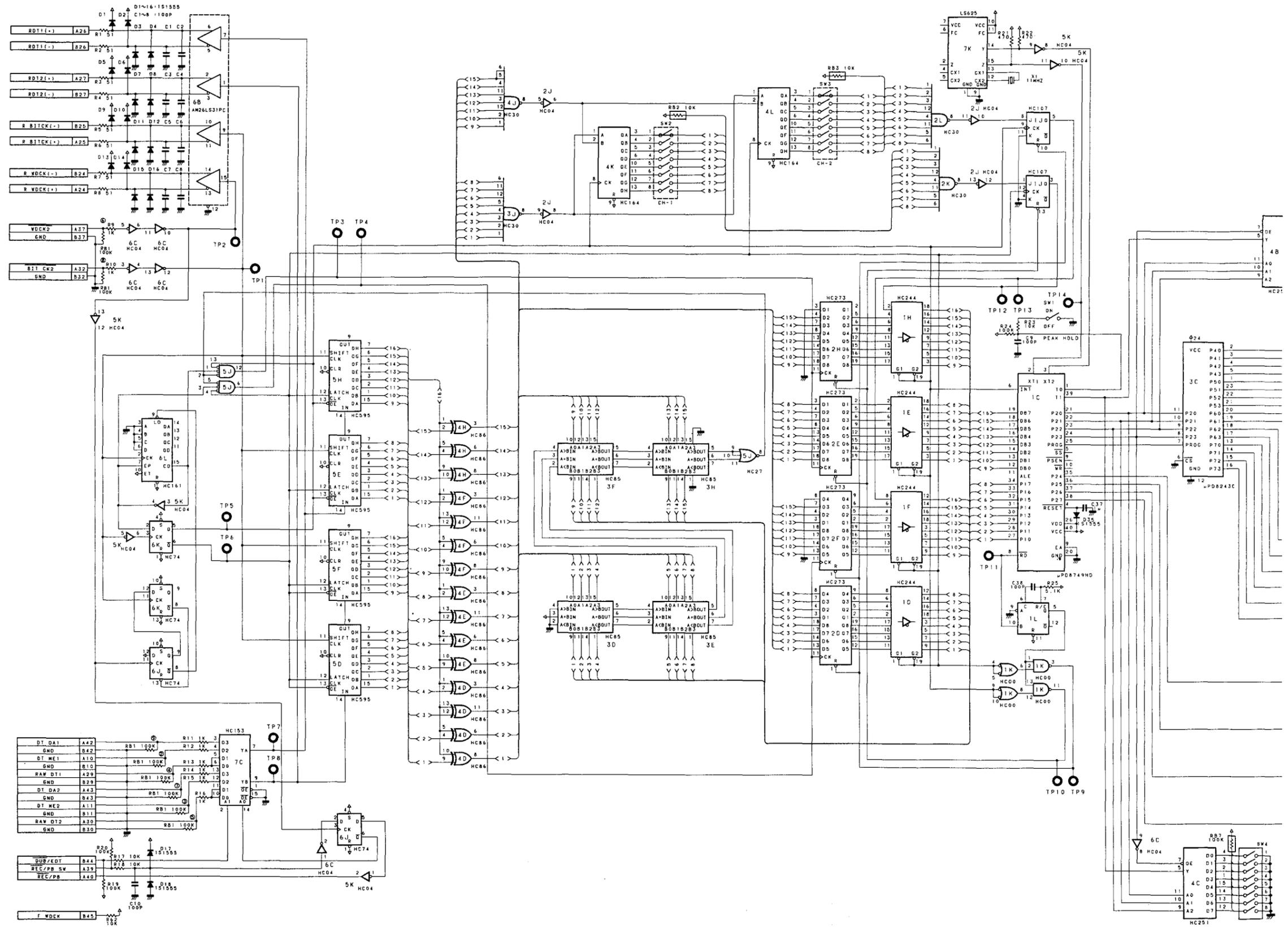
MT-16 BOARD (1-616-297-11)  
Component Side

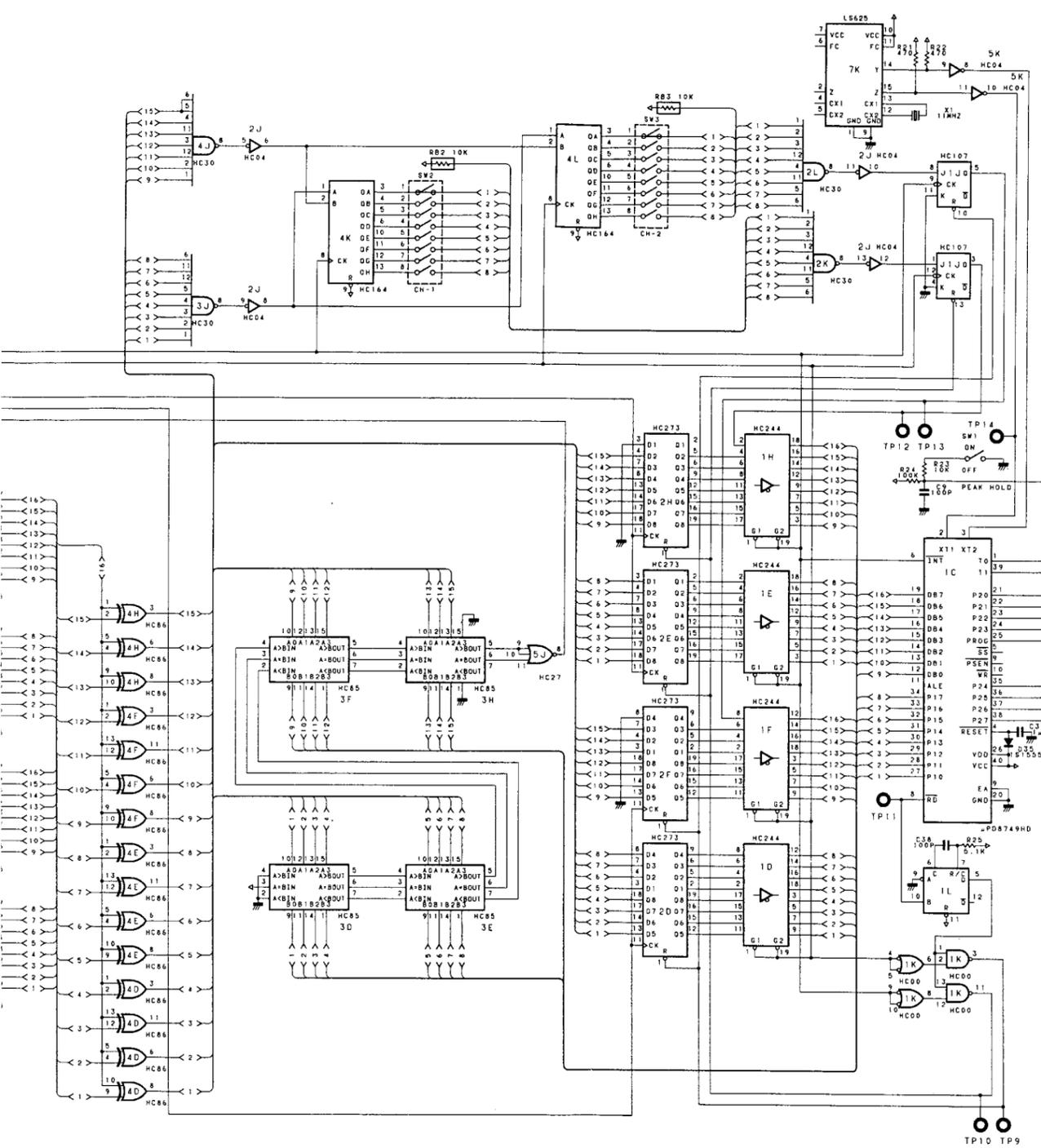


MT-16  
SONY MADE IN JAPAN

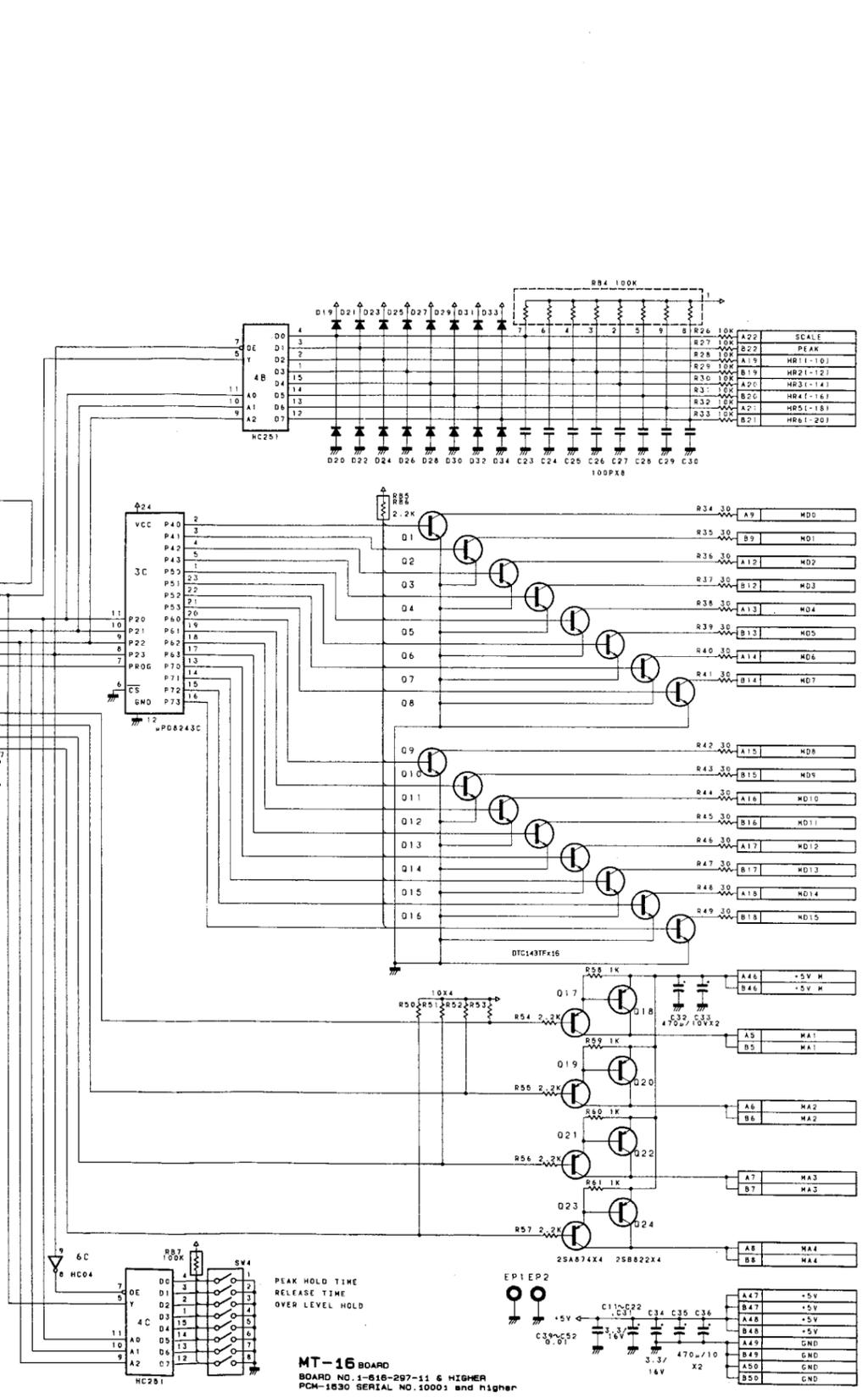
■ SOLDER SIDE PATTERN 1-616-297-11

MT-16 BOARD  
Meter Control





C-34

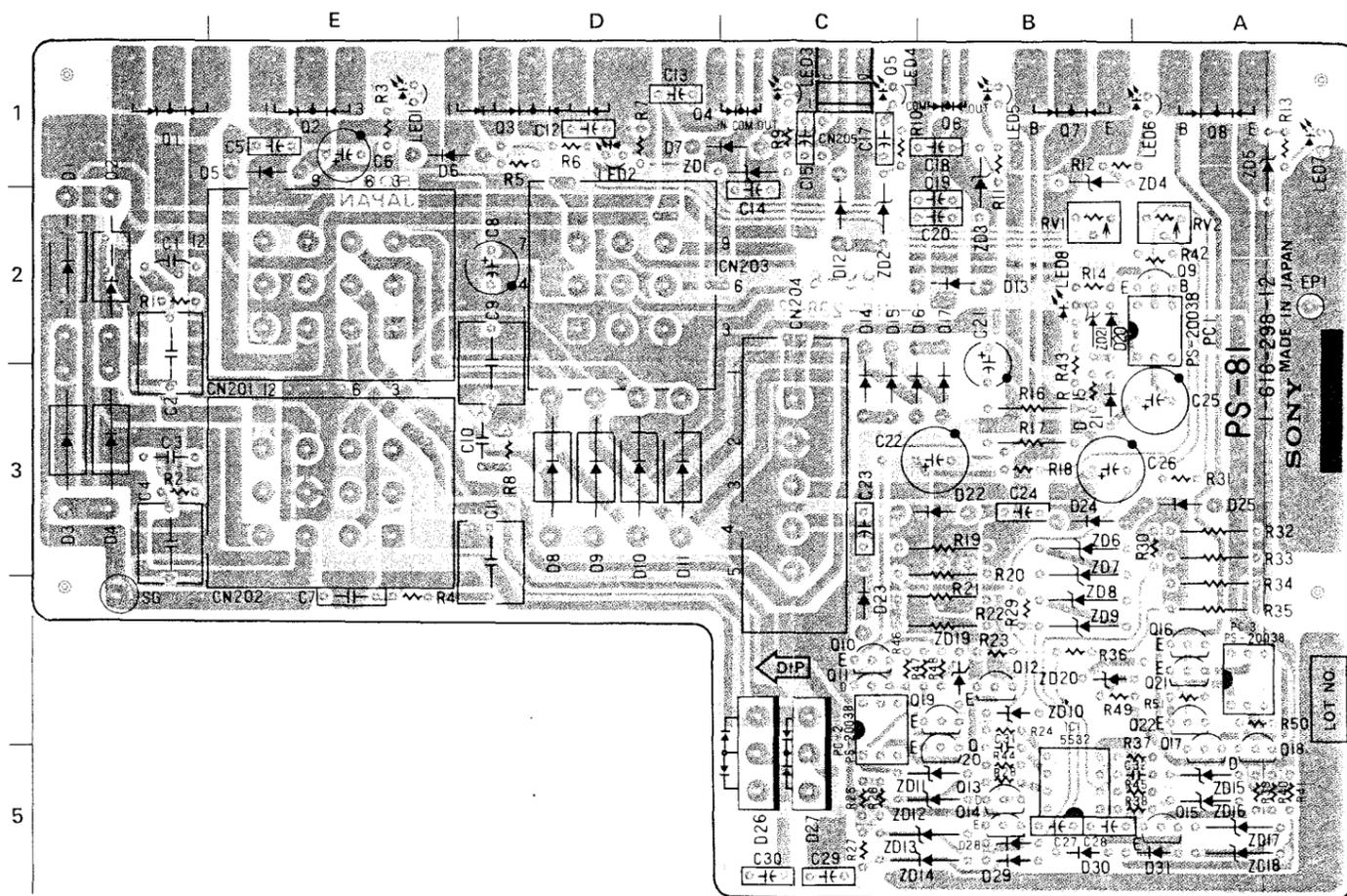
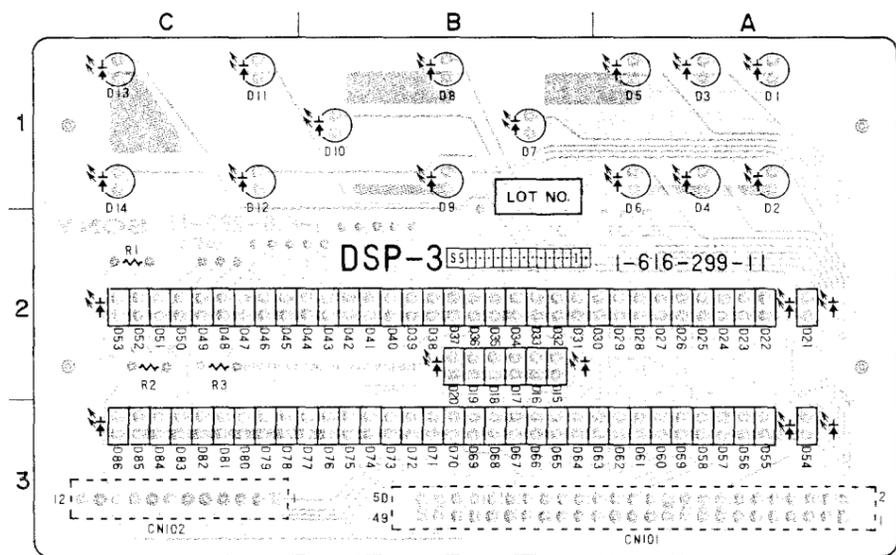


MT-16 BOARD BOARD NO. 1-818-287-11 & HIGHER PCM-1830 SERIAL NO.10001 and higher

C-35

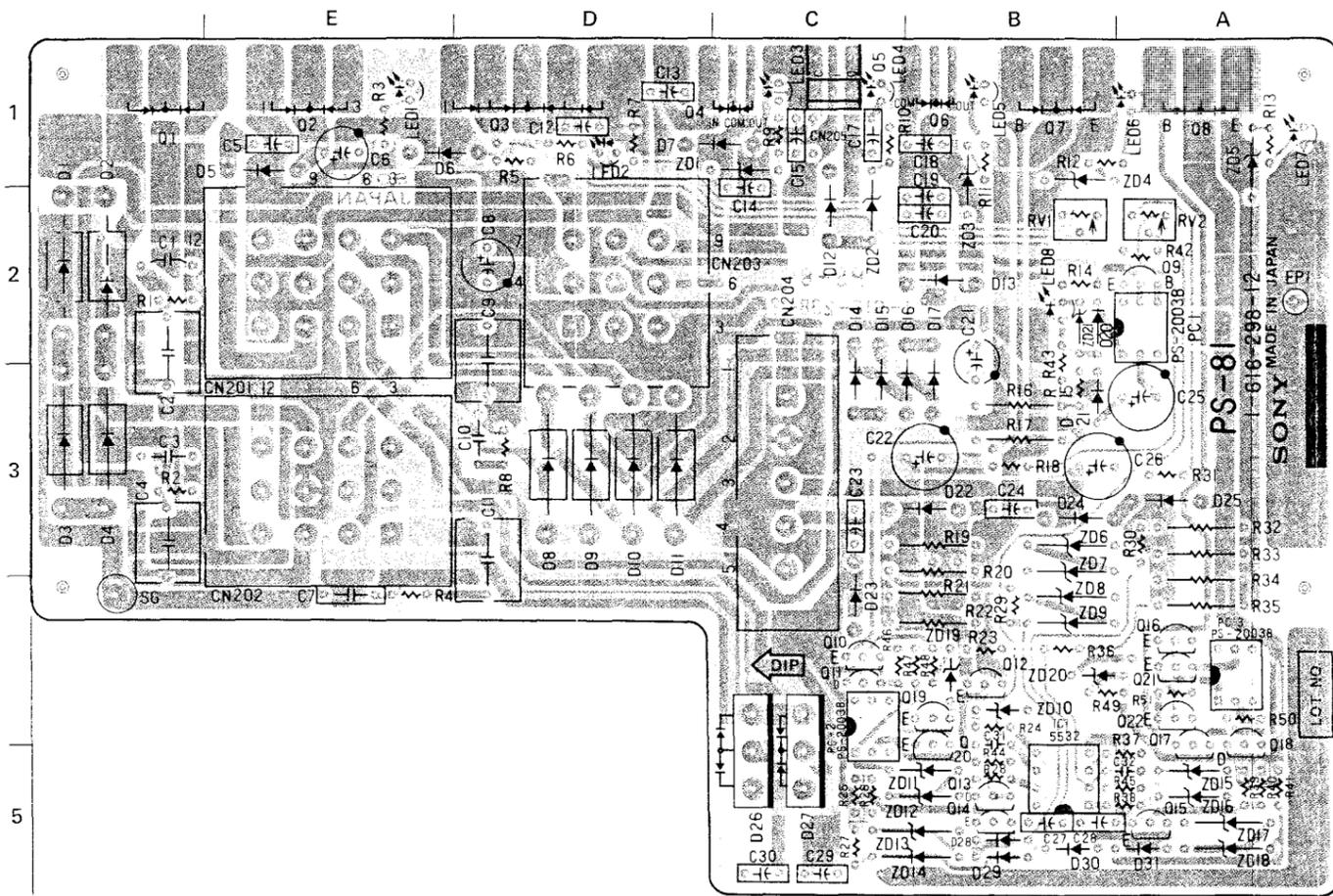
DSP-3 BOARD (1-616-299-11)  
Component Side

PS-81 BOARD (1-616-298-12)  
Component Side

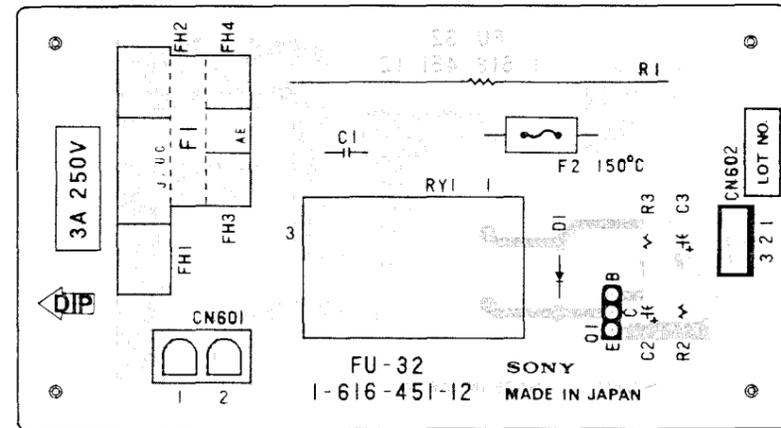


SOLDER SIDE PATTERN 1-616-298-12

PS-81 BOARD (1-616-298-12)  
Component Side



FU-32 BOARD (1-616-451-12)  
Component Side



☞ SOLDER SIDE PATTERN 1-616-298-12

☞ VOLTAGE OF BATTERY 1.5V (4x1.5V)

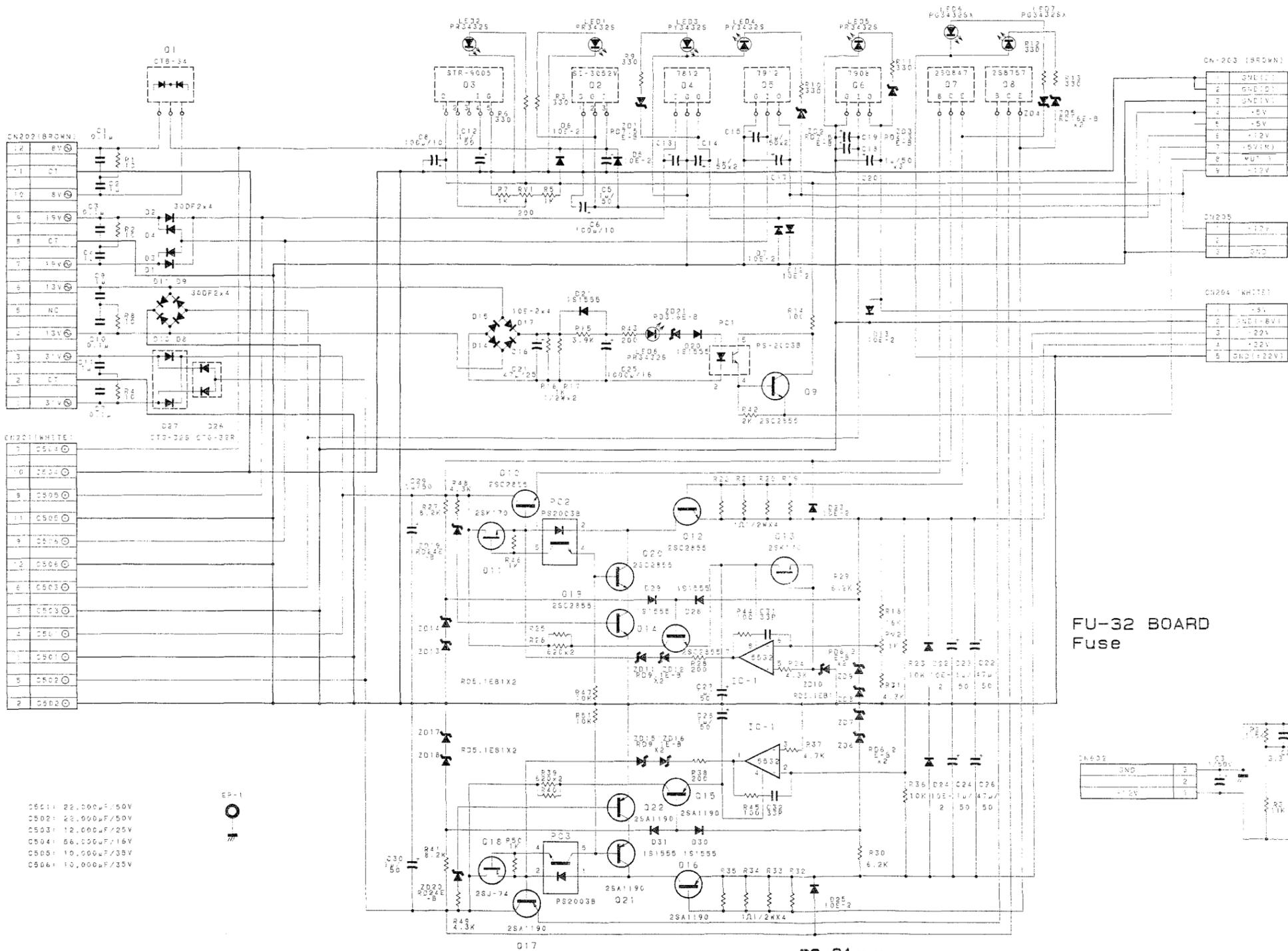


PS-81 BOARD  
Power Supply

1: B5534S  
2: P5534S  
3: P5534S  
4: P5534F  
5: P5531K  
6: P5531KX

W12  
W21  
W22  
W23  
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W100

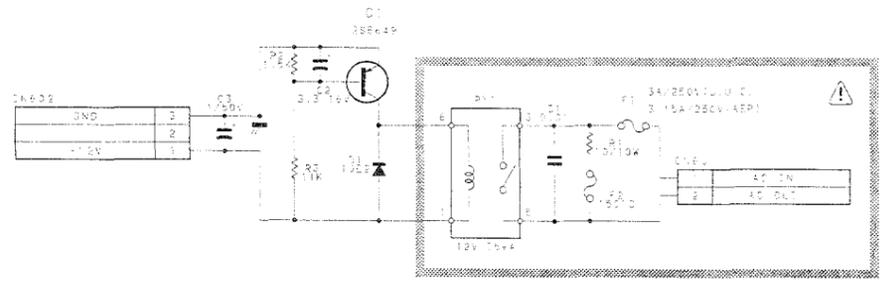
11 & HIGHER  
10001 and higher



- C501: 22,000µF/50V
- C502: 22,000µF/50V
- C503: 12,000µF/25V
- C504: 66,000µF/16V
- C505: 10,000µF/35V
- C506: 10,000µF/35V



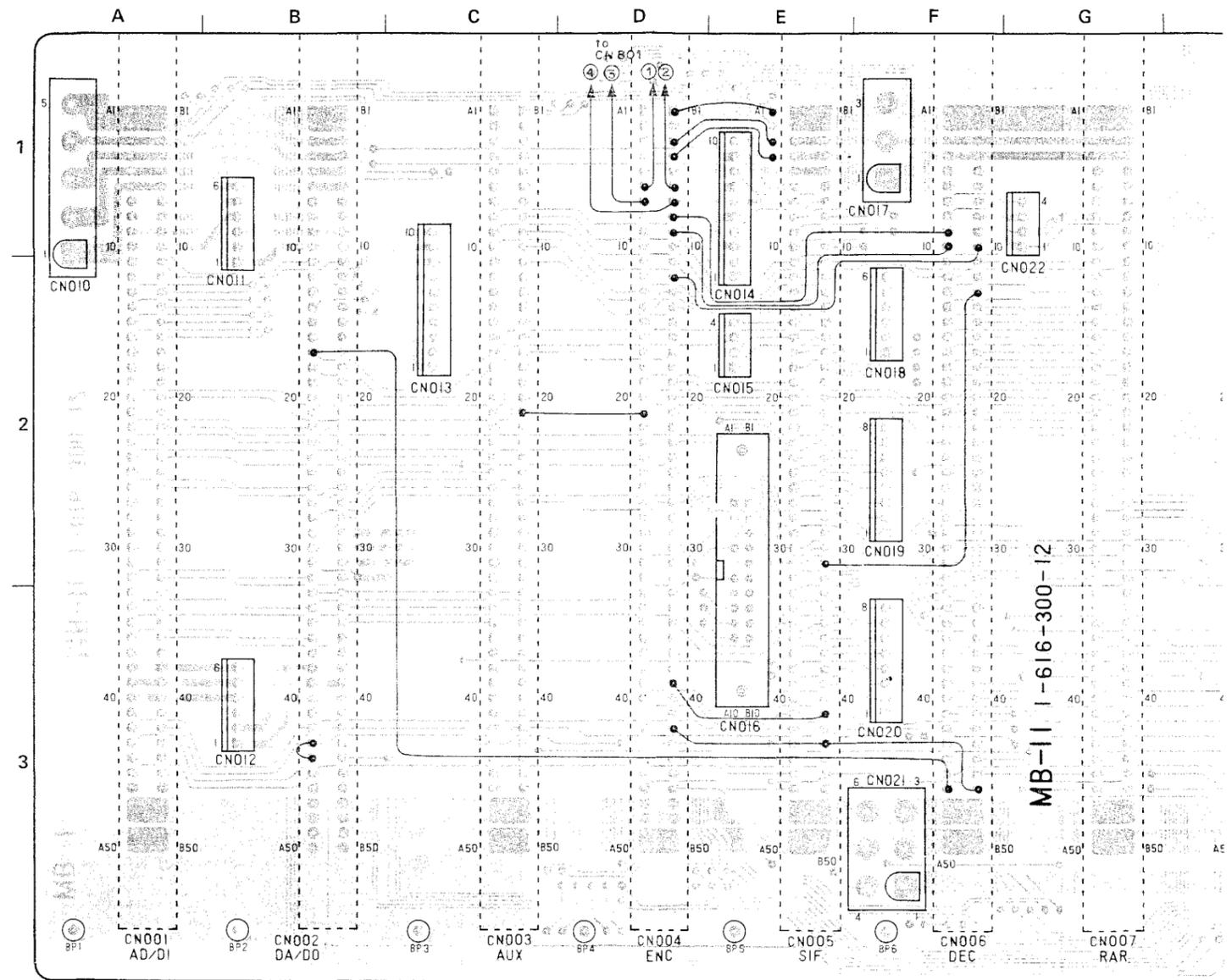
FU-32 BOARD  
Fuse



FU-32 BOARD  
BOARD NO. 1-516-451-11 & HIGHER  
PCM-1630 SERIAL NO. 10001 and higher

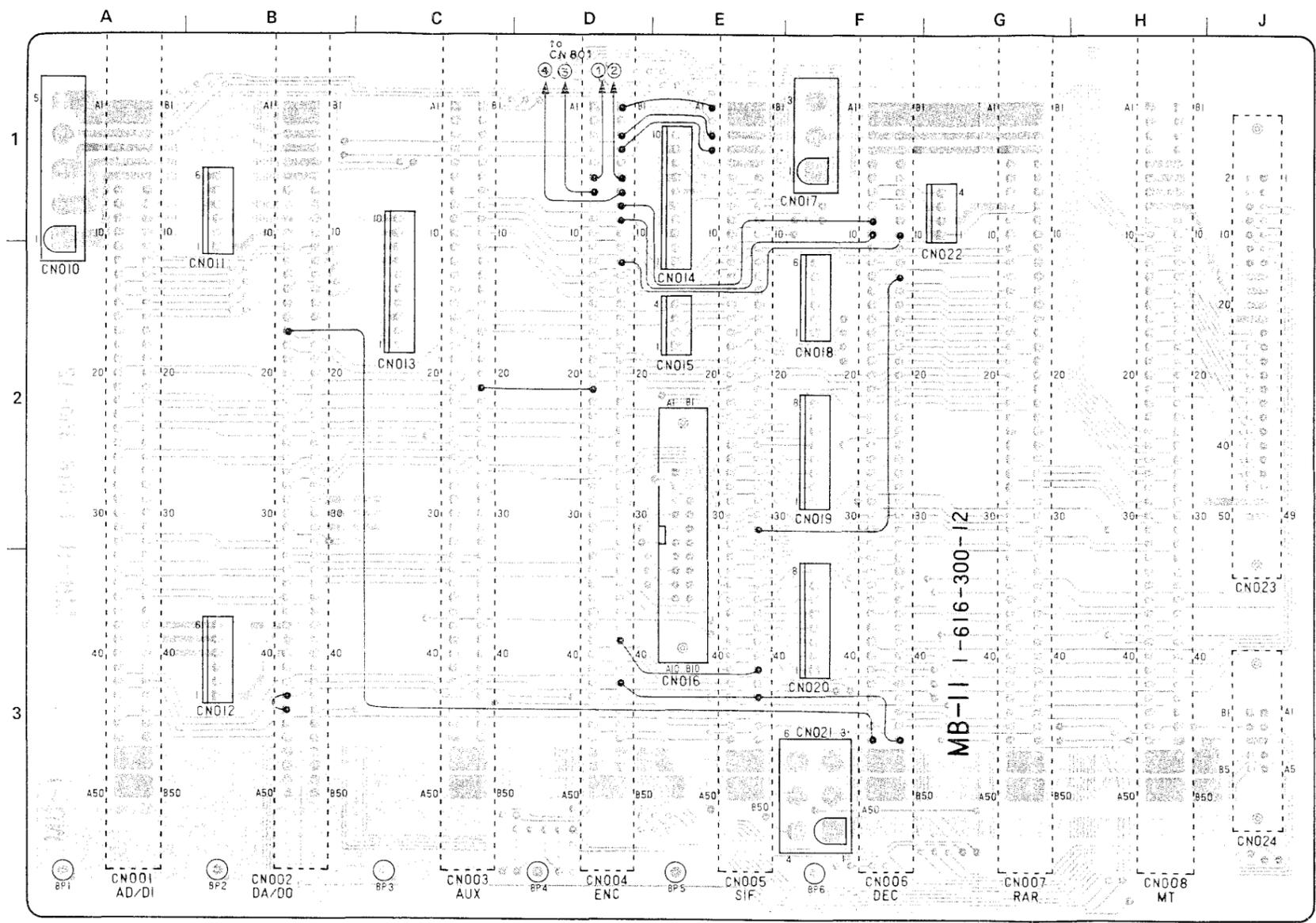
**NOTE:**  
The components marked with are critical to safe operation. These components must be replaced with the same ones as described on the Parts List.

