

Service Manual



ORDER NO.
ARP2180

SOUND FIELD PROCESSOR

SP-P710

MODEL SP-P710 HAS THE FOLLOWING :

Type	Power Requirement	Remarks
ZEB	(DC power supply)	
ZEWZIW	(DC power supply)	

- This manual is applicable to the ZEB type.
- As to the other types, refer to applicable service manual.
- 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 component(s), otherwise damage may result.

CONTENTS

1. EXPLODED VIEWS, PACKING AND PARTS LIST	2	5. IC INFORMATION	19
2. PCB PARTS LIST	5	6. PANEL FACILITIES.....	25
3. SCHEMATIC DIAGRAM	7	7. SPECIFICATIONS	26
4. PCB CONNECTION DIAGRAM.....	11		

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan

PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.

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

© **PIONEER ELECTRONIC CORPORATION 1991**

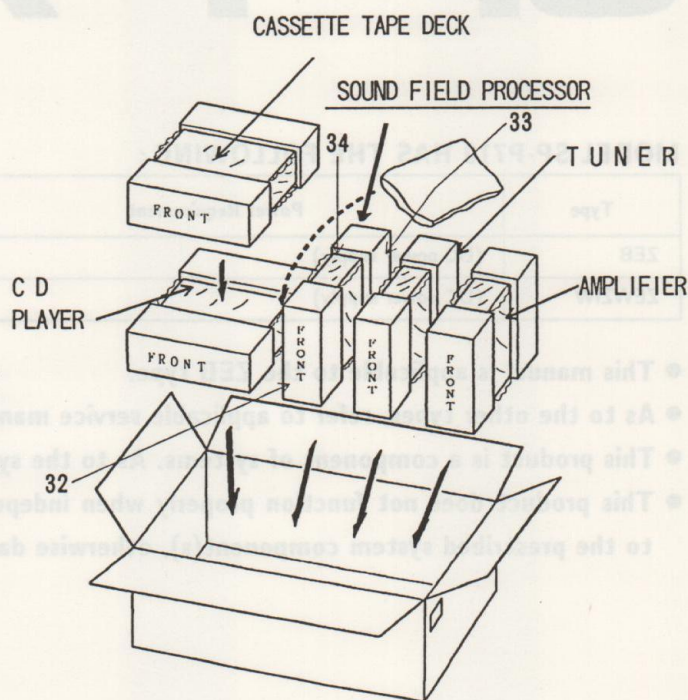
FX FEB. 1991 Printed in Japan

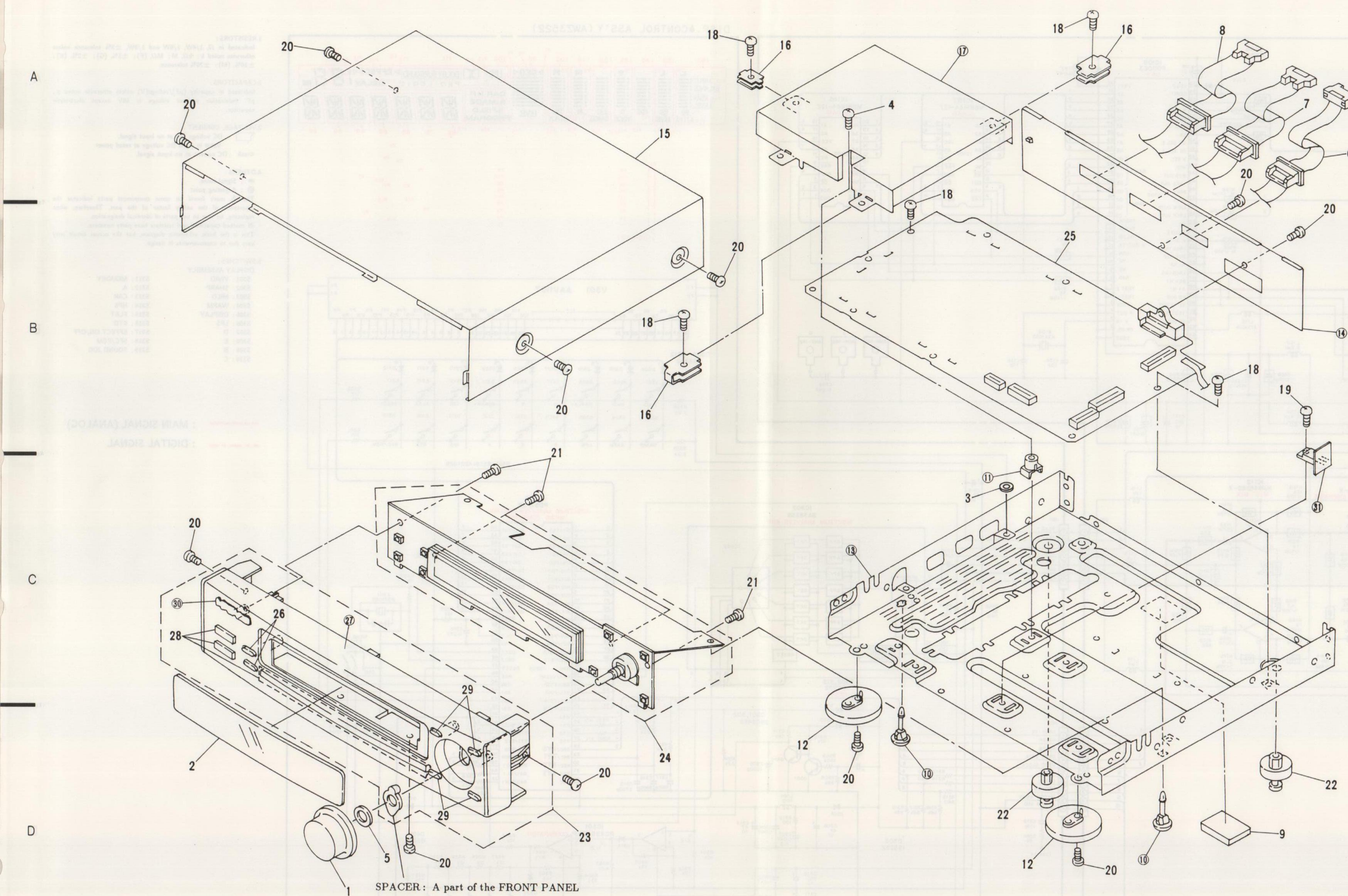
1. EXPLODED VIEWS, PACKING AND PARTS LIST

