

Service Manual

ORDER NO.
ARP2159

SOUND FIELD PROCESSOR

SP-Z570

- Refer to the service manual ARP1909, SP-Z560/ZEBZ.
- This manual is applicable to the SP-Z570/ZEBZ type.
- This product is a component of systems. As to the system composition, refer to the system manuals.
- This product does not function properly when independent ; to avoid malfunctions, be sure to connect it to the prescribed system components, otherwise damage may result.

CONTRAST OF MISCELLANEOUS PARTS

SP-Z570/ZEBZ type is the same as the SP-Z560/ZEBZ type with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		SP-Z560/ZEBZ	SP-Z570/ZEBZ	
	Rotary knob	AAA1005	AAA1003	
	Equalizer button	AAD1681	AAD1608	
	EQ mode button	AAD1683	AAD1610	
	DES button	AAD1684	AAD1611	
	SFC mode button	AAD1685	AAD1612	
	Display panel	AAK1852	AAK2118	
	Code with plug	ADE1072	ADE1109	
	Packing case	AHD1779	AHD2011	
	Front panel assembly	AMB1579	AMB1776	

1. P.C.B.'S PART LIST

NOTES:

- Parts without part number cannot be supplied.
 - Parts marked by "®" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
 - The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
 - When ordering resistors: first convert resistance values into code form as shown in the following examples.
- Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and E=10%).
- 560Ω 56X10 1→561.....RD1/4PS000J
47kΩ 47X10 3→473.....RD1/4PS000J
0.5Ω 05.....RS1R000X
10 010.....RS1R000X
- Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).
- 5.62kΩ 562X10 1→562J.....RN1/4R000JF

Mark NO	Description	Part NO	Mark NO	Description	Part NO
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SFC CONTROL ASSEMBLY (AWK1232)
SFC CONTROL Assembly is split into CONTROL Assembly and Display Assembly.

DISPLAY ASS'Y

SEMI CONDUCTORS	IC251 FL DRIVER IC	MS7112-01SS	OTHERS	CNI 13P JUMPER CONNECTOR	KPE13
D251-268 DIODE	HSS104-02			V251 FL TUBE	AAV1083
D267, 268 LED (RED)	AEL1089			X101 CERAMIC RESONATOR	ASS1010

SWITCHES

S251-277 SWITCH	ASG1029		CONTROL ASS'Y		
S278 SWITCH	ASC-711		SEMI CONDUCTORS		
S279-281 SWITCH	ASG1029		IC101-106 OP-AMP IC	NJ4558DXP	
S282 ROTARY ENCODER	ASX1007		IC107 LOGIC IC	TC4061BP	
			IC108	PD3141	

CAPACITOR

C101, 102 CERAMIC CAPACITOR	CKCY4823N25		Q101-103 TRANSISTOR	DTG124ES	
C103 CERAMIC CAPACITOR	CKCY473N25		Q104-106 TRANSISTOR	2SC2458	
C104, 105 CERAMIC CAPACITOR	CKCY333N25		Q107-113 TRANSISTOR	DTG124ES	
C106 CERAMIC CAPACITOR	CKCY473N25		Q114 TRANSISTOR	2SA1048	
C107, 108 CERAMIC CAPACITOR	CKCY473N25		Q115 TRANSISTOR	2SC2458	
C109 CERAMIC CAPACITOR	CKCY473N25		Q116 TRANSISTOR	DTG124ES	
C110, 111 CERAMIC CAPACITOR	CKCY472N50		D101-117 DIODE	HSS104-02	
C112 CERAMIC CAPACITOR	CKCY473N25		D118 ZENER DIODE	R05-65382	
C113, 114 CERAMIC CAPACITOR	CKCYB182N50		D119, 120 DIODE	HSS104-02	
C115 CERAMIC CAPACITOR	CKCY473N25		COIL & FILTER & TRANSFORMERS		
C116, 117 CERAMIC CAPACITOR	CKCYB821N50		L101 AXIAL INDUCTOR	LAI221K	
C118 CERAMIC CAPACITOR	CKCY473N25		L102 AXIAL INDUCTOR	LAI560K	
C119, 120 CERAMIC CAPACITOR	CKCYB331N50		CAPACITOR		
C121, 122 CERAMIC CAPACITOR	CKCY473N25		C251 CERAMIC CAPACITOR(0.022μ)	ACG1022	
C123 ELECT. CAPACITOR	CEAS221M10		C252 CERAMIC CAPACITOR(100P)	ACG1017	
C124 (0.022μ)	ACG1022		C253 ELECTROLYTIC CAPACITOR	CEJA101M10	
C125 CEA (47000/5.5V)	ACH1070		C254 CERAMIC CAPACITOR(0.01μ)	ACG1021	
C126 ELECT. CAPACITOR	CEAS100N25		C255 CERAMIC CAPACITOR (330P)	ACG1018	
C127 ELECT. CAPACITOR	CEAS221N10		C256 CERAMIC CAPACITOR(1000P)	ACG1020	
C128 AUDIO FILM CAPACITOR	RCF1X104J50		C257 ELECTROLYTIC CAPACITOR	CEJA101M10	

