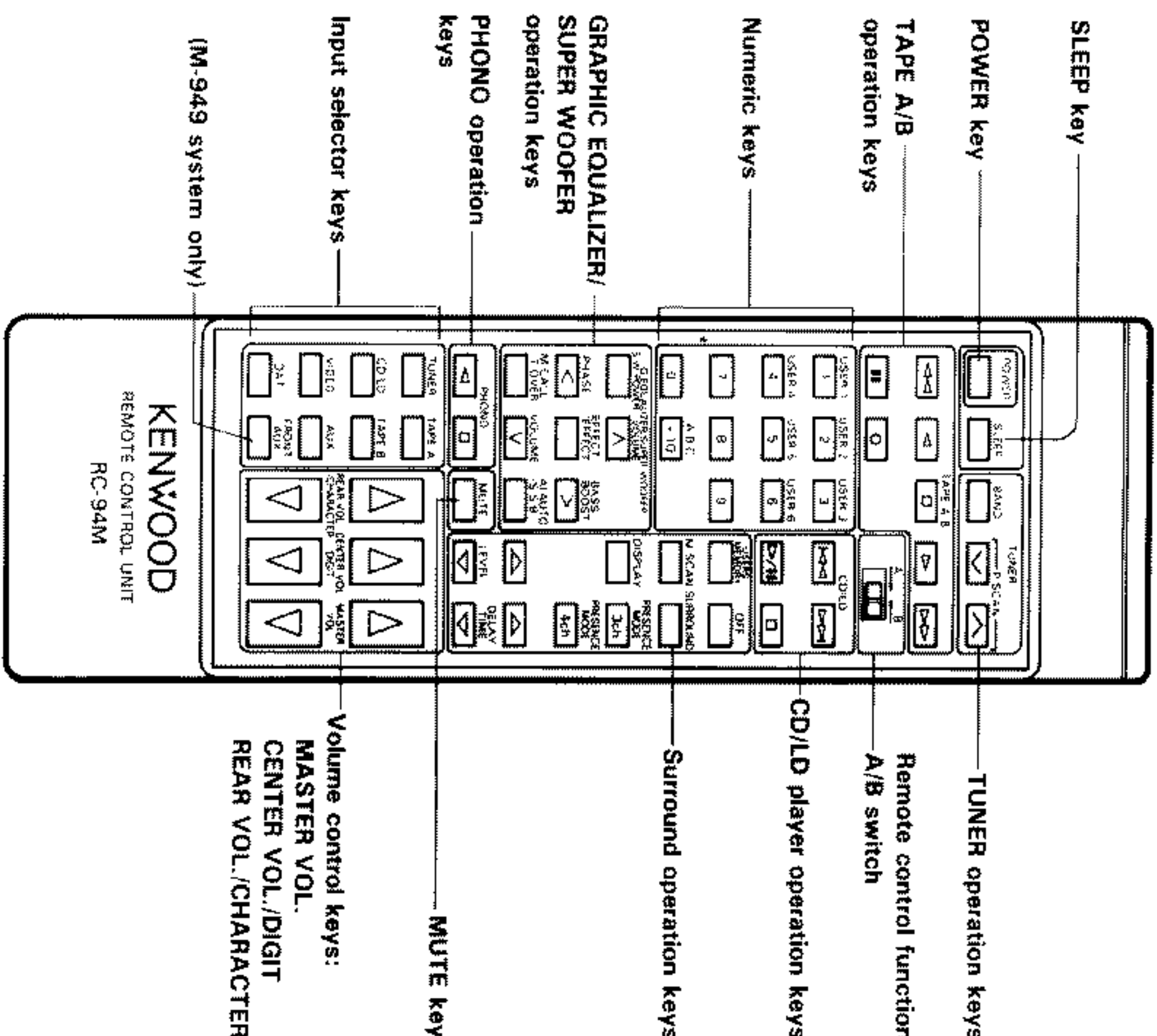


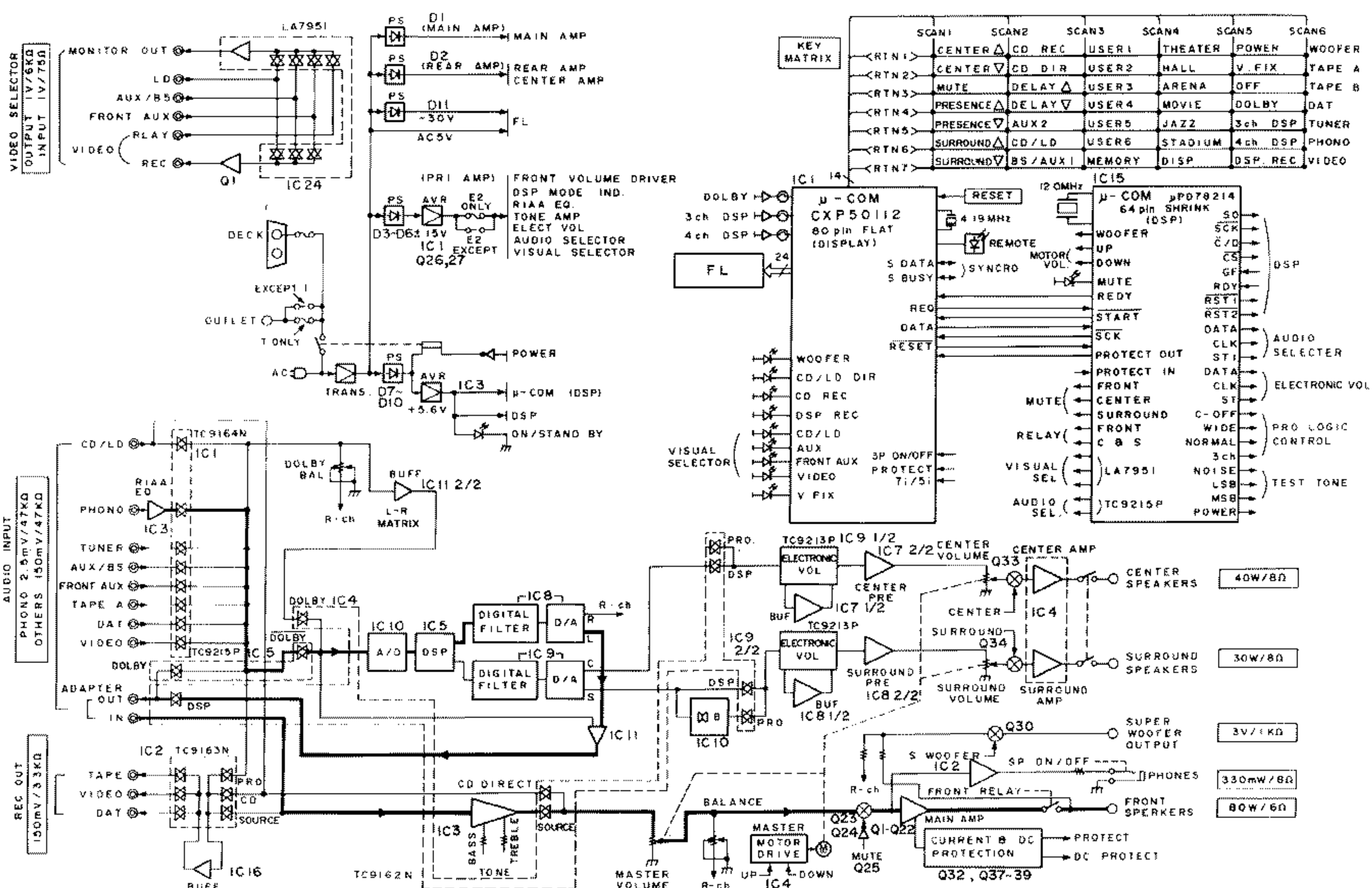
CONTENTS

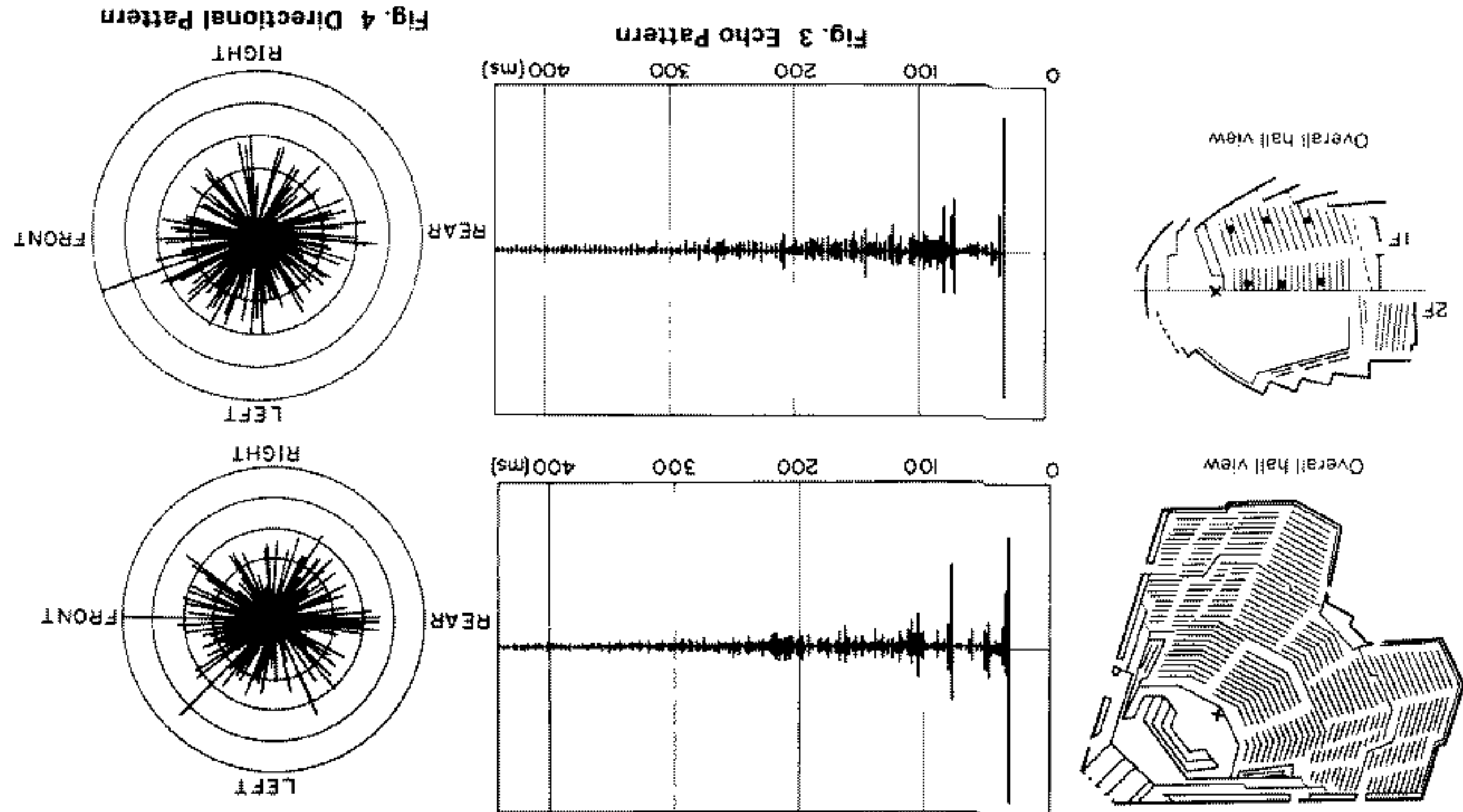
REMOTE CONTROL UNIT	2	SCHEMATIC DIAGRAM	33
BLOCK DIAGRAM	3	EXPLODED VIEW	41
CIRCUIT DESCRIPTION	4	PARTS LIST	42
WIRING DIAGRAM	23	SPECIFICATIONS	Back cover
PC BOARD	25		

REMOTE CONTROL UNIT



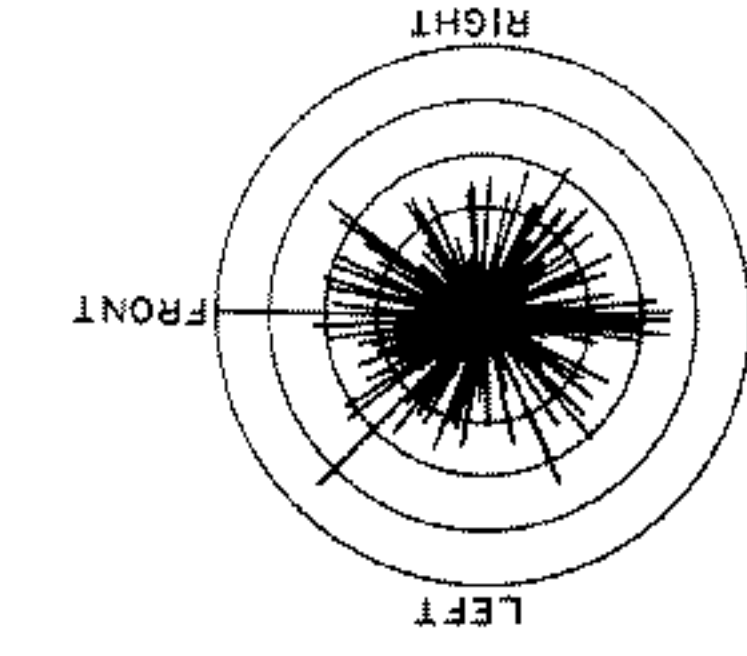
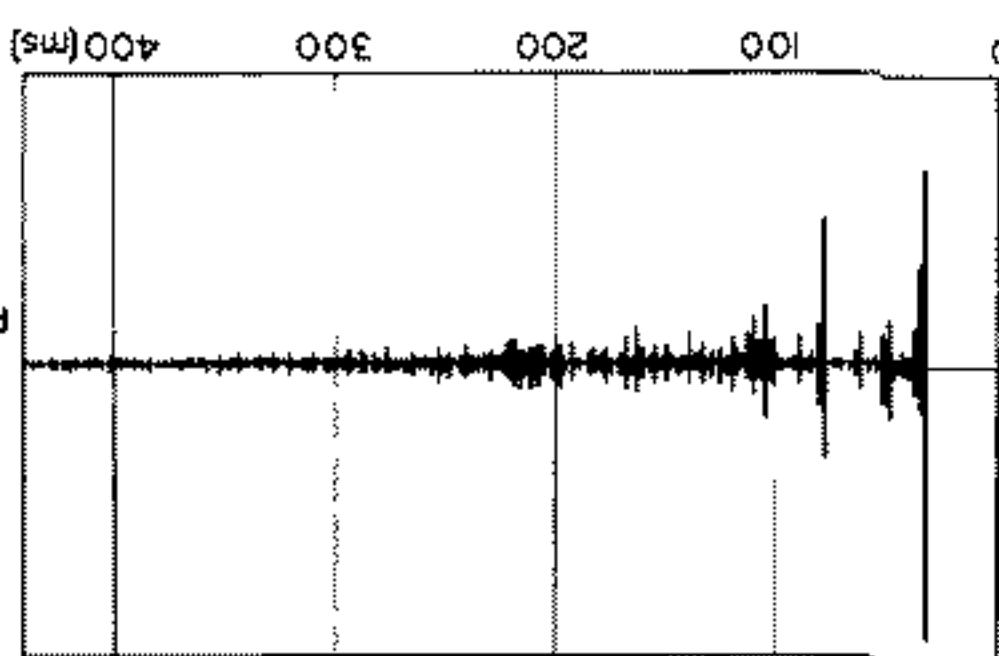
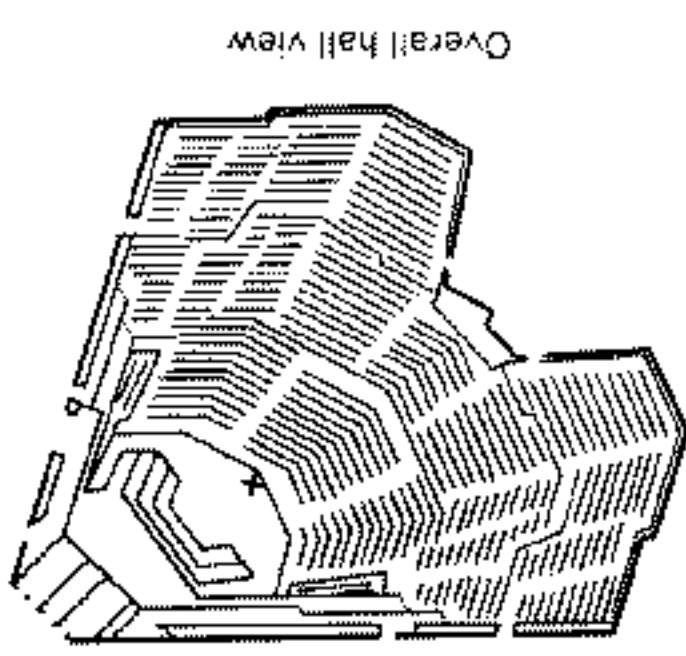
BLOCK DIAGRAM





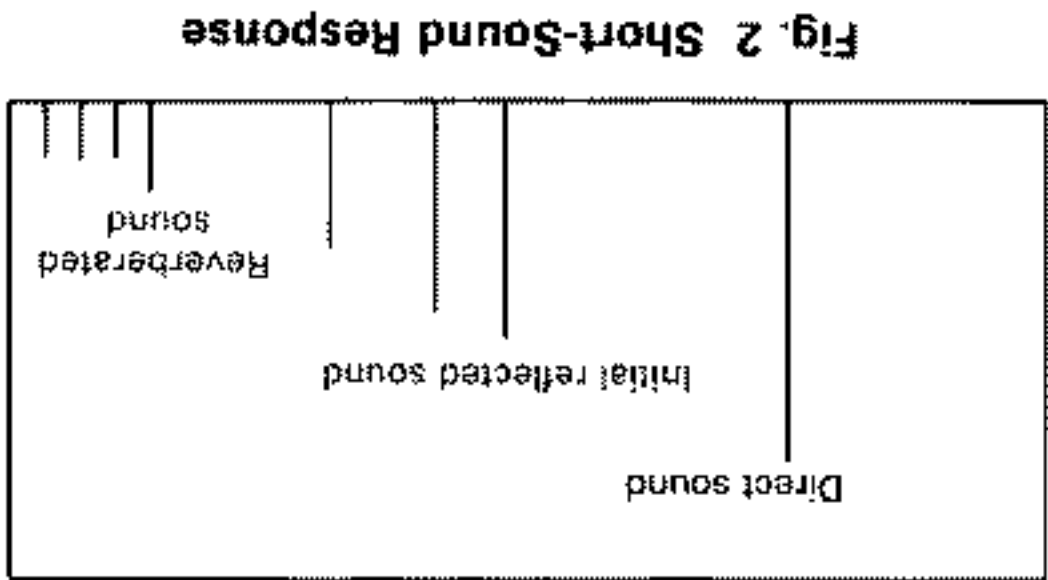
The actual sound characteristics of a concert hall are represented by an echo pattern (short-sound response) and directional pattern. The characteristic examples are shown in Figures 3 and 4.

Fig. 2-2 Overall hall view



The sound field peculiar to a concert hall consists of 1) a direct sound, 2) an initial reflected sound, and 3) a reverberated sound. The direct sound reaches the listening point directly from the sound source. The initial reflected sound reaches the listening point about 50 ms after being reflected off a wall or the ceiling several times. The reverberated sound is a high-order reflected sound that is heard as a continuous sound without a sense of direction. Figure 1 shows the conduction status of a reflected sound. Figure 2 shows the response at the listening point when a short sound is used as the sound source.

Fig. 2-1 Sound field component

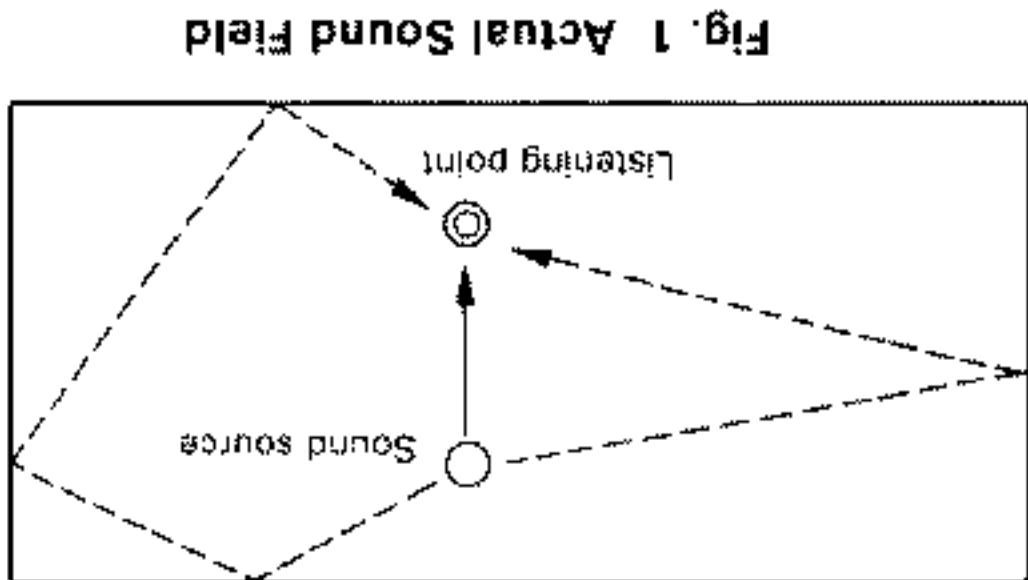


2. ACTUAL SOUND FIELD PROPERTY AND ITS MODELING

The digital signal processor (DSP) processes a digitized signal digitally to realize the desired functions. With the spread of digital audio, many audio digital processors have been developed recently. At present, the audio digital signal processor is primarily used for the following:
1) Digital filter (graphic equalizer and tone control)
2) Sound field control (hall sound creation)
The outline of the digital signal processor used for the sound field control in step 2 is described below.