MB-11 BOARD (1-616-300-12)  
Solder Side



COMPONENT SIDE PATTERN 1-616-300-12

MB-11 BOARD (1-616-300-12)  
Solder Side



COMPONENT SIDE PATTERN 1-616-300-12

Applicable Serial No.	Jumpers that have been soldered.
J, U/C, AEP: 11301 and higher	CN005-B31---- CN006-B13 CN002-A43---- CN002-A44 CN003-B21---- CN004-A21
J, U/C, AEP: 12801 and higher	CN002-A17---- CN006-A46 CN004-B1---- CN005-A1 CN004-B3---- CN005-A3 CN004-B4---- CN005-A4 CN004-B8---- CN006-A9 CN004-B9---- CN006-A10 CN004-B12---- CN006-B10 CN004-B39---- CN005-B41 CN004-B42---- CN005-B43 CN005-B43---- CN006-B46 CN004-A6---- CN801 ① CN004-B6---- CN801 ② CN004-A7---- CN801 ③ CN004-B7---- CN801 ④

MB-11 BOARD (1/2)  
Mother Board

MB-11 MB-11

CN001  
AD (DI)

COMPONENT SIDE				SOLDERING SIDE			
DESTINATION	I/O	NAME	A B	NAME	I/O	DESTINATION	
CN010 ⑤	I	GND	1	GND	I	CN010 ⑤	
CN010 ⑤	I	GND	2	GND	I	CN010 ⑤	
CN010 ④	I	+22V	3	+22V	I	CN010 ④	
CN010 ③	I	-22V	4	-22V	I	CN010 ③	
CN010 ②	I	GND	5	GND	I	CN010 ②	
CN010 ①	I	-8V	6	-8V	I	CN010 ①	
			7				
CN011 ⑥	I	A IN1(+)	8	A IN1(+)	I	CN011 ⑥	
CN011 ⑤	I	A IN1(-)	9	A IN1(-)	I	CN011 ⑤	
CN011 ④	I	A IN1(G)	10	A IN1(G)	I	CN011 ④	
DA A11	O	REC MON1	11	GND	O	DA B11	
			12				
AUX A13	I	FIL BITCK	13	GND	I	AUX B13	
AUX A14	I	FIL WCK	14	GND	I	AUX B14	
AUX A15	O	AD FIL1	15	GND	O	AUX B15	
AUX A16	O	AD FIL2	16	GND	O	AUX B16	
			17				
		TEST1	18	I		AUX B18	
		FIL ON	19	I		AUX B19	
CN015 ④	I	W SYNC IN	20	GND	I	CN015 ③	
			21				
SIF A22	I	IO CK	22	GND	I	SIF B22	
SIF A23	I	IO SYNC	23				
AUX A24	ENC A24	DI EN	24	DI SYNC	O	SIF B29	
			25				
DEC A26	I	BIT CK1	26	GND	I	DEC B26	
			27				
SIF A28	O	AD DT1	28	GND	O	SIF B28	
SIF A29	O	AD DT2	29	GND	O		
			30				
			31				
DA A32	D	REC MON2	32	GND	D	DA B32	
			33				
ENC A34	I	EM PB SW	34				
SIF A35	ENC A35	EM REC SW	35				
DEC A36	I	WD CK1	36	GND	I	DEC B36	
			37				
CN012 ⑥	I	A IN2(+)	38	A IN2(+)	I	CN012 ⑥	
CN012 ⑤	I	A IN2(-)	39	A IN2(-)	I	CN012 ⑤	
CN012 ④	I	A IN2(G)	40	A IN2(G)	I	CN012 ④	
			41				
SIF A42	I	DT DA1	42	GND	I	SIF B42	
SIF A43	I	DT DA2	43	GND	I		
			44				
CN021 ④	I	MUT1	45				
			46				
DA A47-48,B47-48	I	+5V	47	+5V	I	DA A47-48,B47-48	
DA A47-48,B47-48	I	+5V	48	+5V	I	DA A47-48,B47-48	
DA A49-50,B49-50	I	GND	49	GND	I	DA A49-50,B49-50	
DA A49-50,B49-50	I	GND	50	GND	I	DA A49-50,B49-50	

CN002  
DA (DO)

COMPONENT SIDE				SOLDERING SIDE			
DESTINATION	I/O	NAME	A B	NAME	I/O	DESTINATION	
CN010 ⑤	I	GND	1	GND	I	CN010 ⑤	
CN010 ⑤	I	GND	2	GND	I	CN010 ⑤	
CN010 ④	I	+22V	3	+22V	I	CN010 ④	
CN010 ③	I	-22V	4	-22V	I	CN010 ③	
CN010 ②	I	GND	5	GND	I	CN010 ②	
CN010 ①	I	-8V	6	-8V	I	CN010 ①	
			7				
CN011 ③	O	A OUT1(+)	8	A OUT1(+)	O	CN011 ③	
CN011 ②	O	A OUT1(-)	9	A OUT1(-)	O	CN011 ②	
CN011 ①	O	A OUT1(G)	10	A OUT1(G)	O	CN011 ①	
AD A11	I	REC MON1	11	GND	I	AD B11	
			12				
CN013 ⑩	O	MON1	13	GND	O	CN013 ⑨⑥	
CN013 ⑧	O	LVL DUT1	14	LVL IN1	I	CN013 ⑦	
			15				
			16				
DEC A46	AUX A17	TEST4	17				
	AUX A18	TEST2	18				
			19				
			20				
			21				
SIF A22	I	IO CK	22	GND	I	SIF B22	
SIF A23	I	IO SYNC	23				
			24	DO EN	D	ENC B24	
			25				
DEC A26	I	BIT CK1	26	GND	I	DEC B26	
RAR A27	I	RAW DT1	27	GND	I	RAR B27	
RAR A28	I	RAW DT2	28	GND	I	RAR B28	
			29				
CN013 ②	O	MON2	30	GND	O	CN013 ①③	
CN013 ⑤	O	LVL OUT2	31	LVL IN2	I	CN013 ④	
AD A32	I	REC MON2	32	GND	I	AD B32	
AUX A-B33	I	GND	33	GND	I	AUX A-B33	
ENC A34	I	EM PB SW	34	TST DA1	I	AUX A34	
		EM PB SW	35	TST DA2	I	AUX A35	
DEC A36	I	WD CK1	36	GND	I	DEC B36	
			37				
CN012 ③	O	A OUT2(+)	38	A OUT2(+)	O	CN012 ③	
CN012 ②	O	A OUT2(-)	39	A OUT2(-)	O	CN012 ②	
CN012 ①	O	A OUT2(G)	40	A OUT2(G)	O	CN012 ①	
MT A40	I	REC/PB	41				
SIF A42	I	DT DA1	42	GND	I	SIF B42	
SIF A43	I	DT DA2	43	GND	I		
			44	DUB/EDT	I	RAR A44	
CN021 ④	I	MUT1	45				
			46				
AUX A47-48,B47-48	I	+5V	47	+5V	I	AUX A47-48,B47-48	
AUX A47-48,B47-48	I	+5V	48	+5V	I	AUX A47-48,B47-48	
AUX A49-50,B49-50	I	GND	49	GND	I	AUX A49-50,B49-50	
AUX A49-50,B49-50	I	GND	50	GND	I	AUX A49-50,B49-50	

CN003  
(AUX)

COMPONENT SIDE				SOLDERING SIDE			
DESTINATION	I/O	NAME	A B	NAME	I/O	DESTINATION	
			1				
			2				
			3				
			4				
			5				
			6				
			7				
SIF A11	I	FLD O/E	8	GND	I	SIF B11	
SIF A12	I	VD	9	HD	I	SIF B12	
SIF A13	I	VBLK1	10	GND	I	SIF B13	
			11	INT BLK	I	SIF B14	
			12				
AD A13	O	FIL BIT CK	13	GND	O	AD B13	
AD A14	O	FIL WD CK	14	GND	O	AD B14	
AD A15	I	AD FIL1	15	GND	I	AD B15	
AD A16	I	AD FIL2	16	GND	I	AD B16	
DA A17	O	TEST4	17	TEST3	O	ENC B17	
DA A18	O	TEST2	18	TEST1	O	AD B18	
			19	FIL ON	O	AD B19	
			20				
			21				
			22				
			23				
			24				
AD A24	I	DI EN	24				
RAR A27	I	RAW DT1	25	GND	I	RAR B27	
RAR A28	I	RAW DT2	26	GND	I	RAR B28	
DEC A27	I	BIT CK3	27	GND	I	DEC B27	
SIF A28	O	AD DT1	28	GND	O	SIF B28	
SIF A29	O	AD DT2	29	GND	O		
			30				
			31				
			32				
DA A-B33	O	GND	33	GND	O	DA A-B33	
DA B34	O	TST DA1	34				
DA B35	O	TST DA2	35				
			36				
			37				
DEC A38	I	WD CK3	38	GND	I	DEC B38	
			39				
			40				
			41				
SIF A42	I	DT DA1	42	GND	I	SIF B42	
SIF A43	I	DT DA2	43	GND	I		
			44				
			45	F WCK	O	ENC B43 SIF-DEC-RAR-MT B45	
			46				
ENC A47-48,B47-48	I	+5V	47	+5V	I	ENC A47-48,B47-48	
ENC A47-48,B47-48	I	+5V	48	+5V	I	ENC A47-48,B47-48	
ENC A49-50,B49-50	I	GND	49	GND	I	ENC A49-50,B49-50	
ENC A49-50,B49-50	I	GND	50	GND	I	ENC A49-50,B49-50	



MB-11 BOARD (2/2)  
Mother Board

CN007  
(RAR)

COMPONENT SIDE				SOLDERING SIDE			
DESTINATION	I/O	NAME	A/B	NAME	I/O	DESTINATION	
CN017 (3)	I	GND	1	GND	I	CN017 (3)	
CN017 (3)	I	GND	2	GND	I	CN017 (3)	
CN017 (2)	I	+12V	3	+12V	I	CN017 (2)	
CN017 (1)	I	-12V	4	-12V	I	CN017 (1)	
			5				
			6				
			7				
CN022 (2)	I	V PCM IN B	8	GND	I	CN022 (1)	
			9				
			10				
SIF A11	I	FLD D/E	11	GND	I		
SIF A12	I	VD	12	PAR	I	DEC B12	*2
DEC A13	D	RAR CRC	13	EOIT	I	DEC B13	*1
DEC A14	I	DEC1	14	DELAY	I	DEC B14	*3
DEC A15	I	DEC2	15	RAR ST	I	DEC B15	*4
DEC A16	I	AVE1	16	AVE2	I	DEC B16	
DEC A17	I	HOLD1	17	HOLD2	I	DEC B17	
DEC A18	I	DEC MUT	18	RAR AVE	D	DEC B18	
DEC A19	D	RAR HLD	19	RAR MUT	D	DEC B19	
SIF A20	I	CK MST	20	GND	I	SIF B20	
DEC A21	I	RAR EN	21	MUT3	I	SIF B21	
DEC A22	D	RAR BD	22	RAR B	D	DEC B22	
			23				
			24				
			25				
AUX A25	MT A29	DA A27	D	RAW DT1	27	GND	0
AUX A26	MT A30	DA A28	D	RAW DT2	28	GND	0
ENC A30	SIF A30	D	DEC DT1	30	GND	0	SIF B30
ENC A31	SIF A31	D	DEC DT2	31	GND	0	ENC B30
DEC A32	I	BIT CK2	32	GND	I	DEC B32	
			33				
			34				
			35	EM ID R	D		
			36				
DEC A37	I	WD CK2	37	GND	I	DEC B37	
			38				
			39	MUTE R			
			40	HOLD R			
			41				
			42				
			43				
MT B44	DA B44	D	DUB/EDT	44	DUB RAW	I	DEC B44
DEC A45	D	DUB RAW S	45	F WDCK	I	AUX B45	
			46				
DEC A47-48, B47-48	I	+5V	47	+5V	I	DEC A47-48, B47-48	
DEC A47-48, B47-48	I	+5V	48	+5V	I	DEC A47-48, B47-48	
DEC A49-50, B49-50	I	GND	49	GND	I	DEC A49-50, B49-50	
DEC A49-50, B49-50	I	GND	50	GND	I	DEC A49-50, B49-50	

CN008  
MT

COMPONENT SIDE				SOLDERING SIDE			
DESTINATION	I/O	NAME	A/B	NAME	I/O	DESTINATION	
			1				
			2				
			3				
			4				
CN023 (15) (16)	D	MA1	5	MA1	D	CN023 (15) (16)	
CN023 (17) (18)	D	MA2	6	MA2	D	CN023 (17) (18)	
CN023 (19) (20)	D	MA3	7	MA3	D	CN023 (19) (20)	
CN023 (21) (22)	D	MA4	8	MA4	D	CN023 (21) (22)	
CN023 (23)	D	MD0	9	MD1	D	CN023 (23)	
ENC A10	I	DT ME1	10	GND	I	ENC B10	
ENC A11	I	DT ME2	11	GND	I	ENC B11	
CN023 (25)	D	MD2	12	MD3	D	CN023 (25)	
CN023 (27)	D	MD4	13	MD5	D	CN023 (27)	
CN023 (29)	D	MD6	14	MD7	D	CN023 (29)	
CN023 (31)	D	MD8	15	MD9	D	CN023 (31)	
CN023 (33)	D	MD10	16	MD11	D	CN023 (33)	
CN023 (35)	D	MD12	17	MD13	D	CN023 (35)	
CN023 (37)	D	MD14	18	MD15	D	CN023 (37)	
CN023 (39)	I	HR1	19	HR2	I	CN023 (39)	
CN023 (41)	I	HR3	20	HR4	I	CN023 (41)	
CN023 (43)	I	HR5	21	HR6	I	CN023 (43)	
CN023 (45)	I	SCALE	22	PEAK	I	CN023 (45)	
			23				
CN016 B6	D	R WDCK(+)	24	R WDCK(-)	D	CN016 B5	
CN016 B7	D	R BIT CK(+)	25	R BIT CK(-)	D	CN016 B8	
CN016 A9	D	R DT1(+)	26	R DT1(-)	D	CN016 B9	
CN016 A10	D	R DT2(+)	27	R DT2(-)	D	CN016 B10	
			28				
RAR A27	I	RAW DT1	29	GND	I	RAR B27	
RAR A28	I	RAW DT2	30	GND	I	RAR B28	
			31				
DEC A32	I	BIT CK2	32	GND	I	DEC B32	
			33				
ENC A34	I	EM PB SW	34	EM ENC	I	ENC B34	
			35				
			36				
DEC A37	I	WD CK2	37	GND	I	DEC B37	
			38				
CN024 B2	CN016 A1	I	REC/PB SW	39			
	DA A41	O	REC/PB	40			
			41				
SIF A42	I	DT DA1	42	GND	I	SIF B42	
SIF A43	I	DT DA2	43	GND	I		
			44	DUB/EDT	I	RAR A44	
			45	F WDCK	I	AUX B45	
CN021 (1)	I	+5V M	46	+5V M	I	CN021 (1)	
RAR A47-48, B47-48	CN023 (47) (48)	I	+5V	47	+5V	I	RAR A47-48, B47-48
RAR A47-48, B47-48	CN023 (47) (48)	I	+5V	48	+5V	I	RAR A47-48, B47-48
RAR A49-50, B49-50	CN023 (49) (50)	I	GND	49	GND	I	RAR A49-50, B49-50
RAR A49-50, B49-50	CN023 (49) (50)	I	GND	50	GND	I	RAR A49-50, B49-50

CN010

No.	NAME	DESTINATION
1	-8V	CN001 A6-B6
2	-8V(G)	CN001 A5-B5
3	-22V	CN001 A4-B4
4	+22V	CN001 A3-B3
5	+22V(G)	CN001 A1-2, B1-2

CN011

No.	NAME	DESTINATION
1	A OUT1(G)	CN002 A10-B10
2	A OUT1(-)	CN002 A9-B9
3	A OUT1(+)	CN002 A8-B8
4	A IN1(G)	CN001 A10-B10
5	A IN1(-)	CN001 A9-B9
6	A IN1(+)	CN001 A8-B8

CN012

No.	NAME	DESTINATION
1	A OUT2(G)	CN002 A40-B40
2	A OUT2(-)	CN002 A39-B39
3	A OUT2(+)	CN002 A38-B38
4	A IN2(G)	CN001 A40-B40
5	A IN2(-)	CN001 A39-B39
6	A IN2(+)	CN001 A38-B38

CN013

No.	NAME	DESTINATION
1	MDN2(G)	CN002 B30
2	MDN2	CN002 A30
3	LVL2(G)	CN002 B30
4	LVL IN2	CN002 B31
5	LVL DUT2	CN002 A31
6	LVL1(G)	CN002 B13
7	LVL IN1	CN002 B14
8	LVL DUT1	CN002 A14
9	MDN1(G)	CN002 B13
10	MDN1	CN002 A13

CN014

No.	NAME	DESTINATION
1		
2		
3	GND	CN005 A5-B5
4	V PCM OUT4	CN005 B7
5	GND	CN005 A5-B5
6	V PCM DUT3	CN005 A7
7	GND	CN005 A5-B5
8	V PCM DUT2	CN005 B6
9	GND	CN005 A5-B5
10	V PCM DUT1	CN005 A6

CN015

No.	NAME	DESTINATION
1	GND	CN005 B16
2	W SYNC OUT	CN005 A16
3	GND	CN005 B15
4	W SYNC IN	CN005 A15

CN017

No.	NAME	DESTINATION
1	-12V	CN005-6 A4-B4
2	+12V	CN005-6 A3-B3
3	+12V(G)	CN005-6 A1-2, B1-2

CN018

No.	NAME	DESTINATION
1	GND	CN005 B10
2	C SYNC IN	CN005 A10
3	GND	CN005 B8
4	C SYNC DT2	CN005 A9
5	GND	CN005 B8
6	C SYNC DT1	CN005 A8

CN019

No.	NAME	DESTINATION
1	GND	CN005 B27
2	DA IN2	CN005 A27
3	GND	CN005 B26
4	DA IN1	CN005 A26
5	GND	CN005 B25
6	ENC IN2	CN005 A25
7	GND	CN005 B24
8	ENC IN1	CN005 A24

CN020

No.	NAME	DESTINATION
1	GND	CN005 B39
2	DEC OUT2	CN005 A39
3	GND	CN005 B38
4	DEC OUT1	CN005 A38
5	GND	CN005 B37
6	AD OUT2	CN005 A37
7	GND	CN005 B36
8	AD OUT1	CN005 A36

CN021

No.	NAME	DESTINATION
1	+5V-MT	CN008 A46-B46
2	+5V(G)	CN005-6 A49-50, B49-50
3	+5V	CN005-6 A47-48, B47-48
4	MUT1	CN005 A45
5	+5V(G)	CN005-6 A49-50, B49-50
6	+5V	CN005-6 A47-48, B47-48

CN022

No.	NAME	DESTINATION
1	GND	CN006 B8
2	V PCM INB	CN006 A8
3	GND	CN006 B7
4	V PCM INA	CN006 A7

Note: The connector name marked with \*1 is applicable to the units with Serial No.11301 and higher.  
The connector names marked with \*2, 3 and 4 are applicable to the units with Serial No.12801 and higher.

**CN016**

DESTINATION	NAME	A	B	NAME	DESTINATION
CN008 A39	REC/PB	1	1	PAR	CN006 B42
CN006 A24	HLD	2	2	EMP	CN004 A33
CN006 A49	GND	3	3	A/B	CN006 A23
CN006 B23	AVE	4	4	MUTE	CN006 B24
CN006 A49	GND	5	5	W CLK	CN008 B24
CN006 A25	CRC	6	6	W CLK	CN008 A24
CN006 A49	GND	7	7	B CLK	CN008 A25
CN006 B25	FS ID	8	8	B CLK	CN008 B25
CN008 A26	ME CH-1	9	9	ME CH-1	CN008 B26
CN008 A27	ME CH-2	10	10	ME CH-2	CN008 B27

INATION
+6 A4-B4
+6 A3-B3
A1-2,B1-2

INATION
5 B10
5 A10
5 B8
5 A9
5 B8
5 A8

**CN023**

DESTINATION	NAME	No.	NAME	DESTINATION
CN005 A17	FS INT 0	1	FS INT 1	CN005 B17
CN005 A18	FS EXT 0	3	FS EXT 1	CN005 B18
CN006 A40	FS ID 0	5	FS ID 1	CN006 B40
CN004 A36	EMPH	7	MUTE	CN006 A39
CN006 B39	CRC ER	9	RAR ON	CN006 A41
CN006 B41	A ON	11	B ON	CN006 A42
CN004 A37	DI ON	13	DO ON	CN004 B37
CN008 A5	MA1	15	MA1	CN008 B5
CN008 A6	MA2	17	MA2	CN008 B6
CN008 A7	MA3	19	MA3	CN008 B7
CN008 A8	MA4	21	MA4	CN008 B8
CN008 A9	MD0	23	MD1	CN008 B9
CN008 A12	MD2	25	MD3	CN008 B12
CN008 A13	ND4	27	ND5	CN008 B13
CN008 A14	MD6	29	MD7	CN008 B14
CN008 A15	MD8	31	MD9	CN008 B15
CN008 A16	MD10	33	MD11	CN008 B16
CN008 A17	MD12	35	MD13	CN008 B17
CN008 A18	MD14	37	MD15	CN008 B18
CN008 A19	HR1	39	HR2	CN008 B19
CN008 A20	HR3	41	HR4	CN008 B20
CN008 A21	HR5	43	HR6	CN008 B21
CN008 A22	SCALE	45	PEAK	CN008 B22
CN008 A47-B47	+5V	47	+5V	CN008 A47-B47
CN008 A49-B49	GND	49	GND	CN008 A49-B49

INATION
5 B27
5 A27
5 B26
5 A26
5 B25
5 A25
5 B24
5 A24

INATION
5 B39
5 A39
5 B38
5 A38
5 B37
5 A37
5 B36
5 A36

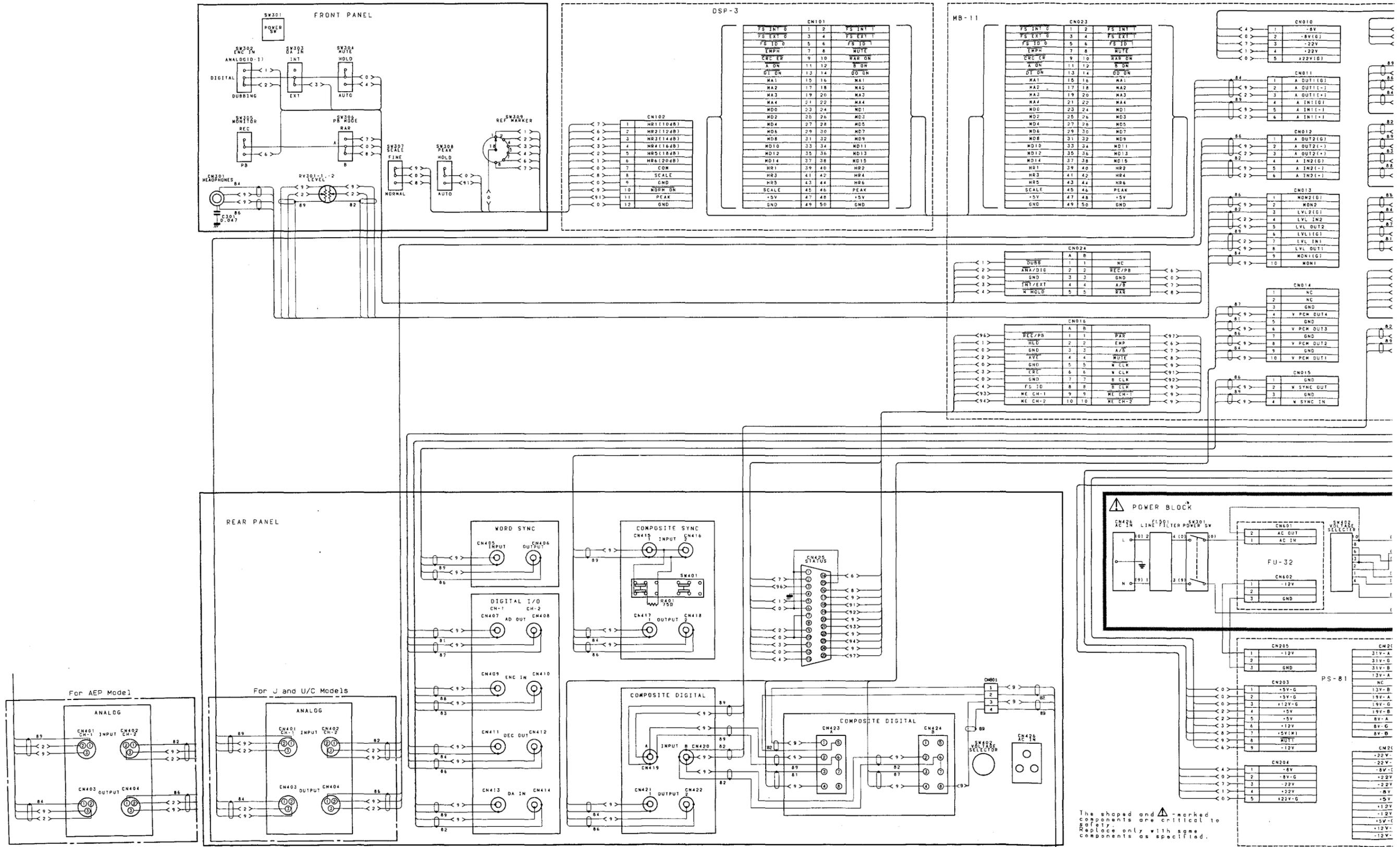
INATION
1 A46-B46
149-50,B49-50
147-48,B47-48
105 A45
149-50,B49-50
147-48,B47-48

**CN024**

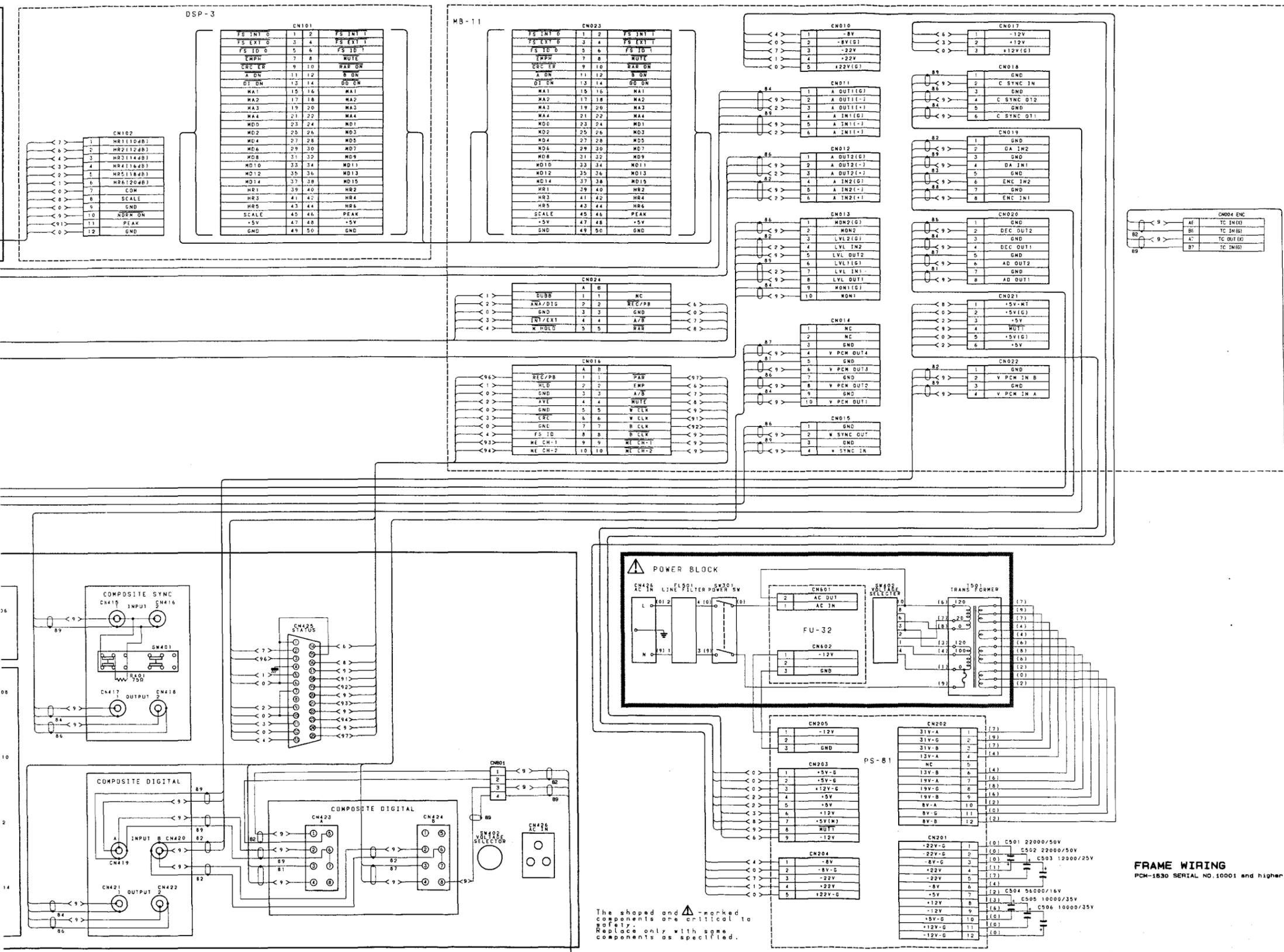
DESTINATION	NAME	A	B	NAME	DESTINATION
CN004 A43	DUBB	1	1		CN007 A44
CN004 A45	ANA/DIG	2	2	REC/PB	CN008 A39
CN008 B49	GND	3	3	GND	CN008 B49
CN004 B45	INT/EXT	4	4	A/B	CN006 B43
CN006 A43	W HOLD	5	5	RAR	CN006 A44

INATION
106 B8
106 A8
106 B7
106 A7

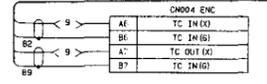
**MB-11BOARD (2/2)**  
 BOARD NO. 1-616-300-11 & HIGHER  
 PCM-1630 SERIAL NO. 10001 and higher



The shaped and  $\Delta$ -marked components are critical to safety. Replace only with same components as specified.



