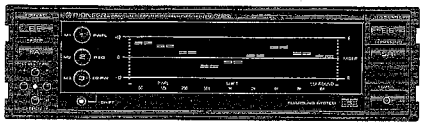
PIONEER®
The future of sound and vision.

Service Manual



ORDER NO.
CRT1169

GRAPHIC EQUALIZER

EQ-600

EW

CONTENTS

SPECIFICATIONS

Power source	DC 14.4 V (10.8—15.6 V allowable)
Grounding system	Negative type
Dimensions (chassis)	180(W) × 50(H) × 137(D) mm
(nose)	170(W) × 46(H) × 16(D) mm
Weight	0.9 kg
Equalization frequency	60 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz
Gain	−2 dB
Equalization range	±12 dB
Frequency response	20—30,000 Hz (±3 dB)
Distortion	0.06% (1 kHz, 70 mV)
Signal-to-noise ratio	99 dB (IEC-A network)
Input impedance	22 kΩ
Output impedance	1 kΩ
Max. output level	250 mV/1 kHz, 1% THD

Note:
Specifications and the design are subject to possible modification without notice due to improvements.

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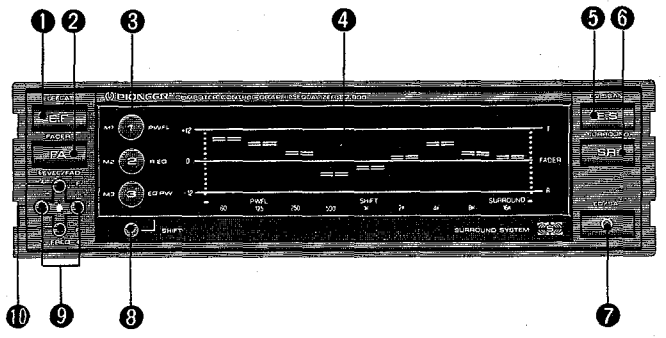
PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

1. NOMENCLATURE AND USE



❶ Flat Curve Button

Pressing this button produces an uncompensated equalizer curve.

❷ Fader Button

Switches to fader adjust display. The fader adjust button can be used to adjust the volume of the front and rear speakers. Pressing again or leaving for approximately 10 seconds after adjustment returns the display to its original status.

❸ Equalizer Preset Button

Up to 3 equalizer curves (user preset curve) can be assigned to this button making it possible to later select a curve by simply pressing the button. This button is also pressed after the shift button ("SHIFT" appears on display) to select one of 3 factory preset curves.

❹ Display

❺ Equalizer Scan Button

Sequentially recalls 6 types of preset curves (at approximately 4-second intervals). Pressing again while any preset curve is recalled selects that preset curve.

❻ Surround Button

Activates the surround function

- *The surround effect can only be obtained with a 2-amp, 4-speaker system and not with a 2-speaker system.*

❼ Display Select Button

Each press of this button switches the display in the following sequence: GRAPHIC EQUALIZER → SPECTRUM ANALYZER (PEAK HOLD) → SPECTRUM ANALYZER (SYMMETRIC) → SPECTRUM ANALYZER (PEAK LINE) → SPECTRUM ANALYZER SCAN

❽ Shift Button

Switches between the factory preset curves and user preset curves. Pressing this button causes "SHIFT" to appear on the display, allowing selection of factory preset curves.

❾ Frequency Select Button

Used to select the frequency when adjusting the graphic equalizer level. Pressing the (+) button makes the frequency higher, while (−) button makes the frequency lower.

❿ Level Up (+), Down (−)/Fader Adjust Button

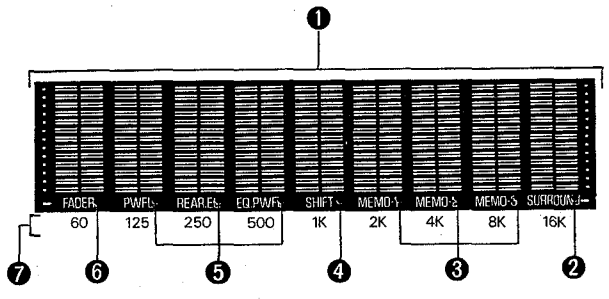
Level Up (+), Down (−) Buttons

Used to adjust graphic equalizer levels. Pressing the (+) button raises the level, while pressing the (−) button lowers the level. Adjustments are made after pressing the frequency select button to cause the selected frequency to flash. Only the frequency that is flashing can be adjusted.

Fader Adjust Button

Adjusts the front and rear speaker volume for 2-amp, 4-speaker system. Pressing the fader button causes a fader adjust display to appear. Pressing the (F) button while this display is shown reduces output from the rear speaker until output is being produced by the front speaker only. Pressing the (R) button while this display is shown reduces output from the front speaker until output is being produced by the rear speaker only.

• Reading the Displays

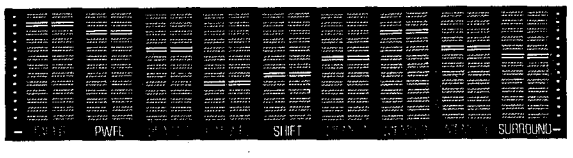


❶ Graphic Equalizer/Spectrum Analyzer/Fader Adjust Display

Each press of the display select button causes the display contents to change as illustrated A, B, C, D and E below. Display F is produced by pressing the fader button.

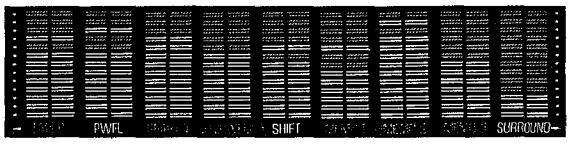
A: Graphic Equalizer Display

Levels are shown divided among 9 frequencies. The level indicated by the orange lines on the display are the uncompensated levels, while red indicates high level and blue indicates low level.

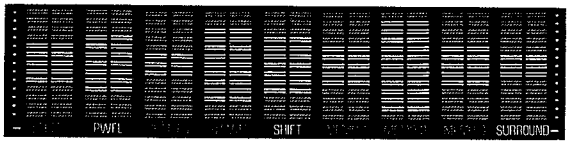


B: Spectrum Analyzer (Peak Hold) Display

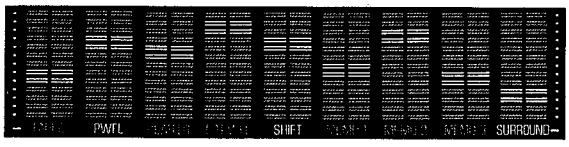
The power levels of the 9 frequency divisions are momentarily held and displayed.



C: Spectrum Analyzer (Symmetric) Display
The power levels of the 9 frequency divisions are divided into upper and lower along the center on the display.

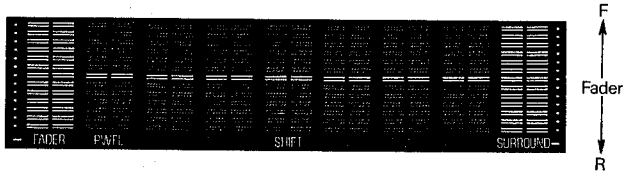


D: Spectrum Analyzer (Peak line) Display
Displays the peak values only for the power levels of the 9-band spectrum analyzer.

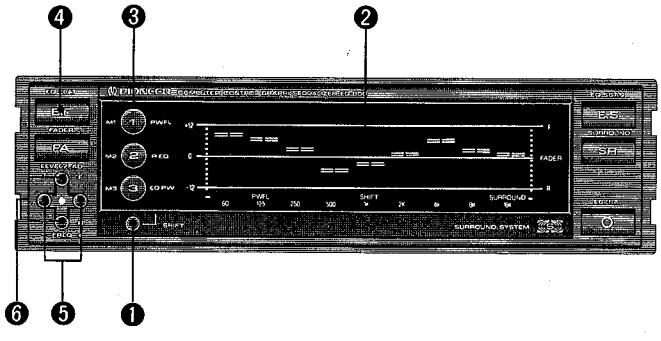


E: Spectrum Analyzer Scan
Shows three different spectrum analyzer displays (peak hold, symmetric, peak line) for about five seconds each.

F: Fader Adjust Display
Pressing the fader button changes to the fader adjust display, and pressing again returns to the original display. The display indicates that the front and rear speaker volume levels are equal when the bar is at the center position. The front speaker output gets higher when the bar is moved toward F, while the rear speaker output gets higher when the bar is moved toward R.



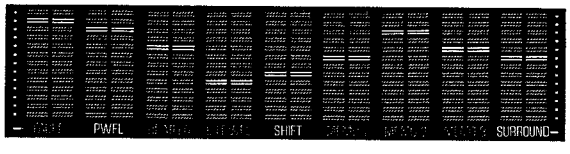
• Using the Graphic Equalizer



Factory Preset Curves

1. Press the shift button ❶ and "SHIFT" appears on the display ❷.
2. Press the PWFL, R.EQ, EQPW equalizer preset buttons ❸ or flat curve button ❹ to select one of the following equalizer curves.

PWFL: Powerful Curve
Enhances the low and high ranges to produce a powerful curve.



❷ Surround Display
Appears on and disappears from the display when the surround button is pressed.

❸ User Preset Display
Displays the button pressed when a user preset curve is selected after pressing the equalizer preset button.

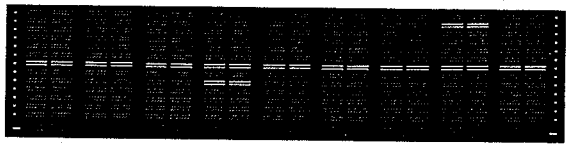
❹ Shift Display
Appears on and disappears from the display when the shift button is pressed.

❺ Factory Preset Curve Display
Displays the button pressed when a factory preset curve is selected after pressing the equalizer preset button.

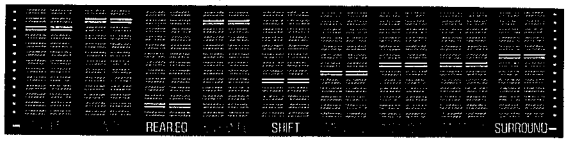
❻ Fader Display
Appears on and disappears from the display when the fader button is pressed.

❼ Frequency Display
Demo Mode
When the spectrum analyzer display is being used during tape playback, the display automatically switches to the demo mode when the unrecorded portion of a cassette tape continues longer than about 20 seconds. The spectrum analyzer display is restored when a recorded portion of the tape is reached.

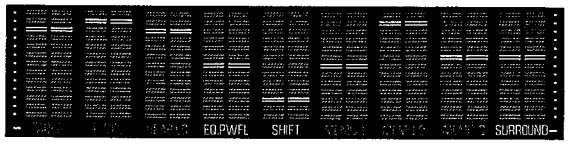
Demo mode display



R.EQ: Rear speaker Equalizer Curve
Compensates for the frequency characteristics inside of the vehicle to produce the equivalent of a flat curve (in most vehicles).



