

8K1

INTEGRATED AMPLIFIER

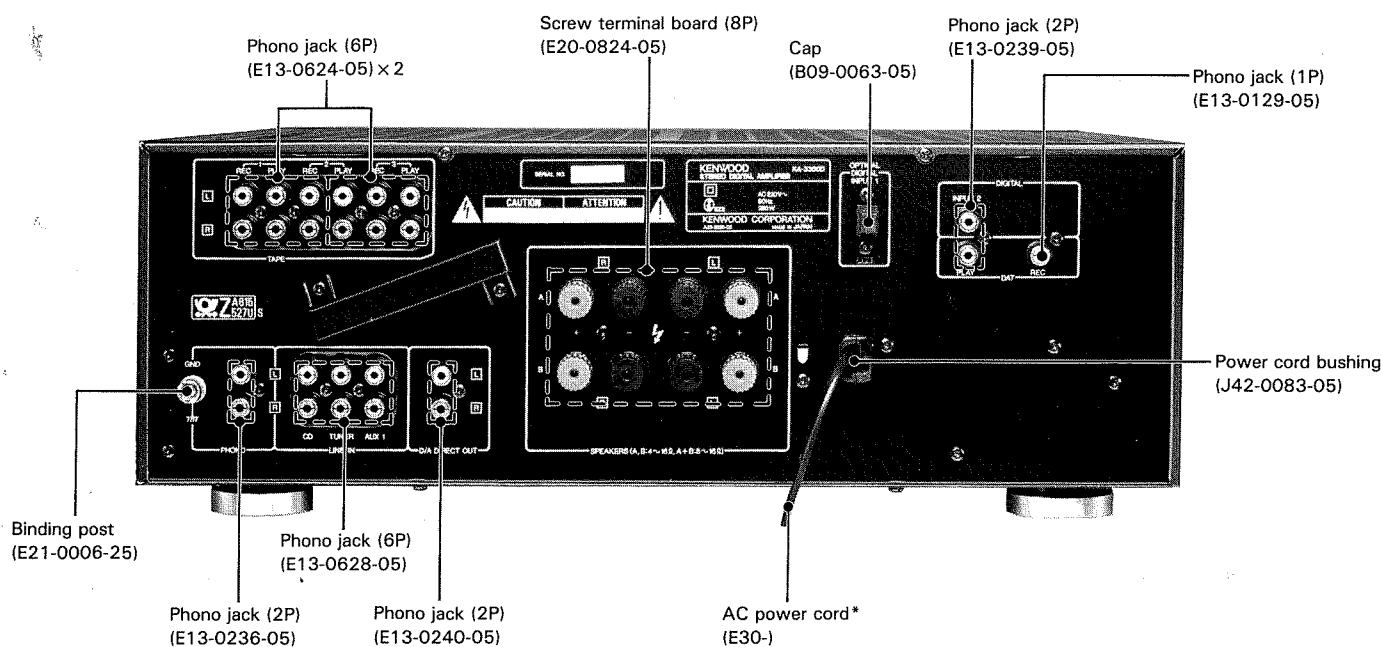
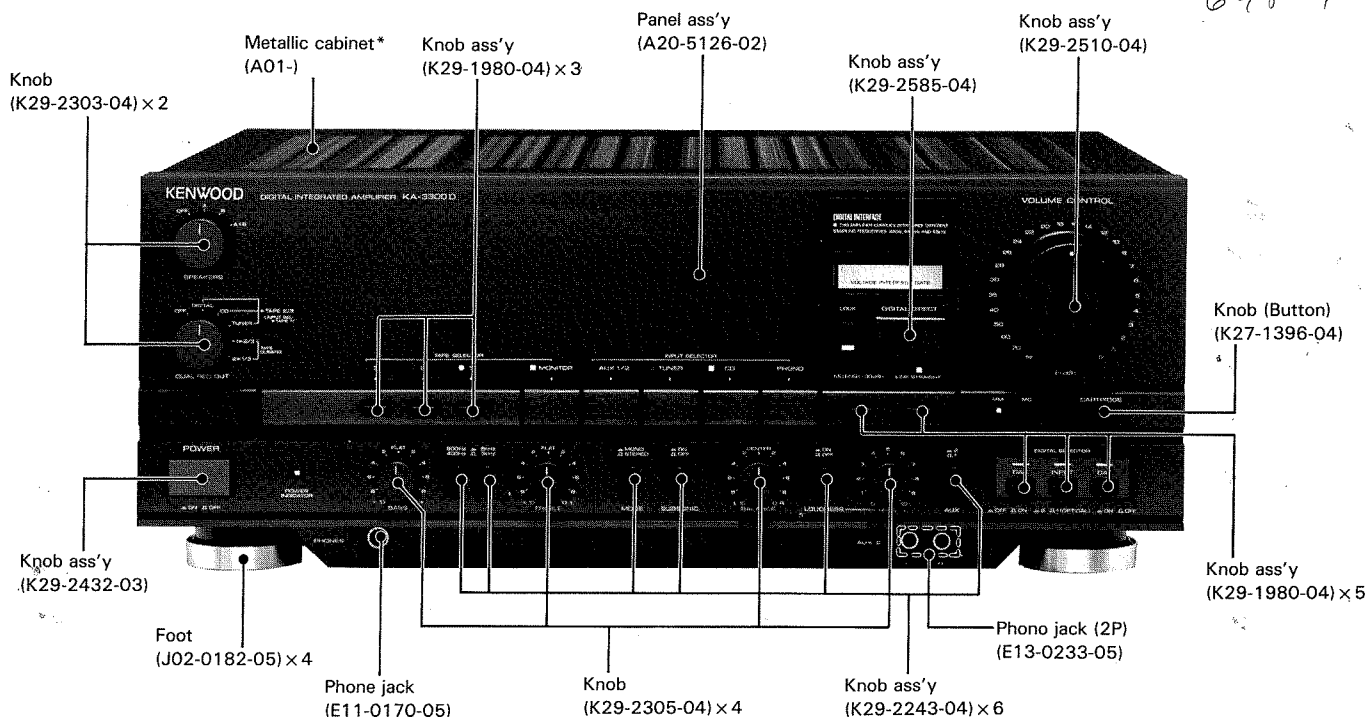
KA-3300D

SERVICE MANUAL

KENWOOD

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Malfunction with the KA-3300D digital circuitry, such as the absence of output, could be due to the digital signal input source such as the CD player as well as the KA-3300D.

Therefore, when servicing such trouble, be sure to check and repair the source equipment as well as the KA-3300D.

* Refer to Parts List on page 55.

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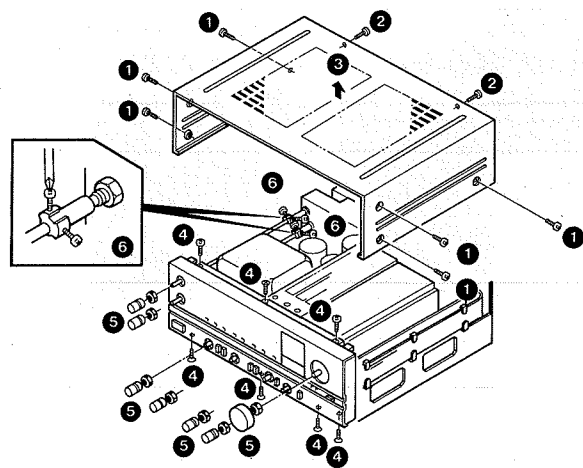
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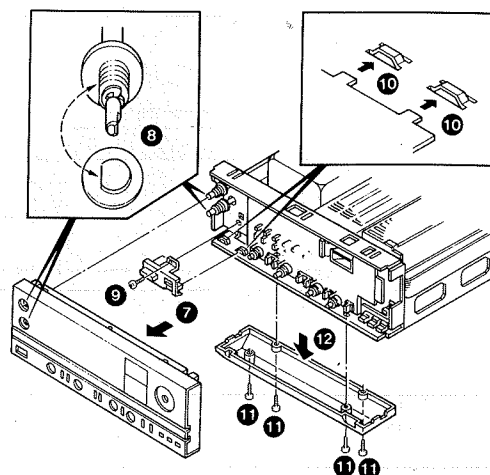
DISASSEMBLY FOR REPAIR

1. REMOVING THE FRONT PANEL AND CONTROL UNIT

1. Remove the six screws fixing the metallic cabinet to the chassis (left side: 3, right side: 3) (1).
2. Remove the two screws attached to the metallic cabinet (2).
3. Remove the metallic cabinet by lifting it in the direction of the arrow (3).
4. Remove the seven screws attached to the front panel (4).
5. Remove the seven knobs from the front panel. Also remove the seven nuts taking care not to damage the front panel (5).
6. Loosen the four screws insert into the two couplings (No.19 in the enlarged diagram) (6).

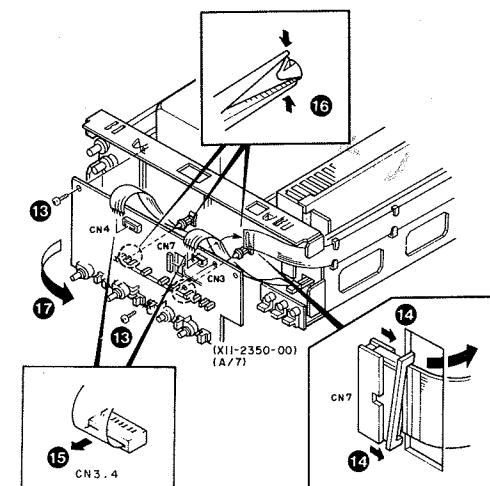


7. Remove the front panel in the direction of the arrow (7).
8. When attaching the front panel again, align the grooves the front panel with those of the extension shaft. If this has not been done, the panel cannot be attached correctly (8).
9. Remove the screw from the metal part in the power switch section (9).
10. When attaching the power switch section again, insert the guide pins of the metal part (two on each part) into the slots on the frame (front) (10).
11. Remove the four screws attaching the connector cover (11).
12. Remove the connector cover in the direction of the arrow (12).

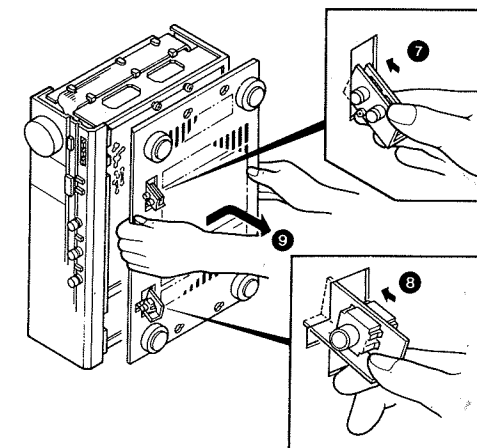


DISASSEMBLY FOR REPAIR

13. Remove the two screws from the Control Unit (X11-2350-81) (A/7) (13).
14. Remove the parallel cable which has been connected to CN7 of the Control Unit (X11-) (A/7) in the direction of the arrow (14).
15. Remove the parallel cables which have been connected to CN3 and CN4 of the Control Unit (X11-) (A/7) (15).
16. Crush the heads of two unit holders which attach the Control Unit (X11-) (A/7) to the frame (front) using radio pliers, and pull them out from the Control Unit (16).
17. Remove the Control Unit (X11-) (A/7) in the direction of the arrow (17).

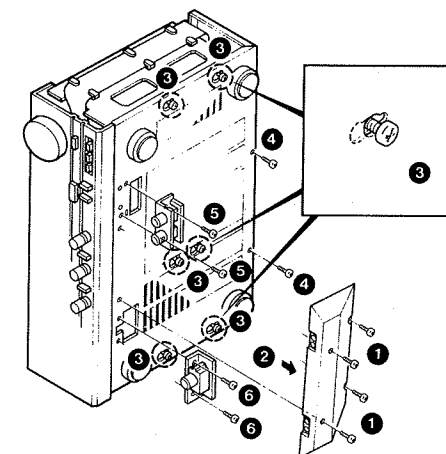


7. Insert the AUX connector section into the slot on the bottom panel (7).
8. Insert the PHONES jack section into the slot on the bottom panel (8).
9. Remove the bottom panel from the main chassis in the direction of the arrow (9).



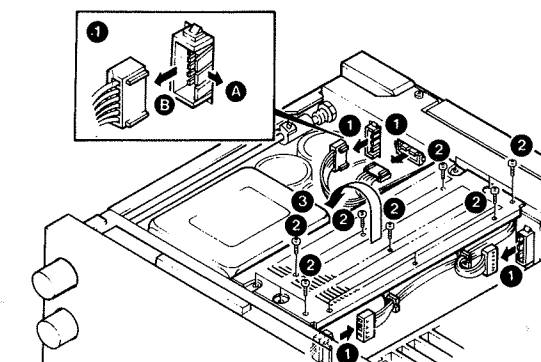
2. REMOVING THE BOTTOM PANEL

1. Remove the four screws from the connector cover (1).
2. Remove the connector cover in the direction of the arrow (2).
3. Loosen the six screws on the bottom panel (3).
4. Remove the two screws from the rear side of the bottom panel (4).
5. Remove the two screws from the AUX connector section (5).
6. Remove the two screws from the PHONES jack section (6).



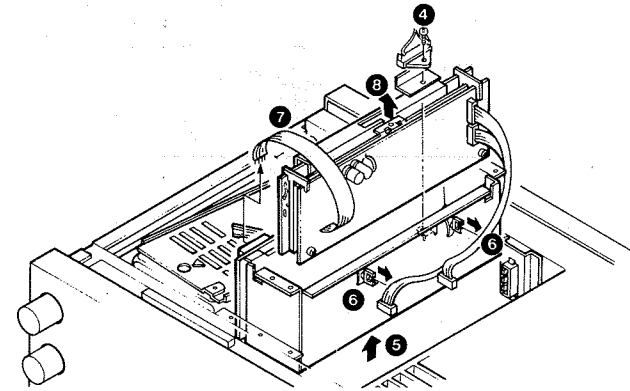
3. REMOVING THE SIGNAL PROCESSOR UNITS AND REAR PANEL

1. Remove the metallic cabinet and bottom panel before performing the following operations.
2. Disconnect the four connectors which have been connected to the frame (rear and front) (1).
3. Remove the 13 screws retaining the shield cover (2).
4. Remove the shield cover in the direction of the arrow (3).

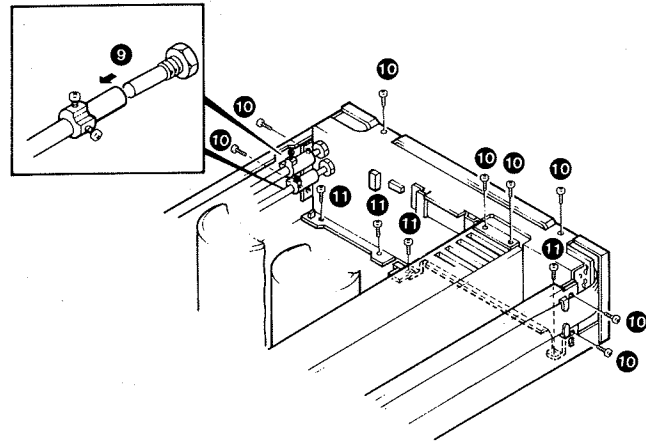


DISASSEMBLY FOR REPAIR

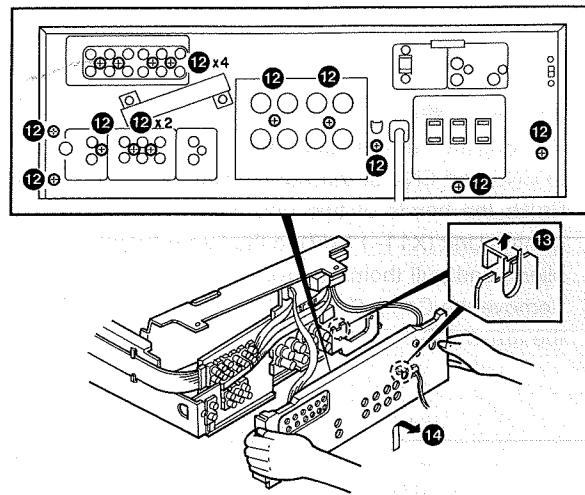
5. Remove the screw retaining the thermal switch, then remove the thermal switch and its metal fixture (4).
6. Lift the shield case upward (5).
7. Separate the connector cord from two unit holders attached to the shield case (6).
8. Disconnect the parallel cable from CN1 of the Signal Processor Unit (X32-1112-71) (C/6) (7).
9. Lift the two Signal Processor Units (X32-) (A/6, B/6) in the shield case upward.



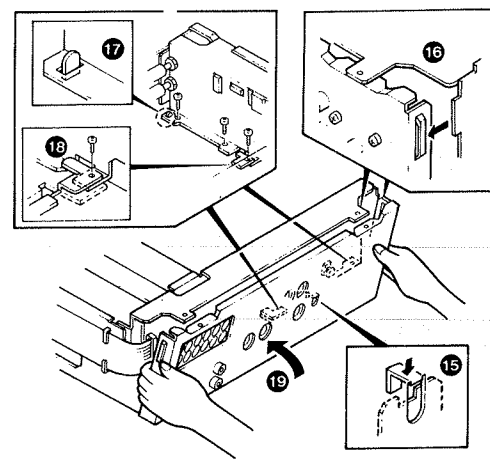
10. Pull out the coupling from the remote switch shaft (9).
11. Remove the eight screws (four from the upper side, four from the bottom side) from the frame (rear) (10).
12. Remove the four screws from the bottom side of the frame (rear) (11).



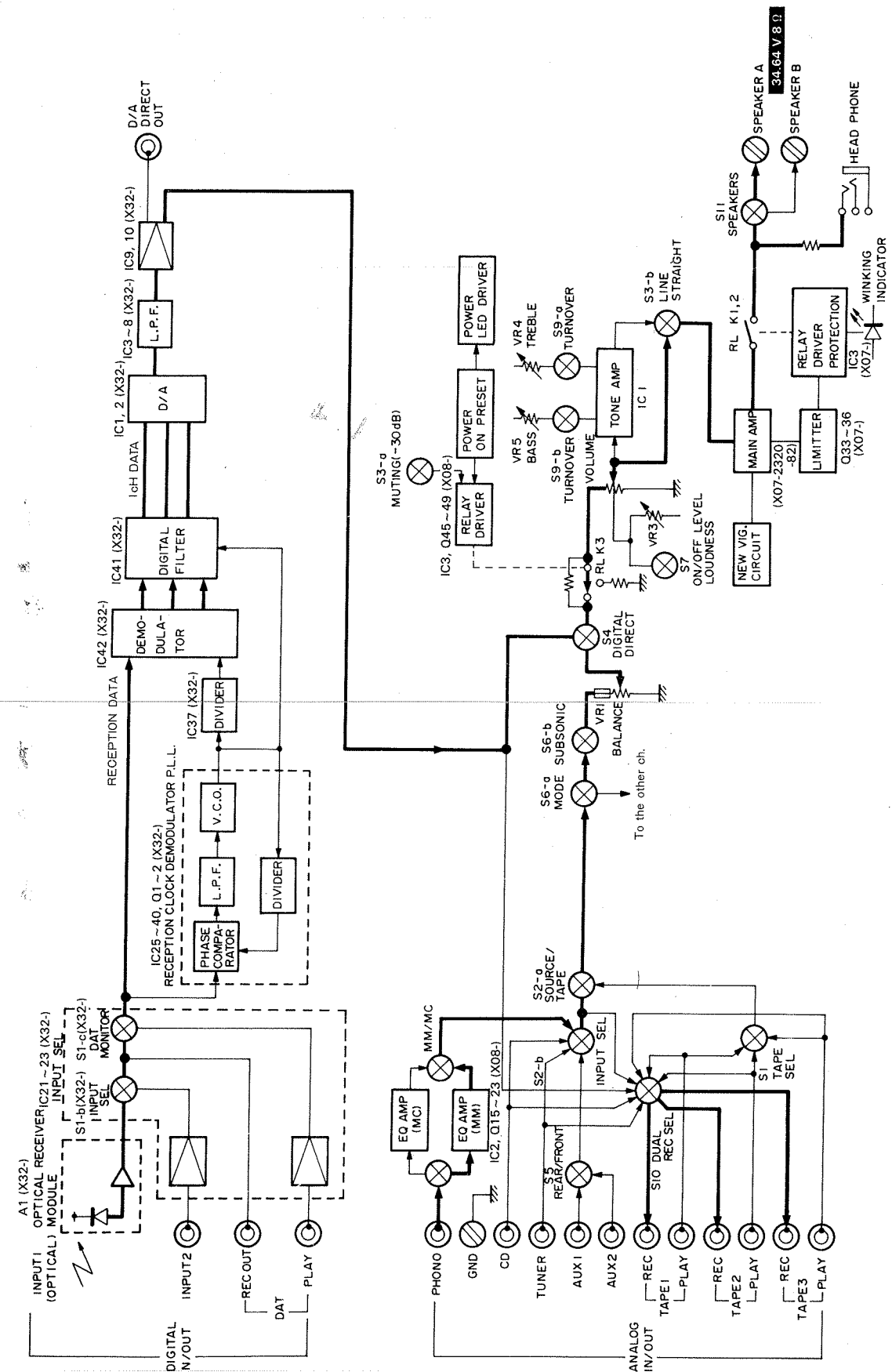
13. Remove the 14 screws from the rear panel (12).
14. Disengage the claw fixing the rear panel to the chassis (13).
15. Remove the rear panel in the direction of the arrow by sliding the left-hand side upward (14).



16. When attaching the rear panel, follow the procedure and cautions below.
17. Engage the claw of the rear panel onto the notch on the chassis (15).
18. Insert the claw of the frame (left) correctly into the slot on the right side of the rear panel. At this time, the upper surface of the frame (rear) shall come above the rear panel (16).
19. Insert the claw of the chassis into the slot on the frame (rear) (17).
20. Pile the Main Amplifier unit reinforcement metal (No.736 in the enlarged diagram), frame (rear), Main Amplifier Unit (X07-2320-82) and chassis in this order, and fix them together using a screw (18).
21. Attach the rear panel as shown in the diagram (19).



BLOCK & LEVEL DIAGRAM



CIRCUIT DESCRIPTION

DESCRIPTION OF COMPONENTS

Main Amplifier Unit (X07-2320-82)

Component	Use/Function	Operation/Condition/Compatibility
Q1 ~ 4	Predriver	
Q5 ~ 8	Predriver	
Q9 ~ 20	Cascode bootstrap circuit	Transistors forming the VIG circuit. Q9, 10, 13 and 14 form the constant-voltage circuit, Q11, 12, 15 and 16 the buffer, and Q17 to 20 are grounded-base circuit for cascode grounding.
Q21, 22	Bias circuit	For temperature compensation of final transistors.
Q23, 24	Constant-voltage circuit	Constant-voltage regulator circuit for the main A Class 1st-stage differential amp, provided to improve the CMRR and SUR.
Q25 ~ 28	High-side power transistors	Final transistors for high-power output.
Q29 ~ 32	Low-side power transistors	Final transistors for low-power output.
Q33 ~ 36	Current limiter	Limits the current to final transistors during over-load driving.
Q51 ~ 54	Constant-voltage circuit	Constant-voltage regulator circuit for the main A Class stage. Q51 and 52 are control transistors, and Q53 and 54 form an error amplifier.
Q55, 56	Protection driver	Ripple removal circuit inserted in the B line for A Class 1st-stage amp.
Q57	Constant-voltage circuit	Used to transmit the operation signal of current limiter Q33 and Q34 to the protection IC (IC3).
Q58	Constant-voltage circuit	Constant-voltage regulated circuit for the muting relay and tact SW driver circuitry.
Q59 ~ 62	Constant-voltage circuit	Constant-voltage regulated circuit for the equalizer amp. Q59 and 60 are control transistors, and Q61 and 62 form an error amplifier.
IC1, 2	DLD switching IC	DLD High/Low switching circuit.
IC3	Protection IC	Performs muting when power is turned ON/OFF, and output relay control in case of DC leakage to SP pin overload, etc.

Preampfier Unit (X08-2180-82)

Component	Use/Function	Operation/Condition/Compatibility
Q1 ~ 4	EQ MC 1st-stage differential amp	
Q5 ~ 8	EQ 1st-stage cascode circuit	
Q9, 10, 23, 24	EQ constant-voltage circuit	Provided to improve the SVRR and CMRR of 1st-stage differential amp.
Q11 ~ 14	EQ MC output-stage emitter-follower circuit	
Q15 ~ 18	EQ MM 1st-stage differential amp	
Q19 ~ 22	EQ MM output-stage emitter-follower circuit	
Q25, 26	A Class 1st-stage differential amp	
Q27 ~ 30	A Class 1st-stage cascode circuit	
Q31 ~ 34	A Class 2nd-stage differential amp	
Q35 ~ 38	A Class 3rd-stage differential amp	
Q39 ~ 42	A Class cascode circuit	
Q43, 44	A Class current Miller circuit	
Q45 ~ 49	Muting control and driver circuit	Control and drive of the muting lamp and relays.
IC1, 2	EQ op amp IC	
IC3	Muting circuit IC	J-K flip-flop.

CIRCUIT DESCRIPTION

Signal Processor Unit (X32-1112-71)

Component	Use/Function	Operation/Condition/Compatibility
Q1, 2	Switching transistors	Used for switching time constant of IC26 (one-shot multivibrator).
Q3	PLL filter amp	Amplifier for PLL loop filter (active filter).
Q4	LED driver	LOCK display LED driver.
Q5	Muting driver	Driver of muting relay.
Q6	Deemphasis driver	Driver of deemphasis switching relay.
Q7, 8	Constant-voltage circuit	
IC1, 2	D/A converter	16-bit D/A converter.
IC3 ~ 8	General-purpose op amp	ICs for L.P.F.
IC9, 10	General-purpose op amp	Line amplifier.
IC21	General-purpose inverter	
IC22, 23	NAND gate IC	
IC24	General-purpose inverter	
IC25	Exclusive OR gate	
IC26, 35	Monostable multivibrator	
IC27	PLL phase comparator	
IC28	V.C.O.	
IC29	D-type flip-flop	
IC30, 38	Digital counter IC	
IC31, 33	JK-type flip-flop	
IC32	Exclusive OR gate	
IC34, 43	TR switch stabilizer circuit	
IC36	NOR gate IC	
IC37	Oscillator IC	
IC39	NAND gate IC	
IC40, 44	General-purpose inverter	
IC41	Quadruple oversampling digital filter	
IC42	Data receiver-demodulator	
IC45, 46	3-pin regulator	Constant-voltage ± 5 V regulated power supply for DAC analog line.
IC47, 48	3-pin regulator	Constant-voltage ± 5 V regulated power supply V for digital line.
IC49	General-purpose op amp	Error amplifier for ± 12 V regulated power supply for analog line.
D1		DAC ON/OFF display LED.
D2		DIGITAL INPUT 1/2 display LED.
D3		DAT MONITOR display LED.
D4 ~ 11		For protection against static electricity.
D12, 36		Form an AND circuit with R93.
D13		For discharging C96.
D14		Interchangeable with ISS97.
D15, 16		Form and AND circuit with R118.
D17		For holding charge of C100.
D18		For discharging C129.
D19		For discharging C130.
D20, 21		Form and AND circuit with R125.
D22, 23		For absorption of relay's counterelectromotive force.
D24		Constant-current diode.
D25		For generating reference voltage of constant-voltage regulated power supply.

CIRCUIT DESCRIPTION

Component	Use/Function	Operation/Condition/Compatibility
D26		Constant-voltage regulated power supply (FAST OFF).
D27 ~ 35		For current shaping.
D37 ~ 43		For protection against static electricity.
A1	Optical reception module	Converts optical signal into electric signal.

Control Unit (X11-2350-81)

Component	Use/Function	Operation/Condition/Compatibility
Q1	LED drive switching circuit	
Q2, 3	Blinking circuit	The LED lights continuously while the power indicator and set are operating normally. It blinks during the period between power ON and amplifier stabilization (for approx. 5 sec.) or when the protection circuit is activated due to a malfunction in the power amplifier.
Q4	Constant-voltage circuit for lamp	Controls the voltage applied to the lamp to 27 V.
IC1	Tone control circuit IC	

1. NEW VIG DLD CIRCUIT

1-1. Features

The KA-3300D is not only an upgraded unit of KA-1100D, but a variable superb integrated amplifier incorporated with digital technology.