Note:  
The cables (CN004 to CN801, CN423 and CN424) are applicable to the units with Serial No.12801 and higher.



The shaped and  $\Delta$ -marked components are critical to safety. Replace only with same components as specified.

FRAME WIRING  
PCH-1630 SERIAL NO.10001 and higher

# SECTION D REPLACEABLE PARTS

## PARTS ORDERING INFORMATION

### Standardization of Parts

Repair parts supplied from Sony Parts Center may not be always identical with the part which actually in use due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts". This manual's exploded views and electrical parts list are indicating the parts numbers of the "standardized genuine parts at present".

### Parts marked with S in the column of SP

These parts are normally stocked as replaceable parts.

### Parts marked with O in the column of SP

Orders for these parts will be processed, but allow for additional delivery time.

### Parts without Part No.

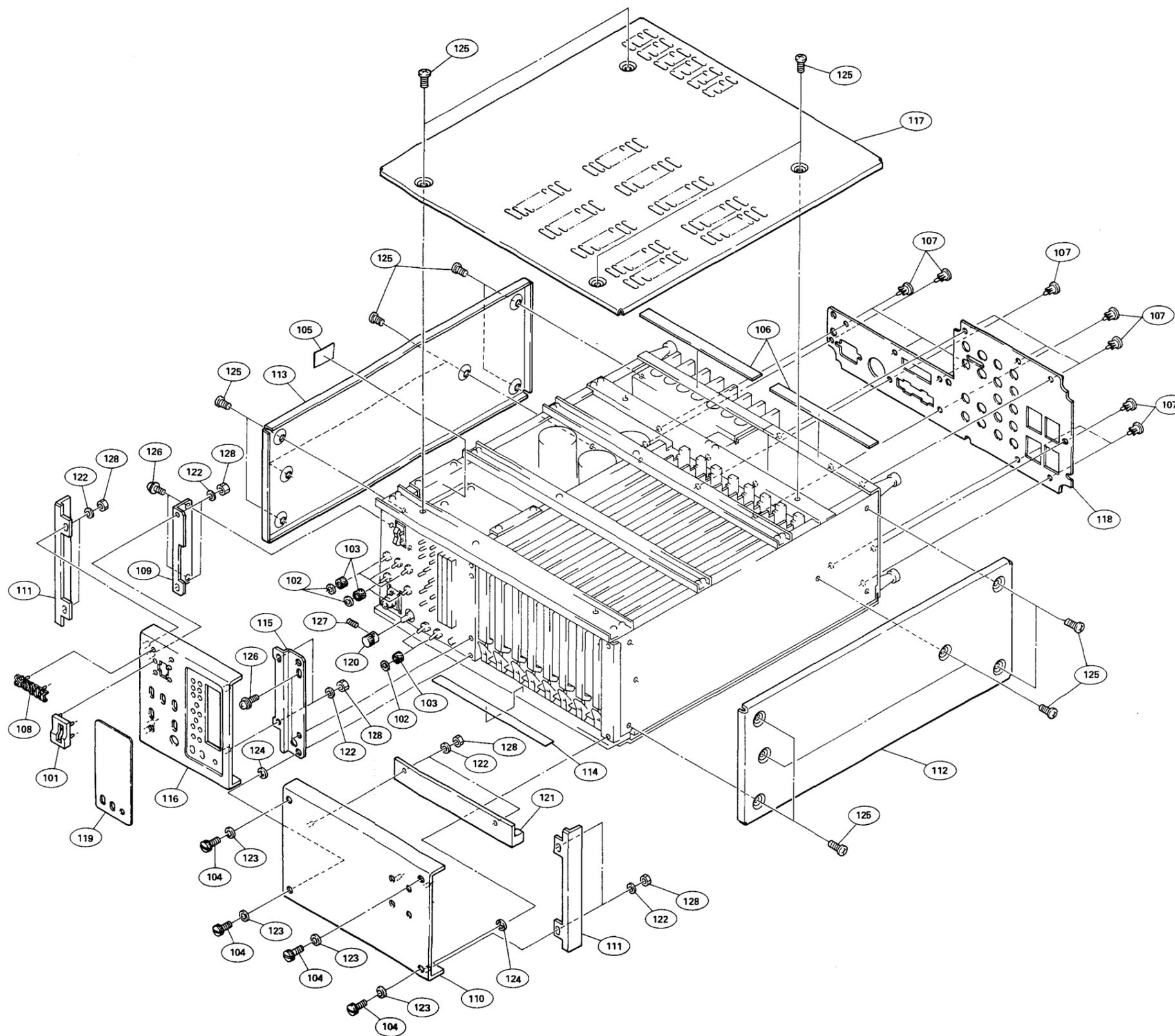
These parts are not stocked because they are seldom required for routine service.

The components marked with  $\Delta$  are critical to safe operation. These components must be replaced with the same ones as described on the Parts List.

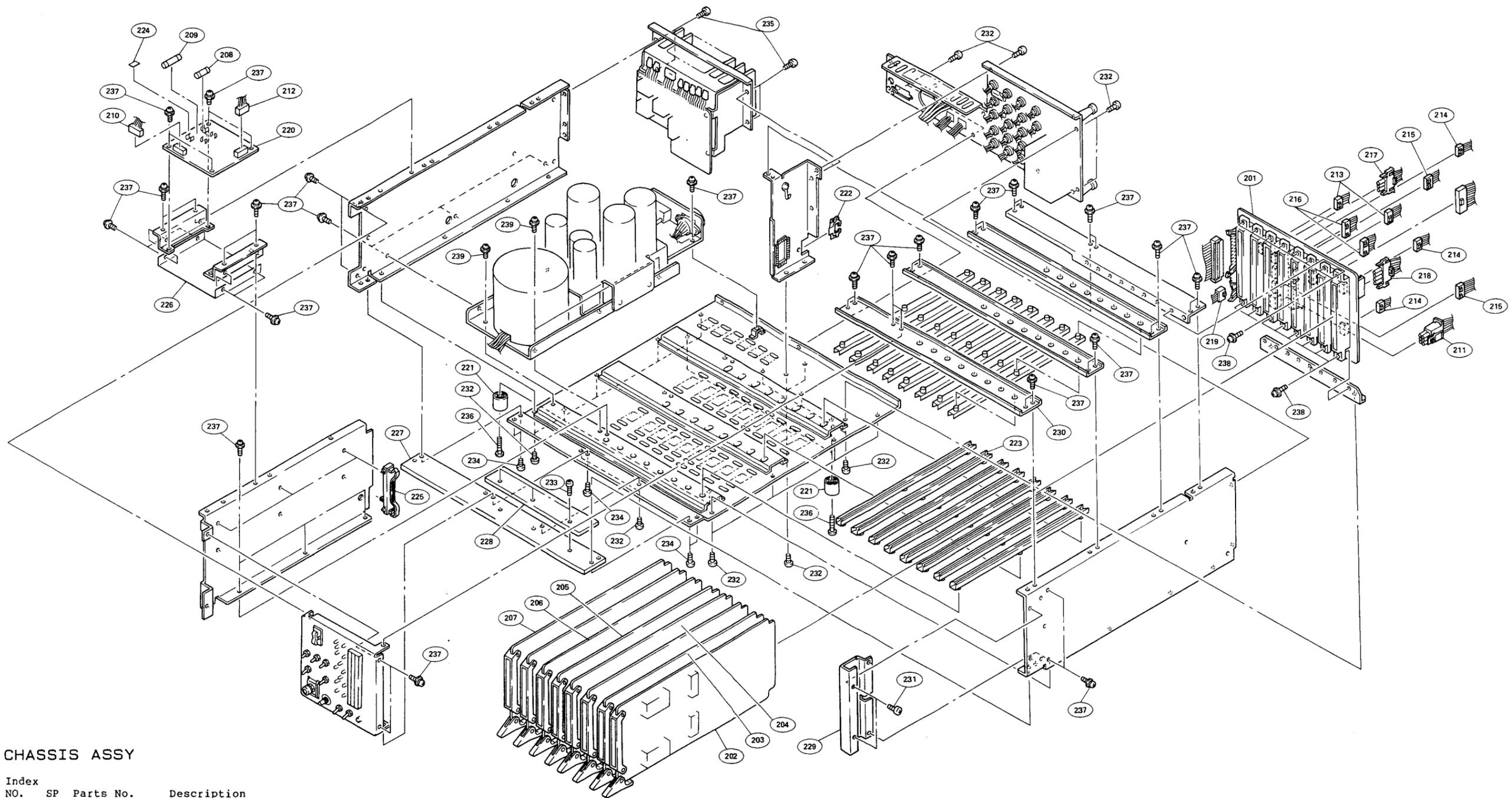
## D-1 EXPLODED VIEWS AND PARTS LIST

### OVERALL ASSY

Index NO.	SP	Parts No.	Description
101	O	2-251-642-00	GUARD, POWER SWITCH
102	S	2-300-629-00	PLATE, BLIND
103	S	2-300-636-00	CUSHION
104	S	3-621-050-11	SCREW, COVER
105	O	3-703-044-26	LABEL, CAUTION
106	S	3-831-441-XX	FELT, PANEL
107	S	4-812-134-11	RIVET, NYLON, 3.5
108	O	4-840-002-00	EMBLEM, SONY
109	O	4-874-186-01	BRACKET (LEFT), METER PANEL
110	O	4-874-198-01	PANEL, FRONT
111	O	4-874-199-01	ESCUTCHEON, SIDE
112	O	4-911-701-01	PANEL (RIGHT), SIDE
113	O	4-911-702-01	PANEL (LEFT), SIDE
114	O	4-911-705-01	LABEL, PC BOARD POSITION
115	O	4-911-707-01	BRACKET (RIGHT), METER PANEL
116	O	4-911-716-01	PANEL, METER
117	O	4-911-719-01	PANEL, TOP
118	O	4-911-729-01	PLATE, ORNAMENTAL, REAR
119	S	4-911-739-01	SEAT, METER
120	S	4-911-740-01	KNOB, HEADPHONES (A)
121	O	4-911-744-01	CLAMP, PC BOARD
122	S	7-623-208-22	SPRING WASHER, M3
123	S	7-623-925-01	WASHER, NYLON, M4
124	S	7-624-106-04	STOP RING 3
125	S	7-682-560-09	SCREW, +B4x6
126	S	7-682-947-01	SCREW, +PSW3x6
127	S	7-683-237-01	SET SCREW, 3x3
128	S	7-684-023-04	NUT, M3



CHASSIS ASSY CHASSIS ASSY

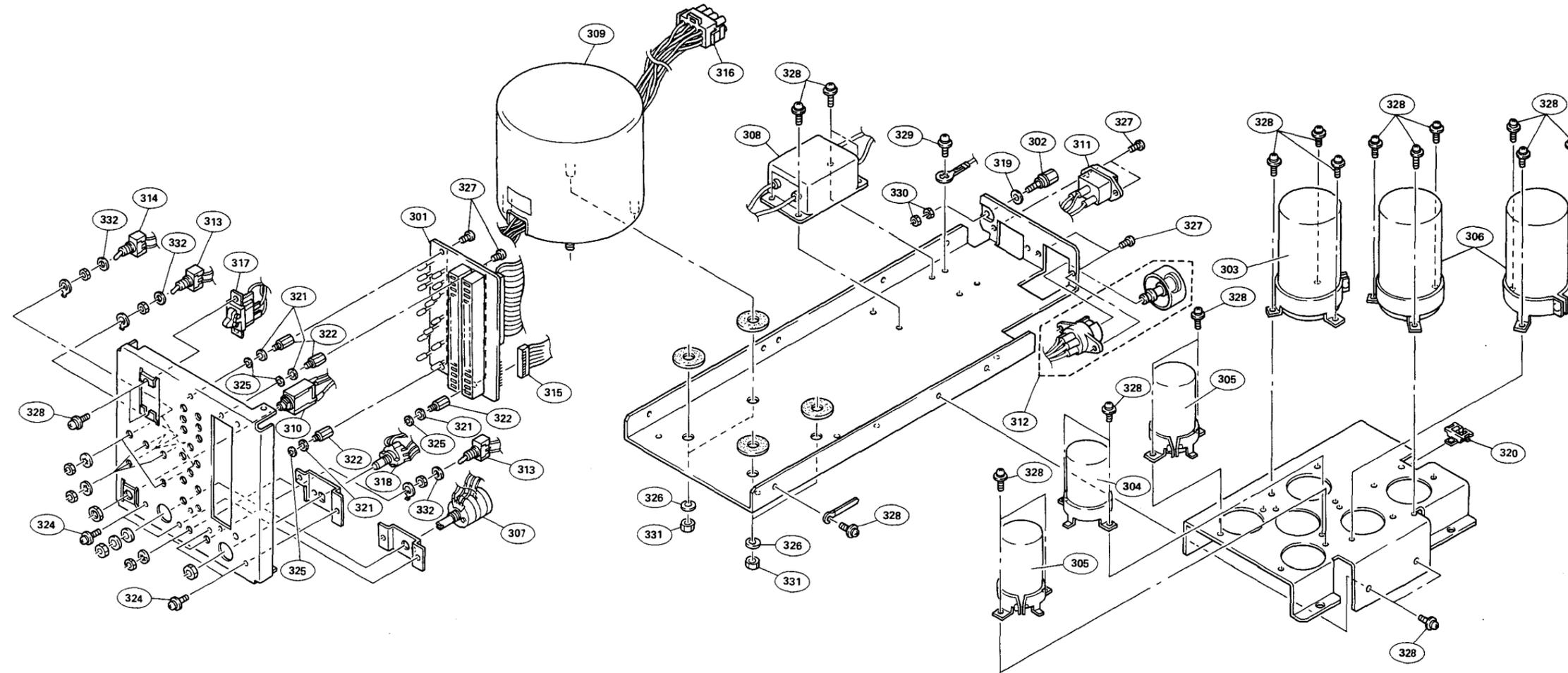


CHASSIS ASSY

Index

NO.	SP	Parts No.	Description
201	O	A-7850-287-A	COMPLETE PCB,MB-11
202	O	A-7850-291-A	COMPLETE PCB,AD-23
203	O	A-7850-293-A	COMPLETE PCB,DA-15
204	O	A-7850-295-A	COMPLETE PCB,ENC-2
205	O	A-7850-297-A	COMPLETE PCB,SIF-1
206	O	A-7850-299-A	COMPLETE PCB,DEC-15
207	O	A-7850-301-A	COMPLETE PCB,MT-16
208	S	1-532-237-00	FUSE,TIME-LAG 3.15A (For AE Model)
209	S	1-532-713-00	FUSE,TIME-LAG 3A (For J and UC Models)
210	O	1-561-069-00	PLUG,HOUSING,2P (For CN601,FU-32 Board)
	O	1-535-206-00	CONTACT,FEMALE
211	O	1-561-071-00	PLUG,HOUSING,3P
	O	1-561-067-00	CONTACT,FEMALE
212	O	1-561-515-00	PLUG,HOUSING,3P
	O	1-560-372-00	CONTACT,FEMALE
213	O	1-561-516-00	PLUG,HOUSING,4P
	O	1-560-372-00	CONTACT,FEMALE
214	O	1-561-518-00	PLUG,HOUSING,6P
	O	1-560-372-00	CONTACT,FEMALE
215	O	1-561-519-00	PLUG,HOUSING,8P
	O	1-560-372-00	CONTACT,FEMALE
216	O	1-561-520-00	PLUG,HOUSING,10P
	O	1-560-372-00	CONTACT,FEMALE
217	O	1-561-828-00	PLUG,HOUSING,3P
	O	1-561-067-00	CONTACT,FEMALE
218	O	1-561-863-00	PLUG,HOUSING,5P
	O	1-561-067-00	CONTACT,FEMALE
219	O	1-561-888-00	PLUG,HOUSING,10P
	O	1-560-768-00	CONTACT,FEMALE
220	O	1-616-451-11	PC BOARD,FU-32
221	S	3-642-656-01	FOOT
222	O	3-646-071-00	HOLDER,WIRE
223	O	3-673-676-41	RAIL,GUIDE,PC BOARD
224	S	3-701-948-19	LABEL,FUSE (For AE Model Only)
225	O	4-874-187-01	CLIP,CABLE
226	O	4-874-191-01	PLATE,SHIELD,FU-32
227	O	4-874-194-01	STAY,LOWER
228	O	4-874-195-01	STOPPER
229	O	4-911-706-01	BRACKET,FRONT PANEL
230	O	4-911-721-01	STAY,UPPER
231	S	7-682-546-04	SCREW,+B3x5
232	S	7-682-546-09	SCREW,+B3x5
233	S	7-682-549-04	SCREW,+B3x10
234	S	7-682-548-09	SCREW,+B3x8
235	S	7-682-560-09	SCREW,+B4x6
236	S	7-682-566-09	SCREW,+B4x20
237	S	7-682-947-01	SCREW,+PSW3x6
238	S	7-682-950-01	SCREW,+PSW3x12
239	S	7-682-961-01	SCREW,+PSW4x8

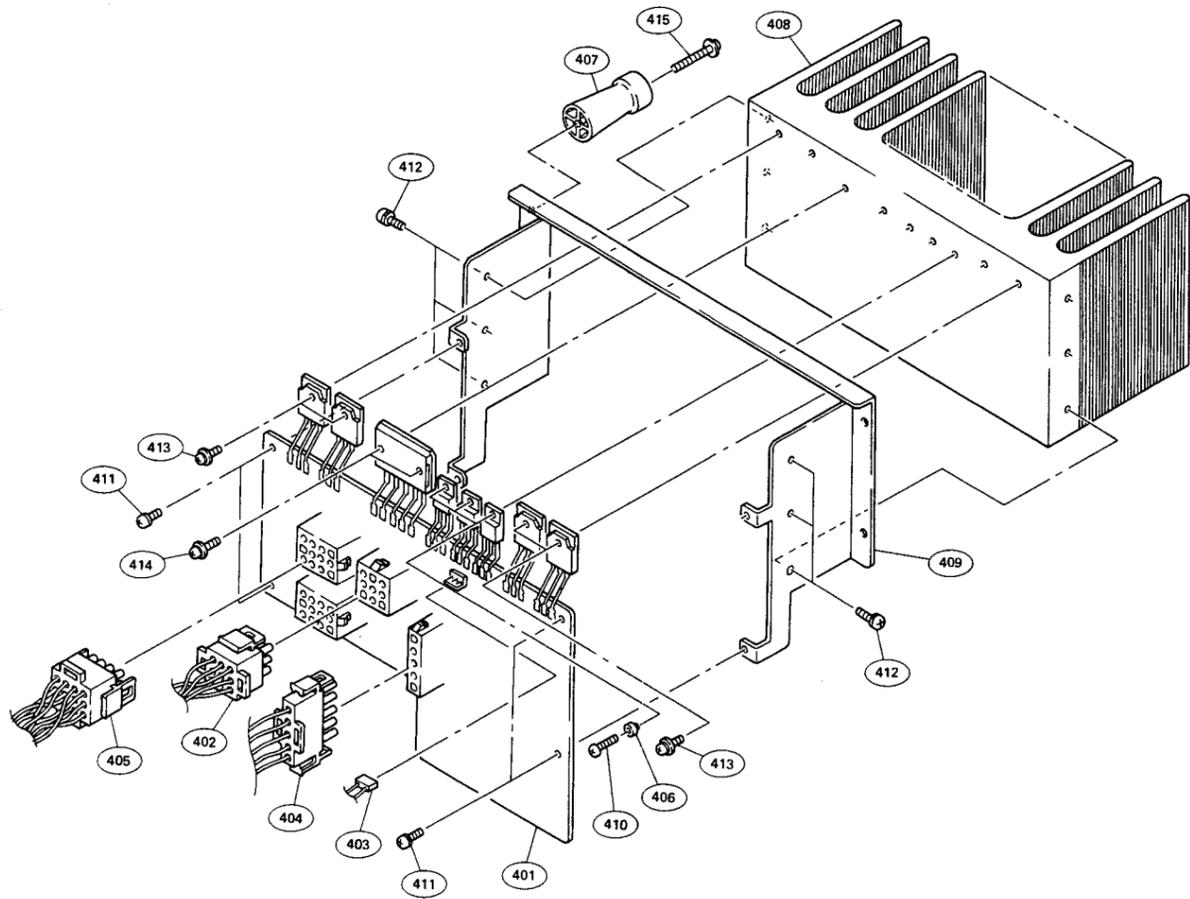
POWER & METER ASSY POWER & METER ASSY



POWER & METER ASSY

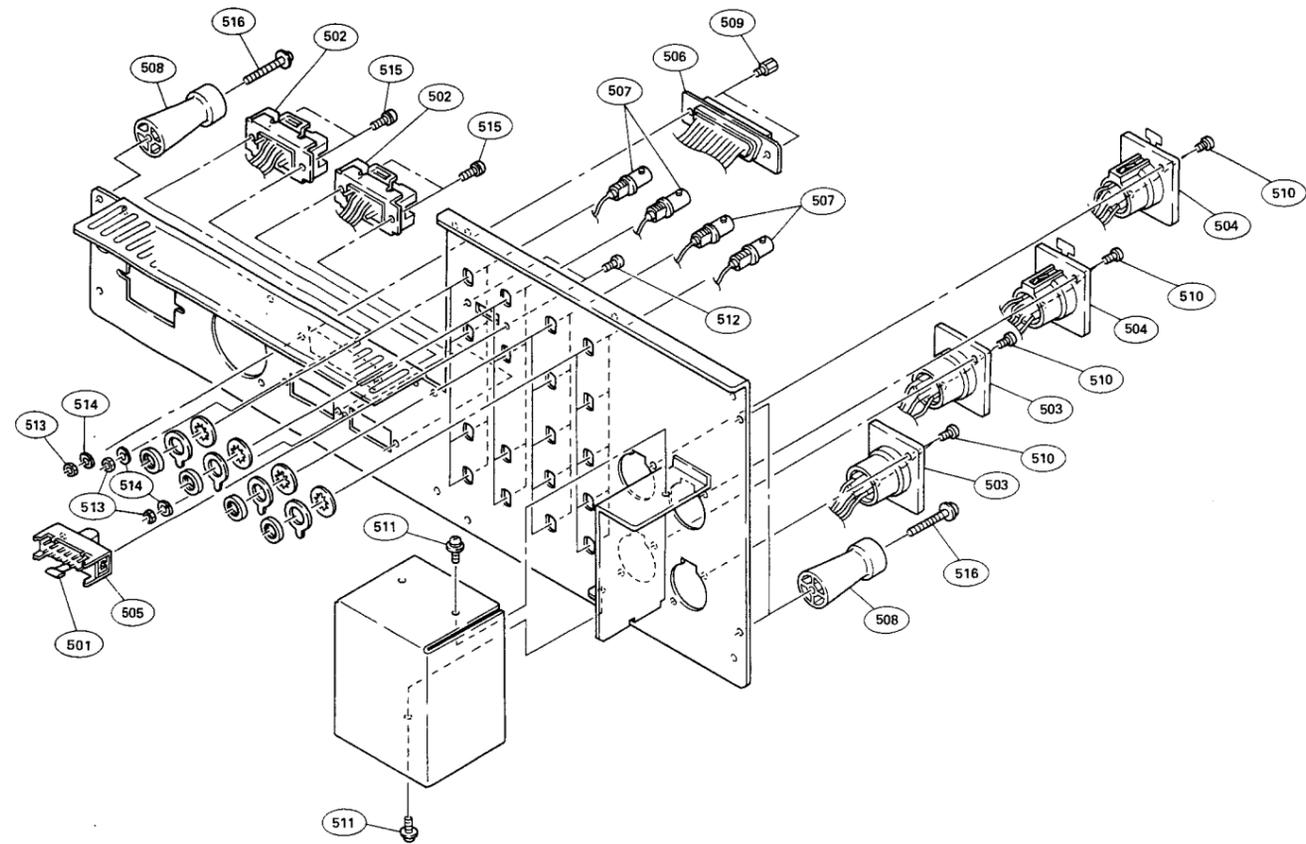
Index NO.	SP	Parts No.	Description
301	O	A-7850-289-A	COMPLETE PCB,DSP-3
302	O	X-4801-204-0	TERMINAL ASSY
303	S	1-125-406-00	CAP,ELECT 56000 20% 16V
304	S	1-125-407-00	CAP,ELECT 12000 20% 25V
305	S	1-125-408-00	CAP,ELECT 10000 20% 35V
306	S	1-125-409-00	CAP,ELECT 22000 20% 50V
307	S	1-230-880-11	RES,VAR,CARBON 10K/10K RV24
308	S	1-421-518-00	FILTER,NOISE
309	S	1-448-295-11	TRANSFORMER POWER
310	S	1-507-507-00	JACK
311	S	1-509-547-00	3P INLET
312	S	1-526-572-00	SOCKET,POWER VOLTAGE SELECT
313	S	1-553-244-00	SWITCH,TOGGLE
314	S	1-553-247-00	SWITCH,TOGGLE
315	O	1-561-521-00	PLUG,HOUSING,12P
	O	1-560-372-00	CONTACT,FEMALE
316	O	1-562-849-11	PLUG,HOUSING,12P
	O	1-535-206-00	CONTACT,FEMALE
317	S	1-570-117-11	SWITCH,SEESAW(AC POWER)
318	S	1-570-297-11	SWITCH,ROTARY
319	O	2-376-536-00	SPACER,STOPPER
320	O	3-646-071-00	HOLDER,WIRE
321	S	3-845-490-00	WASHER
322	O	3-880-616-00	BOSS
324	S	7-621-759-35	SCREW,+PSW2.6x5
325	S	7-623-208-22	SPRING WASHER,M3
326	S	7-623-213-22	SPRING WASHER,M6
327	S	7-682-547-09	SCREW,+B3x6
328	S	7-682-947-01	SCREW,+PSW3x6
329	S	7-682-961-01	SCREW,+PSW4x8
330	S	7-684-023-04	NUT,M3
331	S	7-684-026-04	NUT,M6
332	S	7-688-006-01	WASHER,M6,SMALL

HEAT SINK ASSY REAR PANEL ASSY



HEAT SINK ASSY

Index NO.	SP	Parts No.	Description
401	O	A-7804-024-A	COMPLETE PCB,PS-81
402	O	1-561-072-00	PLUG,HOUSING,3P
	O	1-561-067-00	CONTACT,FEMALE
403	O	1-561-515-00	PLUG,HOUSING,3P
	O	1-560-372-00	CONTACT,FEMALE
404	O	1-561-863-00	PLUG,HOUSING,5P
	O	1-561-067-00	CONTACT,FEMALE
405	O	1-562-849-21	PLUG,HOUSING,12P
	O	1-561-067-00	CONTACT,FEMALE
406	S	2-832-007-00	BUSHING(K),INSULATING
407	S	3-668-924-00	FOOT,REAR
408	O	4-874-193-01	HEAT SINK
409	O	4-911-718-01	BRACKET,HEAT SINK
410	S	7-621-775-40	SCREW,+B2.6x8
411	S	7-682-547-09	SCREW,+B3x6
412	S	7-682-661-01	SCREW,+PS4x8
413	S	7-682-949-01	SCREW,+PSW3x10
414	S	7-682-950-01	SCREW,+PSW3x12
415	S	7-682-970-01	SCREW,+PSW4x40



REAR PANEL ASSY

Index NO.	SP	Parts No.	Description
501	S	1-214-105-00	RES,METAL FILM 75 1& 1/4W
502	S	1-509-095-00	8P MULTI SOCKET
503	S	1-509-176-31	RECEPTACLE,MALE,XLR3P
504	S	1-509-184-31	RECEPTACLE,FEMALE,XLR3P
505	S	1-514-580-00	SWITCH,SLIDE
506	S	1-558-096-11	CORD(WITH D SUB CONNECTOR)
507	O	1-562-261-00	RECEPTACLE,BNC
508	S	3-668-924-00	FOOT,REAR
509	O	3-673-910-00	SCREW,CONNECTOR
510	S	7-621-259-42	SCREW,+P2.6x6
511	S	7-621-759-35	SCREW,+PSW2.6x5
512	S	7-621-775-10	SCREW,+B2.6x4
513	S	7-622-207-05	NUT,M2.6
514	S	7-623-207-22	SPRING WASHER,M2.6
515	S	7-628-254-45	SCREW,+PS2.6x12
516	S	7-682-970-01	SCREW,+PSW4x40