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.

Mark	No.	Description	Part No.
	1	GEQ KNOB	AAB1182
	2	PLATE(PVC)	AAK2009
	3	WASHER	ABE-053
	4	SCREW	ABA1024
	5	NUT	ABN1016
	6	CORD WITH PLUG(BLACK)	ADE1093
	7	CORD WITH PLUG(WHITE)	ADE1095
	8	CORD WITH PLUG(GREEN)	ADE1097
	9	INSULATOR	AEB1131
	10	PCB SUPPORT	
	11	PCB MOULD	
	12	INSULATOR ASSY	AMR2148
	13	CHASSIS	
	14	REAR PANEL	
	15	BONNET(FE)	ANE1259
	16	SHIELD BRACKET	ANG1489
	17	SHIELD CASE (U)	
	18	SCREW	BBZ30P080FMC
	19	SCREW	BBZ30P060FMC
	20	SCREW	BBZ30P080FZK
	21	SCREW	BPZ26P080FMC
	22	FOOT (RUBBER)	REC-434
	23	FRONT PANEL ASSY	AMB1713
●	24	DISP.& CONTROL ASS'Y	AWZ3522
●	25	SFC ASS'Y	AWZ3396
	26	TACT BUTTON	AAD1850
	27	FRONT PANEL	
	28	GEQ BUTTON	AAD1847
	29	IMAGE BUTTON	AAD1851
	30	NAME PLATE(PLASTIC)	
	31	SFC REG ASS'Y	
	32	FRONT PAD	AHA1323
	33	REAR PAD	AHA1324
	34	PACKING SHEET	AHG1175





2. PCB PARTS 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 K = 10%).
560 Ω 56 $\times 10^1$ 561 RD1/4PS 5 6 1 J
47k Ω 47 $\times 10^3$ 473 RD1/4PS 4 7 3 J
0.5 Ω 0R5 RD2H 0 R 5 K
1 Ω 010 RD1P 0 1 0 K

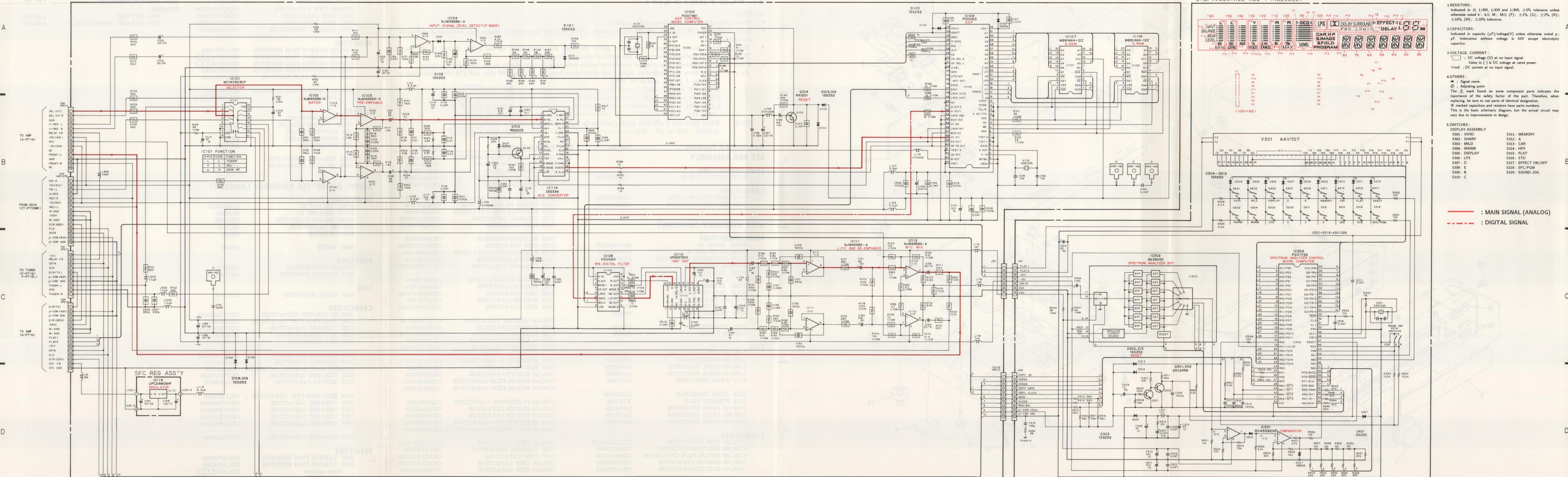
Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).
5.62k Ω 562 $\times 10^1$ 5621 RD1/4SR 5 6 2 1 F