EQPW: Equalizer Powerful Curve
Compensates for the frequency characteristics inside of the vehicle while enhancing the low and high ranges to produce a powerful sound.



EQ FLAT: Flat Curve
An uncompensated flat curve that can be used as a reference to determine the effects of the other curves. The flat curve can be recalled regardless of the ON/OFF status of the shift button.

Forming Equalizer Curves

1. Press the frequency select button ❺ and adjust to the desired frequency (level indicator blinks on display ❷). Pressing the (+) button increases the frequency, while the (−) button decreases the frequency.
2. Use the level up (+)/down (−) buttons ❻ to set the frequency to the desired level.

- Repeat steps 1 and 2 to adjust the other frequencies.
- User preset curves based on a factory preset curve by first calling the desired factory preset curve.

Recording to Memory

Once an equalizer curve is created, the following operation is used to assign the curve to preset buttons M1 through M3

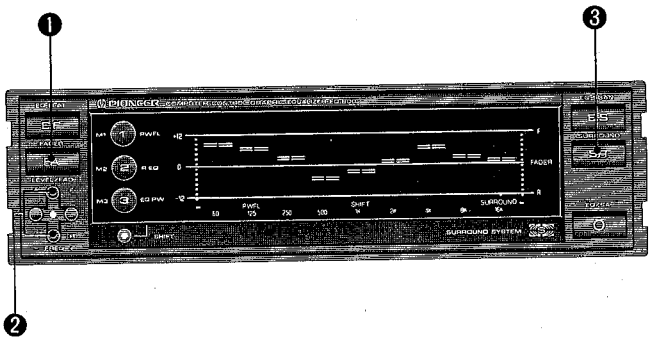
3. Press the shift button ❶ and "SHIFT" disappears on the display ❷.
4. Press and hold down one of the equalizer curve preset buttons (M1—M3) until a beep is heard (approximately 2 seconds). This signals that the curve has been stored in memory under the preset button pressed.

- The procedure outlined above can be used to create and store up to 3 equalizer curves.

Note:

- Changes in low pitched sounds may not be discernible even when the 60 Hz frequency level is adjusted if the program source does not include components in the 60 Hz vicinity or if the small diameter speakers are used.
- Changes in high pitched sounds may not be discernible even when the 16 kHz frequency level is adjusted if the program source does not include components in the 16 kHz vicinity.

• Surround Function



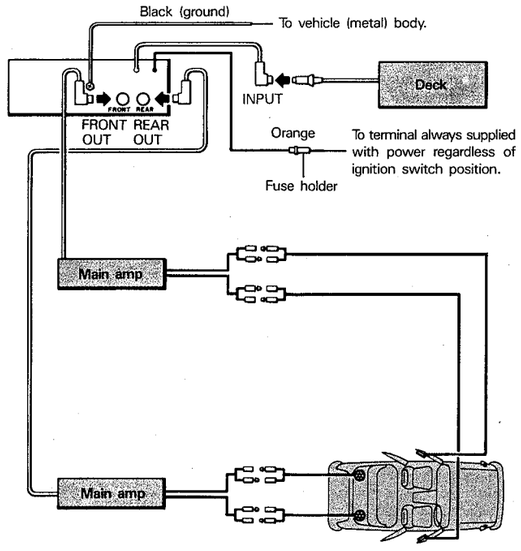
The surround function provides powerful concert hall ambience, giving the feeling of sitting in the center of a concert hall or sound studio.
The following procedure allows the most effective use of the surround system:

1. Adjust the front and rear speaker volume to the same levels using the fader button ❶ and fader adjust button ❷.
2. Press the surround button ❸.
3. The rear speaker volume level may increase with certain sources. At this time, reduce the rear speaker volume level using the fader button ❶ and fader adjust button ❷.

- The surround effect can only be obtained with a 2-amp, 4-speaker system and not with a 2-speaker system.
- The surround effect cannot be obtained with a monaural source
- Left/right volume balance of the rear speakers cannot be adjusted while the surround function is being used.
- The effectiveness of the surround function depends upon the source.

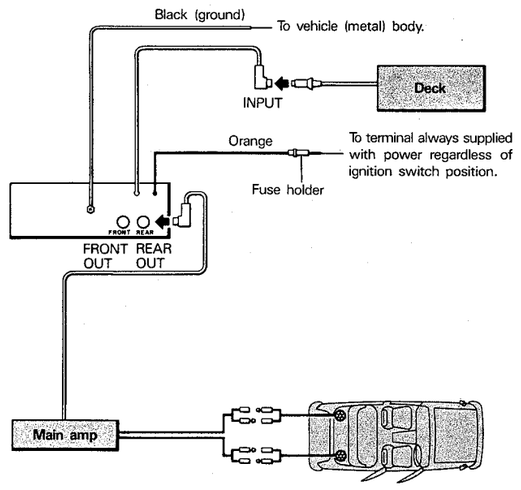
2. CONNECTIONS

4-Speaker System



2-Speaker System

- In a 2-speaker system, wire the rear output terminal to the main amp.



3. DISASSEMBLY

• Removing the Case

1. Remove the three fastening screws and then remove the case.

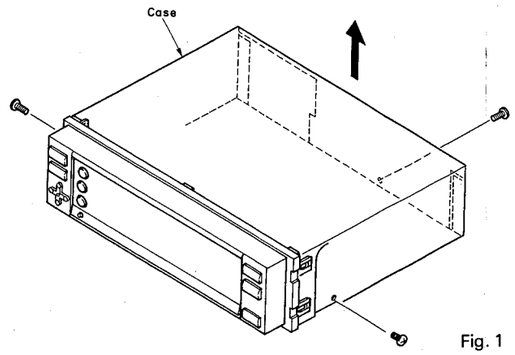


Fig. 1

• Removing the Grille Unit

1. Remove the grille unit tab and pull the grille straight out.

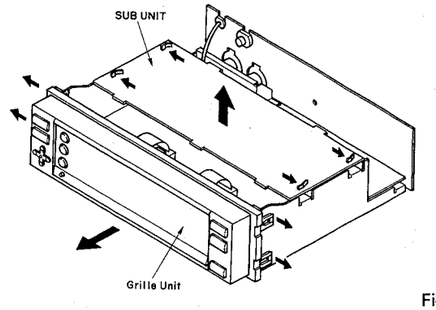


Fig. 2

• Removing the Sub Unit (Fig. 2)

1. Unbend the four tabs and lift up the sub unit.

• Removing the Key Board Unit

1. Disconnect two connectors.
2. Remove the four fastening screws and lift up the key board unit.

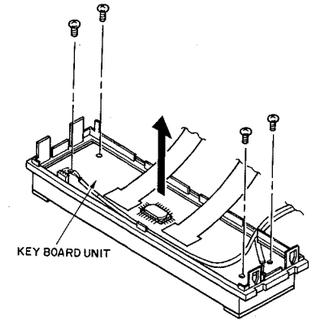


Fig. 3

• Removing Main Unit

1. Remove the two fastening screws.
2. Unbend the three tabs and lift up the main unit.

Fig. 4

4. BLOCK DIAGRAM

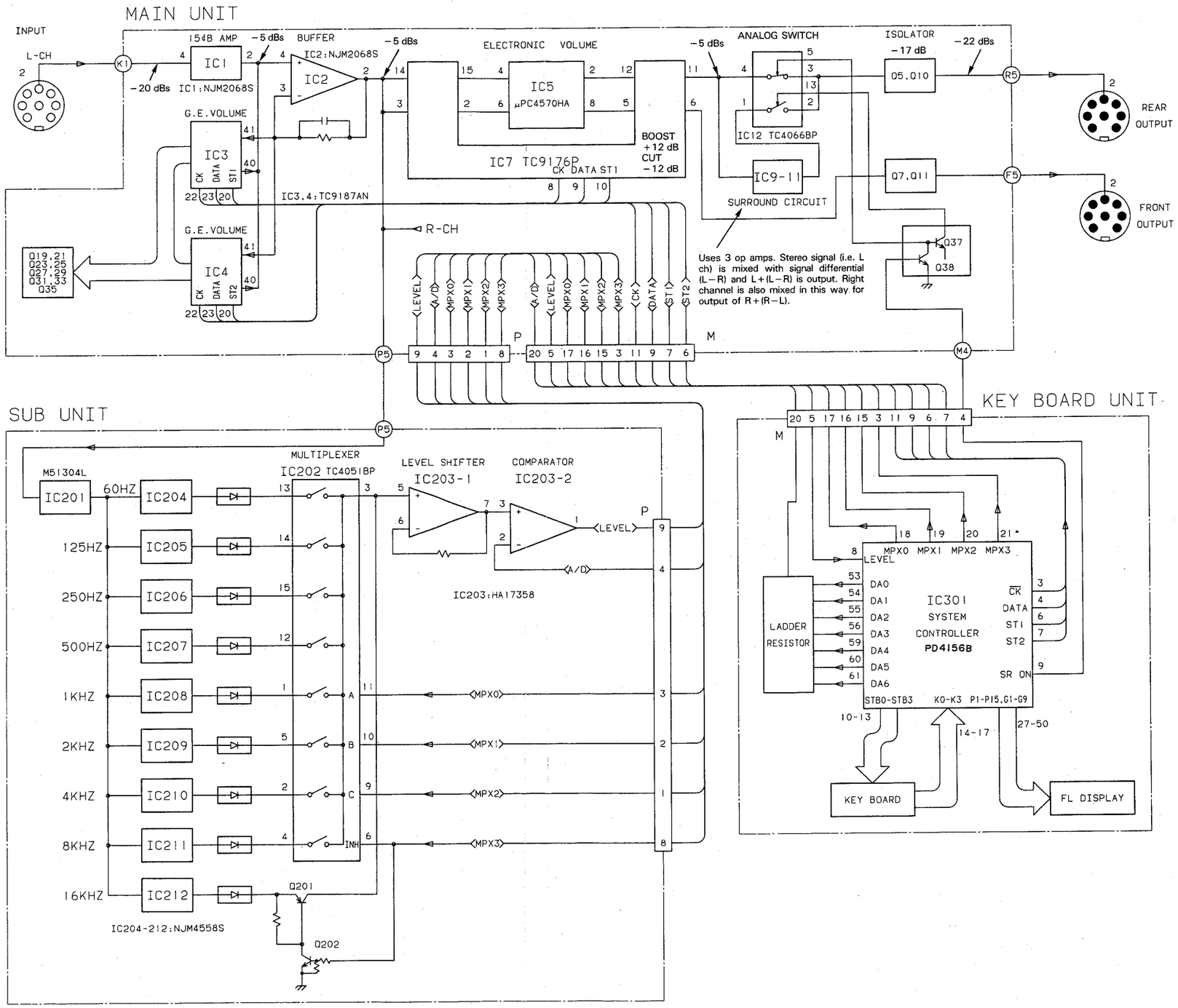
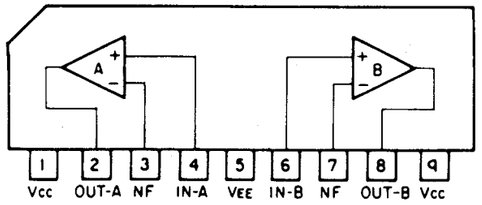
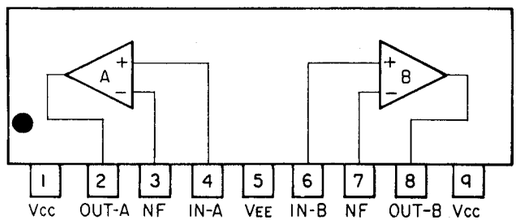