DSP CIRCUIT

1. INTRODUCTION



CIRCUIT DESCRIPTION

A-94

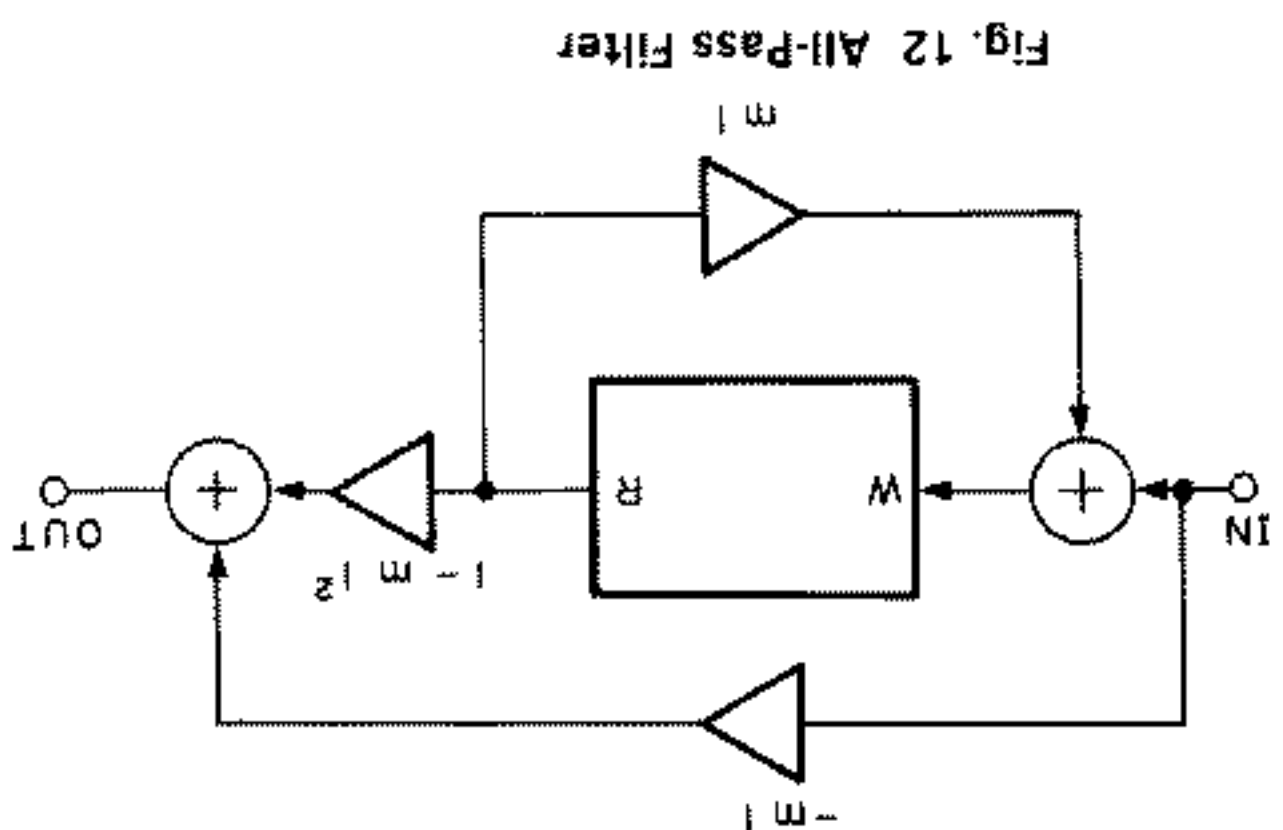


Fig. 12 All-Pass Filter

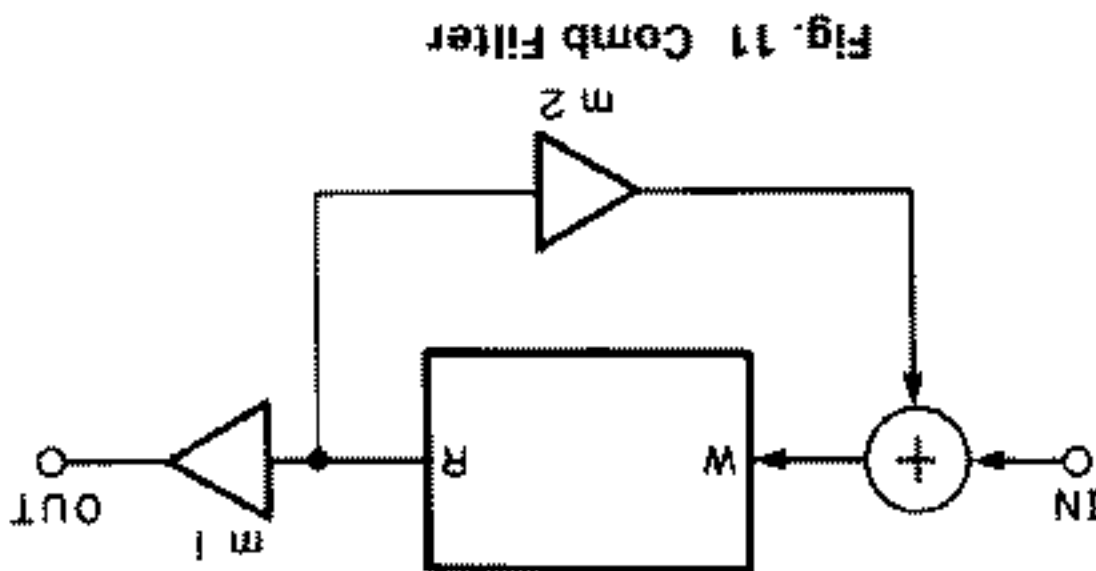


Fig. 11 Comb Filter

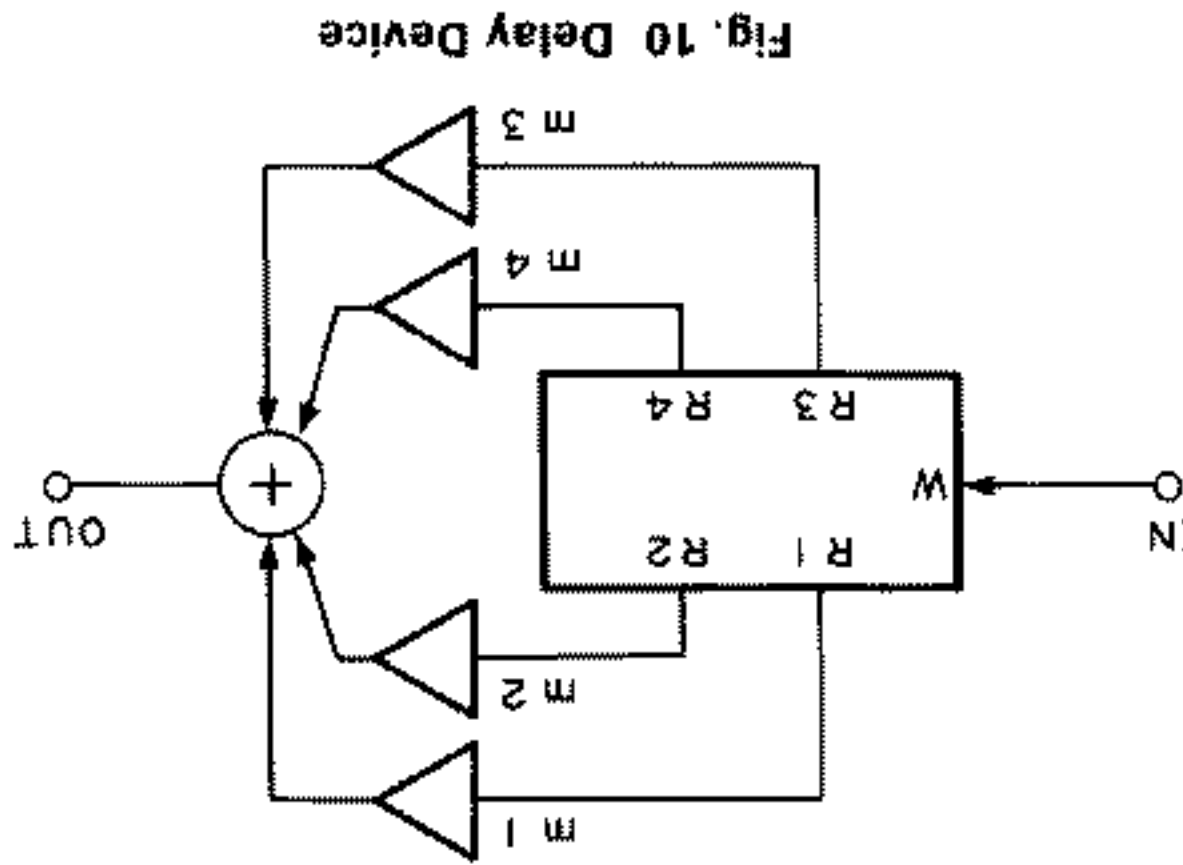
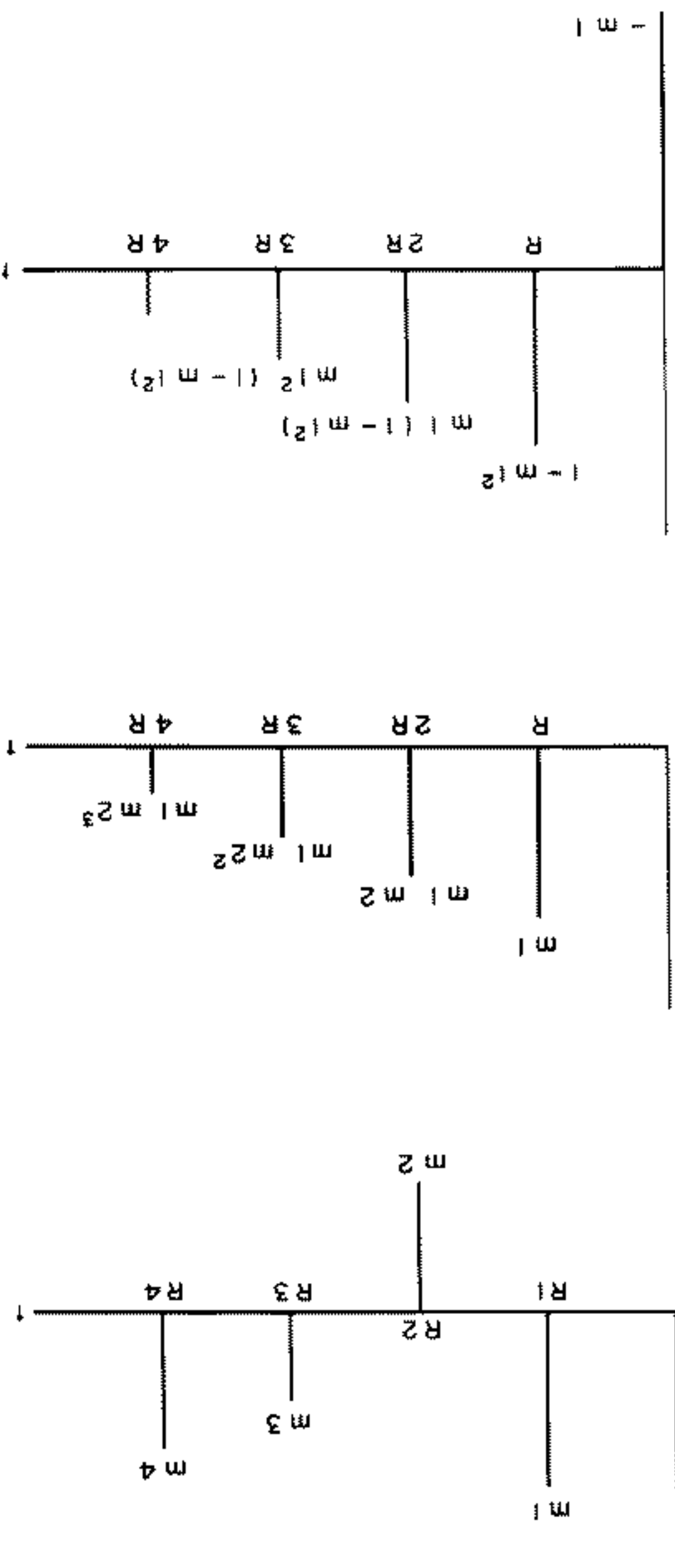


Fig. 10 Delay Device



The basic components and echo patterns used to simulate the sound field of a hall are shown in Figures 10 through 12. Figure 10 shows the delay device that reproduces the initial reflected sound. A reverberated signal is reproduced using the reverberation system of a shredder. The reverberation system consists of a comb filter, shown in Figure 11, and an all-pass filter, shown in Figure 12.

3. PROCESSING USING DIGITAL SIGNAL PROCESSOR

The sound field characteristics of the hall described in the preceding section are realized with a digital signal processor as explained below.