RESISTOR

R251-273 CARBONFILM RESISTOR	RD1/8PM000J		RESISTOR		
R101-188 CARBONFILM RESISTOR	RD1/8PM000J		R101-188 CARBONFILM RESISTOR	RD1/8PM000J	
R169 METAL OXIDE RESISTOR	RKSZLN681J		R169 METAL OXIDE RESISTOR	RKSZLN681J	
R170-189 CARBONFILM RESISTOR	RD1/8PM000J		R170-189 CARBONFILM RESISTOR	RD1/8PM000J	
R201-218 CARBONFILM RESISTOR	RD1/8PM104J		R201-218 CARBONFILM RESISTOR	RD1/8PM104J	

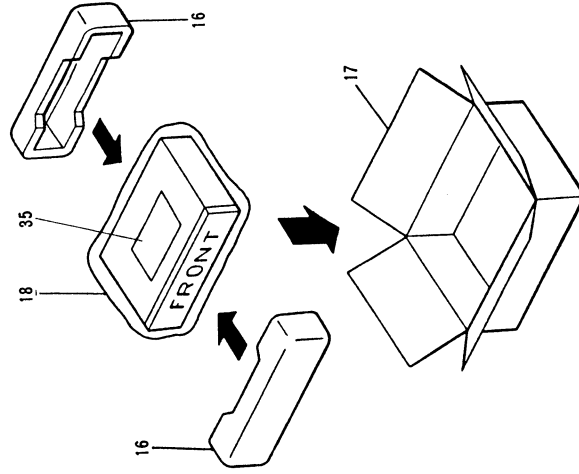
2. EXPLODED VIEWS, PACKING AND PART LIST

