

SOLID STATE STEREO POWER AMPLIFIER

SM-700

KL



INSTALLATION, OPERATION AND SERVICE MANUAL

Including PARTS LIST, CIRCUIT DIAGRAMS
AND MOUNTING TEMPLATE.

 **PIONEER®**

FEATURES

STABLE, SILICON TRANSISTORS

The advanced, direct-coupled circuitry of the SM-700, and the use of the finest silicon transistors, results in a unit of high performance and extreme stability.

HIGH POWER

Efficient design enables the SM-700 to put out a big 120 watts, yet its size is quite compact.

EASY ADAPTABILITY

The voltage selector switch on the front panel has three positions (0.5, 1 and 2 volts) for flexibility in matching a preamplifier, and maximum ease in operating the master volume control.

VERSATILE OPERATION

The SM-700 can power 2 pairs of speaker systems, and the 3-position selector switch allows combinations A, B, A + B. The center channel output is effective in filling the "hole" that may occur in the sound when the speakers are placed far apart or the listening area is large.

CHOICE OF PHASE

Also included on the front panel are two buttons for normal phase operation or reversed.

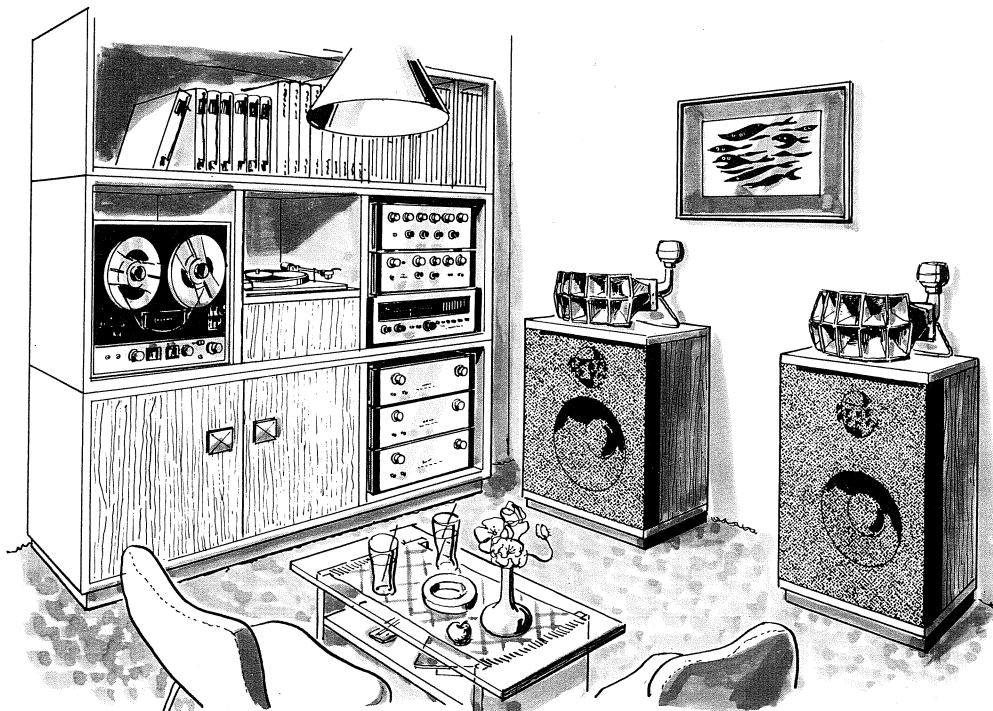
NEAT APPEARANCE

The SM-700 is a handsome unit, with an uncluttered design set off by two contrasting polished wooden endpieces.

INSTALLATION

When selecting the location for the SM-700 unit, the following points must be taken into consideration:

- Avoid places where the unit may be exposed to the direct sun rays or the heated air from a nearby space heater.
- Avoid places where the unit may be exposed to damp air or dust or where the ventilation is poor.
- Avoid places where the unit may be subject to vibration or shocks or where stable installation is difficult.



STEREO SYSTEM SETUP USING SM-700

The SM-700 is a stereo power amplifier. Most typical SM-700 applications for stereo system setups are illustrated in Fig. 1 to 5. Fig. 1 shows a standard setup, and Figs. 2 to 5, various applications such as a 3-dimensional (3-D) system and a multichannel amplifier system.