CIRCUIT DESCRIPTION

A-94

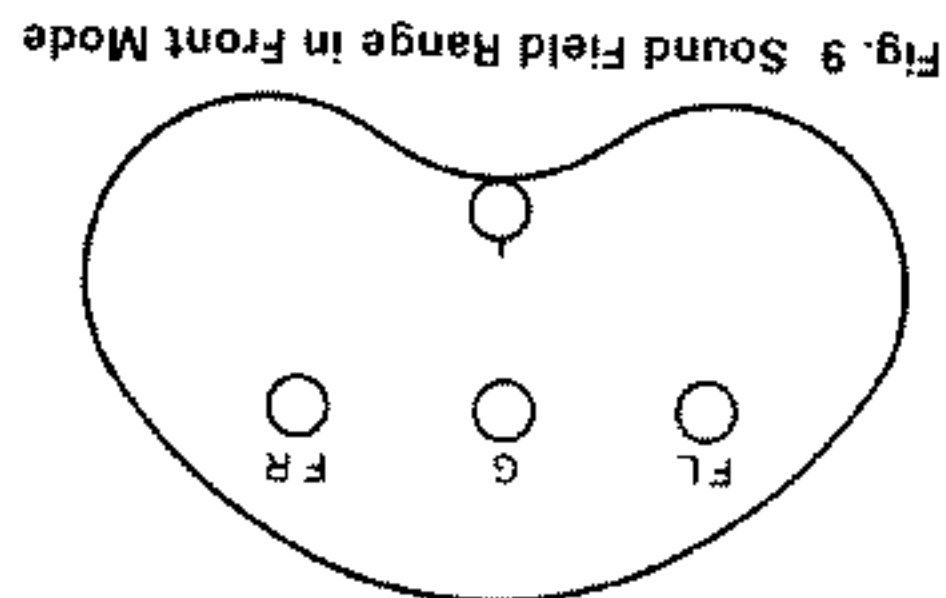


Fig. 9 Sound Field Range in Front Mode

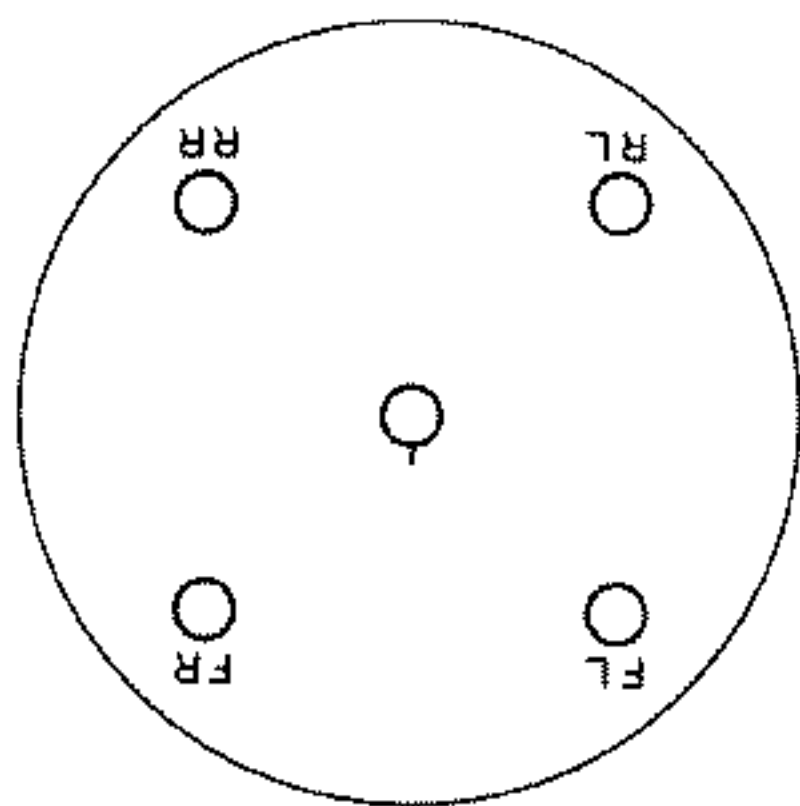


Fig. 7 Speaker Arrangement and Sound Field Range

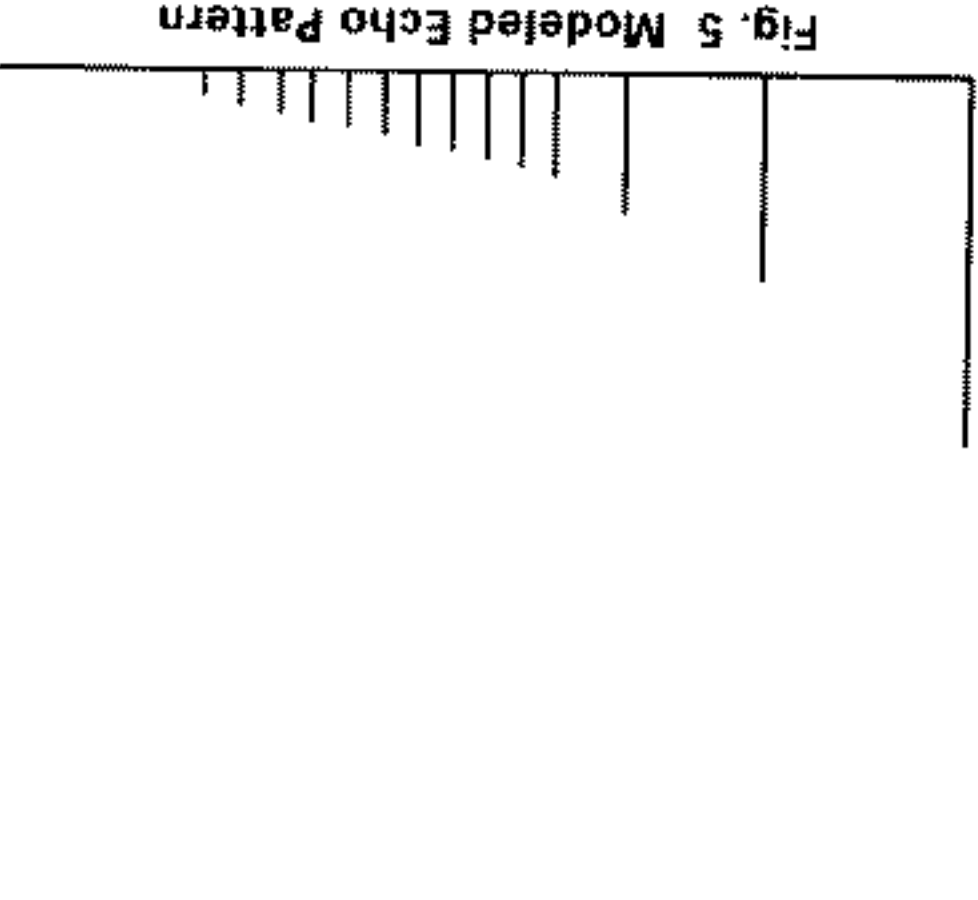


Fig. 5 Modeled Echo Pattern

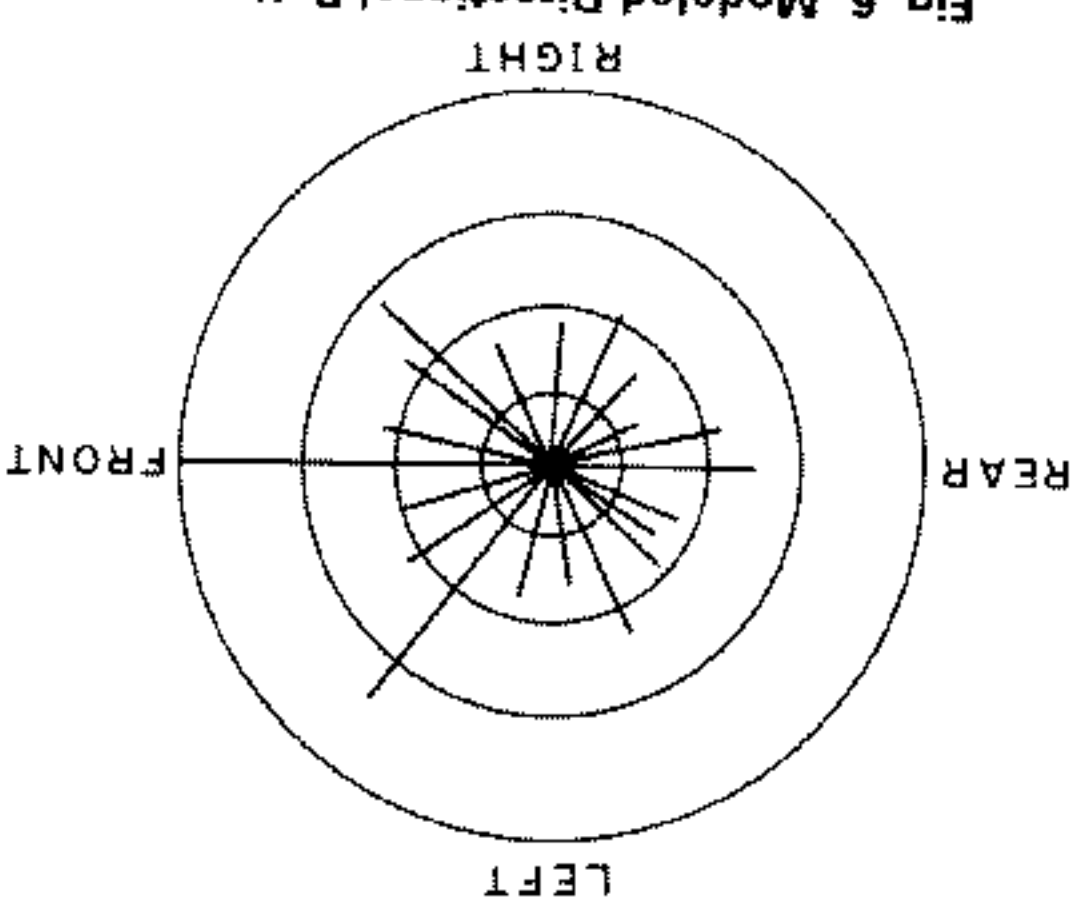


Fig. 6 Modeled Directional Pattern

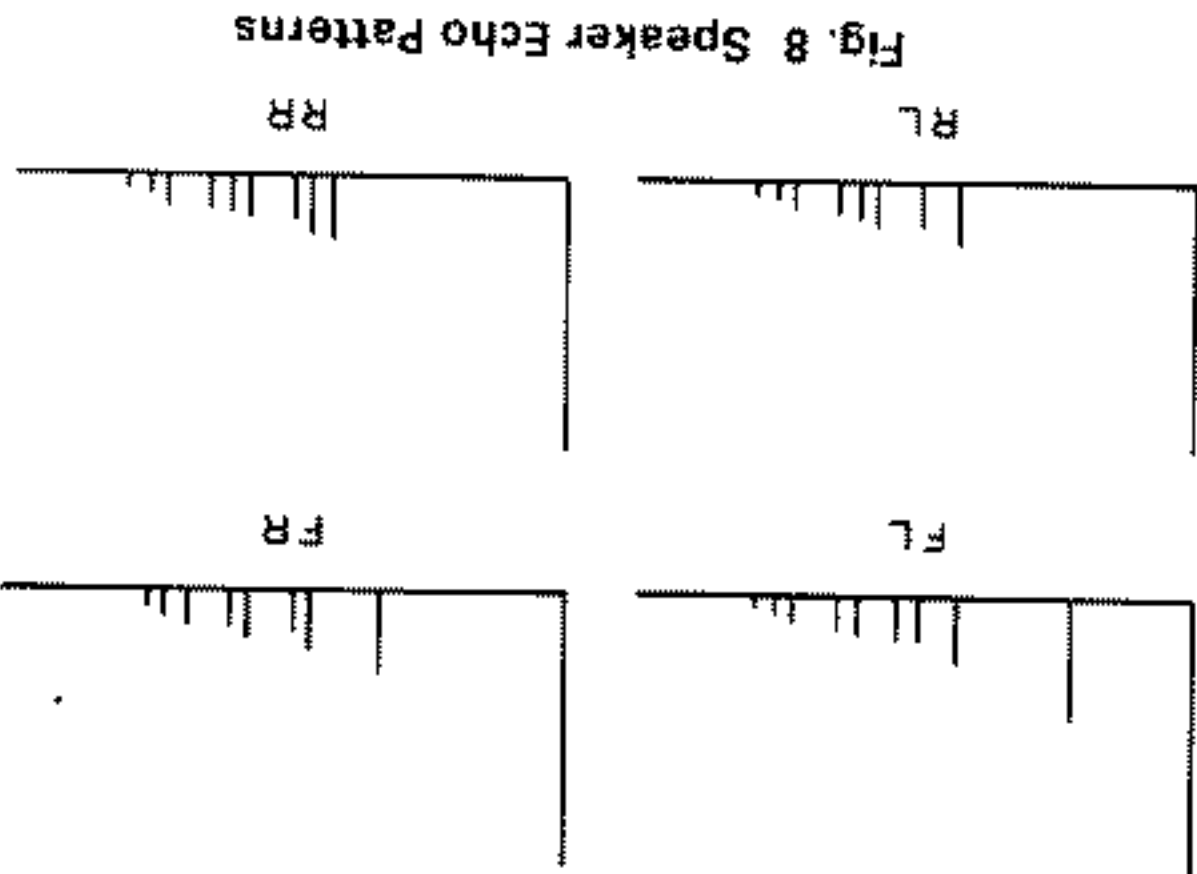


Fig. 8 Speaker Echo Patterns

To reproduce a hall sound with a digital signal processor, the sound field characteristics are modeled according to the functions of the digital signal processor, as described below.
1) Extract pulses characterizing the hall from the echo pattern shown in Figure 3.
2) Distribute the speakers used in accordance with the directional pattern shown in Figure 4.
Figures 5 and 6 show the modeled echo pattern and directional pattern.

CIRCUIT DESCRIPTION

A-94

During the above signal processing, various coefficients are used in each block in the course of signal flow. Various parameters such as reverberation time, low-pass filter cut-off frequency, and direct sound-to-indirect sound ratio, as well as initial

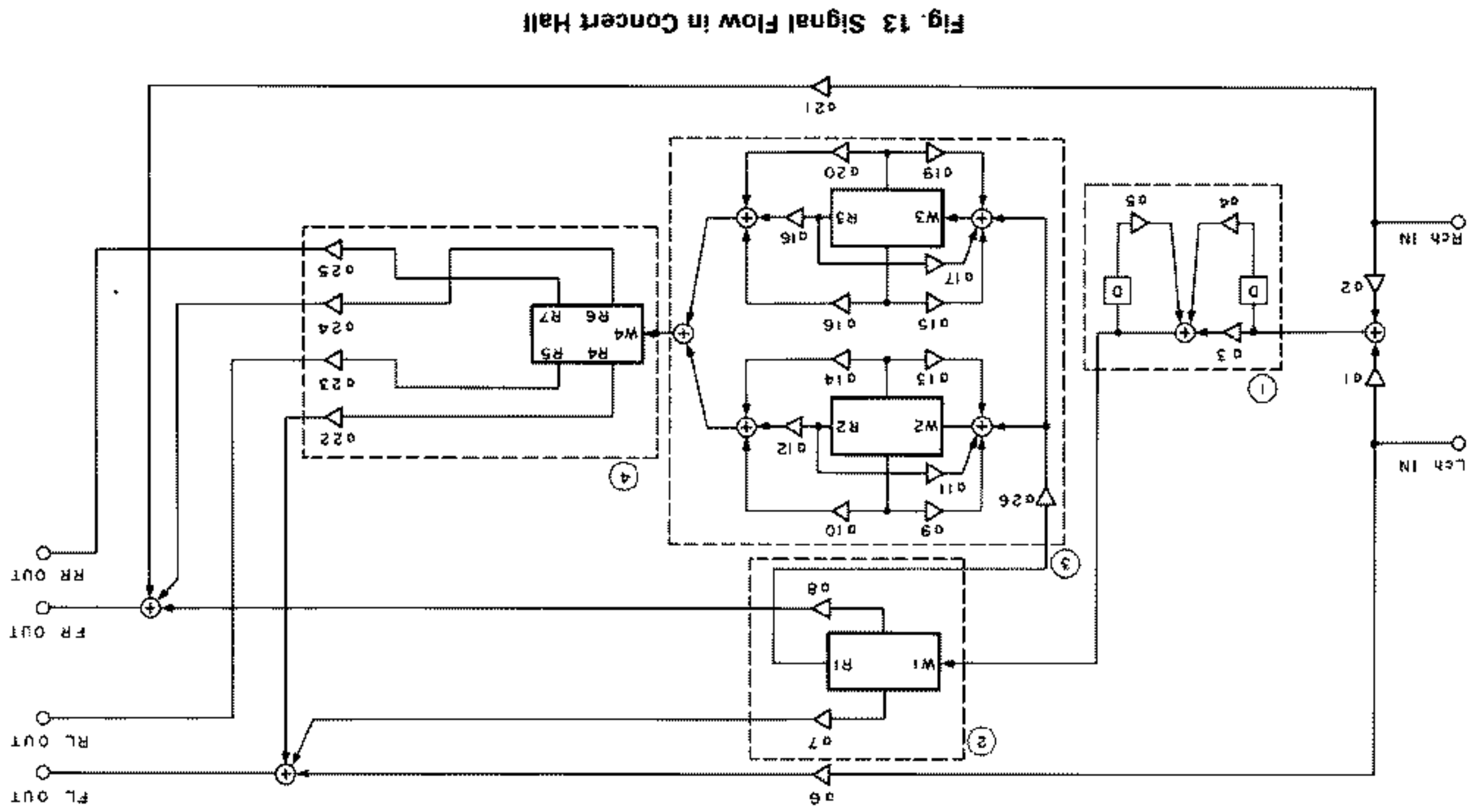


Fig. 13 Signal Flow in Concert Hall

Figure 13 shows a signal flow example when the sound field in a concert hall is reproduced with two front channels and two rear channels (4 channels in total) and four speakers based on the components in the preceding section.
The input signal for the left and right channels branches into two paths. One is output to the front left and right channels as a direct sound. The other path is used to reproduce an indirect sound. The signal path in which the indirect sound is reproduced produces an L + R mono signal to simplify the processing. The indirect sound can also produce an attenuated high-frequency component characteristic by repeating the reflection. The output signal of block 3 is input to block 4 and delayed relative to the front and rear left and right channels. The resultant signal is output to each channel.

3-2-Signal Processing Based on Signal Flow

CIRCUIT DESCRIPTION

A-94

the input and output gains of the X32-1710

+8 dB amplifier and low-pass filter (3-degree) that adjust

digital-to-analog converter includes a μ PD6376, and an

output.

The KAS03 includes a digital filter and 16-bit SH5807. The

ing of a hybrid integrated circuit (HIC), and has a 4-channel

The digital-to-analog converter uses two KAS03s consist-

(iii) D/A converter

put is a 2's complement

converter has an internal sample and hold circuit. The out-

Sixteen-bit integrating analog-to-digital converter. This

(iii) A/D converter (TD6726N)

er.

Tchebychev low-pass filter and analog-to-digital convert-

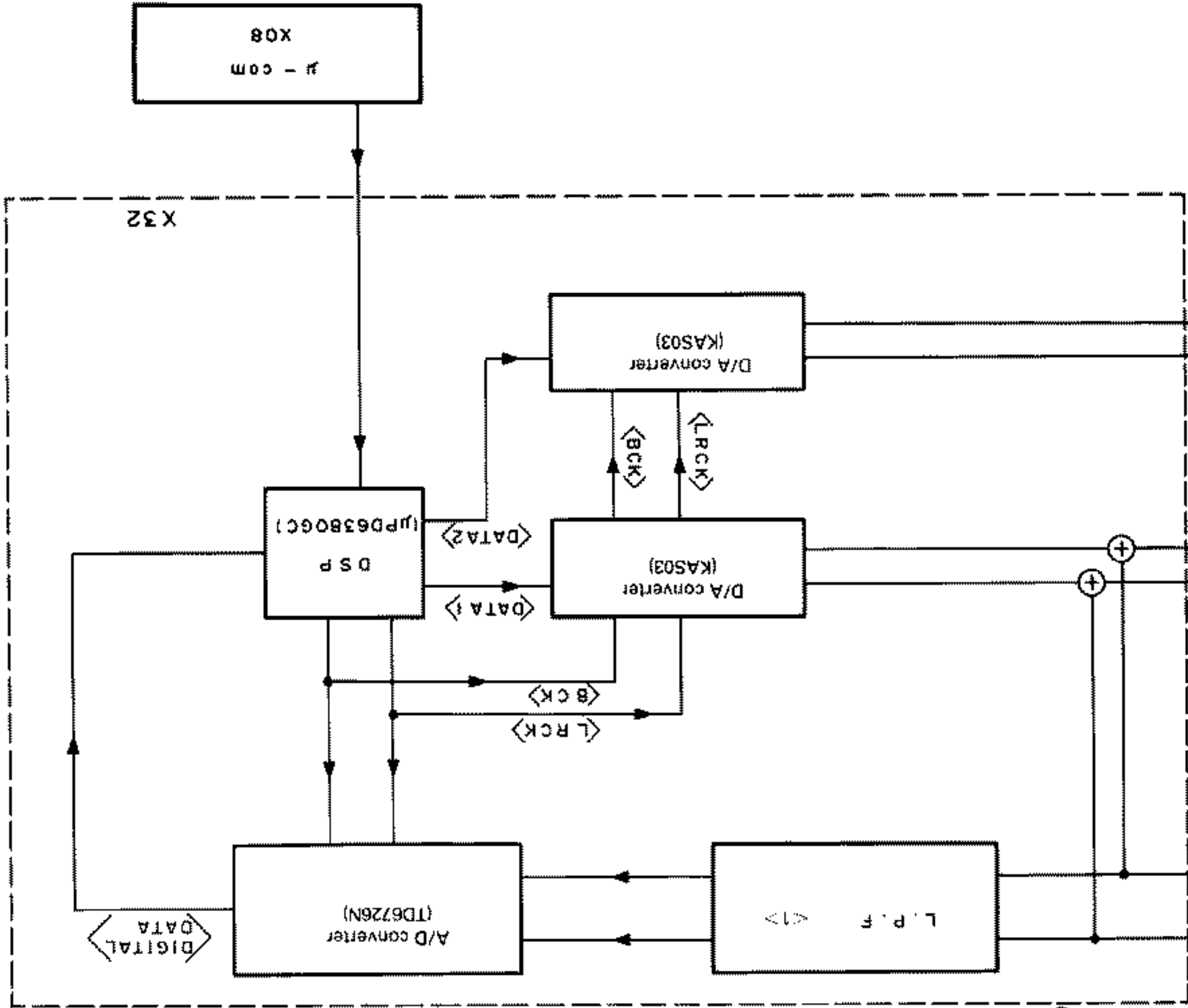
or more at 32 kHz to prevent cyclical noise in a 7-degree

Cut-off frequency f_c is 15 kHz. The voltage levels -70 dB

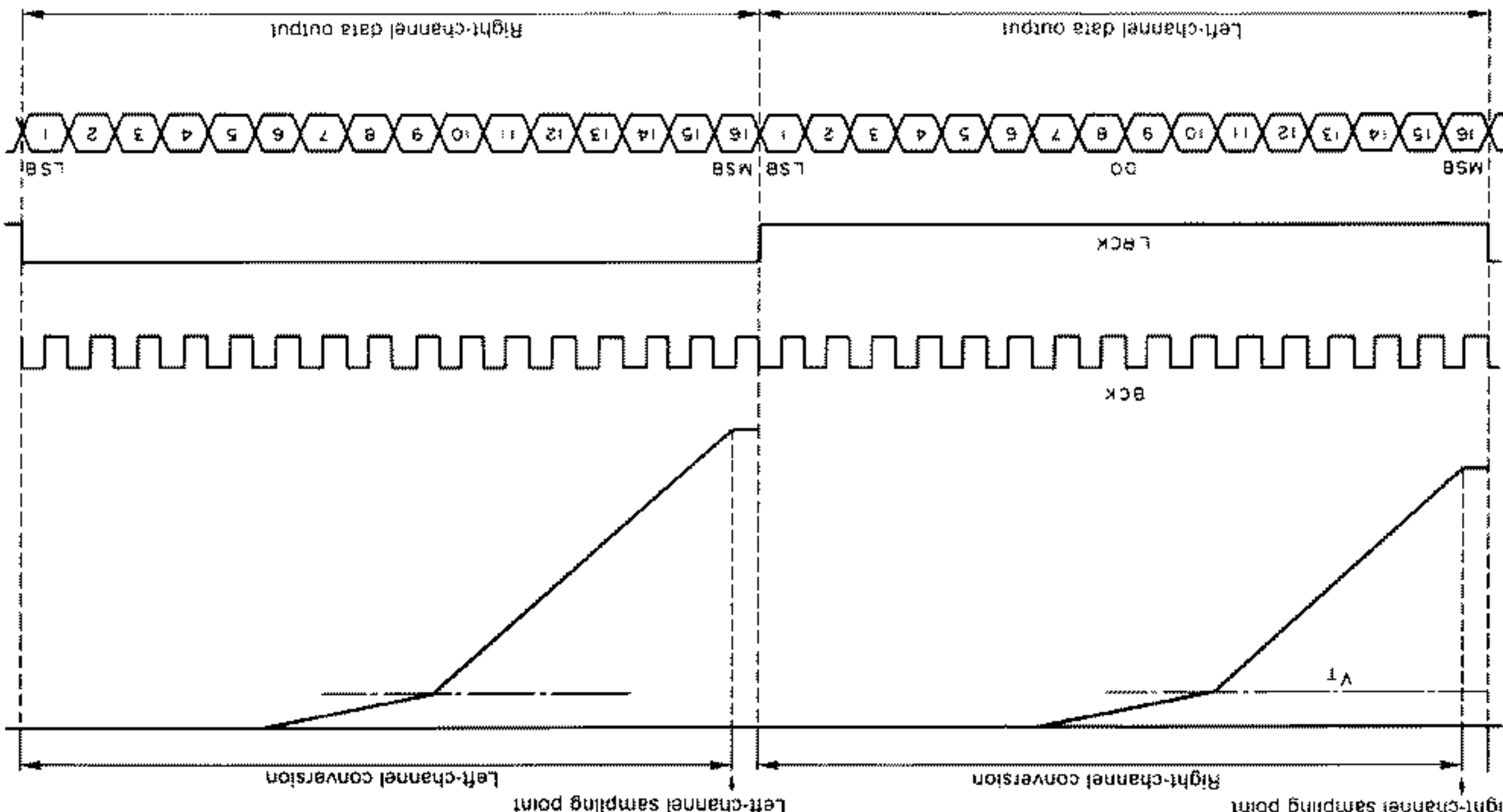
(i) Low-pass filter (LPF) <1>

- Sampling frequency $f_s = 32$ kHz
 - A/D converter MCK = 67.7376 MHz
 - D/A converter MCK = 24.576 MHz
 - Digital signal processor MCK = 12.288 MHz
- The D/A converter MCK frequency is obtained by halving
- the 24.576 MHz frequency.
- (i) The front channel output signal is produced when the out-
- put signal for which the sound field is controlled by the di-
- gital signal processor and the through data are added.