KA-3300D incorporates new technology appropriate for an up-market integrated amplifier, such as:

1. A new VIG DLD (Dynamic Linear Drive) circuit
2. A dual phono equalizer
3. A dual REC OUT switch

1-2. A New VIG DLD Circuit

Refer to the KA-990V new-product data for an explanation of the principle on which VIG operates.

The configuration of the VIG circuit incorporated in the current KA-990V is depicted in Fig. 1.

In addition to preventing the influx of undesirable power source components (such as ripples) into the Q1 driver transistor, the VIG circuit also applies a bootstrap to the output as shown in Fig. 1 (A). The output from the VIG then follows the output from the amplifier in a constant voltage shift pattern. The input signal is no longer absorbed by the power source according to the potential which exists between the input and the power, and high-frequency characteristics and distortion rates are improved.

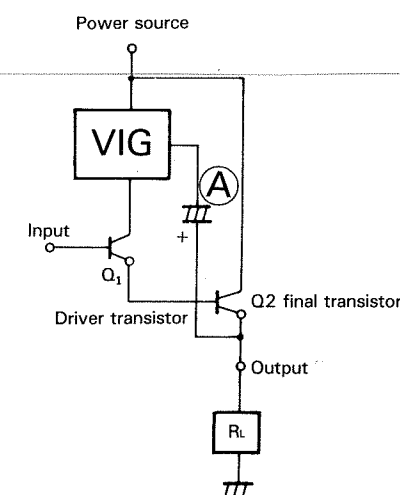


Fig. 1 Configuration of a Conventional VIG Circuit

CIRCUIT DESCRIPTION

As a result, the voltage across the output of Q1 (the emitter) and the power source (the collector) is held constant whether or not there is a signal (see Fig. 2).

This insertion of a VIG circuit in the initial stage of a Darlington connection circuit means that undesirable power source components do not undergo current amplification at Q2, the final transistor. In other words, large-capacity power sources free of ripples become the norm.

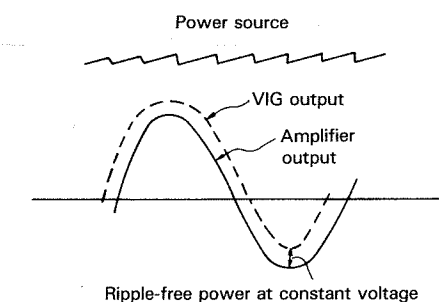


Fig. 2 VIG Output and Amplifier Output

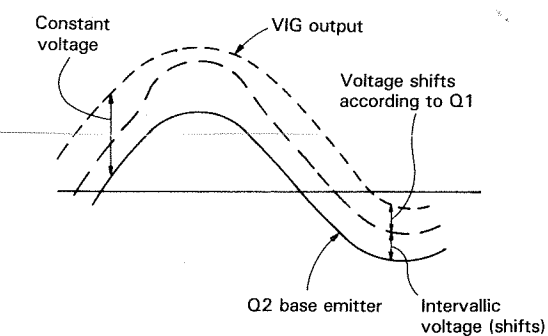


Fig. 3 VB-E and VIG Output

CIRCUIT DESCRIPTION

Upon further investigation, however, doubts arose concerning operation of the Q2 driver transistor at the abovementioned constant voltage. That is, the voltage across the transistor base and emitter could be thought of as normally about 0.6 volts, but the final transistor voltage shifted between 0.6 to about 2.0 volts in keeping with the output current (see Fig. 3). In the conventional configuration depicted in Fig. 1, this shift caused the voltage applied to the driver transistor Q1 to shift as well. It became clear that with the conventional configuration undesirable power source components were suppressed, but this in turn produced new voltage shift components.

The new VIG circuit applies a bootstrap to the Q2 final transistor base as shown in Fig. 4. In addition, a buffer has been inserted so that any undesirable power source components which may leak through the bootstrap do not undergo current amplification at Q2.

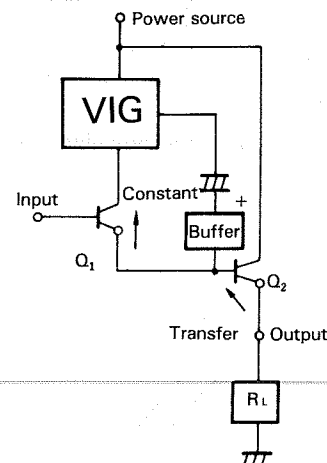


Fig. 4 Configuration of the New VIG Circuit

With this configuration, the new VIG circuit permits capacities to be utilized to the fullest extent.

Undesirable power source components can be suppressed, as can the shift component produced by operation of the circuit itself, for effectiveness 25 times greater than that of conventional circuit configurations. This permits Q1 to operate at an ideal constant voltage and allows only very pure signals to be input to the final transistor, making possible "cleaner" overall amplification.

1-3. Effects of the New VIG Circuit

1. Effects on the amplifier of ripples and signal components caused by the power source, as well as the cross modulation distortion to which they give rise, are drastically reduced for clear, sharp audio.
2. Power can be boosted accordingly (over 10 times conventional levels) for brilliant audio.
3. Improves raw effects at the pre-negative feedback voltage amplification stage for broad band, low-distortion sound.
4. Reduces dynamic crosstalk and other power source-induced interference.

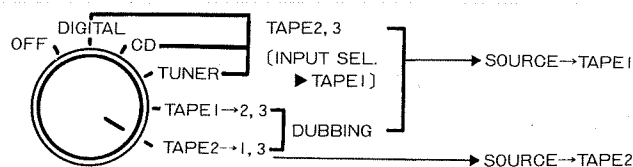
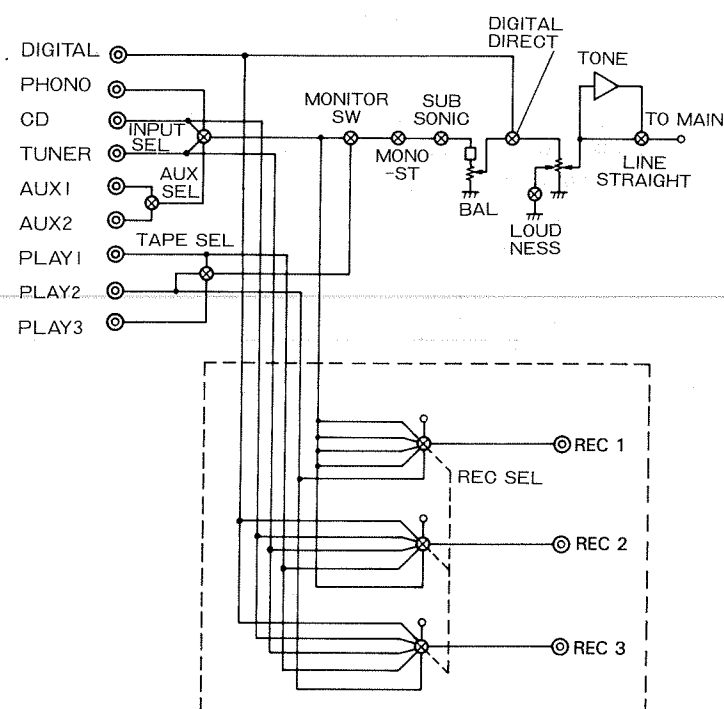
1-4. Dual REC OUT

REC 1, 2, 3 output the signals indicated in the chart at right. REC 1 functions as the source selector, while REC functions as the REC selector.

During tape dubbing, the source signal is output at the playback TAPE REC-OUT.

POSITION	REC1	REC2	REC3
OFF	OFF	OFF	OFF
DIGITAL → 2, 3	SOURCE	DIGITAL	DIGITAL
CD → 2, 3	SOURCE	CD	CD
TUNER → 2, 3	SOURCE	TUNER	TUNER
TAPE 1 → 2, 3	SOURCE	PLAY 1	PLAY 1
TAPE 2 → 1, 3	PLAY2	SOURCE	PLAY 2

Note: Signal selected by the SOURCE INPUT SEL.

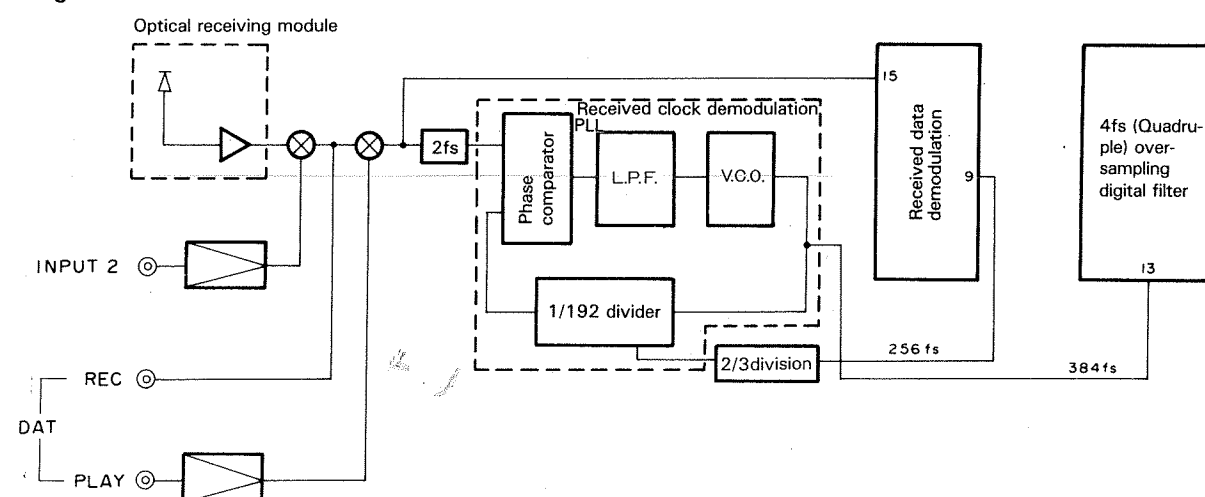


CIRCUIT DESCRIPTION

2. DIGITAL AUDIO INTERFACE

This is a self-synchronization, serial interface designed for connection of digital signals between digital audio equipment (CD player, DAT, etc.).

Block diagram

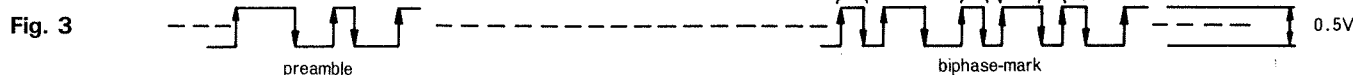
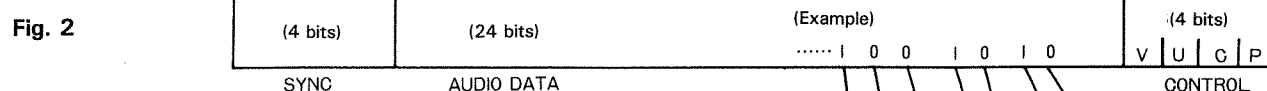
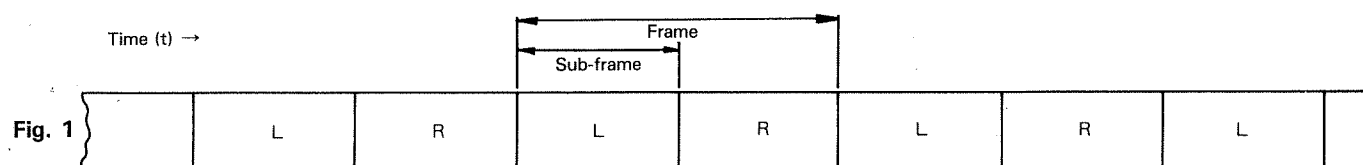


3. DIGITAL SIGNAL FORMATS

3-1. The sub-frame is the minimum unit of transmitted data. It consists of 32 bits of data obtained by one audio-signal sampling operation. With the CD format the sampling frequency of which is 44.1 kHz, 44,100 data per second are sampled with each of the L and R channels, so that a total of 88,200 data are obtained every second. Each of data obtained in this way corresponds to one sub-frame. (Fig. 1)

3-2. A sub-frame consists of the SYNC part which is a special pattern called preamble, the audio data part, and the control part which includes emphasis data, etc. (Fig. 2)

3-3. The data is transferred after biphas-mark modulation. With this modulation, bits "1" are inverted twice while bits "0" are inverted once. (Fig. 3)



CIRCUIT DESCRIPTION

4. THREE SAMPLING FREQUENCIES AND TRANSMITTED SIGNAL

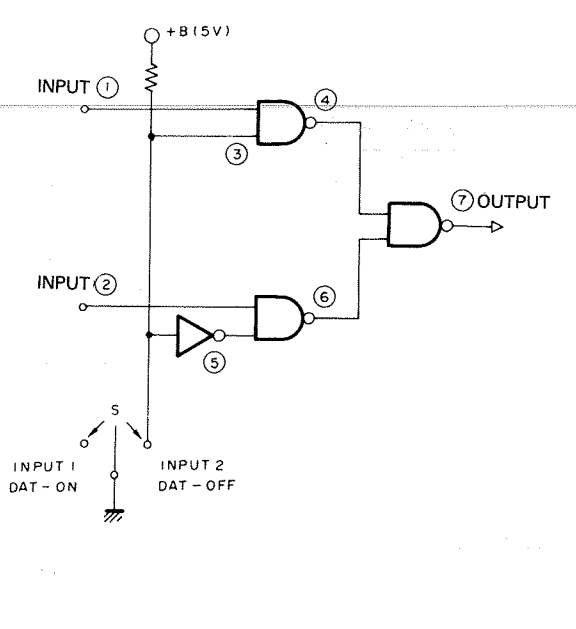
The digital signal is output at 0.5 Vp-p. The L and R signals are time-division multiplexed so that stereo digital audio data is transmitted via one single cable (optical cable or 75-ohm coaxial cable). The information required for sound reproduction by the receiving equipment (bit, clock and emphasis data) is also transferred together with the audio data.

The signal is transmitted at 32 times the sampling frequency, and "bits" "1" are transmitted at twice the abovementioned transmission frequency. To enable direct connection of the digital signals from the equipment described in 1 (CD player, DAT, BS), the three types of sampling frequencies are prepared defined by the standard.

Sampling Frequency (fs)	Transmission Frequency		Source Equipment of fs
	32 × fs with "0"	2 × 32 × fs with "1"	
32 kHz	1.024 MHz	2.048 MHz	DBS, DAT (option)
44.1 kHz	1.4112 MHz	2.8224 MHz	CD, DAT (PCM processor signal)
48 kHz	1.536 MHz	3.072 MHz	DAT (record/play type), DBS

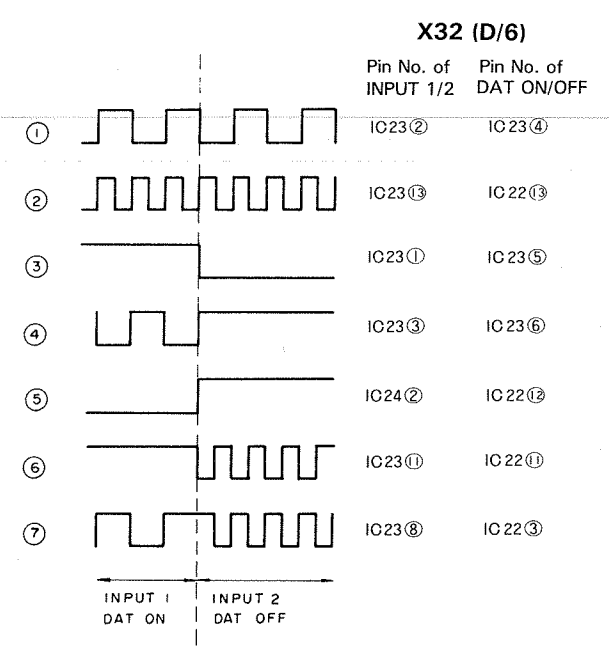
5. INPUT SWITCHING CIRCUIT

Three input systems are switched by purely electronic method. The X32 (D/6) input switching circuit has the basic configuration as shown below. The contents of its operation is shown in the timing chart below.

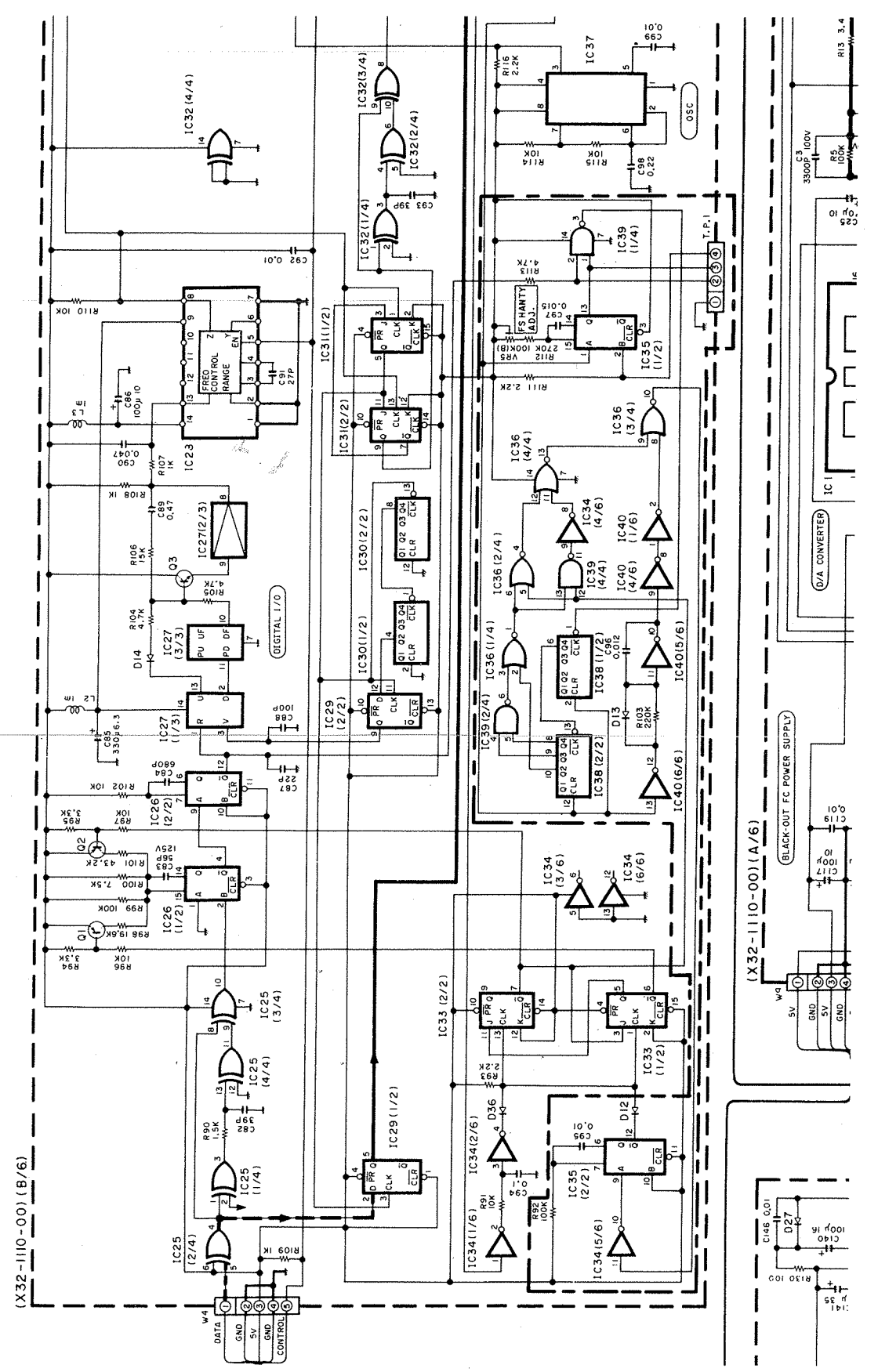


6. DIGITAL I/O CIRCUIT

The signal is input to received data demodulation IC pin 15. At this stage, the signal contains the clock required for data reproduction in addition to the digital audio data. The clock must first be reproduced because it is used as the basis for demodulating the biphase-modulated signal into ordinary digital data and for converting it into analog signal using the D/A converter. All processing after this stage until the D/A conversion is performed based on the clock.



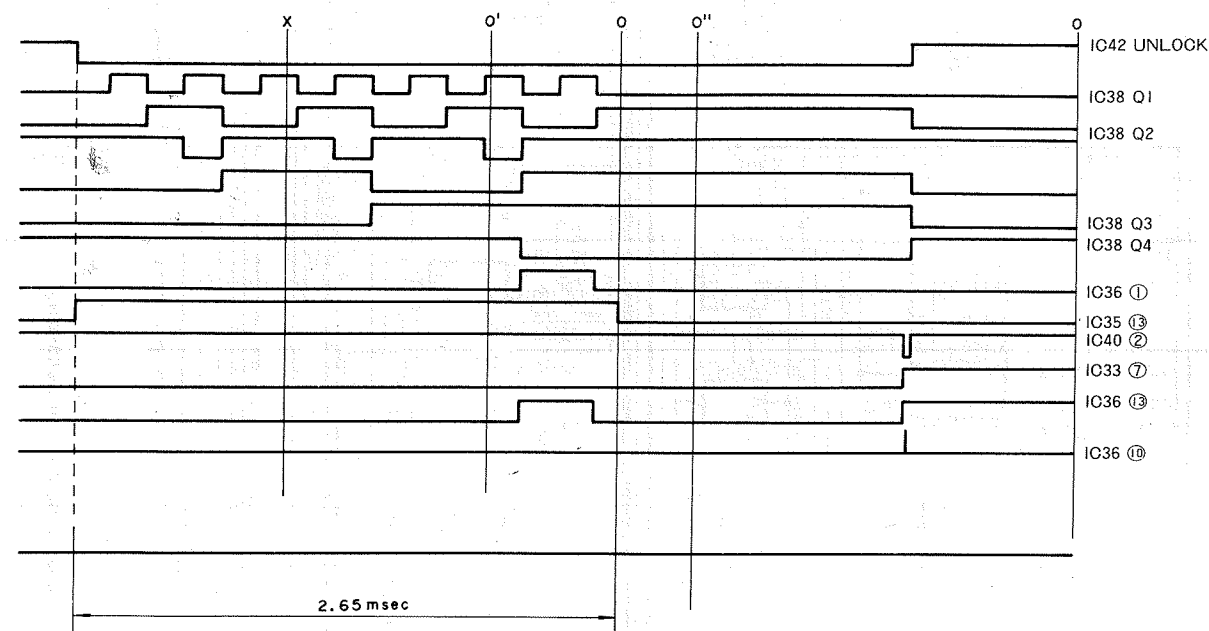
SAMPLING FREQUENCY (fs) IDENTIFICATION CIRCUIT
RECEIVED CLOCK DEMODULATION PLL



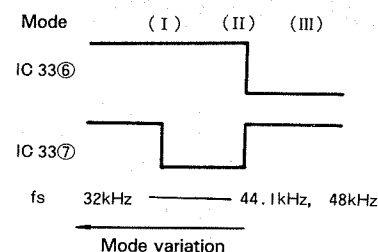
Some circuit boards are equipped with VR5 and 4-pin TP1. However, this adjustment circuit is not used so it is not necessary to adjust VR5. (The parts boxed with "----" are not operating.)

CIRCUIT DESCRIPTION

6-1. Operation of sampling frequency (fs) identification circuit

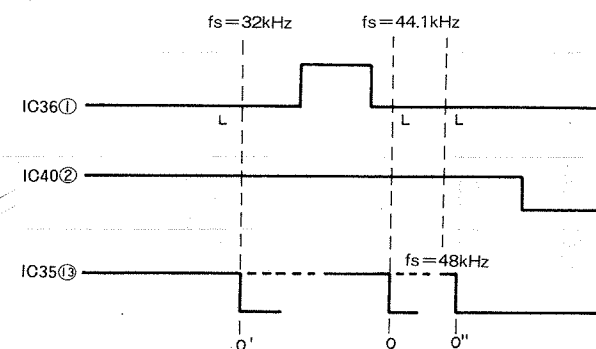


Q1 and Q2 in the circuit diagram are used to switch the window for detection of the SYNC signal. The state at IC33 pins 6 and 7 varies in three modes depending on the output of each Q.



When $f_s = 32$ kHz is input, the PLL is locked in mode (I). It is locked in mode (III) when $f_s = 48$ kHz. The mode of IC33 varies via D36 and D12. However, when $f_s = 32$ kHz or 48 kHz, the mode will not be varied by the signal passing through D12. This is because, when $f_s = 32$ kHz or 48 kHz, the PLL is locked first only in mode (I) or (III). Next, when $f_s = 44.1$ kHz is input, the locked mode can either be mode (II) or (III) because it is close to $f_s = 48$ kHz. When the PLL is locked in mode (III), the inputs to IC39 pin 12 and IC36 pin 5 go "L" and the output at IC36 pin 1 is output directly at IC36 pin 13. When it is locked in mode (II), the output at IC36 pin 1 is inverted and output at IC36 pin 13.

The signal output at IC36 pin 1 depends on the f_s as well as on the time constant across IC35 pins 15 and 14. If the pulse duration is set to 2.65 ms, the output goes "L". This is shown in the timing chart, with IC36 pin 1 output during transition of IC35 pin 13 output from "H" to "L". This diagram shows the case in which $f_s = 44.1$ kHz, but the output is also "L", with the "L" point at the position of O' when $f_s = 32$ kHz and at the position of O'' when $f_s = 48$ kHz.



CIRCUIT DESCRIPTION

Assuming that the PLL is locked in mode (II) with $f_s = 44.1$ kHz, IC33 pin 7 is "L" in this mode and IC40 pin 2 goes from "H" to "L" in a certain period of time (approx. 1.35 ms).

At this time, IC36 pin 10 outputs "H" for an instant, and the 3-mode switch of IC33 changes the mode to "HH". The PLL is unlocked at this time as shown in the top of the timing chart. However, the DISCHG signal is input from IC42 to IC33, the mode is changed, and the PLL is locked finally in mode (III).

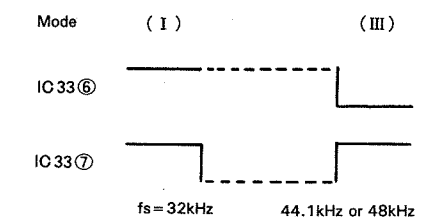
If the PLL is locked in mode (III) with $f_s = 44.1$ kHz, IC33 pin 7 is "H", and IC36 pin 10 does not generate pulse even when IC40 pin 2 goes "L", so the PLL lock state is maintained.

The "L" pulse extracted from IC36 pin 1 is used to ensure stable locking even when f_s drops around 40 kHz due to the variable-pitch circuit. Under such condition, the "L" (negative-going) edge of the above-mentioned 2.65 ms pulse is generated on the above-mentioned pulse. Even when the mode is (II) at this time, IC36 pin 10 does not output pulse so the locking is stabilized in mode (II).

In short, the additional circuit which incorporates a counter, etc. functions so that the PLL is locked in the following condition:

IC33			
		pin 6	pin 7
$f_s = 32$ kHz:	Mode (I)	(H)	(H)
$f_s = 44.1$ kHz:	Mode (III)	(L)	(H)
$f_s = 40$ kHz:	Mode (II) or (III)	(H) (L)	(L) (H)
			(Variable-pitch)

In the actual circuit, D12 is eliminated, and shown enclosed in broken lines (---) in the circuit diagram, is not operating. Then the models with Serial No. 73K00000 and after, the parts boxed with "----" are eliminated. Therefore, the PLL of the IC33 in modes (6) and (7) locks with (I) and (III).



6-2. Received clock demodulator PLL

The output from VCO IC28 pin 6 becomes 384-fs, a part of the signal is divided into 1/192 by IC31 and IC30 to generate a signal which is input to phase-comparator IC27 pin 3. The 2 f of the input signal is also input to IC27 via pin 1, and the PLL is locked when the signals at pins 1 and 3 become identical.