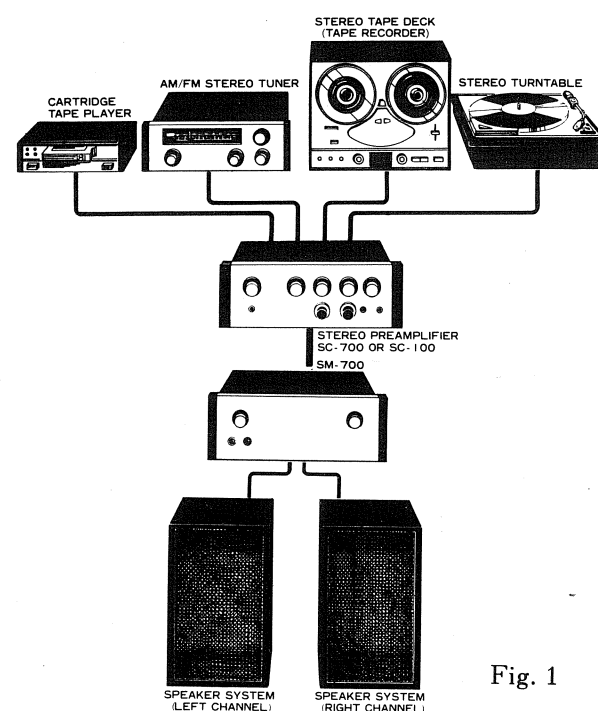


Fig. 1

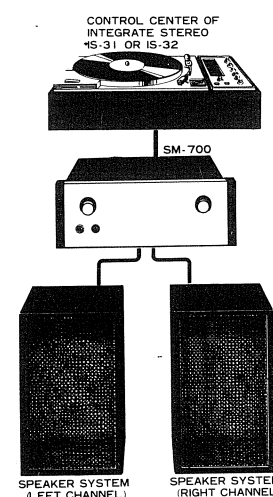


Fig. 2

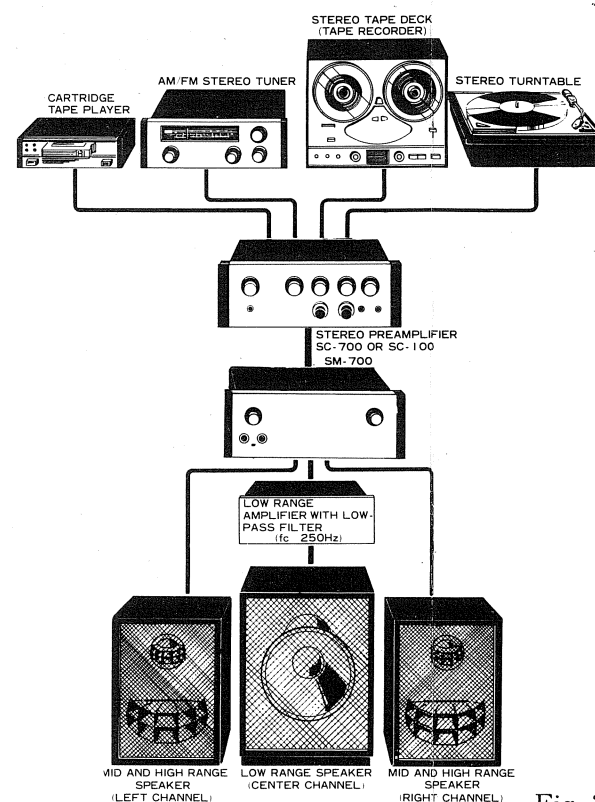


Fig. 3

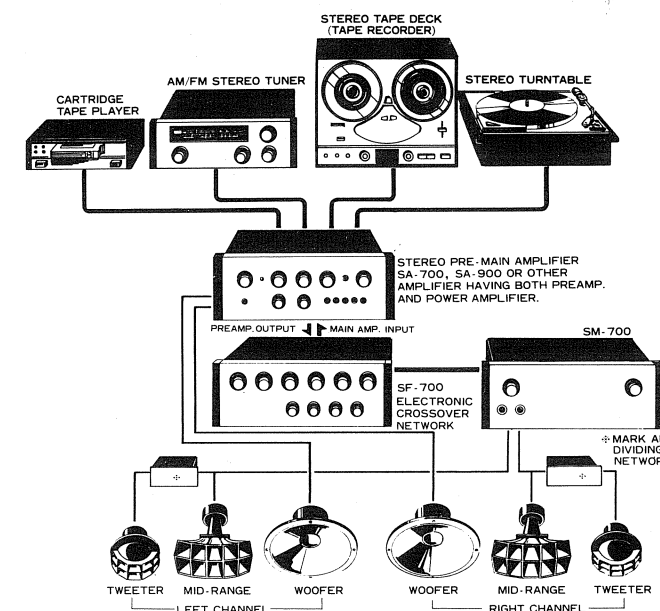


Fig. 4

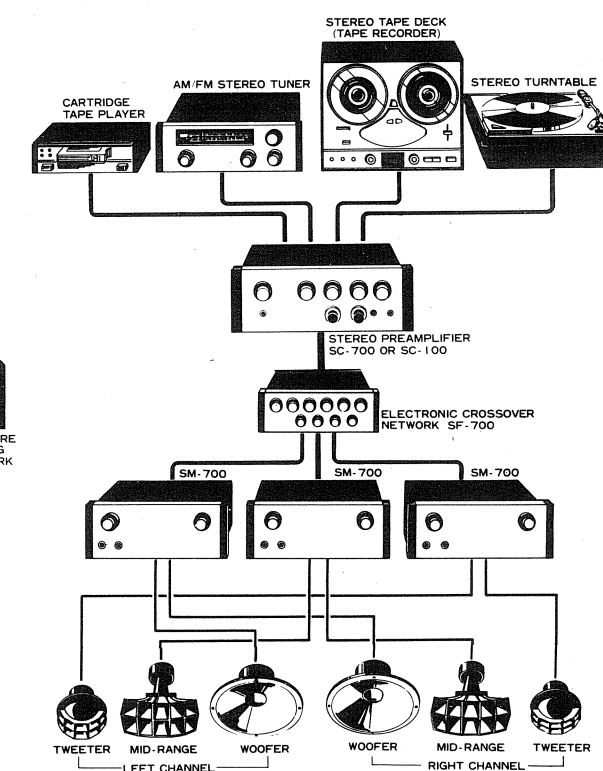


Fig. 5

CONSIDERATIONS IN SELECTING STEREO COMPONENTS

• PREAMPLIFIER (OR CONTROL AMPLIFIER)

When constructing a stereo system using the SM-700 unit, use of the PIONEER SC-700 or SC-100 preamplifier is recommended as the preamplifier for the system. The combination of the SM-700 with the IS-31 or IS-32 integrated stereo unit containing both the record player and the AM/FM tuner is also ideal. When you select any preamplifier other than those mentioned above, make sure that the preamp can provide a linear output higher than 0.5 volt with a 65 k Ω output impedance at 1 kHz. Also make sure that the preamplifier has a coupling capacitor larger than 0.5 microfarads in the output circuit.