## D-2. ELECTRICAL PARTS LIST

Ref.No. or Qty SP	Part No.	Description	Ref.No. or Qty SP	Part No.	Description
<b>AD-23 BOARD</b>					
1pc	O A-7850-291-A	COMPLETE PCB,AD-23 (This assembly includes the following parts.)	C46	S 1-101-004-00	CAP,CERAMIC 0.01 50V
1pc	S 2-251-622-00	LEVER,PC BOARD	C47	S 1-101-004-00	CAP,CERAMIC 0.01 50V
1pc	O 3-673-867-00	PLATE,INDICATION,PC BOARD	C48	S 1-101-004-00	CAP,CERAMIC 0.01 50V
2pcs	O 4-874-188-01	SHIELD,AD CONVERTER	C49	S 1-101-004-00	CAP,CERAMIC 0.01 50V
2pcs	O 4-874-192-01	HEAT SINK	C50	S 1-101-004-00	CAP,CERAMIC 0.01 50V
1pc	O 4-911-704-51	LABEL(AD),PC BOARD	C55	S 1-131-450-00	CAP,TANT 1 20% 50V
1pc	O 4-911-722-01	CASE(UPPER),SHIELD,AD	C56	S 1-131-450-00	CAP,TANT 1 20% 50V
1pc	O 4-911-723-01	CASE(LOWER),SHIELD,AD	C57	S 1-131-450-00	CAP,TANT 1 20% 50V
2pcs	O 4-911-749-01	SHEET, AD	C58	S 1-131-449-11	CAP,TANT 3.3 20% 16V
2pcs	S 7-626-317-21	PIN,SPRING 2.5x8	C59	S 1-131-449-11	CAP,TANT 3.3 20% 16V
3pcs	S 7-682-547-04	SCREW,+B3x6	C60	S 1-124-721-41	CAP,ELECT 10 20% 50V
3pcs	S 7-684-023-04	NUT,M3	C61	S 1-161-894-00	CAP,CERAMIC 0.1 50V
AFL101	S 8-830-503-01	H-IC BH-106	C62	S 1-101-004-00	CAP,CERAMIC 0.01 50V
AFL201	S 8-830-503-01	H-IC BH-106	C63	S 1-101-004-00	CAP,CERAMIC 0.01 50V
C1	S 1-124-725-41	CAP,ELECT 100 20% 50V	C101	S 1-130-479-00	CAP,MYLAR 0.0047 5% 50V
C2	S 1-161-894-00	CAP,CERAMIC 0.1 50V	C102	S 1-131-449-11	CAP,TANT 3.3 20% 16V
C3	S 1-161-894-00	CAP,CERAMIC 0.1 50V	C103	S 1-161-894-00	CAP,CERAMIC 0.1 50V
C4	S 1-124-725-41	CAP,ELECT 100 20% 50V	C104	S 1-162-176-00	CAP,CERAMIC 1.5 25V
C5	S 1-131-450-00	CAP,TANT 1 20% 50V	C105	S 1-162-176-00	CAP,CERAMIC 1.5 25V
C6	S 1-124-724-41	CAP,ELECT 47 20% 50V	C106	S 1-104-239-00	CAP,STYROL 1500P 5% 125V
C7	S 1-124-725-41	CAP,ELECT 100 20% 50V	C107	S 1-161-461-00	CAP,CERAMIC 150P 5% 50V
C8	S 1-161-894-00	CAP,CERAMIC 0.1 50V	C108	S 1-131-449-11	CAP,TANT 3.3 20% 16V
C9	S 1-161-894-00	CAP,CERAMIC 0.1 50V	C109	S 1-136-141-00	CAP,MYLAR 0.001 5% 50V
C10	S 1-124-725-41	CAP,ELECT 100 20% 50V	C110	S 1-136-141-00	CAP,MYLAR 0.001 5% 50V
C11	S 1-131-450-00	CAP,TANT 1 20% 50V	C111	S 1-136-141-00	CAP,MYLAR 0.001 5% 50V
C12	S 1-124-724-41	CAP,ELECT 47 20% 50V	C113	S 1-131-449-11	CAP,TANT 3.3 20% 16V
C13	S 1-131-450-00	CAP,TANT 1 20% 50V	C114	S 1-131-450-00	CAP,TANT 1 20% 50V
C14	S 1-124-724-41	CAP,ELECT 47 20% 50V	C115	S 1-131-450-00	CAP,TANT 1 20% 50V
C15	S 1-131-450-00	CAP,TANT 1 20% 50V	C116	S 1-161-894-00	CAP,CERAMIC 0.1 50V
C16	S 1-124-724-41	CAP,ELECT 47 20% 50V	C117	S 1-124-721-41	CAP,ELECT 10 20% 50V
C17	S 1-161-894-00	CAP,CERAMIC 0.1 50V	C118	S 1-131-450-00	CAP,TANT 1 20% 50V
C18	S 1-161-894-00	CAP,CERAMIC 0.1 50V	C119	S 1-131-450-00	CAP,TANT 1 20% 50V
C19	S 1-161-894-00	CAP,CERAMIC 0.1 50V	C120	S 1-131-450-00	CAP,TANT 1 20% 50V
C20	S 1-161-894-00	CAP,CERAMIC 0.1 50V	C121	S 1-131-450-00	CAP,TANT 1 20% 50V
C21	S 1-124-478-11	CAP,ELECT 100 20% 25V	C122	S 1-162-176-00	CAP,CERAMIC 1.5 25V
C22	S 1-161-894-00	CAP,CERAMIC 0.1 50V	C123	S 1-162-176-00	CAP,CERAMIC 1.5 25V
C23	S 1-124-478-11	CAP,ELECT 100 20% 25V	C124	S 1-131-450-00	CAP,TANT 1 20% 50V
C24	S 1-161-894-00	CAP,CERAMIC 0.1 50V	C125	S 1-131-450-00	CAP,TANT 1 20% 50V
C25	S 1-124-478-11	CAP,ELECT 100 20% 25V	C126	S 1-131-450-00	CAP,TANT 1 20% 50V
C26	S 1-124-478-11	CAP,ELECT 100 20% 25V	C127	S 1-161-894-00	CAP,CERAMIC 0.1 50V
C27	S 1-101-004-00	CAP,CERAMIC 0.01 50V	C128	S 1-124-721-41	CAP,ELECT 10 20% 50V
C28	S 1-124-478-11	CAP,ELECT 100 20% 25V	C129	S 1-131-450-00	CAP,TANT 1 20% 50V
C29	S 1-101-004-00	CAP,CERAMIC 0.01 50V	C130	S 1-131-450-00	CAP,TANT 1 20% 50V
C30	S 1-161-894-00	CAP,CERAMIC 0.1 50V	C131	S 1-131-450-00	CAP,TANT 1 20% 50V
C31	S 1-102-510-00	CAP,CERAMIC 12P 5% 50V	C132	S 1-131-450-00	CAP,TANT 1 20% 50V
C32	S 1-161-894-00	CAP,CERAMIC 0.1 50V	C133	S 1-131-450-00	CAP,TANT 1 20% 50V
C33	S 1-102-953-00	CAP,CERAMIC 18P 5% 50V	C134	S 1-131-449-11	CAP,TANT 3.3 20% 16V
C34	S 1-131-449-11	CAP,TANT 3.3 20% 16V	C135	S 1-124-697-41	CAP,ELECT 47 20% 25V
C35	S 1-136-141-00	CAP,MYLAR 0.001 5% 50V	C136	S 1-131-449-11	CAP,TANT 3.3 20% 16V
C36	S 1-136-141-00	CAP,MYLAR 0.001 5% 50V	C137	S 1-161-894-00	CAP,CERAMIC 0.1 50V
C37	S 1-101-004-00	CAP,CERAMIC 0.01 50V	C138	S 1-131-450-00	CAP,TANT 1 20% 50V
C38	S 1-101-004-00	CAP,CERAMIC 0.01 50V	C139	S 1-107-054-00	CAP,MICA 33P 10% 500V
C39	S 1-131-449-11	CAP,TANT 3.3 20% 16V	C140	S 1-124-721-41	CAP,ELECT 10 20% 50V
C40	S 1-131-450-00	CAP,TANT 1 20% 50V	C141	S 1-124-721-41	CAP,ELECT 10 20% 50V
C41	S 1-101-004-00	CAP,CERAMIC 0.01 50V	C142	S 1-161-894-00	CAP,CERAMIC 0.1 50V
C42	S 1-101-004-00	CAP,CERAMIC 0.01 50V	C143	S 1-161-894-00	CAP,CERAMIC 0.1 50V
C43	S 1-101-004-00	CAP,CERAMIC 0.01 50V	C144	S 1-124-721-41	CAP,ELECT 10 20% 50V
C44	S 1-101-004-00	CAP,CERAMIC 0.01 50V	C145	S 1-124-721-41	CAP,ELECT 10 20% 50V
C45	S 1-101-004-00	CAP,CERAMIC 0.01 50V	C146	S 1-161-894-00	CAP,CERAMIC 0.1 50V
			C147	S 1-161-894-00	CAP,CERAMIC 0.1 50V
			C148	S 1-124-477-11	CAP,ELECT 47 20% 25V
			C149	S 1-161-894-00	CAP,CERAMIC 0.1 50V
			C150	S 1-124-721-41	CAP,ELECT 10 20% 50V
			C151	S 1-161-894-00	CAP,CERAMIC 0.1 50V
			C201	S 1-130-479-00	CAP,MYLAR 0.0047 5% 50V
			C202	S 1-131-449-11	CAP,TANT 3.3 20% 16V

Ref.No. or Qty SP	Part No.	Description	Ref.No. or Qty SP	Part No.	Description
C203	S 1-161-894-00	CAP,CERAMIC 0.1 50V	IC1	S 8-719-120-23	DIODE PS2003B-KA
C204	S 1-162-176-00	CAP,CERAMIC 1.5 25V	IC2	S 8-759-200-30	IC TC40H158P
C205	S 1-162-176-00	CAP,CERAMIC 1.5 25V	IC3	S 8-719-901-87	DIODE HCPL2630
C206	S 1-104-239-00	CAP,STYROL 1500P 5% 125V	IC4	S 8-759-220-02	IC TC40H002P
C207	S 1-161-461-00	CAP,CERAMIC 150P 5% 50V	IC5	S 8-759-220-04	IC TC40H004P
C208	S 1-131-449-11	CAP,TANT 3.3 20% 16V	IC6	S 8-759-200-34	IC TC40H163P
C209	S 1-136-141-00	CAP,MYLAR 0.001 5% 50V	IC7	S 8-759-200-21	IC TC40H107AP
C210	S 1-136-141-00	CAP,MYLAR 0.001 5% 50V	IC8	S 8-759-220-02	IC TC40H002P
C211	S 1-136-141-00	CAP,MYLAR 0.001 5% 50V	IC9	S 8-719-901-87	DIODE HCPL2630
C213	S 1-131-449-11	CAP,TANT 3.3 20% 16V	IC10	S 8-759-220-74	IC TC40H074P
C214	S 1-131-450-00	CAP,TANT 1 20% 50V	IC11	S 8-759-301-95	IC HD74HC125P
C215	S 1-131-450-00	CAP,TANT 1 20% 50V	IC12	S 8-759-220-74	IC TC40H074P
C216	S 1-161-894-00	CAP,CERAMIC 0.1 50V	IC13	S 8-759-220-04	IC TC40H004P
C217	S 1-124-721-41	CAP,ELECT 10 20% 50V	IC14	S 8-759-920-33	IC MM5437N
C218	S 1-131-450-00	CAP,TANT 1 20% 50V	IC15	S 8-759-001-16	IC MC10116L
C219	S 1-131-450-00	CAP,TANT 1 20% 50V	IC16	S 8-759-920-33	IC MM5437N
C220	S 1-131-450-00	CAP,TANT 1 20% 50V	IC101	S 8-759-900-72	IC NE5532P
C221	S 1-131-450-00	CAP,TANT 1 20% 50V	IC102	S 8-759-910-83	IC TL072ACP
C223	S 1-162-176-00	CAP,CERAMIC 1.5 25V	IC103	S 8-759-910-83	IC TL072ACP
C224	S 1-131-450-00	CAP,TANT 1 20% 50V	IC104	S 8-759-905-42	IC NE5534P
C225	S 1-131-450-00	CAP,TANT 1 20% 50V	IC106	S 8-759-108-96	IC uPC811C
C226	S 1-131-450-00	CAP,TANT 1 20% 50V	IC107	S 8-759-108-96	IC uPC811C
C227	S 1-161-894-00	CAP,CERAMIC 0.1 50V	IC108	S 8-759-918-92	IC HA3-2525-5
C228	S 1-124-721-41	CAP,ELECT 10 20% 50V	IC109	S 8-752-001-80	IC CX20018
C229	S 1-131-450-00	CAP,TANT 1 20% 50V	IC201	S 8-759-900-72	IC NE5532P
C230	S 1-131-450-00	CAP,TANT 1 20% 50V	IC202	S 8-759-910-83	IC TL072ACP
C231	S 1-131-450-00	CAP,TANT 1 20% 50V	IC203	S 8-759-910-83	IC TL072ACP
C232	S 1-131-450-00	CAP,TANT 1 20% 50V	IC204	S 8-759-905-42	IC NE5534P
C233	S 1-131-450-00	CAP,TANT 1 20% 50V	IC206	S 8-759-108-96	IC uPC811C
C234	S 1-131-449-11	CAP,TANT 3.3 20% 16V	IC207	S 8-759-108-96	IC uPC811C
C235	S 1-124-697-41	CAP,ELECT 47 20% 25V	IC208	S 8-759-918-92	IC HA3-2525-5
C236	S 1-131-449-11	CAP,TANT 3.3 20% 16V	IC209	S 8-752-001-80	IC CX20018
C237	S 1-161-894-00	CAP,CERAMIC 0.1 50V	L1	S 1-409-309-00	COIL,SN 72UH
C238	S 1-131-450-00	CAP,TANT 1 20% 50V	L2	S 1-535-178-00	RES,FERRITE
C239	S 1-107-054-00	CAP,MICA 33 10% 500V	L3	S 1-409-309-00	COIL,SN 72UH
C240	S 1-124-721-41	CAP,ELECT 10 20% 50V	L4	S 1-535-178-00	RES,FERRITE
C241	S 1-124-721-41	CAP,ELECT 10 20% 50V	L5	S 1-535-178-00	RES,FERRITE
C242	S 1-161-894-00	CAP,CERAMIC 0.1 50V	L6	S 1-535-178-00	RES,FERRITE
C243	S 1-161-894-00	CAP,CERAMIC 0.1 50V	L7	S 1-409-309-00	COIL,SN 72UH
C244	S 1-124-721-41	CAP,ELECT 10 20% 50V	L8	S 1-409-309-00	COIL,SN 72UH
C245	S 1-124-721-41	CAP,ELECT 10 20% 50V	L9	S 1-407-682-00	INDUCTOR,MICRO 1.2 10%
C246	S 1-161-894-00	CAP,CERAMIC 0.1 50V	L10	S 1-407-681-00	INDUCTOR,MICRO 1 10%
C247	S 1-161-894-00	CAP,CERAMIC 0.1 50V	L11	S 1-535-178-00	RES,FERRITE
C248	S 1-124-477-11	CAP,ELECT 47 20% 25V	L12	S 1-535-178-00	RES,FERRITE
C249	S 1-161-894-00	CAP,CERAMIC 0.1 50V	L101	S 1-535-178-00	RES,FERRITE
C250	S 1-124-721-41	CAP,ELECT 10 20% 50V	L102	S 1-535-178-00	RES,FERRITE
C251	S 1-161-894-00	CAP,CERAMIC 0.1 50V	L103	S 1-535-178-00	RES,FERRITE
C301	S 1-102-864-00	CAP,CERAMIC 5P 0.5P 50V	L104	S 1-535-178-00	RES,FERRITE
C302	S 1-102-864-00	CAP,CERAMIC 5P 0.5P 50V	L105	S 1-535-178-00	RES,FERRITE
CV1	S 1-141-245-00	TRIMMER,CERAMIC	L106	S 1-535-178-00	RES,FERRITE
D1	S 8-719-911-19	DIODE 1SS119	L107	S 1-535-178-00	RES,FERRITE
D2	S 8-719-911-19	DIODE 1SS119	L201	S 1-535-178-00	RES,FERRITE
D3	S 8-719-911-19	DIODE 1SS119	L202	S 1-535-178-00	RES,FERRITE
D101	S 8-719-911-19	DIODE 1SS119	L203	S 1-535-178-00	RES,FERRITE
D102	S 8-719-911-19	DIODE 1SS119	L204	S 1-535-178-00	RES,FERRITE
D103	S 8-719-911-19	DIODE 1SS119	L205	S 1-535-178-00	RES,FERRITE
D104	S 8-719-911-19	DIODE 1SS119	L206	S 1-535-178-00	RES,FERRITE
D105	S 8-719-951-12	DIODE HZ5BLL	L207	S 1-535-178-00	RES,FERRITE
D201	S 8-719-911-19	DIODE 1SS119	Q1	S 8-759-171-15	IC UPC7815H
D202	S 8-719-911-19	DIODE 1SS119	Q2	S 8-759-179-15	IC UPC7915H
D203	S 8-719-911-19	DIODE 1SS119	Q3	S 8-759-171-15	IC UPC7815H
D204	S 8-719-911-19	DIODE 1SS119	Q4	S 8-759-179-15	IC UPC7915H
D205	S 8-719-951-12	DIODE HZ5BLL	Q5	S 8-759-700-28	IC NJM7905A
			Q6	S 8-759-700-51	IC NJM7805A
			Q7	S 8-759-700-28	IC NJM7905A

Ref.No. or Qty	SP	Part No.	Description	Ref.No. or Qty	SP	Part No.	Description
Q101	S	8-729-800-43	TRANSISTOR 2SK152-3	R135	S	1-214-130-00	RES, METAL 820 1% 1/4W
Q102	S	8-729-699-51	TRANSISTOR 2SA995	R136	S	1-214-132-00	RES, METAL 1K 1% 1/4W
Q103	S	8-729-800-43	TRANSISTOR 2SK152-3	R137	S	1-214-108-00	RES, METAL 100 1% 1/4W
Q201	S	8-729-800-43	TRANSISTOR 2SK152-3	R138	S	1-214-108-00	RES, METAL 100 1% 1/4W
Q202	S	8-729-699-51	TRANSISTOR 2SA995	R139	S	1-214-147-00	RES, METAL 4.3K 1% 1/4W
Q203	S	8-729-800-43	TRANSISTOR 2SK152-3	R140	S	1-210-828-00	RES, CARBON 4.7M 5% 1/4W
R1	S	1-214-156-00	RES, METAL 10K 1% 1/4W	R141	S	1-215-493-00	RES, METAL 1M 1% 1/6W
R2	S	1-214-156-00	RES, METAL 10K 1% 1/4W	R142	S	1-214-892-00	RES, METAL 15K 1% 1/2W
R3	S	1-214-156-00	RES, METAL 10K 1% 1/4W	R143	S	1-214-168-00	RES, METAL 33K 1% 1/4W
R4	S	1-214-156-00	RES, METAL 10K 1% 1/4W	R144	S	1-214-153-00	RES, METAL 7.5K 1% 1/4W
R5	S	1-214-132-00	RES, METAL 1K 1% 1/4W	R145	S	1-214-153-00	RES, METAL 7.5K 1% 1/4W
R6	S	1-214-132-00	RES, METAL 1K 1% 1/4W	R201	S	1-214-896-31	RES, METAL 20K 1% 1/2W
R7	S	1-214-132-00	RES, METAL 1K 1% 1/4W	R202	S	1-214-888-00	RES, METAL 10K 1% 1/2W
R8	S	1-214-132-00	RES, METAL 1K 1% 1/4W	R203	S	1-214-896-31	RES, METAL 20K 1% 1/2W
R9	S	1-214-130-00	RES, METAL 820 1% 1/4W	R204	S	1-214-888-00	RES, METAL 10K 1% 1/2W
R10	S	1-214-130-00	RES, METAL 820 1% 1/4W	R206	S	1-214-875-00	RES, METAL 3K 1% 1/2W
R11	S	1-214-156-00	RES, METAL 10K 1% 1/4W	R207	S	1-214-847-00	RES, METAL 200 1% 1/2W
R12	S	1-214-156-00	RES, METAL 10K 1% 1/4W	R208	S	1-214-874-00	RES, METAL 2.7K 1% 1/2W
R13	S	1-214-132-00	RES, METAL 1K 1% 1/4W	R209	S	1-214-892-00	RES, METAL 15K 1% 1/2W
R14	S	1-214-132-00	RES, METAL 1K 1% 1/4W	R210	S	1-214-892-00	RES, METAL 15K 1% 1/2W
R15	S	1-214-132-00	RES, METAL 1K 1% 1/4W	R211	S	1-214-865-00	RES, METAL 1.1K 1% 1/2W
R16	S	1-214-132-00	RES, METAL 1K 1% 1/4W	R212	S	1-214-159-00	RES, METAL 13K 1% 1/4W
R17	S	1-214-937-00	RES, METAL 1M 1% 1/2W	R213	S	1-214-139-00	RES, METAL 2K 1% 1/4W
R18	S	1-214-937-00	RES, METAL 1M 1% 1/2W	R214	S	1-214-937-00	RES, METAL 1M 1% 1/2W
R19	S	1-214-913-00	RES, METAL 100K 1% 1/2W	R215	S	1-214-875-00	RES, METAL 3K 1% 1/2W
R20	S	1-214-913-00	RES, METAL 100K 1% 1/2W	R216	S	1-214-863-00	RES, METAL 910 1% 1/2W
R21	S	1-214-124-00	RES, METAL 470 1% 1/4W	R217	S	1-214-180-00	RES, METAL 100K 1% 1/4W
R22	S	1-214-152-00	RES, METAL 6.8K 1% 1/4W	R218	S	1-214-872-00	RES, METAL 2.2K 1% 1/2W
R23	S	1-214-126-00	RES, METAL 560 1% 1/4W	R219	S	1-214-877-00	RES, METAL 3.6K 1% 1/2W
R24	S	1-214-126-00	RES, METAL 560 1% 1/4W	R220	S	1-214-937-00	RES, METAL 1M 1% 1/2W
R25	S	1-214-142-00	RES, METAL 2.7K 1% 1/4W	R221	S	1-214-937-00	RES, METAL 1M 1% 1/2W
R26	S	1-214-132-00	RES, METAL 1K 1% 1/4W	R222	S	1-214-889-00	RES, METAL 11K 1% 1/2W
R27	S	1-214-156-00	RES, METAL 10K 1% 1/4W	R223	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R101	S	1-214-896-31	RES, METAL 20K 1% 1/2W	R224	S	1-214-111-00	RES, METAL 130 1% 1/4W
R102	S	1-214-888-00	RES, METAL 10K 1% 1/2W	R225	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R103	S	1-214-896-31	RES, METAL 20K 1% 1/2W	R226	S	1-214-147-00	RES, METAL 4.3K 1% 1/4W
R104	S	1-214-888-00	RES, METAL 10K 1% 1/2W	R227	S	1-214-152-00	RES, METAL 6.8K 1% 1/4W
R106	S	1-214-875-00	RES, METAL 3K 1% 1/2W	R228	S	1-214-166-00	RES, METAL 27K 1% 1/4W
R107	S	1-214-847-00	RES, METAL 200 1% 1/2W	R229	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R108	S	1-214-874-00	RES, METAL 2.7K 1% 1/2W	R230	S	1-214-139-00	RES, METAL 2K 1% 1/4W
R109	S	1-214-892-00	RES, METAL 15K 1% 1/2W	R231	S	1-214-152-00	RES, METAL 6.8K 1% 1/4W
R110	S	1-214-892-00	RES, METAL 15K 1% 1/2W	R232	S	1-214-154-00	RES, METAL 8.2K 1% 1/4W
R111	S	1-214-865-00	RES, METAL 1.1K 1% 1/2W	R233	S	1-214-126-00	RES, METAL 560 1% 1/4W
R112	S	1-214-159-00	RES, METAL 13K 1% 1/4W	R234	S	1-214-126-00	RES, METAL 560 1% 1/4W
R113	S	1-214-139-00	RES, METAL 2K 1% 1/4W	R235	S	1-214-130-00	RES, METAL 820 1% 1/4W
R114	S	1-214-937-00	RES, METAL 1M 1% 1/2W	R236	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R115	S	1-214-875-00	RES, METAL 3K 1% 1/2W	R237	S	1-214-108-00	RES, METAL 100 1% 1/4W
R116	S	1-214-863-00	RES, METAL 910 1% 1/2W	R238	S	1-214-108-00	RES, METAL 100 1% 1/4W
R117	S	1-214-180-00	RES, METAL 100K 1% 1/4W	R239	S	1-214-147-00	RES, METAL 4.3K 1% 1/4W
R118	S	1-214-872-00	RES, METAL 2.2K 1% 1/2W	R240	S	1-210-828-00	RES, CARBON 4.7M 5% 1/4W
R119	S	1-214-877-00	RES, METAL 3.6K 1% 1/2W	R241	S	1-215-493-00	RES, METAL 1M 1% 1/6W
R120	S	1-214-937-00	RES, METAL 1M 1% 1/2W	R242	S	1-214-892-00	RES, METAL 15K 1% 1/2W
R121	S	1-214-937-00	RES, METAL 1M 1% 1/2W	R243	S	1-214-168-00	RES, METAL 33K 1% 1/4W
R122	S	1-214-889-00	RES, METAL 11K 1% 1/2W	R244	S	1-214-153-00	RES, METAL 7.5K 1% 1/4W
R123	S	1-214-156-00	RES, METAL 10K 1% 1/4W	R245	S	1-214-153-00	RES, METAL 7.5K 1% 1/4W
R124	S	1-214-111-00	RES, METAL 130 1% 1/4W	RV101	S	1-230-879-11	RES, VAR, CARBON 10K
R125	S	1-214-156-00	RES, METAL 10K 1% 1/4W	RV102	S	1-228-763-00	RES, ADJ, CERMET 5K
R126	S	1-214-147-00	RES, METAL 4.3K 1% 1/4W	RV103	S	1-228-763-00	RES, ADJ, CERMET 5K
R127	S	1-214-152-00	RES, METAL 6.8K 1% 1/4W	RV201	S	1-230-879-11	RES, VAR, CARBON 10K
R128	S	1-214-166-00	RES, METAL 27K 1% 1/4W	RV202	S	1-228-763-00	RES, ADJ, CERMET 5K
R129	S	1-214-132-00	RES, METAL 1K 1% 1/4W	RV203	S	1-228-763-00	RES, ADJ, CERMET 5K
R130	S	1-214-139-00	RES, METAL 2K 1% 1/4W				
R131	S	1-214-152-00	RES, METAL 6.8K 1% 1/4W				
R132	S	1-214-154-00	RES, METAL 8.2K 1% 1/4W				
R133	S	1-214-126-00	RES, METAL 560 1% 1/4W				
R134	S	1-214-126-00	RES, METAL 560 1% 1/4W				

Ref.No. or Qty SP	Part No.	Description	Ref.No. or Qty SP	Part No.	Description			
SW1	S 1-553-441-00	SWITCH, TOGGLE	C36	S 1-124-477-11	CAP, ELECT	47	20%	25V
SW2	S 1-552-430-00	SWITCH, SLIDE	C37	S 1-161-894-00	CAP, CERAMIC	0.1		50V
			C38	S 1-124-478-11	CAP, ELECT	100	20%	25V
X1	S 1-567-185-00	CRYSTAL 48.0010MHZ	C39	S 1-161-894-00	CAP, CERAMIC	0.1		50V
			C40	S 1-124-478-11	CAP, ELECT	100	20%	25V
			C41	S 1-161-894-00	CAP, CERAMIC	0.1		50V
			C42	S 1-161-894-00	CAP, CERAMIC	0.1		50V
			C43	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C44	S 1-124-478-11	CAP, ELECT	100	20%	25V
			C45	S 1-124-478-11	CAP, ELECT	100	20%	25V
			C46	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C47	S 1-131-449-11	CAP, TANT	3.3	20%	16V
			C48	S 1-130-477-00	CAP, MYLAR	0.0033	5%	50V
			C49	S 1-130-476-00	CAP, MYLAR	0.0027	5%	50V
			C50	S 1-107-169-00	CAP, MICA	100P	5%	500V
			C51	S 1-107-169-00	CAP, MICA	100P	5%	500V
			C52	S 1-161-894-00	CAP, CERAMIC	0.1		50V
			C53	S 1-161-894-00	CAP, CERAMIC	0.1		50V
			C54	S 1-124-721-41	CAP, ELECT	10	20%	50V
			C55	S 1-130-471-00	CAP, MYLAR	0.001	5%	50V
			C56	S 1-124-721-41	CAP, ELECT	10	20%	50V
			C57	S 1-102-512-00	CAP, CERAMIC	16P	5%	50V
			C58	S 1-161-894-00	CAP, CERAMIC	0.1		50V
			C59	S 1-102-973-00	CAP, CERAMIC	100P	5%	50V
			C60	S 1-124-697-41	CAP, ELECT	47	20%	25V
			C61	S 1-161-894-00	CAP, CERAMIC	0.1		50V
			C62	S 1-124-478-11	CAP, ELECT	100	20%	25V
			C63	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C64	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C65	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C66	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C67	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C68	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C69	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C70	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C71	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C72	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C73	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C74	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C75	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C76	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C77	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C78	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C79	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C80	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C81	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C82	S 1-101-004-00	CAP, CERAMIC	0.01		50V
			C83	S 1-131-449-11	CAP, TANT	3.3	20%	16V
			C84	S 1-131-449-11	CAP, TANT	3.3	20%	16V
			C85	S 1-131-449-11	CAP, TANT	3.3	20%	16V
			C86	S 1-131-449-11	CAP, TANT	3.3	20%	16V
			C101	S 1-130-471-00	CAP, MYLAR	0.001	5%	50V
			C102	S 1-130-471-00	CAP, MYLAR	0.001	5%	50V
			C103	S 1-124-697-41	CAP, ELECT	47	20%	25V
			C104	S 1-161-894-00	CAP, CERAMIC	0.1		50V
			C105	S 1-131-449-11	CAP, TANT	3.3	20%	16V
			C106	S 1-131-449-11	CAP, TANT	3.3	20%	16V
			C107	S 1-131-449-11	CAP, TANT	3.3	20%	16V
			C109	S 1-131-449-11	CAP, TANT	3.3	20%	16V
			C110	S 1-104-239-00	CAP, STYROL	1500P	5%	125V
			C111	S 1-104-239-00	CAP, STYROL	1500P	5%	125V
			C112	S 1-131-450-00	CAP, TANT	1	20%	50V
			C113	S 1-131-450-00	CAP, TANT	1	20%	50V
			C114	S 1-131-450-00	CAP, TANT	1	20%	50V
<b>DA-15 BOARD</b>								
1pc	O A-7850-293-A	COMPLETE PCB, DA-15						
(This assembly includes the following parts.)								
1pc	S 2-251-622-00	LEVER, PC BOARD						
1pc	O 3-673-867-00	PLATE, INDICATION, PC BOARD						
4pcs	O 4-874-192-01	HEAT SINK						
1pc	O 4-911-745-01	CASE (LOWER), DA SHIELD						
1pc	O 4-911-746-01	CASE (UPPER), DA SHIELD						
1pc	O 4-911-704-41	LABEL (DA), PC BOARD						
2pcs	S 7-626-317-21	PIN, SPRING 2.5x8						
4pcs	S 7-682-547-04	SCREW, +B3x6						
4pcs	S 7-684-023-04	NUT, M3						
AFL101	S 1-235-609-11	FILTER, LOW-PASS 24KHZ						
AFL201	S 1-235-609-11	FILTER, LOW-PASS 24KHZ						
C1	S 1-124-725-41	CAP, ELECT 100	20%	50V				
C2	S 1-161-894-00	CAP, CERAMIC 0.1		50V				
C3	S 1-124-725-41	CAP, ELECT 100	20%	50V				
C4	S 1-161-894-00	CAP, CERAMIC 0.1		50V				
C5	S 1-124-725-41	CAP, ELECT 100	20%	50V				
C6	S 1-161-894-00	CAP, CERAMIC 0.1		50V				
C7	S 1-124-725-41	CAP, ELECT 100	20%	50V				
C8	S 1-161-894-00	CAP, CERAMIC 0.1		50V				
C9	S 1-124-725-41	CAP, ELECT 100	20%	50V				
C10	S 1-161-894-00	CAP, CERAMIC 0.1		50V				
C11	S 1-124-725-41	CAP, ELECT 100	20%	50V				
C12	S 1-161-894-00	CAP, CERAMIC 0.1		50V				
C13	S 1-131-450-00	CAP, TANT 1	20%	50V				
C14	S 1-124-724-41	CAP, ELECT 47	20%	50V				
C15	S 1-161-894-00	CAP, CERAMIC 0.1		50V				
C16	S 1-131-450-00	CAP, TANT 1	20%	50V				
C17	S 1-124-724-41	CAP, ELECT 47	20%	50V				
C18	S 1-161-894-00	CAP, CERAMIC 0.1		50V				
C19	S 1-131-450-00	CAP, TANT 1	20%	50V				
C20	S 1-124-725-41	CAP, ELECT 100	20%	50V				
C21	S 1-161-894-00	CAP, CERAMIC 0.1		50V				
C22	S 1-131-450-00	CAP, TANT 1	20%	50V				
C23	S 1-124-725-41	CAP, ELECT 100	20%	50V				
C24	S 1-161-894-00	CAP, CERAMIC 0.1		50V				
C25	S 1-131-450-00	CAP, TANT 1	20%	50V				
C26	S 1-124-724-41	CAP, ELECT 47	20%	50V				
C27	S 1-161-894-00	CAP, CERAMIC 0.1		50V				
C28	S 1-131-450-00	CAP, TANT 1	20%	50V				
C29	S 1-124-724-41	CAP, ELECT 47	20%	50V				
C30	S 1-161-894-00	CAP, CERAMIC 0.1		50V				
C31	S 1-131-450-00	CAP, TANT 1	20%	50V				
C32	S 1-124-721-41	CAP, ELECT 10	20%	50V				
C33	S 1-161-894-00	CAP, CERAMIC 0.1		50V				
C34	S 1-124-477-11	CAP, ELECT 47	20%	25V				
C35	S 1-161-894-00	CAP, CERAMIC 0.1		50V				