Fig. 5

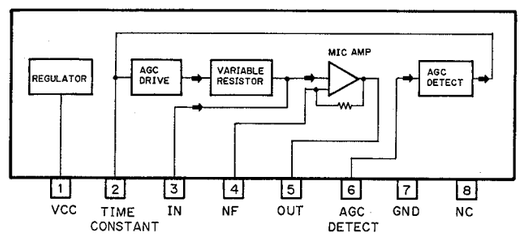
IC1, 2: NJM2068S



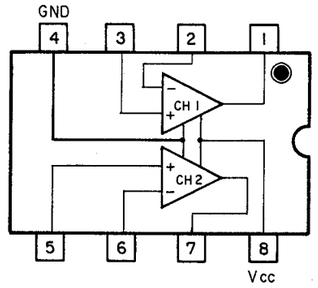
IC5, 6, 9-11: µPC4570HA



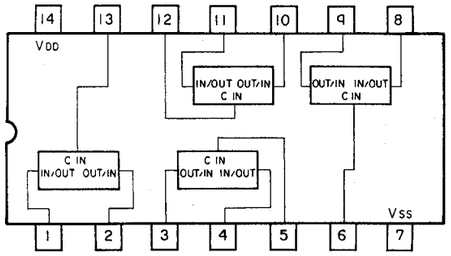
IC201: M51304L



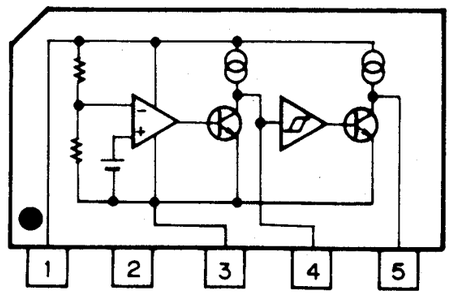
IC203: HA17358



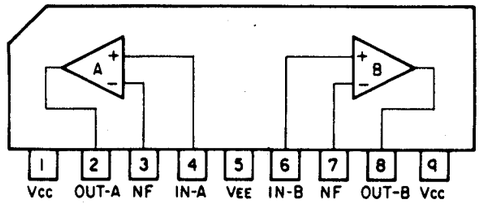
IC12: TC4066BP



IC13: M51954AL

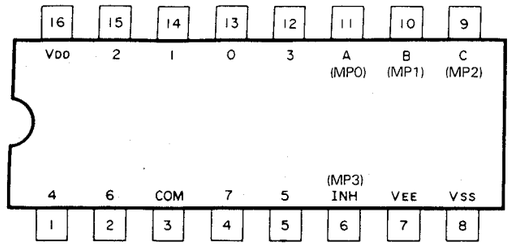


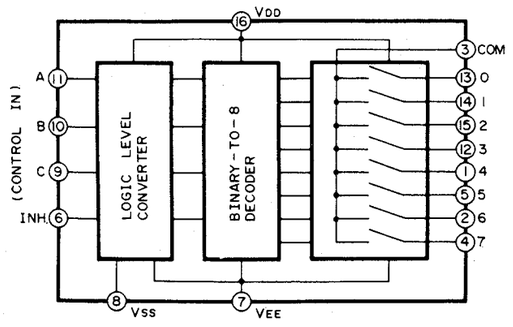
IC204-212: NJM4558S



• Sub Unit

IC202: TC4051BP





The TC4051BP is an 8 channel multiplexer capable of both selecting between the analog signal and digital signal and combining them. The switch corresponding to each of the 8 channels is turned on by the digital signal in the control pin.

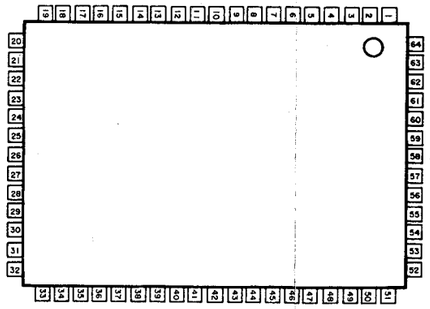
Control input signals				"ON" channel
INH	C	B	A	
L	L	L	L	0
L	L	L	H	1
L	L	H	L	2
L	L	H	H	3
L	H	L	L	4
L	H	L	H	5
L	H	H	L	6
L	H	H	H	7

When a HIGH level is input to INH, no channel turns on regardless of the state of the other inputs.

• Key Board Unit

*IC's marked by *are MOS type.*
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

*IC301: PD4156B



• **Pin Function (PD4156B)**

Pin No.	Pin Name	I/O	Function and Operation
1	NC		Not used.
2	DIM	INPUT	Dimmer control input terminal. Dimmer ON when H level input.
3	$\overline{CK}$	CMOS OUTPUT	Control data clock terminal. Output of electronic GEQ volume control data of synchronization clock.
4	DATA	CMOS OUTPUT	Control data terminal. Output of electronic GEQ volume control data.
5	BTB1	INPUT	BT+B input terminal. Input of system power supply control. System switches ON with input of H level. Power is switched OFF and unit enters stand-by mode with change iron H level to L level.
6 7	ST1 ST2	CMOS OUTPUT	Electronic GEQ volume control data latch output terminals.
8	LEVEL	INPUT	Spectrum analyzer level input terminals. Input of spectrum analyzer display level comparator output.
9	SRON	CMOS OUTPUT	Surround control output terminal. H level when active.
10–13	STB0 – STB3	CMOS OUTPUT	Strobe output terminal for key matrix. H level when active.
14–17	K0 – K3	INPUT	Input terminal for key matrix.
18–21	MPX0 – MPX3	CMOS OUTPUT	B.P.F. switch data output terminal for spectrum analyzer.

MPX Control Data

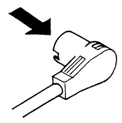
B.P.F	60Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz
MPX0	0	1	0	1	0	1	0	1	0
MPX1	0	0	1	1	0	0	1	1	0
MPX2	0	0	0	0	1	1	1	1	0
MPX3	0	0	0	0	0	0	0	0	1

22	EVENT		Not used.
23 24	X2 X1	OUTPUT INPUT	Oscillation circuit output terminal Oscillation circuit input terminal
25	VSS		GND terminal
26	VDD		Power supply terminal
27–33 34,35 36–41	P13–P7 P14, P15 P1–P6	OUTPUT Pch Open Drain	FL display tube segment output terminal
42–50	G9 – G1	OUTPUT Pch Open Drain	FL display tube timing output terminal
51	VLOAD	INPUT	Display driver power supplyterminal
52	VPRE	INPUT	Pre-driver power supplyterminal
53–56 59–61	DA0 – DA3 DA4 – DA6	CMOS OUTPUT	A/D converter control output for spectrum analyzer
57	BTB2	INPUT	Stand-by cancel interrupt input terminal. Stand-by mode cancelled with change iron L level to H level.
58	VDD		Power supply terminal
62	$\overline{SROFF}$	CMOS OUTPUT	Surround control output terminal. L level when active.
63	RESET	INPUT	Reset input terminal.
64	BEEP	CMOS OUTPUT	Key touch tone output terminal(4kHz,30ms)

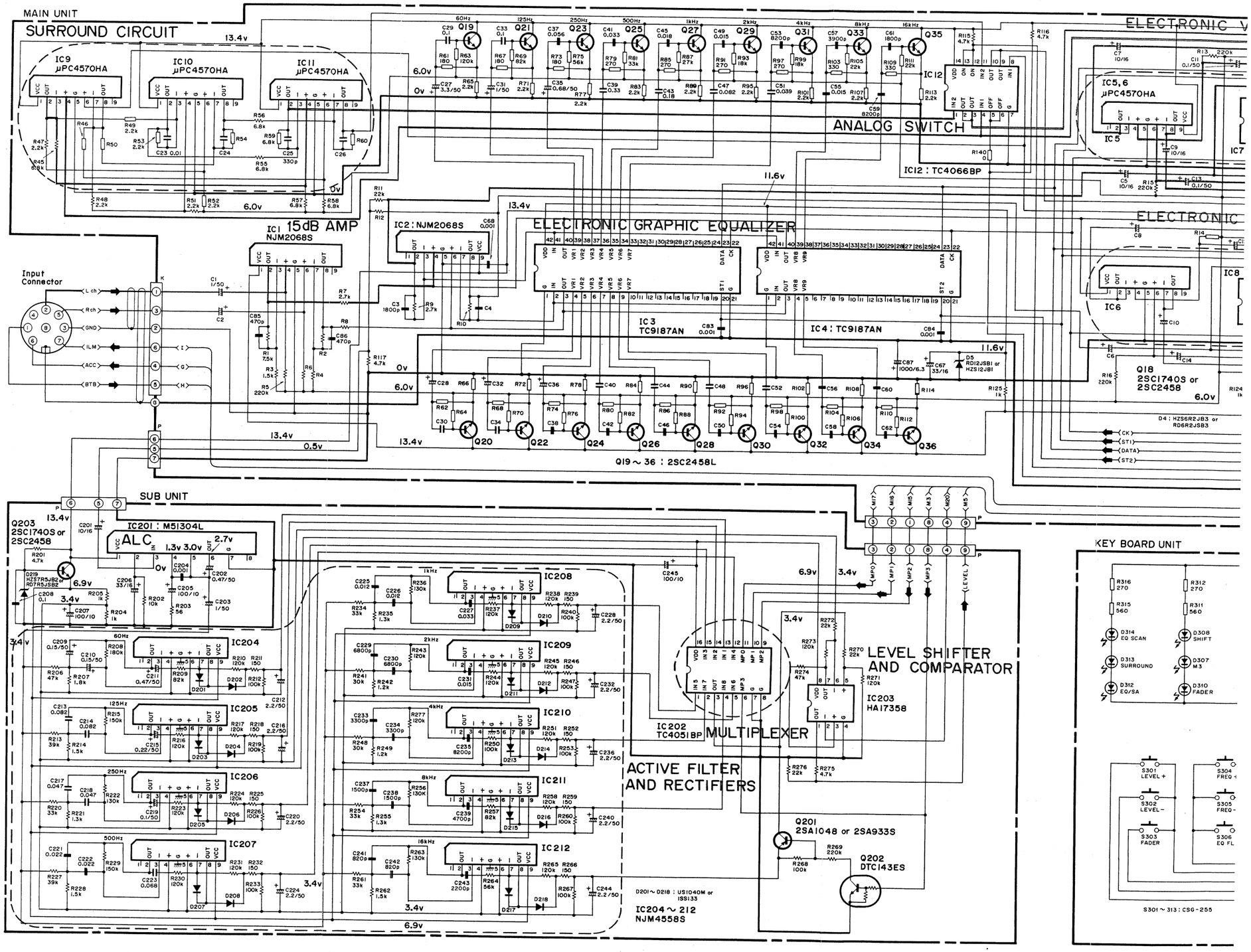
SPECTRUM ANALYZER A/D CONVERSION THRESHOLD VALUE