• SPEAKER SYSTEMS

Various high-fidelity speakers including the full-range, 2-way, 3-way and 4-way types are available from PIONEER. In addition, PIONEER manufactures a full complement of high-performance speaker systems including the closed and bass reflex types. Use of PIONEER speaker systems will ensure superior tonal quality.

NOTE: The SM-700 has two sets of speaker outputs and allows you to connect two stereo speaker systems to the SM-700 simultaneously. However, when using two sets of speaker systems simultaneously (Switch position A + B), make sure that the impedance of each speaker system is 8 ohms or more. Also, care must be taken to the speaker hookup so that the "-" (minus) leads of the two speaker system should not be used in common.

SWITCHES AND CONTROLS ON FRONT PANEL

SPEAKER SELECTOR

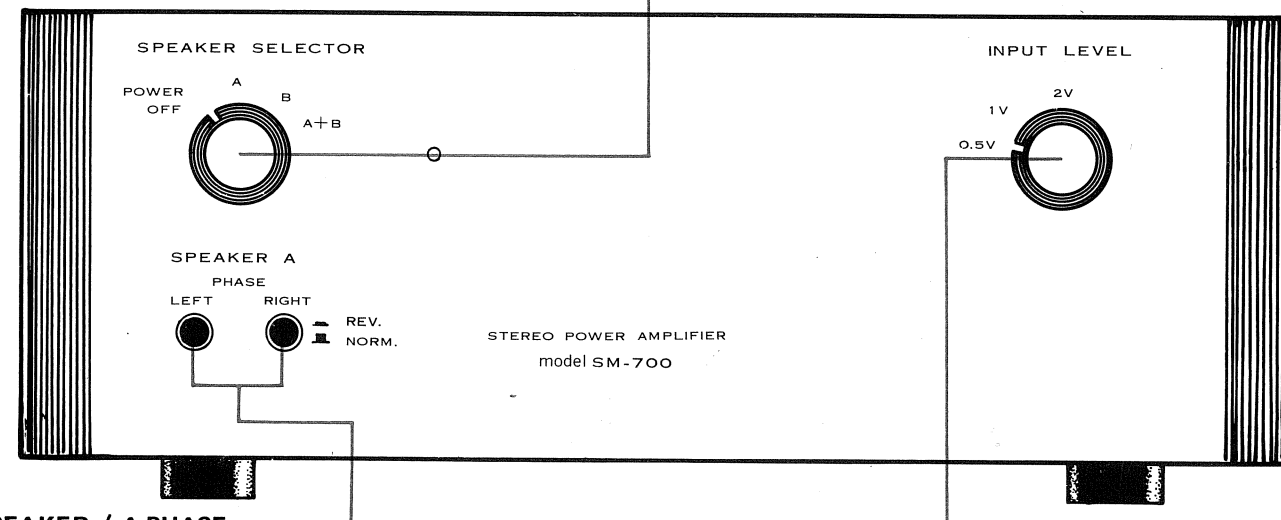
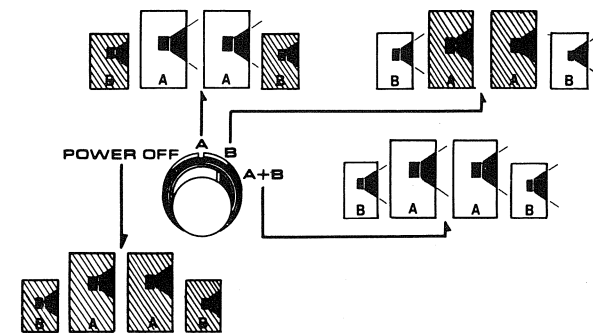
Controls power to the SM-700 unit and also functions as a speaker selector switch.

POWER OFF turns power off.

A turns power on and, at the same time, provides an output to the speaker systems connected to the A output connector on the rear panel.

B provides an output to the speaker systems connected to the B output connector on the rear.

A + B provides an output to the speaker systems connected to both A and B output connectors on the rear panel.



SPEAKER / A PHASE

Reverse the phase of the speaker systems connected to the A output connector on the rear panel. Pressing the button into a flush position (REV) will reverse the phases, and pressing it again will restore the button to the normal position (NORM), bringing the phases back to normal. With an ordinary stereo system, this button should be kept in the normal position; however, if the system is a multichannel amplifier system, operate this button while music is being reproduced, to see if phase reversal improves the sound quality.

INPUT LEVEL

Controls the input sensitivity of the SM-700 according to the output level of the preamplifier used.

0.5V The control should be set to this position if the preamplifier output is below 0.5 volt.

1V The control should be set to this position if the preamplifier output is from 0.5 to 1 volt.

2V The control should be set to this position if the preamplifier output is from 1 to 2 volts.

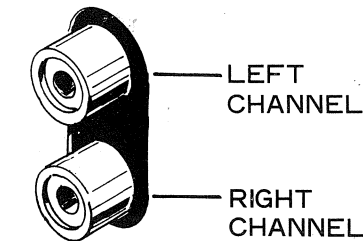
LEVEL MATCHING

- If the output level of the preamplifier is not properly matched with the input sensitivity of the SM-700, the SM-700 may not provide the rated output or may provide an output containing excessive harmonics. For a better result, set the VOLUME control of the preamp to the midpoint of the control range and then adjust the INPUT LEVEL control of the SM-700 while listening to the music.