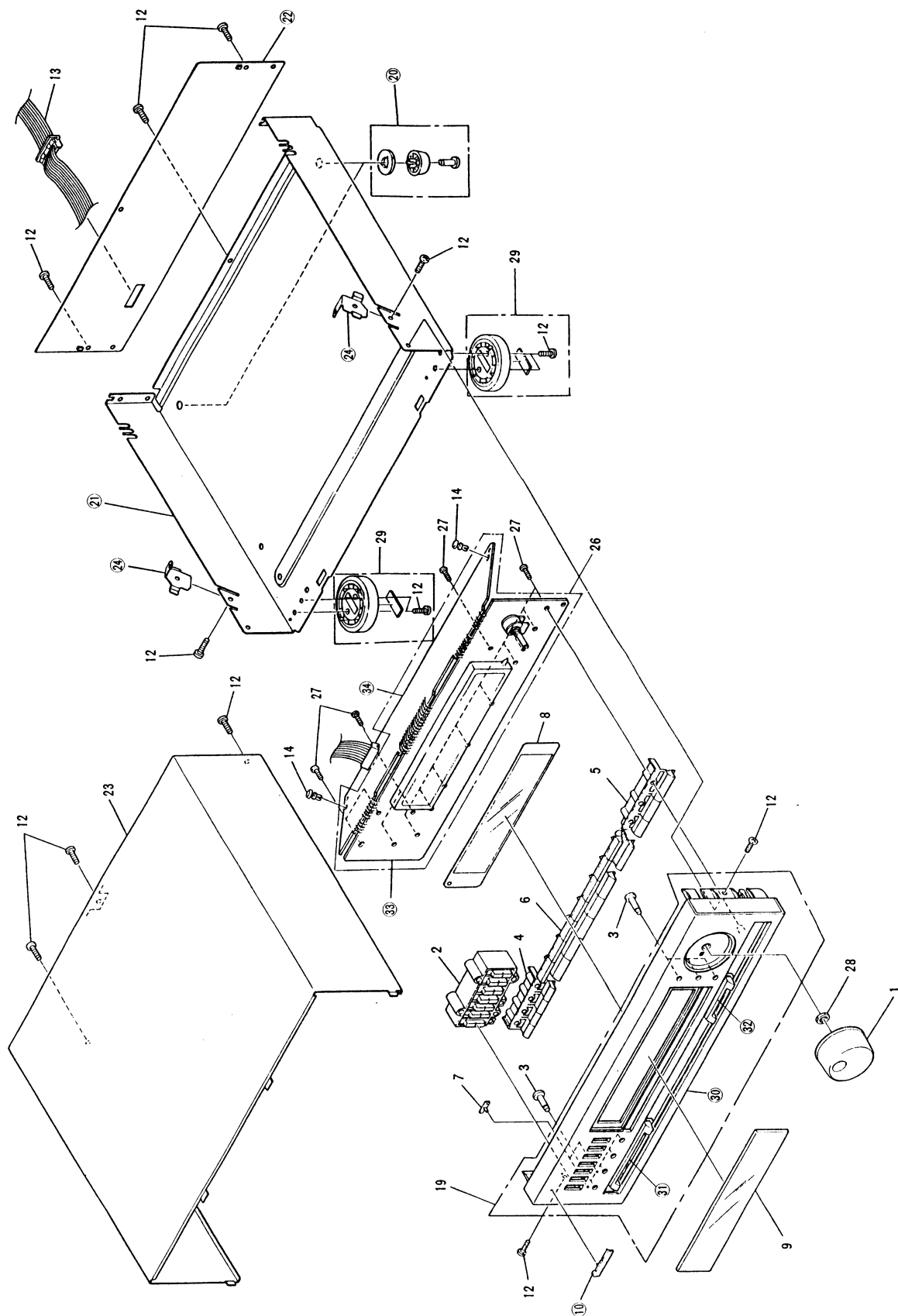
NOTES:

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Mark NO	Description	Part NO
1	ROTARY KNOB	AAA1005
2	EQUALIZER BUTTON	AAI1681
3	KIN BUTTON	AAI1682
4	EQ MODE BUTTON	AAI1683
5	DES BUTTON	AAI1684
6	SFC MODE BUTTON	AAI1685
7	ACRYLIC LENS S	AAK1758
8	FL FILTER	AAK1763
9	DISPLAY PANEL	AAK1852
10	NAME PLATE (ABS)	-----
11	SCREW	ABA-238
12	CORD WITH PLUG	ADE1072
13	NYLON RIVET	AEC-510
14	-----	-----
15	FR PAD	AHA1269
16	PACKING CASE	AHD1779
17	SHEET	AHG1018
18	FRONT PANEL ASS'Y	AMB1579
19	FOOT ASS'Y (S)	-----
20	CHASSIS	ANE1212
21	REAR PANEL	-----
22	BONNET	AWK1232
23	FITTING (A)	BBZ28P080FMC
24	-----	NK70FUC
25	SFC CONTROL ASS'Y	EXA1278
26	SCREW	-----
27	NUTS	-----
28	FOOT ASS'Y	-----
29	FRONT PANEL	-----
30	SASH L	-----
31	SASH R	-----
32	DISPLAY ASS'Y	-----
33	CONTROL ASS'Y	-----
34	CAUTION ("NOTE")	ARH1047
35	-----	-----