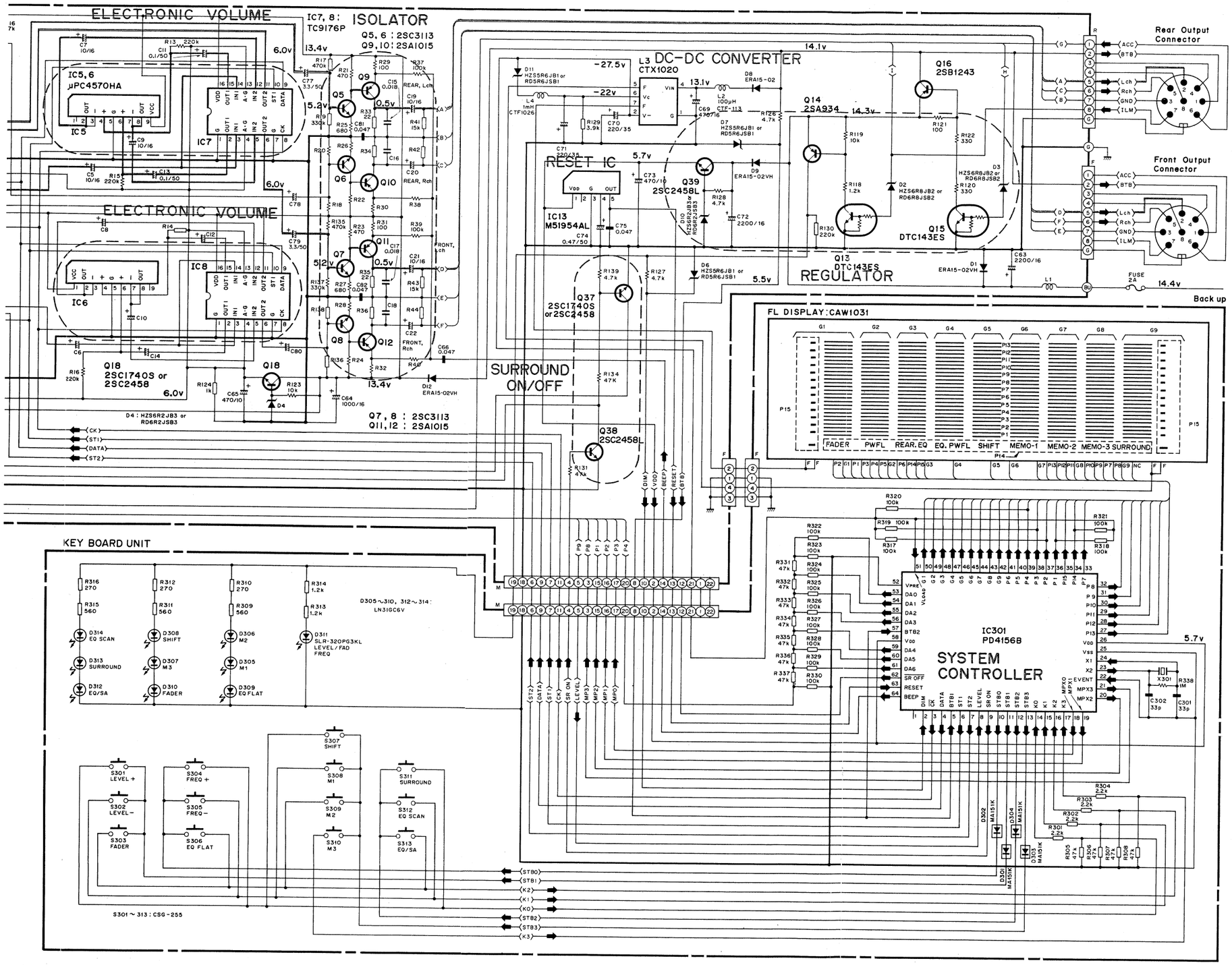
THRESHOLD VALUE							(HEX)	LEVEL	D/A Output (V)
DA6	DA5	DA4	DA3	DA2	DA1	DA0			
1	1	1	0	0	0	1	71	12	2.2
1	0	1	1	0	1	0	5A	11	1.76
1	0	0	1	0	0	0	48	10	1.41
0	1	1	1	0	0	1	39	9	1.11
0	1	0	1	1	0	1	2D	8	0.880
0	1	0	0	1	0	0	24	7	0.703
0	0	1	1	1	0	1	1D	6	0.566
0	0	1	0	1	1	1	17	5	0.449
0	0	1	0	0	1	0	12	4	0.352
0	0	0	1	1	1	0	0E	3	0.273
0	0	0	1	0	1	1	0B	2	0.215
0	0	0	1	0	0	1	09	1	0.176

5. SCHEMATIC CIRCUIT DIAGRAM



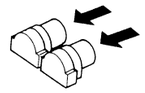
The view of the connector is one seen from the mating connector.





NOTE:

- Indicates a chip resistor
- Indicates a chip capacitor
- Indicates a chip diode

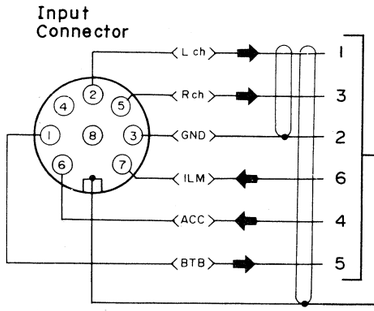


The view of the connector is one seen from the mating connector.

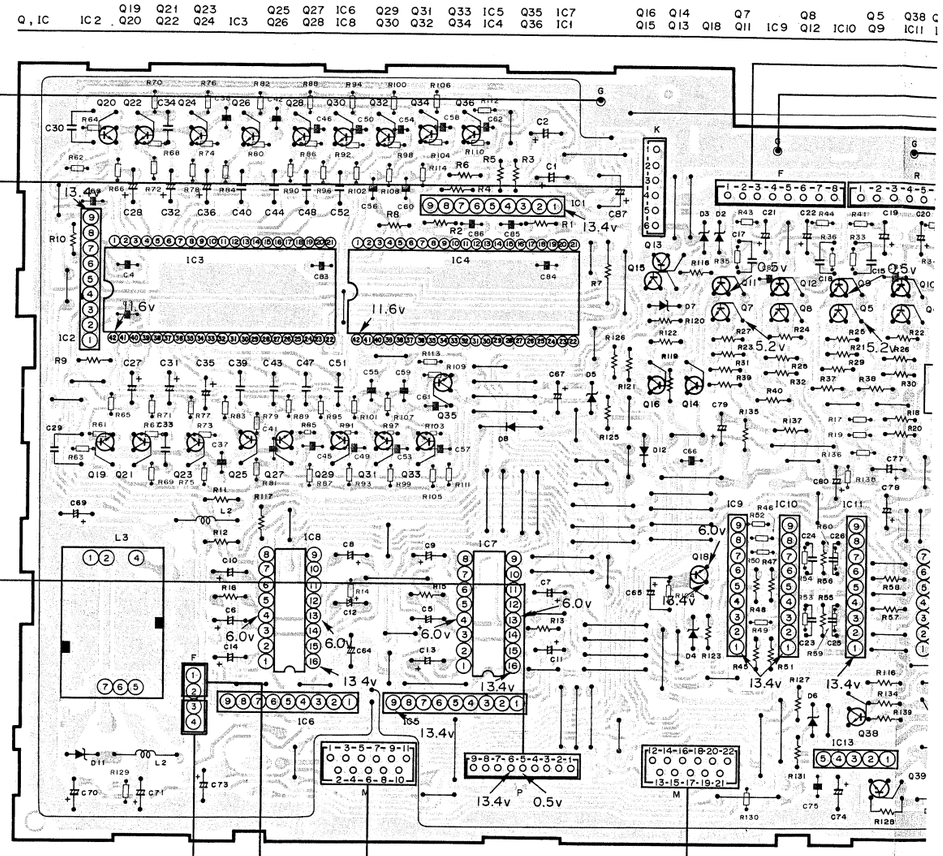
Graphic Equalizer Assy
Consists of • Main Unit • Sub Unit