(2) Operation



CIRCUIT DESCRIPTION

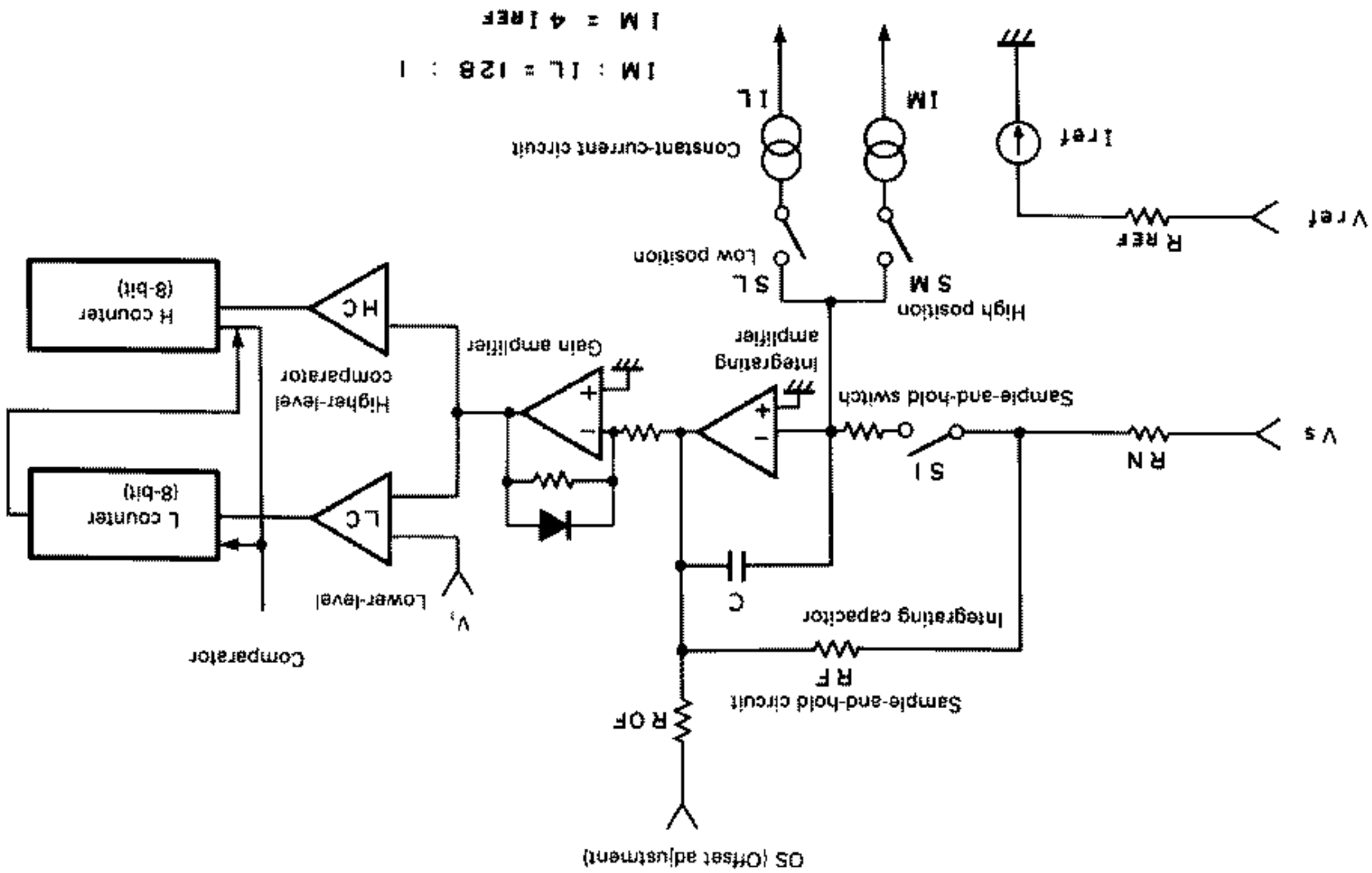


Analog-to-Digital Conversion Timing Chart

Pin No.	Symbol	I/O	Description	Remarks
13	VCCA	—	Analog positive supply voltage (+5 V)	
14	MSBL	O	MSB "1" -1 V, "0" $+1$ V	Left-channel MSB signal output. (Output in offset binary codes.)
15	VEEA	—	Analog negative supply voltage (-5 V)	
16	VTL	I	Left-channel comparator reference voltage	
17	AMPOL	I	Left-channel DC gain amplifier input	
18	AMPIL	I	Left-channel DC gain amplifier input	
19	AOUTL	O	Left-channel integrating amplifier output	
20	AINL	I	Left-channel integrating amplifier input	
26	AINR	I	Right-channel integrating amplifier input	
27	AOUTR	O	Right-channel integrating amplifier output	
28	AMPRR	I	Right-channel DC gain amplifier input	
29	AMPOR	O	Right-channel DC gain amplifier output	
30	VTR	I	Right-channel comparator reference voltage	

CIRCUIT DESCRIPTION

Basic Analog-to-Digital Conversion



Block Diagram

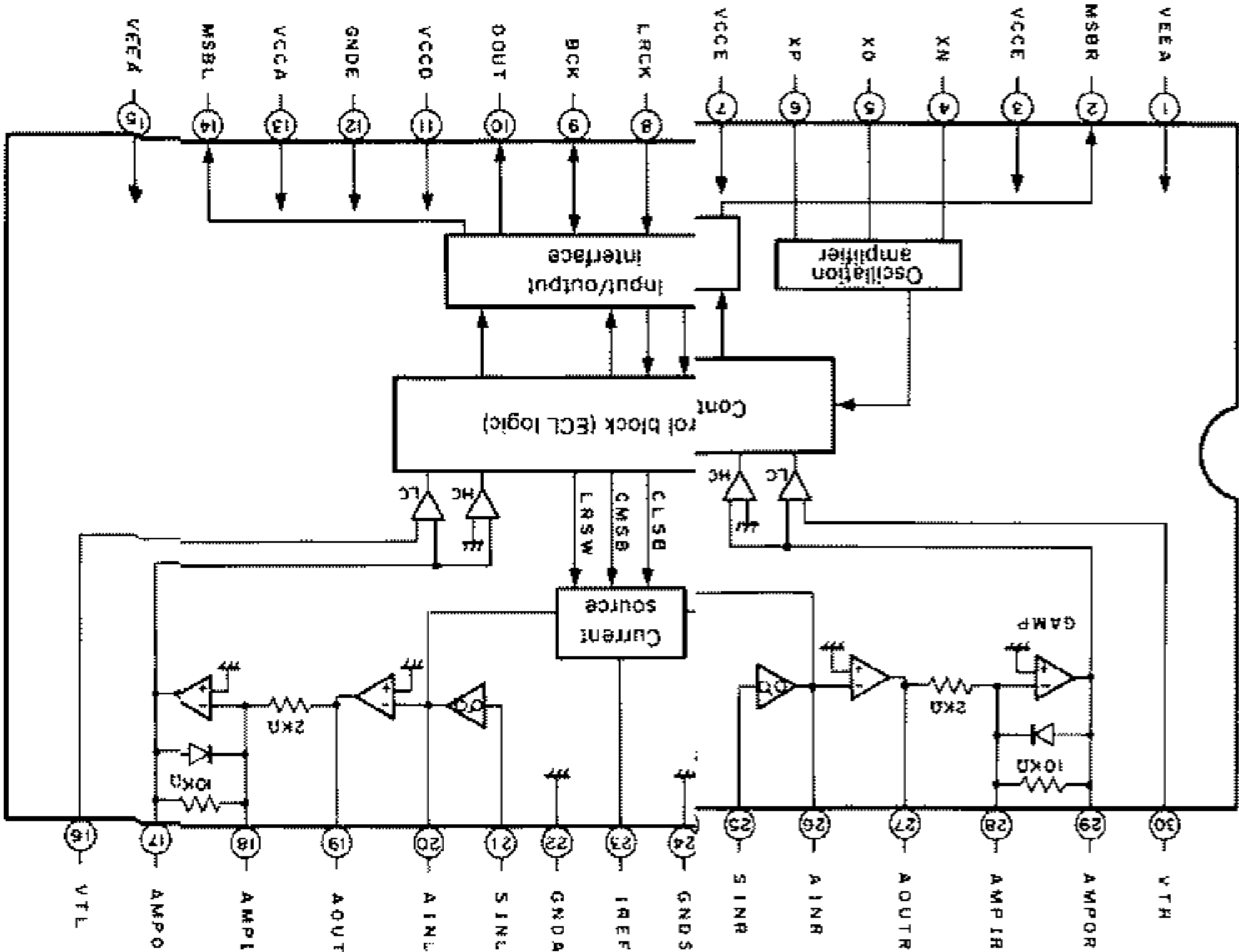
CIRCUIT DESCRIPTION

Pin No.	Symbol	I/O	Description	Remarks
1	SM	I	Sample-and-hold switch	Turns off sample-and-hold switch S1 and holds the voltage just before the switch is turned off in a capacitor.
3	SL	I	Source level	Turns on the SM signal and discharges the capacitor with constant-current source IM. Turns off the SM signal when the capacitor voltage (VO) becomes zero. The higher-level M counter then counts the fck frequency.
4	Count	O	Count	(Conversion-2) Turns on the SL signal when the VO voltage becomes zero. Then discharges the capacitor with constant-current source IL. Turns off the SL signal when the VO voltage becomes zero. The L counter then counts the fck frequency. The L counter is carried to the M counter when a carry is produced by the L counter.
5	Hold	O	Hold	(Conversion completion) An A/D-converted digital data when the L and M counter information is concatenated is produced after all operations above are completed.

Basic Operation

CIRCUIT DESCRIPTION

Block Diagram



Pin Functions

Pin No.	Symbol	I/O	Description	Remarks
1	ΔVEEA	O	Analog negative supply voltage (-5 V)	
2	MSBR	O	Right-channel MSB signal output. (Output in offset binary codes.)	
3	VCCCE	—	ECL logic positive supply voltage (+5 V)	
4	XN	I	Oscillation amplifier input/output	
5	XO	O	A Colpitts oscillator can be easily configured by connecting a coil, capacitor, and resistor to the crystal oscillator.	
6	XP	I		
7	VCCCE	—	ECL logic positive supply voltage (+5 V)	
8	LCK	I	LR clock input	
9	BCK	I	Bit clock input	
10	DOUT	O	Digital audio data output (Synchronized on the falling edge of the BCK signal for MSB data first-out operation.)	
11	VCCD	—	Digital positive supply voltage (+5 V)	
12	GNDDE	—	ECL logic ground	

CIRCUIT DESCRIPTION

Master Microcomputer

Outline (CXP50112-154Q)

- The main features of the A-94 display microcomputer are as follows:
- 1) 9-channel audio input and 4-channel video input
- 2) Digital signal processor (DSP)
- 3) Digital signal processor (DSP) recording

Initial Setting

Item	Setting	Item	Setting
POWER	OFF	Surround mode	OFF
Selector (audio)	TUNER	MEMORY	OFF
Selector (video)	VIDEO	VISUAL FIX	OFF
CD DIRECT	OFF	CENTER	DOLBY -25 dB
MUTE	OFF	REAR	DOLBY -15 dB
CD REC	OFF	DELAY TIME	DSP 35 ms
DSP REC	OFF	PRESENCE LEVEL	DSP only -8 dB
DISPLAY	Selector mode	DSP (30 ch, 4 ch)	3 CH
SUPER WOOFER	OFF	4 CH	ARENA

Memory Clear

Switch on while holding down the TUNER key.

Test mode

- The amplifier test mode includes the two tests below
Test 1: Fluorescent display, LED, and lamp lighting test
Test 2: Surround test
a) Center level
b) Rear level
c) Presence level
d) Delay time
1) Selecting test mode
Switch on while holding down the CD key.
2) Use
1) The fluorescent display and LED indicators light when the amplifier is switched on while the CD key is being hold down. Lamps then light in the order of DOLBY, DSP3CH, and DSP4CH. Test 1 mode is entered.
2) The amplifier enters test 2 mode when the keys below are pressed in test 1 mode. (Test 1 mode is canceled.)
a) CENTER UP KEY
b) REAR UP KEY
c) PRESENCE UP KEY
d) DELAY UP KEY

Timing Chart

16-Bit Communication Format

PPM two-wire bidirectional serial communication system

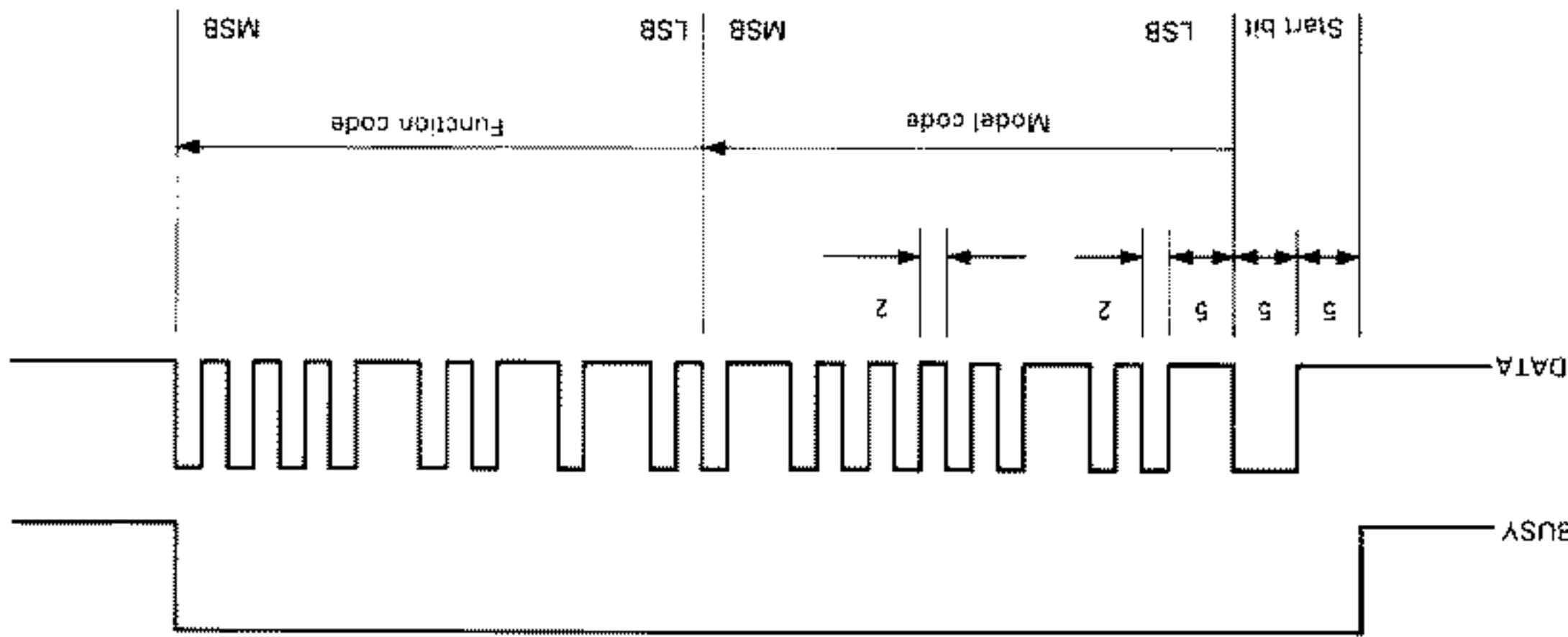
Data configuration

The data configuration consists of 16 bits below.

Model code 8 bits

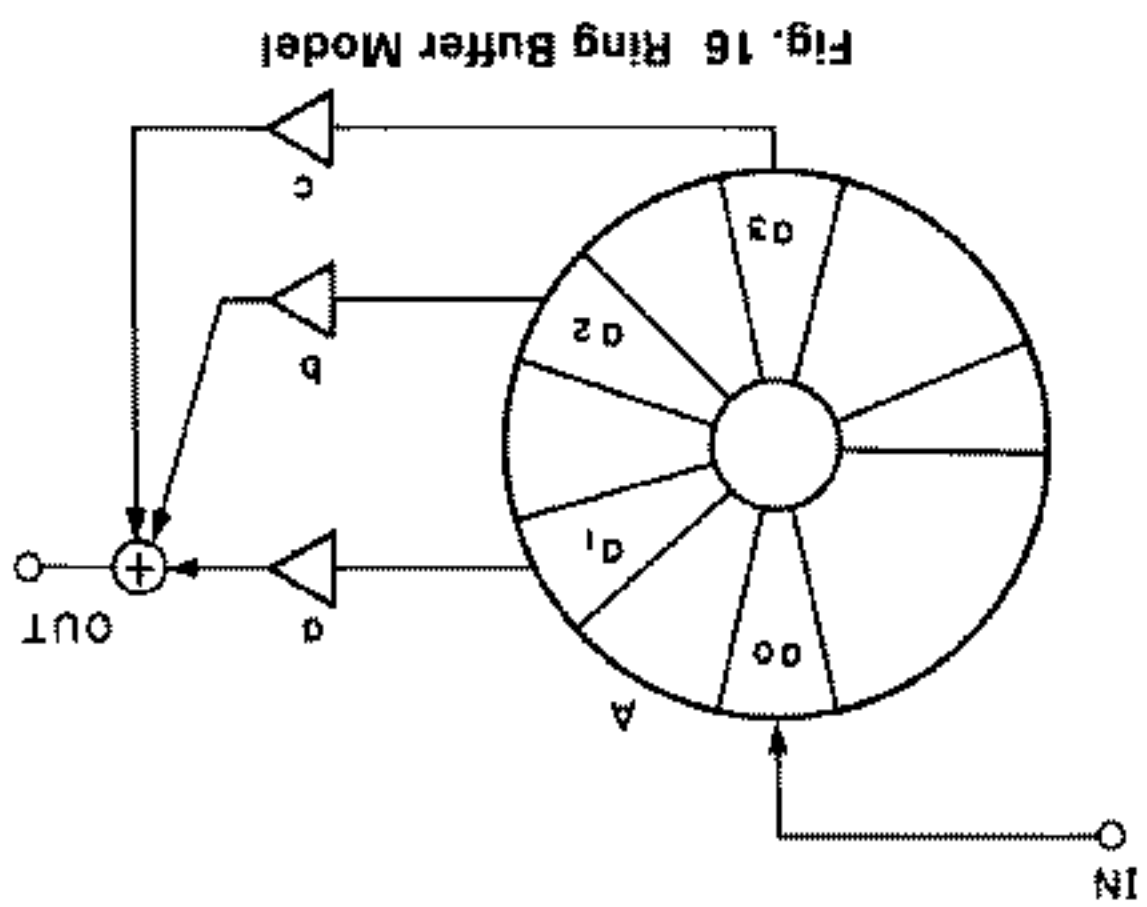
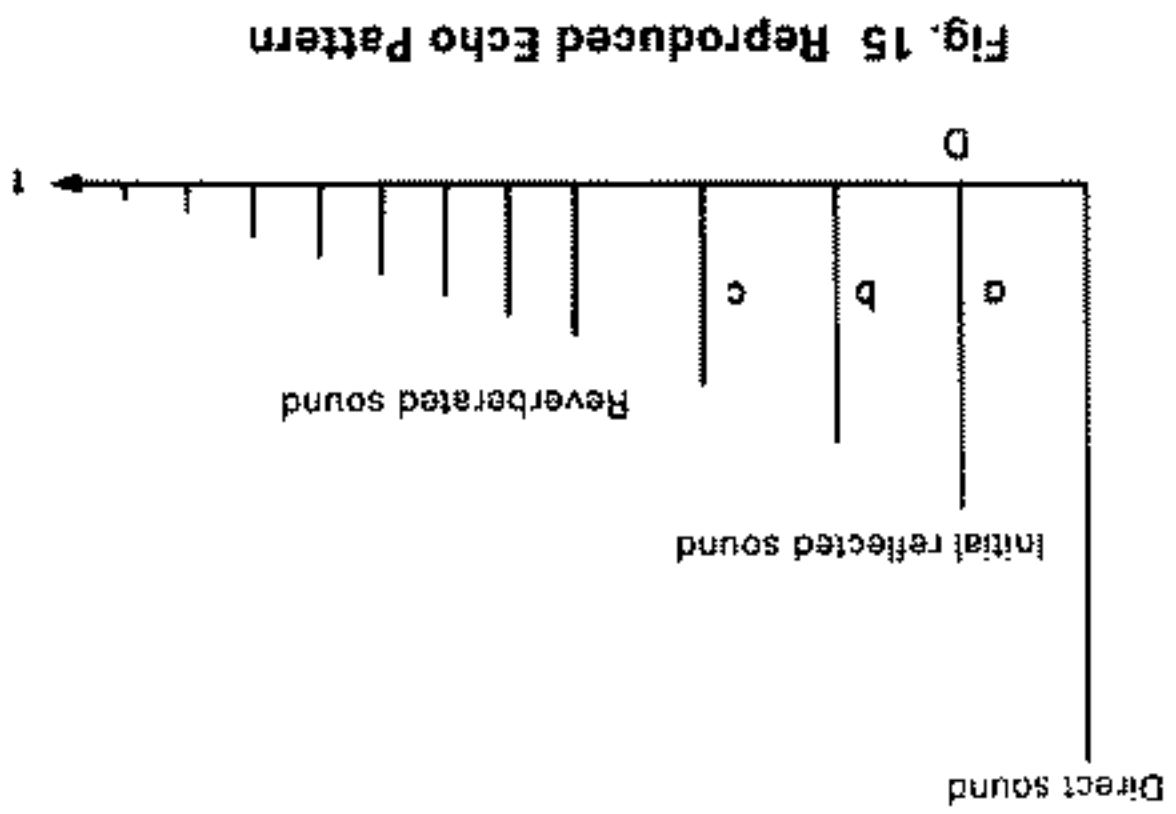
Function code 8 bits

Data format



CIRCUIT DESCRIPTION

The process when the echo pattern shown in Figure 15 is reproduced by a digital signal processor is described below with the initial reflected sound as an example. See Figure 14, "Internal Block Diagram".



3-3 Internal Configuration and Operation of Digital Signal Processor

Figure 14 shows the internal block diagram of a digital signal processor (NEC μ PD6380). Each block operation is explained below.