Mark	Symbol & Description	Part No.	Mark	Symbol & Description	Part No.
SFC REG ASSEMBLY					
SEMICONDUCTORS					
IC113	REGULATOR IC	UPC24M05HF	C111-114	MYLOR FILM CAPACITOR	CQMA103J50
			C115	ELECTR.CAPACITOR	CEAS101M10
			C116	CHIP CAPACITOR	CKSQYF473Z50
			C117	ELECTR.CAPACITOR	CEAS101M10
			C118	CHIP CAPACITOR	CKSQYF473Z50
CAPACITORS			C119	ELECTROLYTIC CAPACITOR	CEAS100M25
C157	ELECTR.CAPACITOR	CEAS470M25	C120	MYLOR FILM CAPACITOR	CQMA473J50
C158	ELECTR.CAPACITOR	CEAS101M10	C121	ELECTROLYTIC CAPACITOR	CEAS6R8M50
			C122	CERAMIC CAPACITOR	CKDYX104M25
			C123	CHIP CAPACITOR	CKSQYF473Z50
●SFC ASSEMBLY (AWZ3396)			C124	ELECTR.CAPACITOR	CEAS220M16
SEMICONDUCTORS			C125	CHIP CAPACITOR	CKSQYF103Z50
IC101	LOGIC IC	MC14052BCP	C126	ELECTROLYTIC CAPACITOR	CEAS6R8M50
IC102-104	OP-AMP IC	NJM4558S-X	C127	ELECTR.CAPACITOR	CEAS220M16
IC105	DSP MICRO COMPUTER	PD0078B1	C128	CERAMIC CAPACITOR	CKCYX223M25
IC106,107	MEMORY IC	MB81464-12Z	C129,130	ELECTR.CAPACITOR	CEAS470M16
IC108	DSP IC	PD0063	C131	ELECTR.CAPACITOR	CEAS101M16
IC109	IC DIGITAL FILTER	PD0060	C132	CHIP CAPACITOR	CKSQYF473Z50
IC110	D/A CONVERTER	UPD6376CX	C133	ELECTR.CAPACITOR	CEAS101M10
IC111,112	OP-AMP IC	NJM4558S-X	C134	CHIP CAPACITOR	CKSQYF473Z50
IC114	A/D CONVERTER	CS5339	C135,136	CERAMIC CAPACITOR	CCDCH100D50
Q102	TRANSISTOR	RN2203	C138	ELECTR.CAPACITOR	CEAS101M10
Q104	TRANSISTOR	RN1201	C139	CERAMIC CAPACITOR	CKCYX473M25
D101-109	DIODE	1SS252	C140,141	ELECTR.CAPACITOR	CEAS101M10
			C142	CERAMIC CAPACITOR	CKCYX473M25
COIL			C143	MYLOR FILM CAPACITOR	CQMA473J50
L101,102	AXIAL INDUCTOR	LAU2R2M	C144	ELECTR.CAPACITOR	CEAS101M10
L103,105	FERRITE BEAD	LAU2R2M	C145,146	ELECTR.CAPACITOR	CEAS470M16
L106,107	AXIAL INDUCTOR	LAU2R2M	C147,148	MYLOR FILM CAPACITOR	CQMA683K50
L108-110	AXIAL INDUCTOR	LAU330K	C149,150	MYLOR FILM CAPACITOR	CQMA122K50
L111	AXIAL INDUCTOR	LAU101K	C151,152	PL.STYRENE CAPACITOR	CQSA561J50
L112	AXIAL INDUCTOR	LAU2R2M	C153,154	ELECTR.CAPACITOR	CEAS220M16
L113	FERRITE BEAD	ATX1008	C155,156	ELECTR.CAPACITOR	CEAS470M16
L114-116	AXIAL INDUCTOR	LAU010M	C159	ELECTROLYTIC CAPACITOR	CEASR22M50
L505,506	AXIAL INDUCTOR	LAU010M	C160,161	ELECTROLYTIC CAPACITOR	CEAS6R8M50
L508,509	AXIAL INDUCTOR	LAU010M	C164,165	CHIP CAPACITOR	CKSQYF473Z50
			C166	CERAMIC CAPACITOR	CKCYF473Z50
CAPACITORS			C197	CHIP CAPACITOR	CKSQYF473Z50
C101,102	CHIP CAPACITOR	CCSQSL331J50	C501-505	CHIP CAPACITOR	CKSQYB102K50
C103,104	ELECTR.CAPACITOR	CEAS220M25	C506,507	CHIP CAPACITOR	CCSQSL331J50
C105,106	MYLOR FILM CAPACITOR	CQMA393J50			
C107,108	ELECTR.CAPACITOR	CEAS220M25			
C109,110	ELECTR.CAPACITOR	CEAS470M16			