Note: As to the operating instructions,
refer to the Service manual (ARP1929)





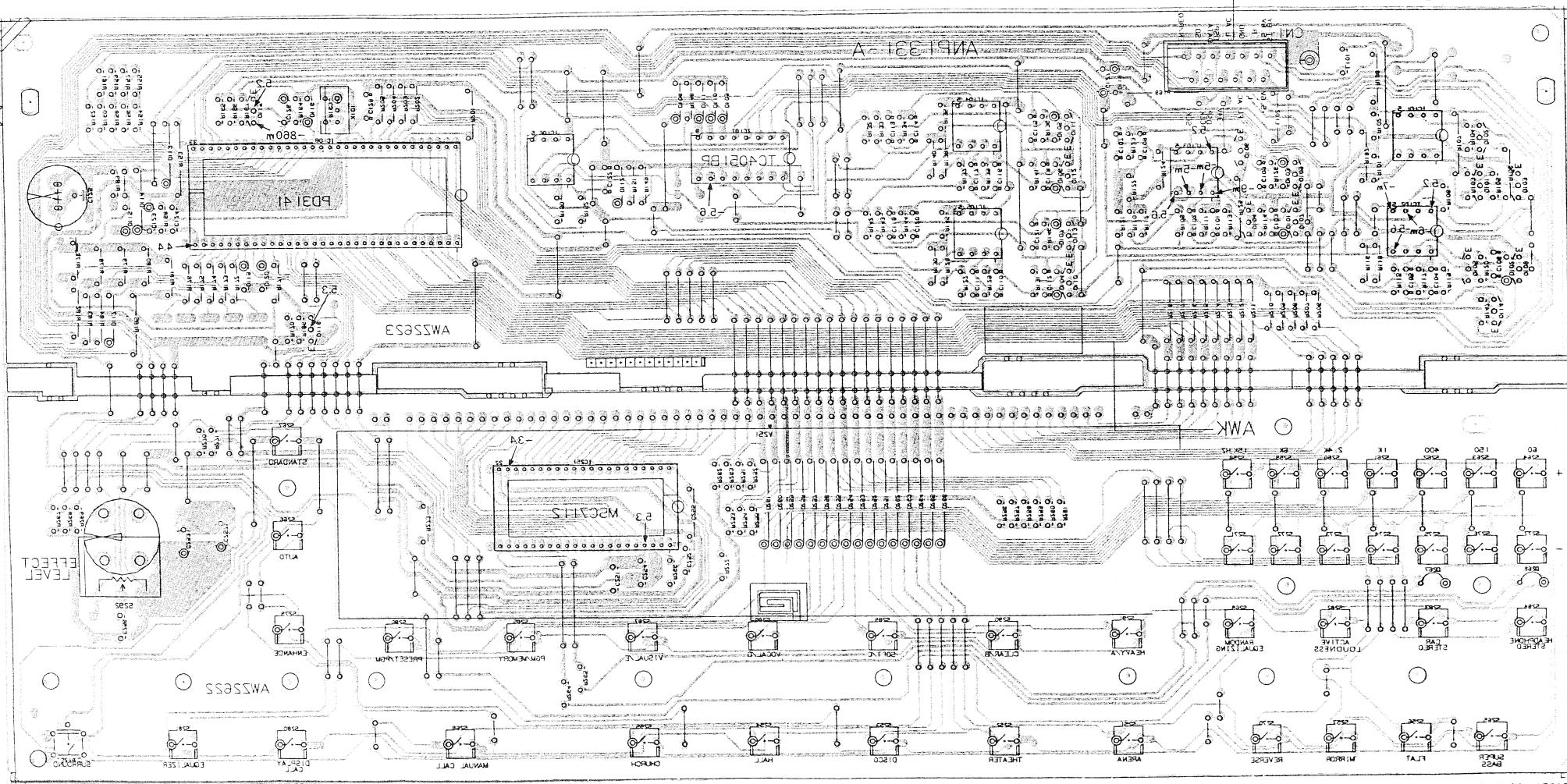


This P.C. B. connection diagram is viewed from the foil side.