Ref.No. or Qty SP	Part No.	Description			Ref.No. or Qty SP	Part No.	Description						
C115	S	1-131-450-00	CAP,TANT	1	20%	50V	C214	S	1-131-450-00	CAP,TANT	1	20%	50V
C116	S	1-124-721-41	CAP,ELECT	10	20%	50V	C215	S	1-131-450-00	CAP,TANT	1	20%	50V
C117	S	1-124-721-41	CAP,ELECT	10	20%	50V	C216	S	1-124-721-41	CAP,ELECT	10	20%	50V
C118	S	1-124-721-41	CAP,ELECT	10	20%	50V	C217	S	1-124-721-41	CAP,ELECT	10	20%	50V
C119	S	1-131-449-11	CAP,TANT	3.3	20%	16V	C218	S	1-124-721-41	CAP,ELECT	10	20%	50V
C120	S	1-131-449-11	CAP,TANT	3.3	20%	16V	C219	S	1-131-449-11	CAP,TANT	3.3	20%	16V
C121	S	1-131-449-11	CAP,TANT	3.3	20%	16V	C220	S	1-131-449-11	CAP,TANT	3.3	20%	16V
C123	S	1-131-449-11	CAP,TANT	3.3	20%	16V	C221	S	1-131-449-11	CAP,TANT	3.3	20%	16V
C124	S	1-107-054-00	CAP,MICA	33P	10%	500V	C223	S	1-131-449-11	CAP,TANT	3.3	20%	16V
C125	S	1-131-450-00	CAP,TANT	1	20%	50V	C224	S	1-107-054-00	CAP,MICA	33P	10%	500V
C126	S	1-131-450-00	CAP,TANT	1	20%	50V	C225	S	1-131-450-00	CAP,TANT	1	20%	50V
C127	S	1-124-724-41	CAP,ELECT	47	20%	50V	C226	S	1-131-450-00	CAP,TANT	1	20%	50V
C128	S	1-161-894-00	CAP,CERAMIC	0.1		50V	C227	S	1-124-724-41	CAP,ELECT	47	20%	50V
C129	S	1-124-724-41	CAP,ELECT	47	20%	50V	C228	S	1-161-894-00	CAP,CERAMIC	0.1		50V
C130	S	1-161-894-00	CAP,CERAMIC	0.1		50V	C229	S	1-124-724-41	CAP,ELECT	47	20%	50V
C131	S	1-131-450-00	CAP,TANT	1	20%	50V	C230	S	1-161-894-00	CAP,CERAMIC	0.1		50V
C132	S	1-131-450-00	CAP,TANT	1	20%	50V	C231	S	1-131-450-00	CAP,TANT	1	20%	50V
C133	S	1-130-479-00	CAP,MYLAR	0.0047	5%	50V	C232	S	1-131-450-00	CAP,TANT	1	20%	50V
C134	S	1-131-450-00	CAP,TANT	1	20%	50V	C233	S	1-130-479-00	CAP,MYLAR	0.0047	5%	50V
C135	S	1-131-450-00	CAP,TANT	1	20%	50V	C234	S	1-131-450-00	CAP,TANT	1	20%	50V
C136	S	1-162-176-00	CAP,CERAMIC	1.5		25V	C235	S	1-131-450-00	CAP,TANT	1	20%	50V
C137	S	1-162-176-00	CAP,CERAMIC	1.5		25V	C236	S	1-162-176-00	CAP,CERAMIC	1.5		25V
C138	S	1-131-450-00	CAP,TANT	1	20%	50V	C237	S	1-162-176-00	CAP,CERAMIC	1.5		25V
C139	S	1-131-450-00	CAP,TANT	1	20%	50V	C238	S	1-131-450-00	CAP,TANT	1	20%	50V
C140	S	1-131-449-11	CAP,TANT	3.3	20%	16V	C239	S	1-131-450-00	CAP,TANT	1	20%	50V
C141	S	1-131-449-11	CAP,TANT	3.3	20%	16V	C240	S	1-131-449-11	CAP,TANT	3.3	20%	16V
C142	S	1-161-894-00	CAP,CERAMIC	0.1		50V	C241	S	1-131-449-11	CAP,TANT	3.3	20%	16V
C143	S	1-131-450-00	CAP,TANT	1	20%	50V	C242	S	1-161-894-00	CAP,CERAMIC	0.1		50V
C144	S	1-131-450-00	CAP,TANT	1	20%	50V	C243	S	1-131-450-00	CAP,TANT	1	20%	50V
C145	S	1-124-724-41	CAP,ELECT	47	20%	50V	C244	S	1-131-450-00	CAP,TANT	1	20%	50V
C146	S	1-124-724-41	CAP,ELECT	47	20%	50V	C245	S	1-124-724-41	CAP,ELECT	47	20%	50V
C147	S	1-131-450-00	CAP,TANT	1	20%	50V	C246	S	1-124-724-41	CAP,ELECT	47	20%	50V
C148	S	1-131-450-00	CAP,TANT	1	20%	50V	C247	S	1-131-450-00	CAP,TANT	1	20%	50V
C149	S	1-107-036-00	CAP,MICA	68P	5%	500V	C248	S	1-131-450-00	CAP,TANT	1	20%	50V
C150	S	1-107-054-00	CAP,MICA	33P	10%	500V	C249	S	1-107-036-00	CAP,MICA	68P	5%	500V
C151	S	1-107-054-00	CAP,MICA	33P	10%	500V	C250	S	1-107-054-00	CAP,MICA	33P	10%	500V
C152	S	1-131-450-00	CAP,TANT	1	20%	50V	C251	S	1-107-054-00	CAP,MICA	33P	10%	500V
C153	S	1-124-724-41	CAP,ELECT	47	20%	50V	C252	S	1-131-450-00	CAP,TANT	1	20%	50V
C154	S	1-131-450-00	CAP,TANT	1	20%	50V	C253	S	1-124-724-41	CAP,ELECT	47	20%	50V
C155	S	1-124-724-41	CAP,ELECT	47	20%	50V	C254	S	1-131-450-00	CAP,TANT	1	20%	50V
C156	S	1-131-450-00	CAP,TANT	1	20%	50V	C255	S	1-124-724-41	CAP,ELECT	47	20%	50V
C157	S	1-131-450-00	CAP,TANT	1	20%	50V	C256	S	1-131-450-00	CAP,TANT	1	20%	50V
C158	S	1-107-036-00	CAP,MICA	68P	5%	500V	C257	S	1-131-450-00	CAP,TANT	1	20%	50V
C159	S	1-107-054-00	CAP,MICA	33P	10%	500V	C258	S	1-107-036-00	CAP,MICA	68P	5%	500V
C160	S	1-107-054-00	CAP,MICA	33P	10%	500V	C259	S	1-107-054-00	CAP,MICA	33P	10%	500V
C161	S	1-131-450-00	CAP,TANT	1	20%	50V	C260	S	1-107-054-00	CAP,MICA	33P	10%	500V
C162	S	1-124-724-41	CAP,ELECT	47	20%	50V	C261	S	1-131-450-00	CAP,TANT	1	20%	50V
C163	S	1-131-450-00	CAP,TANT	1	20%	50V	C262	S	1-124-724-41	CAP,ELECT	47	20%	50V
C164	S	1-124-724-41	CAP,ELECT	47	20%	50V	C263	S	1-131-450-00	CAP,TANT	1	20%	50V
C165	S	1-102-518-00	CAP,CERAMIC	33P	5%	50V	C264	S	1-124-724-41	CAP,ELECT	47	20%	50V
C166	S	1-131-449-11	CAP,TANT	3.3	20%	16V	C265	S	1-102-518-00	CAP,CERAMIC	33P	5%	50V
C167	S	1-131-449-11	CAP,TANT	3.3	20%	16V	C266	S	1-131-449-11	CAP,TANT	3.3	20%	16V
C168	S	1-131-449-11	CAP,TANT	3.3	20%	16V	C267	S	1-131-449-11	CAP,TANT	3.3	20%	16V
C169	S	1-104-069-00	CAP,STYROL	470P	5%	50V	C268	S	1-131-449-11	CAP,TANT	3.3	20%	16V
C170	S	1-162-176-00	CAP,CERAMIC	1.5		25V	C269	S	1-104-069-00	CAP,STYROL	470P	5%	50V
C171	S	1-131-450-00	CAP,TANT	1	20%	50V	C270	S	1-162-176-00	CAP,CERAMIC	1.5		25V
C201	S	1-130-471-00	CAP,MYLAR	0.001	5%	50V	C271	S	1-131-450-00	CAP,TANT	1	20%	50V
C202	S	1-130-471-00	CAP,MYLAR	0.001	5%	50V	C301	S	1-102-852-00	CAP,CERAMIC	47P	5%	50V
C203	S	1-124-697-41	CAP,ELECT	47	20%	25V	C302	S	1-136-165-00	CAP,FILM	0.1	5%	50V
C204	S	1-161-894-00	CAP,CERAMIC	0.1		50V	C303	S	1-136-165-00	CAP,FILM	0.1	5%	50V
C205	S	1-131-449-11	CAP,TANT	3.3	20%	16V	CV1	S	1-141-245-00	TRIMMER,CERAMIC			
C206	S	1-131-449-11	CAP,TANT	3.3	20%	16V	D1	S	8-719-911-19	DIODE 1SS119			
C207	S	1-131-449-11	CAP,TANT	3.3	20%	16V	D2	S	8-719-911-19	DIODE 1SS119			
C209	S	1-131-449-11	CAP,TANT	3.3	20%	16V	D3	S	8-719-911-19	DIODE 1SS119			
C210	S	1-104-239-00	CAP,STYROL	1500P	5%	125V	D4	S	8-719-911-19	DIODE 1SS119			
C211	S	1-104-239-00	CAP,STYROL	1500P	5%	125V	D5	S	8-719-915-20	DIODE FC52M			
C212	S	1-131-450-00	CAP,TANT	1	20%	50V	D6	S	8-719-911-19	DIODE 1SS119			
C213	S	1-131-450-00	CAP,TANT	1	20%	50V							

Ref.No. or Qty	SP	Part No.	Description	Ref.No. or Qty	SP	Part No.	Description
D101	S	8-719-951-12	DIODE HZ5BLL	IC103	S	8-759-108-96	IC uPC811C
D102	S	8-719-951-12	DIODE HZ5BLL	IC104	S	8-759-240-53	IC TC4053BP
D103	S	8-719-911-19	DIODE 1SS119				(Only up to Serial No. 10800)
D104	S	8-719-911-19	DIODE 1SS119	IC105	S	8-759-240-53	IC TC4053BP
D106	S	8-719-911-19	DIODE 1SS119	IC106	S	8-759-925-25	IC HA7-2525-5
				IC107	S	8-759-108-96	IC uPC811C
D107	S	8-719-911-19	DIODE 1SS119				
D108	S	8-719-911-19	DIODE 1SS119	IC108	S	8-759-900-72	IC NE5532P
D109	S	8-719-911-19	DIODE 1SS119	IC109	S	8-759-910-83	IC TL072ACP
D110	S	8-719-200-02	DIODE 10E-2	IC110	S	8-759-240-53	IC TC4053BP
D111	S	8-719-911-19	DIODE 1SS119	IC111	S	8-759-745-63	IC NJM4560D-X
				IC112, S		8-741-136-70	IC BX-1367
D112	S	8-719-911-19	DIODE 1SS119	113			(Up to Serial No. 10126, and from 10201 to 10204)
D113	S	8-719-911-19	DIODE 1SS119				8-741-139-10 IC BX-1391
D114	S	8-719-911-19	DIODE 1SS119				(Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)
D115	S	8-719-911-19	DIODE 1SS119				
D116	S	8-719-911-19	DIODE 1SS119				
				IC201	S	8-752-015-20	IC CX20152
D117	S	8-719-911-19	DIODE 1SS119	IC202	S	8-759-108-96	IC uPC811C
D118	S	8-719-911-19	DIODE 1SS119	IC203	S	8-759-108-96	IC uPC811C
D119	S	8-719-911-19	DIODE 1SS119	IC204	S	8-759-240-53	IC TC4053BP
D201	S	8-719-951-12	DIODE HZ5BLL				(Only up to Serial No. 10800)
D202	S	8-719-951-12	DIODE HZ5BLL	IC205	S	8-759-240-53	IC TC4053BP
D203	S	8-719-911-19	DIODE 1SS119	IC206	S	8-759-925-25	IC HA7-2525-5
D204	S	8-719-911-19	DIODE 1SS119	IC207	S	8-759-108-96	IC uPC811C
D206	S	8-719-911-19	DIODE 1SS119	IC208	S	8-759-900-72	IC NE5532P
D207	S	8-719-911-19	DIODE 1SS119	IC209	S	8-759-910-83	IC TL072ACP
D208	S	8-719-911-19	DIODE 1SS119	IC210	S	8-759-240-53	IC TC4053BP
D209	S	8-719-911-19	DIODE 1SS119	IC211	S	8-759-745-63	IC NJM4560D-X
D210	S	8-719-200-02	DIODE 10E-2	IC212, S		8-741-136-70	IC BX-1367
D211	S	8-719-911-19	DIODE 1SS119	213			(Up to Serial No. 10126, and from 10201 to 10204)
D212	S	8-719-911-19	DIODE 1SS119				8-741-139-10 IC BX-1391
D213	S	8-719-911-19	DIODE 1SS119				(Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)
D214	S	8-719-911-19	DIODE 1SS119	L1	S	1-409-309-00	COIL,SN 72
D215	S	8-719-911-19	DIODE 1SS119	L2	S	1-409-309-00	COIL,SN 72
D216	S	8-719-911-19	DIODE 1SS119	L3	S	1-409-309-00	COIL,SN 72
D217	S	8-719-911-19	DIODE 1SS119	L4	S	1-409-309-00	COIL,SN 72
D218	S	8-719-911-19	DIODE 1SS119	L5	S	1-535-178-00	RES,FERRITE
				L6	S	1-535-178-00	RES,FERRITE
D219	S	8-719-911-19	DIODE 1SS119	L7	S	1-535-178-00	RES,FERRITE
D301, S		8-719-951-12	DIODE HZ5BLL	L8	S	1-535-178-00	RES,FERRITE
302			(Only up to Serial No. 10126, and from 10201 to 10204)	L9	S	1-535-178-00	RES,FERRITE
				L10	S	1-535-178-00	RES,FERRITE
IC1	S	8-759-001-16	IC MC10116L	L11	S	1-535-178-00	RES,FERRITE
IC2	S	8-759-220-04	IC TC40H004P	L12	S	1-535-178-00	RES,FERRITE
IC3	S	8-759-200-27	IC TC40H153P	L13	S	1-426-111-00	COIL,RF
IC4	S	8-759-921-03	IC CXD1027P	L14	S	1-408-400-00	INDUCTOR,MICRO 1.8 5%
IC5	S	8-759-921-03	IC CXD1027P	L15	S	1-408-400-00	INDUCTOR,MICRO 1.8 5%
				L16	S	1-535-178-00	RES,FERRITE
IC6	S	8-759-220-00	IC TC40H000P	L101	S	1-535-178-00	RES,FERRITE
IC7	S	8-759-221-75	IC TC40H175P	L102	S	1-408-879-21	INDUCTOR,MICRO 0.47 10%
IC8	S	8-759-200-32	IC TC40H161P	L103	S	1-535-178-00	RES,FERRITE
IC9	S	8-759-200-09	IC TC40H393P	L104	S	1-535-178-00	RES,FERRITE
IC10	S	8-759-200-05	IC TC40H008P	L201	S	1-535-178-00	RES,FERRITE
				L202	S	1-408-879-21	INDUCTOR,MICRO 0.47 10%
IC11	S	8-759-220-04	IC TC40H004P	L203	S	1-535-178-00	RES,FERRITE
IC12	S	8-759-220-74	IC TC40H074P	L204	S	1-535-178-00	RES,FERRITE
IC13	S	8-759-220-02	IC TC40H002P				
IC14	S	8-759-200-32	IC TC40H161P				
IC15	S	8-759-912-53	IC CX23034				
IC16	S	8-759-016-48	IC MC1648P				
IC17	S	8-752-306-50	IC CX23065				
IC18	S	8-759-202-13	IC TC74HCU04P				
IC19	S	8-759-220-74	IC TC40H074P				
IC20	S	8-759-220-74	IC TC40H074P				
IC21	S	8-759-200-05	IC TC40H008P				
IC22	S	8-759-220-00	IC TC40H000P				
IC24	S	8-759-220-04	IC TC40H004P				
IC101	S	8-752-015-20	IC CX20152				
IC102	S	8-759-108-96	IC uPC811C				

Ref.No. or Qty SP	Part No.	Description	Ref.No. or Qty SP	Part No.	Description
Q1	S 8-759-378-18	IC FS7818	R107	S 1-214-159-00	RES,METAL 13K 1% 1/4W
Q2	S 8-759-179-18	IC UPC7918H	R108	S 1-214-164-00	RES,METAL 22K 1% 1/4W
Q3	S 8-759-171-15	IC UPC7815H	R109	S 1-214-159-00	RES,METAL 13K 1% 1/4W
Q4	S 8-759-179-15	IC UPC7915H	R110	S 1-214-156-00	RES,METAL 10K 1% 1/4W
Q5	S 8-759-171-15	IC UPC7815H	R111	S 1-214-164-00	RES,METAL 22K 1% 1/4W
Q6	S 8-759-179-15	IC UPC7915H	R112	S 1-214-147-00	RES,METAL 4.3K 1% 1/4W
Q7	S 8-759-700-28	IC NJM7905A	R113	S 1-214-147-00	RES,METAL 4.3K 1% 1/4W
Q8	S 8-759-700-51	IC NJM7805A	R115	S 1-214-160-00	RES,METAL 15K 1% 1/4W
Q9	S 8-759-700-28	IC NJM7905A	R116	S 1-214-160-00	RES,METAL 15K 1% 1/4W
Q10	S 8-729-993-72	TRANSISTOR 2SA937	R117	S 1-214-143-00	RES,METAL 3K 1% 1/4W
Q11	S 8-729-965-22	TRANSISTOR 2SC1652	R118	S 1-214-115-00	RES,METAL 200 1% 1/4W
Q101	S 8-729-699-51	TRANSISTOR 2SA995	R119	S 1-214-964-00	RES,METAL 1M 1% 1/4W
Q102	S 8-729-800-44	TRANSISTOR 2SK152-4	R120	S 1-214-148-00	RES,METAL 4.7K 1% 1/4W
Q103	S 8-729-800-44	TRANSISTOR 2SK152-4	R121	S 1-214-148-00	RES,METAL 4.7K 1% 1/4W
Q104	S 8-729-306-92	TRANSISTOR 2SD669A	R122	S 1-214-141-00	RES,METAL 2.4K 1% 1/4W
Q105	S 8-729-304-92	TRANSISTOR 2SB649A	R123	S 1-214-150-00	RES,METAL 5.6K 1% 1/4W
Q106	S 8-729-902-11	TRANSISTOR 2SC2021	R124	S 1-214-964-00	RES,METAL 1M 1% 1/4W
Q107	S 8-729-306-92	TRANSISTOR 2SD669A	R125	S 1-214-964-00	RES,METAL 1M 1% 1/4W
Q108	S 8-729-993-72	TRANSISTOR 2SA937	R126	S 1-214-160-00	RES,METAL 15K 1% 1/4W
Q109	S 8-729-304-92	TRANSISTOR 2SB649A	R127	S 1-214-108-00	RES,METAL 100 1% 1/4W
Q110	S 8-729-902-11	TRANSISTOR 2SC2021	R128	S 1-214-160-00	RES,METAL 15K 1% 1/4W
Q111	S 8-729-993-72	TRANSISTOR 2SA937	R129	S 1-214-160-00	RES,METAL 15K 1% 1/4W
Q112	S 8-729-306-92	TRANSISTOR 2SD669A	R130	S 1-214-153-00	RES,METAL 7.5K 1% 1/4W
Q113	S 8-729-304-92	TRANSISTOR 2SB649A	R131	S 1-214-153-00	RES,METAL 7.5K 1% 1/4W
Q114	S 8-729-800-44	TRANSISTOR 2SK152-4	R132	S 1-214-084-00	RES,METAL 10 1% 1/4W
Q201	S 8-729-699-51	TRANSISTOR 2SA995	R133	S 1-214-084-00	RES,METAL 10 1% 1/4W
Q202	S 8-729-800-44	TRANSISTOR 2SK152-4	R134	S 1-214-084-00	RES,METAL 10 1% 1/4W
Q203	S 8-729-800-44	TRANSISTOR 2SK152-4	R135	S 1-214-084-00	RES,METAL 10 1% 1/4W
Q204	S 8-729-306-92	TRANSISTOR 2SD669A	R136	S 1-214-669-00	RES,METAL 3.3 1% 1/4W
Q205	S 8-729-304-92	TRANSISTOR 2SB649A	R137	S 1-214-140-00	RES,METAL 2.2K 1% 1/4W
Q206	S 8-729-902-11	TRANSISTOR 2SC2021	R138	S 1-214-156-00	RES,METAL 10K 1% 1/4W
Q207	S 8-729-306-92	TRANSISTOR 2SD669A	R139	S 1-214-163-00	RES,METAL 20K 1% 1/4W
Q208	S 8-729-993-72	TRANSISTOR 2SA937	R140	S 1-214-156-00	RES,METAL 10K 1% 1/4W
Q209	S 8-729-304-92	TRANSISTOR 2SB649A	R141	S 1-214-163-00	RES,METAL 20K 1% 1/4W
Q210	S 8-729-902-11	TRANSISTOR 2SC2021	R142	S 1-214-669-00	RES,METAL 3.3 1% 1/4W
Q211	S 8-729-993-72	TRANSISTOR 2SA937	R143	S 1-214-669-00	RES,METAL 3.3 1% 1/4W
Q212	S 8-729-306-92	TRANSISTOR 2SD669A	R144	S 1-214-669-00	RES,METAL 3.3 1% 1/4W
Q213	S 8-729-304-92	TRANSISTOR 2SB649A	R145	S 1-214-084-00	RES,METAL 10 1% 1/4W
Q214	S 8-729-800-44	TRANSISTOR 2SK152-4			(Up to Serial No. 10126, and from
Q301	S 8-729-211-81	TRANSISTOR 2SK118			10201 to 10204)
Q302	S 8-729-211-81	TRANSISTOR 2SK118			1-214-091-00 RES,METAL 20 1% 1/4W
R2	S 1-207-634-00	RES,WIRE 68 10% 3W			(Serial No. 10205 and higher for J, U/C
R3	S 1-214-156-00	RES,METAL 10K 1% 1/4W			Serial No. 10127 and higher for AEP)
R4	S 1-214-165-00	RES,METAL 24K 1% 1/4W	R146	S 1-214-156-00	RES,METAL 10K 1% 1/4W
R5	S 1-214-132-00	RES,METAL 1K 1% 1/4W			(Up to Serial No. 10126, and from
R6	S 1-214-180-00	RES,METAL 100K 1% 1/4W			10201 to 10204)
R7	S 1-214-173-00	RES,METAL 51K 1% 1/4W			1-214-158-00 RES,METAL 12K 1% 1/4W
R8	S 1-214-150-00	RES,METAL 5.6K 1% 1/4W			(Serial No. 10205 and higher for J, U/C
R9	S 1-214-126-00	RES,METAL 560 1% 1/4W			Serial No. 10127 and higher for AEP)
R10	S 1-214-126-00	RES,METAL 560 1% 1/4W			1-214-156-00 RES,METAL 10K 1% 1/4W
R11	S 1-214-126-00	RES,METAL 560 1% 1/4W			(Up to Serial No. 10126, and from
R12	S 1-214-126-00	RES,METAL 560 1% 1/4W			10201 to 10204)
R13	S 1-214-126-00	RES,METAL 560 1% 1/4W			1-214-091-00 RES,METAL 20 1% 1/4W
R14	S 1-214-126-00	RES,METAL 560 1% 1/4W			(Serial No. 10205 and higher for J, U/C
R15	S 1-214-135-00	RES,METAL 1.3K 1% 1/4W			Serial No. 10127 and higher for AEP)
R16	S 1-214-160-00	RES,METAL 15K 1% 1/4W			1-214-163-00 RES,METAL 20K 1% 1/4W
R17	S 1-214-156-00	RES,METAL 10K 1% 1/4W			1-214-156-00 RES,METAL 10K 1% 1/4W
R18	S 1-214-132-00	RES,METAL 1K 1% 1/4W			1-214-163-00 RES,METAL 20K 1% 1/4W
R19	S 1-214-131-00	RES,METAL 910 1% 1/4W			1-214-669-00 RES,METAL 3.3 1% 1/4W
R20	S 1-214-132-00	RES,METAL 1K 1% 1/4W			1-214-669-00 RES,METAL 3.3 1% 1/4W
R101	S 1-214-140-00	RES,METAL 2.2K 1% 1/4W			1-214-669-00 RES,METAL 3.3 1% 1/4W
R102	S 1-214-148-00	RES,METAL 4.7K 1% 1/4W			R152
R103	S 1-214-148-00	RES,METAL 4.7K 1% 1/4W			S 1-214-669-00 RES,METAL 3.3 1% 1/4W
R104	S 1-214-159-00	RES,METAL 13K 1% 1/4W			R153
R105	S 1-214-158-00	RES,METAL 12K 1% 1/4W			S 1-214-084-00 RES,METAL 10 1% 1/4W
R106	S 1-214-164-00	RES,METAL 22K 1% 1/4W			(Up to Serial No. 10126, and from
					10201 to 10204)
					1-214-091-00 RES,METAL 20 1% 1/4W
					(Serial No. 10205 and higher for J, U/C
					Serial No. 10127 and higher for AEP)
			R154	S 1-214-180-00	RES,METAL 100K 1% 1/4W
			R155	S 1-214-180-00	RES,METAL 100K 1% 1/4W
			R156	S 1-214-173-00	RES,METAL 51K 1% 1/4W

Ref.No. or Qty SP	Part No.	Description	Ref.No. or Qty SP	Part No.	Description
R157	S 1-214-128-00	RES,METAL 680 1 $\frac{1}{4}$ W	R250	S 1-214-669-00	RES,METAL 3.3 1 $\frac{1}{4}$ W
R158	S 1-214-132-00	RES,METAL 1K 1 $\frac{1}{4}$ W	R251	S 1-214-669-00	RES,METAL 3.3 1 $\frac{1}{4}$ W
R159	S 1-214-143-00	RES,METAL 3K 1 $\frac{1}{4}$ W	R252	S 1-214-669-00	RES,METAL 3.3 1 $\frac{1}{4}$ W
R160	S 1-214-148-00	RES,METAL 4.7K 1 $\frac{1}{4}$ W	R253	S 1-214-084-00	RES,METAL 10 1 $\frac{1}{4}$ W
R161	S 1-214-180-00	RES,METAL 100K 1 $\frac{1}{4}$ W (Up to Serial No. 10126, and from 10201 to 10204)			
	S 1-214-964-00	RES,METAL 1M 1 $\frac{1}{4}$ W (Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)			
R162	S 1-214-172-00	RES,METAL 47K 1 $\frac{1}{4}$ W	R254	S 1-214-180-00	RES,METAL 100K 1 $\frac{1}{4}$ W
R201	S 1-214-140-00	RES,METAL 2.2K 1 $\frac{1}{4}$ W	R255	S 1-214-180-00	RES,METAL 100K 1 $\frac{1}{4}$ W
R202	S 1-214-148-00	RES,METAL 4.7K 1 $\frac{1}{4}$ W	R256	S 1-214-173-00	RES,METAL 51K 1 $\frac{1}{4}$ W
R203	S 1-214-148-00	RES,METAL 4.7K 1 $\frac{1}{4}$ W	R257	S 1-214-128-00	RES,METAL 680 1 $\frac{1}{4}$ W
R204	S 1-214-159-00	RES,METAL 13K 1 $\frac{1}{4}$ W	R258	S 1-214-132-00	RES,METAL 1K 1 $\frac{1}{4}$ W
R205	S 1-214-158-00	RES,METAL 12K 1 $\frac{1}{4}$ W	R259	S 1-214-143-00	RES,METAL 3K 1 $\frac{1}{4}$ W
R206	S 1-214-164-00	RES,METAL 22K 1 $\frac{1}{4}$ W	R260	S 1-214-148-00	RES,METAL 4.7K 1 $\frac{1}{4}$ W
R207	S 1-214-159-00	RES,METAL 13K 1 $\frac{1}{4}$ W	R261	S 1-214-180-00	RES,METAL 100K 1 $\frac{1}{4}$ W
R208	S 1-214-164-00	RES,METAL 22K 1 $\frac{1}{4}$ W			
R209	S 1-214-159-00	RES,METAL 13K 1 $\frac{1}{4}$ W			
R210	S 1-214-156-00	RES,METAL 10K 1 $\frac{1}{4}$ W			
R211	S 1-214-164-00	RES,METAL 22K 1 $\frac{1}{4}$ W	R262	S 1-214-172-00	RES,METAL 47K 1 $\frac{1}{4}$ W
R212	S 1-214-147-00	RES,METAL 4.3K 1 $\frac{1}{4}$ W	R301,	S 1-215-493-00	RES,METAL 1M 1 $\frac{1}{6}$ W
R213	S 1-214-147-00	RES,METAL 4.3K 1 $\frac{1}{4}$ W	302		(Up to Serial No. 10126, and from 10201 to 10204)
R215	S 1-214-160-00	RES,METAL 15K 1 $\frac{1}{4}$ W			
R216	S 1-214-160-00	RES,METAL 15K 1 $\frac{1}{4}$ W			
R217	S 1-214-143-00	RES,METAL 3K 1 $\frac{1}{4}$ W			
R218	S 1-214-115-00	RES,METAL 200 1 $\frac{1}{4}$ W			
R219	S 1-214-964-00	RES,METAL 1M 1 $\frac{1}{4}$ W			
R220	S 1-214-148-00	RES,METAL 4.7K 1 $\frac{1}{4}$ W	R303	S 1-247-894-00	RES,CARBON 430K 5 $\frac{1}{6}$ W
R221	S 1-214-148-00	RES,METAL 4.7K 1 $\frac{1}{4}$ W			(Up to Serial No. 10126, and from 10201 to 10204)
R222	S 1-214-141-00	RES,METAL 2.4K 1 $\frac{1}{4}$ W			
R223	S 1-214-150-00	RES,METAL 5.6K 1 $\frac{1}{4}$ W			
R224	S 1-214-964-00	RES,METAL 1M 1 $\frac{1}{4}$ W	R304	S 1-249-433-11	RES,CARBON 22K 5 $\frac{1}{6}$ W
R225	S 1-214-964-00	RES,METAL 1M 1 $\frac{1}{4}$ W			(Up to Serial No. 10126, and from 10201 to 10204)
R226	S 1-214-160-00	RES,METAL 15K 1 $\frac{1}{4}$ W			
R227	S 1-214-108-00	RES,METAL 100 1 $\frac{1}{4}$ W			
R228	S 1-214-160-00	RES,METAL 15K 1 $\frac{1}{4}$ W			
R229	S 1-214-160-00	RES,METAL 15K 1 $\frac{1}{4}$ W	R305	S 1-249-433-11	RES,CARBON 22K 5 $\frac{1}{6}$ W
R230	S 1-214-153-00	RES,METAL 7.5K 1 $\frac{1}{4}$ W			(Only up to Serial No. 10126, and from 10201 to 10204)
R231	S 1-214-153-00	RES,METAL 7.5K 1 $\frac{1}{4}$ W			
R232	S 1-214-084-00	RES,METAL 10 1 $\frac{1}{4}$ W	R306	S 1-247-894-00	RES,CARBON 430K 5 $\frac{1}{6}$ W
R233	S 1-214-084-00	RES,METAL 10 1 $\frac{1}{4}$ W			(Only up to Serial No. 10126, and from 10201 to 10204)
R234	S 1-214-084-00	RES,METAL 10 1 $\frac{1}{4}$ W			
R235	S 1-214-084-00	RES,METAL 10 1 $\frac{1}{4}$ W	R307,	S 1-249-433-11	RES,CARBON 22K 5 $\frac{1}{6}$ W
R236	S 1-214-669-00	RES,METAL 3.3 1 $\frac{1}{4}$ W	308		(Only up to Serial No. 10126, and from 10201 to 10204)
R237	S 1-214-140-00	RES,METAL 2.2K 1 $\frac{1}{4}$ W			
R238	S 1-214-156-00	RES,METAL 10K 1 $\frac{1}{4}$ W	R309	S 1-247-894-00	RES,CARBON 430K 5 $\frac{1}{6}$ W
R239	S 1-214-163-00	RES,METAL 20K 1 $\frac{1}{4}$ W			(Only up to Serial No. 10126, and from 10201 to 10204)
R240	S 1-214-156-00	RES,METAL 10K 1 $\frac{1}{4}$ W			
R241	S 1-214-163-00	RES,METAL 20K 1 $\frac{1}{4}$ W	R310,	S 1-249-433-11	RES,CARBON 22K 5 $\frac{1}{6}$ W
R242	S 1-214-669-00	RES,METAL 3.3 1 $\frac{1}{4}$ W	311		(Only up to Serial No. 10126, and from 10201 to 10204)
R243	S 1-214-669-00	RES,METAL 3.3 1 $\frac{1}{4}$ W			
R244	S 1-214-669-00	RES,METAL 3.3 1 $\frac{1}{4}$ W	R312	S 1-247-894-00	RES,CARBON 430K 5 $\frac{1}{6}$ W
R245	S 1-214-084-00	RES,METAL 10 1 $\frac{1}{4}$ W			(Only up to Serial No. 10126, and from 10201 to 10204)
	S 1-214-091-00	RES,METAL 20 1 $\frac{1}{4}$ W (Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)	R313,	S 1-249-433-11	RES,CARBON 22K 5 $\frac{1}{6}$ W
R246	S 1-214-156-00	RES,METAL 10K 1 $\frac{1}{4}$ W	314		(Only up to Serial No. 10126, and from 10201 to 10204)
	S 1-214-158-00	RES,METAL 12K 1 $\frac{1}{4}$ W (Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)			
R247	S 1-214-163-00	RES,METAL 20K 1 $\frac{1}{4}$ W			
R248	S 1-214-156-00	RES,METAL 10K 1 $\frac{1}{4}$ W			
R249	S 1-214-163-00	RES,METAL 20K 1 $\frac{1}{4}$ W			