Mark	Symbol & Description	Part No.	Mark	Symbol & Description	Part No.
			OTHERS		
C508,509	CHIP CAPACITOR	CKSQYB102K50	V301	FL TUBE	AAV1107
C510	CHIP CAPACITOR	CKSQYF473Z50	X301	CERAMIC RESONATOR	ASS1025
C511	CHIP CAPACITOR	CKSQYB102K50			
C701	CERAMIC CAPACITOR	CKCYB102K50			
			RESISTORS		
R121,122	CARBON FILM RESISTOR	RD1/4PM390J	R123-126	CARBON FILM RESISTOR	RD1/8PM□□□J
R128-130	CARBON FILM RESISTOR	RD1/8PM□□□J	R181,182	CARBON FILM RESISTOR	RD1/4PM390J
R186	CARBON FILM RESISTOR	RD1/8PM102J	R351,352	CARBON FILM RESISTOR	RD1/8PM103J
			Other resistors		RD1/10PM□□□J
			OTHERS		
CN1	CONNECTOR(10P)	KPE10	X101	CERAMIC RESONATOR	ASS1045
CN102	CONNECTOR(10P)	KPE10	X102	CRYSTAL RESONATOR	ASS1035
CN2	CONNECTOR(14P)	KPE14			
CN3	CONNECTOR(15P)	KPE15			
CN4	SOCKET(15P)	AKP1076			
			●DISP. & CONTROL ASSEMBLY (AWZ3522)		
			SEMICONDUCTORS		
IC301	OP-AMP IC	RC4558DXP	IC302	GEQ-BPF IC	BA3826S
IC303	MICRO COMPUTER	PD3172B	Q301,302	TRANSISTOR	2SC2458
D301-314	DIODE	1SS252	D401	DIODE	1SS252
			SWITCHES		
S301-318	TACT SWITCH	ASG1029	S319	ROTARY ENCODER	ASX1009
			COIL		
L301	AXIAL INDUCTOR	LAU101K			
			CAPACITORS		
C302,303	CERAMIC CAPACITOR	CKCYX473M25	C304	ELECTROLYTIC CAPACITOR	CEJA100M50
C305	CERAMIC CAPACITOR	CKCYB102K50	C306	ELECTR.CAPACITOR	CEJA470M10
C307	CEA (47000/5.5V)	ACH1037	C308	CERAMIC CAPACITOR	CKDYX473M25
C309	ELECTR.CAPACITOR	CEJA010M50	C310,C311	ELECTROLYTIC CAPACITOR	CEJA101M10
C312	CERAMIC CAPACITOR	CKDYF473Z50	C313	ELECTR.CAPACITOR	CEJA470M10
C314	ELECTROLYTIC CAPACITOR	CEJA220M35	C315	CERAMIC CAPACITOR	CKDYB222K50
C316	CERAMIC CAPACITOR	CKDYB562K50	C317	CERAMIC CAPACITOR	CKDYB102K50
C318	CERAMIC CAPACITOR	CKDYF473Z50	C319	CERAMIC CAPACITOR	CCDSL101J50
			RESISTORS		
R346	CARBON FILM RESISTOR	RD1/4PM390J	R347	CARBON FILM RESISTOR	RD1/4PM390J
Other resistors		RD1/8PM□□□J			

3. SCHEMATIC DIAGRAM

SFC ASS'Y (AWZ3396



1. RESISTORS:

Indicated in Ω , 1/4W, 1/6W and 1/8W, $\pm 5\%$ tolerance unless otherwise noted k; k Ω , M; M Ω , (F); $\pm 1\%$, (G); $\pm 2\%$, (K); $\pm 10\%$, (M); $\pm 20\%$ tolerance.

2. CAPACITORS :
Indicated in capacity (μF)/voltage(V) unless otherwise noted p :
pF. Indication without voltage is 50V except electrolytic
capacitor.

3. VOLTAGE, CURRENT :
 ; DC voltage (V) at no input signal.
 Value in () is DC voltage at rated power.
 mA ; DC current at no input signal.

4. OTHERS :

- ★ : Signal route.
- ⊗ : Adjusting point

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.

* marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. SWITCHES :

DISPLAY ASSEMBLY

\$301 : VIVID	\$311 : MEMORY
\$302 : SHARP	\$312 : A
\$303 : MILD	\$313 : CAR
\$304 : WARM	\$314 : HPS
\$305 : DISPLAY	\$315 : FLAT
\$306 : LPS	\$316 : STD
\$307 : D	\$317 : EFFECT ON/OFF
\$308 : E	\$318 : SFC/PGM
\$309 : B	\$319 : SOUND JOG

— : MAIN SIGNAL (ANALOG)
- - - : DIGITAL SIGNAL

5. IC INFORMATION

5.1 CS5339 : A/D CONVERTER

● Complete CMOS Stereo A/D System

Delta-Sigma A/D Converters
Digital Anti-Alias Filtering
S/H Circuitry and Voltage Reference

● Adjustable System Sampling Rates including 32kHz, 44.1kHz & 48kHz

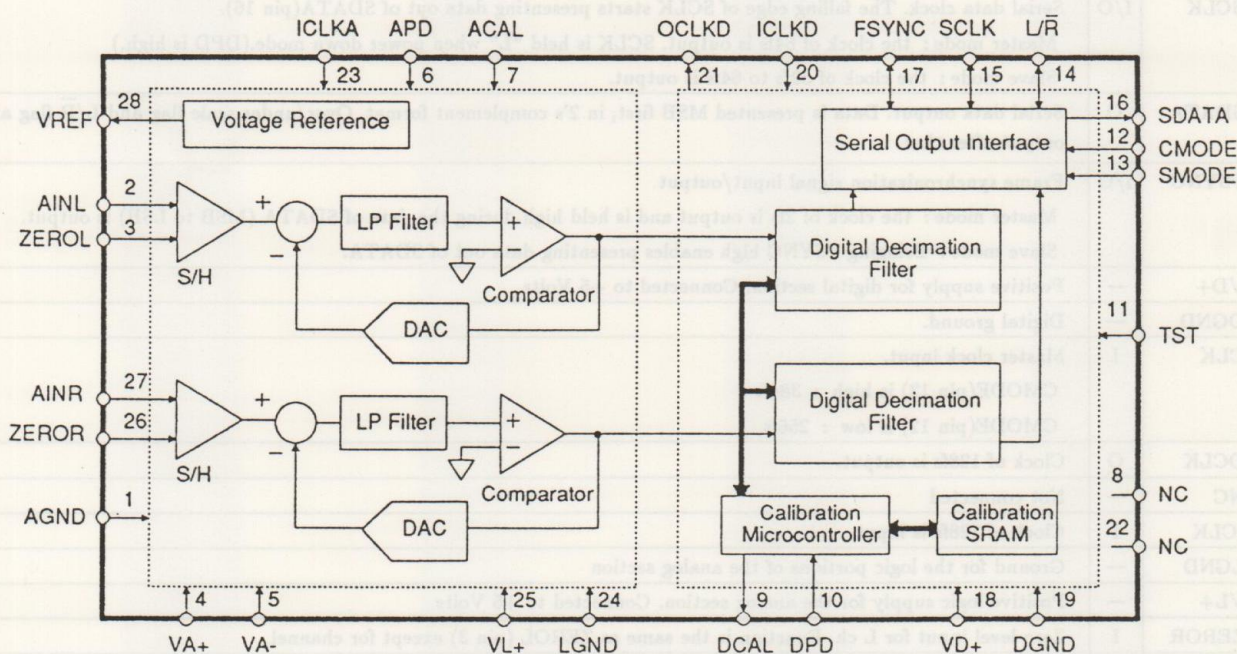
● Low Noise and Distortion > 90 dB S/(N+D)

● Internal 64× Oversampling

● Linear Phase Digital Anti-Alias Filtering 0.01dB Passband Ripple 80dB Stopband Rejection

● Low Power Dissipation : 400 mW Power Down Mode for Portable Applications

● Block Diagram



● General Description

The CS5336, CS5337, CS5338 & CS5339 are complete analog-to-digital converters for stereo digital audio systems. They perform sampling, analog-to-digital conversion and anti-aliasing filtering, generating 16-bit values for both left and right inputs in serial form. The output word rate can be up to 50 kHz per channel.

The ADCs use delta-sigma modulation with 64× oversampling, followed by digital filtering and decimation, which removes the need for an external anti-alias filter.

The CS5336 & CS5338 have an SCLK which clocks out data on rising edges. The CS5337 & CS5339 have an SCLK which clocks out data on falling edges.

The CS5336 & CS5337 have a filter passband of dc to 22kHz. The CS5338 & CS5339 have a filter passband of dc to 24kHz. The filters have linear phase, 0.01 dB passband ripple, and > 80 dB stopband rejection.