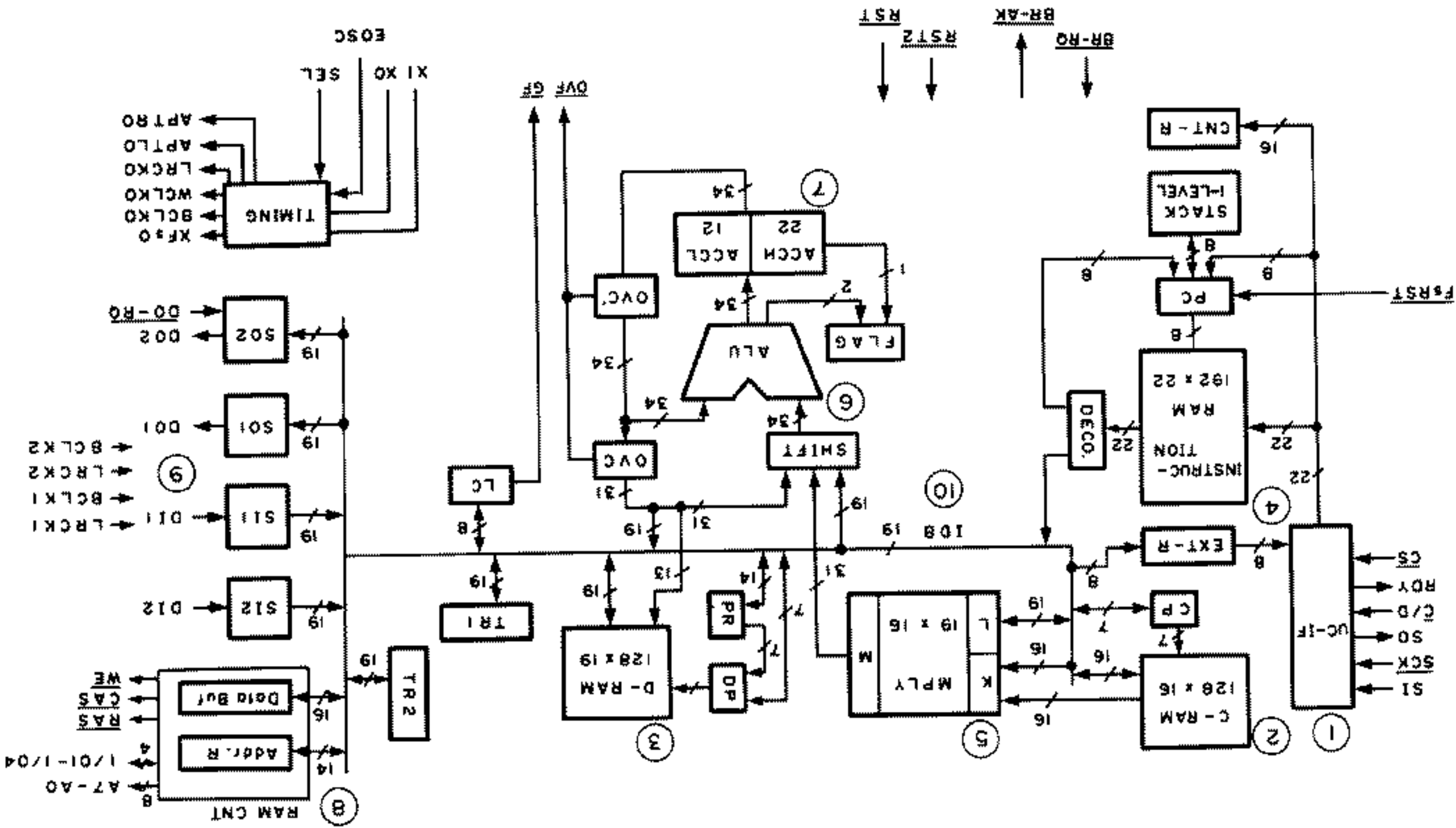


Fig. 14 Internal Block Diagram of Digital Signal Processor

- Microcomputer interface
 - Coefficient RAM (C-RAM)
 - Data RAM (D-RAM)
 - Instruction RAM
 - Multiplier (MPLY)
 - Arithmetic and logic unit (ALU)
 - Accumulator (ACC)
 - External RAM control
 - Audio interface
 - Internal data bus (IDB)
- Interfaced between a microcomputer and the digital signal processor in series.
- The data RAM is a work area that stores data during operation. The address is specified by the D-RAM pointer (DP).
- Stores a program. The address is specified using a program counter (PC).
- The result data is sent to the M register in one instruction cycle when a multiplier and multiplier are transferred to the K and L registers.
- Performs arithmetic and logic operations.
- The accumulator is a register that stores the result data of an ALU operation.
- Controls the external RAM in which delay data is written.
- External RAM control
- Inputs or outputs an audio signal in series.
- The internal data bus is an internal data transfer path between the memory and registers.

The digital signal processor performs the above signal processing at high speeds according to a horizontal instruction format. ALU operation, data transfer, and memory address updating are executed at the same time in one instruction cycle.

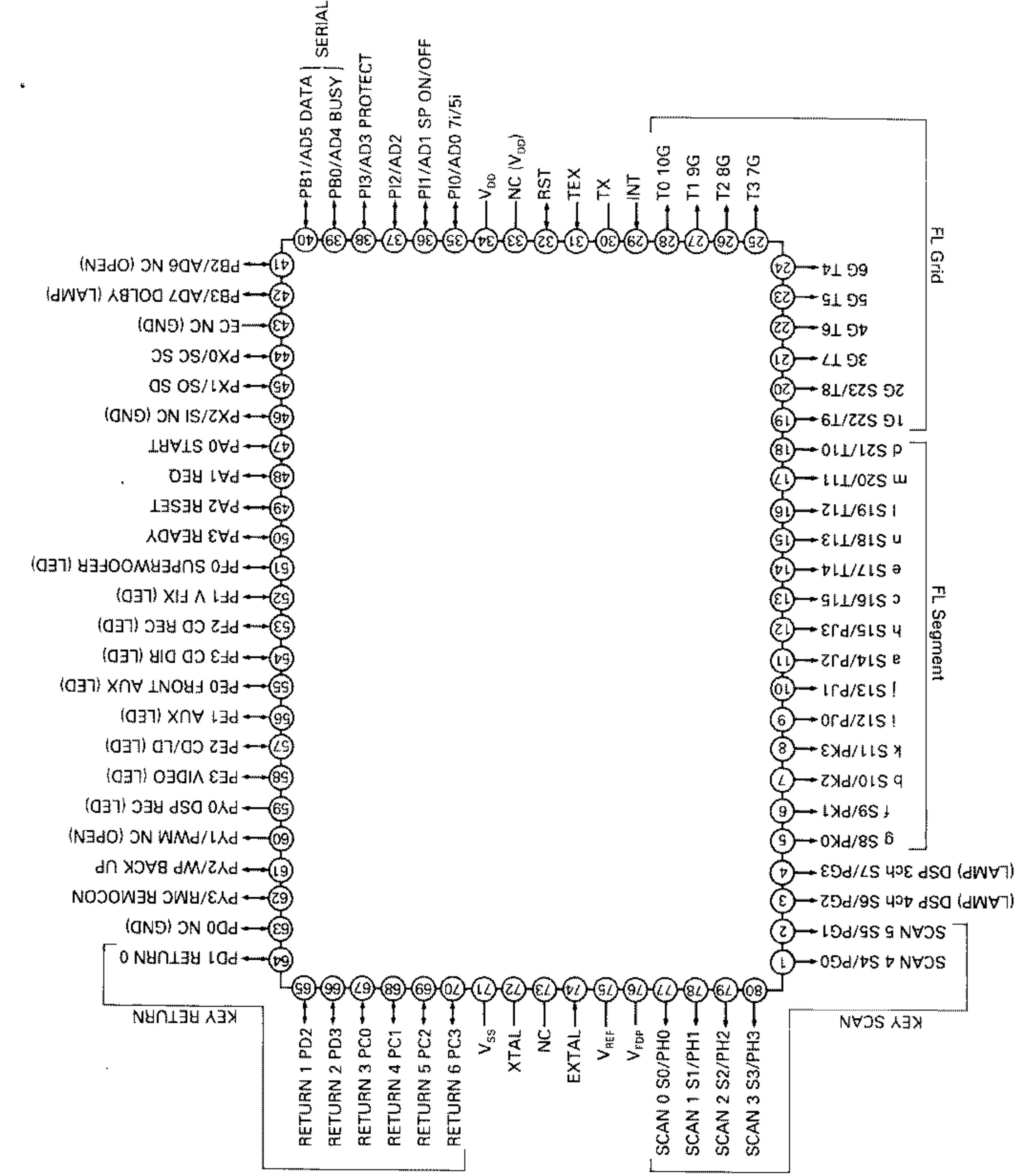
The process when an initial reflected sound that is a times as high as the direct sound is reproduced after D seconds with the digital signal processor is as follows:

An audio signal is fetched from audio interface block 9 for every sampling period of T seconds and sent to external RAM control block 8. Data is then written in the ring buffer example. An address is offset by $A = D/T$ relative to the currently written address and the address is read to obtain the delay time corresponding to D seconds. The read data is sent to the L register of multiplier 5. To make the data size a times the normal, coefficient a is sent from coefficient RAM 2 to the K register of the

CIRCUIT DESCRIPTION

Pin No.	Pin name	I/O	Name	Description
45	PX1/S0	O	SD	S - 0 data (for communication)
46	PV2/S1	—	NC	(GND)
47	PA1	O	START	Start (for communication)
48	PA1	O	REQ	Request (for communication)
49	PA2	O	RESET	Reset (for communication)
50	PA3	I	READY	Ready (for communication)
51	PF0	O	SVPERWOODFER	LED
52	PF1	O	V · FIX	LED
53	PF2	O	CD · REC	LED
54	PF3	O	CD DIR	LED
55	PE0	O	F · RONT AUX	LED
56	PE1	O	AUX	LED
57	PE2	O	CD/LD	LED
58	PE3	O	VDEO	LED
59	PY0	O	DSP REC	LED
60	PY1/DWM	O	NC	NC (OPEN)
61	PY2/WP	I	BACK UP	Backup input
62	PY3/RMC	I	REMOCON	Remote control input
63	PD0	—	NC	NC (GND)
64	PD1	I	RETORN 0	Auto-return 0
65	PD2	I	RETORN 1	Auto-return 1
66	PD3	I	RETORN 2	Auto-return 2
67	PC0	I	RETORN 3	Auto-return 3
68	PC1	I	RETORN 4	Auto-return 4
69	PC2	I	RETORN 5	Auto-return 5
70	PC3	I	RETORN 6	Auto-return 6
71	VSS	—	—	GND
72	XTAL	—	—	Crystal
73	NC	—	—	
74	EXTAL	I	—	Oscillation pin
75	VCCF	—	—	Reference voltage for voltage detection (unused)
76	VDDP	—	—	Fluorescent display power supply
77	PH0	O	SCAN 0	Key scan 0
78	PH1	O	SCAN 1	Key scan 1
79	PH2	O	SCAN 2	Key scan 2
80	PH3	O	SCAN 3	Key scan 3

CIRCUIT DESCRIPTION



CIRCUIT DESCRIPTION

Slave Microcomputer (μ PD78214CW-668)

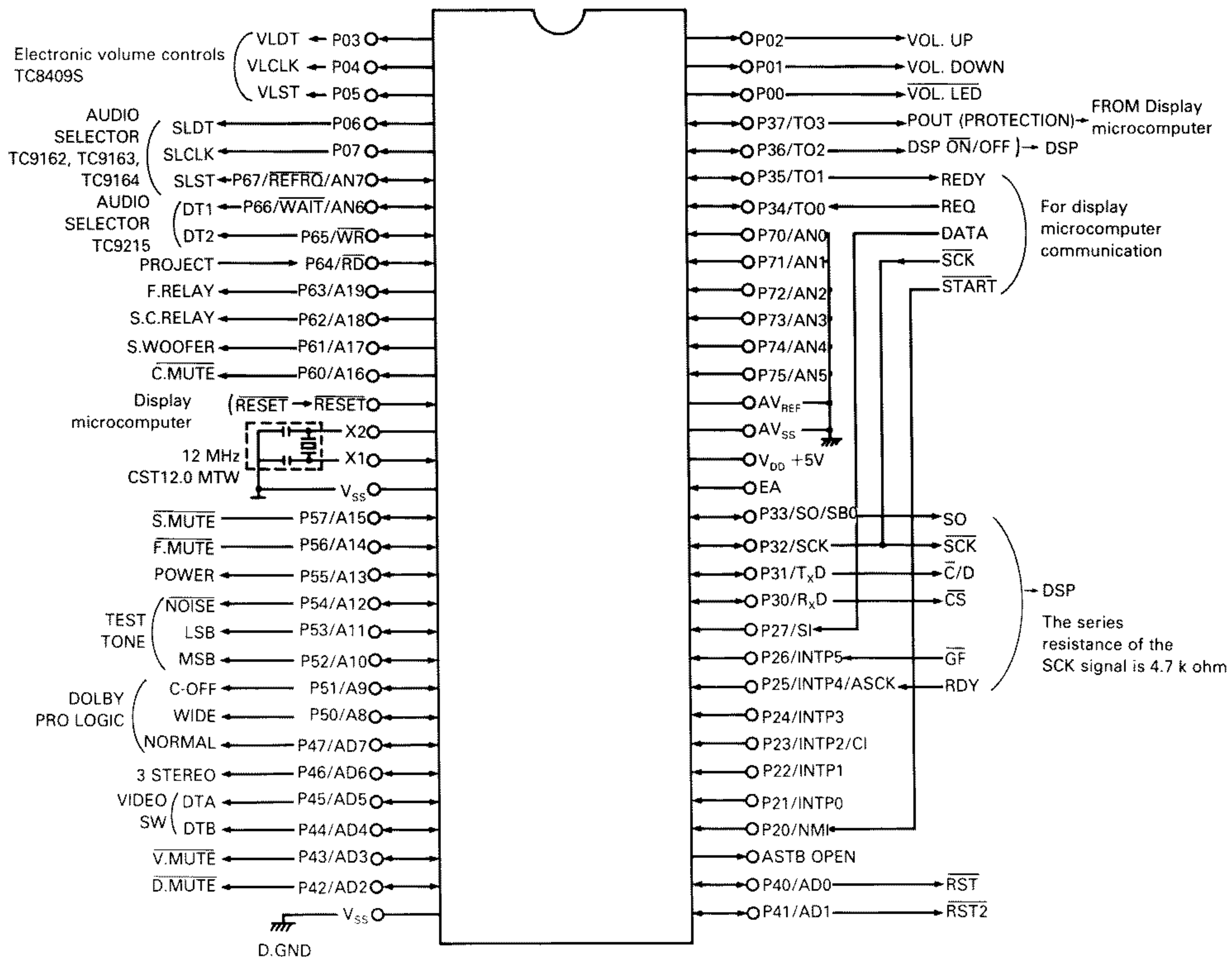
Outline

The slave microcomputer is used for DSP amplifiers. This microcomputer provides the following amplifier control functions through data communications with the display microcomputer (CXP50112-154Q):

- Selector selection (muting control) TC9162N, etc.
- Electronic volume control TC9213P
- Speaker relay control
- Surround control (DSP IC μ PD6380)
 - Dolby surround, Dolby Prologic, and DSP
 - Rear and Center levels (TC9213P)
 - Delay time (DSP IC μ PD6380)
 - Presence level (DSP IC μ PD6380)
- Video selection

2.3 Pin Connection (Top View)

64-pin plastic shrink DIP and 64-pin plastic QJIP



Note: Pin compatible with μ PD78210CW/GQ.

CIRCUIT DESCRIPTION

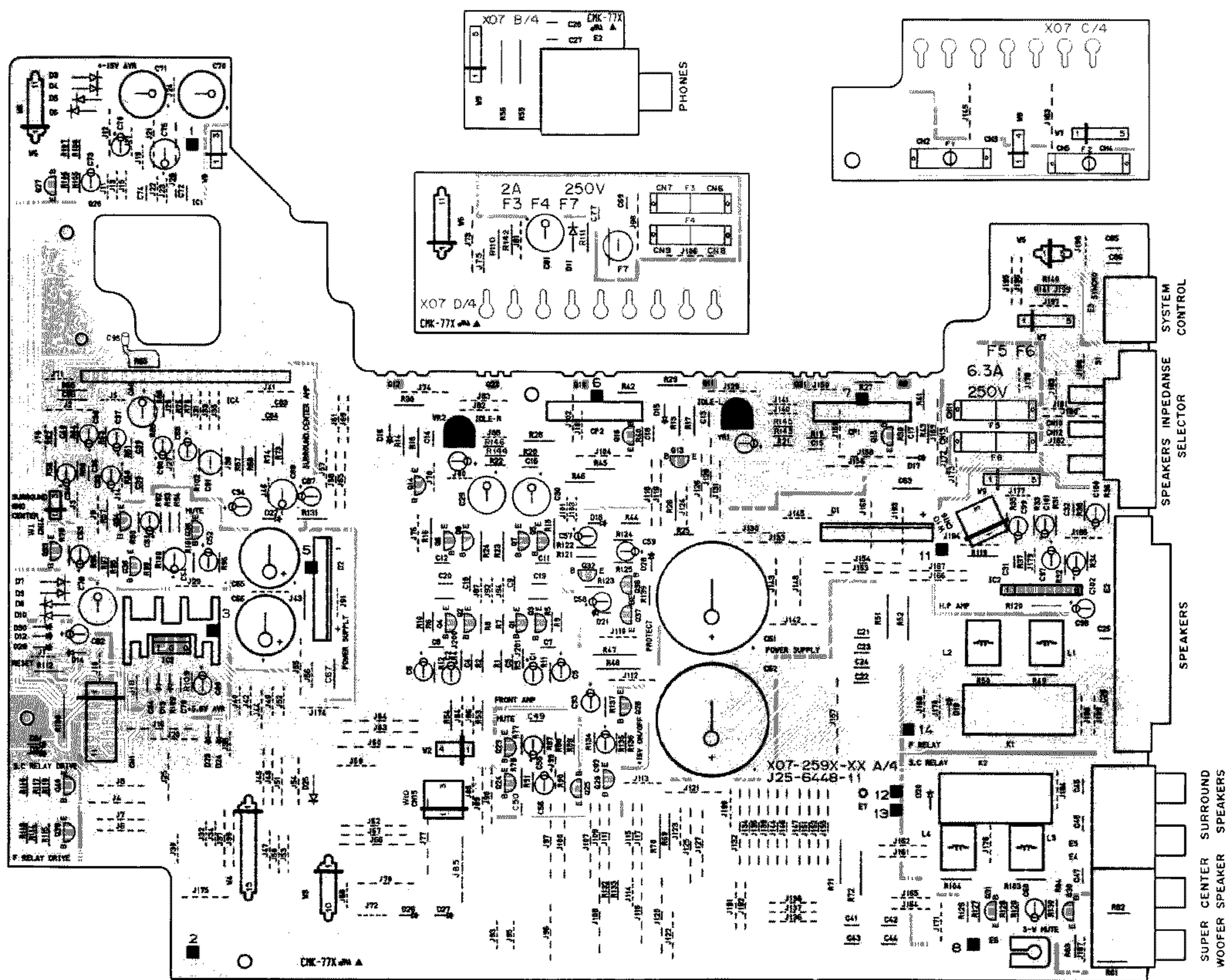
2.4 Pin Functions

Pin No.	Pin name	I/O	Name	Description																				
1	P03	O	VLDT	Electronic volume control IC (TC9213P) data output																				
2	P04	O	VLCLK	Electronic volume control IC (TC9213P) clock output																				
3	P05	O	VLST	Electronic volume control IC (TC9213P) strobe output																				
4	P06	O	SLDT	Switch array IC (TC9162N, TC9163N, and TC9164N) data output																				
5	P07	O	SLCLK	Switch array IC (TC9162N, TC9163N, and TC9164N) clock output																				
6	P67	O	SLST	Switch array IC (TC9162N, TC9163N, and TC9164N) strobe output																				
7	P66	O	DT1	TC9215 DT1 signal output																				
<table><tr><th colspan="2">PROLOGIC</th><th colspan="2">DOL SUR</th></tr><tr><th>MODE</th><th>DT1</th><th>DT2</th><th>DT1</th></tr><tr><td>OFF</td><td>0</td><td>1</td><td>0</td></tr><tr><td>DOLBY</td><td>0</td><td>0</td><td>0</td></tr><tr><td>DSP</td><td>1</td><td>0</td><td>1</td></tr></table>					PROLOGIC		DOL SUR		MODE	DT1	DT2	DT1	OFF	0	1	0	DOLBY	0	0	0	DSP	1	0	1
PROLOGIC		DOL SUR																						
MODE	DT1	DT2	DT1																					
OFF	0	1	0																					
DOLBY	0	0	0																					
DSP	1	0	1																					
8	P65	O	DT2	TC9215 DT2 signal output																				
9	P64	I	PROTECT	Protection signal input																				
10	P63	O	F.RELAY	Front speaker relay control																				
11	P62	O	S.C.RELAY	Rear center speaker relay control																				
12	P61	O	S.WOOFER	Super-woofer output control																				
13	P60	O	CMUTE	Center output mute																				
14	RESET	I		Reset																				
15	X2			System clock oscillator connection (12 MHz)																				
16	X1	I		System clock oscillator connection (12 MHz)																				
17	V _{SS}			Ground																				
18	P57	O	S.MUTE	Rear output mute																				
19	P56	O	F.MUTE	Front output mute																				
20	P55	O	POWER	Power supply control pin																				
21	P54	O	NOISE	Dolby Prologic test tone output control																				
22	P53	O	LSB	Test tone output position specification																				
23	P52	O	MSB																					
<table><tr><th></th><th>L</th><th>C</th><th>R</th><th>S</th></tr><tr><td>LSB</td><td>0</td><td>1</td><td>0</td><td>1</td></tr><tr><td>MSB</td><td>0</td><td>0</td><td>1</td><td>1</td></tr></table>						L	C	R	S	LSB	0	1	0	1	MSB	0	0	1	1					
	L	C	R	S																				
LSB	0	1	0	1																				
MSB	0	0	1	1																				
24	P51	O	C-OFF	Dolby Prologic center mode setting (center off)																				
25	P50	O	WIDE																					
26	P47	O	NORMAL																					
27	P46	O	3 STEREO																					
28	P45	O	DTA	Video selection control																				
29	P44	O	DTB																					
30	P43	O	V.MUTE	Video output muting																				