Fig. 6

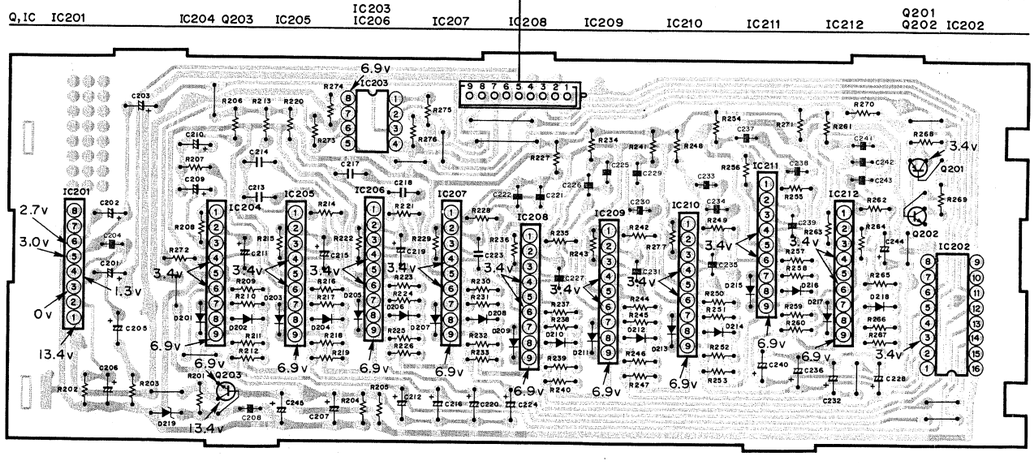
6. CONNECTION DIAGRAM



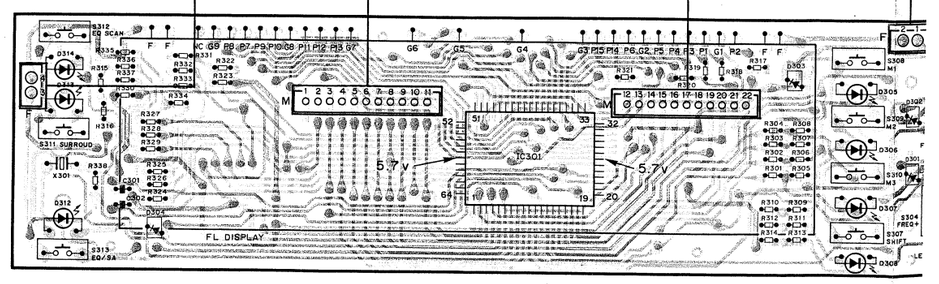
MAIN UNIT



SUB UNIT

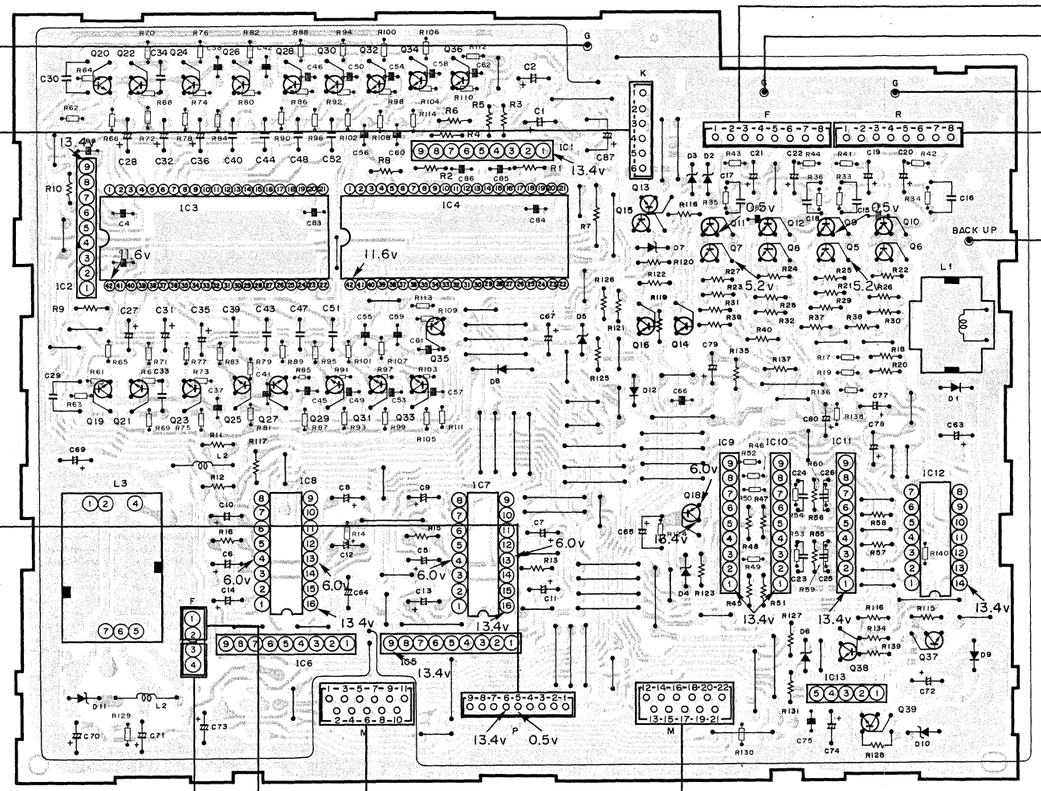


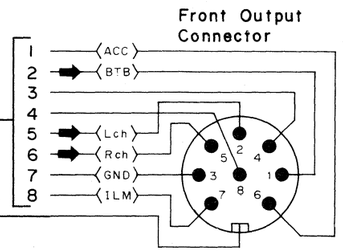
KEY BOARD UNIT

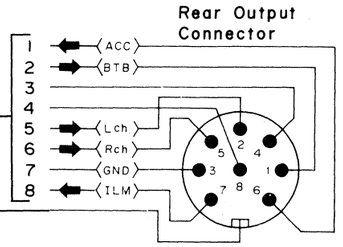


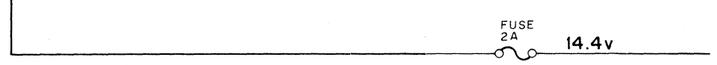
MAIN UNIT

Q, IC IC2 Q19 Q20 Q21 Q22 Q23 Q24 IC3 Q25 Q26 Q27 Q28 IC6 IC8 Q29 Q30 Q31 Q32 Q33 Q34 IC5 IC4 Q35 Q36 IC7 IC1 Q16 Q15 Q14 Q13 Q18 Q7 Q11 IC9 Q8 Q12 IC10 Q5 Q9 Q38 IC11 IC13 Q39 Q6 Q10 Q37 IC12

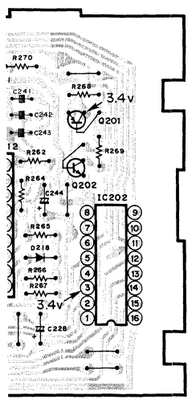








Q201
12 Q202 IC202



KEY BOARD UNIT

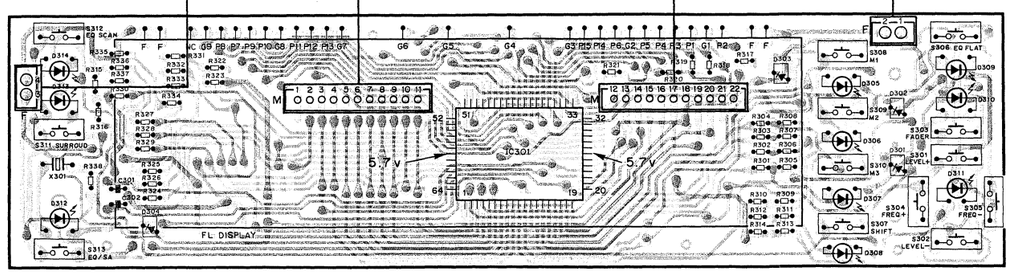


Fig. 7

7. EXPLODED VIEW

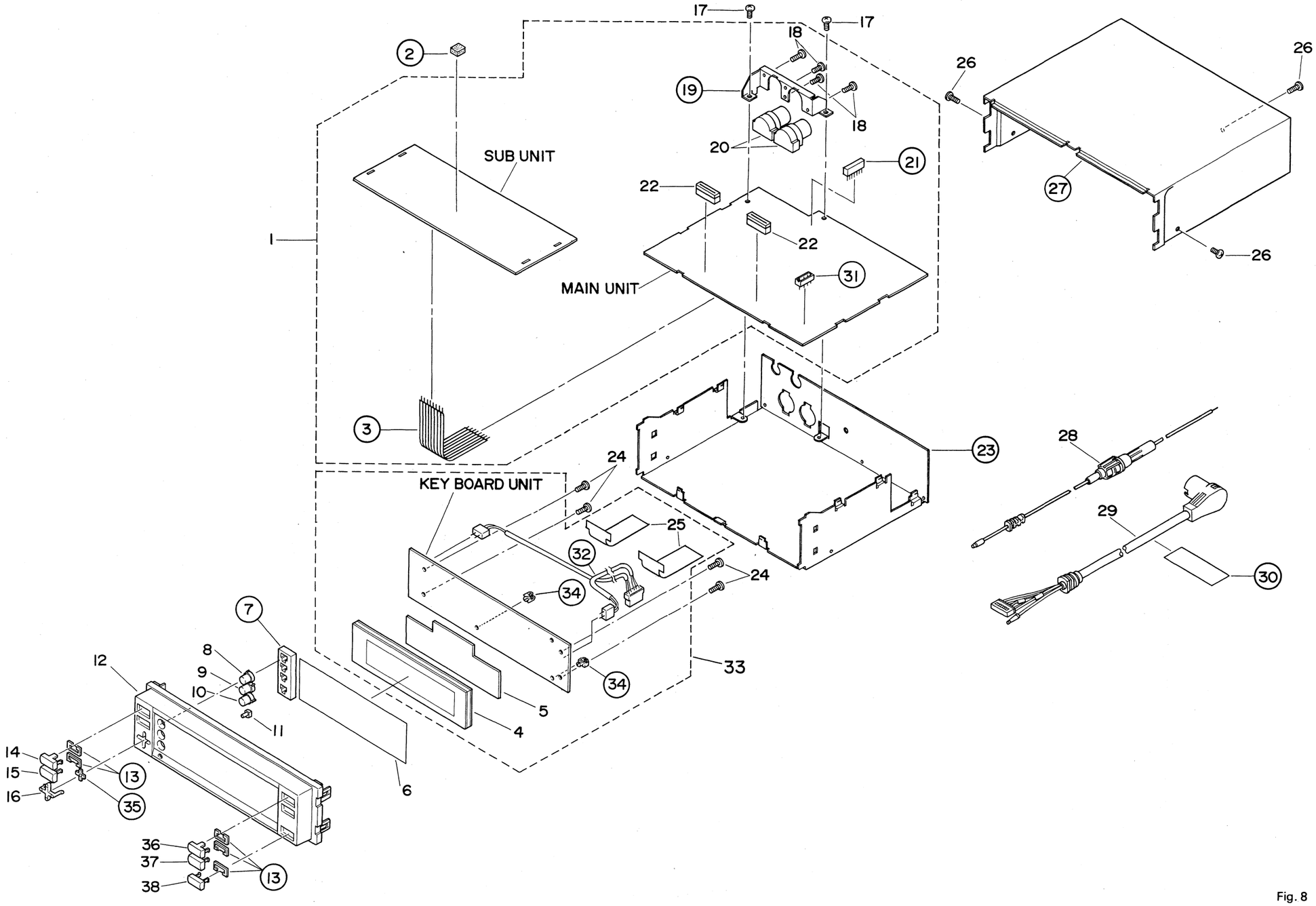


Fig. 8

•Parts List

NOTE:

- *For your Parts ★ ★ and ★. ★ ★: GENER. This classificat. number, tempo*
- *Parts whose pa*
- *Parts marked L longer than us*

Mark	No.	P
◉	1	C
	2	
	3	
	4	C
	5	C
	6	C
	7	
★	8	C
★	9	C
★	10	C
★	11	C
	12	C
	13	
★	14	C
★	15	C
★	16	C
	17	B
	18	B
	19	
	20	C