● Pin Function

No.	Pin Name	I/O	Description
1	AGND	—	Analog ground
2	AINL	I	Analog input for L ch
3	ZEROL	I	Zero level input for L ch. The level on this pin is usually used as zero to calibrate the offset of L ch.
4	VA+	—	Positive analog supply. Connected to +5 Volts.
5	VA—	—	Negative analog supply. Connected to —5 Volts.
6	APD	I	Analog power down input. When high, the analog circuit is in power down mode.
7	ACAL	I	Analog calibration input to select zero level inputs or analog inputs. H : zero level inputs(ZEROL,ZEROR) L : analog inputs(AINL,AINR)
8	NC	—	Not connected
9	DCAL	O	Digital calibration output to indicate the operation of offset calibration. Rises immediately upon entering the power down state (DPD brought high). It returns low 4096 L/R periods, after DPD is brought low, indicating the end of the offset calibration cycle. (which is 85mS when fs is 48kHz.)
10	DPD	I	Digital power down input. Setting it to high puts the digital section into power down mode. Upon returning low, offset calibration cycle starts.
11	TST	I	for test
12	CMODE	I	Master clock selection L : CLK=256fs (12.288MHz at fs=48kHz) H : CLK=384fs (18.432MHz at fs=48kHz)
13	SMODE	I	Serial interface mode input to set all of SCLK, FSYNC and L/R to inputs or outputs L : slave mode (All of them are inputs) H : master mode (All of them are outputs)
14	L/R	I/O	Left/Right selection Master mode (SMODE is high.): fs clock is output. L/R is held high when power down mode.(DPD is high.) SDATA(pin 16) is output 1 SCLK cycle after the edge of L/R. Slave mode (SMODE is low.): fs clock is input. The rising edge starts presenting MSB of L ch data and the falling edge does MSB of R ch data.
15	SCLK	I/O	Serial data clock. The falling edge of SCLK starts presenting data out of SDATA(pin 16). Master mode : the clock of 64fs is output. SCLK is held “L” when power down mode.(DPD is high.) Slave mode : the clock of 32fs to 64fs is output.
16	SDATA	O	Serial data output. Data is presented MSB first, in 2's complement format. Over/under scale flag and L/R flag are output after that.
17	FSYNC	I/O	Frame synchronization signal input/output Master mode : the clock of 2fs is output and is held high during the data of SDATA (MSB to LSB) is output. Slave mode : Bringing FSYNC high enables presenting data out of SDATA.
18	VD+	—	Positive supply for digital section. Connected to +5 Volts.
19	DGND	—	Digital ground.
20	CLK	I	Master clock input. CMODE(pin 12) is high : 384fs CMODE(pin 12) is low : 256fs
21	OCLK	O	Clock of 128fs is output.
22	NC	—	Not connected
23	ICLK	I	Clock of 128fs is input
24	LGND	—	Ground for the logic portions of the analog section
25	VL+	—	Positive logic supply for the analog section. Connected to +5 Volts
26	ZEROR	I	Zero level input for L ch. Function is the same as ZEROL (pin 3) except for channel.
27	AINR	I	Analog input for R ch
28	VREF	O	Voltage reference output Normally —3.68 Volts. The full scale of input signals depends on this voltage. FS is ±3.68 volts when Vref is —3.68V.

5. 2 PD0060 : 8fs DIGITAL FILTER

● Pin Function

No.	Pin Name	I/O	Description
1	XIN	I	Connected crystal oscillator
2	XOUT	O	
3	MODE1	I	Master clock (XIN) and CKOUT selection *1
4	CKOUT	O	External clock output
5	LRCK	I	LR clock input
6	DATA	I	Serial data input (MSB first, in 2's complement format)
7	BCLK	I	Bit clock input for input data
8	Vss	—	GND
9	MODE2	I	H : 18 bits data output *2 L : 16 bits data output
10	SHOUT	O	Sampling hold pulse output
11	LDOUT	O	L ch data output (MSB first, in 2's complement format)
12	RDOUT	O	R ch data output (MSB first, in 2's complement format)
13	MODE3	I	H : 18 or 16 bits data output *2 L : 20 bits data output
14	WOUT	O	Word clock ouput
15	BOUT	O	bit clock output for LDOUT and RDOUT
16	VDD	—	Connected to power supply (+5V)

*1 Master clock (frequency of crystal oscillator connected between XIN and XOUT or input frequency to XIN) can be selected by setting the level of MODE1 as follows :

MODE1	Master Clock (XIN)	CKOUT
H	384fs/392fs	384fs/196fs
L	192fs/196fs	192fs/196fs

Note : As to this product (SP-P710), MODE1 is set to “H”.

*2 Number of bits can be selected by setting the level of MODE2 and 3 as follows :

MODE3	MODE2	Data Out
H	H	18 bits
H	L	16 bits
L	*	20 bits

Notes : (1) * ; Don't care
(2) As to this product, MODE2 is set to “L” and MODE3 to “H”.