2FC CONTROL ASSY (WK1333)

AF ASSEMBLY TO C1504
A-X-920

CONTROL ASSEMBLY



DISPLAY ASSEMBLY

5. IC INFORMATION

PD3141

● General

The PD3141 controls various functions of the SP-Z560 and GR-Z460.

The basic functions of the SP-Z560 are explained below.

1. Spectrum analysis and FL display

The SP-Z560 always receives the audio signal detection DC voltage which is A/D converted and split into seven bands x 2, and converts it into the data of eight bands x 2 (level), which are displayed as bar graph on the FL.

2. Control of DSP control IC and FL display

The SP-Z560 transmits the information to be modified by DSP IC (A-Z560's PD0051: IC905) to the DSP control IC (A-Z560's PDG044-A: IC908) (mainly the same data as that displayed). It also displays the data content on the FL as a graph. (*1)

3. Monitoring of various keys and control of system bus

The SP-Z560 always monitors the status of 39 keys, and performs operation corresponding to the input signal. It uses 4-wire I/O signal to perform handshaking with the system bus by serial signal, and then executes analysis of the commands which are entered and also provides internal information.

4. Decoding of rotary encoder

In each program of the sound field control, SP-Z560 raises or lowers the level by the pulse signal sent from the sound job (rotary encoder).

*1: The segments and grids of the SP-Z560's FL are insufficient, and the FL is controlled by the VF display controller MSC7112-01SS (IC251). The PD3141 controls this controller.

● PD3141 terminal function

Pin No.	Terminal name	I/O	Function
1	S5A	O	FL segment signal output terminal
2	S4A	O	
3	S3A	O	
4	S2A	O	
5	S1A	O	
6	1GA	O	FL grid signal output terminal
7	2GA	O	
8	3GA	O	
9	4GA	O	
10	5GA	O	
11	6GA	O	
12	7GA	O	
13	8GA	O	
14	9GA	O	
15	10GA	O	
16	11GA	O	
17	12GA	O	
18	EGA	I	Rotary encoder pulse input (A) (See Fig. 5-1)
19	ECB	I	Rotary encoder pulse input (B) (See Fig. 5-1)
20	13GA	O	FL grid signal output terminal
21	14GA	O	
22	15GA	O	
23	B7/B9	I/O	Selection between GR-Z460 and SP-Z560 (See Table 5-1.)
24	LOAD	O	MSC7112-01SS (IC251) LOAD control and POR control (See Table 5-1.)
25	DATA	O	MSC7112-01SS (IC251) DATA control

Pin No.	Terminal name	I/O	Function
26	SCLK	O	Control of SCLK and POR of MSC7112-01SS (IC251) (See Table 5-1.)
27	DSP DATA	O	Output of A-Z560's PDG044-A (IC905) communication data
28	DSP CLK	O	Output of A-Z560's PDG044-A (IC905) communication CLK
29	SD	I/O	System bus data with A-Z560
30	SCK	I	System bus clock with A-Z560
31	EN/REC (DSP)	I/O	System bus enable/request with A-Z560
32	Vcc	—	+5V power source
33	L/R	O	L/R PBF input selection (H: Lch input, L: Rch input)
34	A	O	TC4051BP (IC107) A control (See Table 5-2.)
35	B	O	TC4051BP (IC107) B control (See Table 5-2.)
36	C	O	TC4051BP (IC107) C control (See Table 5-2.)
37	DA0	O	D/A output (for comparison)
38	DA1	O	
39	DA2	O	
40	DA3	O	
41	DA4	O	
42	CMPIN	I	Input for A/D conversion
43	POWER	I	Power ON/OFF input (power supply error detection) (See Table 5-1.)
44	KEY1	I	Key scan input
45	KEY2	I	
46	KEY3	I	
47	RESET	I	Reset signal input