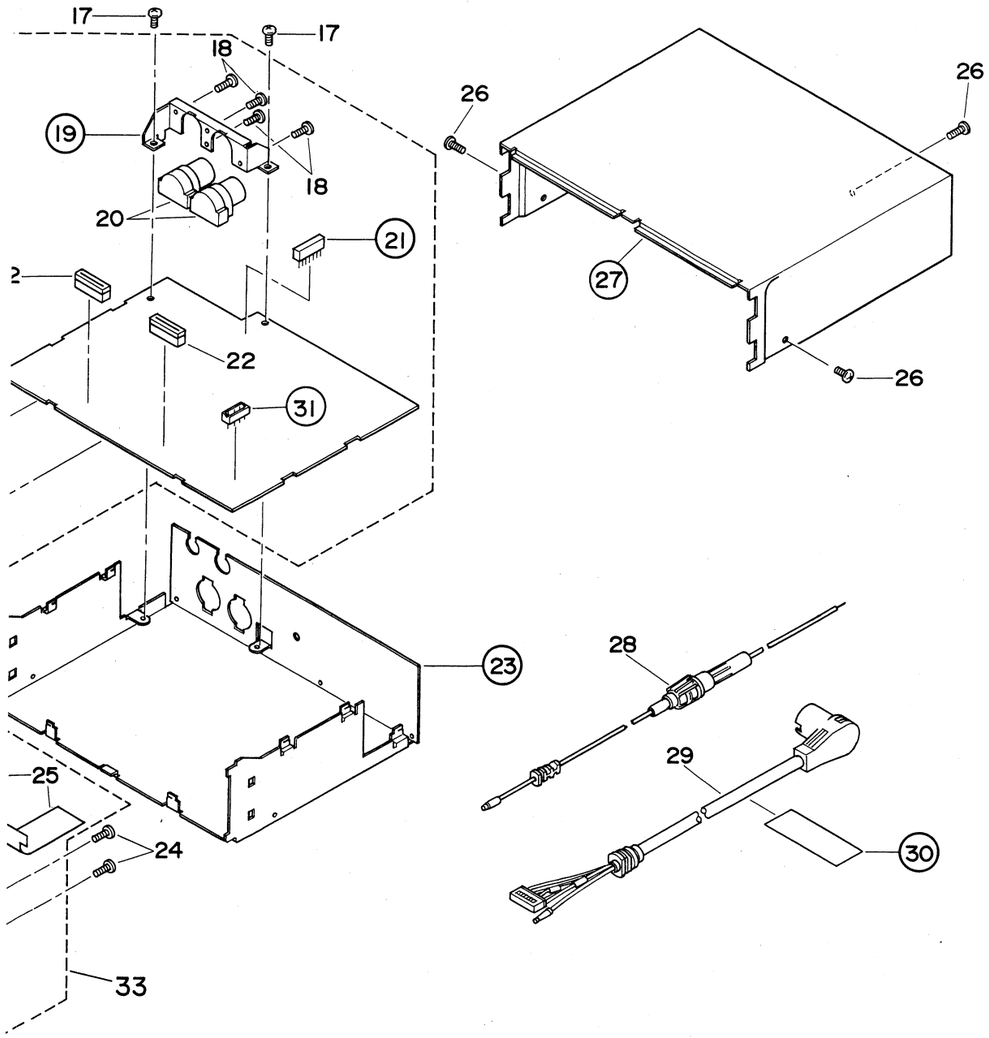


Fig. 8

•Parts List

NOTE:

- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★: GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

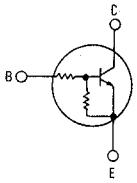
Mark	No.	Part No.	Description
◉	1	CWX1138	Graphic Equalizer Assy
	2		Cushion
	3		Connector
	4	CAW1031	FL Display
	5	CNM1903	Cushion
	6	CNM1997	Film
	7		Cushion
★	8	CAC1614	Button (M1)
★	9	CAC1615	Button (M2)
★	10	CAC1616	Button (M3)
★	11	CAC1622	Button (SHIFT)
	12	CXA2460	Grille Unit
	13		Cushion
★	14	CAC1749	Button (EQ FLAT)
★	15	CAC1750	Button (FADER)
★	16	CAC1637	Button (FREQ/LEVEL)
	17	BMZ30P060FMC	Screw
	18	BMZ20P050FMC	Screw
	19		Bracket
	20	CKS1104	Connector (OUTPUT)

Mark	No.	Part No.	Description
	21		Plug
	22	CKS-397	Connector
	23		Chassis
	24	BPZ20P060FMC	Screw
	25	CNP1484	P.C.Board
	26	BMZ30P040FZK	Screw
	27		Case
	28	CDE1780	Cord (BACK UP)
	29	CDE1537	Connector (INPUT)
	30		Label
	31		Plug
	32		Connector
◉	33	CWS1118	Key Board Unit
	34		Clamper
	35		Cushion
★	36	CAC1751	Button (EQ SCAN)
★	37	CAC1752	Button (SURROUND)
★	38	CAC1632	Button (EQ/SA)

• ICs and Transistors

DTC143ES

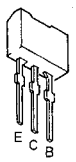
DTC143ES



2SA1048
2SC1740S
2SC2458L
2SC3113

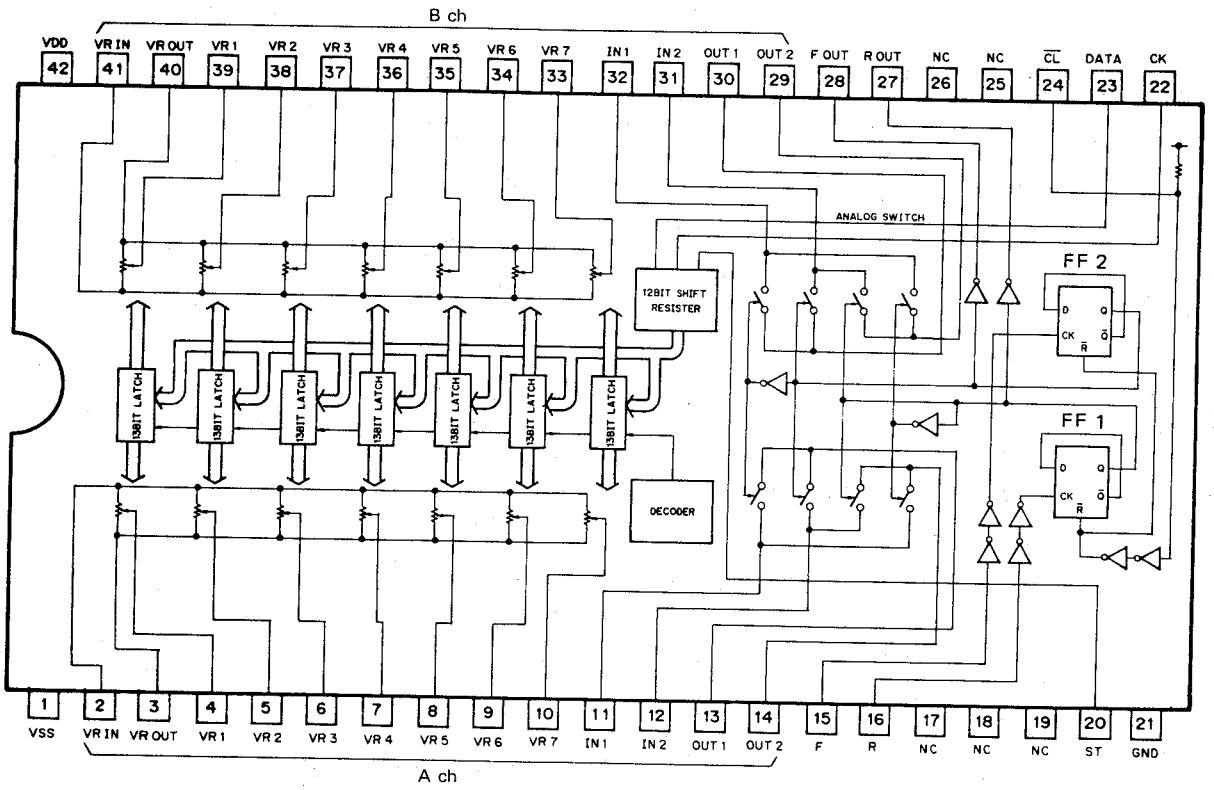
2SA934
2SA1015

2SB1243



• Main Unit

IC3, 4: TC9187AN

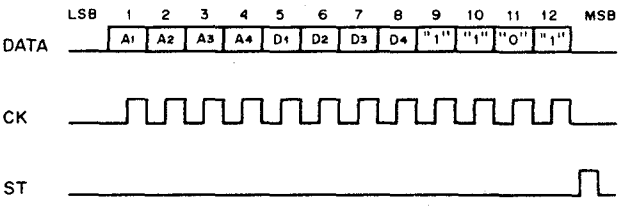


• Pin Functions: (TC9187AN)

Pin	Pin Name	Function and Operation
2 41	(A) (B) VRIN	Common input pin for each volume control
3 40	(A) (B) VROUT	Common output pin for each volume control
4 39	(A) (B) VR1	Common pin for volume control 1 60 Hz
5 38	(A) (B) VR2	Common pin for volume control 2 125 Hz
6 37	(A) (B) VR3	Common pin for volume control 3 250 Hz
7 36	(A) (B) VR4	Common pin for volume control 4 500 Hz
8 35	(A) (B) VR5	Common pin for volume control 5 1 kHz
9 34	(A) (B) VR6	Common pin for volume control 6 3.5 kHz
10 33	(A) (B) VR7	Common pin for volume control 7 10 kHz
11 32	(A) IN1 (B)	Input pin for the analog switch matrix (Input pin for signals that by-pass the EQ circuit.)
12 31	(A) IN2 (B)	Input pin for the analog switch matrix (Input pin for signals that pass through the EQ circuit.)
13 30	(A) (B) OUT1	Front output pin Front output pin
14 29	(A) (B) OUT2	Rear output pin Rear output pin
15	F	Input pin for analog switch control (Turns the front equalizer circuit on and off)
16	R	Input pin for analog switch control (Turns the rear equalizer circuit on anf off)
17 – 19 25 – 28		Not in use
20	ST	Strobe input pin. Control data at the CK pin and DATA pin is latched when this pin goes HIGH.
22	CK	Clock input pin. Fetches control data
23	DATA	Control data input pin. Control data is made up of 12 bits.
24	$\overline{CL}$	Clear input pin for the analog switch matrix. Turns the equalizer circuit off at a LOW level input.
1 21 42	VDD GND VSS	Power supply pin

*Pins 15 and 16 are active HIGH. The states of FF1 and FF2 are reversed at the leading edge of these pins and turns the circuit on and off.

• Control Data Format



a) A1-A4 (bits 1-4)

Data bits 1-4 select one of the seven volume control circuits denoted VR1-VR7.

A1	A2	A3	A4	Volume
H	L	L	H	VR1
L	H	L	H	VR2
H	H	L	H	VR3
L	L	H	H	VR4
H	L	H	H	VR5
L	H	H	H	VR6
H	H	H	H	VR7

b) D1-D4 (bits 5-8)

Data bits 5-8 set each volume step. Data bits 5-8 control the volume selected by A1-A4 in 13 steps.