Ref.No. or Qty SP	Part No.	Description	Ref.No. or Qty SP	Part No.	Description
D1	S 8-719-911-19	DIODE 1SS119	IC8E	S 8-759-001-39	IC MC74HC164N
D2	S 8-719-911-19	DIODE 1SS119	IC8F	S 8-759-202-33	IC TC74HC240P
D3	S 8-719-911-19	DIODE 1SS119	IC8H	S 8-759-901-29	IC MSM5128-15RS
D4	S 8-719-911-19	DIODE 1SS119	IC8K	S 8-759-202-30	IC TC74HC161P
D5	S 8-719-911-19	DIODE 1SS119	IC9B	S 8-759-004-63	IC MC74HC125N
D6	S 8-719-911-19	DIODE 1SS119	IC9D	S 8-759-202-86	IC TC74HC123P
D7	S 8-719-911-19	DIODE 1SS119	IC9H	S 8-759-202-30	IC TC74HC161P
D8	S 8-719-911-19	DIODE 1SS119	IC9J	S 8-759-202-11	IC TC74HC00P
D9	S 8-719-911-19	DIODE 1SS119	IC9K	S 8-759-202-74	IC TC74HC04P
D10	S 8-719-911-19	DIODE 1SS119			
IC1A	S 8-759-203-34	IC TC74HC368P	Q1	S 8-729-902-11	TRANSISTOR 2SC2021
IC1B	S 8-759-202-22	IC TC74HC74P	Q2	S 8-729-902-11	TRANSISTOR 2SC2021
IC1C	S 8-759-202-78	IC TC74HC51P	Q3	S 8-729-902-11	TRANSISTOR 2SC2021
IC1D	S 8-759-202-22	IC TC74HC74P	Q4	S 8-729-902-11	TRANSISTOR 2SC2021
IC1E	S 8-759-202-30	IC TC74HC161P			
IC1F	S 8-759-202-14	IC TC74HC08P	R1	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC1H	S 8-759-202-18	IC TC74HC20P	R2	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC2B	S 8-759-004-63	IC MC74HC125N	R3	S 1-214-149-00	RES,METAL 5.1K 1% 1/4W
IC2C	S 8-759-913-17	IC CX23021	R4	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC2D	S 8-759-001-07	IC MC74HC10N	R5	S 1-214-156-00	RES,METAL 10K 1% 1/4W
IC2E	S 8-759-202-30	IC TC74HC161P	R6	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC2F	S 8-759-202-74	IC TC74HC04P	R7	S 1-214-132-00	RES,METAL 1K 1% 1/4W
IC2H	S 8-759-202-18	IC TC74HC20P	R8	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC2J	S 8-759-202-30	IC TC74HC161P	R9	S 1-214-132-00	RES,METAL 1K 1% 1/4W
IC2K	S 8-759-202-30	IC TC74HC161P	R10	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC3B	S 8-759-202-74	IC TC74HC04P	R11	S 1-214-132-00	RES,METAL 1K 1% 1/4W
IC3C	S 8-759-202-11	IC TC74HC00P	R12	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC3D	S 8-759-202-16	IC TC74HC11P	R13	S 1-214-132-00	RES,METAL 1K 1% 1/4W
IC3E	S 8-759-202-30	IC TC74HC161P	R14	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC3F	S 8-759-202-14	IC TC74HC08P	R15	S 1-214-156-00	RES,METAL 10K 1% 1/4W
IC3H	S 8-759-001-07	IC MC74HC10N	R16	S 1-214-156-00	RES,METAL 10K 1% 1/4W
IC3J	S 8-759-202-30	IC TC74HC161P	R17	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC3K	S 8-759-202-30	IC TC74HC161P	R18	S 1-214-156-00	RES,METAL 10K 1% 1/4W
IC4B	S 8-759-004-63	IC MC74HC125N	R19	S 1-214-156-00	RES,METAL 10K 1% 1/4W
IC4C	S 8-759-202-22	IC TC74HC74P	R20	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC4D	S 8-759-202-22	IC TC74HC74P	R21	S 1-214-156-00	RES,METAL 10K 1% 1/4W
IC4E	S 8-759-202-93	IC TC74HC153P	R22	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC4F	S 8-759-202-76	IC TC74HC30P	R23	S 1-214-156-00	RES,METAL 10K 1% 1/4W
IC4H	S 8-759-202-22	IC TC74HC74P	R24	S 1-214-156-00	RES,METAL 10K 1% 1/4W
IC4J	S 8-759-202-30	IC TC74HC161P	R25	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC4K	S 8-759-202-30	IC TC74HC161P	R26	S 1-214-156-00	RES,METAL 10K 1% 1/4W
IC5B	S 8-759-001-14	IC MC74HC58N	R27	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC5C	S 8-759-202-22	IC TC74HC74P	R28	S 1-214-132-00	RES,METAL 1K 1% 1/4W
IC5D	S 8-759-202-74	IC TC74HC04P	R29	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC5E	S 8-759-202-24	IC TC74HC86P	R30	S 1-214-132-00	RES,METAL 1K 1% 1/4W
IC5F	S 8-759-202-76	IC TC74HC30P	R31	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC5H	S 8-759-202-22	IC TC74HC74P	R32	S 1-214-132-00	RES,METAL 1K 1% 1/4W
IC5J	S 8-759-202-76	IC TC74HC30P	R33	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC5K	S 8-759-202-76	IC TC74HC30P	R34	S 1-214-132-00	RES,METAL 1K 1% 1/4W
IC6B	S 8-759-001-14	IC MC74HC58N	R35	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC6C	S 8-759-202-30	IC TC74HC161P	R36	S 1-214-132-00	RES,METAL 1K 1% 1/4W
IC6D	S 8-759-202-84	IC TC74HC109P	R37	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC6E	S 8-759-203-07	IC TC74HC195P	R38	S 1-214-132-00	RES,METAL 1K 1% 1/4W
IC6F	S 8-759-203-07	IC TC74HC195P	R39	S 1-214-156-00	RES,METAL 10K 1% 1/4W
IC6H	S 8-759-202-27	IC TC74HC157P	R41	S 1-214-108-00	RES,METAL 100 1% 1/4W
IC6J	S 8-759-202-27	IC TC74HC157P	R42	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC6K	S 8-759-202-27	IC TC74HC157P	R43	S 1-214-132-00	RES,METAL 1K 1% 1/4W
IC7B	S 8-759-202-22	IC TC74HC74P	R44	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC7C	S 8-759-001-02	IC MC74HC02N	R45	S 1-214-132-00	RES,METAL 1K 1% 1/4W
IC7D	S 8-759-001-43	IC MC74HC175N	R46	S 1-214-156-00	RES,METAL 10K 1% 1/4W
IC7E	S 8-759-001-39	IC MC74HC164N	R47	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC7K	S 8-759-202-30	IC TC74HC161P	R48	S 1-214-156-00	RES,METAL 10K 1% 1/4W
IC8B	S 8-759-202-74	IC TC74HC04P	R49	S 1-214-180-00	RES,METAL 100K 1% 1/4W
IC8C	S 8-759-202-14	IC TC74HC08P	R50	S 1-214-132-00	RES,METAL 1K 1% 1/4W
IC8D	S 8-759-001-07	IC MC74HC10N	R51	S 1-214-180-00	RES,METAL 100K 1% 1/4W

Ref. No. or Qty SP	Part No.	Description	Ref. No. or Qty SP	Part No.	Description
R52	S 1-214-132-00	RES,METAL 1K 1% 1/4W	C28	S 1-130-475-00	CAP,MYLAR 0.0022 5% 50V
R53	S 1-214-180-00	RES,METAL 100K 1% 1/4W	C29	S 1-131-449-11	CAP,TANT 3.3 20% 16V
R54	S 1-214-132-00	RES,METAL 1K 1% 1/4W	C30	S 1-102-963-00	CAP,CERAMIC 33P 5% 50V
R55	S 1-214-132-00	RES,METAL 1K 1% 1/4W	C31	S 1-102-963-00	CAP,CERAMIC 33P 5% 50V
R56	S 1-214-156-00	RES,METAL 10K 1% 1/4W	C32	S 1-102-963-00	CAP,CERAMIC 33P 5% 50V
R57	S 1-214-156-00	RES,METAL 10K 1% 1/4W	C33	S 1-102-963-00	CAP,CERAMIC 33P 5% 50V
R58	S 1-214-116-00	RES,METAL 220 1% 1/4W	C34	S 1-102-963-00	CAP,CERAMIC 33P 5% 50V
R59	S 1-214-116-00	RES,METAL 220 1% 1/4W	C35	S 1-130-471-00	CAP,MYLAR 0.001 5% 50V
R60	S 1-214-156-00	RES,METAL 10K 1% 1/4W	C36	S 1-131-371-00	CAP,TANT 10 20% 16V
R61	S 1-214-156-00	RES,METAL 10K 1% 1/4W	C37	S 1-123-332-00	CAP,ELECT 47 20% 25V
R62	S 1-214-116-00	RES,METAL 220 1% 1/4W	C38	S 1-101-004-00	CAP,CERAMIC 0.01 50V
R63	S 1-214-084-00	RES,METAL 10 1% 1/4W	C39	S 1-101-004-00	CAP,CERAMIC 0.01 50V
RB1	S 1-235-005-00	RESISTOR BLOCK 47K	C40	S 1-131-449-11	CAP,TANT 3.3 20% 16V
SW1	S 1-553-441-00	SWITCH,TOGGLE	C41	S 1-130-483-00	CAP,MYLAR 0.01 5% 50V
			C44	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C45	S 1-131-449-11	CAP,TANT 3.3 20% 16V
			C46	S 1-107-037-00	CAP,MICA 82P 5% 500V
			C47	S 1-107-171-00	CAP,MICA 120P 5% 500V
			C48	S 1-102-978-00	CAP,CERAMIC 220P 5% 50V
			C49	S 1-102-973-00	CAP,CERAMIC 100P 5% 50V
			C50	S 1-102-973-00	CAP,CERAMIC 100P 5% 50V
			C51	S 1-102-973-00	CAP,CERAMIC 100P 5% 50V
			C52	S 1-102-973-00	CAP,CERAMIC 100P 5% 50V
			C53	S 1-102-973-00	CAP,CERAMIC 100P 5% 50V
			C54	S 1-123-332-00	CAP,ELECT 47 20% 25V
			C55	S 1-123-332-00	CAP,ELECT 47 20% 25V
			C56	S 1-102-959-00	CAP,CERAMIC 22P 5% 50V
			C57	S 1-131-343-00	CAP,TANT 0.22 20% 35V
			C58	S 1-131-343-00	CAP,TANT 0.22 20% 35V
			C60	S 1-123-333-00	CAP,ELECT 100 20% 25V
			C62	S 1-123-332-00	CAP,ELECT 47 20% 25V
			C63	S 1-123-356-00	CAP,ELECT 10 20% 50V
			C64	S 1-131-449-11	CAP,TANT 3.3 20% 16V
			C65	S 1-123-356-00	CAP,ELECT 10 20% 50V
			C66	S 1-131-449-11	CAP,TANT 3.3 20% 16V
			C67	S 1-102-508-00	CAP,CERAMIC 10P 0.5P 50V
			C68	S 1-102-508-00	CAP,CERAMIC 10P 0.5P 50V
			C69	S 1-102-865-00	CAP,CERAMIC 8P 0.5P 50V
			C70	S 1-102-508-00	CAP,CERAMIC 10P 0.5P 50V
			C71	S 1-102-959-00	CAP,CERAMIC 22P 5% 50V
			C72	S 1-102-959-00	CAP,CERAMIC 22P 5% 50V
			C73	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C74	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C75	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C76	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C77	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C78	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C79	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C80	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C81	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C82	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C83	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C84	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C85	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C86	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C87	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C88	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C89	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C90	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C91	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C92	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C93	S 1-101-004-00	CAP,CERAMIC 0.01 50V
			C94	S 1-131-449-11	CAP,TANT 3.3 20% 16V
			C95	S 1-131-449-11	CAP,TANT 3.3 20% 16V
			C96	S 1-101-004-00	CAP,CERAMIC 0.01 50V
SIF-1 BOARD					
1pc	O A-7850-297-A	COMPLETE PCB,SIF-1			
(This assembly includes		the following parts.)			
1pc	S 2-251-622-00	LEVER,PC BOARD			
2pcs	O 3-659-918-01	HEAT SINK,TR			
2pcs	S 3-660-978-00	SHEET,HEAT RESISTING			
2pcs	O 3-673-772-21	TERMINAL,TP			
1pc	O 3-673-867-00	PLATE,INDICATION,PC BOARD			
1pc	O 4-911-704-21	LABEL(SIF),PC BOARD			
1pc	O 4-911-708-01	CASE(UPPER)(1),SHIELD,SIF			
1pc	O 4-911-709-01	CASE(UPPER)(2),SHIELD,SIF			
2pcs	O 4-911-710-01	CASE(LOWER),SHIELD,SIF			
2pcs	S 7-626-317-21	PIN,SPRING 2.5x8			
7pcs	S 7-682-547-04	SCREW,+B3x6			
5pcs	S 7-684-023-04	NUT,M3			
C1	S 1-123-332-00	CAP,ELECT 47 20% 25V			
C2	S 1-123-332-00	CAP,ELECT 47 20% 25V			
C3	S 1-101-004-00	CAP,CERAMIC 0.01 50V			
C4	S 1-101-004-00	CAP,CERAMIC 0.01 50V			
C5	S 1-123-356-00	CAP,ELECT 10 20% 50V			
C6	S 1-131-449-11	CAP,TANT 3.3 20% 16V			
C7	S 1-123-356-00	CAP,ELECT 10 20% 50V			
C8	S 1-131-449-11	CAP,TANT 3.3 20% 16V			
C9	S 1-123-356-00	CAP,ELECT 10 20% 50V			
C10	S 1-131-449-11	CAP,TANT 3.3 20% 16V			
C11	S 1-101-004-00	CAP,CERAMIC 0.01 50V			
C12	S 1-131-449-11	CAP,TANT 3.3 20% 16V			
C13	S 1-136-162-00	CAP,FILM 0.056 5% 50V			
C14	S 1-130-481-00	CAP,MYLAR 0.0068 5% 50V			
C15	S 1-131-449-11	CAP,TANT 3.3 20% 16V			
C18	S 1-107-036-00	CAP,MICA 68P 5% 500V			
C19	S 1-107-169-00	CAP,MICA 100P 5% 500V			
C20	S 1-101-004-00	CAP,CERAMIC 0.01 50V			
C21	S 1-131-449-11	CAP,TANT 3.3 20% 16V			
C22	S 1-107-159-00	CAP,MICA 33P 5% 500V			
C23	S 1-101-004-00	CAP,CERAMIC 0.01 50V			
C24	S 1-101-004-00	CAP,CERAMIC 0.01 50V			
C25	S 1-101-004-00	CAP,CERAMIC 0.01 50V			
C26	S 1-123-356-00	CAP,ELECT 10 20% 50V			
C27	S 1-102-820-00	CAP,CERAMIC 330P 5% 50V			

Ref.No. or Qty	SP	Part No.	Description		Ref.No. or Qty	SP	Part No.	Description
C97	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D11	S	8-719-911-19	DIODE 1SS119
C98	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D12	S	8-719-911-19	DIODE 1SS119
C99	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D13	S	8-719-911-19	DIODE 1SS119
C100	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D14	S	8-719-911-19	DIODE 1SS119
C101	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D15	S	8-719-915-30	DIODE FC53M
C102	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D16	S	8-719-911-19	DIODE 1SS119
C103	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D17	S	8-719-911-19	DIODE 1SS119
C104	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D18	S	8-719-911-19	DIODE 1SS119
C105	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D19	S	8-719-911-19	DIODE 1SS119
C106	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D20	S	8-719-911-19	DIODE 1SS119
C107	S	1-131-449-11	CAP,TANT 3.3	20% 16V	D21	S	8-719-911-19	DIODE 1SS119
C108	S	1-131-449-11	CAP,TANT 3.3	20% 16V	D22	S	8-719-911-19	DIODE 1SS119
C109	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D23	S	8-719-911-19	DIODE 1SS119
C110	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D24	S	8-719-911-19	DIODE 1SS119
C111	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D25	S	8-719-911-19	DIODE 1SS119
C112	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D26	S	8-719-911-19	DIODE 1SS119
C113	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D27	S	8-719-911-19	DIODE 1SS119
C114	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D28	S	8-719-911-19	DIODE 1SS119
C115	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D29	S	8-719-911-19	DIODE 1SS119
C116	S	1-131-449-11	CAP,TANT 3.3	20% 16V	D30	S	8-719-911-19	DIODE 1SS119
C117	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D31	S	8-719-911-19	DIODE 1SS119
C118	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D32	S	8-719-911-19	DIODE 1SS119
C119	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D33	S	8-719-911-19	DIODE 1SS119
C120	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D34	S	8-719-911-19	DIODE 1SS119
C121	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D35	S	8-719-101-97	DIODE 1SS97-1
C122	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1E	S	8-759-202-16	IC TC74HC11P
C123	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1F	S	8-759-001-38	IC MC74HC163N
C124	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1H	S	8-759-201-34	IC TD62503P
C125	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1J	S	8-759-001-27	IC MC74HC113N
C126	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1K	S	8-759-001-38	IC MC74HC163N
C127	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2C	S	8-759-907-35	IC UA733DC
C128	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2D	S	8-759-001-38	IC MC74HC163N
C129	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2E	S	8-759-202-30	IC TC74HC161P
C130	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2F	S	8-759-001-38	IC MC74HC163N
C131	S	1-131-449-11	CAP,TANT 3.3	20% 16V	IC2H	S	8-759-202-14	IC TC74HC08P
C132	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2J	S	8-759-202-22	IC TC74HC74P
C133	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2K	S	8-759-202-22	IC TC74HC74P
C134	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2L	S	8-759-905-29	IC NE529N
C135	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC3D	S	8-759-202-74	IC TC74HC04P
C136	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC3E	S	8-759-202-30	IC TC74HC161P
C137	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC3F	S	8-759-001-38	IC MC74HC163N
C138	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC3H	S	8-759-202-22	IC TC74HC74P
C139	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC3J	S	8-759-202-86	IC TC74HC123P
C140	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC3K	S	8-759-202-11	IC TC74HC00P
C141	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC3N	S	8-759-040-44	IC MC4044P
C142	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC4B	S	8-759-951-24	IC SN75124N
C143	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC4C	S	8-759-202-55	IC TC74HC244P
C144	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC4D	S	8-759-202-11	IC TC74HC00P
C145	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC4E	S	8-759-202-22	IC TC74HC74P
C146	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC4F	S	8-759-001-38	IC MC74HC163N
C147	S	1-131-449-11	CAP,TANT 3.3	20% 16V	IC4H	S	8-759-202-74	IC TC74HC04P
C148	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC4J	S	8-759-203-08	IC TC74HC221P
C149	S	1-131-449-11	CAP,TANT 3.3	20% 16V	IC4K	S	8-759-202-11	IC TC74HC00P
CV1	S	1-141-293-11	CAP,TRIMMER		IC4L	S	8-759-004-63	IC MC74HC125N
CV2	S	1-141-293-11	CAP,TRIMMER		IC4M	S	8-759-202-11	IC TC74HC00P
D1	S	8-719-911-19	DIODE 1SS119		IC4N	S	8-759-202-22	IC TC74HC74P
D2	S	8-719-911-19	DIODE 1SS119		IC5B	S	8-759-951-24	IC SN75124N
D3	S	8-719-911-19	DIODE 1SS119		IC5C	S	8-759-951-21	IC SN75121N
D4	S	8-719-911-19	DIODE 1SS119		IC5D	S	8-759-202-14	IC TC74HC08P
D5	S	8-719-911-19	DIODE 1SS119		IC5E	S	8-759-202-11	IC TC74HC00P
D6	S	8-719-915-43	DIODE FC54M		IC5F	S	8-759-202-74	IC TC74HC04P
D7	S	8-719-911-19	DIODE 1SS119		IC5H	S	8-759-202-55	IC TC74HC244P
D8	S	8-719-911-19	DIODE 1SS119		IC5K	S	8-759-202-14	IC TC74HC08P
D9	S	8-719-911-19	DIODE 1SS119		IC5L	S	8-759-001-38	IC MC74HC163N
D10	S	8-719-911-19	DIODE 1SS119		IC5M	S	8-759-001-38	IC MC74HC163N

Ref.No. or Qty	SP	Part No.	Description	Ref.No. or Qty	SP	Part No.	Description
IC5N	S	8-759-202-11	IC TC74HC00P	R16	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
IC6B	S	8-759-202-55	IC TC74HC244P	R17	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
IC6H	S	8-759-202-22	IC TC74HC74P	R18	S	1-214-156-00	RES,METAL 10K 1% 1/4W
IC6J	S	8-759-004-63	IC MC74HC125N	R19	S	1-214-144-00	RES,METAL 3.3K 1% 1/4W
IC6K	S	8-759-202-11	IC TC74HC00P	R20	S	1-214-164-00	RES,METAL 22K 1% 1/4W
IC6L	S	8-759-001-38	IC MC74HC163N	R21	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC6N	S	8-759-220-00	IC TC40H000P	R22	S	1-214-166-00	RES,METAL 27K 1% 1/4W
IC7B	S	8-759-951-21	IC SN75121N	R23	S	1-214-149-00	RES,METAL 5.1K 1% 1/4W
IC7D	S	8-759-920-45	IC CX23070	R24	S	1-214-149-00	RES,METAL 5.1K 1% 1/4W
IC7F	S	8-759-920-45	IC CX23070	R25	S	1-215-493-00	RES,METAL 1M 1% 1/6W
IC7H	S	8-757-732-00	IC CX-773B	R26	S	1-215-493-00	RES,METAL 1M 1% 1/6W
IC7K	S	8-757-903-00	IC CX-7903	R27	S	1-214-100-00	RES,METAL 47 1% 1/4W
IC7M	S	8-759-220-00	IC TC40H000P	R28	S	1-214-105-00	RES,METAL 75 1% 1/4W
IC7N	S	8-759-202-11	IC TC74HC00P	R29	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC8B	S	8-759-951-21	IC SN75121N	R30	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC8H	S	8-759-202-21	IC TC74HC32P	R31	S	1-214-156-00	RES,METAL 10K 1% 1/4W
IC8J	S	8-759-001-38	IC MC74HC163N	R32	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC8K	S	8-759-202-22	IC TC74HC74P	R33	S	1-214-100-00	RES,METAL 47 1% 1/4W
IC9A	S	8-759-202-55	IC TC74HC244P	R34	S	1-214-105-00	RES,METAL 75 1% 1/4W
IC9B	S	8-759-202-22	IC TC74HC74P	R35	S	1-214-100-00	RES,METAL 47 1% 1/4W
IC9D	S	8-759-920-45	IC CX23070	R36	S	1-214-105-00	RES,METAL 75 1% 1/4W
IC9F	S	8-759-920-45	IC CX23070	R37	S	1-214-100-00	RES,METAL 47 1% 1/4W
IC9H	S	8-759-202-22	IC TC74HC74P	R38	S	1-214-105-00	RES,METAL 75 1% 1/4W
IC9J	S	8-759-001-38	IC MC74HC163N	R39	S	1-214-100-00	RES,METAL 47 1% 1/4W
IC9K	S	8-759-202-74	IC TC74HC04P	R40	S	1-214-105-00	RES,METAL 75 1% 1/4W
IC9N	S	8-759-040-44	IC MC4044P	R41	S	1-214-144-00	RES,METAL 3.3K 1% 1/4W
L1	S	1-409-339-00	COIL,SN	R42	S	1-214-180-00	RES,METAL 100K 1% 1/4W
L2	S	1-409-339-00	COIL,SN	R43	S	1-214-156-00	RES,METAL 10K 1% 1/4W
L3	S	1-408-564-00	INDUCTOR,MICRO 12 10%	R44	S	1-214-132-00	RES,METAL 1K 1% 1/4W
L5	S	1-407-690-00	INDUCTOR,MICRO 5.6 10%	R45	S	1-214-100-00	RES,METAL 47 1% 1/4W
Q1	S	8-759-700-11	IC NJM78M05A	R46	S	1-214-100-00	RES,METAL 47 1% 1/4W
Q2	S	8-759-700-11	IC NJM78M05A	R47	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q3	S	8-759-700-20	IC NJM79M05A	R48	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q4	S	8-729-178-54	TRANSISTOR 2SC2785	R49	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q5	S	8-729-178-54	TRANSISTOR 2SC2785	R50	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q6	S	8-729-124-08	TRANSISTOR 2SC2408	R51	S	1-214-156-00	RES,METAL 10K 1% 1/4W
Q7	S	8-729-124-08	TRANSISTOR 2SC2408	R52	S	1-214-156-00	RES,METAL 10K 1% 1/4W
Q8	S	8-729-124-08	TRANSISTOR 2SC2408	R53	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q9	S	8-729-124-08	TRANSISTOR 2SC2408	R54	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q10	S	8-729-124-08	TRANSISTOR 2SC2408	R55	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q11	S	8-729-124-08	TRANSISTOR 2SC2408	R56	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q12	S	8-729-124-08	TRANSISTOR 2SC2408	R57	S	1-214-156-00	RES,METAL 10K 1% 1/4W
Q13	S	8-729-190-12	TRANSISTOR 2SC2901	R58	S	1-214-156-00	RES,METAL 10K 1% 1/4W
Q14	S	8-729-124-08	TRANSISTOR 2SC2408	R59	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q15	S	8-729-200-43	TRANSISTOR 2SA1048L	R60	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q16	S	8-729-169-02	TRANSISTOR 2SC2690A	R61	S	1-214-156-00	RES,METAL 10K 1% 1/4W
Q17	S	8-729-122-02	TRANSISTOR 2SA1220A	R62	S	1-214-173-00	RES,METAL 51K 1% 1/4W
Q18	S	8-729-306-92	TRANSISTOR 2SD669A	R63	S	1-214-139-00	RES,METAL 2K 1% 1/4W
Q19	S	8-729-306-92	TRANSISTOR 2SD669A	R64	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
Q20	S	8-759-700-12	IC NJM78M06A	R65	S	1-214-156-00	RES,METAL 10K 1% 1/4W
Q21	S	8-759-700-21	IC NJM79M06A	R66	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R1	S	1-217-217-11	RES,WIRE 27 10% 2W	R67	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R2	S	1-217-217-11	RES,WIRE 27 10% 2W	R68	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R3	S	1-214-168-00	RES,METAL 33K 1% 1/4W	R69	S	1-214-149-00	RES,METAL 5.1K 1% 1/4W
R4	S	1-214-132-00	RES,METAL 1K 1% 1/4W	R70	S	1-214-113-00	RES,METAL 160 1% 1/4W
R5	S	1-214-132-00	RES,METAL 1K 1% 1/4W	R71	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R6	S	1-214-174-00	RES,METAL 56K 1% 1/4W	R72	S	1-214-161-00	RES,METAL 16K 1% 1/4W
R7	S	1-214-121-00	RES,METAL 360 1% 1/4W	R73	S	1-214-168-00	RES,METAL 33K 1% 1/4W
R8	S	1-214-113-00	RES,METAL 160 1% 1/4W	R74	S	1-214-176-00	RES,METAL 68K 1% 1/4W
R9	S	1-214-180-00	RES,METAL 100K 1% 1/4W	R75	S	1-214-108-00	RES,METAL 100 1% 1/4W
R10	S	1-214-161-00	RES,METAL 16K 1% 1/4W	R76	S	1-214-125-00	RES,METAL 510 1% 1/4W
R11	S	1-214-168-00	RES,METAL 33K 1% 1/4W	R77	S	1-214-108-00	RES,METAL 100 1% 1/4W
R12	S	1-214-108-00	RES,METAL 100 1% 1/4W	R78	S	1-214-126-00	RES,METAL 560 1% 1/4W
R13	S	1-214-173-00	RES,METAL 51K 1% 1/4W	R79	S	1-214-108-00	RES,METAL 100 1% 1/4W
R14	S	1-214-125-00	RES,METAL 510 1% 1/4W	R80	S	1-214-173-00	RES,METAL 51K 1% 1/4W
R15	S	1-214-146-00	RES,METAL 3.9K 1% 1/4W				