5. 3 PD0063 : DSP

● Pin Function

No.	Pin Name	I/O	Description
1	Vss2	—	GND
2	DRSEL	I	Slector pin for logic at DRDY (pin 35). When the microcomputer (IC105) can receive data with the “H” level, the logic of DRDY (pin 35) is “H” . When the microcomputer can receive data with the “L” level, the logic of DRDY (pin 35) is “L”.
3	XIN	I	Pin for crystal oscillator
4	XOUT	O	
5	EXCK	I	External clock input
6	TEST1	I	Test mode pins with pull-up resistors
7	TEST2	I	
8	RAS	O	Row address strobe pin for an external DRAM
9	WE	O	Write enable pin for an external DRAM
10	OE	O	Output enable pin for an external DRAM
11	CAS	O	Column address strobe pin for an external DRAM
12	AOUT/TX	I	Selector pin for output mode of AOUT2. “H” for normal output mode.
13	TXL/R	I	Selector pin for transmission audio channel. “H” for L ch, “L” for R ch.
14	TXTRG	I	Trigger input pin to select transmission audio channel.
15	TXSCK	I	Input pin for shift clock of transmission audio data.
16	RAM2IO3	I/O	Data I/O pins for an external DRAM
17	RAM2IO2		
18	RAM2IO1		
19	RAM2IO0		
20	RAM1IO3		
21	RAM1IO2		
22	RAM1IO1		
23	RAM1IO0		
24	A0	O	Address output pins for an external DRAM
25	A1		
26	A2		
27	A3		
28	A4		
29	A5		
30	A6		
31	A7		
32	Vss1	—	GND
33	VDD2	—	Power supply
34	RESET	I	Reset signal input

No.	Pin Name	I/O	Description
35	DRDY	O	Output pin indicating whether data from the microcomputer (IC105) can be received. When DRSEL (pin 2) is “L”, this pin indicates “receive enable” with “L” and “receive disable” with “H”. When DRSEL (pin 2) is “H”, this pin indicates “receive enable” with “H” and “receive disable” with “L”. When CS (pin 39) is “H”, this pin is held high impedance.
36	RDATA	I	Input pin for I/F data from the microcomputer (IC105)
37	RCK	I	Input pin for I/F clock from the microcomputer (IC105)
38	A/D	I	Input pin for address/data identification signals from the microcomputer(IC105). “H” for address and “L” for data.
39	CS	I	DASP chip selector input pin. Selected with “L”.
40	CK SEL2	I	Selector pin for the clocks from CKOUT (pin 62)
41	CK SEL1	I	Selector pin for the master clock frequencies
42	XSEL	I	Oscillator/external clock selector pin
43	WCK	O	Word clock output pin
44	2FSOUT	O	2Fs LR clock output pin to A/D converter
45	64FSOUT	O	64Fs bits clock output pin to A/D converter
46	BCKOUT2	O	32Fs bits clock output pin
47	BCKOUT1		
48	LRCKOUT2	O	LR clock output pins. Lch when LRCKOUT1 is “H”, and Rch when “L”.
49	LRCKOUT1	O	
50	N.C.		Not connected
51	AOUT2	O	Output pins for Lch/Rch serial audio data
52	AOUT1	O	
53	LRCKIN2	I	LR clock input pin 2 to receive serial audio data
54	BCKIN2	I	Bit clock input pin 2 to receive serial audio data
55	AIN2	I	Input pin 2 for serial Lch/Rch audio data
56	LRCKIN1	I	LR clock input pin 1 to receive serial audio data
57	BCKIN	I	Bit clock input pin 1 to receive serial audio data

No.	Pin Name	I/O	Description
58	AIN1	I	Input pin 1 for serial Lch/Rch audio data
59	FSOUT	O	Fs LR clock output pin to A/D converter
60	32FSOUT	O	32Fs bits clock output pin to A/D converter
61	TEST3	I	Test mode pin with pull-up resistor
62	CKOUT	O	Output pin for 3/2 demultiplied frequency of master clock or the internal system clock
63	MOUT	O	Master clock output pin
64	VDD1	—	Power supply pin

Selection of the master clocks

XSEL (pin 42)	Mout output (pin 63)
L	EXCK output
H	Crystal oscillator output

Selection of internal system clocks

CKSEL 1 (pin 41)	CKSEL 2 (pin 40)	Internal system clock	CKOUT output (pin 62)
L	L	1/2 times master clock	2/3 times master clock
H	L	1/3 times master clock	2/3 times master clock
L	H	1/2 times master clock	1/2 times master clock
H	H	1/3 times master clock	1/3 times master clock