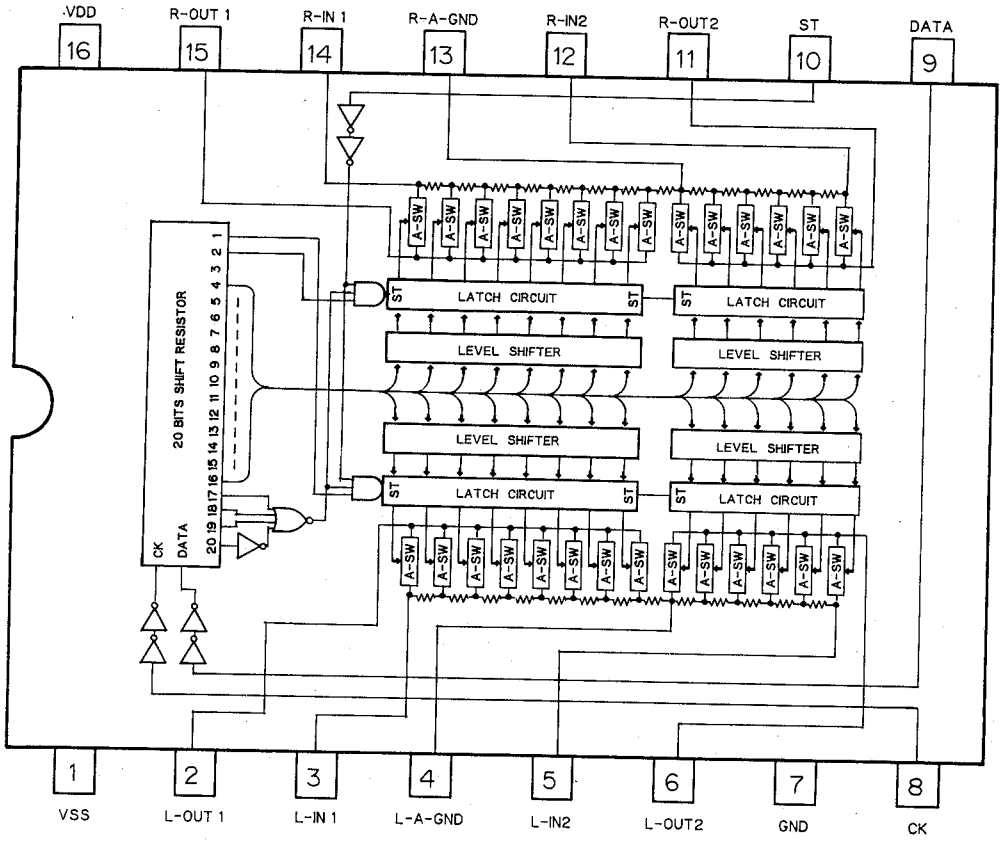
D1	D2	D3	D4	Step
L	H	H	L	+6 (+12 dB)
H	L	H	L	+5 (+10 dB)
L	L	H	L	+4 (+8 dB)
H	H	L	L	+3 (+6 dB)
L	H	L	L	+2 (+4 dB)
H	L	L	L	+1 (+2 dB)
L	L	L	L	0 (0 dB)
H	H	H	H	−1 (−2 dB)
L	H	H	H	−2 (−4 dB)
H	L	H	H	−3 (−6 dB)
L	L	H	H	−4 (−8 dB)
H	H	L	H	−5 (−10 dB)
L	H	L	H	−6 (−12 dB)

c) Codes Bits (bits 9-12)

Data bits 9-12 must match the cods for TC9187AN. Data is received only when these bits are as shown below.

9	10	11	12
H	H	L	H

IC7, 8: TC9176P



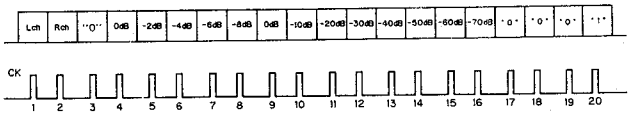
• Pin Functions: (TC9176P)

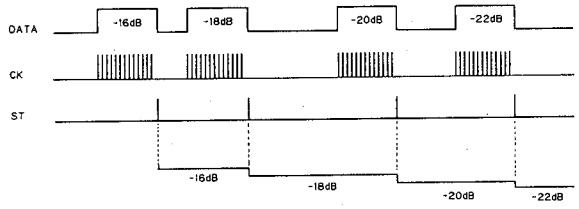
Terminal	Name	I/O	Function and operation
2 15	L-OUT1 R-OUT1	Output	10 dB step attenuator output Signal with IN is attenuated from 0 to 70 dB in B steps at the 10 dB step.
3 14	L-IN1 R-IN1	Input	10 dB attenuator input
4, 13	A-GND		AC ground terminal.
5 12	L-IN2 R-IN2	Input	2 dB attenuator input
6 11	L-OUT2 R-OUT2	Output	2 dB attenuator output Signal with IN is attenuated from 0 to 8 dB in 5 steps at the 2 dB step.
9	DATA	Input	Data input of attenuation amount and channel selection Consisting of 20 bits, it is input by the CK signal.
8	CK	Input	Clock input Clock input to fetch dats of the DATA terminal.
10	ST	Input	Strobe input Attenuation amount and channel selection data fetched from the DATA and CK terminal can be latched by having this terminal set to "H" level. If "H" level is not applied to this terminal, the previous data will be in effect.
16	VDD		(+) power applied terminal
7	GND		Ground terminal
1	VSS		(−) power applied terminal

The TC9176P is a built-in electronic volume IC for loudness ON/OFF. The attenuation volume data output by the system controller (IC301), is input to the DATA, CK, and ST terminals. The data consists of 20 bits. It consists of the following.

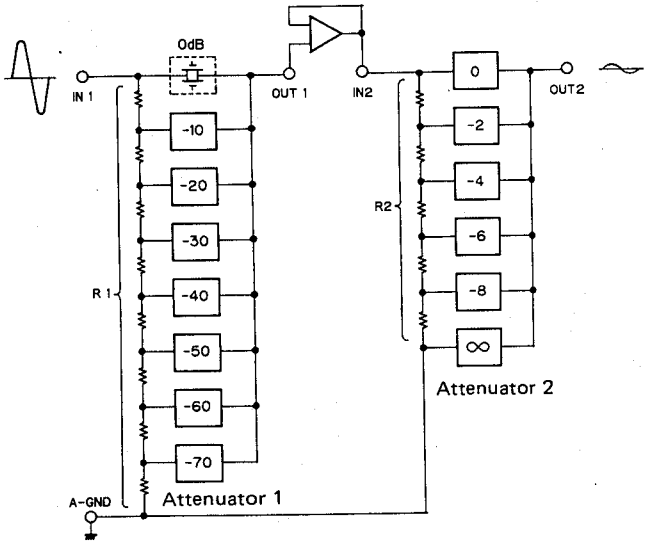
Bit	Description
1, 2	Selection of L channel, R channel
3	Always "0"
4 – 8	Setting of 2 dB step attenuator
9 – 16	Setting of 10 dB step attenuator
17 – 20	Chip select bit "0001" is select mode, for values other than this, there is no operation.

There will be infinite attenuation volume for −78 dB data. Therefore, step up from infinity to 1 will be −76 dB. Changes of the fetched data will all be synchronized with ST signal transition.





The attenuator section consists of a diffused resistor array and an analog switch. Attenuator 1 can attenuate 0 to 70 dB at 10 dB step, and attenuator 2 can attenuate 0 to 8 dB at 2 dB step, for a total attenuation of 0 to 76 dB at 2 dB step.



8. ELECTRICAL PARTS LIST

NOTE:

- *For your Parts Stock Control, the fast moving items are indicated with the marks ✻✻ and ✻.*
  ✻✻ : GENERALLY MOVES FASTER THAN ✻.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The part numbers shown below indicate chip components.*
  Chip Resistor
  RS1/8S□□□J, RS1/10S□□□J
  Chip Capacitor (except for CQS. . . . .)
  CKS....., CCS....., CSZS.....

Unit Number :
Unit Name : Graphic Equalizer Assy

Graphic Equalizer Assy
Consists of ●Main Unit ●Sub Unit

MISCELLANEOUS

Mark	Circuit Symbol & No.	Part Name	Part No.
✻✻	IC 1 2		NJM2068S
✻✻	IC 3 4		TC9187AN
✻✻	IC 5 6 9 10 11		μPC4570HA
✻✻	IC 7 8		TC9176P
✻✻	IC 12		TC4066BP
✻✻	IC 13		M51954AL
✻✻	IC 201		M51304L
✻✻	IC 202		TC4051BP
✻✻	IC 203		HA17358
✻✻	IC 204 205 206 207 208 209 210 211 212		NJM4558S
✻✻	Q 5 6 7 8		2SC3113
✻✻	Q 9 10 11 12		2SA1015
✻✻	Q 13 15		DTC143ES
✻✻	Q 14		2SA934
✻✻	Q 16		2SB1243
✻✻	Q 18 37		2SC1740S (2SC2458)
✻✻	Q 19 20 21 22 23 24 25 26 27 28		2SC2458L
✻✻	Q 29 30 31 32 33 34 35 36 38 39		2SC2458L
✻✻	Q 201		2SA1048 (2SA933S)
✻✻	Q 202		DTC143ES
✻✻	Q 203		2SC1740S (2SC2458)
✻	D 1 9 12		ERA15-02VH
✻	D 2 3		HZS6R8,JB2 (RD6R8,JSB2)
✻	D 4 10		HZS6R2,JB3 (RD6R2,JSB3)
✻	D 5		RD12,JSB1 (HZS12,JB1)
✻	D 6 7 11		HZS5R6,JB1 (RD5R6,JSB1)
✻	D 8		ERA15-02
✻	D 201 202 203 204 205 206 207 208 209 210		US1040M (1SS133)
✻	D 211 212 213 214 215 216 217 218		US1040M (1SS133)
✻	D 219		HZS7R5,JB2 (RD7R5,JSB2)
	L 1	Choke Coil 1mH	CTH1016
	L 2	Coil 100μH	CTF-113
	L 3	Converter	CTX1020
	L 4	Coil 1mH	CTF1026