Pin No.	Terminal name	I/O	Function
48	OSC2	O	4.00 MHz ceramic oscillator connecting terminal
49	OSC1	I	
50	GND	—	Ground
51	CL1	I	Pull-up to Vcc (unused)
52	CL2	O	NC (unused)
53	TEST	I	Pull-up to Vcc (unused)
54	S16A	O	FL segment output terminal
55	S15A	O	
56	S14A	O	
57	S13A	O	
58	S12A	O	
59	S11A	O	
60	S10A	O	
61	S9A	O	
62	S8A	O	
63	S7A	O	
64	S6A	O	

● Rotary pulse encoder

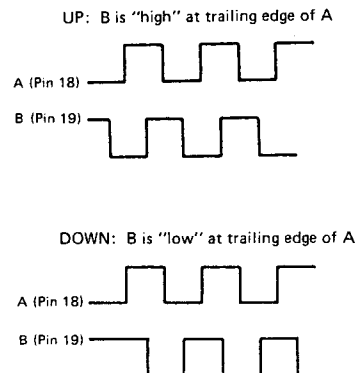


Fig. 5-1 Rotary encoder

● Port control processing (Special processing)

Table 5-1 Port control

Pin No.	Terminal name	Function
23	B7/B9	- GR-Z460/SP-Z560 selection (input) - This is set immediately after resetting, or when scanning the keys. - H: B9 (SP-Z560) - L: B7 (GR-Z460)
24	LOAD	SP-Z560 controls the POR of the display controller (IC251: MSC7112-01SS) by the two ports shown at left. IC RESET is applied if both ports are "high" immediately after POWER ON. This simultaneous "high" state of both ports will not occur during ordinary operation (data transfer).
43	POWER	- POWER ON: H, OFF: L - If this port is "L" continuously for 30 msec after turning OFF power, the backup mode prevails.

● TC4051BP (IC107) control data

Table 5-2 IC107 control

Frequency PD3141 terminal	A (Pin 34)	B (Pin 35)	C (Pin 36)	Switch to be turned ON by TC4051BP (IC107)
15 kHz	0	0	0	a
6 kHz	1	0	0	b
2.4 kHz	0	1	0	c
1 kHz	1	1	0	d
400 Hz	0	0	1	e
150 Hz	1	0	1	f
60 Hz	0	1	1	g