At this PLL, two types of clocks are generated simultaneously; the 384-fs clock required for the processing from the VCO to digital filter; and the 256-fs clock required for data demodulation which is obtained by dividing the 384-fs clock into 2/3.

Sampling frequency	256fs	384fs	Major source unit
32 kHz	8.192 MHz	12.288 MHz	DBS
44.1 kHz	11.2896 MHz	16.9344 MHz	CD
48 kHz	12.288 MHz	18.432 MHz	DAT, DBS

CIRCUIT DESCRIPTION

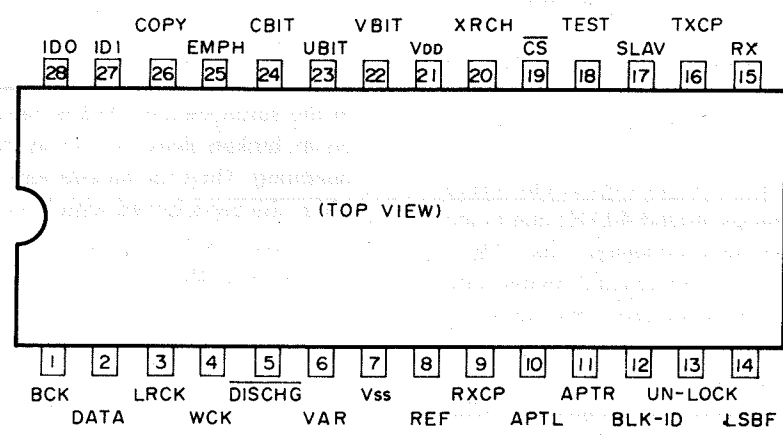
6-3. Received data demodulator IC42

Using the reproduced 256-fs clock, demodulator IC42 demodulates the biphase-modulated audio data to obtain the

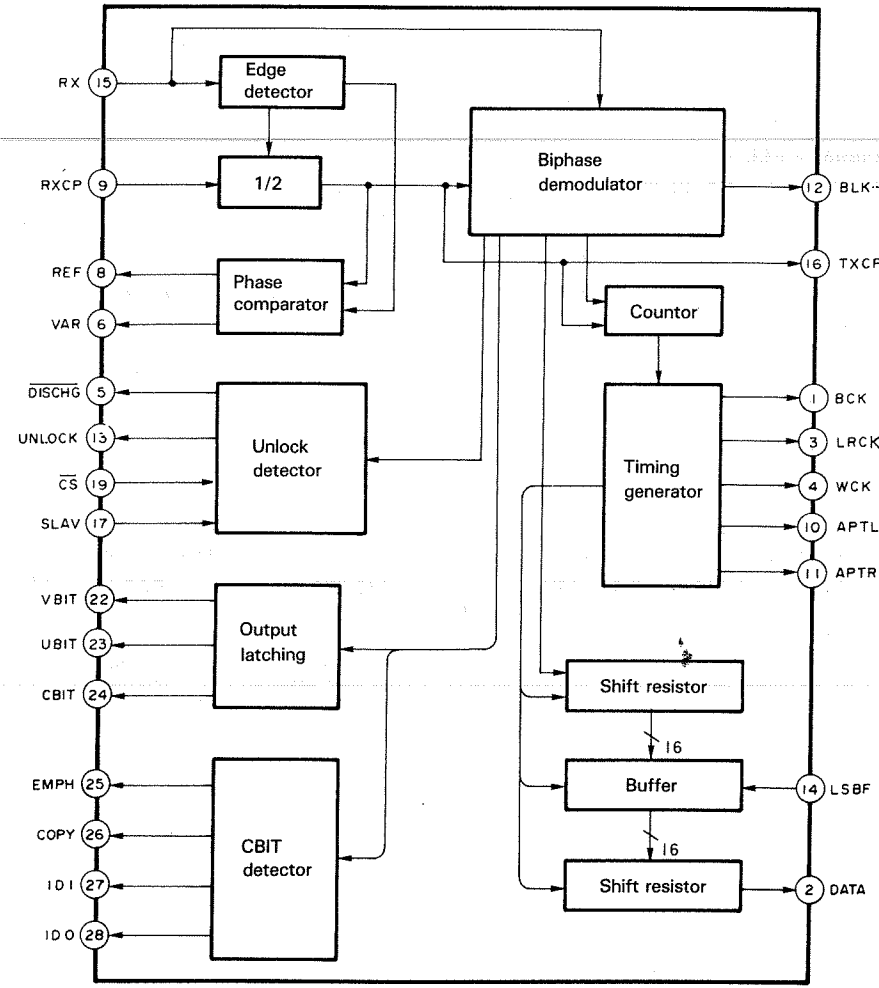
digital audio data that can be D/A modulated and, at the same time, extracts the information from the subcode, such as the emphasis data.

IC42: CXD1076P Received Data Demodulator

Pin Configuration



Block Diagram



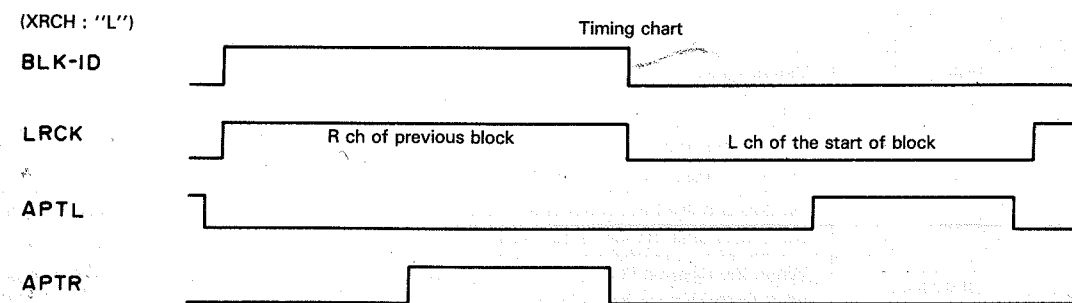
CIRCUIT DESCRIPTION

Explanation of Pins

Pin No.	I/O	Pin Name	Function
1	O	BCK	Digital audio data shift-clock output.
2	O	DATA	Serial output of demodulated digital audio data.
3	O	LRCK	Outputs the audio data L/R channel-identification pulse. The polarity can be switched by XRCH pin. The R CH is "High" when XRCH = "L".
4	O	WCK	Outputs a pulse having twice the frequency of LRCK. The pulse indicate the end of each word. Each word lasts until the fall of this pulse.
5	O	DISCHG	When the external PLL for clock extraction is unlocked, this pin outputs the Low-Active pulse which is used as the trigger for locking it.
6	O	VAR	Outputs the Low-Active pulse to determine the sink current for the external PLL.
7	—	Vss	GND pin.
8	O	REF	Outputs the High-Active pulse to determine the source current for the external PLL.
9	I	RXCP	Inputs the clock with 256 times the fs extracted by the external PLL.
10	O	APTL	Outputs the aperture correction pulse.
11	O	APTR	Outputs the aperture correction pulse.
12	O	BLK-ID	Outputs the block detection pulse for synchronization of the start of the C-bit block.
13	O	UNLOCK	Outputs the detection pulse of the lock status of the external PLL. "L" indicates the locked condition.
14	I	LSBF	Input used for switching the start of the serial audio data output to higher or lower rank. "H": LSB-first. "L": MSB-first.
15	I	RX	Inputs the digital I/O data obtained by demodulation in the digital audio interface format.
16	O	TXCP	Outputs the 128-fs clock used as the master clock of external equipment.
17	I	SLAV	Sets the data TXCP, WCK, LRCK and BCK output pins to the Hi-z status. "L": Normal. "H": Hi-z.
18	I	TEST	Switches between the Test mode and Normal mode. "H": Test mode. "L": Normal mode.
19	I	CS	Inputs the clock for generating DISCHG required for the external PLL.
20	I	XRCH	Determines the polarity of the L and R clocks. "H": L CH High, R CH Low. "L": L CH Low, R CH High.
21	—	VDD	Power supply pin.
22	O	VBIT	Validity flag (V-bit) output.
23	O	UBIT	User-definable data (U-bit) output.
24	O	CBIT	Channel status data (C-bit) output.
25	O	EMPH	Emphasis information output. "H" for ON.
26	O	COPY	Copy inhibit information output. "L" for Inhibit.
27	O	ID1	ID1 output.
28	O	ID0	ID0 output.

CIRCUIT DESCRIPTION

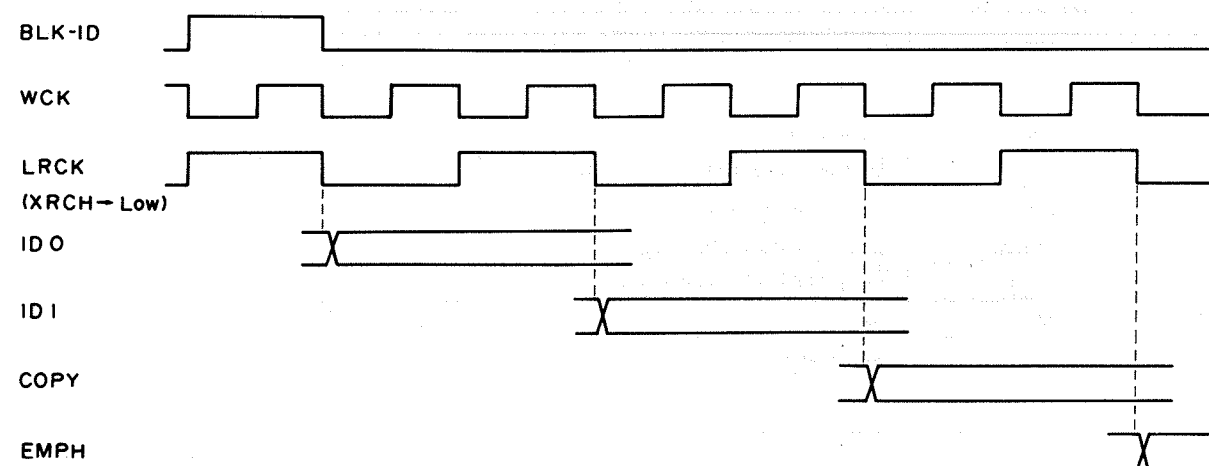
• Timing chart



The timing chart above shows the relations between BLK-ID, LRCK, APTL and APTR. BLK-ID: "H" indicates the beginning of a block. However, since the DATA output is still the RCH data of the end of the

previous block, LRCK goes "High". (XRCH: "L") The first data of the block will be output next time LRCK goes "Low". APTL and APTR are output at the timing above from the respective channel.

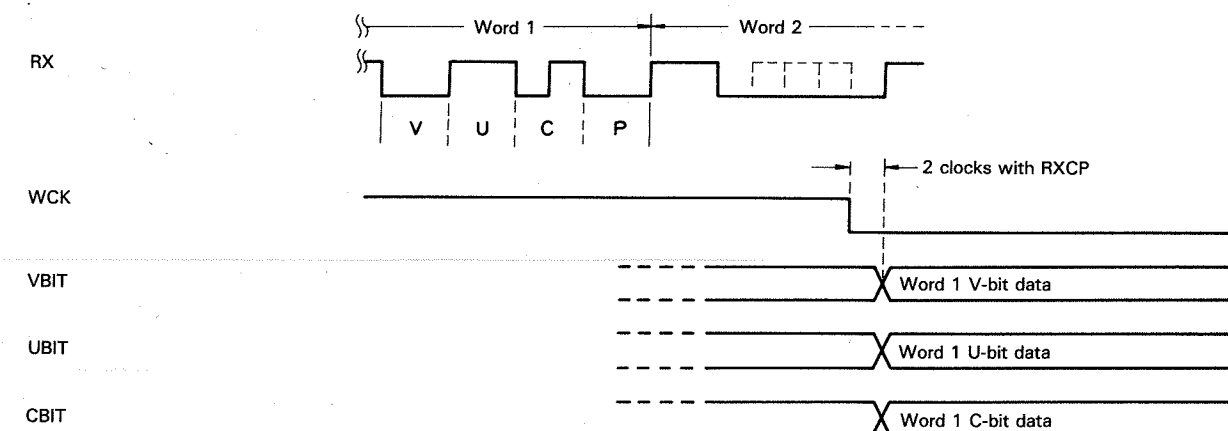
• Channel status data



Among the channel-status data, ID0, ID1, COPY-Inhibit information and Emphasis information are output from the ID0, ID1, COPY and EMPH pins at the timing shown above.

CIRCUIT DESCRIPTION

• User definable data, validity flag

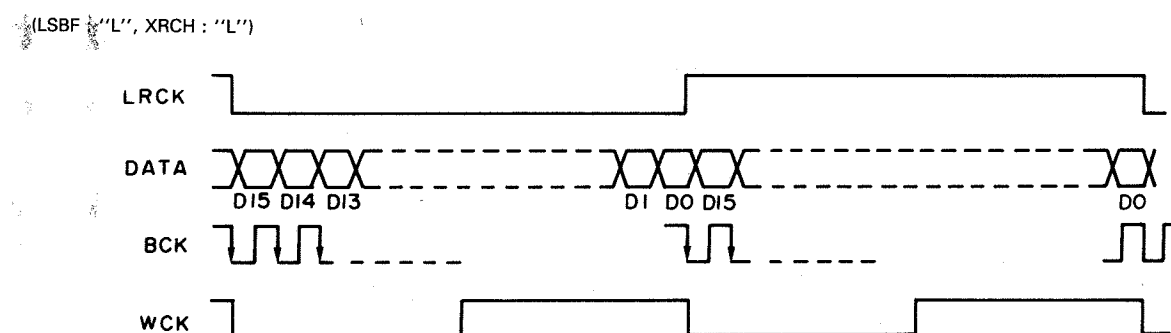


The digital I/O data, user-definable data and validity flag that are input to the RX pin in the digital interface format are out-

put with a slight delay after the fall of WCK. The C-bit data is similarly output at the CBIT pin.

OPERATION

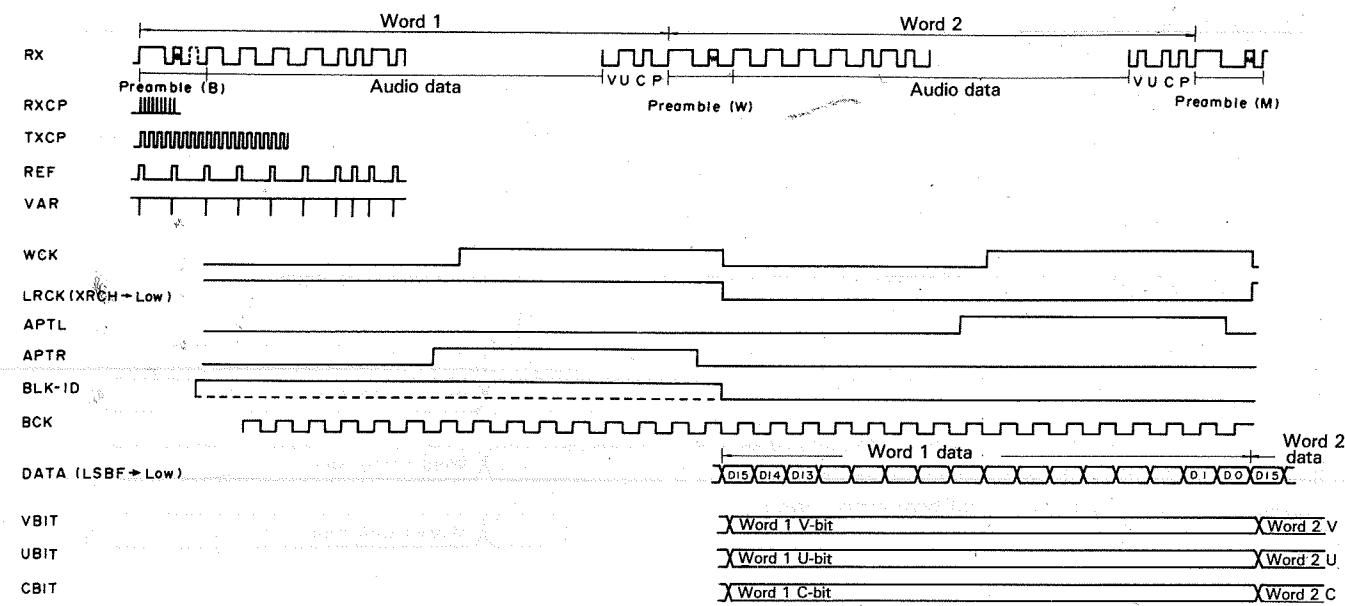
• Digital audio data



The signal timings are designed in consideration of facilitating connection to the D/A converter (CX20017, etc.). LRCK, DATA, BCK and WCK signals are output with the timing shown in the diagram above. The digital audio data (DATA output) is shifted by the negative edge of BCK before being output. The data output is MSB-first when the LSBF pin is "Low", and LSB-first when it is "High". The polarity of LRCK

can be switched by the input at the XRCH pin. When XRCH is "Low", "Low" of LRCK indicates the L CH and the L CH data is output. Therefore, direct connection to CX20017 is possible by setting XRCH to "High". For this operation, it is necessary to input a clock with a frequency below 500 Hz to the CS pin in order to generate DISCHG output required for the external PLL.

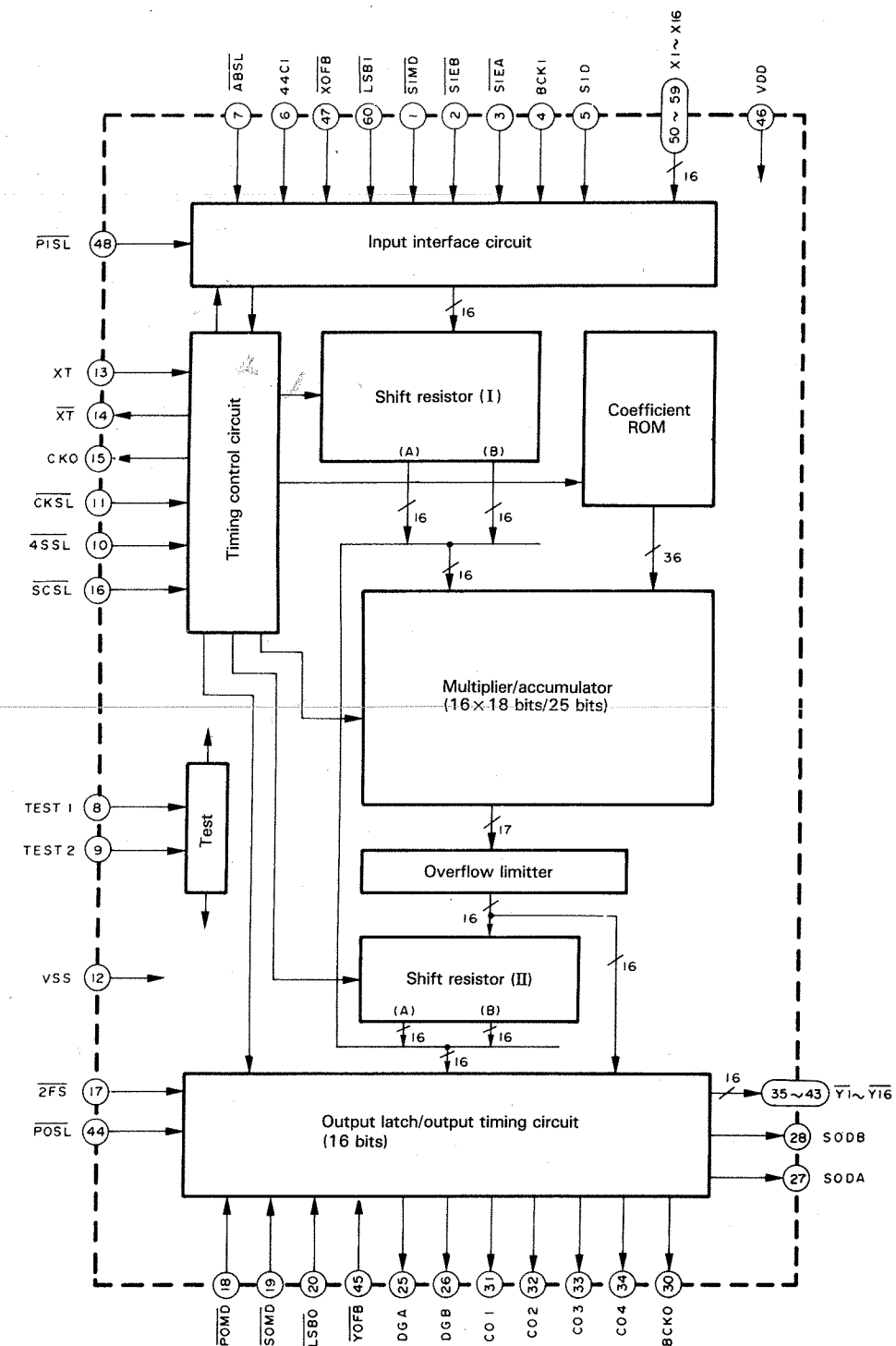
CIRCUIT DESCRIPTION



CIRCUIT DESCRIPTION

6-4. IC41:SM5804B

Block Diagram



Note: In the above diagram, the pin used for two functions are treated as two separate terminals.

CIRCUIT DESCRIPTION

Explanation of Pins

With this LSI, the switching between the serial and parallel inputs/outputs is performed by the $\overline{\text{PISL}}$ and $\overline{\text{POSL}}$ pins. Some

of the functions of pins X1 to X16 and $\overline{\text{Y1}}$ to $\overline{\text{Y16}}$ may be changed by this switching.

All the terminals of this unit function with $\overline{\text{PISL}} = \text{H}$.

Note: ip designates an input jack with a pull-up resistor.

Pin No.	$\overline{\text{PISL}} = \text{H}$		$\overline{\text{PISL}} = \text{L}$		Function
	Pin Name	I/O	Pin Name	I/O	
1	$\overline{\text{SIMD}}$	ip			Serial input mode switching.
			X5	ip	Parallel data input (Bit 5).
2	$\overline{\text{SIEB}}$	ip			B CH serial input enable.
			X4	ip	Parallel data input (Bit 4).
3	$\overline{\text{SIEA}}$	ip			A CH serial input enable.
			X3	ip	Parallel data input (Bit 3).
4	BCKI	ip			Serial input bit clock input.
			X2	ip	Parallel data input (Bit 2).
5	SID	ip			Serial input data.
			X1	ip	Parallel data input (LSB).
6	44CI	ip	←	ip	44.1 kHz sync clock input.
7	$\overline{\text{ABSL}}$	ip	←	ip	$\overline{\text{ABSL}} = \text{H} \rightarrow 44 \text{ CI clock, H/L} = \text{A CH/B CH.}$ $\overline{\text{ABSL}} = \text{L} \rightarrow 44 \text{ CI clock, H/L} = \text{B CH/A CH.}$
8	TEST 1	ip	←	ip	Test input 1 (Normally Open).
9	TEST 2	ip	←	ip	Test input 2 (Normally Open).
10	$\overline{4\text{SSL}}$	ip	←	ip	Normally $\overline{4\text{SSL}} = \text{H}$ or Open. $\overline{4\text{SSL}} = \text{L}$ when input is 16.9344 MHz or 17.2872 MHz.
11	$\overline{\text{CKSL}}$	ip	←	ip	$\overline{\text{CKSL}} = \text{H} \rightarrow$ External clock input. $\overline{\text{CKSL}} = \text{L} \rightarrow$ X'tal oscillation.
12	Vss	←	←	←	GND power supply pin (0 V).
13	XT	I	←	I	$\overline{\text{CKSL}} = \text{H} \rightarrow$ Clock input. $\overline{\text{CKSL}} = \text{L} \rightarrow$ X'tal oscillation input.
14	$\overline{\text{XT}}$	O	←	O	$\overline{\text{CKSL}} = \text{H} \rightarrow$ (Open). $\overline{\text{CKSL}} = \text{L} \rightarrow$ X'tal oscillation output.
15	CKO	O	←	O	Clock output.
16	$\overline{\text{SCSL}}$	ip	←	ip	System clock 96 fs $\rightarrow \overline{\text{SCSL}} = \text{H}$. System clock 98 fs $\rightarrow \overline{\text{SCSL}} = \text{L}$.
17	$\overline{2\text{FS}}$	ip	←	ip	Open.
18	$\overline{\text{POMD}}$	ip	←	ip	$\overline{\text{POMD}} = \text{H} \rightarrow$ Normal parallel output mode. $\overline{\text{POMD}} = \text{L} \rightarrow$ In-phase parallel output mode.
19	$\overline{\text{SOMD}}$	ip	←	ip	$\overline{\text{SOMD}} = \text{L}$ with serial output.
20	$\overline{\text{LSBO}}$	ip	←	ip	$\overline{\text{LSBO}} = \text{H} \rightarrow$ MSB-first serial output. $\overline{\text{LSBO}} = \text{L} \rightarrow$ LSB-first serial output.
21	(NC)	←	←	←	(NC)
22	(NC)	←	←	←	(NC)
23	(NC)	←	←	←	(NC)
24	(NC)	←	←	←	(NC)
25	DGA	O	←	O	A CH deglitch control output.
26	DGB	O	←	O	B CH deglitch control output.
27	SODA	O			A CH serial data output.
			$\overline{\text{YT}}$	O	Parallel output (inverted, LSB).