RESISTORS

Mark	Circuit Symbol & No.	Part Name	Part No.
	R 1 2		RD1/4PS752JL
	R 3 4		RD1/4PS152JL
	R 5 6 13 15 16		RD1/4PS224JL
	R 7		RD1/4PM272J
	R 8 9 10		RD1/4PS272JL
	R 11 12		RD1/4PS223JL
	R 14 130		RS1/8S224J
	R 17 136		RS1/8S474J
	R 18 135		RD1/4PS474JL
	R 19 138		RS1/8S334J
	R 20 137		RD1/4PS334JL
	R 21 22 23 24		RD1/4PS471JL
	R 25 26 27 28		RD1/4PS681JL
	R 29 30 31 32 121		RD1/4PS101JL
	R 33 34 35 36		RS1/8S220J
	R 37 38 39 40		RD1/4PS104JL
	R 41 42 43 44		RS1/8S153J
	R 45 55 56 57 58		RD1/4PS682JL
	R 46 59 60		RS1/10S682J
	R 47 48 51		RD1/4PS222JL
	R 49 50 52 53 54 65 66 71 72 77		RS1/10S222J
	R 61 62 67 68 73 74		RS1/10S181J
	R 63 64		RS1/10S124J
	R 69 70		RS1/10S823J
	R 75 76		RS1/10S563J

Mark	Circuit Symbol & No.	Part Name	Part No.
R	78 83 84 89 90 95 96 101 102 107		RS1/10S222J
R	79 80 85 86 91 92 97 98		RS1/10S271J
R	81 82		RS1/10S333J
R	87 88		RS1/10S273J
R	93 94 99 100		RS1/10S183J
R	103 104 109 110		RS1/10S331J
R	105 106 111 112		RS1/10S223J
R	108 113 114		RS1/10S222J
R	115 116 117 126 127 128 139		RD1/4PS472JL
R	118		RD1/4PS122JL
R	119 123		RD1/4PS103JL
R	120 122		RD1/4PS331JL
R	124		RS1/8S102J
R	125 204 205		RD1/4PS102JL
R	129		RS1/8S392J
R	131 134		RD1/4PS473JL
R	140		RS1/8S0R0J
R	201 275		RD1/4PS472JL
R	202		RD1/4PS103JL
R	203		RD1/4PS560JL
R	206 274		RD1/4PS473JL
R	207		RD1/4PS182JL
R	208		RD1/4PS184JL
R	209 257		RD1/4PS823JL
R	210 217 224 231 238 245 251 258 265 271		RD1/4PS124JL
R	211 218 225 232 239 246 252 259 266		RD1/4PS151JL
R	212 219 226 233 240 247 250 253 260		RD1/4PS104JL
R	213 227		RD1/4PS393JL
R	214 228 262		RD1/4PS152JL
R	215 229		RD1/4PS154JL
R	216 223 230 237 243 244 273 277		RD1/4PS124JL
R	220 234 254 261		RD1/4PS333JL
R	221 235 255		RD1/4PS132JL
R	222 236 256 263		RD1/4PS134JL
R	241 248		RD1/4PS303JL
R	242 249		RD1/4PS122JL
R	264		RD1/4PS563JL
R	267 268		RD1/4PS104JL
R	269		RD1/4PS224JL
R	270 272 276		RD1/4PS223JL

CAPACITORS

Mark	Circuit Symbol & No.	Part Name	Part No.
C	1 2		CEANL010M50L
C	3 4 61 62		CKSQYB182K50
C	5 6 7 8 9 10		CEA100M16L2
C	11 12 13 14		CEA0R1M50L2
C	15 16 17 18		CQMA183K50
C	19 20 21 22		CEA100M16L2
C	23 24		CQMA103K50
C	25 26		CKCYB331K50
C	27 28 77 78 79 80		CEA3R3M50L2
C	29 30 33 34		CQFAH104J50L
C	31 32		CEA010M50L2
C	35 36		CEAR68M50LL
C	37 38		CKSYB563K25
C	39 40		CQFAH334J50L
C	41 42		CKSYB333K50
C	43 44		CQFAH184J50L
C	45 46		CKSQYB183K25
C	47 48		CQMA823K50
C	49 50		CKSQYB153K25
C	51 52		CQMA393K50
C	53 54		CKSQYB822K50
C	55 56		CKSYB153K50
C	57 58		CKSQYB392K50
C	59 60 235		CKSYB822K50
C	63 72	2200μF/16V	CCH1001
C	64		CEA102M16L2
C	65 73		CEA471M10L2
C	66 75 81 82		CKSYB473K25
C	67		CEA330M16L2
C	68 83 84 204		CKSYB102K50
C	69	470μF/16V	CCH-114
C	70 71		CEA221M35L2
C	74		CEAR47M50L2
C	85 86		CKSQYB471K50
C	87		CEA102M6R3L2
C	201		CEA100M16L2
C	202 211		CEAR47M50L2
C	203		CEA010M50L2
C	205 207 245		CEA101M10L2
C	206		CEA330M16L2
C	208		CKSYF104Z25
C	209 210		CEAR15M50LL
C	212 216 220 224 228 232 236 240 244		CEA2R2M50L2
C	213 214		CQMA823K50
C	215		CEAR22M50L2
C	217 218		CQMA473K50
C	219		CEA0R1M50L2
C	221 222		CKSYB223K50
C	223		CQMA683K50
C	225 226		CKSYB123K50
C	227		CKSYB333K50
C	229 230		CKSYB682K50
C	231		CKSYB153K50
C	233 234		CKSYB332K50
C	237 238		CKSYB152K50
C	239		CKSYB472K50
C	241 242		CKSYB821K50
C	243		CKSYB222K50

Unit Number :
Unit Name : Key Board Unit

MISCELLANEOUS

Mark	Circuit Symbol & No.	Part Name	Part No.
**	IC 301		PD4156B
*	D 301 302 303 304	Chip Diode	MA151K
*	D 305 306 307 308 309 310 312 313 314	LED	LN31GCGV
*	D 311	LED	SLR-320PG3KL
	X 301	Xtal	CSS1029
**	S 301 302 303 304 305 306 307 308 309 310	Switch	CSG-255
**	S 311 312 313	Switch	CSG-255
		FL Display	CAW1031

RESISTORS

Mark	Circuit Symbol & No.	Part Name	Part No.
R	301 302 303 304		RS1/10S222J
R	305 306 307 308		RS1/10S473J
R	309 311 315		RS1/10S561J
R	310 312 316		RS1/10S271J
R	313 314		RS1/10S122J
R	317 318 319 320 321		RS1/10S104J
R	322 323 324 325 326 327 328 329 330		RS1/10S104J
R	331 332 333 334 335 336 337		RS1/10S473J
R	338		RS1/10S105J

CAPACITORS

Mark	Circuit Symbol & No.	Part Name	Part No.
C	301 302		CCSQCH330J50

9. PACKING METHOD

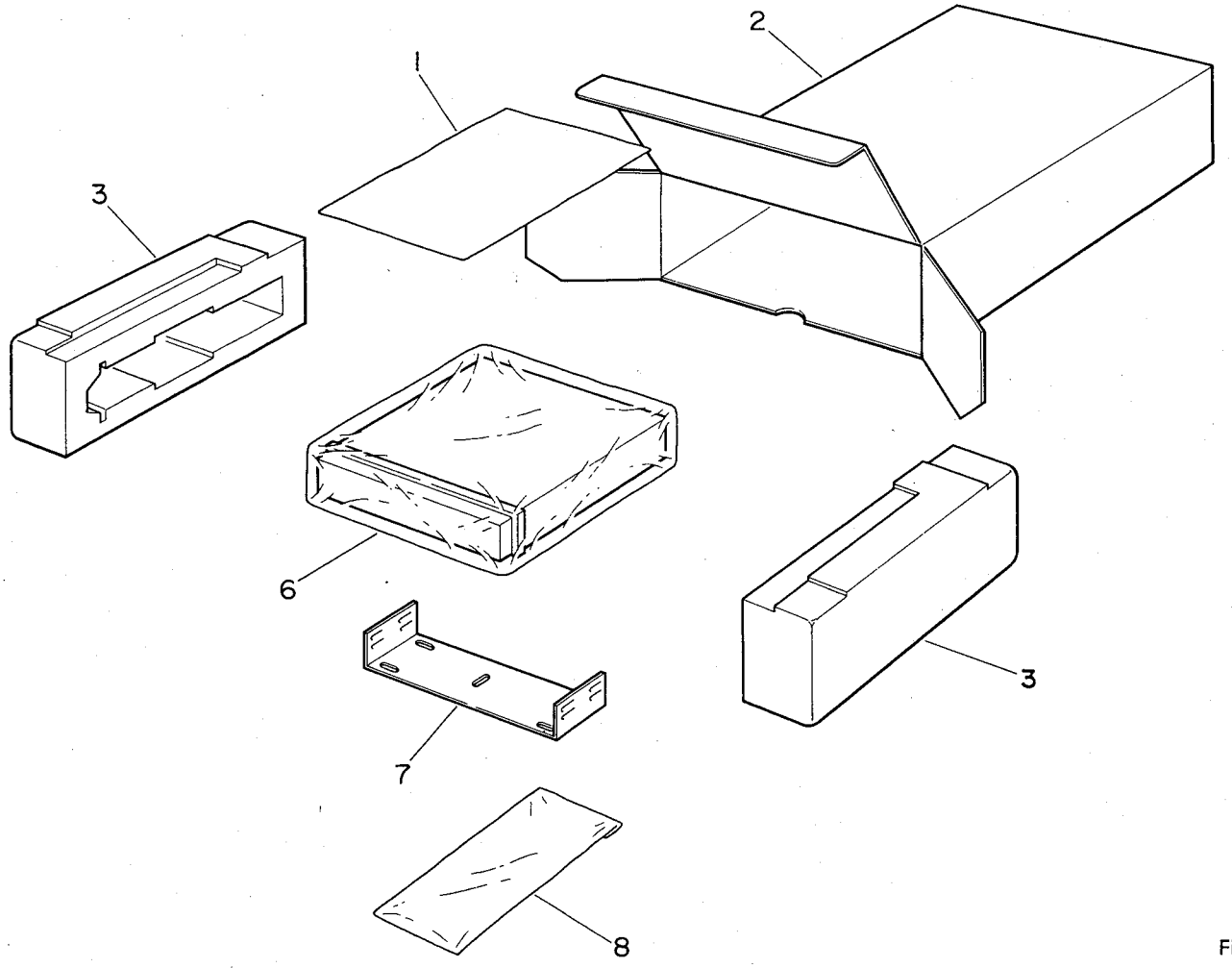


Fig. 9

● Parts List

Mark	No.	Part No.	Description
	1	CRD1223	Owner's Manual
			Card
	2	CHG1486	Carton
	3	CHP1147	Styrofoam
	4,5	·····	
	6	CEG1043	Cover
	7	CNB-723	Mounting Bracket
	8	CEA1322	Accessory Assy
	8-1	CDE1289	Cord
	8-2	CNF-111	Strap

Mark	No.	Part No.	Description
	8-3		Screw Kit
	8-3-1	CBA-102	Screw(×4)
	8-3-2	HMF40P080FUC	Screw
	8-3-3	HMF40P080FZK	Screw(×4)
	8-3-4	NF50FMC	Nut(×4)