5. 4 PD0078B1 : DSP CONTROL MICROCOMPUTER

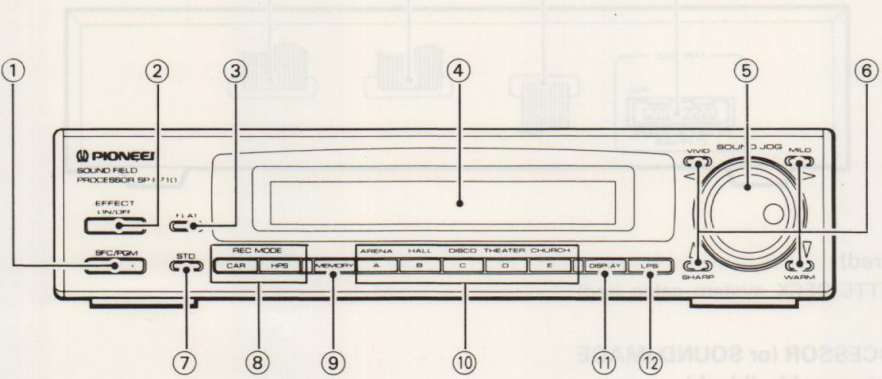
● Pin Function

No.	Pin name	I/O	Description
1	VDD	—	Power supply. Connected to 5 Volts.
2	P26/D6	O	Analog mute
3	P25/D5	O	Not used
4	P24/D4	O	
5	P23/D3	O	
6	P22/D2	O	
7	P21/D1	O	CSB
8	P20/D0	I/O	A/D converter
9	CLK2	O	CLK
10	SO2	O	DATA
11	SI2	I	Not used
12	P33/CNTR	I	DRDY
13	P32/INT2	O	RESET
14	P31/SYNC	O	Not used
15	P30/RBW	O	
16	CLK1	I	GEQ CLK
17	SO1	O	Not used
18	SI1	I	GEQ DATA
19	INT1	I	Not used
20	CNVss	—	GND
21	RST	I	Not used

No.	Pin name	I/O	Description
22	Vss	—	GND
23	X IN	I	Connected to ceramic oscillator
24	X OUT	O	
25	φ OUT	O	Not used
26	P17/A15	O	
27	P16/A14	O	
28	P15/A13	O	
29	P14/A12	O	Not used
30	P13/A11	O	
31	P12/A10	O	
32	P11/A9	O	
33	P10/A8	O	DOLBY ON/OFF (Not used)
34	P07/A7	O	Not used
35	P06/A6	O	
36	P05/A5	O	
37	P04/A4	O	
38	P03/A3	O	A/D converter
39	P02/A2	O	
40	P01/A1	O	
41	P00/A0	O	
42	P27/D7	I	A/D converter

6. PANEL FACILITIES

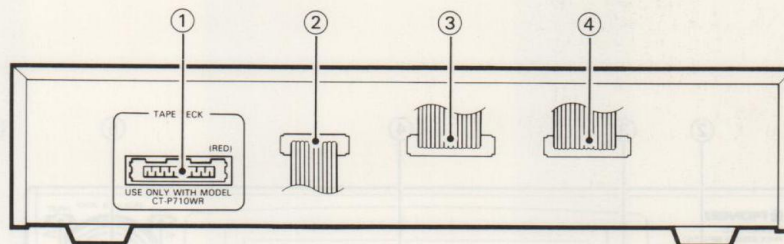
FRONT PANEL FACILITIES



- ① **SFC/PGM button**
Determines whether the sound field recalled by the sound field selector buttons is individually created sound effect patterns or factory preset sound effect patterns.
- ② **EFFECT ON/OFF button**
Use to set sound effect characteristics.
- ③ **FLAT button**
Use this to make all equalization patterns flat.
- ④ **Display section**
- ⑤ **SOUND JOG**
Use to change the sound effect characteristics level.
- ⑥ **Image effect buttons (VIVID, MILD, SHARP, WARM)**
Use these buttons to recall previous effect mode settings. After recalling the desired effect mode, the effect level can be adjusted by using SOUND JOG. When the LPS (listening point selector) is set to ON, the control also becomes a cursor button used to set your own position.
- ⑦ **STD (standard) button**
After modifying sound effects with the SOUND JOG control, press this button to return the effects to their standard response settings.

- ⑧ **REC MODE selector buttons (CAR, HPS)**
Press to set recording frequency response to optimum levels for car stereo (CAR) or headphone stereo (HPS).
- ⑨ **MEMORY button**
Used for storing sound field (image) you input with the sound field (image) selector buttons.
- ⑩ **Sound field buttons (ARENA, HALL, DISCO, THEATER, CHURCH)**
Use to recall one of the preset sound fields.
- ⑪ **DISPLAY button**
Use to switch the display mode in the display section. Spectrum analyzer, graphic equalizer, and listening point selector display are possible.
- ⑫ **LPS (Listening Point Selector) button**
While holding this button pressed, use the remote control unit's number buttons and the tuner's controls or the main unit's image effect buttons to set response characteristics optimally for your present listening position.

REAR PANEL FACILITIES

① **TAPE DECK jack (red)**

Connect the CASSETTE DECK system cable (red) here.

② **SOUND FIELD PROCESSOR (or SOUND IMAGE CONTROLLER) system cable (black)**

Connect to the SOUND PROCESSOR/SOUND CONTROLLER jack (black) of the tuner.

③ **SOUND FIELD PROCESSOR (or SOUND IMAGE CONTROLLER) system cable (white)**

Connect to the SOUND PROCESSOR jack (white) of the amplifier.

④ **SOUND FIELD PROCESSOR (or SOUND IMAGE CONTROLLER) system cable (green)**

Connect to the SOUND PROCESSOR jack (green) of the amplifier.

7. SPECIFICATIONS

Central frequencies 60 Hz, 150 Hz, 400 Hz,
1 kHz, 2.4 kHz, 6 kHz, 15 kHz
Maximum range of variation ± 8 dB

Spectrum Analyzer Section

Central frequencies 60 Hz, 150 Hz, 400 Hz,
1 kHz, 2.4 kHz, 6 kHz, 15 kHz
External dimensions 260 (W) x 58.5 (H) x
243.5 (D) mm
Weight 1.6 kg