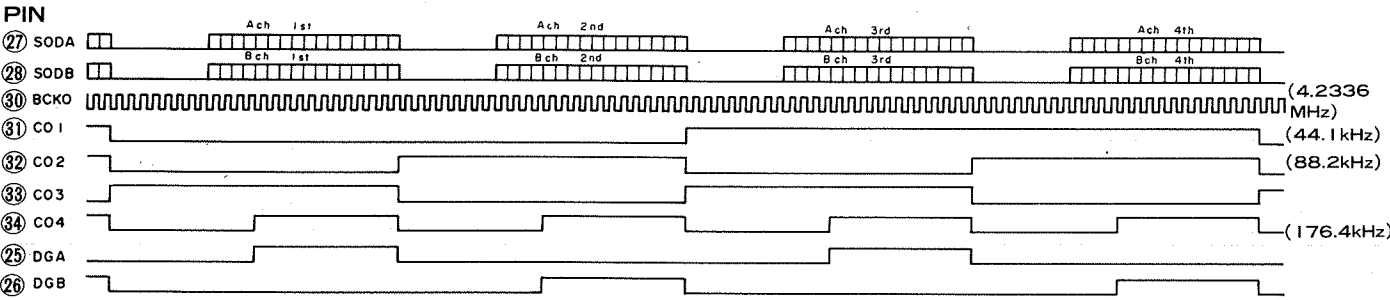
CIRCUIT DESCRIPTION

Pin No.	$\overline{\text{PISL}} = \text{H}$		$\overline{\text{PISL}} = \text{L}$		Function
	Pin Name	I/O	Pin Name	I/O	
28	SODB	O			B CH serial data output.
			$\overline{\text{Y2}}$	O	Parallel output (inverted, Bit 2).
29	(NC)	←	←	←	Internally short-circuited to V _{DD} . Not to be connected externally.
30	BCKO	O			Serial output bit clock output.
			$\overline{\text{Y3}}$	O	Parallel output (inverted, Bit 3).
31	CO1	O			Serial output control clock 1.
			$\overline{\text{Y4}}$	O	Parallel output (inverted, Bit 4).
32	CO2	O			Serial output control clock 2.
			$\overline{\text{Y5}}$	O	Parallel output (inverted, Bit 5).
33	CO3	O			Serial output control clock 3.
			$\overline{\text{Y6}}$	O	Parallel output (inverted, Bit 6).
34	CO4	O			Serial output control clock 4.
			$\overline{\text{Y7}}$	O	Parallel output (inverted, Bit 7).
35	(NC)	Hz			(NC)
			$\overline{\text{Y8}}$	O	Parallel output (inverted, Bit 8).
36	(NC)	Hz			(NC)
			$\overline{\text{Y9}}$	O	Parallel output (inverted, Bit 9).
37	(NC)	Hz			(NC)
			$\overline{\text{Y10}}$	O	Parallel output (inverted, Bit 10).
38	(NC)	Hz			(NC)
			$\overline{\text{Y11}}$	O	Parallel output (inverted, Bit 11).
39	(NC)	Hz			(NC)
			$\overline{\text{Y12}}$	O	Parallel output (inverted, Bit 12).
40	(NC)	Hz			(NC)
			$\overline{\text{Y13}}$	O	Parallel output (inverted, Bit 13).
41	(NC)	Hz			(NC)
			$\overline{\text{Y14}}$	O	Parallel output (inverted, Bit 14).
42	(NC)	Hz			(NC)
			$\overline{\text{Y15}}$	O	Parallel output (inverted, Bit 15).
43	(NC)	Hz			(NC)
			$\overline{\text{Y16}}$	O	Parallel output (inverted, MSB).
44	$\overline{\text{POSL}}$	ip	←	ip	$\overline{\text{POSL}} = \text{H} \rightarrow$ Serial output system. $\overline{\text{POSL}} = \text{L} \rightarrow$ Parallel output system.
45	$\overline{\text{YOFB}}$	ip	←	ip	$\overline{\text{YOFB}} = \text{H} \rightarrow$ 2's complement display output. $\overline{\text{YOFB}} = \text{L} \rightarrow$ Offset binary display output.
46	V _{DD}	←	←	←	+ve power supply pin (5 V).
47	$\overline{\text{XOFB}}$	ip	←	ip	$\overline{\text{XOFB}} = \text{H} \rightarrow$ 2's complement display input. $\overline{\text{XOFB}} = \text{L} \rightarrow$ Offset binary display input.
48	$\overline{\text{PISL}}$	ip	←	ip	$\overline{\text{PISL}} = \text{H} \rightarrow$ Serial input system. $\overline{\text{PISL}} = \text{L} \rightarrow$ Parallel input system.
49	(NC)	←	←	←	(NC)

CIRCUIT DESCRIPTION

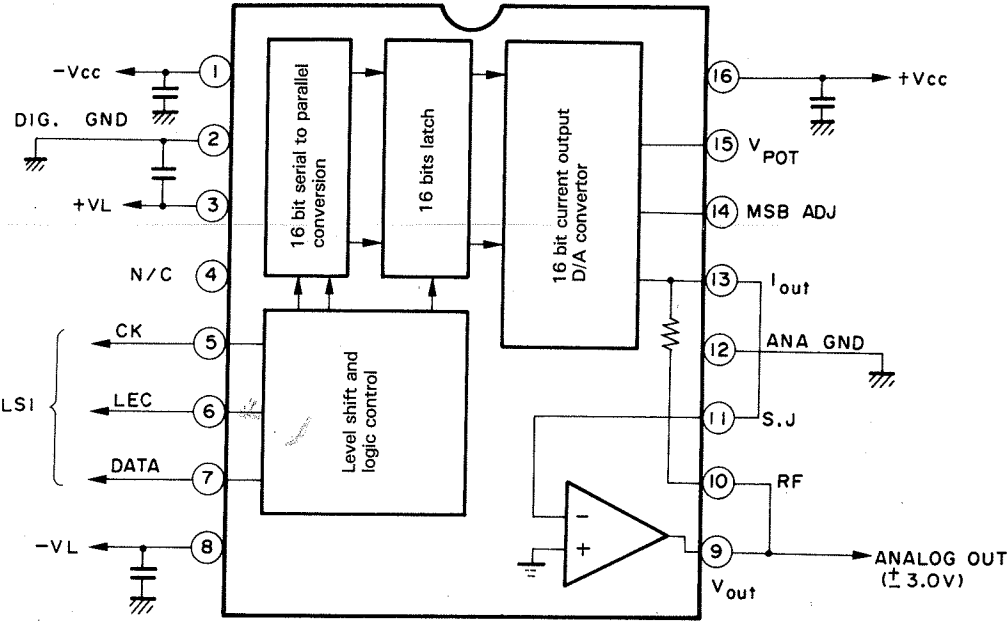
Pin No.	PISL = H		PISL = L		Function
	Pin Name	I/O	Pin Name	I/O	
50	(NC)	ip			(NC)
			X16	ip	Parallel data input (MSB).
51	(NC)	ip			(NC)
			X15	ip	Parallel data input (Bit 15).
52	(NC)	ip			(NC)
			X14	ip	Parallel data input (Bit 14).
53	(NC)	ip			(NC)
			X13	ip	Parallel data input (Bit 13).
54	(NC)	ip			(NC)
			X12	ip	Parallel data input (Bit 12).
55	(NC)	ip			(NC)
			X11	ip	Parallel data input (Bit 11).
56	(NC)	ip			(NC)
			X10	ip	Parallel data input (Bit 10).
57	(NC)	ip			(NC)
			X9	ip	Parallel data input (Bit 9).
58	(NC)	ip			(NC)
			X8	ip	Parallel data input (Bit 8).
59	(NC)	ip			(NC)
			X7	ip	Parallel data input (Bit 7).
60	LSBI	ip			LSBI = H → MSB-first serial input. LSBI = L → LSB-first serial input.
			X6	ip	Parallel data input (Bit 6).

Serial Output Timing (SOMD = L, SCSL = H, system clock = 4.2336 MHz)

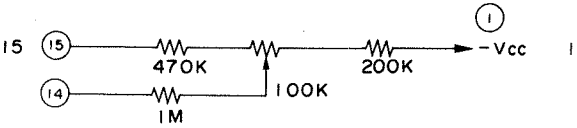


CIRCUIT DESCRIPTION

6-5. D/A converter IC
IC1, IC2: PCM56P-K
1. Block Diagram and Pin Connection



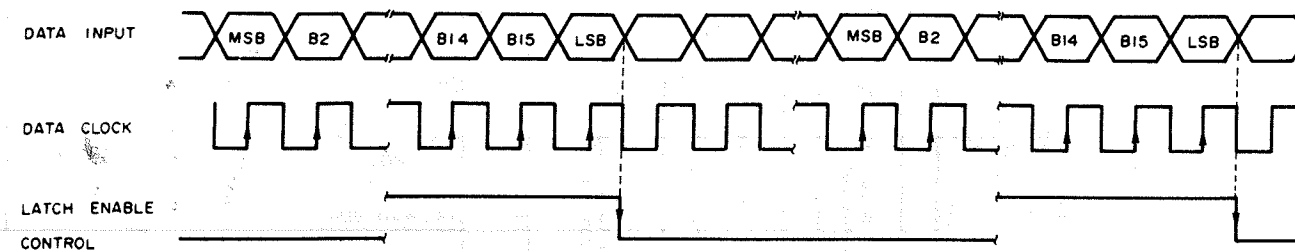
Note: The MSB error and differential linearity error with bipolar zero can be zero-adjusted by the external circuit shown below.



Pin No.	Pin name	Function	Pin No.	Pin Name	Function
1	-Vcc	Analog negative power supply	9	Vout	Voltage output
2	DIG GND	Digital grounding	10	RF	Feedback resistance
3	+VL	Logic positive power supply	11	S.J	Summing junction (op amp input)
4	NC	No connection	12	ANA GND	Analog grounding
5	CK	Clock input	13	Iout	Current output
6	LEC	Latch enable control input	14	MSB ADJ	MSB adjustment pin
7	DATA	Data input	15	VPOT	Potentiometer pin
8	-VL	Logic negative power supply	16	+Vcc	Analog positive power supply

CIRCUIT DESCRIPTION

Timing Diagram



- The data format is 2's complement, MSB-first.
- Data is latched in the shift register at the rise of data clock.
- Latch enable control is performed by the frequency twice the L/R clock, and the LSB corresponds to its rise. It shall be synchronized with the fall of data clock.

7. WAVEFORMS AT MAJOR DIGITAL CIRCUIT PINS (When CD digital signal is connected)

Pin	Output Waveform (Except with IC41 pins 27 and 28, outputs are present even when CD player is not played.)	
IC25⑤ (TC74HC386P)		The actual waveform is superimposed with the waveform of "1".
IC25⑩		The actual waveform is superimposed with the waveform of "1".
IC27① IC27③ (MC4044P)		When a CD player is not connected, the output is present at IC27 pin 3 only (in free-run condition, however).
IC28⑬ (SN74LS624N)		
※ IC28⑧		: Defective. * Shall be no jitter.

CIRCUIT DESCRIPTION

Pin	Output Waveform (Except with IC41 pins 27 and 28, outputs are present even when CD player is not played.)	
※ IC32⑧ (TC74HC86P)		: Defective. * Shall be no jitter.
IC42⑮ (CXD1076P)		32fs
IC42①		32fs
IC42②		16fs
IC42③		fs
IC41⑳ IC41㉑ (SM5804B) (W8 ⑧⑦)		The output is present only during CD player playing.
IC41㉓ (W8 ⑥)		96fs
IC41㉔ (W8 ⑤)		4fs

※ Note: Even when the input cable is apart from the CD player's DIGITAL OUT, the output from IC28 pin 8 and IC32 pin 8 are output from the free-run (time-free) VCO.

ADJUSTMENT/REGLAGES/ABGLEICH

ADJUSTMENT

POWER AMP UNIT (X07-2320-82)

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMPLIFIER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
1	IDLE CURRENT	—	Connect a DC voltmeter across CP3 (L) CP4 (R)	VOLUME: 0	VR1 (L) VR2 (R)	9mV	(a)

SIGNAL PROCESSOR UNIT (X32-1112-71)

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMPLIFIER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
1	OUTPUT LEVEL ADJUSTMENT	Connect the digital output/input jacks and lock the PLL of the KA-3300D.	Connect a load of 10 kΩ to the D/A DIRECT OUT jack and connect an AC voltmeter across the load.	Play the 1kHz, 0 dB signal of the test CD.	VR1 (L) VR2 (R)	Adjust so that the output voltage is 2 V.	(b)

REGLAGES

UNITE D'AMPLIFICATEUR PRINCIPAL (X07-2320-82)

N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DE L'AMPLIFICATEUR	POINS L'ALIGNEMENT	ALIGNER POUR	FIG.
1	COURANT DE POLARISATION	—	Connecter un voltmètre de CC sur CP3 (G) CP4 (D)	VOLUME: 0	VR1 (G) VR2 (D)	9mV	(a)

UNITE DE DISPOSITIF DE TRAITEMENT DE SIGNAUX (X32-1112-71)

N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DE L'AMPLIFICATEUR	POINS L'ALIGNEMENT	ALIGNER POUR	FIG.
1	REGLAGE DE NIVEAU DE SORTIE	Connecter les jacks de sortie/entrée numérique et verrouiller le circuit de verrouillage de phase (PLL) du KA-3300D.	Connecter une charge de 10kΩ au jack "DIRECT OUT" N/A et connecter un voltmètre CA à travers la charge.	Faire jouer le signal de 1kHz, 0 dB du CD d'essai.	VR1 (G) VR2 (D)	Régler pour que la tension de sortie soit de 2 V.	(b)

ABGLEICH

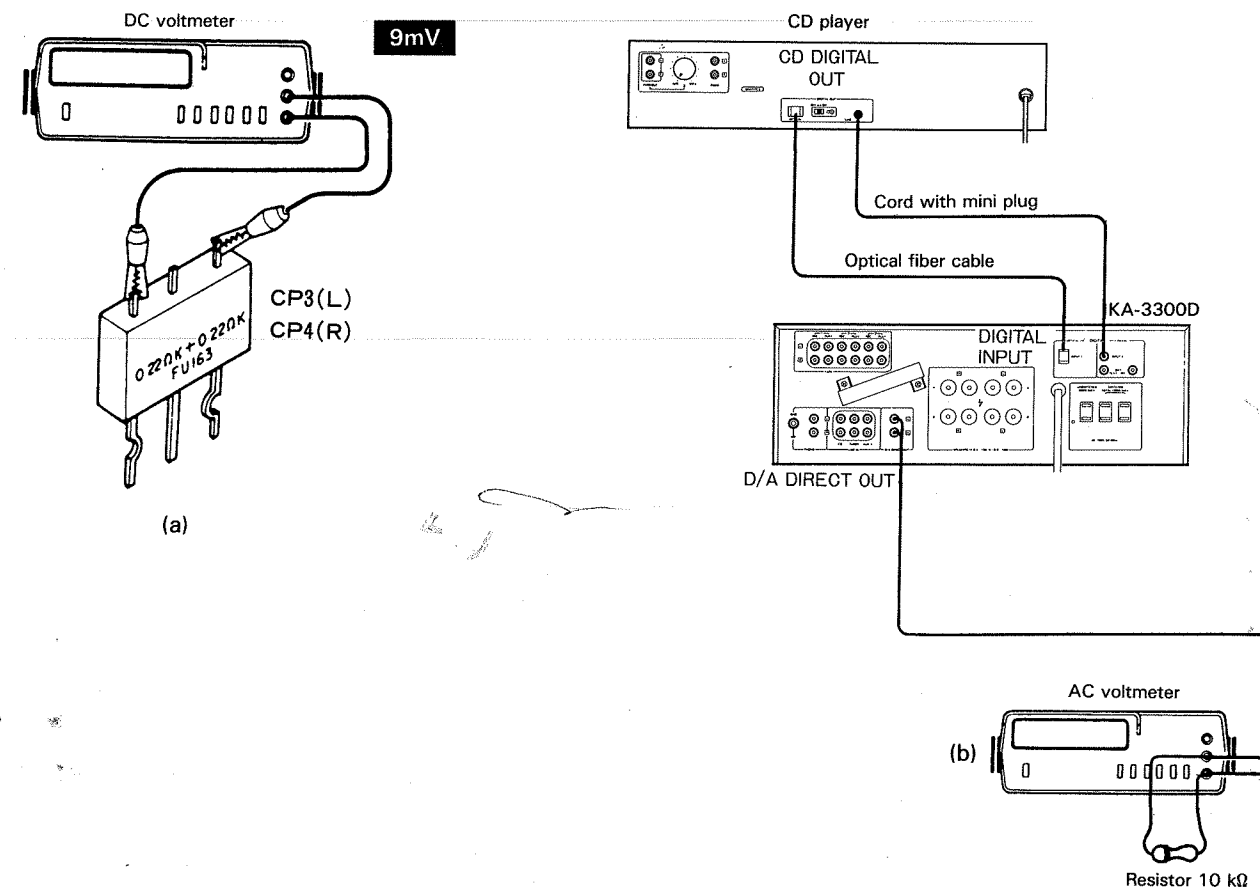
HAUPTVERSTÄRKER (X07-2320-82)

NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSGANGS-EINSTELLUNG	VERSTÄRKER EINSTELLUNG	ABGLEICH-PUNKTE	ABGLEICHEN FÜR	ABB.
1	LEERLAUFSTROM	—	Einen Gleichspannungsmesser über CP3 (L) CP4 (R) anschließen.	VOLUME: 0	VR1 (L) VR2 (R)	9mV	(a)

SIGNALPROZESSOR (X32-1112-71)

NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSGANGS-EINSTELLUNG	VERSTÄRKER EINSTELLUNG	ABGLEICH-PUNKTE	ABGLEICHEN FÜR	ABB.
1	AUSGANGSPEGEL-EINSTELLUNG	Die Digital-Eingang/Ausgang-Buchsen anschließen und den PLL des KA-3300D verriegeln.	Eine Last von 10kΩ an die D/A DIRECT OUT-Buchse anschließen und ein Wechselstrom-Voltmeter über die Last anschließen.	Das 1kHz, 0 dB Signal der Test-CD spielen.	VR1 (L) VR2 (R)	So einstellen, daß die Ausgangsspannung 2 V beträgt.	(b)

ADJUSTMENT/REGLAGES/ABGLEICH



VOLTAGE TABLES

X11-2350-81

Q2	E	3.2V
	C	3.3V
	B	2.8V

Q3	E	3.2V
	C	29.4
	B	1.2V

Q4

E	LAMP ON: -2.0V LAMP OFF: -27.5V
C	—
B	LAMP ON: -1.5V LAMP OFF: -27.5V

X07-2320-82

Q1, 5	E	—
	C	7.7V
	B	—

Q3, 7	E	—
	C	-7.1V
	B	—

Q9	E	71.4V
	C	7.6V
	B	70.4V

X08-2180-82

Q35, 36, 37, 38	E	-56.6V
	C	—
	B	-56.0V

Q47	E	R: 1.8V P: 1.6V
	C	R: 1.4V P: 14.0V
	B	—

Q41, 42	E	—
	C	-1.9V
	B	—

IC1

4	-16V
5	0V
6	0.1V
7	0.1V
8	16V

CN4

1	-16V
2	16V
3	—
4	LAMP ON: -27.6V LAMP OFF: -29.3V
5	37.8V
6	1.2V
7	0V

CN3

1	K3 ON: 12.1V K3 OFF: 0V
2	—
3	MUTE SW BREAK: 16.5V MUTE SW MAKE: 6.6V
4	—
5	14.5V
6	0.7V

Q11

E	1.3V
C	0V
B	0.6V

Q13

E	-71.2V
C	—
B	-71.2V

Q15

E	-1.3V
C	-7.6V
B	-0.6V

Q43, 44

E	—
C	1.9V
B	56.5V

Q39, 40

E	—
C	56.5V
B	—

Q7, 8

E	—
C	7.7V
B	—

CN15

1	0.7V
---	------

CN16

5	56V
---	-----

CN2

1	MC: 0V MM: 19.5V
---	---------------------

Q26

E	—
C	-73.2V
B	—

Q21

E	-1.8V
C	-1.2V
B	-0.4V

Q23

E	—
C	77.8V
B	-14V

Q15, 16, 17, 18

G	0V
S	0.1V
D	—

Q11, 12	E	—
	C	25.4V
	B	—

Q23, 24

E	-15.5V
C	—
B	-15.0V

X32-1110-00

Q1, 2, 3

E	5V
C	—
B	—

Q7

E	11.9V
C	18.3V
B	12.4V

Q8

E	-11.8V
C	-18.3V
B	-12.4V

Q24

E	—
C	-7.3V
B	-14V

Q25, 26

E	—
C	73.2V
B	—

Q27, 28

E	—
C	-73.2V
B	—

Q25

G1	—
S1	0.4V
D1	—
G2	—
S2	0.4V
D2	—

Q19-22

E	—
C	7.7V
B	—

Q27, 29

E	—
C	10.0V
B	2.8V

IC1, 2

1	-5V
2	0V
3	5V
8	-5V
16	5V

IC3-10

4	-11.8V
8	11.9V

Q21

1, 7	0V
14	5V

Q29

E	—
C	40.7V
B	—

Q31

E	—
C	-40.7V
B	—

Q33

E	—
C	—
B	68V

Q31, 33	E	—
	C	—
	B	10.0V

Q26	G1	—
	S1	0.6V
	D1	—
	G2	—
	S2	0.6V
	D2	—

Q32, 34

E	—
C	—
B	9.9V

IC24

7, 9, 11, 13	0V
14	5V

Q22

5	5V
---	----

IC25

6, 14	5V
7	0V

Q35

E	0V
C	-3.7V
B	0V

Q37

E	73.2V
C	0V
B	72.9V

Q55

E	49.5V
C	27.3V
B	49V

Q48	E	14.0V (15.1V)
	C	14.0V (-27.1V)
	B	13.5V (15.1V)

Q28, 30

E	—
C	9.9V
B	2.85V

IC1, 2

2	7.7V
3	7.7V
4	-20.7V
5	7.7V
6	7.7V
8	20.9V

IC26

1	0V
3, 10, 11	5V

IC27

7	0V
14	5V

IC28

1, 7	0V
9, 14	5V
13	2V

Q56

E	-49.6V
C	-19.6V
B	-49V

Q51

E	57.3V
C	71V
B	57.8V

Q52

E	-57.4V
C	-71.3V
B	-58V

IC31, 33

2, 4, 10, 12, 14, 15	5V
----------------------	----

IC32, 34, 36, 39

7	0V
14	5V

IC49

4	-18.3V
8	18.3V

Q53

E	8.2V
C	58V
B	8.8V

Q54

E	0V
C	-58V
B	-0.6V

Q58

E	17V
C	21.5V
B	17.8V

IC3	2	H: 13.8V L: 0.2V
	3	R: 1.4V P: 14.0V
	5, 6	14.0V (15.1V)
	7, 8, 9	0V
	10, 11	14.0V (15.1V)
	12, 13	0V
	16	14.0V (15.1V)

Q49

E	14.0V (15.1V)
C	—
B	13.4V (15.1V)

IC35

3, 10, 11	5V
-----------	----

IC47

IN	10.4V
OUT	5V
GND	0V

IC48

IN	-10.5V
OUT	-5V
GND	0V

Q59

E	20.6V
C	28.8V
B	21.2V

Q60

E	-20.7V
C	-27.0V
B	-21.3V

Q61

E	8.2V
C	21.3V
B	8.8V

IC41

1	0V
2, 3, 7	5V
10, 11, 12	0V
16	5V
19	0V
20	5V
44-48	5V
60	5V

IC42

7, 14	0V
17, 18, 20	0V
21	5V

IC45

IN	11.9V
OUT	5V
GND	0V

Q62

E	-8.2V
C	-21.2V
B	-8.8V

IC1

1	-0.6V
4	-73.2V
6	-42.1V
9	0V
11	42.0V
13	73.2V

IC2

4	-73.2V
6	-42.1V
11	42.0V
13	73.2V

Q45

E	—
C	—
B	H: 0.7V L: 0.1V

Q46

E	R: 1.8V P: 1.6V
C	R: 6.1V P: 1.8V
B	R: 0V P: 2.3V

IC43

3, 5, 9, 11	0V
-------------	----

IC44

1, 7	0V
------	----

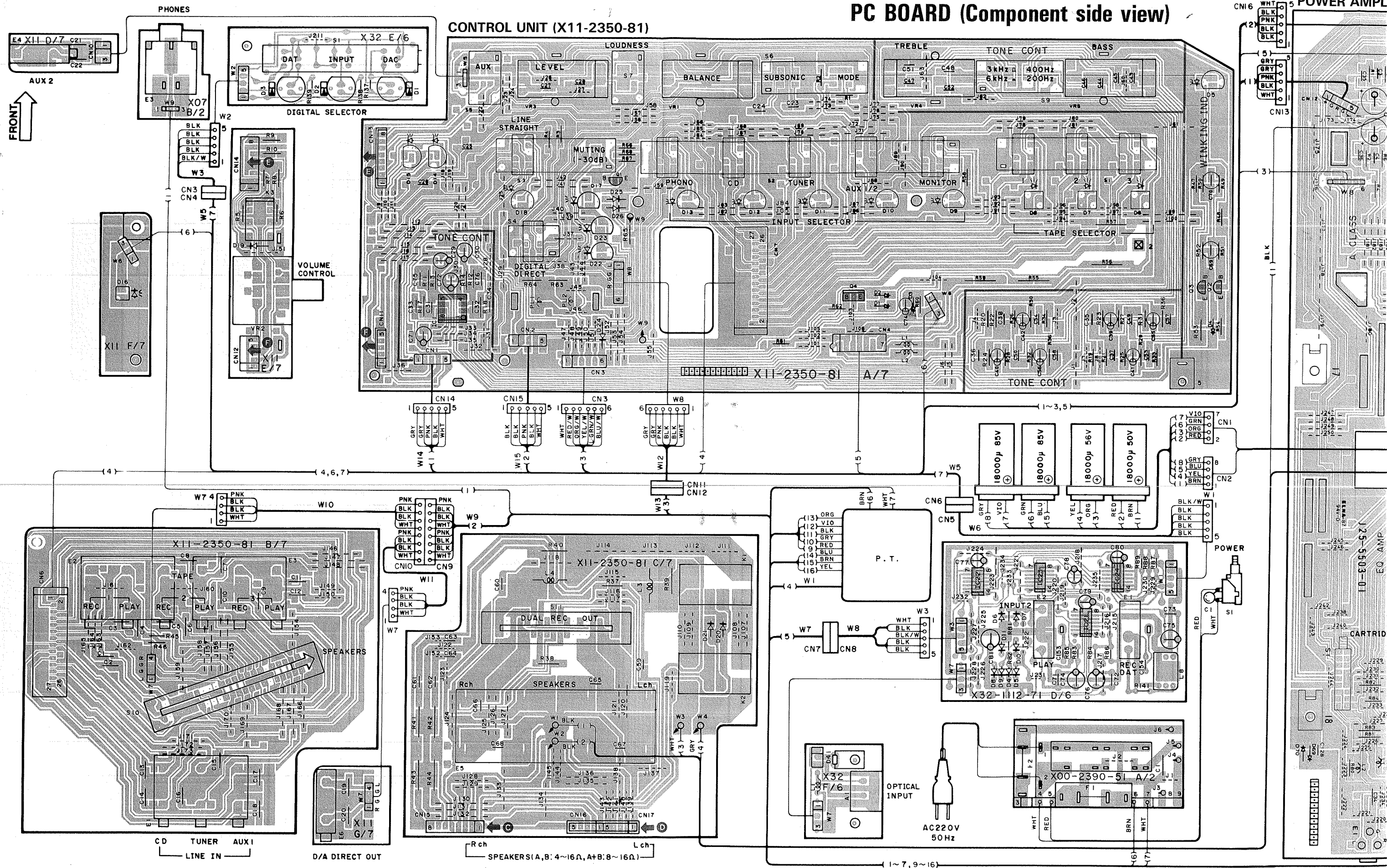
IC46

IN	-11.9V
OUT	-5V
GND	0V

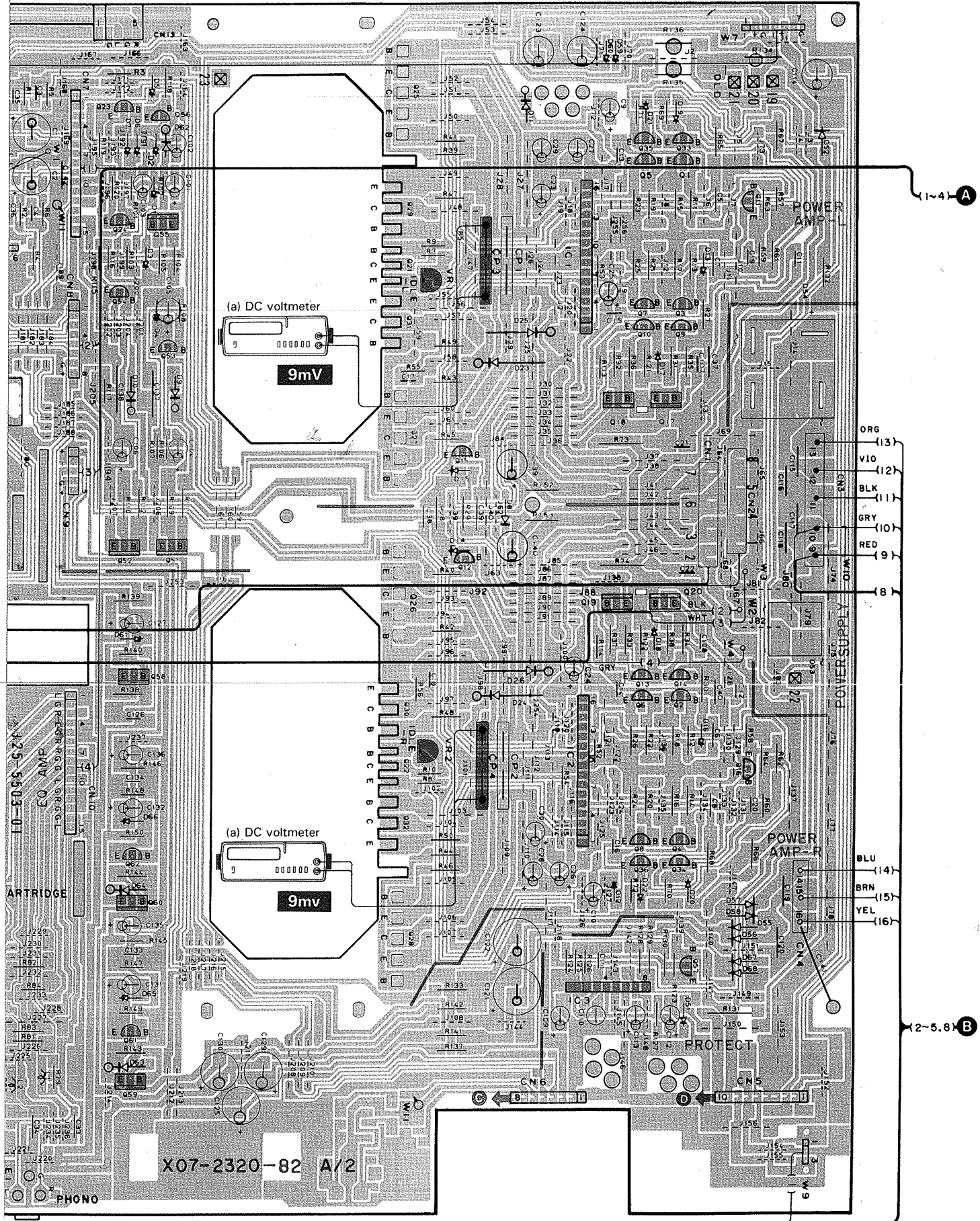
IC29

1, 4, 10, 13	5V
--------------	----

PC BOARD (Component side view)