JACKS, CONNECTORS, AND FUSE ON REAR PANEL

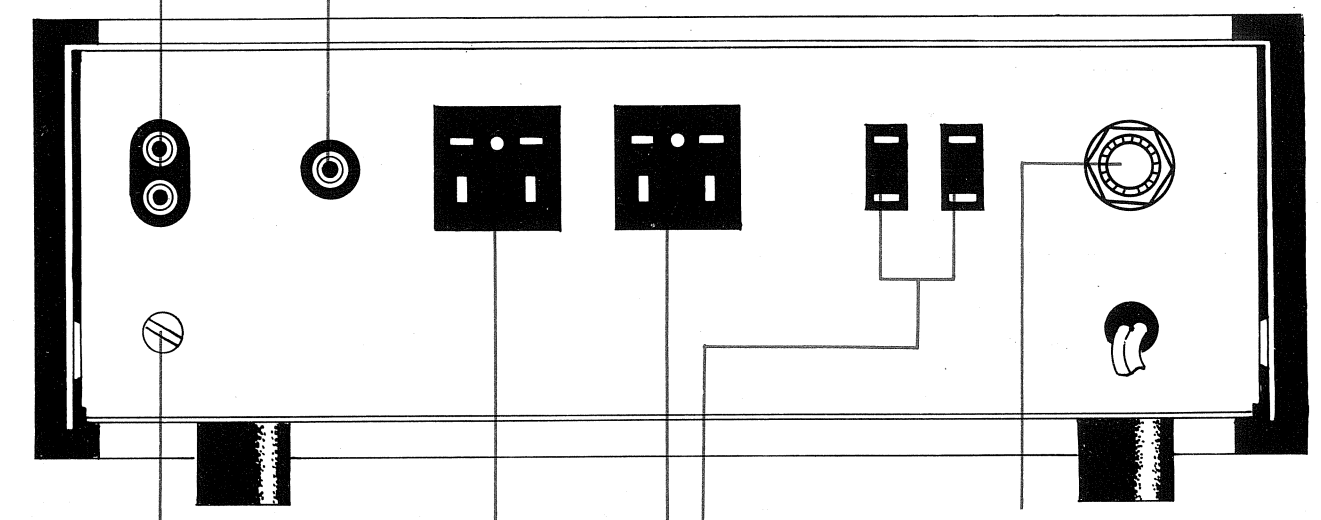
INPUT

The preamplifier output should be connected to these input jacks. The one on top is for the left channel connection, and the other is for the right channel connection.



CENTER CHANNEL

When constructing a 3-dimensional (3-D) system, the low-frequency channel amplifier containing a low-pass filter should be connected to this output jack. When the distance between the left and the right speakers of an ordinary stereo system is too big, a "hole" effect may result. Use of an additional (center channel) amplifier and a speaker placed between the left and right speakers can eliminate the hole effect. In such instance, this CENTER CHANNEL output jack can be used to provide an output to the low-frequency channel amplifier.

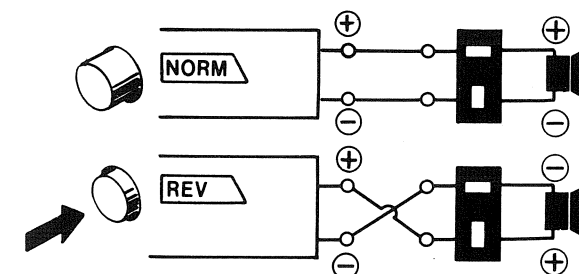


GND

This is a ground terminal for connection to the ground lead of your preamplifier.

SPEAKER OUTPUT A

The speaker plugs that match this speaker output connector are furnished with the SM-700 unit. Using one of the speaker plugs, your stereo speaker system can be connected to this output connector. The R socket is for the right-channel connection, and the L socket, for the left channel connection.



FUSE HOLDER

This is the fuse holder for glass-tube. If it is necessary to replace the fuse, always use a 2A type fuse.

AC OUTLET

These are the outlets that provide a source of AC power convenient for your preamplifier or any other stereo component. Each outlet can provide power up to 200 watts; the one marked SWITCHED is controlled by the SPEAKER SELECTOR switch located on the front panel.

SPEAKER OUTPUT B

This is an auxiliary speaker output connector. When two speaker systems are to be used, the second system may be connected to this output connector. Use of this connector is the same as that of SPEAKER OUTPUT A.

CONNECTION AND INSTALLATION OF SPEAKER SYSTEM

- To connect the speaker system to the SM-700 unit, use the connector plug furnished in the accessory group. For speaker hookup, see the wiring diagram shown in Fig. 6. Be sure that the speaker leads are connected to the speaker plug terminals as illustrated in the figure, with special attention to the + and - connections.
- NOTES:
 - a. If two speaker systems are connected to the SM-700 unit, the impedance of each system must be higher than 8 ohms. If two speakers each having an impedance lower than 8 ohms are simultaneously connected to the SM-700, it may cause trouble to the output transistors of the unit.
 - b. Never use one common lead for connecting the "L" terminals of two speaker systems to the "L" pins (the bottom socket pins) of both SPEAKER OUTPUT A and SPEAKER OUTPUT B connectors. Since the

SM-700 has a provision to reverse the phases (+ and-) of the speaker leads connected to the SPEAKER OUTPUT A connector, common use of the "L" terminals of both A and B speaker output connectors will short-circuit the output circuit when the SPEAKER A PHASE button is used to reverse the phases of the speaker leads. This short circuit will immediately burn out the power transistors used in the output circuit.

- The best stereo effect is obtained when the listener is situated at the apex of a regular triangle with its base being 1 to 2.5 meters and with the left and right speakers placed at the extreme ends of the base. It is also recommended to make the heights of both speakers from the floor as nearly equal as possible. If the difference between the heights is too large, the stereo effect may be impaired.