6. SPECIFICATIONS

Graphic equalizer section

Equalizer band

Center frequencies 60 Hz, 150 Hz, 400 Hz,
1 kHz, 2.4 kHz, 6 kHz, 15 kHz

Variable range ± 7 dB

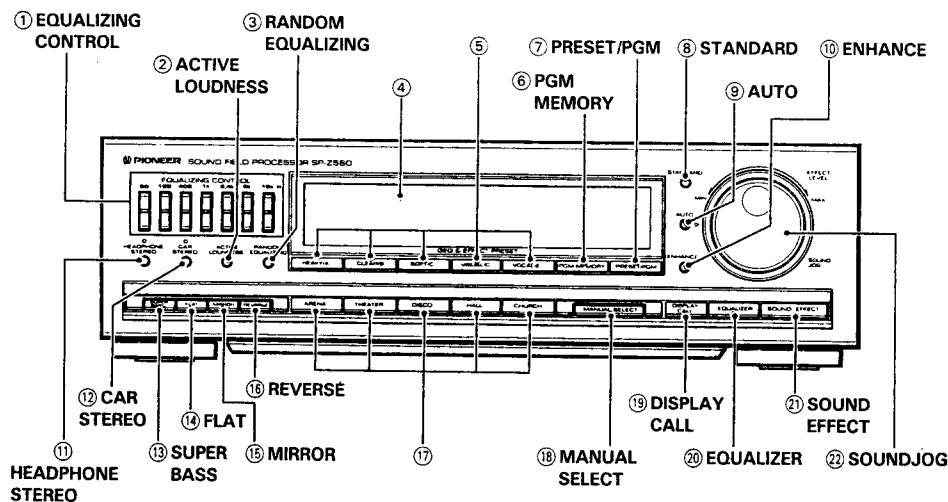
Spectrum analyzer section

Center frequencies 60 Hz, 150 Hz, 400 Hz, 1 kHz,
2.4 kHz, 6 kHz, 15 kHz

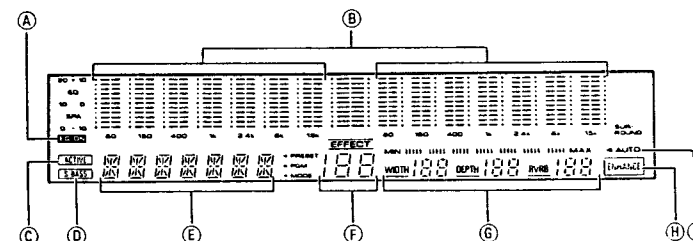
Miscellaneous

Dimensions 360 (W) x 332 (D) x 105.5 (H) mm
Weight (without package) 2.8 kg

7. PANEL FACILITIES



Display section



① EQUALIZING CONTROL switches

Use these to adjust equalization of each frequency band.

② ACTIVE LOUDNESS switch

This switches the active loudness function ON and OFF. Depending on the volume setting on the amplifier, this function automatically boosts bass and treble response.

③ RANDOM EQUALIZING switch

This switches the random equalizing function ON. Random equalization patterns for the seven frequency bands are automatically created by this function.

Each time you press it, you get a new equalization pattern. If you press a switch for another operation, for example the REVERSE switch, RANDOM EQUALIZING switches OFF.

④ Display section

⑤ Memory recall switches

Used for recalling sound field memory.

⑥ PGM MEMORY switch

Used for storing sound field you input in the memory recall switches (A - E).

⑦ PRESET/PGM(PROGRAM) switch

Determines whether the sound field recalled by the Memory recall switches are your memorized curves or factory preset curves.

⑧ STANDARD switch

Use this to return to the initial sound field effect level settings.

⑨ AUTO switch

Use this to return to AUTO mode after operating effect level parameters manually.

⑩ ENHANCE switch

This is the acoustic enhancer ON/OFF switch.

⑪ HEADPHONE STEREO switch

Press this switch to recall the optimum equalization settings when recording a tape for headphone stereo listening. ENHANCE switches OFF.

⑫ CAR STEREO switch

Press this switch to recall the optimum equalization settings when recording a tape for car stereo listening. ENHANCE switches ON.

NOTE:

When using CAR STEREO and HEADPHONE STEREO, super bass, active loudness, and enhance can be switched ON or OFF.

⑬ SUPER BASS switch

Use this when you want to boost bass level. Press once more to switch it OFF.

⑭ FLAT switch

Use this to make all equalization patterns flat.

⑮ MIRROR switch

Press this switch to change treble and bass equalization patterns in the 1kHz frequency band.

⑯ REVERSE switch

Press this switch to reverse equalization settings so that boosted frequencies will be reduced and vice versa.

⑰ SOUND FIELD selector switches

Use to recall preset sound fields.

⑱ MANUAL SELECT switch

Use this when you want to change sound field parameters manually.

⑲ DISPLAY CALL switch

Use to switch the display mode in the display section. Spectrum analyzer, graphic equalizer, and surround (two types) display is possible.

⑳ EQUALIZER switch

Turns the equalizer on and off. The EQUALIZER indicator lights when this switch is on.

㉑ SOUND EFFECT switch

Use to switch sound field control ON.

㉒ SOUNDJOG dial

Use to adjust sound field effect level, and parameter effect level when in the manual mode.