MPLIFIER UNIT (X07-2320-82)

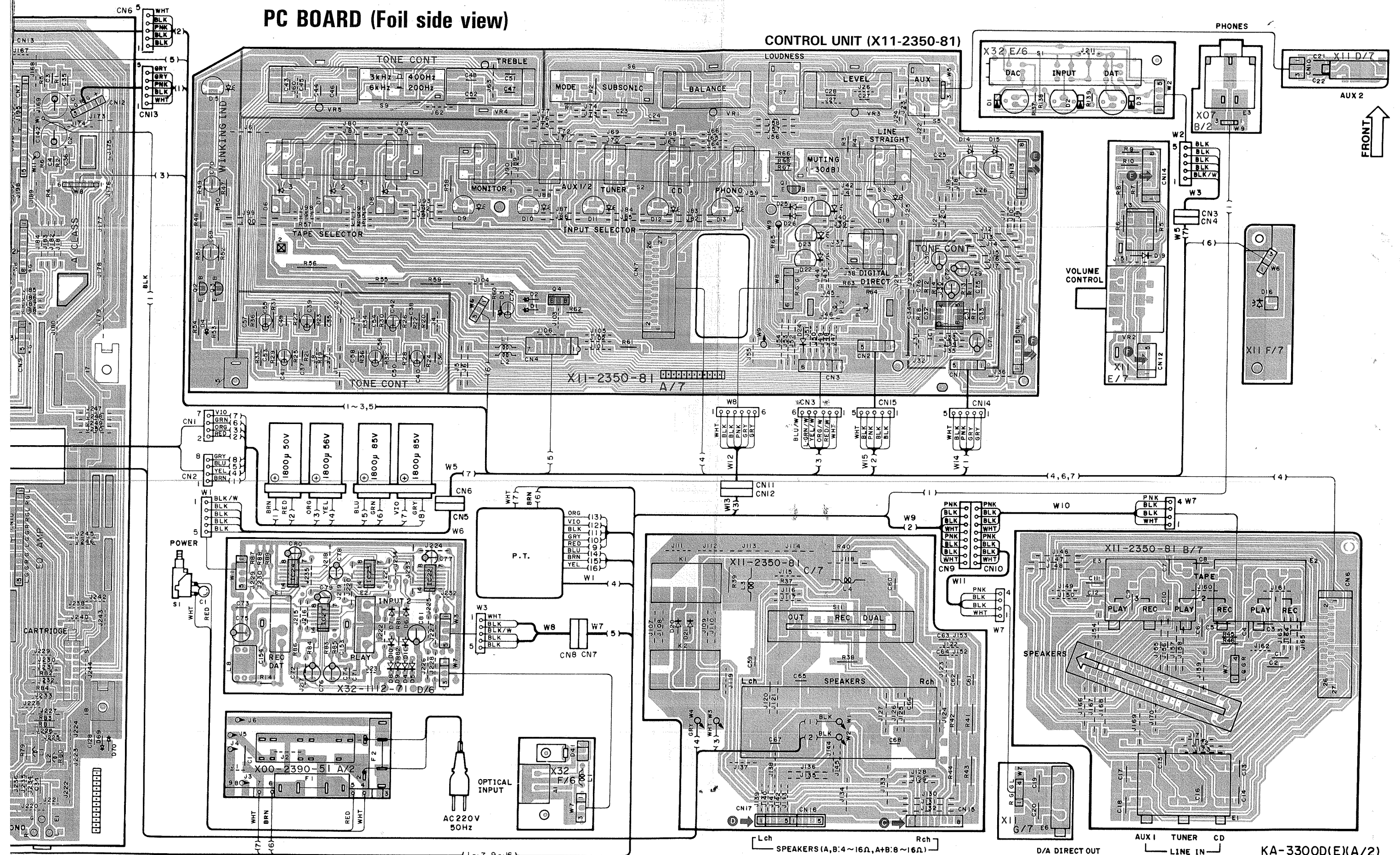


Refer to the schematic diagram for the values of resistors and capacitors.

KA-3300D(E)(A/2)

PC BOARD (Foil side view)

CONTROL UNIT (X11-2350-81)



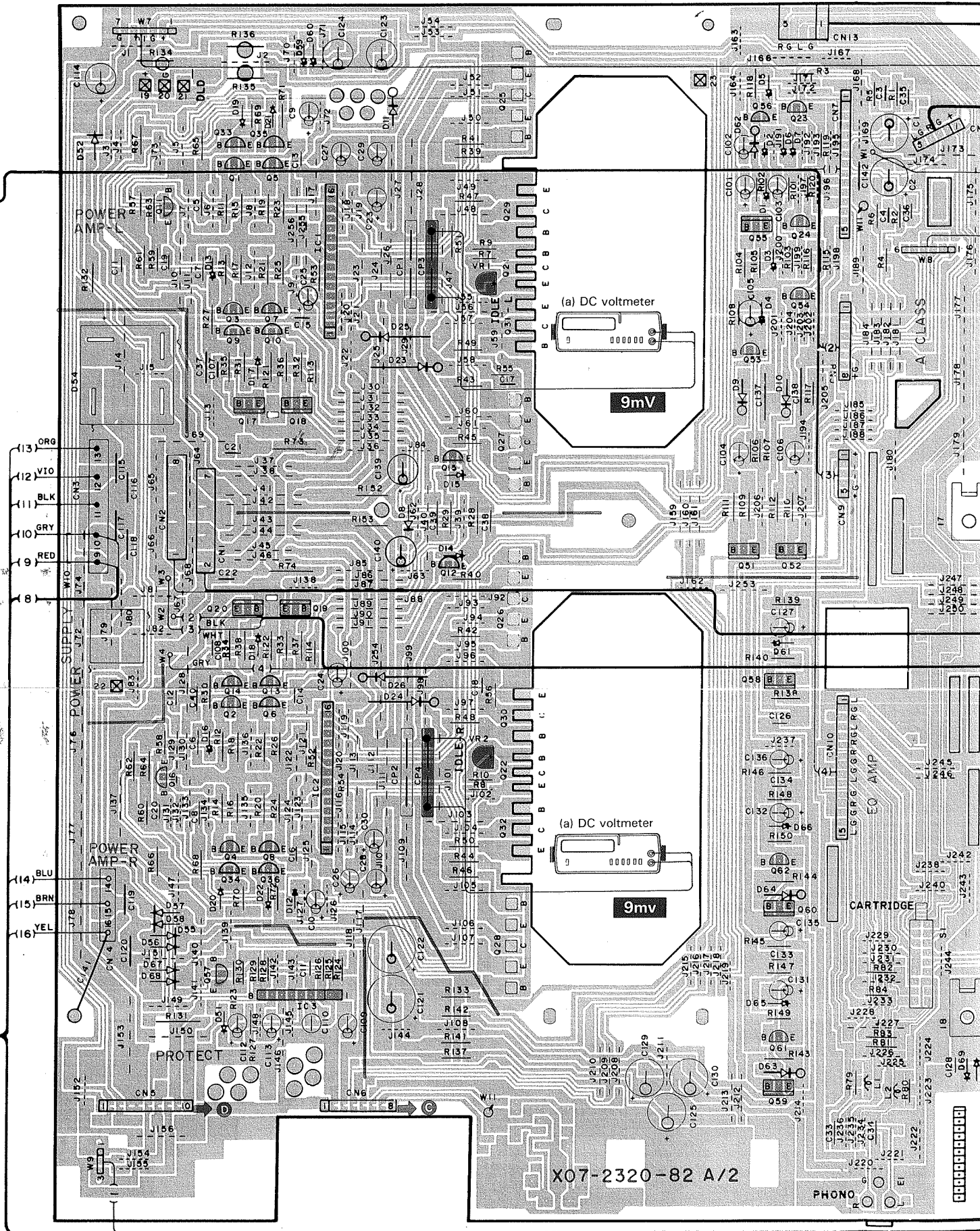
* The IC21 - IC24 (X32-1112-71) are installed in pattern side.

Refer to the schematic diagram for the values of resistors and capacitors.

POWER AMPLIFIER UNIT (X07-2320-82)

A

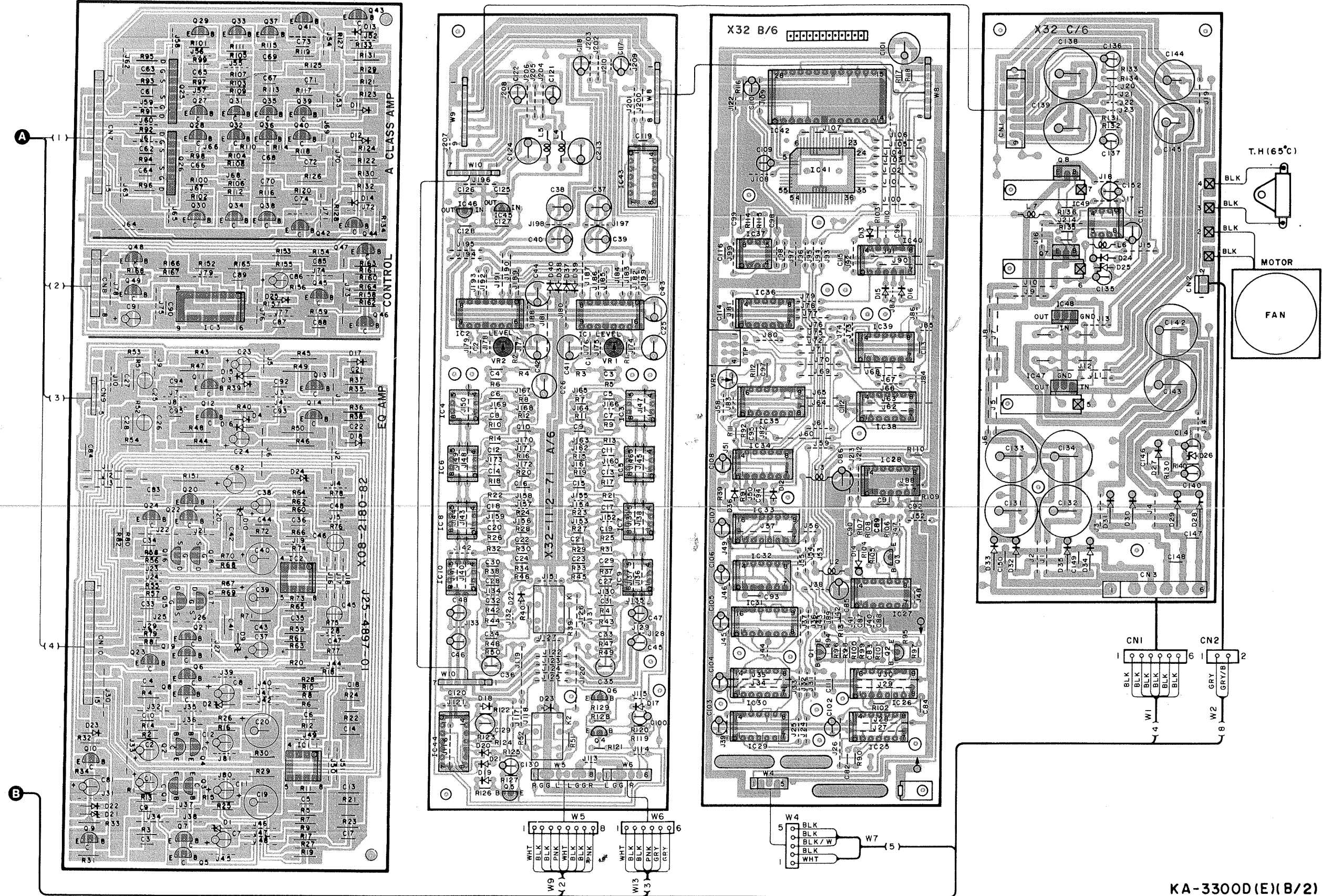
B 42~5.8



PC BOARD (Component side view)

PRE AMPLIFIER UNIT (X08-2180-82)

PROCESSOR UNIT (X32-1112-71)



* The IC41 (X32-) (B/6)
is installed in pattern side.

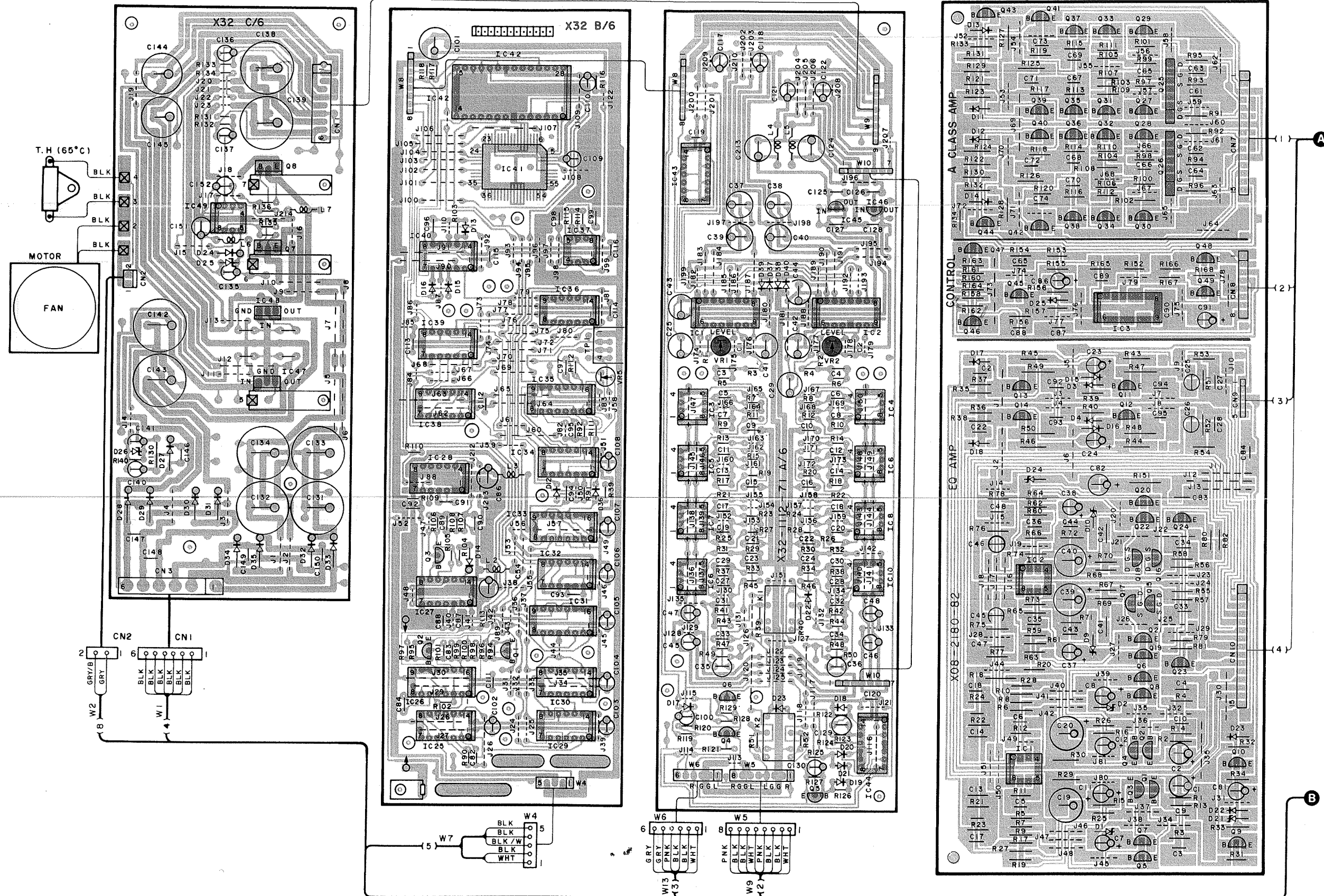
Refer to the schematic diagram for the values of resistors and capacitors.

KA-3300D(E)(B/2)

PC BOARD (Foil side view)

PROCESSOR UNIT (X32-1112-71)

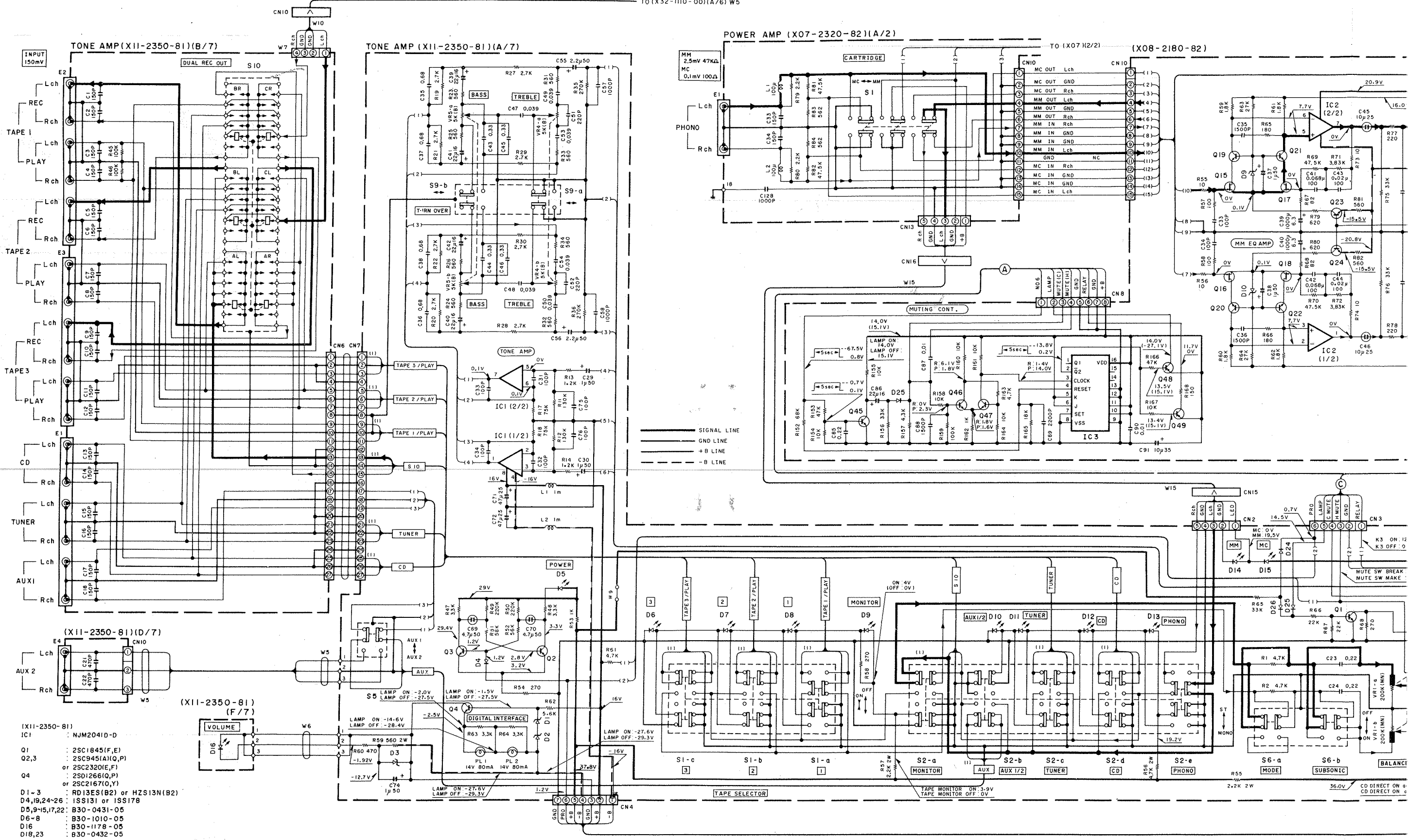
PRE AMPLIFIER UNIT (X08-2180-82)

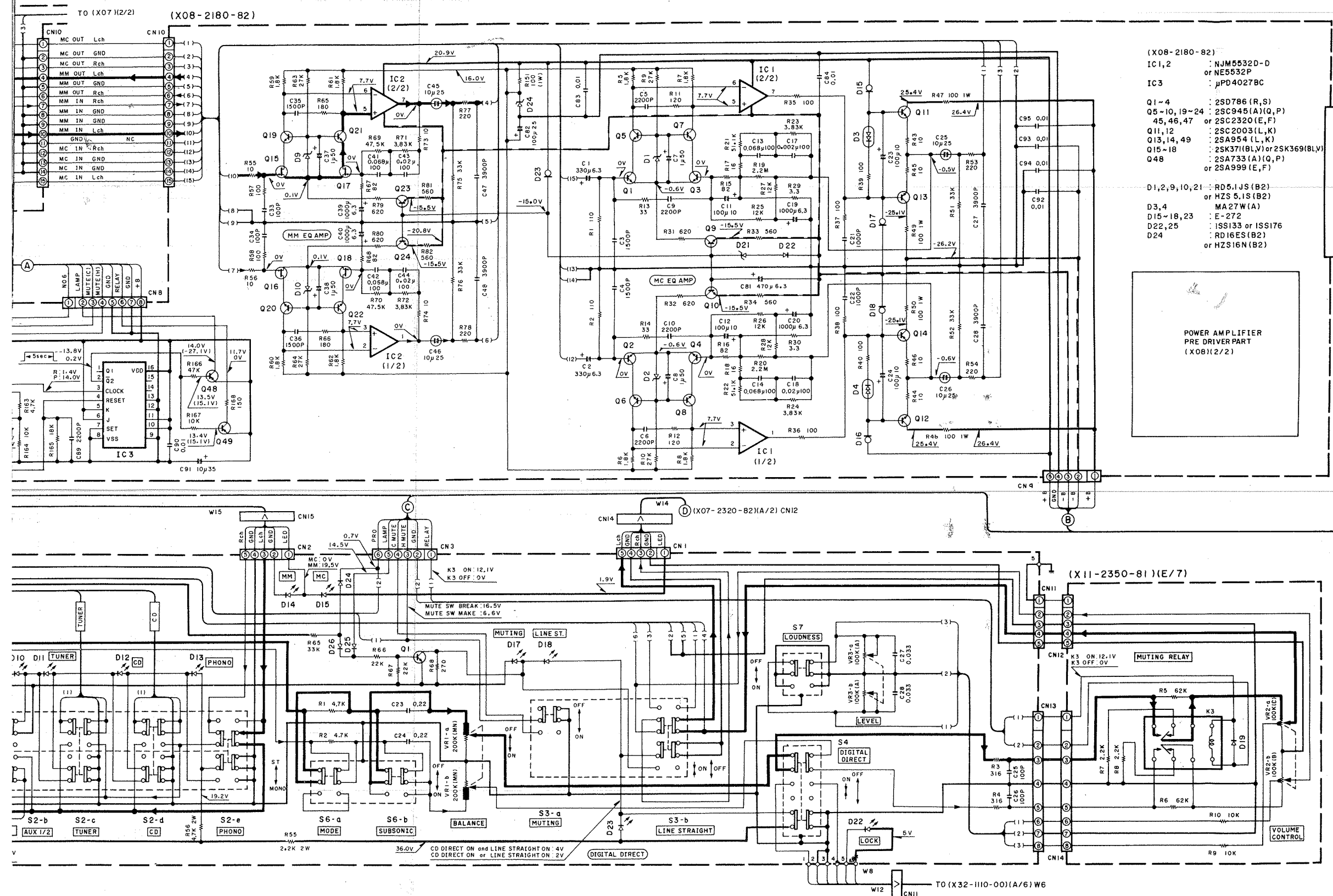


* The IC41 (X32-) (B/6)
is installed in pattern side.

KA-3300D(E)(B/2)

Refer to the schematic diagram for the values of resistors and capacitors.