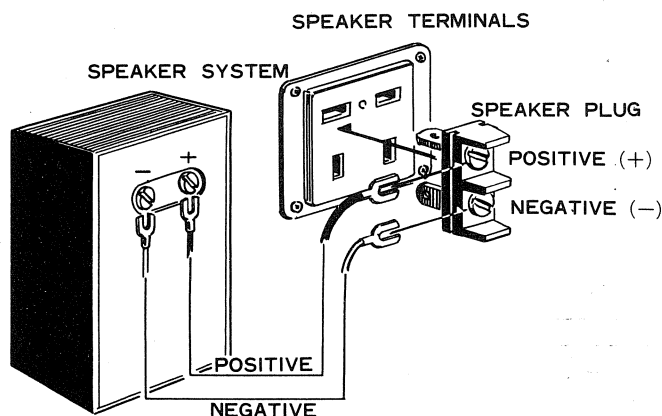


Fig. 6

A WORD ABOUT ROOM ACOUSTICS

- After the SM-700 is properly installed and connected to other components, put the stereo system into operation, and listen to the music reproduced. The quality of reproduced sound varies according to the size and shape of the room, the materials of walls, floor and ceiling and the amount and arrangement of furniture. Too harsh or "bright" a sound usually results from too many hard reflecting surfaces, and/or too low a ceiling. This condition is improved by having ample carpet area or covering the wall (especially that facing the speakers)

with a thick curtain.

On the other hand, too many absorbing surfaces will tend to "Soak up" the sound, resulting in a certain "deadness".

Furniture may be rearranged to provide irregular reflection of the sound. In any event, the true stereo effect is lost if the two speaker systems are placed too far apart. This may be corrected by angling them slightly toward each other or reducing the distance between them.

SPECIFICATIONS

• AUDIO SECTION

Music Power Output 8 Ω 80 watts total (IHF rating)
 4 Ω 120 watts total
 Continuous Power Output 8 Ω 32 w/32 w (1 kHz)
 (Each channel driven) 4 Ω 42 w/42 w (1 kHz)
 Continuous Power Output 8 Ω 27 w + 27 w (1 kHz)
 (Both channels driven) 4 Ω 31 w + 31 w (1 kHz)
 Harmonic Distortion Less than 0.05%
 (at 1 kHz, 20 W power output)

Damping Factor More than 30 (at 8 Ω , 1 kHz)
 Frequency Response 15 Hz to 60 kHz, ± 0.5 dB
 Power Bandwidth 15 Hz to 60 kHz (IHF rating)
 Signal to Noise Ratio More than 100 dB
 Input Sensitivity and Impedance

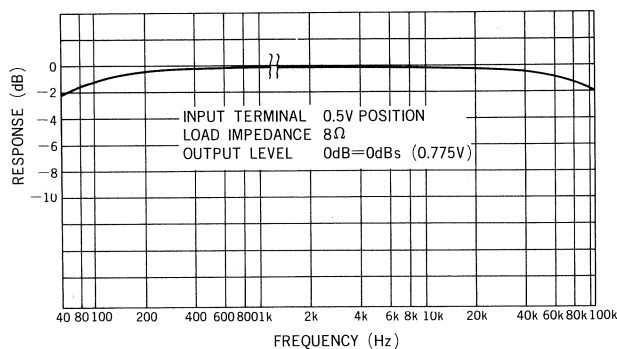
(at 1 kHz, continuous power output) 0.5 V 65 k Ω
 1.0 V 80 k Ω (switchable)
 2.0 V 200 k Ω

Output Jacks and Terminals Speakers (A, B)
 4 to 16 ohms
 CENTER CHANNEL
 OUTPUT

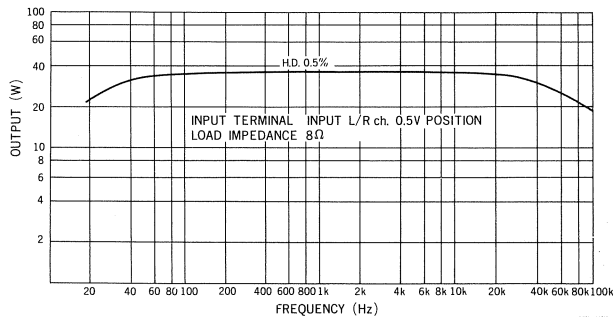
• MISCELLANEOUS

Power Requirements 120 volts
 Power Consumption 190 VA
 Dimensions (Overall) 11-13/16"/300mm (width)
 4-5/8"/118mm (height)
 10"/254mm (depth)
 Weight Without package
 11 lb 11 oz/5.3 kg
 With package
 15 lb/6.8 kg