Ref.No. or Qty SP	Part No.	Description	Ref.No. or Qty SP	Part No.	Description
R81	S 1-214-174-00	RES, METAL 56K 1% 1/4W			
R82	S 1-214-132-00	RES, METAL 1K 1% 1/4W			
R83	S 1-249-455-11	RES, CARBON 4.7 5% 1/4W			
R84	S 1-214-140-00	RES, METAL 2.2K 1% 1/4W			
R85	S 1-214-140-00	RES, METAL 2.2K 1% 1/4W			
R86	S 1-249-455-11	RES, CARBON 4.7 5% 1/4W			
R87	S 1-214-140-00	RES, METAL 2.2K 1% 1/4W			
R88	S 1-249-455-11	RES, CARBON 4.7 5% 1/4W			
R89	S 1-214-140-00	RES, METAL 2.2K 1% 1/4W			
R90	S 1-249-455-11	RES, CARBON 4.7 5% 1/4W			
R91	S 1-214-140-00	RES, METAL 2.2K 1% 1/4W			
R92	S 1-249-455-11	RES, CARBON 4.7 5% 1/4W			
R93	S 1-214-116-00	RES, METAL 220 1% 1/4W			
R94	S 1-214-116-00	RES, METAL 220 1% 1/4W			
R95	S 1-214-116-00	RES, METAL 220 1% 1/4W			
R96	S 1-214-116-00	RES, METAL 220 1% 1/4W			
R97	S 1-214-136-00	RES, METAL 1.5K 1% 1/4W			
R98	S 1-214-139-00	RES, METAL 2K 1% 1/4W			
R99	S 1-214-133-00	RES, METAL 1.1K 1% 1/4W			
R100	S 1-214-161-00	RES, METAL 16K 1% 1/4W			
R101	S 1-214-172-00	RES, METAL 47K 1% 1/4W			
R102	S 1-214-128-00	RES, METAL 680 1% 1/4W			
R103	S 1-214-156-00	RES, METAL 10K 1% 1/4W			
R104	S 1-214-141-00	RES, METAL 2.4K 1% 1/4W			
R105	S 1-214-105-00	RES, METAL 75 1% 1/4W			
R106	S 1-214-105-00	RES, METAL 75 1% 1/4W			
R107	S 1-214-146-00	RES, METAL 3.9K 1% 1/4W			
R108	S 1-214-132-00	RES, METAL 1K 1% 1/4W			
R109	S 1-214-140-00	RES, METAL 2.2K 1% 1/4W			
R110	S 1-214-140-00	RES, METAL 2.2K 1% 1/4W			
R111	S 1-214-144-00	RES, METAL 3.3K 1% 1/4W			
R112	S 1-214-144-00	RES, METAL 3.3K 1% 1/4W			
R113	S 1-214-144-00	RES, METAL 3.3K 1% 1/4W			
R114	S 1-214-108-00	RES, METAL 100 1% 1/4W			
R115	S 1-214-148-00	RES, METAL 4.7K 1% 1/4W			
R116	S 1-214-140-00	RES, METAL 2.2K 1% 1/4W			
R117	S 1-214-156-00	RES, METAL 10K 1% 1/4W			
R118	S 1-214-132-00	RES, METAL 1K 1% 1/4W			
R119	S 1-247-211-00	RES, CARBON 62 5% 1/2W			
R120	S 1-247-211-00	RES, CARBON 62 5% 1/2W			
R121	S 1-214-105-00	RES, METAL 75 1% 1/4W			
R122	S 1-214-105-00	RES, METAL 75 1% 1/4W			
R123	S 1-214-105-00	RES, METAL 75 1% 1/4W			
R124	S 1-214-105-00	RES, METAL 75 1% 1/4W			
R125	S 1-214-156-00	RES, METAL 10K 1% 1/4W			
R200	S 1-215-469-00	RES, METAL 100K 1% 1/6W (Serial No. 12801 and higher)			
RB1	S 1-231-410-00	RESISTOR BLOCK 10K			
RV1	S 1-224-937-00	RES, ADJ, METAL 1K			
RV2	S 1-228-763-00	RES, ADJ, CERMET 5K			
RV3	S 1-224-940-00	RES, ADJ, METAL 10K			
RV4	S 1-224-940-00	RES, ADJ, METAL 10K			
SW1	S 1-553-441-00	SWITCH, TOGGLE			
X1	S 1-567-517-11	OSCILLATOR, 14.34MHZ			
X2	S 1-567-475-11	VIBRATOR, CRYSTAL			
X3	S 1-567-025-00	VIBRATOR, CRYSTAL			
X4	S 1-567-514-11	OSCILLATOR, 11.3MHZ			
			DEC-15 BOARD		
			1pc O A-7850-299-A	COMPLETE PCB, DEC-15	
			(This assembly includes	the following parts.)	
			1pc S 2-251-622-00	LEVER, PC BOARD	
			1pc O 3-673-867-00	PLATE, INDICATION, PC BOARD	
			1pc O 4-911-704-11	LABEL(DEC), PC BOARD	
			2pcs S 7-626-317-21	PIN, SPRING 2.5x8	
			C1 S 1-123-332-00	CAP, ELECT 47	20% 25V
			C2 S 1-123-332-00	CAP, ELECT 47	20% 25V
			C3 S 1-101-004-00	CAP, CERAMIC 0.01	50V
			C4 S 1-101-004-00	CAP, CERAMIC 0.01	50V
			C5 S 1-123-306-00	CAP, ELECT 47	20% 10V
			C6 S 1-101-004-00	CAP, CERAMIC 0.01	50V
			C7 S 1-123-356-00	CAP, ELECT 10	20% 50V
			C8 S 1-123-356-00	CAP, ELECT 10	20% 50V
			C9 S 1-123-333-00	CAP, ELECT 100	20% 25V
			C10 S 1-123-333-00	CAP, ELECT 100	20% 25V
			C11 S 1-102-951-00	CAP, CERAMIC 15P	5% 50V
			C12 S 1-123-333-00	CAP, ELECT 100	20% 25V
			C13 S 1-136-149-00	CAP, MYLAR 0.0047	5% 50V
			C14 S 1-101-004-00	CAP, CERAMIC 0.01	50V
			C15 S 1-102-958-00	CAP, CERAMIC 20P	5% 50V
			C16 S 1-102-958-00	CAP, CERAMIC 20P	5% 50V
			C17 S 1-131-344-00	CAP, TANT 0.33	10% 35V
			C18 S 1-102-951-00	CAP, CERAMIC 15P	5% 50V
			C19 S 1-136-153-00	CAP, MYLAR 0.01	5% 50V
			C20 S 1-136-157-00	CAP, MYLAR 0.022	5% 50V
			C21 S 1-131-449-11	CAP, TANT 3.3	20% 16V
			C22 S 1-131-449-11	CAP, TANT 3.3	20% 16V
			C23 S 1-131-449-11	CAP, TANT 3.3	20% 16V
			C24 S 1-131-449-11	CAP, TANT 3.3	20% 16V
			C25 S 1-101-884-00	CAP, CERAMIC 56P	5% 50V
			C26 S 1-101-888-00	CAP, CERAMIC 68P	5% 50V
			C27 S 1-123-356-00	CAP, ELECT 10	20% 50V
			C28 S 1-131-379-00	CAP, TANT 22	10% 10V
			C29 S 1-131-347-00	CAP, TANT 1	20% 35V
			C30 S 1-102-106-00	CAP, CERAMIC 100P	10% 50V
			C31 S 1-101-001-00	CAP, CERAMIC 0.001	50V
			C32 S 1-101-001-00	CAP, CERAMIC 0.001	50V
			C33 S 1-101-001-00	CAP, CERAMIC 0.001	50V
			C34 S 1-131-376-00	CAP, TANT 6.8	10% 10V
			C35 S 1-131-377-00	CAP, TANT 10	10% 10V
			C36 S 1-131-377-00	CAP, TANT 10	10% 10V
			C37 S 1-131-377-00	CAP, TANT 10	10% 10V
			C38 S 1-131-377-00	CAP, TANT 10	10% 10V
			C39 S 1-102-106-00	CAP, CERAMIC 100P	10% 50V
			C40 S 1-102-106-00	CAP, CERAMIC 100P	10% 50V
			C41 S 1-102-106-00	CAP, CERAMIC 100P	10% 50V
			C42 S 1-102-106-00	CAP, CERAMIC 100P	10% 50V
			C43 S 1-102-106-00	CAP, CERAMIC 100P	10% 50V
			C44 S 1-102-106-00	CAP, CERAMIC 100P	10% 50V
			C45 S 1-131-449-11	CAP, TANT 3.3	20% 16V
			C46 S 1-131-449-11	CAP, TANT 3.3	20% 16V
			C47 S 1-101-004-00	CAP, CERAMIC 0.01	50V
			C48 S 1-101-004-00	CAP, CERAMIC 0.01	50V
			C49 S 1-101-004-00	CAP, CERAMIC 0.01	50V
			C50 S 1-101-004-00	CAP, CERAMIC 0.01	50V
			C51 S 1-123-356-00	CAP, ELECT 10	20% 50V
			C52 S 1-123-356-00	CAP, ELECT 10	20% 50V
			C53 S 1-123-356-00	CAP, ELECT 10	20% 50V
			C54 S 1-123-356-00	CAP, ELECT 10	20% 50V
			C55 S 1-101-004-00	CAP, CERAMIC 0.01	50V
			C56 S 1-101-004-00	CAP, CERAMIC 0.01	50V
			C57 S 1-101-004-00	CAP, CERAMIC 0.01	50V
			C58 S 1-101-004-00	CAP, CERAMIC 0.01	50V
			C59 S 1-101-004-00	CAP, CERAMIC 0.01	50V
			C60 S 1-101-004-00	CAP, CERAMIC 0.01	50V

Ref.No. or Qty	SP	Part No.	Description		Ref.No. or Qty	SP	Part No.	Description
C61	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D11	S	8-719-911-19	DIODE 1SS119
C62	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D12	S	8-719-911-19	DIODE 1SS119
C63	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D13	S	8-719-911-19	DIODE 1SS119
C64	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D14	S	8-719-911-19	DIODE 1SS119
C65	S	1-131-449-11	CAP,TANT 3.3	20% 16V	D15	S	8-719-911-19	DIODE 1SS119
C66	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D16	S	8-719-911-19	DIODE 1SS119
C67	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D17	S	8-719-911-19	DIODE 1SS119
C68	S	1-123-356-00	CAP,ELECT 10	20% 50V	D18	S	8-719-911-19	DIODE 1SS119
C69	S	1-123-356-00	CAP,ELECT 10	20% 50V	D19	S	8-719-911-19	DIODE 1SS119
C70	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D20	S	8-719-911-19	DIODE 1SS119
C71	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D21	S	8-719-911-19	DIODE 1SS119
C72	S	1-131-449-11	CAP,TANT 3.3	20% 16V	D22	S	8-719-911-19	DIODE 1SS119
C73	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D23	S	8-719-911-19	DIODE 1SS119
C74	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D24	S	8-719-911-19	DIODE 1SS119
C75	S	1-123-356-00	CAP,ELECT 10	20% 50V	D25	S	8-719-911-19	DIODE 1SS119
C76	S	1-123-356-00	CAP,ELECT 10	20% 50V	D26	S	8-719-911-19	DIODE 1SS119
C77	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D27	S	8-719-911-19	DIODE 1SS119
C78	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D28	S	8-719-903-43	DIODE PR3432S
C79	S	1-102-106-00	CAP,CERAMIC 100P	10% 50V	D29	S	8-719-903-43	DIODE PR3432S
C80	S	1-131-449-11	CAP,TANT 3.3	20% 16V	D30	S	8-719-903-43	DIODE PR3432S
C81	S	1-131-449-11	CAP,TANT 3.3	20% 16V	D31	S	8-719-903-43	DIODE PR3432S
C82	S	1-131-449-11	CAP,TANT 3.3	20% 16V	D32	S	8-719-914-32	DIODE PG3432S
C83	S	1-131-449-11	CAP,TANT 3.3	20% 16V	D33	S	8-719-934-33	DIODE PY3432S
C84	S	1-131-449-11	CAP,TANT 3.3	20% 16V	D34	S	8-719-903-43	DIODE PR3432S
C85	S	1-131-449-11	CAP,TANT 3.3	20% 16V	D35	S	8-719-903-43	DIODE PR3432S
C86	S	1-131-449-11	CAP,TANT 3.3	20% 16V	D36	S	8-719-911-19	DIODE 1SS119
C87	S	1-131-449-11	CAP,TANT 3.3	20% 16V	D37	S	8-719-911-19	DIODE 1SS119
C88	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D38	S	8-719-911-19	DIODE 1SS119
C89	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D39	S	8-719-911-19	DIODE 1SS119
C90	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D40	S	8-719-911-19	DIODE 1SS119
C91	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D41	S	8-719-911-19	DIODE 1SS119
C92	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D42	S	8-719-911-19	DIODE 1SS119
C93	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D43	S	8-719-911-19	DIODE 1SS119
C94	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D44	S	8-719-911-19	DIODE 1SS119
C95	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D45	S	8-719-911-19	DIODE 1SS119
C96	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D46	S	8-719-911-19	DIODE 1SS119
C97	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D47	S	8-719-911-19	DIODE 1SS119
C98	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D48	S	8-719-911-19	DIODE 1SS119
C99	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D49	S	8-719-911-19	DIODE 1SS119
C100	S	1-101-004-00	CAP,CERAMIC 0.01	50V	DL1	S	1-415-168-00	DELAY LINE
C101	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1C	S	8-759-174-11	IC UPC741C
C102	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1E	S	8-759-905-29	IC NE529N
C103	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1H	S	8-759-174-11	IC UPC741C
C104	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1J	S	8-759-174-11	IC UPC741C
C105	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1K	S	8-759-240-53	IC TC4053BP
C106	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1L	S	8-759-001-43	IC MC74HC175N
C107	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1M	S	8-759-202-74	IC TC74HCO4P
C108	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2B	S	8-759-240-53	IC TC4053BP
C109	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2C	S	8-759-925-25	IC HA7-2525-5
C110	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2E	S	8-759-905-29	IC NE529N
C111	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2H	S	8-759-131-11	IC UPC311C
C112	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2J	S	8-759-174-11	IC UPC741C
C113	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2L	S	8-759-004-63	IC MC74HC125N
C114	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2M	S	8-759-001-38	IC MC74HC163N
C115	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2N	S	8-759-202-24	IC TC74HC86P
C116	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC3A	S	8-759-202-55	IC TC74HC244P
C117	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC3B	S	8-759-925-25	IC HA7-2525-5
D1	S	8-719-911-19	DIODE 1SS119		IC3C	S	8-759-925-25	IC HA7-2525-5
D2	S	8-719-911-19	DIODE 1SS119		IC3D	S	8-759-131-11	IC UPC311C
D3	S	8-719-911-19	DIODE 1SS119		IC3E	S	8-759-131-11	IC UPC311C
D4	S	8-719-911-19	DIODE 1SS119		IC3K	S	8-759-240-53	IC TC4053BP
D5	S	8-719-100-29	DIODE RD5.1EB1		IC3L	S	8-759-202-74	IC TC74HCO4P
D6	S	8-719-100-29	DIODE RD5.1EB1		IC3M	S	8-759-202-14	IC TC74HCO8P
D7	S	8-719-911-19	DIODE 1SS119		IC3N	S	8-759-202-22	IC TC74HC74P
D8	S	8-719-911-19	DIODE 1SS119		IC4K	S	8-759-240-53	IC TC4053BP
D9	S	8-719-911-19	DIODE 1SS119					
D10	S	8-719-911-19	DIODE 1SS119					

Ref.No. or Qty SP	Part No.	Description
IC4L S	8-759-004-63	IC MC74HC125N
IC4M S	8-759-001-07	IC MC74HC10N
IC4N S	8-759-202-86	IC TC74HC123P
IC5B S	8-759-201-34	IC TD62503P
IC5C S	8-759-202-74	IC TC74HC04P
IC5D S	8-759-202-27	IC TC74HC157P
IC5K S	8-759-901-29	IC MSM5128-15RS
IC6A S	8-759-202-55	IC TC74HC244P
IC6B S	8-759-202-74	IC TC74HC04P
IC6C S	8-759-202-22	IC TC74HC74P
IC6D S	8-759-202-11	IC TC74HC00P
IC6F S	8-759-920-47	IC CX23072
IC6M S	8-759-001-31	IC MC74HC151N
IC6N S	8-759-201-34	IC TD62503P
IC7A S	8-759-202-55	IC TC74HC244P
IC7B S	8-759-004-63	IC MC74HC125N
IC7C S	8-759-202-22	IC TC74HC74P
IC7D S	8-759-202-11	IC TC74HC00P
IC7E S	8-759-202-74	IC TC74HC04P
IC7H S	8-759-920-46	IC CX23071
IC7K S	8-759-901-29	IC MSM5128-15RS
IC7L S	8-759-300-54	IC HM6148HP-45
IC7M S	8-759-202-86	IC TC74HC123P
IC7N S	8-759-202-86	IC TC74HC123P
IC8B S	8-759-201-34	IC TD62503P
IC8C S	8-759-202-11	IC TC74HC00P
IC8D S	8-759-202-74	IC TC74HC04P
IC8E S	8-759-001-07	IC MC74HC10N
IC8F S	8-759-001-39	IC MC74HC164N (Serial No. 12201 and higher)
IC9C S	8-759-202-74	IC TC74HC04P
IC9D S	8-759-202-22	IC TC74HC74P
IC9E S	8-759-202-86	IC TC74HC123P
IC9K S	8-759-920-49	IC CX23074
IC9M S	8-759-972-60	IC CX23073B
L1 S	1-409-339-00	COIL, SN
L2 S	1-409-339-00	COIL, SN
Q1 S	8-729-105-75	TRANSISTOR 2SK523
Q2 S	8-729-902-11	TRANSISTOR 2SC2021
Q3 S	8-729-993-72	TRANSISTOR 2SA937
Q4 S	8-729-902-11	TRANSISTOR 2SC2021
Q5 S	8-729-902-11	TRANSISTOR 2SC2021
R1 S	1-214-121-00	RES, METAL 360 1% 1/4W
R2 S	1-214-121-00	RES, METAL 360 1% 1/4W
R3 S	1-214-105-00	RES, METAL 75 1% 1/4W
R4 S	1-214-105-00	RES, METAL 75 1% 1/4W
R5 S	1-214-108-00	RES, METAL 100 1% 1/4W
R6 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R7 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R8 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R9 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R10 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R11 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R12 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R13 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R14 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R15 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R16 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R17 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R18 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R19 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R20 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R21 S	1-214-108-00	RES, METAL 100 1% 1/4W
R22 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R23 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R24 S	1-214-161-00	RES, METAL 16K 1% 1/4W
R25 S	1-214-164-00	RES, METAL 22K 1% 1/4W

Ref.No. or Qty SP	Part No.	Description
R26 S	1-214-108-00	RES, METAL 100 1% 1/4W
R27 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R28 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R29 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R30 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R31 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R32 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R33 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R34 S	1-214-147-00	RES, METAL 4.3K 1% 1/4W
R35 S	1-214-147-00	RES, METAL 4.3K 1% 1/4W
R36 S	1-214-147-00	RES, METAL 4.3K 1% 1/4W
R37 S	1-214-150-00	RES, METAL 5.6K 1% 1/4W
R38 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R39 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R40 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R41 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R42 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R43 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R44 S	1-214-161-00	RES, METAL 16K 1% 1/4W
R45 S	1-214-164-00	RES, METAL 22K 1% 1/4W
R46 S	1-214-124-00	RES, METAL 470 1% 1/4W
R47 S	1-214-150-00	RES, METAL 5.6K 1% 1/4W
R48 S	1-214-157-00	RES, METAL 11K 1% 1/4W
R49 S	1-214-144-00	RES, METAL 3.3K 1% 1/4W
R50 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R51 S	1-214-180-00	RES, METAL 100K 1% 1/4W
R52 S	1-214-155-00	RES, METAL 9.1K 1% 1/4W
R53 S	1-214-126-00	RES, METAL 560 1% 1/4W
R54 S	1-214-144-00	RES, METAL 3.3K 1% 1/4W
R55 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R56 S	1-214-164-00	RES, METAL 22K 1% 1/4W
R57 S	1-214-164-00	RES, METAL 22K 1% 1/4W
R58 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R59 S	1-214-108-00	RES, METAL 100 1% 1/4W
R60 S	1-214-164-00	RES, METAL 22K 1% 1/4W
R61 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R62 S	1-214-180-00	RES, METAL 100K 1% 1/4W
R63 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R64 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R65 S	1-214-163-00	RES, METAL 20K 1% 1/4W
R66 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R67 S	1-214-180-00	RES, METAL 100K 1% 1/4W
R68 S	1-214-163-00	RES, METAL 20K 1% 1/4W
R69 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R70 S	1-214-163-00	RES, METAL 20K 1% 1/4W
R71 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R72 S	1-214-163-00	RES, METAL 20K 1% 1/4W
R73 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R74 S	1-214-163-00	RES, METAL 20K 1% 1/4W
R75 S	1-214-163-00	RES, METAL 20K 1% 1/4W
R76 S	1-214-137-00	RES, METAL 1.6K 1% 1/4W
R77 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R78 S	1-214-144-00	RES, METAL 3.3K 1% 1/4W
R79 S	1-214-132-00	RES, METAL 1K 1% 1/4W
R80 S	1-214-163-00	RES, METAL 20K 1% 1/4W
R81 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R82 S	1-214-163-00	RES, METAL 20K 1% 1/4W
R83 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R84 S	1-214-163-00	RES, METAL 20K 1% 1/4W
R85 S	1-214-156-00	RES, METAL 10K 1% 1/4W
R86 S	1-214-163-00	RES, METAL 20K 1% 1/4W
R87 S	1-214-163-00	RES, METAL 20K 1% 1/4W
R88 S	1-214-136-00	RES, METAL 1.5K 1% 1/4W
R89 S	1-214-136-00	RES, METAL 1.5K 1% 1/4W
R90 S	1-214-136-00	RES, METAL 1.5K 1% 1/4W

Ref.No. or Qty	SP	Part No.	Description
R91	S	1-214-134-00	RES,METAL 1.2K 1% 1/4W
R92	S	1-214-134-00	RES,METAL 1.2K 1% 1/4W
R93	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R94	S	1-214-124-00	RES,METAL 470 1% 1/4W
R95	S	1-214-124-00	RES,METAL 470 1% 1/4W
R96	S	1-214-124-00	RES,METAL 470 1% 1/4W
R97	S	1-214-124-00	RES,METAL 470 1% 1/4W
R98	S	1-214-116-00	RES,METAL 220 1% 1/4W
R99	S	1-214-116-00	RES,METAL 220 1% 1/4W
R100	S	1-214-116-00	RES,METAL 220 1% 1/4W
R101	S	1-214-167-00	RES,METAL 30K 1% 1/4W
R102	S	1-214-167-00	RES,METAL 30K 1% 1/4W
R103	S	1-214-167-00	RES,METAL 30K 1% 1/4W
R104	S	1-214-167-00	RES,METAL 30K 1% 1/4W
R105	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R106	S	1-214-116-00	RES,METAL 220 1% 1/4W
R107	S	1-214-116-00	RES,METAL 220 1% 1/4W
R108	S	1-214-119-00	RES,METAL 300 1% 1/4W
R109	S	1-214-119-00	RES,METAL 300 1% 1/4W
R110	S	1-214-119-00	RES,METAL 300 1% 1/4W
R111	S	1-214-119-00	RES,METAL 300 1% 1/4W
R112	S	1-214-116-00	RES,METAL 220 1% 1/4W
R113	S	1-214-116-00	RES,METAL 220 1% 1/4W
R114	S	1-214-084-00	RES,METAL 10 1% 1/4W
R115	S	1-214-084-00	RES,METAL 10 1% 1/4W
R116	S	1-214-084-00	RES,METAL 10 1% 1/4W
R117	S	1-214-084-00	RES,METAL 10 1% 1/4W
R118	S	1-214-084-00	RES,METAL 10 1% 1/4W
R119	S	1-214-084-00	RES,METAL 10 1% 1/4W
R120	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R121	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R122	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R123	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R124	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R125	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R126	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R127	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R128	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R129	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R130	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R131	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R132	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R133	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R134	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R135	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R136	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R137	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R138	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R139	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R140	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R141	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R142	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R143	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R144	S	1-214-084-00	RES,METAL 10 1% 1/4W
R145	S	1-214-137-00	RES,METAL 1.6K 1% 1/4W
R146	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R147	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R148	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R149	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R150	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R151	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R152	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R153	S	1-214-159-00	RES,METAL 13K 1% 1/4W
R154	S	1-214-167-00	RES,METAL 30K 1% 1/4W
R155	S	1-214-156-00	RES,METAL 10K 1% 1/4W

Ref.No. or Qty	SP	Part No.	Description
RB1	S	1-231-410-00	RESISTOR BLOCK 10K
RB2	S	1-231-410-00	RESISTOR BLOCK 10K
RB3	S	1-231-410-00	RESISTOR BLOCK 10K
RB4	S	1-235-005-00	RESISTOR BLOCK 47K
RV1	S	1-224-937-00	RES,ADJ,METAL 1K
RV2	S	1-224-937-00	RES,ADJ,METAL 1K
SW1	S	1-516-923-21	SWITCH,DIP
SW2	S	1-516-923-21	SWITCH,DIP
SW3	S	1-516-923-21	SWITCH,DIP

**MT-16 BOARD**

lpc O A-7850-301-A COMPLETE PCB,MT-16  
(This assembly includes the following parts.)

lpc	O	1-526-662-00	SOCKET, IC (DP) 40P
lpc	S	2-251-622-00	LEVER, PC BOARD
lpc	O	3-673-867-00	PLATE, INDICATION, PC BOARD
lpc	O	4-911-704-01	LABEL (MT), PC BOARD
2pcs	S	7-626-317-21	PIN, SPRING 2.5x8
C1	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C2	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C3	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C4	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C5	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C6	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C7	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C8	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C9	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C10	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C11	S	1-131-449-11	CAP TANT 3.3 20% 16V
C12	S	1-131-449-11	CAP TANT 3.3 20% 16V
C13	S	1-131-449-11	CAP TANT 3.3 20% 16V
C14	S	1-131-449-11	CAP TANT 3.3 20% 16V
C15	S	1-131-449-11	CAP TANT 3.3 20% 16V
C16	S	1-131-449-11	CAP TANT 3.3 20% 16V
C17	S	1-131-449-11	CAP TANT 3.3 20% 16V
C18	S	1-131-449-11	CAP TANT 3.3 20% 16V
C19	S	1-131-449-11	CAP TANT 3.3 20% 16V
C20	S	1-131-449-11	CAP TANT 3.3 20% 16V
C21	S	1-131-449-11	CAP TANT 3.3 20% 16V
C22	S	1-131-449-11	CAP TANT 3.3 20% 16V
C23	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C24	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C25	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C26	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C27	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C28	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C29	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C30	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C31	S	1-131-449-11	CAP TANT 3.3 20% 16V
C32	S	1-123-310-00	CAP,ELECT 470 20% 10V
C33	S	1-123-310-00	CAP,ELECT 470 20% 10V
C34	S	1-131-449-11	CAP TANT 3.3 20% 16V
C35	S	1-123-310-00	CAP,ELECT 470 20% 10V

Ref.No. or Qty	SP	Part No.	Description		Ref.No. or Qty	SP	Part No.	Description	
C36	S	1-123-310-00	CAP,ELECT 470	20%	10V	IC3C	S	8-759-182-43	IC UPD8243C(M)
C37	S	1-130-789-00	CAP,FILM 1	5%	100V	IC3D	S	8-759-202-82	IC TC74HC85P
C38	S	1-107-085-00	CAP,MICA 100P	5%	50V	IC3E	S	8-759-202-82	IC TC74HC85P
C39	S	1-101-004-00	CAP,CERAMIC 0.01		50V	IC3F	S	8-759-202-82	IC TC74HC85P
C40	S	1-101-004-00	CAP,CERAMIC 0.01		50V	IC3H	S	8-759-202-82	IC TC74HC85P
C41	S	1-101-004-00	CAP,CERAMIC 0.01		50V	IC3J	S	8-759-202-76	IC TC74HC30P
C42	S	1-101-004-00	CAP,CERAMIC 0.01		50V	IC4B	S	8-759-203-17	IC TC74HC251P
C43	S	1-101-004-00	CAP,CERAMIC 0.01		50V	IC4C	S	8-759-203-17	IC TC74HC251P
C44	S	1-101-004-00	CAP,CERAMIC 0.01		50V	IC4D	S	8-759-202-24	IC TC74HC86P
C45	S	1-101-004-00	CAP,CERAMIC 0.01		50V	IC4E	S	8-759-202-24	IC TC74HC86P
C46	S	1-101-004-00	CAP,CERAMIC 0.01		50V	IC4F	S	8-759-202-24	IC TC74HC86P
C47	S	1-101-004-00	CAP,CERAMIC 0.01		50V	IC4H	S	8-759-202-24	IC TC74HC86P
C48	S	1-101-004-00	CAP,CERAMIC 0.01		50V	IC4J	S	8-759-202-76	IC TC74HC30P
C49	S	1-101-004-00	CAP,CERAMIC 0.01		50V	IC4K	S	8-759-001-39	IC MC74HC164N
C50	S	1-101-004-00	CAP,CERAMIC 0.01		50V	IC4L	S	8-759-001-39	IC MC74HC164N
C51	S	1-101-004-00	CAP,CERAMIC 0.01		50V	IC5D	S	8-759-203-52	IC TC74HC595P
C52	S	1-101-004-00	CAP,CERAMIC 0.01		50V	IC5E	S	8-759-203-52	IC TC74HC595P
D1	S	8-719-911-19	DIODE 1SS119			IC5F	S	8-759-203-52	IC TC74HC595P
D2	S	8-719-911-19	DIODE 1SS119			IC5H	S	8-759-203-52	IC TC74HC595P
D3	S	8-719-911-19	DIODE 1SS119			IC5J	S	8-759-202-20	IC TC74HC27P
D4	S	8-719-911-19	DIODE 1SS119			IC5K	S	8-759-202-74	IC TC74HC04P
D5	S	8-719-911-19	DIODE 1SS119			IC6B	S	8-759-926-31	IC AM26LS31PC
D6	S	8-719-911-19	DIODE 1SS119			IC6C	S	8-759-202-74	IC TC74HC04P
D7	S	8-719-911-19	DIODE 1SS119			IC6J	S	8-759-202-22	IC TC74HC74P
D8	S	8-719-911-19	DIODE 1SS119			IC6K	S	8-759-202-22	IC TC74HC74P
D9	S	8-719-911-19	DIODE 1SS119			IC6L	S	8-759-202-30	IC TC74HC161P
D10	S	8-719-911-19	DIODE 1SS119			IC7C	S	8-759-202-93	IC TC74HC153P
D11	S	8-719-911-19	DIODE 1SS119			IC7K	S	8-759-903-46	IC SN74LS625N
D12	S	8-719-911-19	DIODE 1SS119			Q1	S	8-729-900-46	TRANSISTOR DTC143TF
D13	S	8-719-911-19	DIODE 1SS119			Q2	S	8-729-900-46	TRANSISTOR DTC143TF
D14	S	8-719-911-19	DIODE 1SS119			Q3	S	8-729-900-46	TRANSISTOR DTC143TF
D15	S	8-719-911-19	DIODE 1SS119			Q4	S	8-729-900-46	TRANSISTOR DTC143TF
D16	S	8-719-911-19	DIODE 1SS119			Q5	S	8-729-900-46	TRANSISTOR DTC143TF
D17	S	8-719-911-19	DIODE 1SS119			Q6	S	8-729-900-46	TRANSISTOR DTC143TF
D18	S	8-719-911-19	DIODE 1SS119			Q7	S	8-729-900-46	TRANSISTOR DTC143TF
D19	S	8-719-911-19	DIODE 1SS119			Q8	S	8-729-900-46	TRANSISTOR DTC143TF
D20	S	8-719-911-19	DIODE 1SS119			Q9	S	8-729-900-46	TRANSISTOR DTC143TF
D21	S	8-719-911-19	DIODE 1SS119			Q10	S	8-729-900-46	TRANSISTOR DTC143TF
D22	S	8-719-911-19	DIODE 1SS119			Q11	S	8-729-900-46	TRANSISTOR DTC143TF
D23	S	8-719-911-19	DIODE 1SS119			Q12	S	8-729-900-46	TRANSISTOR DTC143TF
D24	S	8-719-911-19	DIODE 1SS119			Q13	S	8-729-900-46	TRANSISTOR DTC143TF
D25	S	8-719-911-19	DIODE 1SS119			Q14	S	8-729-900-46	TRANSISTOR DTC143TF
D26	S	8-719-911-19	DIODE 1SS119			Q15	S	8-729-900-46	TRANSISTOR DTC143TF
D27	S	8-719-911-19	DIODE 1SS119			Q16	S	8-729-900-46	TRANSISTOR DTC143TF
D28	S	8-719-911-19	DIODE 1SS119			Q17	S	8-729-987-42	TRANSISTOR 2SA874
D29	S	8-719-911-19	DIODE 1SS119			Q18	S	8-729-982-22	TRANSISTOR 2SB822
D30	S	8-719-911-19	DIODE 1SS119			Q19	S	8-729-987-42	TRANSISTOR 2SA874
D31	S	8-719-911-19	DIODE 1SS119			Q20	S	8-729-982-22	TRANSISTOR 2SB822
D32	S	8-719-911-19	DIODE 1SS119			Q21	S	8-729-987-42	TRANSISTOR 2SA874
D33	S	8-719-911-19	DIODE 1SS119			Q22	S	8-729-982-22	TRANSISTOR 2SB822
D34	S	8-719-911-19	DIODE 1SS119			Q23	S	8-729-987-42	TRANSISTOR 2SA874
D35	S	8-719-911-19	DIODE 1SS119			Q24	S	8-729-982-22	TRANSISTOR 2SB822
IC1C	S	8-759-763-49	IC UPD8749HD-MT01, EPROM			R1	S	1-214-101-00	RES,METAL 51 1% 1/4W
IC1D	S	8-759-202-55	IC TC74HC244P			R2	S	1-214-101-00	RES,METAL 51 1% 1/4W
IC1E	S	8-759-202-55	IC TC74HC244P			R3	S	1-214-101-00	RES,METAL 51 1% 1/4W
IC1F	S	8-759-202-55	IC TC74HC244P			R4	S	1-214-101-00	RES,METAL 51 1% 1/4W
IC1H	S	8-759-202-55	IC TC74HC244P			R5	S	1-214-101-00	RES,METAL 51 1% 1/4W
IC1J	S	8-759-202-83	IC TC74HC107P			R6	S	1-214-101-00	RES,METAL 51 1% 1/4W
IC1K	S	8-759-202-11	IC TC74HC00P			R7	S	1-214-101-00	RES,METAL 51 1% 1/4W
IC1L	S	8-759-202-86	IC TC74HC123P			R8	S	1-214-101-00	RES,METAL 51 1% 1/4W
IC2D	S	8-759-203-21	IC TC74HC273P			R9	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC2E	S	8-759-203-21	IC TC74HC273P			R10	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC2F	S	8-759-203-21	IC TC74HC273P			R11	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC2H	S	8-759-203-21	IC TC74HC273P			R12	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC2J	S	8-759-202-74	IC TC74HC04P			R13	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC2K	S	8-759-202-76	IC TC74HC30P			R14	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC2L	S	8-759-202-76	IC TC74HC30P			R15	S	1-214-132-00	RES,METAL 1K 1% 1/4W