2SA733 (A)
2SA954
2SA999
2SC1845
2SC2003
2SC2320
2SC945 (A)
2SD786

2SC2167
2SD1266

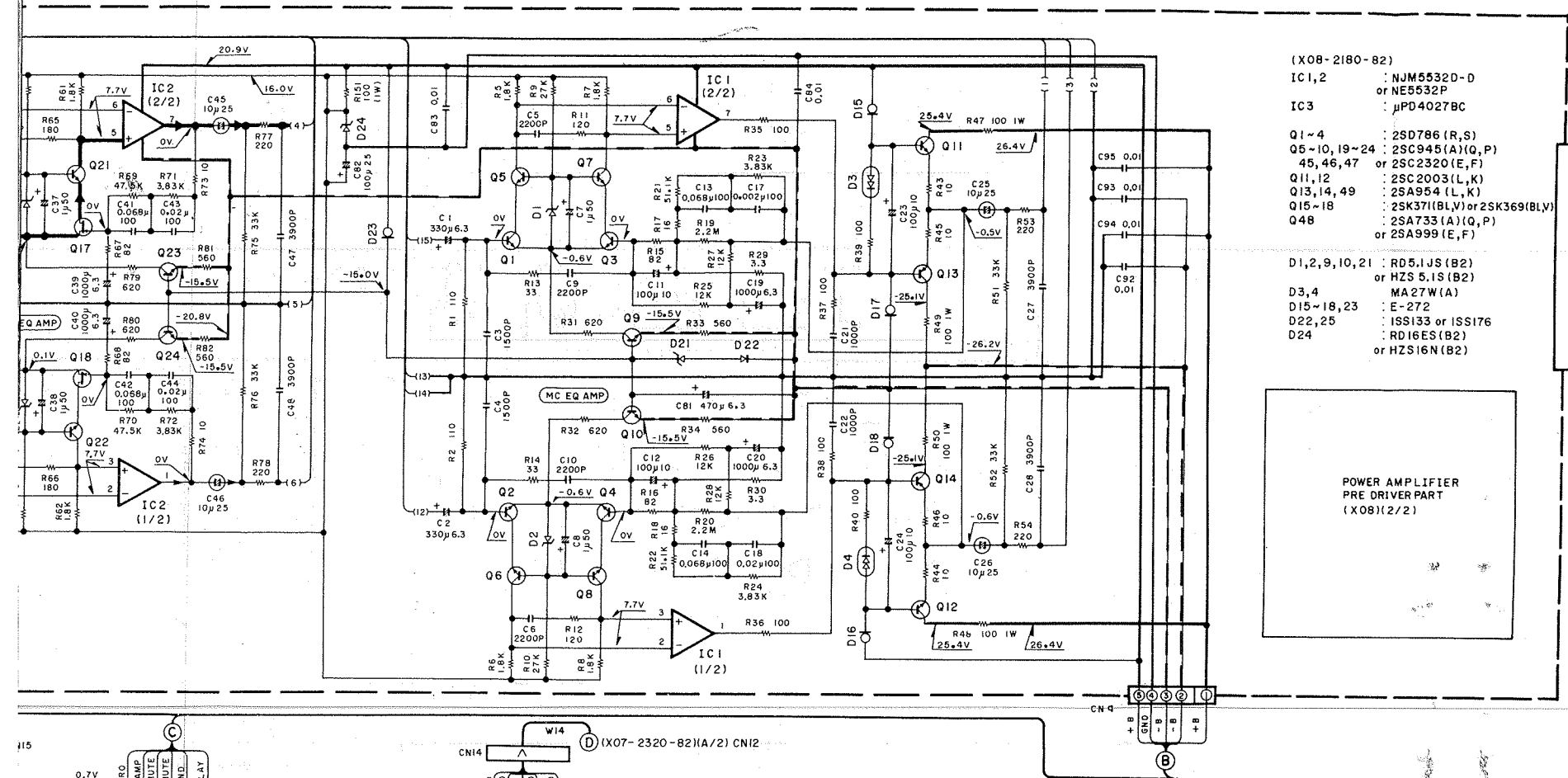
2SK371

DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance sans signal d'entrée. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

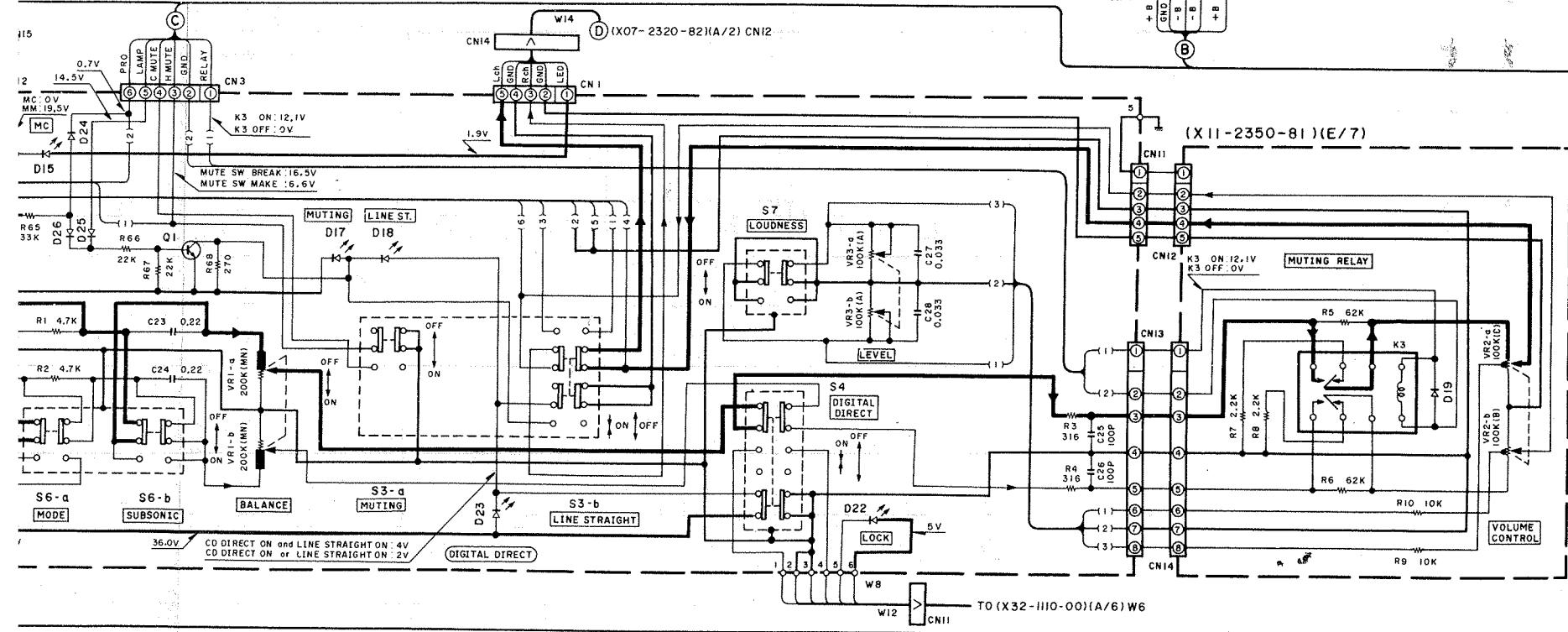
Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser ohne Eingangssignal gemessen. Dabei schwanden die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig.

CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.



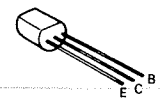
- (X08-2180-82)
- IC1,2 : NJM5532D-D
or NE5532P
- IC3 : μ PD4027BC
- Q1~4 : 2SD786 (R,S)
Q5~10, 19~24 : 2SC945 (A)(Q,P)
45, 46, 47 : 2SC2320 (E,F)
Q11, 12 : 2SC2003 (L,K)
Q13, 14, 49 : 2SA954 (L,K)
Q15~18 : 2SK371 (BL,V) or 2SK369 (BL,V)
Q48 : 2SA733 (A)(Q,P)
or 2SA999 (E,F)
- D1,2,9,10,21 : RD5.1JS (B2)
or HZS 5.1S (B2)
D3,4 : MA27W (A)
D15~18,23 : E-272
D22,25 : ISS133 or ISS176
D24 : RD16S (B2)
or HZS16N (B2)

POWER AMPLIFIER
PRE DRIVER PART
(X08)(2/2)

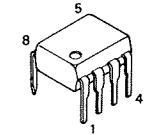


KA-3300D (E) (1/3)

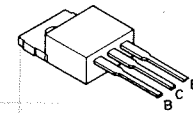
- 2SA733 (A)
2SA954
2SA999
2SC1845
2SC2003
2SC2320
2SC945 (A)
2SD786



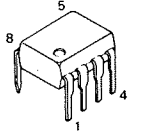
NE5532P



- 2SC2167
2SD1266

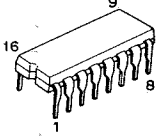
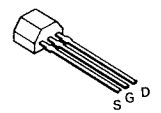


NJM2041D-D
NJM5532D-D



2SK371

μ PD4027BC

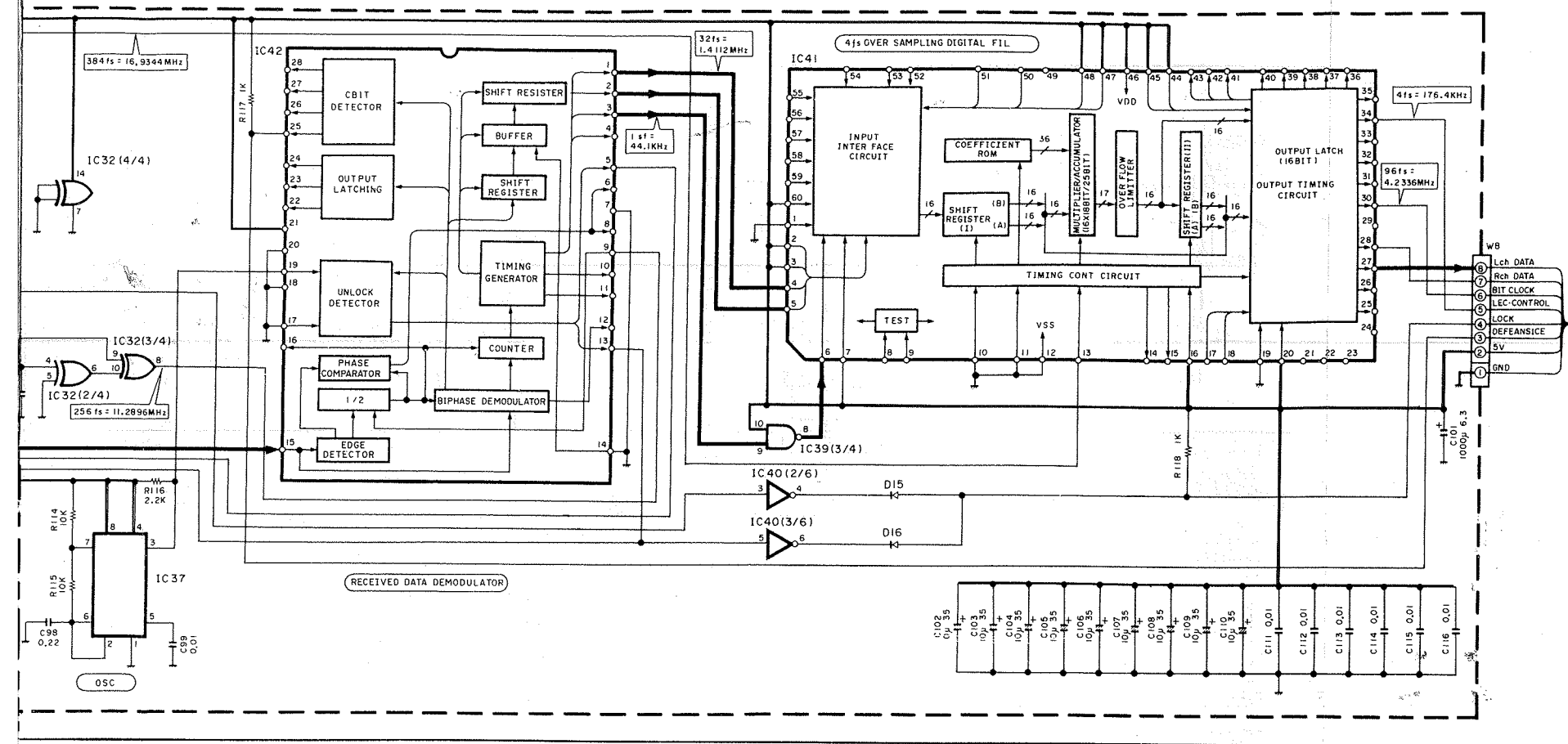


DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

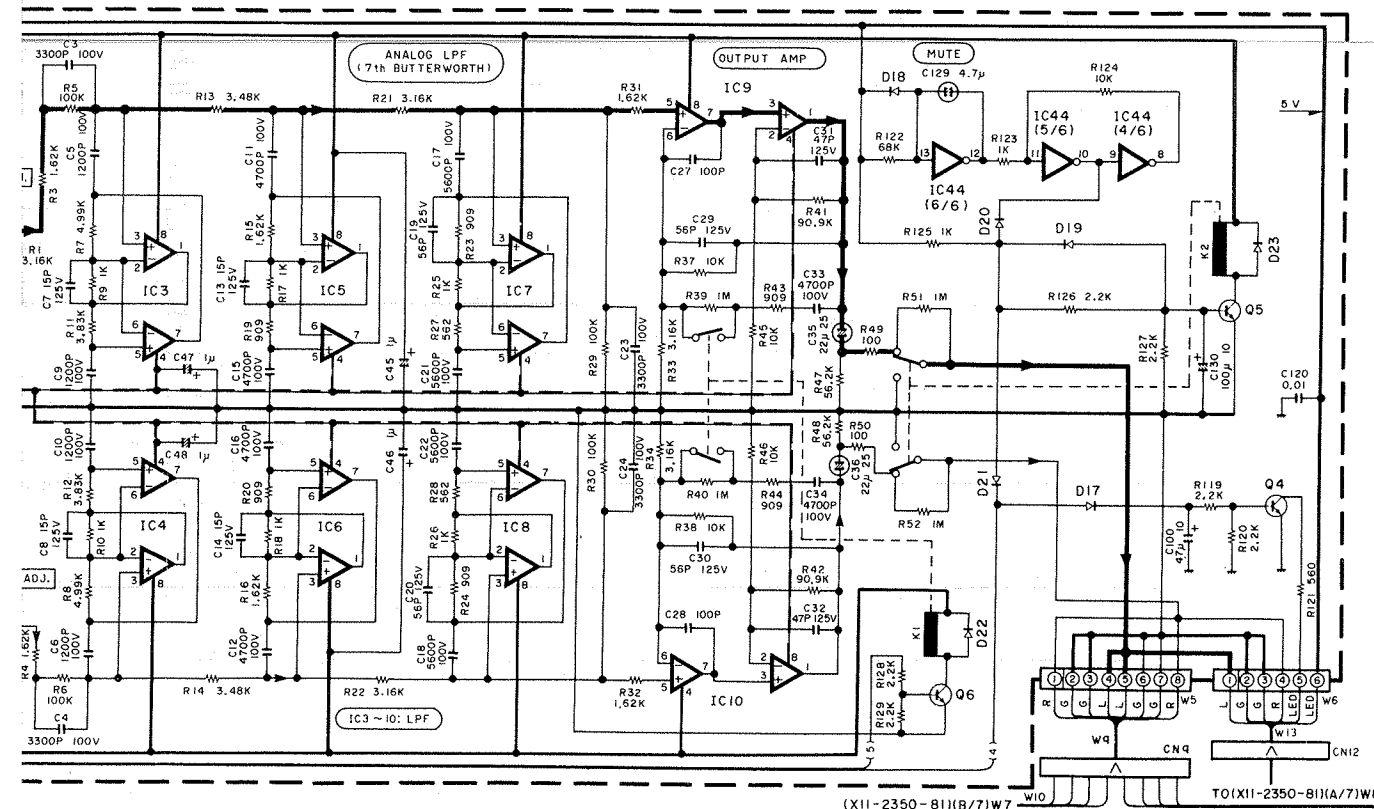
Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance sans signal d'entrée. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser ohne Eingangssignal gemessen. Dabei schwanden die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig.

CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.



fs = 44.1 kHz (Major source: CD)

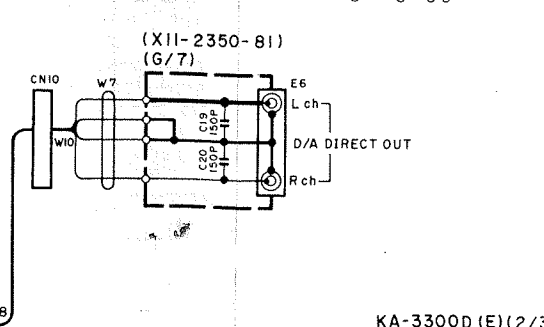


SIGNAL LINE
GND LINE
+B LINE
-B LINE

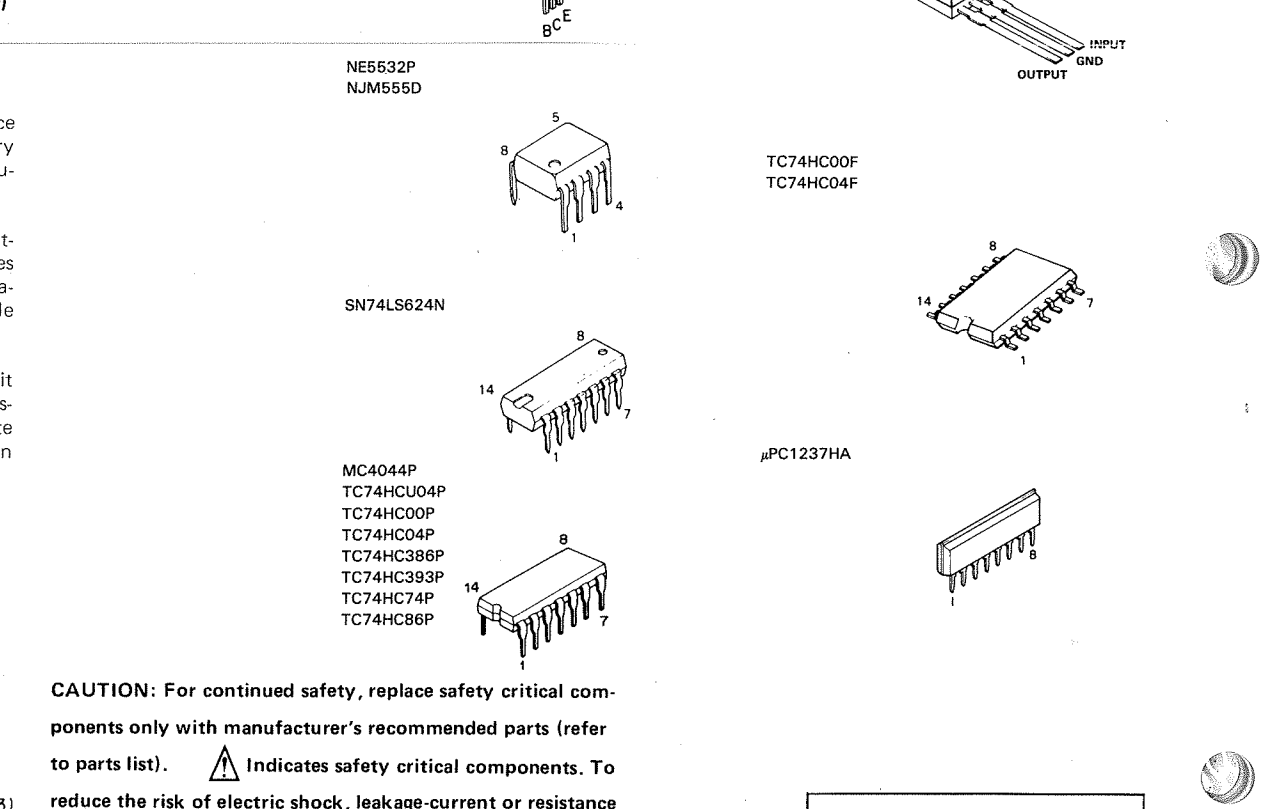
DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance sans signal d'entrée. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser ohne Eingangssignal gemessen. Dabei schwanden die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig.

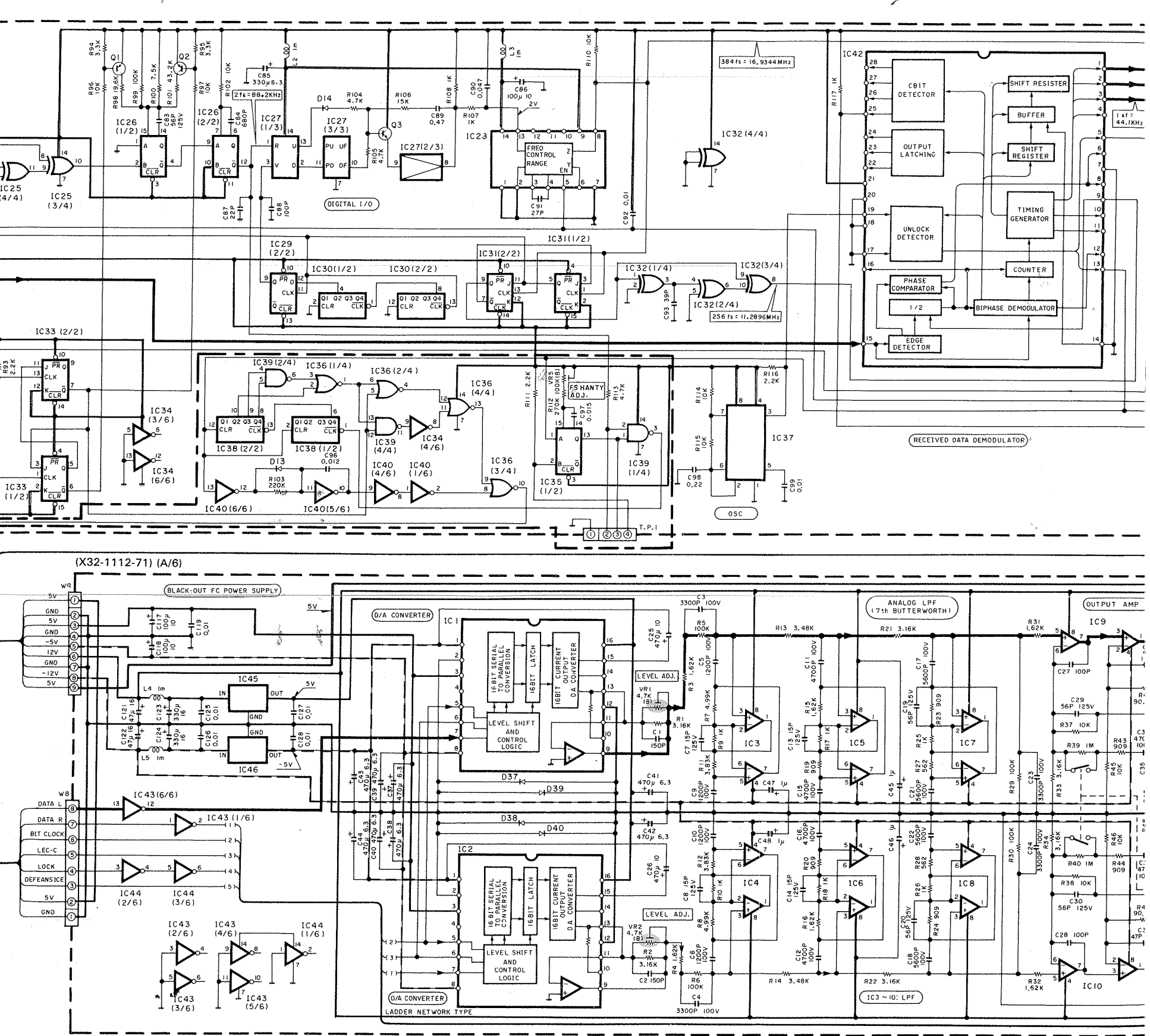
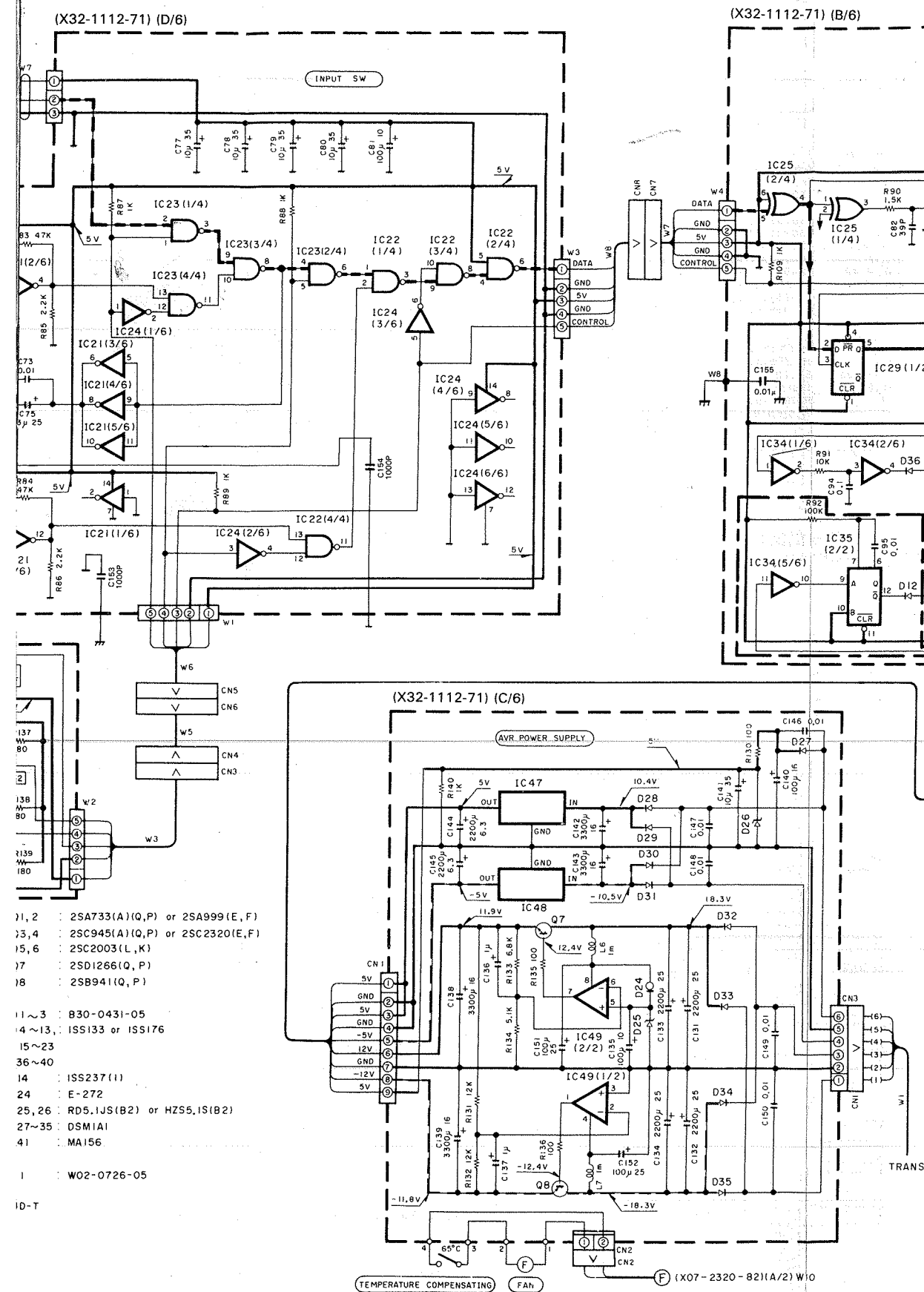


KA-3300D (E) (2/3)

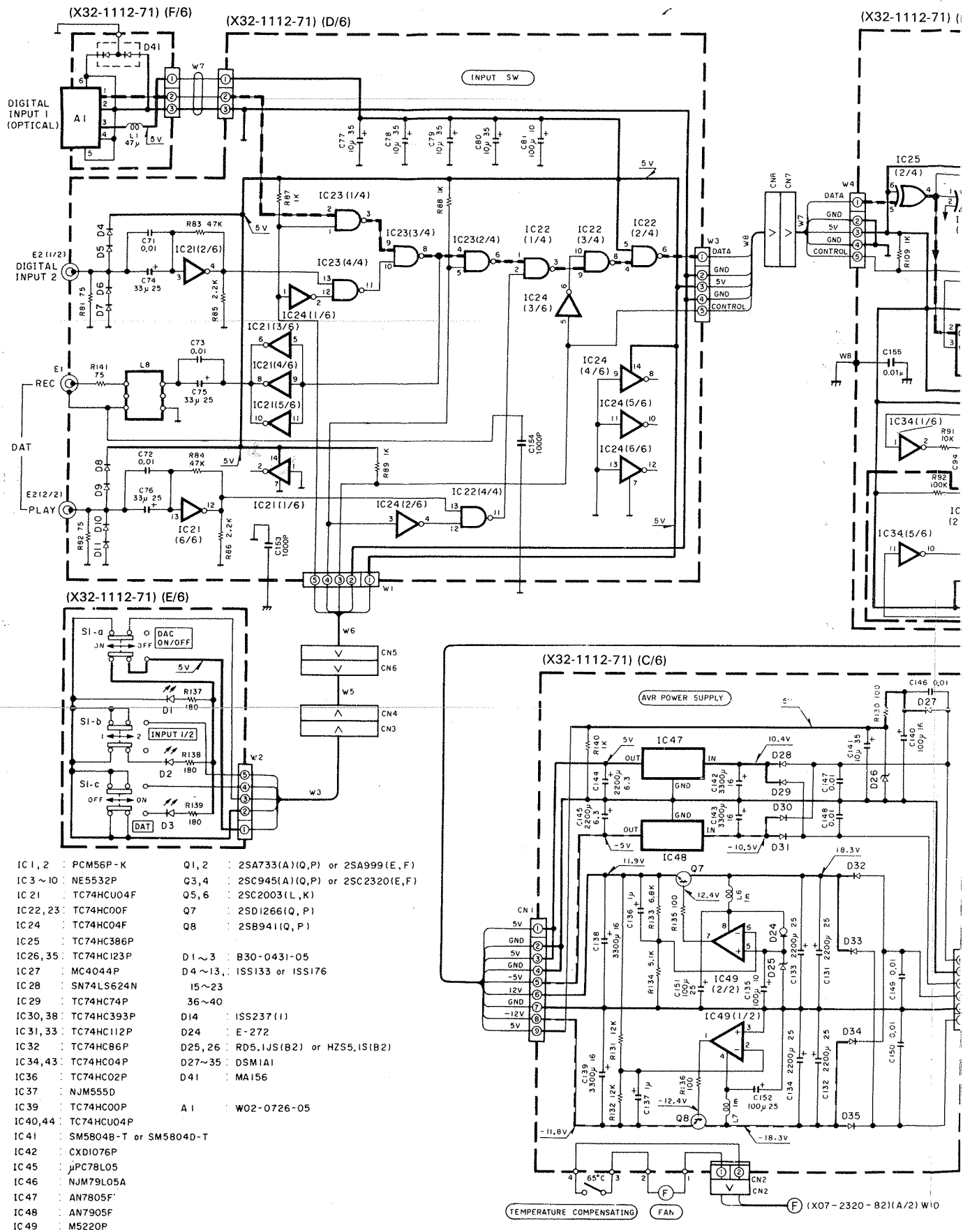


CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

KA-3300D
KENWOOD



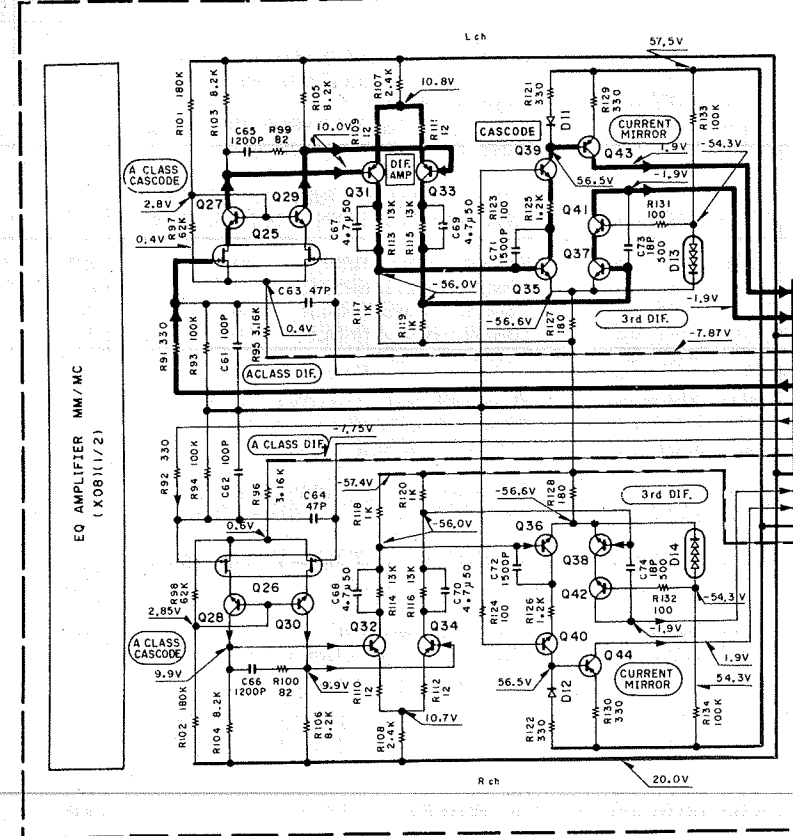
In the actual circuit, D12 is eliminated, and shown enclosed in broken lines (---) in the circuit diagram, is not operating. Then the models with Serial No. 73K00000 and after, the parts boxed with "----" are eliminated.