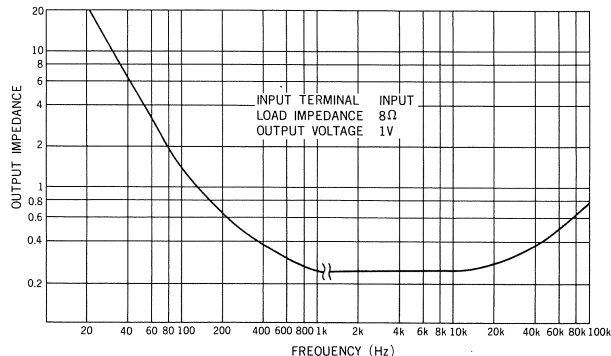
FREQUENCY RESPONSE



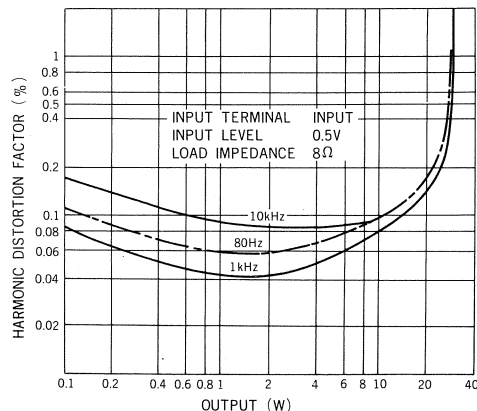
POWER BAND WIDTH



FREQUENCY/OUTPUT IMPEDANCE CHARACTERISTICS



OUTPUT/HARMONIC DISTORTION FACTOR



PARTS LIST

CAPACITORS

IN μ F, 10% TOLERANCE UNLESS OTHERWISE NOTED

p: μ F

Symbol	Description			Part No.
C1	Electrolytic	2200	80V	C52-071-O
C2	Ceramic	0.01	+80% -20% DC1.4kV	C43-003-O
C3	Ceramic	0.01	+80% -20% DC1.4kV	C43-003-O

RESISTORS

IN Ω , 10% TOLERANCE, $\frac{1}{4}$ W UNLESS OTHERWISE NOTED

k: k Ω , M: M Ω

Symbol	Description			Part No.
R1	Carbon film	56k	$\frac{1}{8}$ W	RF $\frac{1}{8}$ PS 56k-K
R2	Carbon film	56k	$\frac{1}{8}$ W	RF $\frac{1}{8}$ PS 56k-K
R3	Carbon film	82k	$\frac{1}{8}$ W	RF $\frac{1}{8}$ PS 82k-K
R4	Carbon film	82k	$\frac{1}{8}$ W	RF $\frac{1}{8}$ PS 82k-K
R5	Carbon film	100k	$\frac{1}{8}$ W	RF $\frac{1}{8}$ PS 100k-K
R6	Carbon film	100k	$\frac{1}{8}$ W	RF $\frac{1}{8}$ PS 100k-K
R7	Carbon film	6.8k	$\frac{1}{2}$ W	RF $\frac{1}{2}$ PS 6R8k-K
R8	Carbon film	6.8k	$\frac{1}{2}$ W	RF $\frac{1}{2}$ PS 6R8k-K
R9	Carbon film	470	$\frac{1}{2}$ W	RF $\frac{1}{2}$ PS 470-K

TRANSFORMER

Symbol	Description	Part No.
	Power Transformer	T52-189-O

DIODES

Symbol	Description	Part No.
D1	SW-1-02 Diode	
D2	SW-1-02 Diode	
D3	SW-1-02 Diode	
D4	SW-1-02 Diode	

SWITCHES

Symbol	Description	Part No.
S1	INPUT SELECTOR	S14-037-O
S2	SPEAKER SELECTOR and POWER Switch	S11-032-O

MISCELLANEOUS

Symbol	Description	Part No.
	MAIN AMP UNIT	W15-060-O
	PUSH SWITCH UNIT	W15-074-O
	Front Panel	M21-379-O
	Metal Cover	M33-115-O
	Knob for Seaker Selector and Input Selector	A12-120-A
	Lens for Pilot lamp	A62-045-O
	1P Input Terminal	K21-005-C
	2P Input Terminal	K21-009-D
	Spare AC Outlet	K82-011-O
	Pilot lamp socket	K42-003-B
	Fuse Holder	K91-005-O
	Fuse Holder	K96-007-A
	Speaker socket	K73-003-B
	Pilot Lamp	E22-027-O
	Fuse 2A	E21-020-O
	Fuse 1A	E21-004-O
	Foot	M61-016-O

MAIN AMP UNIT (W15-060)

CAPACITORS

Symbol	Description			Part No.
C1	Electrolytic	3.3	10V	CEMX 3R3MF 10V
C2	Electrolytic	3.3	10V	CEMX 3R3MF 10V
C3	Electrolytic	100	50V	CEMX 100MF 50V
C4	Electrolytic	100	50V	CEMX 100MF 50V
C5	Electrolytic	3.3	25V	CEMX 3R3MF 25V
C6	Electrolytic	3.3	25V	CEMX 3R3MF 25V
C7	Electrolytic	100	50V	CEMX 100MF 50V
C8	Electrolytic	100	50V	CEMX 100MF 50V
C9	Ceramic	100p	50V	CCDSL 101K 50
C10	Ceramic	100p	50V	CCDSL 101K 50
C11	Electrolytic	100	3V	CEMX 100MF 3V
C12	Electrolytic	100	3V	CEMX 100MF 3V
C13	Electrolytic	1000	35V	C52-068-O
C14	Electrolytic	1000	35V	C52-068-O
C15	Ceramic	47p	50V	CCDSL 470K 50
C16	Ceramic	47p	50V	CCDSL 470K 50
C17	Mylar	0.022 \pm 20%	50V	CQMA 223M 50
C18	Mylar	0.022 \pm 20%	50V	CQMA 223M 50
C19	Ceramic	100p	50V	CCDSL 101K 50
C20	Ceramic	100p	50V	CCDSL 101K 50