Ref.No. or Qty	SP	Part No.	Description	Ref.No. or Qty	SP	Part No.	Description
R16	S	1-214-132-00	RES,METAL 1K 1/4W	DSP-3 BOARD			
R17	S	1-214-156-00	RES,METAL 10K 1/4W	lpc	O	A-7850-289-A	COMPLETE PCB,DSP-3
R18	S	1-214-156-00	RES,METAL 10K 1/4W	(This assembly includes the following parts.)			
R19	S	1-214-180-00	RES,METAL 100K 1/4W	CN101	O	1-556-921-00	FLAT CABLE ASSY
R20	S	1-214-180-00	RES,METAL 100K 1/4W	CN102	O	1-560-363-00	POST HEADER,ILG 12P
R21	S	1-214-124-00	RES,METAL 470 1/4W	D1	S	8-719-907-76	DIODE BG5534S
R22	S	1-214-124-00	RES,METAL 470 1/4W	D2	S	8-719-907-76	DIODE BG5534S
R23	S	1-214-156-00	RES,METAL 10K 1/4W	D3	S	8-719-907-76	DIODE BG5534S
R24	S	1-214-180-00	RES,METAL 100K 1/4W	D4	S	8-719-907-76	DIODE BG5534S
R25	S	1-214-149-00	RES,METAL 5.1K 1/4W	D5	S	8-719-907-76	DIODE BG5534S
R26	S	1-214-156-00	RES,METAL 10K 1/4W	D6	S	8-719-907-76	DIODE BG5534S
R27	S	1-214-156-00	RES,METAL 10K 1/4W	D7	S	8-719-907-76	DIODE BG5534S
R28	S	1-214-156-00	RES,METAL 10K 1/4W	D8	S	8-719-907-78	DIODE PR5534S
R29	S	1-214-156-00	RES,METAL 10K 1/4W	D9	S	8-719-907-78	DIODE PR5534S
R30	S	1-214-156-00	RES,METAL 10K 1/4W	D10	S	8-719-907-79	DIODE PY5534S
R31	S	1-214-156-00	RES,METAL 10K 1/4W	D11	S	8-719-907-76	DIODE BG5534S
R32	S	1-214-156-00	RES,METAL 10K 1/4W	D12	S	8-719-907-76	DIODE BG5534S
R33	S	1-214-156-00	RES,METAL 10K 1/4W	D13	S	8-719-907-79	DIODE PY5534S
R34	S	1-214-095-00	RES,METAL 30 1/4W	D14	S	8-719-907-79	DIODE PY5534S
R35	S	1-214-095-00	RES,METAL 30 1/4W	D15	S	8-719-905-31	DIODE PY5531K
R36	S	1-214-095-00	RES,METAL 30 1/4W	D16	S	8-719-905-31	DIODE PY5531K
R37	S	1-214-095-00	RES,METAL 30 1/4W	D17	S	8-719-905-31	DIODE PY5531K
R38	S	1-214-095-00	RES,METAL 30 1/4W	D18	S	8-719-905-31	DIODE PY5531K
R39	S	1-214-095-00	RES,METAL 30 1/4W	D19	S	8-719-905-31	DIODE PY5531K
R40	S	1-214-095-00	RES,METAL 30 1/4W	D20	S	8-719-905-31	DIODE PY5531K
R41	S	1-214-095-00	RES,METAL 30 1/4W	D21	S	8-719-955-31	DIODE PR5531K
R42	S	1-214-095-00	RES,METAL 30 1/4W	D22	S	8-719-955-32	DIODE PG5531KX
R43	S	1-214-095-00	RES,METAL 30 1/4W	D23	S	8-719-955-32	DIODE PG5531KX
R44	S	1-214-095-00	RES,METAL 30 1/4W	D24	S	8-719-955-32	DIODE PG5531KX
R45	S	1-214-095-00	RES,METAL 30 1/4W	D25	S	8-719-955-32	DIODE PG5531KX
R46	S	1-214-095-00	RES,METAL 30 1/4W	D26	S	8-719-955-32	DIODE PG5531KX
R47	S	1-214-095-00	RES,METAL 30 1/4W	D27	S	8-719-955-32	DIODE PG5531KX
R48	S	1-214-095-00	RES,METAL 30 1/4W	D28	S	8-719-955-32	DIODE PG5531KX
R49	S	1-214-095-00	RES,METAL 30 1/4W	D29	S	8-719-955-32	DIODE PG5531KX
R50	S	1-214-156-00	RES,METAL 10K 1/4W	D30	S	8-719-955-32	DIODE PG5531KX
R51	S	1-214-156-00	RES,METAL 10K 1/4W	D31	S	8-719-955-32	DIODE PG5531KX
R52	S	1-214-156-00	RES,METAL 10K 1/4W	D32	S	8-719-955-32	DIODE PG5531KX
R53	S	1-214-156-00	RES,METAL 10K 1/4W	D33	S	8-719-955-32	DIODE PG5531KX
R54	S	1-214-140-00	RES,METAL 2.2K 1/4W	D34	S	8-719-955-32	DIODE PG5531KX
R55	S	1-214-140-00	RES,METAL 2.2K 1/4W	D35	S	8-719-955-32	DIODE PG5531KX
R56	S	1-214-140-00	RES,METAL 2.2K 1/4W	D36	S	8-719-955-32	DIODE PG5531KX
R57	S	1-214-140-00	RES,METAL 2.2K 1/4W	D37	S	8-719-955-32	DIODE PG5531KX
R58	S	1-214-149-00	RES,METAL 5.1K 1/4W	D38	S	8-719-955-32	DIODE PG5531KX
R59	S	1-214-149-00	RES,METAL 5.1K 1/4W	D39	S	8-719-955-32	DIODE PG5531KX
R60	S	1-214-149-00	RES,METAL 5.1K 1/4W	D40	S	8-719-955-32	DIODE PG5531KX
R61	S	1-214-149-00	RES,METAL 5.1K 1/4W	D41	S	8-719-955-32	DIODE PG5531KX
R62	S	1-214-156-00	RES,METAL 10K 1/4W	D42	S	8-719-955-32	DIODE PG5531KX
RB1	S	1-231-411-00	RESISTOR BLOCK 100K	D43	S	8-719-955-32	DIODE PG5531KX
RB2	S	1-231-410-00	RESISTOR BLOCK 10K	D44	S	8-719-955-32	DIODE PG5531KX
RB3	S	1-231-410-00	RESISTOR BLOCK 10K	D45	S	8-719-955-32	DIODE PG5531KX
RB4	S	1-231-411-00	RESISTOR BLOCK 100K	D46	S	8-719-955-32	DIODE PG5531KX
RB5	S	1-231-407-00	RESISTOR BLOCK 2.2K	D47	S	8-719-955-32	DIODE PG5531KX
RB6	S	1-231-407-00	RESISTOR BLOCK 2.2K	D48	S	8-719-955-32	DIODE PG5531KX
RB7	S	1-231-411-00	RESISTOR BLOCK 100K	D49	S	8-719-955-32	DIODE PG5531KX
SW1	S	1-553-441-00	SWITCH, TOGGLE	D50	S	8-719-955-32	DIODE PG5531KX
SW2	S	1-516-925-21	SWITCH, DIP	D51	S	8-719-955-32	DIODE PG5531KX
SW3	S	1-516-925-21	SWITCH, DIP	D52	S	8-719-955-32	DIODE PG5531KX
SW4	S	1-516-925-21	SWITCH, DIP	D53	S	8-719-955-32	DIODE PG5531KX
X1	S	1-527-854-12	OSCILLATOR, CRYSTAL	D54	S	8-719-955-31	DIODE PR5531K
				D55	S	8-719-955-32	DIODE PG5531KX
				D56	S	8-719-955-32	DIODE PG5531KX
				D57	S	8-719-955-32	DIODE PG5531KX
				D58	S	8-719-955-32	DIODE PG5531KX
				D59	S	8-719-955-32	DIODE PG5531KX
				D60	S	8-719-955-32	DIODE PG5531KX

Ref.No. or Qty	SP	Part No.	Description	Ref.No. or Qty	SP	Part No.	Description
D61	S	8-719-955-32	DIODE PG5531KX	C22	S	1-123-359-00	CAP,ELECT 47 20% 50V
D62	S	8-719-955-32	DIODE PG5531KX	C23	S	1-131-450-00	CAP,TANT 1M 20% 50V
D63	S	8-719-955-32	DIODE PG5531KX	C24	S	1-131-450-00	CAP,TANT 1M 20% 50V
D64	S	8-719-955-32	DIODE PG5531KX	C25	S	1-124-555-00	CAP,ELECT 1000 20% 16V
D65	S	8-719-955-32	DIODE PG5531KX	C26	S	1-123-359-00	CAP,ELECT 47 20% 50V
D66	S	8-719-955-32	DIODE PG5531KX	C27	S	1-131-450-00	CAP,TANT 1M 20% 50V
D67	S	8-719-955-32	DIODE PG5531KX	C28	S	1-131-450-00	CAP,TANT 1M 20% 50V
D68	S	8-719-955-32	DIODE PG5531KX	C29	S	1-131-450-00	CAP,TANT 1M 20% 50V
D69	S	8-719-955-32	DIODE PG5531KX	C30	S	1-131-450-00	CAP,TANT 1M 20% 50V
D70	S	8-719-955-32	DIODE PG5531KX	C31	S	1-102-963-00	CAP,CERAMIC 33P 5% 50V
D71	S	8-719-955-32	DIODE PG5531KX	C32	S	1-102-963-00	CAP,CERAMIC 33P 5% 50V
D72	S	8-719-955-32	DIODE PG5531KX	CN201	O	1-564-943-21	CONNECTOR,PC BOARD 12P
D73	S	8-719-955-32	DIODE PG5531KX	CN202	O	1-564-943-11	CONNECTOR,PC BOARD 12P
D74	S	8-719-955-32	DIODE PG5531KX	CN203	O	1-560-752-00	CONNECTOR,PC BOARD 9P
D75	S	8-719-955-32	DIODE PG5531KX	CN204	O	1-560-753-00	CONNECTOR,PC BOARD 5P
D76	S	8-719-955-32	DIODE PG5531KX	CN205	O	1-560-357-00	POST HEADER,ILG 3P
D77	S	8-719-955-32	DIODE PG5531KX	D1	S	8-719-230-02	DIODE 30DF2
D78	S	8-719-955-32	DIODE PG5531KX	D2	S	8-719-230-02	DIODE 30DF2
D79	S	8-719-955-32	DIODE PG5531KX	D3	S	8-719-230-02	DIODE 30DF2
D80	S	8-719-955-32	DIODE PG5531KX	D4	S	8-719-230-02	DIODE 30DF2
D81	S	8-719-955-32	DIODE PG5531KX	D5	S	8-719-200-02	DIODE 10E-2
D82	S	8-719-955-32	DIODE PG5531KX	D6	S	8-719-200-02	DIODE 10E-2
D83	S	8-719-955-32	DIODE PG5531KX	D7	S	8-719-200-02	DIODE 10E-2
D84	S	8-719-955-32	DIODE PG5531KX	D8	S	8-719-230-02	DIODE 30DF2
D85	S	8-719-955-32	DIODE PG5531KX	D9	S	8-719-230-02	DIODE 30DF2
D86	S	8-719-955-32	DIODE PG5531KX	D10	S	8-719-230-02	DIODE 30DF2
R1	S	1-214-116-00	RES,METAL 220 1% 1/4W	D11	S	8-719-230-02	DIODE 30DF2
R2	S	1-214-116-00	RES,METAL 220 1% 1/4W	D12	S	8-719-200-02	DIODE 10E-2
R3	S	1-214-120-00	RES,METAL 330 1% 1/4W	D13	S	8-719-200-02	DIODE 10E-2
				D14	S	8-719-200-02	DIODE 10E-2
				D15	S	8-719-200-02	DIODE 10E-2
				D16	S	8-719-200-02	DIODE 10E-2
				D17	S	8-719-200-02	DIODE 10E-2
				D20	S	8-719-911-19	DIODE 1SS119
				D21	S	8-719-911-19	DIODE 1SS119
				D22	S	8-719-200-02	DIODE 10E-2
				D23	S	8-719-200-02	DIODE 10E-2
				D24	S	8-719-200-02	DIODE 10E-2
				D25	S	8-719-200-02	DIODE 10E-2
				D26	S	8-719-300-39	DIODE CTG-32R
				D27	S	8-719-300-40	DIODE CTG-32S
				D28	S	8-719-911-19	DIODE 1SS119
				D29	S	8-719-911-19	DIODE 1SS119
				D30	S	8-719-911-19	DIODE 1SS119
				D31	S	8-719-911-19	DIODE 1SS119
				IC1	S	8-759-900-72	IC NE5532P
				LED1	S	8-719-903-43	DIODE PR3432S
				LED2	S	8-719-903-43	DIODE PR3432S
				LED3	S	8-719-934-33	DIODE PY3432S
				LED4	S	8-719-934-33	DIODE PY3432S
				LED5	S	8-719-903-43	DIODE PR3432S
				LED6	S	8-719-914-32	DIODE PG3432S
				LED7	S	8-719-914-32	DIODE PG3432S
				LED8	S	8-719-903-43	DIODE PR3432S
				PC1	S	8-719-120-23	DIODE PS2003B-KA
				PC2	S	8-719-120-23	DIODE PS2003B-KA
				PC3	S	8-719-120-23	DIODE PS2003B-KA
				Q1	S	9-983-504-01	DIODE CTB-34
				Q2	S	8-749-930-52	IC SI-3052V
				Q3	S	8-749-990-05	IC STR9005
				Q4	S	8-759-700-06	IC NJM7812B
				Q5	S	8-759-179-12	IC UPC7912H
<b>PS-81 BOARD</b>							
lpc	O	A-7804-024-A	COMPLETE PCB,PS-81				
(This assembly includes the following parts.)							
C1	S	1-130-777-00	CAP,FILM 0.1 5% 100V				
C2	S	1-130-789-00	CAP,FILM 1 5% 100V				
C3	S	1-130-777-00	CAP,FILM 0.1 5% 100V				
C4	S	1-130-789-00	CAP,FILM 1 5% 100V				
C5	S	1-131-450-00	CAP,TANT 1M 20% 50V				
C6	S	1-123-307-00	CAP,ELECT 100 20% 10V				
C7	S	1-130-777-00	CAP,FILM 0.1 5% 100V				
C8	S	1-123-307-00	CAP,ELECT 100 20% 10V				
C9	S	1-130-789-00	CAP,FILM 1 5% 100V				
C10	S	1-130-777-00	CAP,FILM 0.1 5% 100V				
C11	S	1-130-789-00	CAP,FILM 1 5% 100V				
C12	S	1-131-450-00	CAP,TANT 1M 20% 50V				
C13	S	1-131-450-00	CAP,TANT 1M 20% 50V				
C14	S	1-131-450-00	CAP,TANT 1M 20% 50V				
C15	S	1-131-450-00	CAP,TANT 1M 20% 50V				
C17	S	1-131-450-00	CAP,TANT 1M 20% 50V				
C18	S	1-131-450-00	CAP,TANT 1M 20% 50V				
C19	S	1-131-450-00	CAP,TANT 1M 20% 50V				
C20	S	1-131-450-00	CAP,TANT 1M 20% 50V				
C21	S	1-123-332-00	CAP,ELECT 47 20% 25V				



Ref.No. or Qty SP	Part No.	Description
<b>MB-11 BOARD</b>		
lpc	0 A-7850-287-A	MOUNTED PCB,MB-11 (This assembly includes the following parts.)
CN001	0 1-562-893-11	CONNECTOR,PC BOARD 100P
CN002	0 1-562-893-11	CONNECTOR,PC BOARD 100P
CN003	0 1-562-893-11	CONNECTOR,PC BOARD 100P
CN004	0 1-562-893-11	CONNECTOR,PC BOARD 100P
CN005	0 1-562-893-11	CONNECTOR,PC BOARD 100P
CN006	0 1-562-893-11	CONNECTOR,PC BOARD 100P
CN007	0 1-562-893-11	CONNECTOR,PC BOARD 100P
CN008	0 1-562-893-11	CONNECTOR,PC BOARD 100P
CN010	0 1-560-753-00	CONNECTOR,PC BOARD 5P
CN011	0 1-560-360-00	POST HEADER,ILG 6P
CN012	0 1-560-360-00	POST HEADER,ILG 6P
CN013	0 1-560-362-00	POST HEADER,ILG 10P
CN014	0 1-560-362-00	POST HEADER,ILG 10P
CN015	0 1-560-358-00	POST HEADER,ILG 4P
CN016	0 1-560-726-00	HEADER,PIN 20P
CN017	0 1-560-723-00	CONNECTOR,PC BOARD 3P
CN018	0 1-560-360-00	POST HEADER,ILG 6P
CN019	0 1-560-361-00	POST HEADER,ILG 8P
CN020	0 1-560-361-00	POST HEADER,ILG 8P
CN021	0 1-560-178-00	CONNECTOR 6P
CN022	0 1-560-358-00	POST HEADER,ILG 4P
CN023	0 1-564-944-11	HEADER,MINIATURE 50P
CN024	0 1-560-724-00	HEADER,PIN 10P

**FRAME**

lpc	S 1-558-096-11	CORD(WITH D SUB CONNECTOR)
C301	S 1-161-059-00	CAP,CERAMIC 0.047 10% 50V
C501	S 1-125-409-00	CAP,ELECT 22000 20% 50V
C502	S 1-125-409-00	CAP,ELECT 22000 20% 50V
C503	S 1-125-406-00	CAP,ELECT 56000 20% 16V
C504	S 1-125-407-00	CAP,ELECT 12000 20% 25V
C505	S 1-125-408-00	CAP,ELECT 10000 20% 35V
C506	S 1-125-408-00	CAP,ELECT 10000 20% 35V
CN010	0 1-561-863-00	PLUG,HOUSING,5P
	0 1-561-067-00	CONTACT,FEMALE
CN011	0 1-561-518-00	PLUG,HOUSING,6P
	0 1-560-372-00	CONTACT,FEMALE
CN012	0 1-561-518-00	PLUG,HOUSING,6P
	0 1-560-372-00	CONTACT,FEMALE
CN013	0 1-561-520-00	PLUG,HOUSING,10P
	0 1-560-372-00	CONTACT,FEMALE
CN014	0 1-561-520-00	PLUG,HOUSING,10P
	0 1-560-372-00	CONTACT,FEMALE

Ref.No. or Qty SP	Part No.	Description
CN015	0 1-561-516-00	PLUG,HOUSING,4P
	0 1-560-372-00	CONTACT,FEMALE
CN017	0 1-561-828-00	PLUG,HOUSING,3P
	0 1-561-067-00	CONTACT,FEMALE
CN018	0 1-561-518-00	PLUG,HOUSING,6P
	0 1-560-372-00	CONTACT,FEMALE
CN019	0 1-561-519-00	PLUG,HOUSING,8P
	0 1-560-372-00	CONTACT,FEMALE
CN020	0 1-561-519-00	PLUG,HOUSING,8P
	0 1-560-372-00	CONTACT,FEMALE
CN021	0 1-561-071-00	PLUG,HOUSING,3P
	0 1-561-067-00	CONTACT,FEMALE
CN022	0 1-561-516-00	PLUG,HOUSING,4P
	0 1-560-372-00	CONTACT,FEMALE
CN024	0 1-561-888-00	PLUG,HOUSING,10P
	0 1-560-768-00	CONTACT,FEMALE
CN102	0 1-561-521-00	PLUG,HOUSING,12P
	0 1-560-372-00	CONTACT,FEMALE
CN201	0 1-562-849-21	PLUG,HOUSING,12P
	0 1-561-067-00	CONTACT,FEMALE
CN202	0 1-562-849-11	PLUG,HOUSING,12P
	0 1-535-206-00	CONTACT,FEMALE
CN203	0 1-561-072-00	PLUG,HOUSING,3P
	0 1-561-067-00	CONTACT,FEMALE
CN204	0 1-561-863-00	PLUG,HOUSING,5P
	0 1-561-067-00	CONTACT,FEMALE
CN205	0 1-561-515-00	PLUG,HOUSING,3P
	0 1-560-372-00	CONTACT,FEMALE
CN301	S 1-507-507-00	JACK
CN401	S 1-509-184-31	RECEPTACLE,FEMALE,XLR3P
CN402	S 1-509-184-31	RECEPTACLE,FEMALE,XLR3P
CN403	S 1-509-176-31	RECEPTACLE,MALE,XLR3P
CN404	S 1-509-176-31	RECEPTACLE,MALE,XLR3P
CN405	0 1-562-261-00	RECEPTACLE,BNC
CN406	0 1-562-261-00	RECEPTACLE,BNC
CN407	0 1-562-261-00	RECEPTACLE,BNC
CN408	0 1-562-261-00	RECEPTACLE,BNC
CN409	0 1-562-261-00	RECEPTACLE,BNC
CN410	0 1-562-261-00	RECEPTACLE,BNC
CN411	0 1-562-261-00	RECEPTACLE,BNC
CN412	0 1-562-261-00	RECEPTACLE,BNC
CN413	0 1-562-261-00	RECEPTACLE,BNC
CN414	0 1-562-261-00	RECEPTACLE,BNC
CN415	0 1-562-261-00	RECEPTACLE,BNC
CN416	0 1-562-261-00	RECEPTACLE,BNC
CN417	0 1-562-261-00	RECEPTACLE,BNC
CN418	0 1-562-261-00	RECEPTACLE,BNC
CN419	0 1-562-261-00	RECEPTACLE,BNC
CN420	0 1-562-261-00	RECEPTACLE,BNC
CN421	0 1-562-261-00	RECEPTACLE,BNC
CN422	0 1-562-261-00	RECEPTACLE,BNC
CN423	S 1-509-095-00	8P MULTI SOCKET
CN424	S 1-509-095-00	8P MULTI SOCKET
CN426	S $\Delta$ 1-509-547-00	3P INLET
CN601	0 1-561-069-00	PLUG,HOUSING,2P
	0 1-535-206-00	(For CN601,FU-32 Board) CONTACT,FEMALE
CN602	0 1-561-515-00	PLUG,HOUSING,3P
	0 1-560-372-00	CONTACT,FEMALE

Ref.No. or Qty SP	Part No.	Description
CN801 O	1-560-006-00	TERMINAL, EI
O	1-561-156-00	CONNECTOR, EI HOUSING
O	1-560-406-00	PRESS TERMINAL, PLUG
O	1-560-524-11	PLUG HOUSING, EI CONNECTOR 5P (CN801 is added from Serial No. 12801 and higher.)
F1 S	△ 1-532-237-00	FUSE, TIME-LAG 3.15A (For AE and Model)
F1 S	1-532-713-00	FUSE, TIME-LAG 3A (For J and UC Models)
FL501 S	△ 1-421-518-00	FILTER, NOISE
R401 S	1-214-105-00	RES, METAL FILM 75 1% 1/4W
RV301 S	1-230-880-11	RES, VAR, CARBON 10K/10K RV24
SW301 S	△ 1-570-117-11	SWITCH, SEESAW (AC POWER)
SW302 S	1-553-247-00	SWITCH, TOGGLE
SW303 S	1-553-244-00	SWITCH, TOGGLE
SW304 S	1-553-244-00	SWITCH, TOGGLE
SW305 S	1-553-244-00	SWITCH, TOGGLE
SW306 S	1-553-247-00	SWITCH, TOGGLE
SW307 S	1-553-244-00	SWITCH, TOGGLE
SW308 S	1-553-244-00	SWITCH, TOGGLE
SW309 S	1-570-297-11	SWITCH, ROTARY
SW401 S	1-514-580-00	SWITCH, SLIDE
SW402 S	△ 1-526-572-00	SOCKET, POWER VOLTAGE SELECT
T501 S	1-448-295-11	TRANSFORMER POWER

### D-3. ACCESSORIES SUPPLIED

Qty	SP	Part No.	Description
2pcs	O	A-7810-169-A	ADAPTER ASSY, RACK MOUNT (This assembly includes the following parts.)
1pc	O	2-241-803-00	HANDLE
1pc	O	4-911-711-01	ANGLE, RACK
1pc	O	4-911-712-01	COVER, RACK
2pcs	S	7-682-275-09	SCREW, +K5x10
1pc	S	A-7850-303-A	MOUNTED PCB, EX-71 (This assembly includes the following part.)
1pc	O	1-562-893-11	CONNECTOR, PC BOARD 100P
1pc	S	1-534-392-11	CONNECTION CORD
1pc	S	△ 1-534-827-00	CORD, POWER (For UC Model)
2pcs	S	1-551-475-51	CABLE ASSY
1pc	S	△ 1-556-760-11	CORD, POWER (3 CORE) (For AE Model)
1pc	S	1-558-180-11	CORD, POWER (For J Model)
4pcs	S	3-703-064-00	WASHER, ORNAMENT (DIA.5)
4pcs	S	7-682-378-04	SCREW, +RK5x16
4pcs	S	7-682-563-04	SCREW, +B4x12
4pcs	S	7-682-965-01	SCREW, +PSW4x16

## SECTION E PARTS CHANGE INFORMATION

At Sony, we continually strive to keep up with latest electronic developments by adding circuit and component improvements to our instruments as soon as they are developed and tested. The following information covers the parts change of the former units.

### Electrical Parts List Changes

#### DA-15 BOARD

	DA-15 BOARD (Board No. 1-616-293-11) SERIAL NO.10001 to 10204 (PCM-1630 J, U/C) SERIAL No.10001 to 10126 (PCM-1630 AEP)			DA-15 BOARD (Board No. 1-616-293-12) SERIAL NO.10205 to 10800 (PCM-1630 J, U/C) SERIAL NO.10127 to 10800 (PCM-1630 AEP)			DA-15 BOARD (Board No. 1-616-293-13) SERIAL NO.10801 and higher (PCM-1630 J, U/C, AEP)		
Ref. No.	SP	Part No.	Description	SP	Part No.	Description	SP	Part No.	Description
D301	S	8-719-951-12	DIODE HZ5BLL		DELETED			DELETED	
D302	S	8-719-951-12	DIODE HZ5BLL		DELETED			DELETED	
IC104	S	8-759-240-53	IC TC4053BP	S	8-759-240-53	IC TC4053BP		DELETED	
IC112	S	8-741-136-70	IC BX-1367	S	8-741-139-10	IC BX-1391	S	8-741-139-10	IC BX-1391
IC113	S	8-741-136-70	IC BX-1367	S	8-741-139-10	IC BX-1391	S	8-741-139-10	IC BX-1391
IC204	S	8-759-240-53	IC TC4053BP	S	8-759-240-53	IC TC4053BP		DELETED	
IC212	S	8-741-136-70	IC BX-1367	S	8-741-139-10	IC BX-1391	S	8-741-139-10	IC BX-1391
IC213	S	8-741-136-70	IC BX-1367	S	8-741-139-10	IC BX-1391	S	8-741-139-10	IC BX-1391
R145	S	1-214-084-00	RES,METAL 10 1% 1/4W	S	1-214-091-00	RES,METAL 20 1% 1/4W	S	1-214-091-00	RES,METAL 20 1% 1/4W
R146	S	1-214-156-00	RES,METAL 10K 1% 1/4W	S	1-214-158-00	RES,METAL 12K 1% 1/4W	S	1-214-158-00	RES,METAL 12K 1% 1/4W
R153	S	1-214-084-00	RES,METAL 10 1% 1/4W	S	1-214-091-00	RES,METAL 20 1% 1/4W	S	1-214-091-00	RES,METAL 20 1% 1/4W
R161	S	1-214-180-00	RES,METAL 100K 1% 1/4W	S	1-214-964-00	RES,METAL 1M 1% 1/4W	S	1-214-964-00	RES,METAL 1M 1% 1/4W
R245	S	1-214-084-00	RES,METAL 10 1% 1/4W	S	1-214-091-00	RES,METAL 20 1% 1/4W	S	1-214-091-00	RES,METAL 20 1% 1/4W
R246	S	1-214-156-00	RES,METAL 10K 1% 1/4W	S	1-214-158-00	RES,METAL 12K 1% 1/4W	S	1-214-158-00	RES,METAL 12K 1% 1/4W
R253	S	1-214-084-00	RES,METAL 10 1% 1/4W	S	1-214-091-00	RES,METAL 20 1% 1/4W	S	1-214-091-00	RES,METAL 20 1% 1/4W
R261	S	1-214-180-00	RES,METAL 100K 1% 1/4W	S	1-214-964-00	RES,METAL 1M 1% 1/4W	S	1-214-964-00	RES,METAL 1M 1% 1/4W
R301	S	1-215-493-00	RES,METAL 1M 1% 1/6W	S	1-215-485-00	RES,METAL 470K 1% 1/6W	S	1-215-485-00	RES,METAL 470K 1% 1/6W
R302	S	1-215-493-00	RES,METAL 1M 1% 1/6W	S	1-215-485-00	RES,METAL 470K 1% 1/6W	S	1-215-485-00	RES,METAL 470K 1% 1/6W
R303	S	1-247-894-00	RES,CARBON 430K 5% 1/6W	S	1-215-493-00	RES,METAL 1M 1% 1/6W	S	1-215-493-00	RES,METAL 1M 1% 1/6W
R304	S	1-249-433-11	RES,CARBON 22K 5% 1/6W	S	1-215-493-00	RES,METAL 1M 1% 1/6W	S	1-215-493-00	RES,METAL 1M 1% 1/6W
R305	S	1-249-433-11	RES,CARBON 22K 5% 1/6W		DELETED			DELETED	
R306	S	1-247-894-00	RES,CARBON 430K 5% 1/6W		DELETED			DELETED	
R307	S	1-249-433-11	RES,CARBON 22K 5% 1/6W		DELETED			DELETED	
R308	S	1-249-433-11	RES,CARBON 22K 5% 1/6W		DELETED			DELETED	
R309	S	1-247-894-00	RES,CARBON 430K 5% 1/6W		DELETED			DELETED	
R310	S	1-249-433-11	RES,CARBON 22K 5% 1/6W		DELETED			DELETED	
R311	S	1-249-433-11	RES,CARBON 22K 5% 1/6W		DELETED			DELETED	
R312	S	1-247-894-00	RES,CARBON 430K 5% 1/6W		DELETED			DELETED	
R313	S	1-249-433-11	RES,CARBON 22K 5% 1/6W		DELETED			DELETED	
R314	S	1-249-433-11	RES,CARBON 22K 5% 1/6W		DELETED			DELETED	
RV103	S	1-224-940-00	RES,ADJ,METAL 10K	S	1-226-278-00	RES,ADJ,METAL 20	S	1-226-278-00	RES,ADJ,METAL 20
RV104	S	1-224-940-00	RES,ADJ,METAL 10K	S	1-226-278-00	RES,ADJ,METAL 20	S	1-226-278-00	RES,ADJ,METAL 20
RV203	S	1-224-940-00	RES,ADJ,METAL 10K	S	1-226-278-00	RES,ADJ,METAL 20	S	1-226-278-00	RES,ADJ,METAL 20
RV204	S	1-224-940-00	RES,ADJ,METAL 10K	S	1-226-278-00	RES,ADJ,METAL 20	S	1-226-278-00	RES,ADJ,METAL 20

	DEC-15 BOARD (Board No. 1-616-296-11) SERIAL NO.12201 and higher		
Ref. No.	SP	Part No.	Description
IC8F	S	8-759-001-39	IC MC74HC164N

SIF-1 BOARD (Board No. 1-616-295-12)  
SERIAL NO.12801 and higher (PCM-1630 J, U/C, AEP)

Ref. No.	SP	Part No.	Description
R200	S	1-215-469-11	RES, METAL 100K 1/2 1/6W

FRAME  
SERIAL NO.12801 and higher (PCM-1630 J, U/C, AEP)

Ref. No.	SP	Part No.	Description
CN801	O	1-560-006-00	TERMINAL, EI
	O	1-561-156-00	CONNECTOR, EI HOUSING
	O	1-560-406-00	PRESS TERMINAL, PLUG
	O	1-560-524-11	PLUG HOUSING, EI CONNECTOR 5P