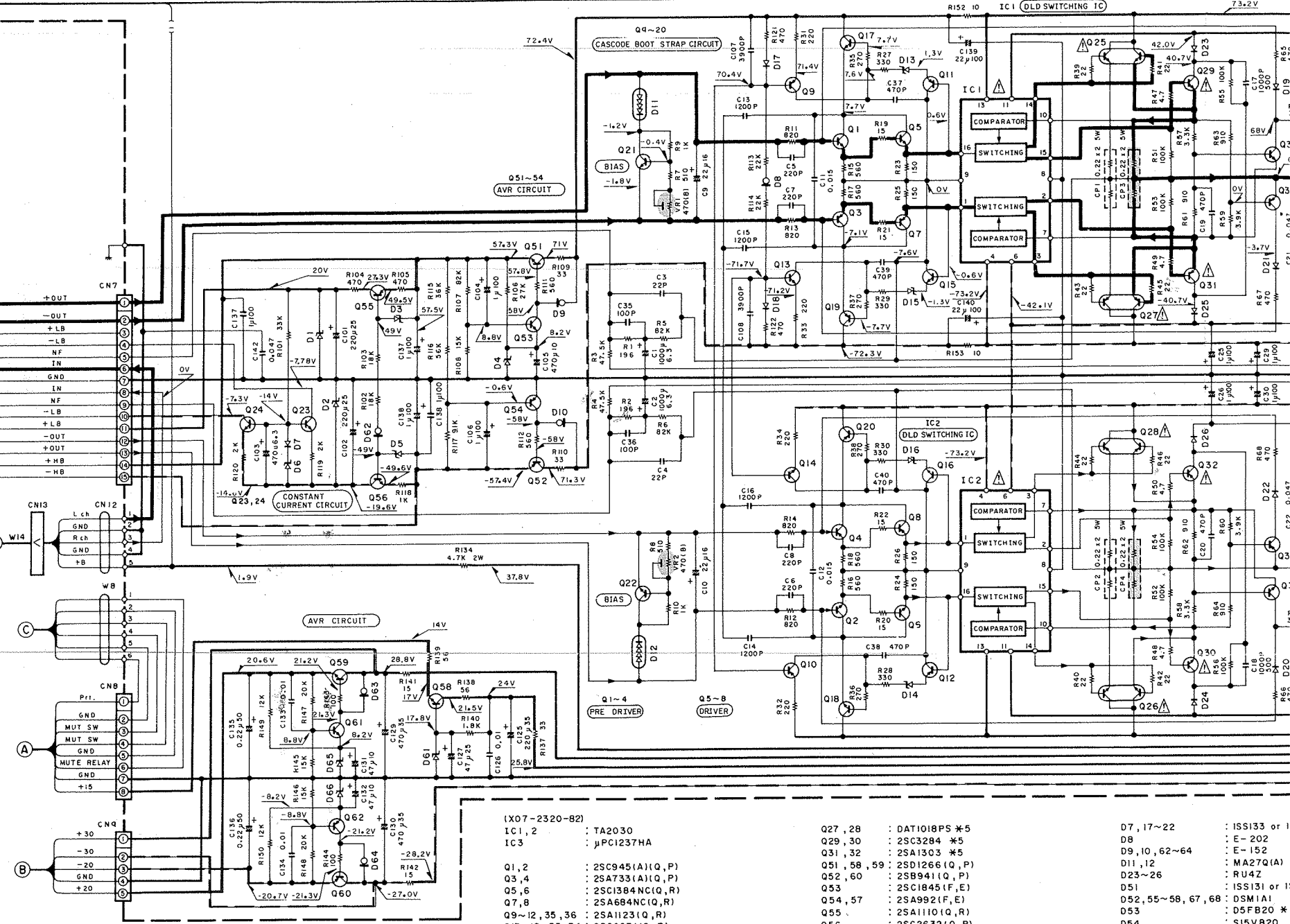
POWER AMP (X07-2320-82) (A/2)

TOIX0811/2

PRE AMP (X08-2180-82)



Q25, 26 : μ PA68H(K,L)
Q27-30 : 2SC945(A)(Q,P) or 2SC2320(E,F)
Q31-34 : 2SA733(A)(Q,P) or 2SA999(E,F)
Q35-42 : 2SC2632(I,Q,R,S)
Q43, 44 : 2SA1124(I,Q,R,S)
D11, 12 : ISS133 or ISS176
D13, 14 : MA27Q(A)



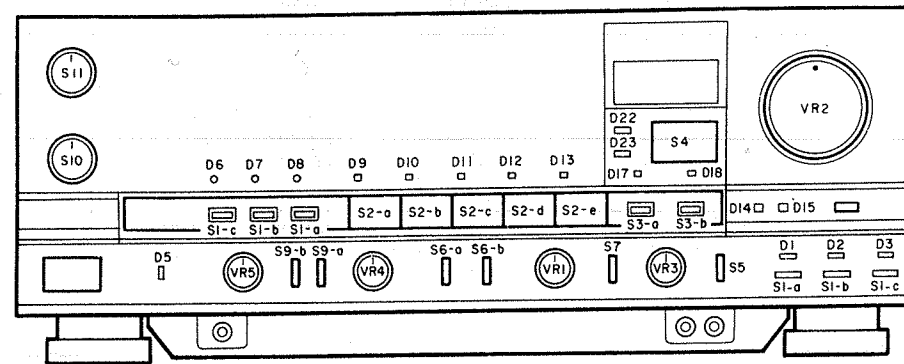
(X07-2320-82)

IC1, 2 : TA2030
IC3 : μ PC1237HA
Q1, 2 : 2SC945(A)(Q,P)
Q3, 4 : 2SA733(A)(Q,P)
Q5, 6 : 2SC1384(NC)(Q,R)
Q7, 8 : 2SA684(NC)(Q,R)
Q9-12, 35, 36 : 2SA1123(I,Q,R)
Q13-16, 33, 34 : 2SC2631(I,Q,R)
Q17, 18 : 2SC3944(A)(Q,R)
Q19, 20 : 2SA1535(A)(Q,R)
Q21, 22 : 2SC3419(Y)
Q23, 24, 61 : 2SC945(A)(Q,P) or 2SC2320(E,F)
Q25, 26 : DAT1018NS *5

Q27, 28 : DAT1018PS *5
Q29, 30 : 2SC3284 *5
Q31, 32 : 2SA1303 *5
Q51, 58, 59 : 2SD1266(I,Q,P)
Q52, 60 : 2SB941(I,Q,P)
Q53 : 2SC1845(F,E)
Q54, 57 : 2SA992(F,E)
Q55 : 2SA1110(I,Q,R)
Q56 : 2SC2632(I,Q,R)
Q62 : 2SA733(A)(Q,P) or 2SA999(E,F)

D1, 2 : RD20JS(B) or HZS20S(B)
D3-5 : RD8.2JS(B2) or HZS8.2S(B2)
D6, 13-16 : RD5.1JS(B2) or HZS5.1S(B2)

D7, 17-22 : ISS133 or I
D8 : E-202
D9, 10, 62-64 : E-152
D11, 12 : MA27Q(A)
D23-26 : RU4Z
D51 : ISS131 or I
D52, 55-58, 67, 68 : DSM1A1
D53 : D5FB20 *
D54 : S15VB20
D59, 60 : RD16ES(B2)
D61 : RD18ES(B)
D65, 66 : RD8.2JS(B)



PARTS LIST

* New Parts

Parts without Parts No. are not supplied.

Les articles non mentionnés dans le Parts No. ne sont pas fournis.

Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名/規格	Desti- nation 仕向	Re- marks 備考
KA-3300D						
1	1B		A01-1502-01	METALLIC CABINET	TE	
1	1B		A01-1506-01	METALLIC CABINET	KPM	
2	3A	*	A20-5126-02	PANEL ASSY		
8	3A		B03-1950-04	DRESSING PLATE (KNØB)		
9	2A		B03-2132-04	DRESSING PLATE (FR AUX)		
10	3A	*	B03-2176-04	DRESSING PLATE (DIGITAL)		
11	3B		B19-0529-04	LIGHTING BOARD		
12	1B	*	B19-0531-05	OPTICAL FIBER ASSY		
13	3A	*	B43-0278-04	KENWOOD BADGE		
-			B46-0092-03	WARRANTY CARD	K	
-			B46-0121-03	WARRANTY CARD	P	
-			B46-0122-13	WARRANTY CARD	E	
-			B46-0143-03	WARRANTY CARD	T	
-		*	B50-6564-00	INSTRUCTION MANUAL (ENGLISH)		
-		*	B50-6565-00	INSTRUCTION MANUAL (FRENCH)	PME	
-		*	B50-6566-00	INSTRUCTION MANUAL (SPANISH)	M	
-		*	B50-6567-00	INSTRUCTION MANUAL (G,D,I)	E	
-			B58-0269-04	CAUTION CARD	K	
-			B58-0803-03	CAUTION CARD	E	
△ C1			C91-0023-05	CERAMIC 0.01UF AC250V	M	
△ C1			C91-0647-05	CERAMIC 0.01UF P	KPTE	
C2	1C	*	C90-1468-05	ELECTRO 18000UF 85WV		
C3	1C	*	C90-1470-05	ELECTRO 18000UF 56WV		
17	3C		D21-1103-03	EXTENSION SHAFT (CARTRIDGE)		
18	1C		D21-1107-34	EXTENSION SHAFT		
19	1C		D22-0047-04	SHAFT COUPLING		
23	1D		E21-0006-25	BINDING POST (GND)		
24	1B		E30-1427-05	AUDIO CORD		
25	1D		E30-0459-05	AC POWER CORD	E	
25	1D		E30-0812-05	AC POWER CORD	M	
25	1D		E30-0974-05	AC POWER CORD	KP	
25	1D		E30-1416-05	AC POWER CORD	T	
△ F1	1C		F05-4025-05	FUSE (SEMKO) (250V T4A)	TE	
△ F1	1C		F05-8029-05	FUSE (UL) (250V 8A)	KP	
△ F1 .2	1C		F05-4022-05	FUSE (250V 4A)	M	
29	3A, 3B		G01-1751-04	COMPRESSION SPRING (KNØB)		
-		*	H01-7420-04	ITEM CARTON CASE		
-			H10-3339-02	POLYSTYRENE FOAMED FIXTURE (F)		
-			H10-3340-02	POLYSTYRENE FOAMED FIXTURE (R)		
-			H25-0232-04	PROTECTION BAG (235X350X0.03)		
-			H25-0274-04	PROTECTION BAG (900X500X0.05)		
37	2A, 2B		J02-0182-15	FOOT		
38	2B		J19-0515-05	UNIT HOLDER (H=14.6)		
39	3C		J19-0586-05	UNIT HOLDER (H=6.7)		
40	2B		J19-2536-05	UNIT HOLDER		
41	1D		J42-0083-05	POWER CORD BUSHING		
-			J61-0307-05	WIRE BAND		
45	2B		K27-1396-04	KNØB (BUTTON) CARTRIDGE		
46	2B, 3B		K29-1980-04	KNØB ASSY (BUTTON) TAPE, DIGITAL		

E: Scandinavia & Europe K: USA P: Canada

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47	2B		K29-2243-04	KNØB ASSY (BUTTON) BASS, TREBLE		
48	3A		K29-2303-04	KNØB (SPEAKERS, DUAL REC OUT)		
49	3A		K29-2305-04	KNØB (TONE)		
50	3B		K29-2307-04	KNØB (BUTTON) INPUT SELECTOR		
51	2B		K29-2432-03	KNØB ASSY (BUTTON) POWER		
52	3A		K29-2510-04	KNØB ASSY (CAP) VOLUME CONTROL		
53	3A	*	K29-2585-04	KNØB ASSY (BUTTON) DIGITAL DIR		
△ 57	1B	*	L01-7541-05	POWER TRANSFORMER	KP	
△ 57	1B	*	L01-7542-05	POWER TRANSFORMER	E	
△ 57	1B	*	L01-7545-05	POWER TRANSFORMER	M	
△ 57	1B	*	L01-7547-05	POWER TRANSFORMER	T	
-		*	L92-0019-05	FERRITE CORE		
63	1B		N10-2090-46	HEXAGON NUT (M9)		
D	2B, 1D	*	N09-1790-05	MACHINE SCREW		
L	1B		N09-0301-05	TAPTITE SCREW (Ø3X8)		
67	1D		S90-0093-05	REMOTE SWITCH SHAFT (REC OUT)		
68	1D		S90-0094-05	REMOTE WIRE (SPEAKERS)		
69	1D		S90-0095-05	REMOTE WIRE (DUAL REC OUT)		
70	1C		S90-0100-05	REMOTE SWITCH SHAFT (SPEAKERS)		
△ -			S59-1055-05	THERMAL SWITCH	MTE	
-			S59-1056-05	THERMAL SWITCH		
S1	2B		S40-1094-05	PUSH SWITCH (POWER TYPE)	KP	
POWER SUPPLY UNIT (X00-2390-51)						
△ C1			C91-0023-05	CERAMIC 0.01UF AC250V	M	
△ C1			C91-0647-05	CERAMIC 0.01UF P	KPTE	
△ 78	1C	*	E03-0077-05	AC OUTLET	M	
△ 78	1C	*	E03-0078-05	AC OUTLET	KP	
82	1C		J13-0041-05	FUSE CLIP	KPM	
82	1C		J13-0054-05	FUSE CLIP	TE	
△ S1			S31-2083-05	SLIDE SWITCH (POWER TYPE)	M	
POWER AMPLIFIER UNIT (X07-2320-82)						
C1 .2			CE04KW0J102M	ELECTRO 1000UF 6.3WV		
C3 .4			CC45FSL1H220J	CERAMIC 22PF J		
C5 -8			C91-0749-05	CERAMIC 220PF K		
C9 .10			CE04KW1C220M	ELECTRO 22UF 16WV		
C11 .12			CF92FV1H153J	MF 0.015UF J		
C13 .14			CF92FV1H122J	MF 1200PF J		
C15		*	CF92FV1H122J	MF 1200PF J		
C16			CF92FV1H122J	MF 1200PF J		
C17 .18			CK45FB2H102K	CERAMIC 1000PF K		
C19 .20			CK45FB1H471K	CERAMIC 470PF K		
C21 .22			CF92FV1H473J	MF 0.047UF J		
C23 -30			CE04KW2A010M	ELECTRO 1.0UF 100WV		
C33 .34			C91-0747-05	CERAMIC 150PF K		
C35 .36			CC45FSL1H101J	CERAMIC 100PF J		
C37			C91-0753-05	CHIP C 470PF K		
C38 -40			C91-0753-05	CHIP C 470PF K		
C101, 102			CE04KW1E221M	ELECTRO 220UF 25WV		
C103			CE04KW0J471M	ELECTRO 470UF 6.3WV		
C104			CE04KW2A010M	ELECTRO 1.0UF 100WV		
C105			CE04KW1A471M	ELECTRO 470UF 10WV		

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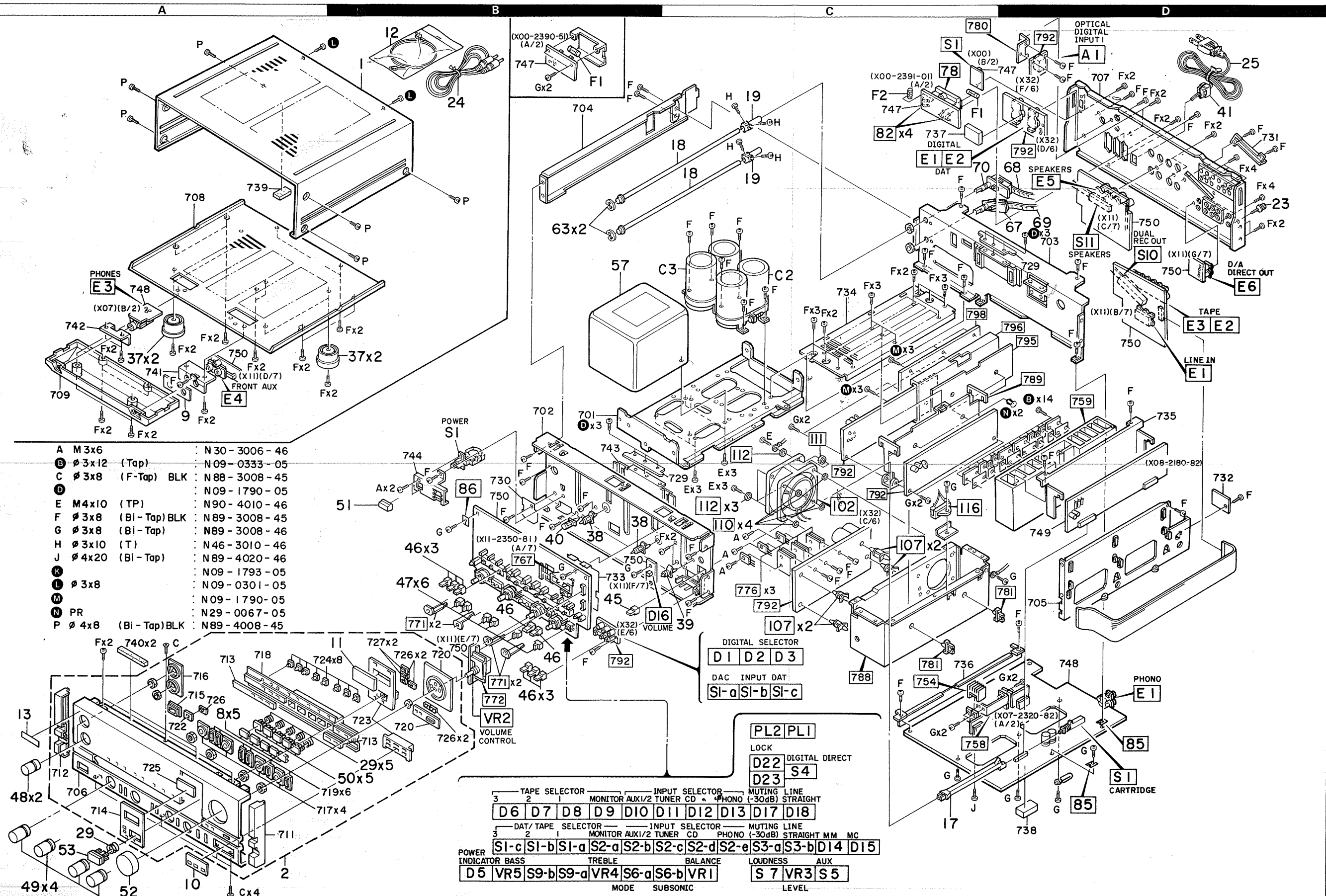
U: PX (Far East, Hawaii) T: England M: Other Areas

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KA-3300D KA-3300D

EXPLODED VIEW



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Parts with the exploded numbers larger than 700 are not supplied.

PARTS LIST

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C106 C107 C108 C109 C110			CE04KW2A010M CF92FV1H392J CF92FV1H392J CE04KW1C220M C90-1333-05	ELECTR0 1.0UF 100WV MF 3900PF J MF 3900PF J ELECTR0 22UF 16WV NP-ELEC 22UF 10WV		
C111 C112 C113 C114 C115-120			CF92FV1H223J CE04KW1V4R7M CE04KW1C470M CE04KW1H101M CK45FE2H103P	MF 0.022UF J ELECTR0 4.7UF 35WV ELECTR0 47UF 16WV ELECTR0 100UF 50WV CERAMIC 0.010UF P		
C121,122 C123,124 C125 C126 C127			CE04KW1V102M CE04KW1E221M CE04KW1V221M CF92FV1H103J CE04KW1E470M	ELECTR0 1000UF 35WV ELECTR0 220UF 25WV ELECTR0 220UF 35WV MF 0.010UF J ELECTR0 47UF 25WV		
C128 C129,130 C131,132 C133,134 C135,136			CK45FB1H102K CE04KW1V471M CE04KW1A470M CF92FV1H103J CE04KW1HR22M	CERAMIC 1000PF K ELECTR0 470UF 35WV ELECTR0 47UF 10WV MF 0.010UF J ELECTR0 0.22UF 50WV		
C137,138 C139,140 C141 C142			C91-0033-05 CE04KW2A220M CC45SL1H151J CK45F1H473Z	MF 1UF 100V ELECTR0 22UF 100WV CERAMIC 150PF J CERAMIC 0.047UF Z		
85 E1 E3	3D 3D 1A	* * *	E23-0125-05 E13-0236-05 E11-0170-05	TERMINAL PHONE JACK (2P) PHONE JACK		
L1 ,2 B CP1 -4 R1 ,2 R3 ,4 R11 -14 R15 -18 R19 -22 R23 -26 R27 -30 R31 -34 R35 -38 R39 -46 R47 -50 R61 -64 R65 -68 R73 ,74 R81 ,82 R83 ,84 R104,105 R109,110 R111,112 R118 R121,122 R131 R132	2D		L40-1011-47 N09-0333-05 R90-0187-05 RN14BK2C1960FTS RN14BK2C4752FTS RD14AB2E821J RD14AB2E561J RD14AB2E150J RD14AB2E151J RD14AB2E331J RD14AB2E221J RD14AB2E271J RD14AB2E220J RD14AB2E4R7J RD14AB2E911J RD14AB2E471J RS14DB3D220JTE RN14BK2C4752FTS RN14BK2C5620FTS RD14AB2E471J RD14AB2E330J RD14AB2E561J RD14AB2E102J RD14AB2E471J RS14DB3D681JTE RD14AB2E100J	SMALL FIXED INDUCTOR(100UH,K) TAPPING SCREW (Ø3X12)TR MULTI-COMP 0.22X2 K 5W RN 196.0 F 1/6W RN 47.5K F 1/6W FL-PROOF RD 820 J 1/4W FL-PROOF RD 560 J 1/4W FL-PROOF RD 15 J 1/4W FL-PROOF RD 150 J 1/4W FL-PROOF RD 330 J 1/4W FL-PROOF RD 220 J 1/4W FL-PROOF RD 270 J 1/4W FL-PROOF RD 22 J 1/4W FL-PROOF RD 4.7 J 1/4W FL-PROOF RD 910 J 1/4W FL-PROOF RD 470 J 1/4W FL-PROOF RS 22 J 2W RN 47.5K F 1/6W RN 562.0 F 1/6W FL-PROOF RD 470 J 1/4W FL-PROOF RD 33 J 1/4W FL-PROOF RD 560 J 1/4W FL-PROOF RD 1.0K J 1/4W FL-PROOF RD 470 J 1/4W FL-PROOF RS 680 J 2W FL-PROOF RD 10 J 1/4W		

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R133 R134 R135,136 R137 R138,139		*	RD14AB2E4R7J RS14DB3D472JTE RS14DB3D182JTE RD14AB2E330J RD14AB2E560J	FL-PROOF RD 4.7 J 1/4W FL-PROOF RS 4.7K J 2W FL-PROOF RS 1.8K J 2W FL-PROOF RD 33 J 1/4W FL-PROOF RD 56 J 1/4W		
R141,142 R143,144 R152,153 VR1 ,2			RD14AB2E150J RD14AB2E101J RD14AB2E100J R12-0094-05	FL-PROOF RD 15 J 1/4W FL-PROOF RD 100 J 1/4W FL-PROOF RD 10 J 1/4W TRIMMING POT. (470)BIAS		
S1	3D		S40-6027-05	PUSH SWITCH (CARTRIDGE)		
D1 ,2 D1 ,2 D3 -5 D3 -5 D6		*	HZS20S(B) RD20JS(B) HZS8, 2S(B2) RDB, 2JS(B2) HZS5, 1S(B2)	ZENER DIODE ZENER DIODE ZENER DIODE ZENER DIODE ZENER DIODE		
D6 D7 D7 D8 D9 ,10			RD5, 1JS(B2) 1SS133 1SS176 E-202 E-152	ZENER DIODE DIODE DIODE CONSTANT CURRENT DIODE CONSTANT CURRENT DIODE		
D11 ,12 D13 -16 D13 -16 D17 -22 D17 -22			MA27Q(A) HZS5, 1S(B2) RD5, 1JS(B2) 1SS133 1SS176	VARISTOR ZENER DIODE ZENER DIODE DIODE DIODE		
D23 -26 D51 D51 D52 D53			RU4Z 1SS131 1SS178 DSM1A1 D5FB20*1	DIODE DIODE DIODE DIODE DIODE		
D54 D55 -58 D59 ,60 D59 ,60 D61			S15VB20 DSM1A1 HZS16N(B2) RD16ES(B2) HZS18N(B)	DIODE DIODE ZENER DIODE ZENER DIODE ZENER DIODE		
D61 D62 -64 D65 ,66 D65 ,66 D67 ,68		*	RD18ES(B) E-152 HZS8, 2S(B2) RDB, 2JS(B2) DSM1A1	ZENER DIODE CONSTANT CURRENT DIODE ZENER DIODE ZENER DIODE DIODE		
IC1 ,2 IC3 Q1 ,2 Q3 ,4 Q5 ,6			TA2030 UPC1237HA 2SC945(A) (Q,P) 2SA733(A) (Q,P) 2SC1384NC (Q,R)	IC (LO/HI SWITCHING) IC (POWER AMP) TRANSISTOR TRANSISTOR TRANSISTOR		
Q7 ,8 Q9 -12 Q13 -16 Q17 ,18 Q17 ,18		*	2SA684NC (Q,R) 2SA1123 (Q,R) 2SC2631 (Q,R) 2SC3944A (Q) 2SC3944A (R)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q19 ,20 Q19 ,20 Q21 ,22 Q23 ,24		*	2SA1535A (Q) 2SA1535A (R) 2SC3419 (Y) 2SC2320 (E,F)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		