RESISTORS

Symbol	Description		Part No.
R1	Carbon film	2.2k	RF $\frac{1}{4}$ PS 2R2k-K
R2	Carbon film	2.2k	RF $\frac{1}{4}$ PS 2R2k-K
R3	Carbon film	2.2M	RF $\frac{1}{4}$ PS 2R2M-K
R4	Carbon film	2.2M	RF $\frac{1}{4}$ PS 2R2M-K
R5	Carbon film	100k	RF $\frac{1}{4}$ PS 100k-K
R6	Carbon film	100k	RF $\frac{1}{4}$ PS 100k-K
R7	Carbon film	18k	RF $\frac{1}{4}$ PS 18k-K
R8	Carbon film	18k	RF $\frac{1}{4}$ PS 18k-K
R9	Carbon film	15k	RF $\frac{1}{4}$ PS 15k-K
R10	Carbon film	15k	RF $\frac{1}{4}$ PS 15k-K
R11	Carbon film	150	RF $\frac{1}{4}$ PS 150-K
R12	Carbon film	150	RF $\frac{1}{4}$ PS 150-K
R13	Carbon film	820 $\frac{1}{2}W$	RF $\frac{1}{2}$ PS 820-K
R14	Carbon film	820 $\frac{1}{2}W$	RF $\frac{1}{2}$ PS 820-K
R15	Carbon film	39k	RF $\frac{1}{4}$ PS 39k-K
R16	Carbon film	39k	RF $\frac{1}{4}$ PS 39k-K
R17	Carbon film	3.3k	RF $\frac{1}{4}$ PS 3R3k-K
R18	Carbon film	3.3k	RF $\frac{1}{4}$ PS 3R3k-K
R19	Carbon film	4.7k	RF $\frac{1}{4}$ PS 4R7k-K
R20	Carbon film	4.7k	RF $\frac{1}{4}$ PS 4R7k-K
R21	Carbon film	150	RF $\frac{1}{4}$ PS 150-K
R22	Carbon film	150	RF $\frac{1}{4}$ PS 150-K
R23	Carbon film	22 $\frac{1}{2}W$	RF $\frac{1}{2}$ PS 22-K
R24	Carbon film	22 $\frac{1}{2}W$	RF $\frac{1}{2}$ PS 22-K
R25	Carbon film	150	RF $\frac{1}{4}$ PS 150-K
R26	Carbon film	150	RF $\frac{1}{4}$ PS 150-K
R27	Carbon film	22 $\frac{1}{2}W$	RF $\frac{1}{2}$ PS 22-K
R28	Carbon film	22 $\frac{1}{2}W$	RF $\frac{1}{2}$ PS 22-K
R29	Carbon film	150	RF $\frac{1}{4}$ PS 150-K
R30	Carbon film	150	RF $\frac{1}{4}$ PS 150-K
R31	Wire wound	0.5 2W	RS2P 0R5-K
R32	Wire wound	0.5 2W	RS2P 0R5-K
R33	Wire wound	0.5 2W	RS2P 0R5-K
R34	Wire wound	0.5 2W	RS1P 0R5-K
R35	Carbon film	15k	RF $\frac{1}{4}$ PS 15k-K
R36	Carbon film	15k	RF $\frac{1}{4}$ PS 15k-K
R37	Carbon film	8.2k	RF $\frac{1}{4}$ PS 8R2k-K
R38	Carbon film	8.2k	RF $\frac{1}{4}$ PS 8R2k-K
R39	Carbon film	10 $\frac{1}{2}W$	RF $\frac{1}{2}$ PS 10-K
R40	Carbon film	10 $\frac{1}{2}W$	RF $\frac{1}{2}$ PS 10-K

DIODES AND TRANSISTORS

Symbol	Description	Part No.
D1	STV-3 Varistor	
D2	STV-3 Varistor	
Q1	2SC732 Transistor	
Q2	2SC732 Transistor	
Q3	2SC497-0 or Y Transistor	
Q4	2SC497-0 or Y Transistor	
Q5	2SC497-0 or Y Transistor	
Q6	2SC497-0 or Y Transistor	
Q7	2SA497-0 or Y Transistor	
Q8	2SA497-0 or Y Transistor	
Q9	2SC793-Y Transistor	
Q10	2SC793-Y Transistor	
Q11	2SC793-Y Transistor	
Q12	2SC793-Y Transistor	

POTENTIOMETERS

Symbol	Description	Part No.
VR1	30k Ω Semi-fixed	C92-024-B
VR2	30k Ω Semi-fixed	C92-024-B
VR3	50 Ω Semi-fixed	C92-043-B
VR4	50 Ω Semi-fixed	C92-043-B

OTHERS

Smybol	Description	Part No.
	Fuse 2A	E 21-005-0
	Heat Sink	M14-050-0
	Insulator Bush	E 32-039-0
	Mylar Insulator	E 32-040-0
	Fuse Holder	K 91-006-0

PUSH SWITCH UNIT (W15-074)