CIRCUIT DESCRIPTION

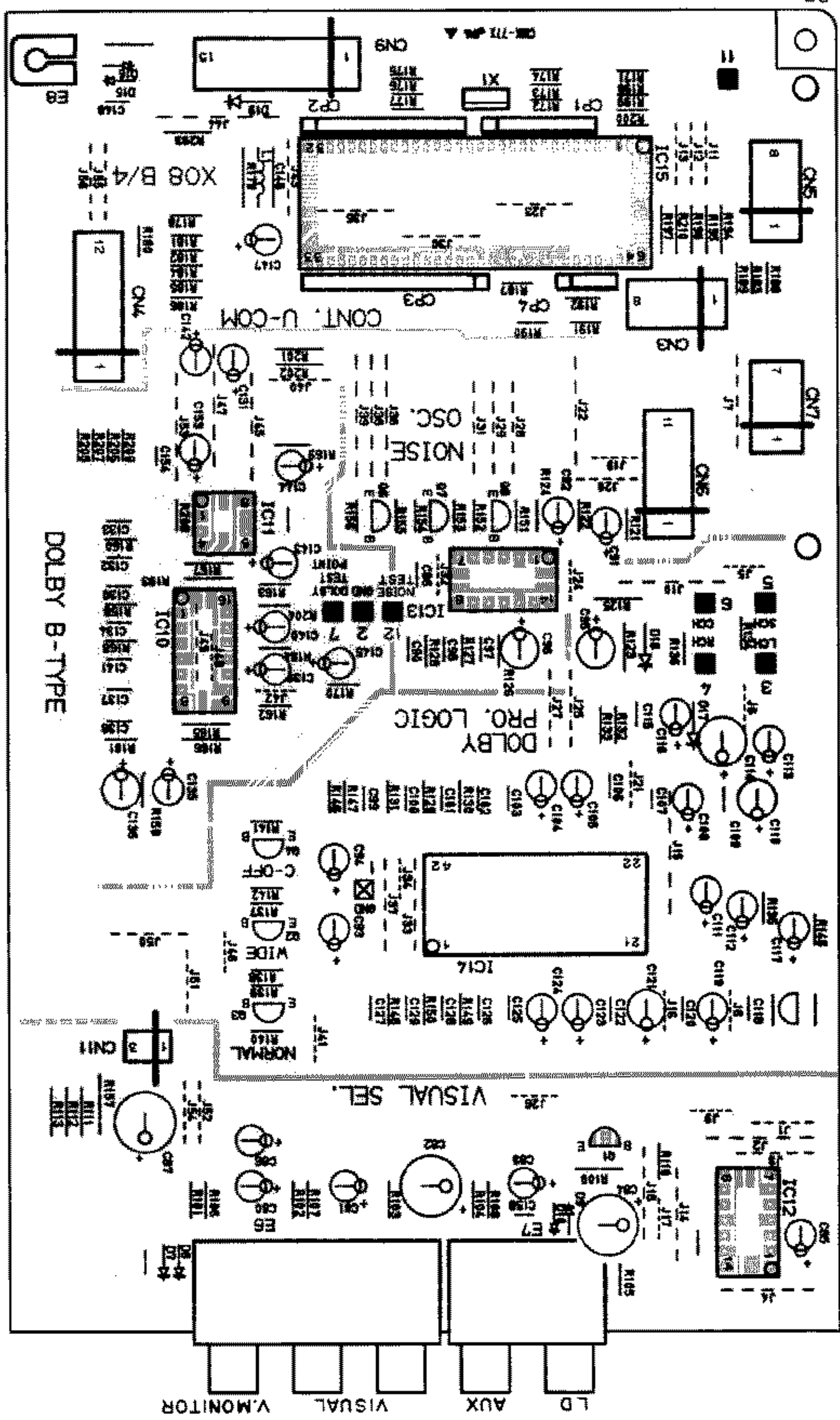
Pin No.	Pin name	I/O	Name	Description
31	P42	O	D.MUTE	DSP board output muting
32	V _{SS}			Ground
33	P41	O	RST2	DSP IC (μPD6380) RST2 signal output
34	P40	O	RST	DSP IC (μPD6380) RST signal output
35	ASTB	O		Unused (opened, pulled up, and pulled down)
36	P20/NMIT	I		START signal input for communications with display microcomputer
37	P21	I		Unused (pulled up and pulled down)
~	~			Unused (pulled up and pulled down)
40	P24	I		Unused (pulled up and pulled down)
41	P25	I	RDY	DSP IC (μPD6380) RDY signal input
42	P26	I	GF	DSP IC (μPD6380) GF signal input
43	P27/SI	I	DATA	Data signal input for communications with display microcomputer
44	P30	O	CS	DSP IC (μPD6380) CS signal output
45	P31	O	C/D	DSP IC (μPD6380) C/D signal output
46	P32	I/O	SCK	SCK signal input during communications with display microcomputer SCK signal output during DSP IC (μPD6380) data output
47	P33/SO	O	SO	DSP IC (μPD6380) SO (data) signal output
48	EA	I		Unused (ROMless operation instruction) Pulled up or pulled down.
49	V _{DD}			Microcomputer power supply
50	AV _{SS}			Unused (ground for analog-to-digital converter) Ground
51	AV _{REF}			Unused (Reference voltage for analog-to-digital converter is applied) Ground
52	P75/AN5	I		Unused Ground
~	~	~		~
57	P70/AN0	I		Unused Ground
58	P34/TO0	I	REQ	REQ signal input for communications with display microcomputer
59	P35/TO1	I	REDY	REDY signal output for communications with display microcomputer
60	P36/TO2	O	DSP ON/OFF	DSP oscillator stop control on DSP board
61	P37/TO3	O	POUT	Protection status report signal to display microcomputer
62	P00	O	VOL LED	Electronic volume control LED drive
63	P01	O	VOL DOWN	Electronic volume control down signal output
64	P02	O	VOL UP	Electronic volume control up signal output

PC BOARD (Component side view) MAIN AMPLIFIER UNIT



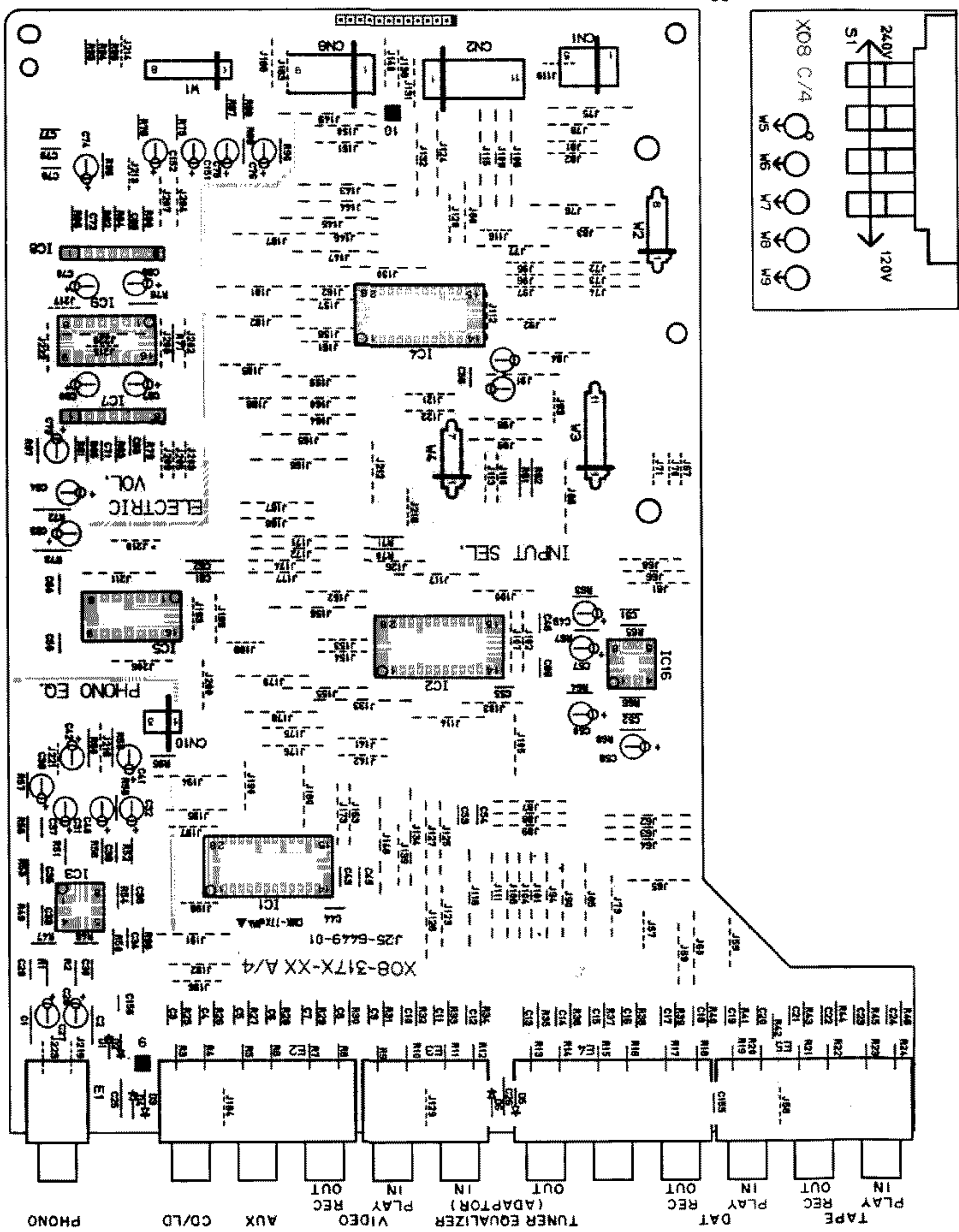
X07-2592-XX		
Ref. No.	Q	Address
1C	1	5E
	2	5D
	3	5E
	4	5D
	5	4E
	6	4D
	7	4E
	8	4D
	9	4G
	10	4E
	11	4F
	12	4D
	13	4F
	14	4D
	15	4G
	16	4E
	21	4F
	22	4E
	23	6E
	24	6E
	25	6E
	26	2B
	27	2B
	28	5E
	29	6E
	30	6H
	31	6H
	32	4E
	33	4B
	34	4B
	35	4B
	36	4C
	37	5E
	38	5E
	39	6B
	40	6B
1		2C
2		5H
3		5C

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



PREAMPLIFIER UNIT

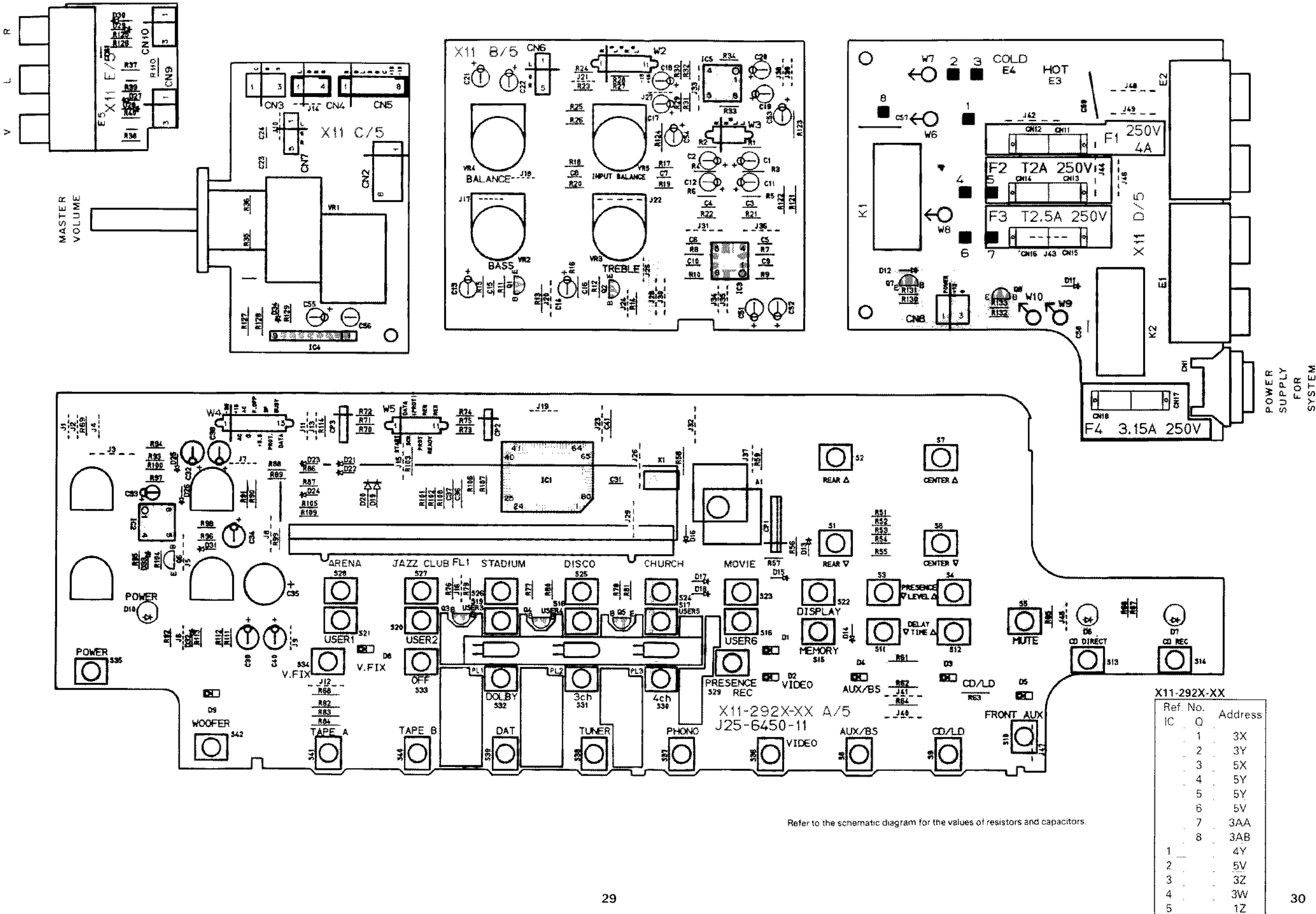
PC BOARD (Component side view)