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Q23 ,24 Q25 ,26 Q27 ,28 Q29 ,30 Q31 ,32		*	2SC945(A) (Q,P) DAT1018NS*5 DAT1018PS*5 2SC3284*5 2SA1303*5	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q33 ,34 Q35 ,36 Q51 Q52 Q53		*	2SC2631 (Q,R) 2SA1123 (Q,R) 2SD1266 (Q,P) 2SB941 (Q,P) 2SC1845 (F,E)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q54 Q55 Q56 Q57 Q58 ,59			2SA992 (F,E) 2SA1110 (Q,R) 2SC2632 (Q,R) 2SA992 (F,E) 2SD1266 (Q,P)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q60 Q61 Q61 Q62 Q62		*	2SB941 (Q,P) 2SC2320 (E,F) 2SC945(A) (Q,P) 2SA733(A) (Q,P) 2SA999 (E,F)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
PRE AMPLIFIER UNIT (X08-2180-82)						
C1 ,2 C3 ,4 C5 ,6 C7 ,8 C9 ,10			CE04KW0J331M CK45FB1H152K CK45FB1H222K CE04KW1H010M CK45FB1H222K	ELECTR CERAMIC CERAMIC ELECTR CERAMIC	330UF 1500PF 2200PF 1.0UF 2200PF	6.3WV K K 50WV K
C11 ,12 C13 ,14 C17 ,18 C19 ,20 C21 ,22			CE04KW1A101M CQ93HP2A683G CQ93HP2A203G CE04KW0J102M CK45FB1H102K	ELECTR MYLAR MYLAR ELECTR CERAMIC	100UF 0.068UF 0.020UF 1000UF 1000PF	10WV G G 6.3WV K
C23 ,24 C25 ,26 C27 ,28 C33 ,34 C35 ,36			CE04KW1A101M C90-1332-05 CF92FV1H392J CC45FSL1H101J CK45FB1H152K	ELECTR NP-ELEC MF CERAMIC CERAMIC	100UF 10UF 3900PF 100PF 1500PF	10WV 16WV J J K
C37 ,38 C39 ,40 C41 ,42 C43 ,44 C45 ,46			CE04KW1H010M CE04KW0J102M CQ93HP2A683G CQ93HP2A203G C90-1332-05	ELECTR ELECTR MYLAR MYLAR NP-ELEC	1.0UF 1000UF 0.068UF 0.020UF 10UF	50WV 6.3WV G G 16WV
C47 ,48 C61 ,62 C63 ,64 C65 ,66 C67 -70			CF92FV1H392J CC45FSL1H101J CC45FSL1H470J CF92FV1H122J C90-1335-05	MF CERAMIC CERAMIC MF NP-ELEC	3900PF 100PF 47PF 1200PF 4.7UF	J J J J 50WV
C71 ,72 C73 ,74 C81 C82 C83 ,84		*	CK45FB1H152K CC45FSL2H180J CE04KW0J471M CE04KW1E101M CF92FV1H103J	CERAMIC CERAMIC ELECTR ELECTR MF	1500PF 18PF 470UF 100UF 0.010UF	K J 6.3WV 25WV J
C85 C86 C87 C88			CF92FV1H224J CE04KW1C220M CK45FF1H103Z CK45FB1H152K	MF ELECTR CERAMIC CERAMIC	0.22UF 22UF 0.010UF 1500PF	J 16WV Z K

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C89 C90 C91 C92 -95			CK45FB1H222K CK45FF1H103Z CE04KW1V100M CF92FV1H103J	CERAMIC 2200PF K CERAMIC 0.010UF Z ELECTRO 10UF 35WV MF 0.010UF J		
R21 ,22 R23 ,24 R29 ,30 R43 -46 R47 -50		*	RN14BK2C5112FTS RN14BK2C3831FTS RN14BK2E3R30FTS RD14AB2E100JTS RS14DB3A101JTE	RN 51.1K F 1/6W RN 3.83K F 1/6W RN 3.30 F 1/4W FL-PROOF RD 10 J 1/4W FL-PROOF RS 100 J 1W		
R67 ,68 R69 ,70 R71 ,72 R93 ,94 R95 ,96		*	RN14BK2C82R0FTS RN14BK2C4752FTS RN14BK2C3831FTS RN14BK2C1003FTS RN14BK2C3161FTS	RN 82.0 F 1/6W RN 47.5K F 1/6W RN 3.83K F 1/6W RN 100K F 1/6W RN 3.16K F 1/6W		
R121,122 R123,124 R125,126 R127,128 R129,130		*	RD14AB2E331JTS RD14AB2E101JTS RD14AB2E122JTS RD14AB2E181JTS RD14AB2E331JTS	FL-PROOF RD 330 J 1/4W FL-PROOF RD 100 J 1/4W FL-PROOF RD 1.2K J 1/4W FL-PROOF RD 180 J 1/4W FL-PROOF RD 330 J 1/4W		
R131,132 R151		*	RD14AB2E101JTS RS14DB3A101JTE	FL-PROOF RD 100 J 1/4W FL-PROOF RS 100 J 1W		
D1 ,2 D1 ,2 D3 ,4 D9 ,10 D9 ,10			HZS5.1S(B2) RD5.1JS(B2) MA27W(A) HZS5.1S(B2) RD5.1JS(B2)	ZENER DIODE ZENER DIODE VARISTOR ZENER DIODE ZENER DIODE		
D11 ,12 D11 ,12 D13 ,14 D15 -18 D21			1SS133 1SS176 MA27Q(A) E-272 HZS5.1S(B2)	DIODE DIODE VARISTOR CONSTANT CURRENT DIODE ZENER DIODE		
D21 D22 D22 D23 D24			RD5.1JS(B2) 1SS133 1SS176 E-272 HZS16N(B2)	ZENER DIODE DIODE DIODE CONSTANT CURRENT DIODE ZENER DIODE		
D24 D25 D25 IC1 ,2 IC1 ,2			RD16ES(B2) 1SS133 1SS176 NE5532P NJM5532D-D	ZENER DIODE DIODE DIODE IC(OP AMP X2) IC(OP AMP X2)		
IC3 Q1 -4 Q5 -10 Q5 -10 Q11 ,12		*	UPD4027BC 2SD786(R,S) 2SC2320(E,F) 2SC945(A)(Q,P) 2SC2003(L,K)	IC(JK FLIP-FL0P X2) TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q13 ,14 Q15 -18 Q15 -18 Q19 -24 Q19 -24		*	2SA954(L,K) 2SK369(BL,V) 2SK371(BL,V) 2SC2320(E,F) 2SC945(A)(Q,P)	TRANSISTOR FET FET TRANSISTOR TRANSISTOR		
Q25 ,26 Q27 -30 Q27 -30			UPA68H(K,L) 2SC2320(E,F) 2SC945(A)(Q,P)	DUAL FET TRANSISTOR TRANSISTOR		

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Q31 -34 Q31 -34 Q35 -42 Q43 ,44 Q45 -47			2SA733(A)(Q,P) 2SA999(E,F) 2SC2632(Q,R,S) 2SA1124(Q,R,S) 2SC2320(E,F)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q45 -47 Q48 Q48 Q49			2SC945(A)(Q,P) 2SA733(A)(Q,P) 2SA999(E,F) 2SA954(L,K)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
CONTROL UNIT (X11-2350-81)						
D5 D6 -8 D9 -15 D16 D17	3B 3B 3B,3C 3B 3C		B30-0431-05 B30-1010-05 B30-0431-05 B30-1178-05 B30-0431-05	LED(LN21CPH) POWER INDICATOR LED(SLP-281F-50U) TAPE SEL LED(LN21CPH) INPUT SEL,MM,MC LED (VOLUME) LED(LN21CPH) MUTING		
D18 D22 D23 PL1 ,2	3C 3C 3C 3C		B30-0432-05 B30-0431-05 B30-0432-05 B30-1025-05	LED(LN31GCPH(U)) LINE STRAIGHT LED(LN21CPH) LOCK LED(LN31GCPH(U)) LAMP(14V 0.08A) DIG, INTERFACE		
C1 -20 C21 ,22 C23 ,24 C25 ,26 C27 ,28			C91-0747-05 C91-0753-05 CF92FV1H224J CC45FSL1H101J CF92FV1H333J	CERAMIC 150PF K CHIP C 470PF K MF 0.22UF J CERAMIC 100PF J MF 0.033UF J		
C29 ,30 C31 -34 C35 -38 C39 -42 C43 -46			CE04KW1H010M CC45FSL1H101J CF92FV1H684J CE04KW1C220M CF92FV1H334J	ELECTRO 1.0UF 50WV CERAMIC 100PF J MF 0.68UF J ELECTRO 22UF 16WV MF 0.33UF J		
C47 -50 C51 ,52 C53 ,54 C55 ,56 C57 ,58			CF92FV1H393J CC45FSL1H221J CF92FV1H393J CE04KW1H2R2M CK45FB1H102K	MF 0.039UF J CERAMIC 220PF J MF 0.039UF J ELECTRO 2.2UF 50WV CERAMIC 1000PF K		
C59 ,60 C61 -64 C65 -68 C69 ,70 C71 ,72			CF92FV1H334J CF92FV1H104J CK45FF1H472Z C90-1335-05 CE04KW1E470M	MF 0.33UF J MF 0.10UF J CERAMIC 4700PF Z NP-ELEC 4.7UF 50WV ELECTRO 47UF 25WV		
C74 C75 ,76			CE04KW1H010M CC45FSL1H101J	ELECTRO 1.0UF 50WV CERAMIC 100PF J		
E6 E1 E2 ,3 E4 E5	2B 2D 2D 2A 1D		E23-0149-05 E13-0628-05 E13-0624-05 E13-0233-05 E20-0824-05	TERMINAL PHONE JACK(6P) LINE IN PHONE JACK(6P) TAPE PHONE JACK(2P) FRONT AUX SCREW TERMINAL BOARD(8P) SPKRS		
E6	1D	*	E13-0240-05	PHONE JACK D/A DIRECT OUT		
---			J61-0307-05	WIRE BAND		
L1 ,2 L3 ,4			L40-1021-14 L39-0080-15	SMALL FIXED INDUCTOR(1.0MH,K) PHASE-COMPENSATION COIL		
R3 ,4 R37 ,38			RN14BK2C3160FTS RD14AB2E330JTS	RN 316.0 F 1/6W FL-PROOF RD 33 J 1/4W		

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R39 ,40 R41 ,42 R43 ,44 R53 R55			RS14DB3A100JTE RS14DB3D180JTE RS14DB3D561JTE RD14AB2E102JTS RS14DB3D222JTE	FL-PROOF RS 10 J 1W FL-PROOF RS 18 J 2W FL-PROOF RS 560 J 2W FL-PROOF RD 1.0K J 1/4W FL-PROOF RS 2.2K J 2W		
R56 R57 R59			RS14DB3D472JTE RS14DB3D222JTE RS14DB3D561JTE	FL-PROOF RS 4.7K J 2W FL-PROOF RS 2.2K J 2W FL-PROOF RS 560 J 2W		
VR1 VR2	2B 3C		R06-5143-05 R10-5023-05	POTENTIOMETER(200K)BALANCE POTENTIOMETER (VOLUME CONTROL		
VR3 VR4 VR5	3C 3B 3B		R06-5154-05 R06-2017-05 R06-2016-05	POTENTIOMETER(100KX2)LEVEL POTENTIOMETER(5KBX2) TREBLE POTENTIOMETER(5KBX2) BASS		
K1 ,2 K3 S1 S2 S3	3B 3B,3C 3C	*	S51-2045-05 S51-2074-05 S42-3093-05 S42-5045-05 S42-2145-05	MAGNETIC RELAY MAGNETIC RELAY MULTIPLE PUSH SWITCH(TAPE SEL MULTIPLE PUSH SWITCH(MONI,ETC MULTIPLE PUSH SWITCH(MUTE,LINE		
S4 S5 S6 S7 S9	3C 3C 3B,3C 3C 3B		S40-4062-05 S40-2200-05 S42-2109-05 S40-2200-05 S42-2137-05	PUSH SWITCH (DIGITAL DIRECT PUSH SWITCH (AUX) MULTIPLE PUSH SWITCH(MQ,SUBS) PUSH SWITCH (LOUDNESS) MULTIPLE PUSH SWITCH		
S10 S11	1D 1D		S90-0078-05 S90-0062-05	SLIDE SWITCH (DUAL REC OUT) SLIDE SWITCH (SPEAKERS)		
D1 -3 D1 -3			HZS13N(B2) RD13ES(B2)	ZENER DIODE ZENER DIODE		
D4 D4 D19 -21			1SS131 1SS178 1SS131	DIODE DIODE DIODE		
D19 -21 D24 -26 D24 -26 IC1 Q1			1SS178 1SS131 1SS178 NJM2041D-D 2SC1845(F,E)	DIODE DIODE DIODE IC(OP AMP X2) TRANSISTOR		
Q2 ,3 Q2 ,3 Q4 Q4			2SC2320(E,F) 2SC945(A)(Q,P) 2SC2167(Q,Y) 2SD1266(Q,P)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
COMPOUND ASS'Y UNIT (X90-2262-71)						
C1			CK45B1H122K	CERAMIC 1200PF K		
102	2C	*	FD9-0064-05	FAN		
107	2C,3C		J19-2598-05 J61-0033-05	HOLDER WIRE BAND		
110 111 112 K M	2C 2C 2C 2C 2C	*	N19-1077-05 N10-2040-46 N16-0040-46 N09-1793-05 N09-1790-05	FLAT WASHER HEXAGON NUT (M4) SPRING WASHER MACHINE SCREW (FAN) MACHINE SCREW		
N	2D		N29-0067-05	PUSH RIVET (3.5X4.5)		
116	2C	*	S59-1080-05	THERMAL SWITCH		

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PROCESSOR UNIT (X32-1112-71)						
D1 -3 C1 ,2 C3 ,4 C5 ,6 C7 ,8 C9 ,10	3C		B30-0431-05 CQ09FS1H151JZS CQ93HP2A332GMA CQ93HP2A122GMA C91-0168-05 CQ93HP2A122GMA	LED(LN21CPH) DIGITAL SELECTOR POLYSTY 150PF J MYLAR 3300PF G MYLAR 1200PF G POLYSTY 68PF K MYLAR 1200PF G		
C11 ,12 C13 ,14 C15 ,16 C17 ,18 C19 ,20		*	CQ93HP2A472GMA C91-0168-05 CQ93HP2A472GMA CQ93HP2A562GMA C91-0175-05	MYLAR 4700PF G POLYSTY 68PF K MYLAR 4700PF G MYLAR 5600PF G POLYSTY 56PF K		
C21 ,22 C23 ,24 C25 ,26 C27 ,28 C29 ,30		*	CQ93HP2A562GMA CQ93HP2A332GMA CE04KW1A471MEL CQ09FS1H101JZS C91-0175-05	MYLAR 5600PF G MYLAR 3300PF G ELECTRO 470UF 10WV POLYSTY 100PF J POLYSTY 56PF K		
C31 ,32 C33 ,34 C35 ,36 C37 -44 C45 -48		*	C91-0174-05 CQ93HP2A472GMA C90-1353-05 CE04KW0J471MEL CE04KW1H010MEL	POLYSTY 47PF K MYLAR 4700PF G NP-ELEC 10UF 25WV ELECTRO 470UF 6.3WV ELECTRO 1.0UF 50WV		
C71 -73 C74 -76 C77 -80 C81 C82		*	CF92FV1H103J CE04JW1E330MEL CE04JW1V100MEL CE04JW1A101MEL C91-0735-05	MF 0.010UF J ELECTRO 33UF 25WV ELECTRO 10UF 35WV ELECTRO 100UF 10WV CERAMIC 39PF J		
C83 C84 C85 C86 C87		*	C91-0927-05 CQ09FS1H681JZS CE04DWOJ331MEL CE04JW1A101MEL CC45FSL1H220J	POLYSTY 56PF G POLYSTY 680PF J ELECTRO 330UF 6.3WV ELECTRO 100UF 10WV CERAMIC 22PF J		
C88 C89 C90 C91 C92			CC45FSL1H101J CF92FV1H474J CF92FV1H473J CC45FSL1H270J CF92FV1H103J	CERAMIC 100PF J MF 0.47UF J MF 0.047UF J CERAMIC 27PF J MF 0.010UF J		
C93 C94 C98 C99 C100		*	C91-0735-05 CF92FV1H104J CF92FV1H224J CF92FV1H103J CE04KW1A470MEL	CERAMIC 39PF J MF 0.10UF J MF 0.22UF J MF 0.010UF J ELECTRO 47UF 10WV		
C101 C102-110 C111 C113 C115,116		*	CE04KW0J102MEL CE04JW1V100MEL C91-0769-05 C91-0769-05 C91-0769-05	ELECTRO 1000UF 6.3WV ELECTRO 10UF 35WV CERAMIC 0.01UF M CERAMIC 0.01UF M CERAMIC 0.01UF M		
C117,118 C119,120 C121,122 C123,124 C125-128		*	CE04KW1A101MEL C91-0769-05 CE04KW1C470MEL CE04KW1C331MEL CF92FV1H103J	ELECTRO 100UF 10WV CERAMIC 0.01UF M ELECTRO 47UF 16WV ELECTRO 330UF 16WV MF 0.010UF J		
C129			C90-1335-05	NP-ELEC 4.7UF 50WV		

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C130 C131-134 C135 C136,137 C138,139			CE04KW1A101MEL CE04KW1E222MEL CE04KW1A101MEL CE04KW1H010MEL CE04KW1C332MEL	ELECTR0 100UF 10WV ELECTR0 2200UF 25WV ELECTR0 100UF 10WV ELECTR0 1.0UF 50WV ELECTR0 3300UF 16WV		
C140 C141 C142,143 C144,145 C146-150			CE04KW1C101MEL CE04KW1V100MEL CE04KW1C332MEL CE04KW0J222MEL CK45FF1H103Z	ELECTR0 100UF 16WV ELECTR0 10UF 35WV ELECTR0 3300UF 16WV ELECTR0 2200UF 6.3WV CERAMIC 0.010UF Z		
C151,152 C153 C154 C155			CE04KW1E101MEL C91-0757-05 C91-0757-05 CK45FF1H103Z	ELECTR0 100UF 25WV CERAMIC 0.001UF K CERAMIC 0.001UF K CERAMIC 0.010UF Z		
E1 E2	1C	*	E13-0129-05 E13-0239-05	PHONE JACK(1P) REC PHONE JACK(1P) DIGITAL INPUT		
L1 L2 L3 L4 ,5 L6 ,7		*	L40-4701-14 L92-0018-05 L40-1021-14 L40-1021-11 L40-1021-14	SMALL FIXED INDUCTOR(47UH,K) FERRITE CORE SMALL FIXED INDUCTOR(1.0MH,K) SMALL FIXED INDUCTOR(1.0MH,K) SMALL FIXED INDUCTOR(1.0MH,K)		
L8			L39-0142-05	MATCHING COIL		
R1 ,2 R3 ,4 R5 ,6 R7 ,8 R9 ,10		*	RN14BK2C3161FTS RN14BK2C1621FTS RN14BK2C1003FTS RN14BK2C4991FTS RN14BK2C1001FTS	RN 3.16K F 1/6W RN 1.62K F 1/6W RN 100K F 1/6W RN 4.99K F 1/6W RN 1.00K F 1/6W		
R11 ,12 R13 ,14 R15 ,16 R17 ,18 R19 ,20		*	RN14BK2C3831FTS RN14BK2C3481FTS RN14BK2C1621FTS RN14BK2C1001FTS RN14BK2C9090FTS	RN 3.83K F 1/6W RN 3.48K F 1/6W RN 1.62K F 1/6W RN 1.00K F 1/6W RN 909.0 F 1/6W		
R21 ,22 R23 ,24 R25 ,26 R27 ,28 R29 ,30		*	RN14BK2C3161FTS RN14BK2C9090FTS RN14BK2C1001FTS RN14BK2C5620FTS RN14BK2C1003FTS	RN 3.16K F 1/6W RN 909.0 F 1/6W RN 1.00K F 1/6W RN 562.0 F 1/6W RN 100K F 1/6W		
R31 ,32 R33 ,34 R37 ,38 R41 ,42 R43 ,44		*	RN14BK2C1621FTS RN14BK2C3161FTS RN14BK2C1002FTS RN14BK2C9092FTS RN14BK2C9090FTS	RN 1.62K F 1/6W RN 3.16K F 1/6W RN 10.0K F 1/6W RN 90.9K F 1/6W RN 909.0 F 1/6W		
R45 ,46 R47 ,48 R49 ,50 R98 R99		*	RN14BK2C1002FTS RN14BK2C5622FTS RN14BK2C1000FTS RN14BK2C1962FTS RN14BK2C1003FTS	RN 10.0K F 1/6W RN 56.2K F 1/6W RN 100.0 F 1/6W RN 19.6K F 1/6W RN 100K F 1/6W		
R100 R101 R130 VR1 ,2		*	RN14BK2C7501FTS RN14BK2C4322FTS RD14GB2E101JTS R12-1409-05	RN 7.50K F 1/6W RN 43.2K F 1/6W FL-PROOF RD 100 J 1/4W TRIMMING POT. (LEVEL ADJ)		
K1 ,2 S1	3C	*	S51-2074-05 S42-3104-05	MAGNETIC RELAY MULTIPLE PUSH SWITCH(DIGITAL		

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D4 -11 D4 -11 D14 D15 -23 D15 -23		*	1SS133 1SS176 1SS237(1) 1SS133 1SS176	DIODE DIODE DIODE DIODE DIODE		
D24 D25 ,26 D25 ,26 D27 -35 D36 -40			E-272 HZ55.1S(B2) RD5.1JS(B2) DSM1A1 1SS133	CONSTANT CURRENT DIODE ZENER DIODE ZENER DIODE DIODE DIODE		
D36 -40 D41 IC1 ,2 IC3 -10 IC21		*	1SS176 MA156 PCM56P-K NE5532P TC74HCU04F	DIODE DIODE IC(DA CONVERTER) IC(OP AMP X2) IC(HEX INVERTER)		
IC22,23 IC24 IC25 IC26 IC27		*	TC74HCU0F TC74HCU04F TC74HC386P TC74HC123P MC4044P	IC(QUAD 2-INPUT NAND GATE) IC(HEX INVERTER) IC(EXCLUSIVE OR GATE) IC(DUAL MONO MULTI) IC(PHASE-FREQ DETECTOR)		
IC28 IC29 IC30 IC31 IC32		*	SN74LS624N TC74HC74P TC74HC393P TC74HC112P TC74HC86P	IC(VCO) IC(D-FLIP FLOP) IC(DUAL BINARY COUNTER) IC(JK FLIP FLOP) IC(EXCLUSIVE OR GATE)		
IC33 IC34 IC37 IC39 IC40		*	TC74HC112P TC74HCU04P NJM555D TC74HCU0P TC74HCU04P	IC(JK FLIP FLOP) IC(HEX INVERTER) IC(TIMER) IC(QUAD 2-INPUT NAND GATE) IC(HEX INVERTER)		
IC41 IC41 IC42 IC43,44 IC45		*	SM5804B-T SM5804D-T CXD1076P TC74HCU04P UPC78L05	IC(DIGITAL FILTER FOR CD) IC(DIGITAL FILTER) IC(DIGITAL AUDIO DATA) IC(HEX INVERTER) IC(VOLTAGE REGULATOR/ +5V)		
IC46 IC47 IC48 IC49 Q1 ,2		*	NJM79L05A AN7805F AN7905F MS220P 2SA733(A)(Q,P)	IC(VOLTAGE REGULATOR/ +5V) IC(VOLTAGE REGULATOR/ +15V) IC(VOLTAGE REGULATOR/ -5V) IC(OP AMP X2) TRANSISTOR		
Q1 ,2 Q3 ,4 Q3 ,4 Q5 ,6 Q7		*	2SA999(E,F) 2SC2320(E,F) 2SC945(A)(Q,P) 2SC2003(L,K) 2SD1266(Q,P)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
Q8		*	2SB941(Q,P)	TRANSISTOR		
A1	1D	*	W02-0726-05	OPTIC RECEIVING MODULE		

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SPECIFICATIONS

Power Output

150 watts per channel minimum RMS, both channels driven, at 8 ohms from 20 Hz to 20,000 Hz with no more than 0.004% total harmonic distortion

Maximum Continuous Power Output (DIN) 1 kHz at 4 ohms	220 W
Maximum Continuous Power Output (DIN) 1 kHz at 8 ohms	160 W
Maximum Continuous Power Output (IEC/NF) from 63 Hz to 12,500 Hz, 0.7%	
Total Harmonic Distortion at 8 ohms	160 W + 160 W
Dynamic Power	178 W per channel at 8 ohms 320 W per channel at 4 ohms 460 W per channel at 2 ohms

Total Harmonic Distortion

AUX input to SPEAKER output (20 Hz - 20,000 Hz)	: 0.004% at 150 W into 8 ohms
(20 Hz - 20,000 Hz)	: 0.003% at 75 W into 8 ohms
PHONO input to SPEAKER output (1 kHz)	: 0.005% at 150 W with VOLUME -20 dB
Intermodulation Distortion (60 kHz:7 kHz = 4:1)	: 0.003% at 150 W into 8 ohms
Damping Factor	: 1,000 (50 Hz into 8 ohms)
Power Bandwidth	: 5 Hz to 50 kHz at 0.04% T.H.D.
Frequency Response	: 1 Hz to 150 kHz/+0 dB, -3 dB

Input Sensitivity/Impedance

PHONO (MM)	: 2.5 mV/ 47 kohms
PHONO (MC)	: 0.1 mV/100 ohms
TUNER/AUX/TAPE	: 150 mV/ 47 kohms

Signal to Noise Ratio (IHF-A)

PHONO (MM)	: 87 dB (2.5 mV)
PHONO (MC)	: 76 dB (250 μ V)
TUNER/AUX/TAPE	: 110 dB

Signal to Noise Ratio Unweighted: 50 mW (DIN)

PHONO (MM)	: 60 dB
PHONO (MC)	: 60 dB
TAPE/AUX/TUNER	: 63 dB

Channel Separation (at 1,000 Hz) (DIN)

PHONO (Terminated with 2.2 kohms)	: 67 dB
AUX (Terminated with 47 kohms + 250 pF)	: 58 dB

Phono Input Capacity (DIN)

(MM)	: 250 pF
(MC)	: 1,650 pF

Phono Maximum Input Level

(MM)	: 210 mV, (RMS) T.H.D. 0.003% at 1 kHz
(MC)	: 8 mV, (RMS) T.H.D. 0.003% at 1 kHz

Output Level/Impedance

TAPE REC	: 150 mV/220 ohms
PRE OUT	: 2 V/600 ohms

Phono Frequency Response

Tone Control	: RIAA standard curve ± 0.2 dB (20 Hz to 20 kHz)
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BASS (at 50 Hz)

(at 100 Hz)	: ± 10 dB
TREBLE (at 10 kHz)	: ± 10 dB
(at 20 kHz)	: ± 10 dB

Loudness Control (at -30 dB Volume Level)

Subsonic Filter (at -3 dB)	: 0-8 dB at 100 Hz
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	: 6 dB/Oct. at 18 Hz
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D/A converter section

Digital Inputs

: Optical x 1:	-15 ~ -28 dBm
: Coaxial x 2:	0.5 Vp-p/75 ohms

Digital Output

: Coaxial x 1:	0.5 Vp-p/75 ohms
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Signal to Noise Ratio

: More than 105 dB at 1 kHz

Total Harmonic Distortion

: Less than 0.003% at 1 kHz

Channel Separation

: More than 115 dB at 1 kHz

GENERAL

Power Consumption

: 7.1 A (U.S.A. and Canada)
: 280 W (Other)

AC Outlet

: Switched x 2 (100 W)
: Unswitched x 1 (400 W) (Except European and U.K. Models)

Dimensions

: W 440 mm (17-5/16")
: H 170 mm (6-11/16")
: D 420 mm (16-9/16")

Weight (Net)

: 19.1 kg (42 lb)

(IHF'66)

Kenwood follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

Kenwood poursuit une politique de progrès constants en ce qui concerne le développement. Pour cette raison, les spécifications sont sujettes à modifications sans préavis.

Kenwood strebt ständige, Verbesserungen in der Entwicklung an. Daher bleiben Änderungen der technischen Daten jederzeit vorbehalten.

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