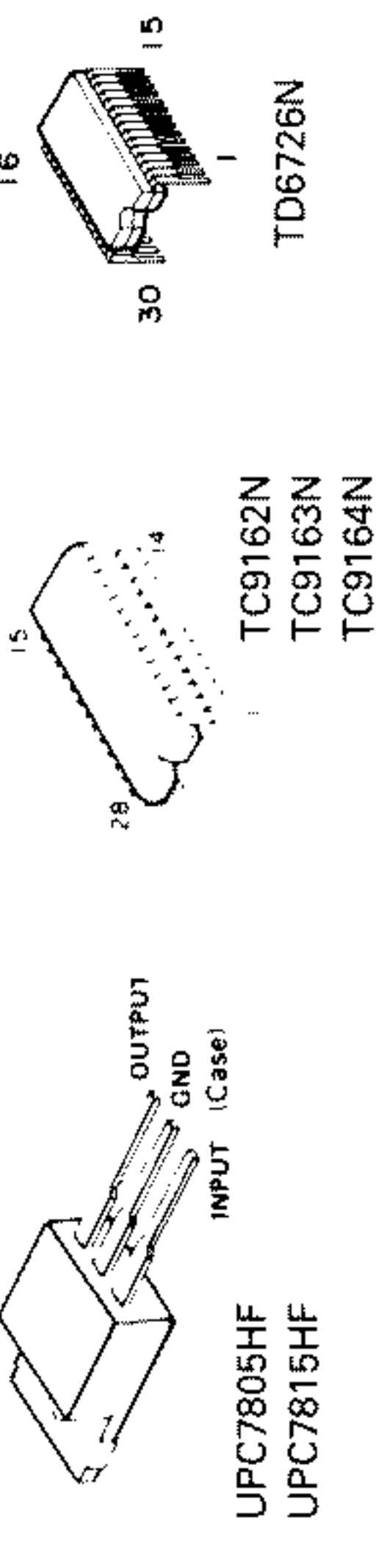
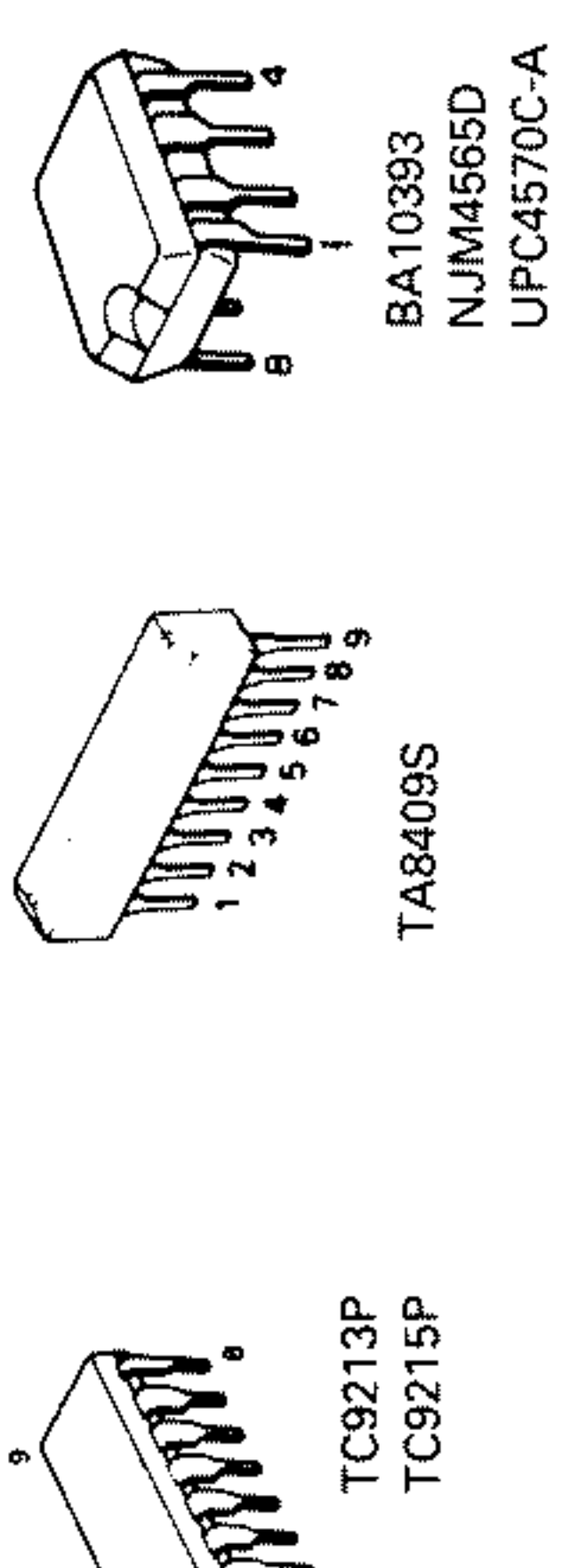
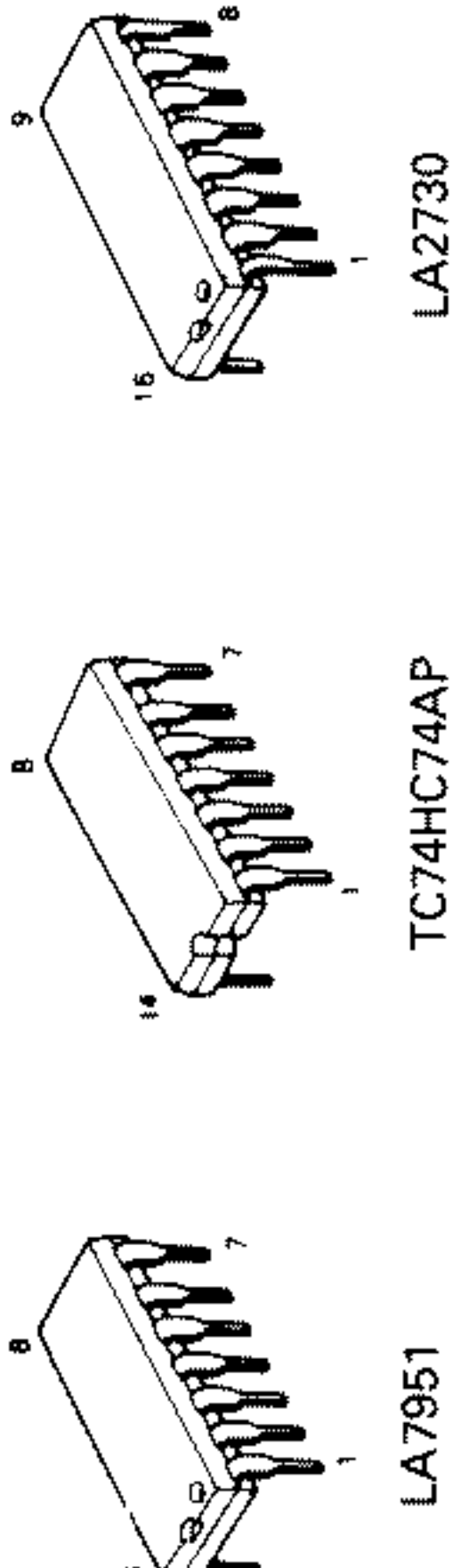
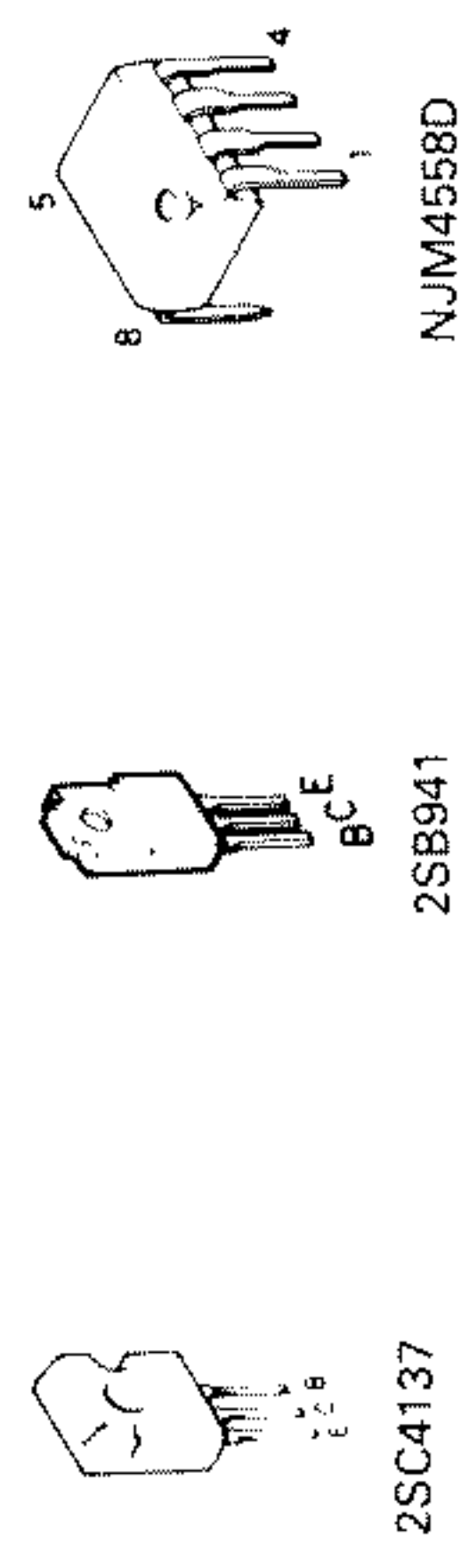
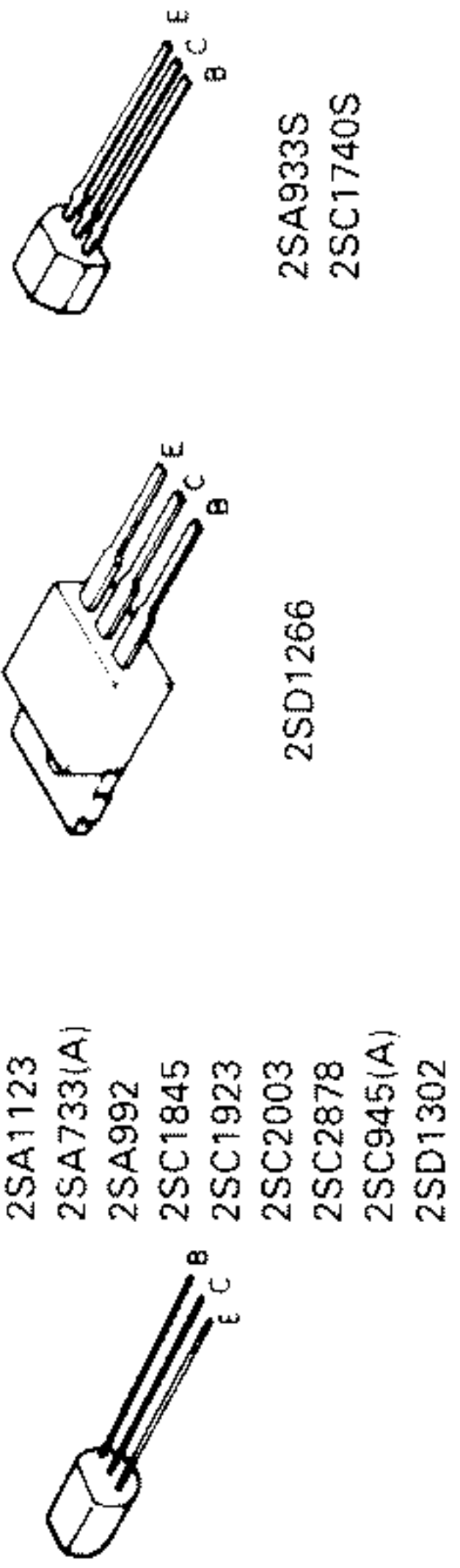


Ref. No.	IC	Address
08-317X-XX	1	2L
	0	3R
		4Q
		3S
		5Q
		4S
		5S
		6S
		9
		10
		4M
		5M
		12
		2K
		15
		16

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

PC BOARD (Component side view) CONTROL UNIT



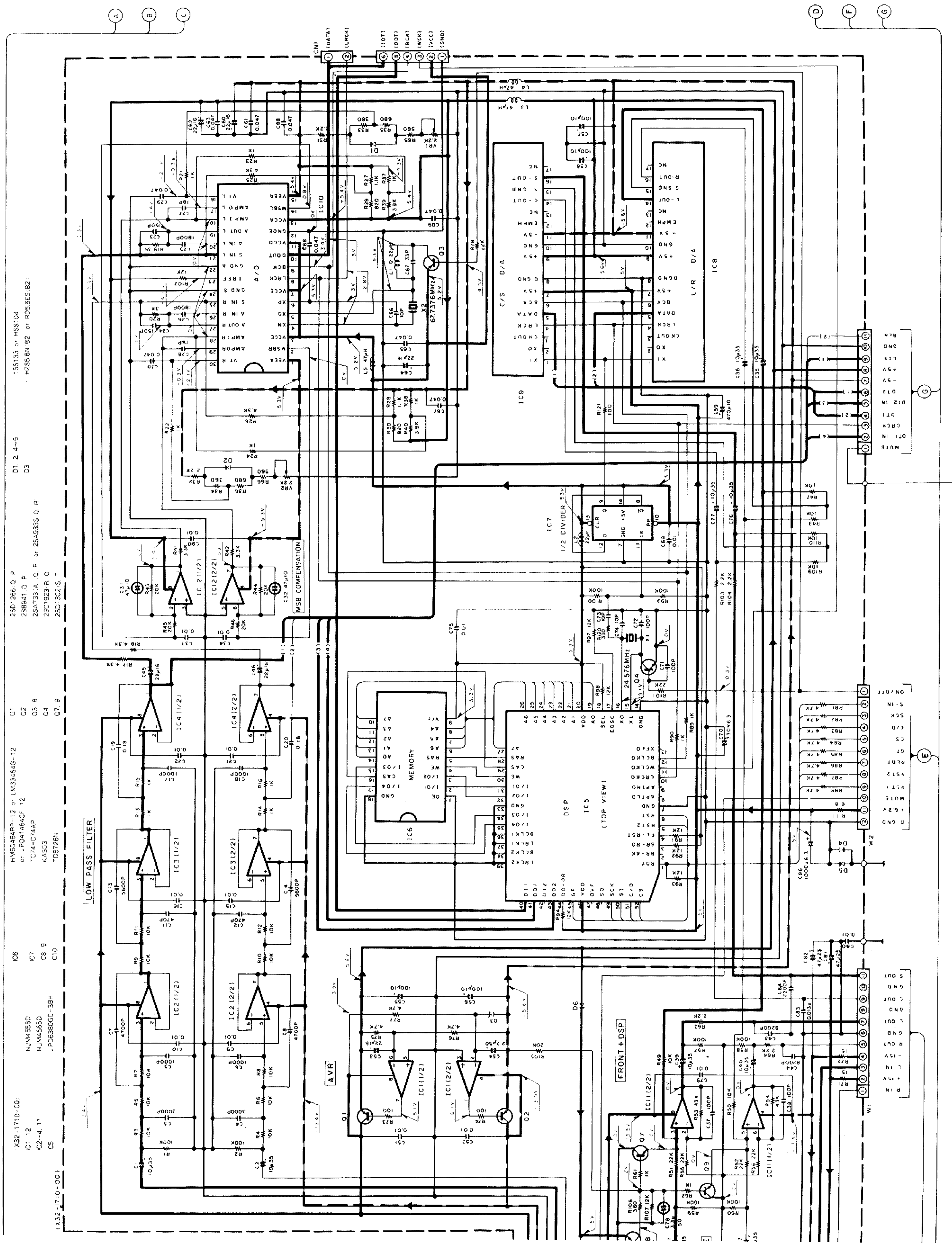


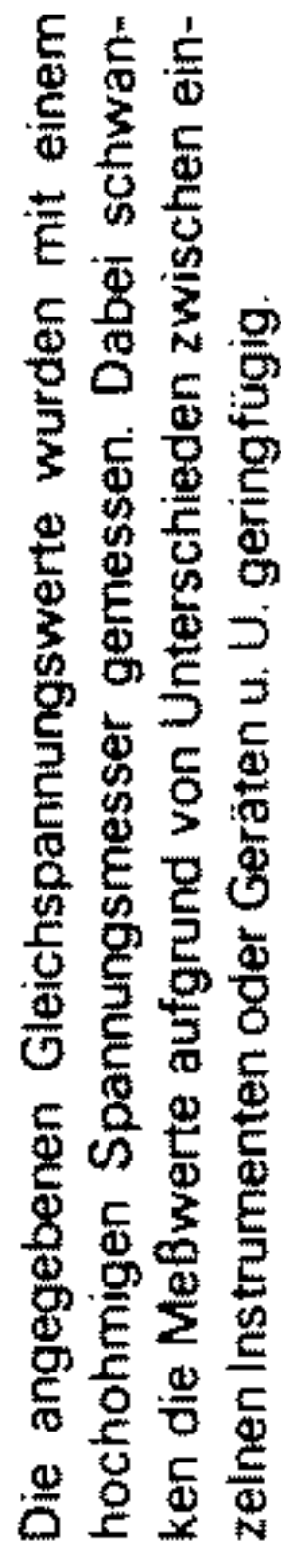
CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). **⚠** Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably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

▲ Others
DC voltages are as measured with a high impedance voltmeter. 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. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

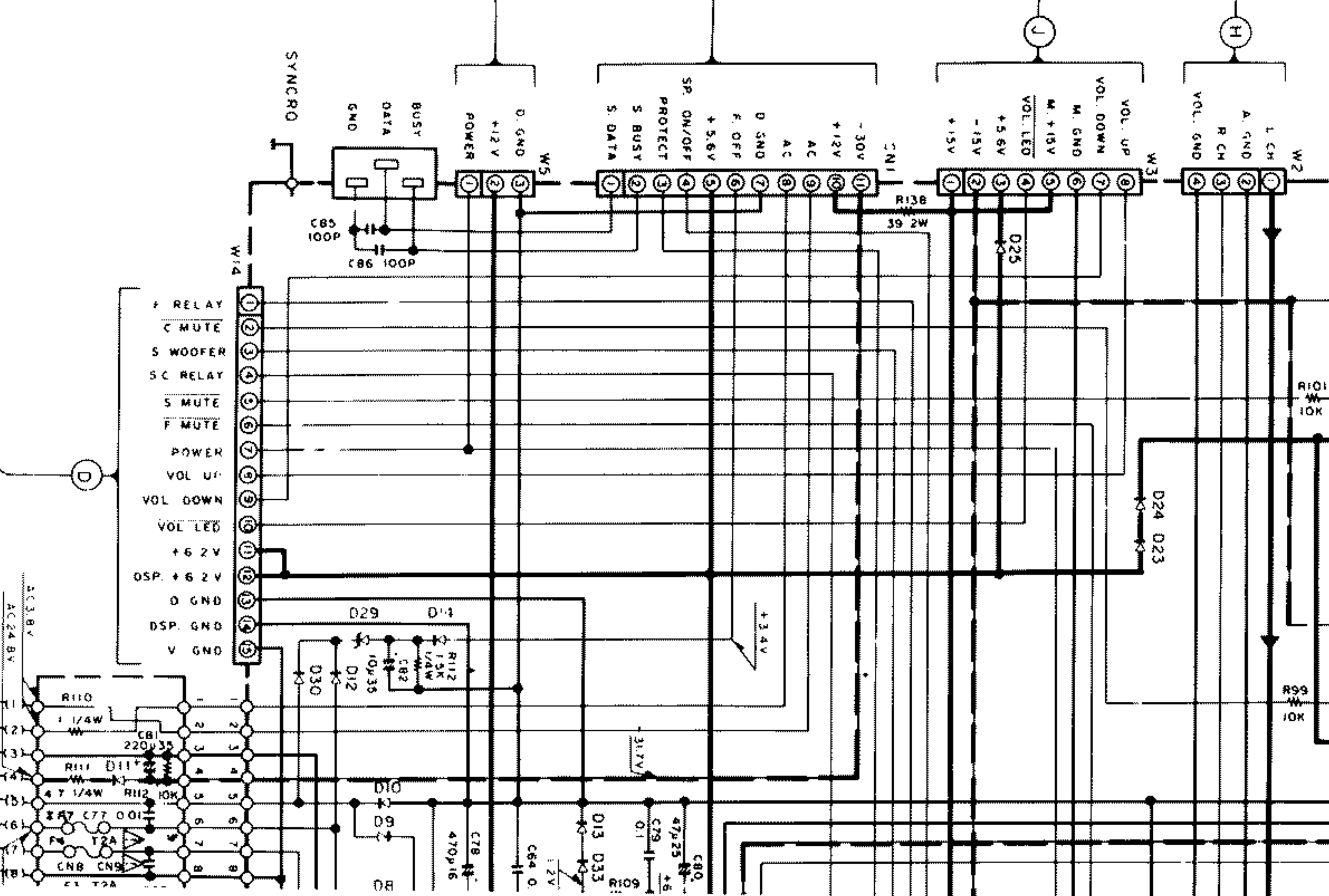
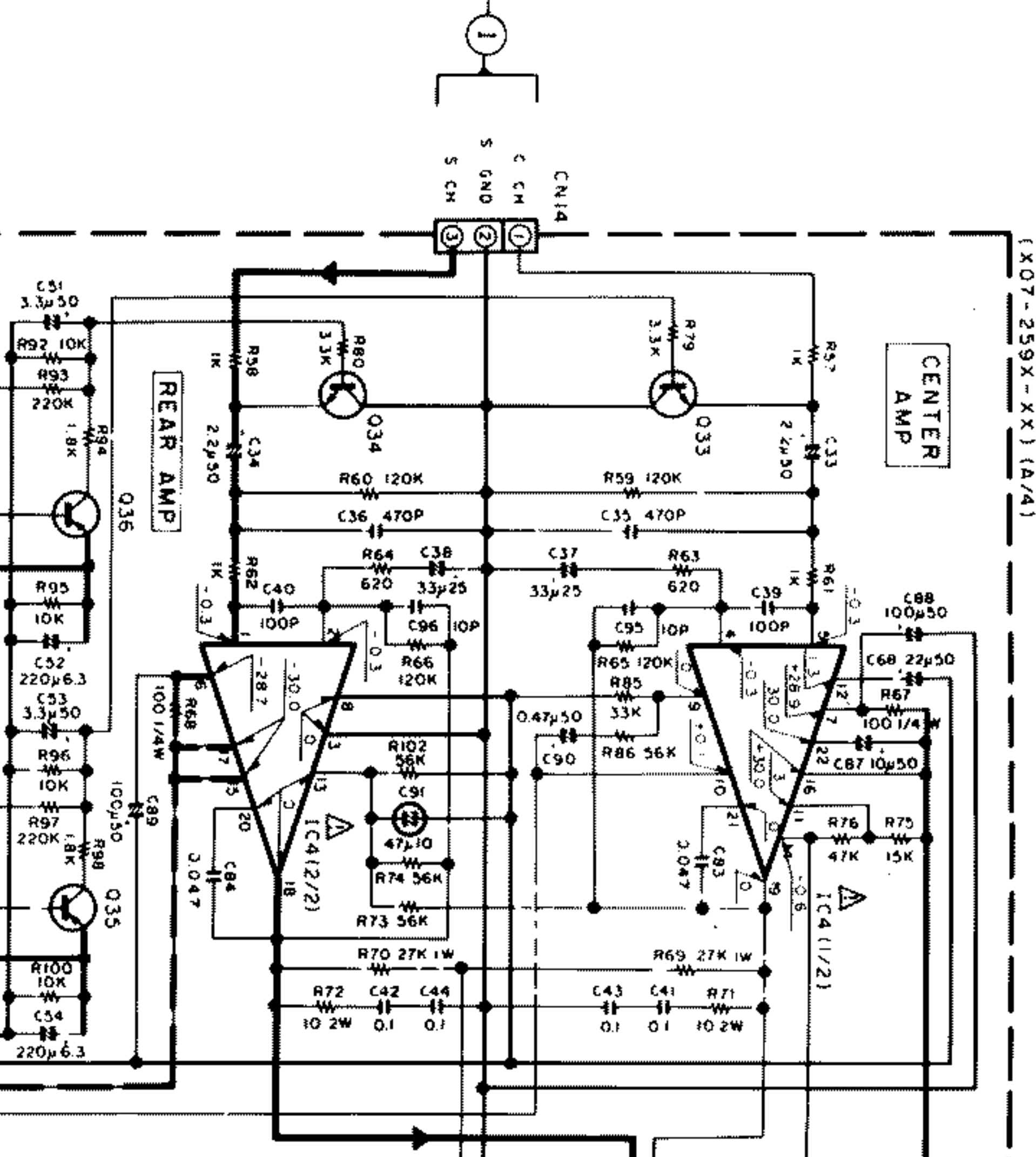
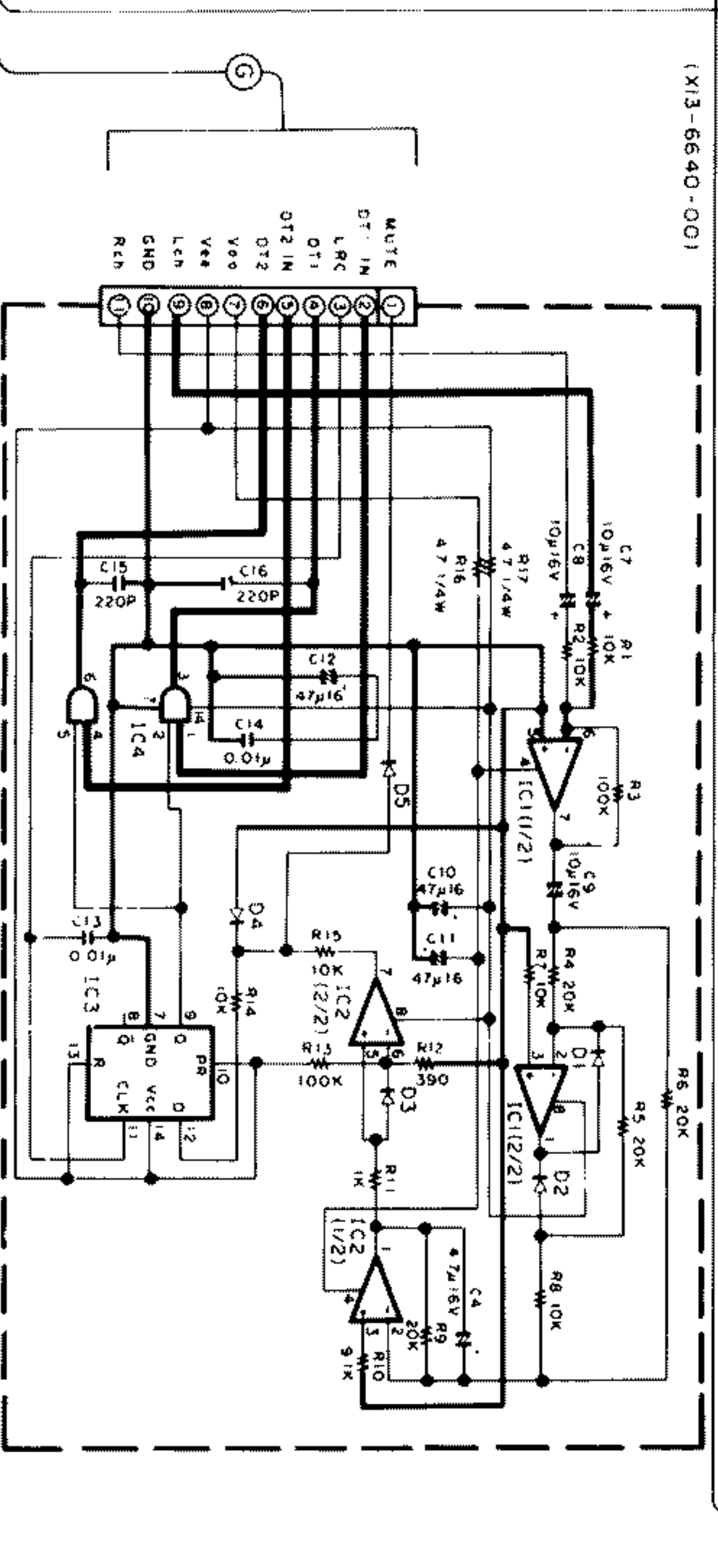
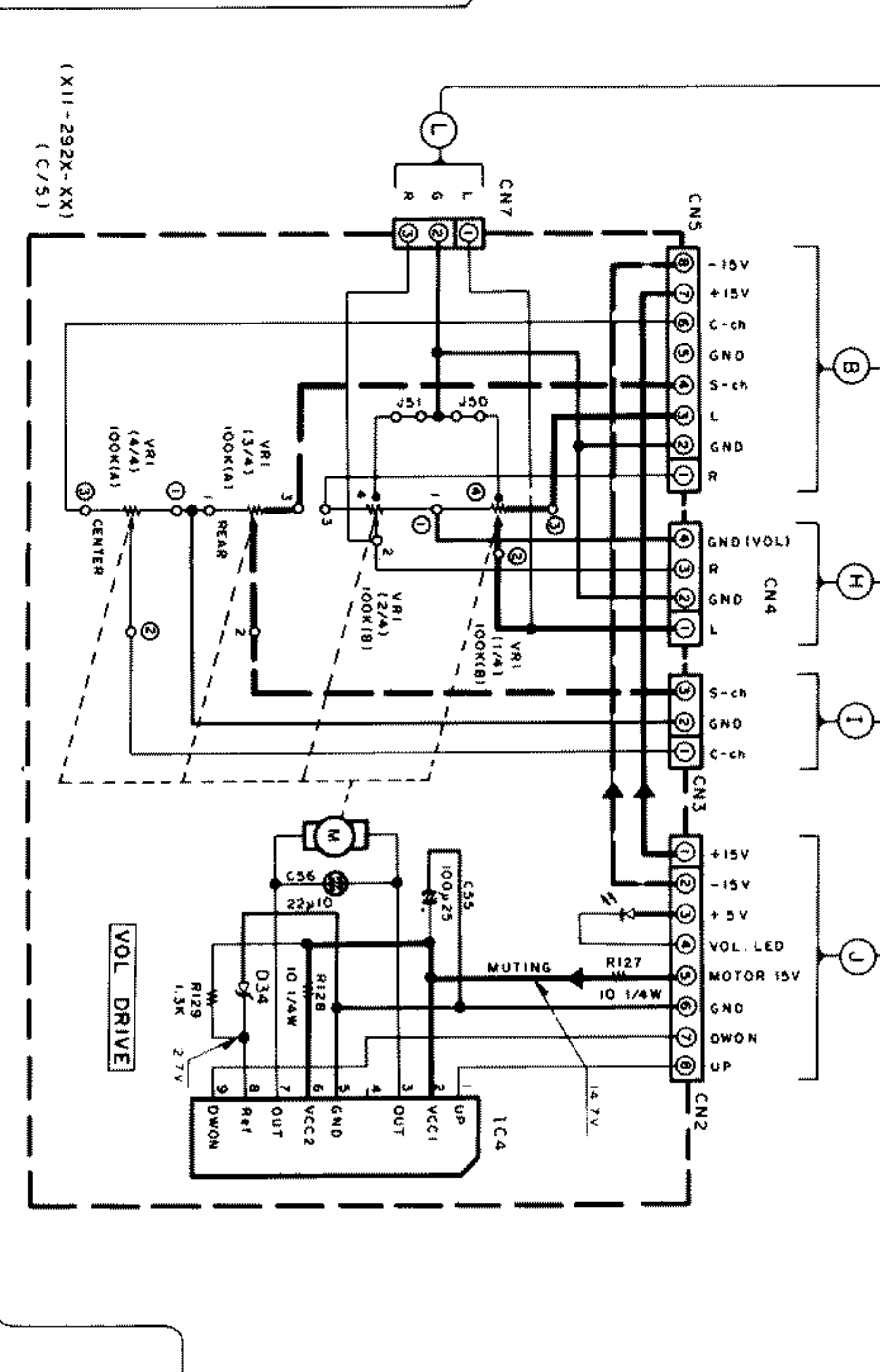
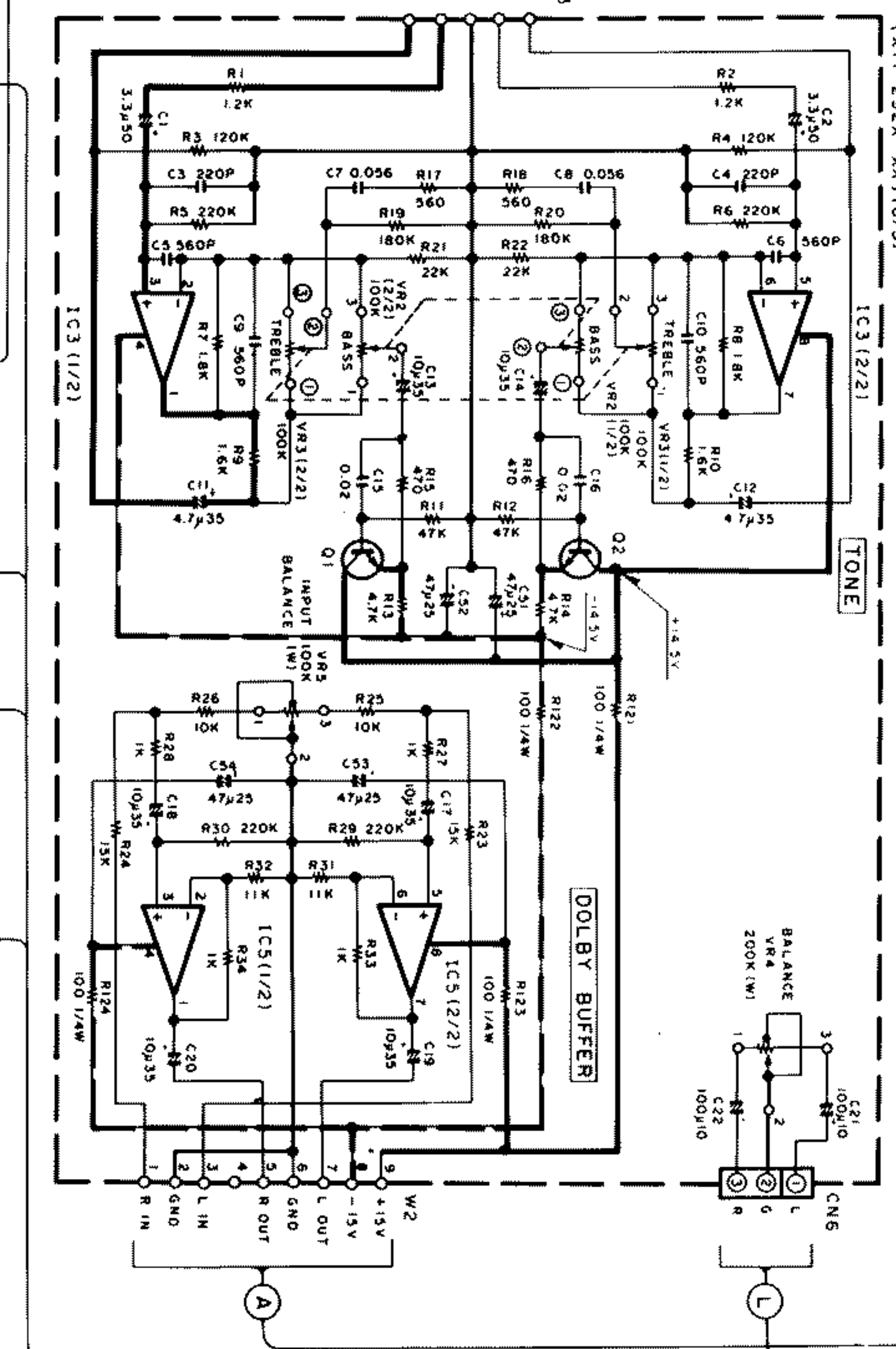
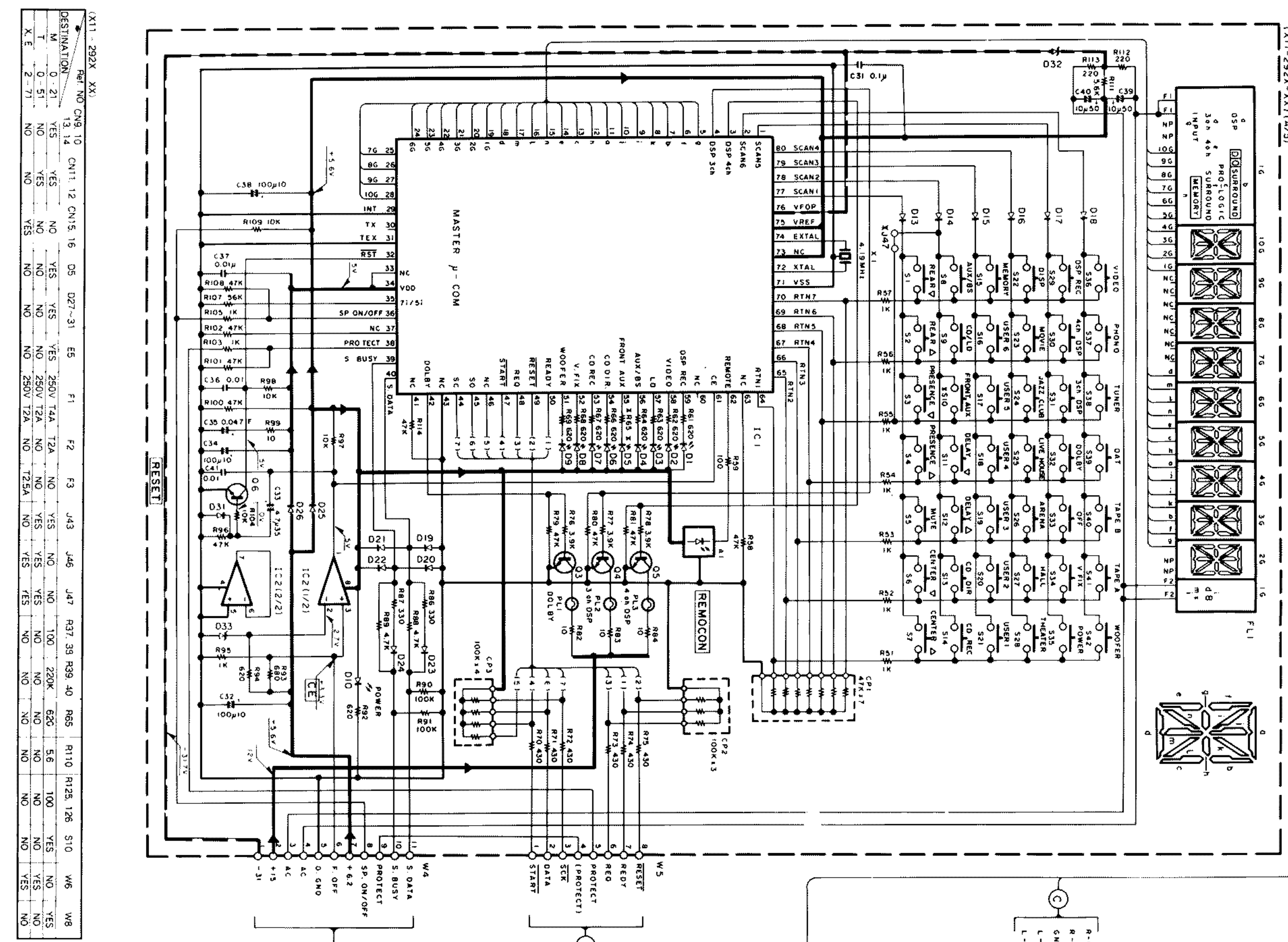
Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u. U. geringfügig.





(X11-292X-XX)
IC1 : CXP0112-154Q
IC2 : AN6814 or BA10933
IC3 : NJM45800-D or NJ4570C-A
IC4 : TA8409S
Q1-6 : 2SC1740S (Q1) or 2SC945A (Q1, Q2)
Q7, 8 : 2SC2003 (L, K)
D1-5, 8, 9 : B90-1289-05
D6, 7, 10 : B90-1291-05
D11, 12 : 1SS131 or HSS104A

D13-31 : 1SS133 or HSS104
Q32 : HZ55JIN (B2) or R05JES (B2)
Q33, 34 : HZ52JIN (B2) or R02JES (B2)



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	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向備考
IC1		*	CXP50112-154Q	IC	
IC2		*	AN5914	IC	
IC2			BA10393	IC(DUAL COMPALATOR)	
IC3			NJM4580D-D	IC	
IC3			UPC4570C-A	IC	
IC4			TA8409S	IC(MOTOR CONTROL)	
IC5			NJM4580D-D	IC	
IC5			UPC4570C-A	IC	
Q1 -6			2SC1740S(Q,R)	TRANSISTOR	
Q1 -6			2SC945(A)(Q,P)	TRANSISTOR	
Q7 ,8			2SC2003(L,K)	TRANSISTOR	
A1			W02-0776-05	ELECTRIC CIRCUIT MODULE	
A1		*	W02-1046-05	ELECTRIC CIRCUIT MODULE	
DSP SUB UNIT (X13-6640-00)					
C4			CE04JW1C47M	ELECTRO 4.7UF	16WV
C7 -9			CE04JW1C100M	ELECTRO 10UF	16WV
C10 -12			CE04JW1C470M	ELECTRO 47UF	16WV
C13 ,14			C91-0769-05	CERAMIC 0.01UF	K
C15 ,16			CC45FSL1H221J	CERAMIC 220PF	J
D1 -5			HSS104	DIODE	
D1 -5			1SS133	DIODE	
IC1 ,2			NJM4580D-D	IC	
IC1 ,2			UPC4570C-A	IC	
IC3			TC74HC74AP	IC(DUAL D-TYPE FLIP FLOP)	
IC4			TC74HC08AP	IC	
SIGNAL PROCESSOR UNIT (X32-1710-00)					
C1 ,2			CE04KW1V100M	ELECTRO 10UF	35WV
C3 ,4			CF92FV1H302J	MF 3000PF	J
C5 ,6			CF92FV1H102J	MF 1000PF	J
C7 ,8			CF92FV1H472J	MF 4700PF	J
C9 ,10			CK45FF1H103Z	CERAMIC 0.010UF	Z
C11 ,12			CF92FV1H471J	MF 470PF	J
C13 ,14			CF92FV1H562J	MF 5600PF	J
C15 ,16			CK45FF1H103Z	CERAMIC 0.010UF	Z
C17 ,18			CF92FV1H102J	MF 1000PF	J
C19 ,20			CF92FV1H184J	MF 0.18UF	J
C21 ,22			CK45FF1H103Z	CERAMIC 0.010UF	Z
C23 ,24			CC45FSL1H151J	CERAMIC 150PF	J
C25 ,26			CQ09FS1H182J	POLYSTY 1800PF	J
C27 ,28			CC45FSL1H180J	CERAMIC 18PF	J
C29 ,30			CK45FF1H473Z	CERAMIC 0.047UF	Z
C31 ,32			C90-1334-05	NP-ELEC	10WV
C33 ,34			CK45FF1H103Z	CERAMIC 0.010UF	Z
C35 ,36			CE04KW1V100M	ELECTRO 10UF	35WV
C37 ,38			CC45FSL1H101J	CERAMIC 100PF	J
C39 -42			CE04KW1V100M	ELECTRO 10UF	35WV
C43 ,44			CF92FV1H822J	MF 8200PF	J
C45 ,46			CE04KW1C220M	ELECTRO 22UF	16WV
C51 ,52			CK45FF1H103Z	CERAMIC 0.010UF	Z
C53			CE04KW1C220M	ELECTRO 22UF	16WV
C54			CE04KW1H2R2M	ELECTRO 2.2UF	50WV
C55 -58			CE04KW1A101M	ELECTRO 100UF	10WV
C59			CE04KW1A471M	ELECTRO 470UF	10WV

E: Scandinavia & Europe K: USA P: Canada
Y: PX(Far East, Hawaii) T: England M: Other Areas
Y: AAFES(Europe) X: Australia
△ indicates safety critical components.

PARTS LIST

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Teile ohne Parts No. werden nicht geliefert.

Ref. No. 参照番号	Address 位置	New Parts	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向備考
C60			CE04KW1C220M	ELECTRO 22UF	16WV
C61			CK45FF1H473Z	CERAMIC 0.047UF	Z
C62			CE04KW1C220M	ELECTRO 22UF	16WV
C63			CK45FF1H473Z	CERAMIC 0.047UF	Z
C64			CE04KW1C220M	ELECTRO 22UF	16WV
C65			CK45FF1H473Z	CERAMIC 0.047UF	Z
C66			CC45FCH1H100D	10PF	D
C67			CC45FCH1H330J	33PF	J
C68			CK45FF1H473Z	CERAMIC 0.047UF	Z
C69			CK45FF1H103Z	CERAMIC 0.010UF	Z
C70			CE04KW0J331M	ELECTRO 330UF	6.3WV
C71 ,72			CC45FSL1H101J	CERAMIC 100PF	J
C73 ,74			CC45FCH1H100D	CERAMIC 10PF	D
C75			CK45FF1H103Z	CERAMIC 0.010UF	Z
C76 ,77			CE04KW1V100M	ELECTRO 10UF	35WV
C78			C90-1351-05	NP-ELEC	50WV
C79 ,80			CK45FF1H103Z	CERAMIC 0.010UF	Z
C81 ,82			CE04KW1E470M	ELECTRO 47UF	25WV
C83			CF92FV1H133J	MF 0.013UF	J
C84			CF92FV1H222J	MF 2200PF	J
C86			CE04DW0J102M	ELECTRO 1000UF	6.3WV
C87 -89			CK45FF1H473Z	CERAMIC 0.047UF	Z
C90			CK45FF1H103Z	CERAMIC 0.010UF	Z
L1			L40-2281-17	SMALL FIXED INDUCTOR	
L2 -5			L40-3301-17	SMALL FIXED INDUCTOR(33UH,K)	
X1			L77-1125-05	CRYSTAL RESONATOR 24.576MHz	
X2			L77-1128-05	CRYSTAL RESONATOR 67.7376MHz	
R71 ,72			RD14GB2E150J	FL-PROOF RD 15	J 1/4W
R111			RD14GB2E6R8J	FL-PROOF RD 6.8	J 1/4W
VR1 ,2			R12-1086-05	TRIM POT. 1K	
D1 ,2			HSS104	DIODE	
D1 ,2			1SS133	DIODE	
D3			HZS5.6N(B2)	ZENER DIODE	
D3			RD5.6ES(B2)	ZENER DIODE	
D4 -6			HSS104	DIODE	
D4 -6			1SS133	DIODE	
IC1			NJM4558D	IC(OP AMP X2)	
IC2 -4			NJM4565D	IC(OP AMP X2)	
IC5		*	UPD6380GC-3BH	IC(DIGITAL SIGNAL PROCESSOR)	
IC6		*	HM50464RP-12	IC	
IC6		*	LM33464G-12	IC	
IC6		*	UPD41464CF-12	IC	
IC7			TC74HC74AP	IC(DUAL D-TYPE FLIP FLOP)	
IC8 ,9		*	KAS03	IC	
IC10		*	TD6726N	IC(16BIT A/D CONVERTER)	
IC11			NJM4565D	IC(OP AMP X2)	
IC12			NJM4558D	IC(OP AMP X2)	
Q1			2SD1266(Q,P)	TRANSISTOR	
Q2			2SB941(Q,P)	TRANSISTOR	
Q3			2SA733(A)(Q,P)	TRANSISTOR	
Q3			2SA933S(Q,R)	TRANSISTOR	
Q4			2SC1923(R,Ø)	TRANSISTOR	
Q7			2SD1302(S,T)	TRANSISTOR	
Q8			2SA733(A)(Q,P)	TRANSISTOR	

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