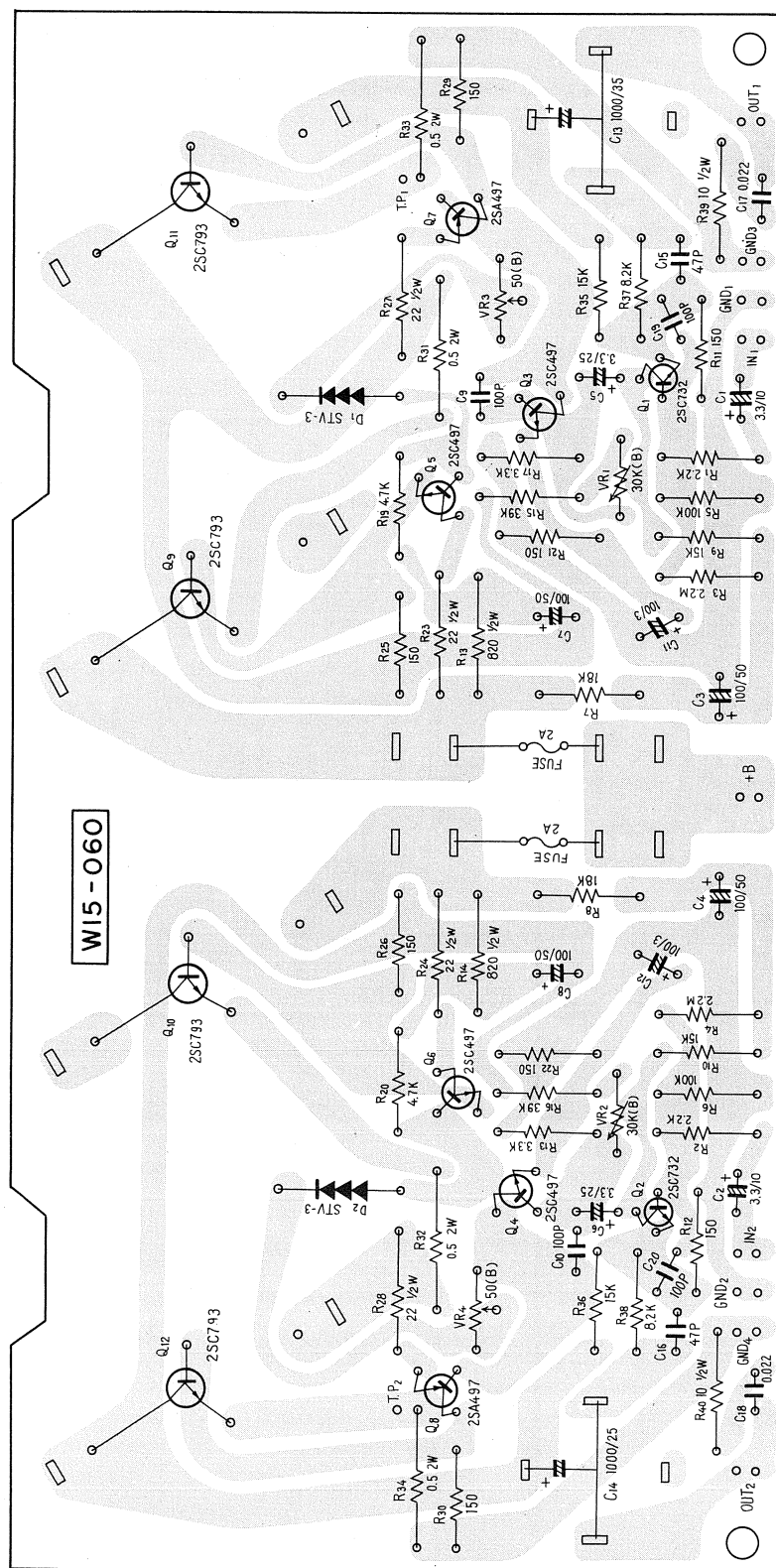
SWITCHES

Symbol	Description	Part No.
S1	SPEAKER PHASE Switch (Left)	S31-022-0
S2	SPEAKER PHASE Switch (Right)	S31-022-0

OTHERS

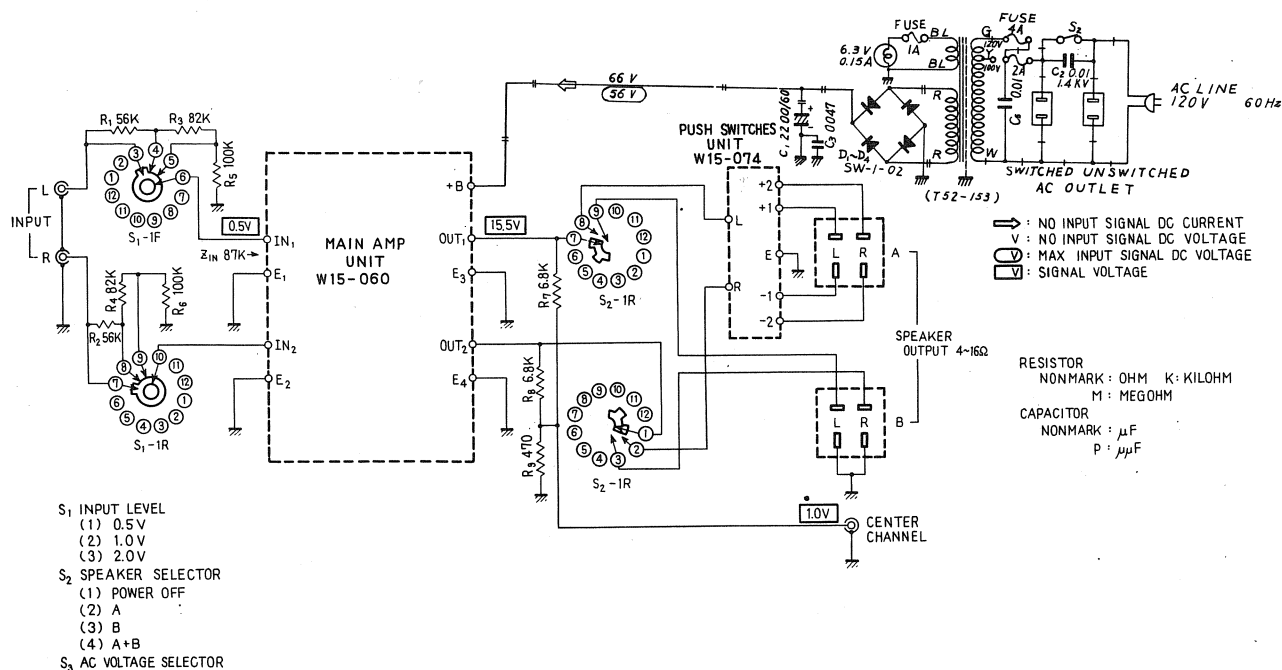
Symbol	Description	Part No.
	Knob for Speaker Phase Switch Left and Right	A19-081-0

PRINTED CIRCUIT BOARDS



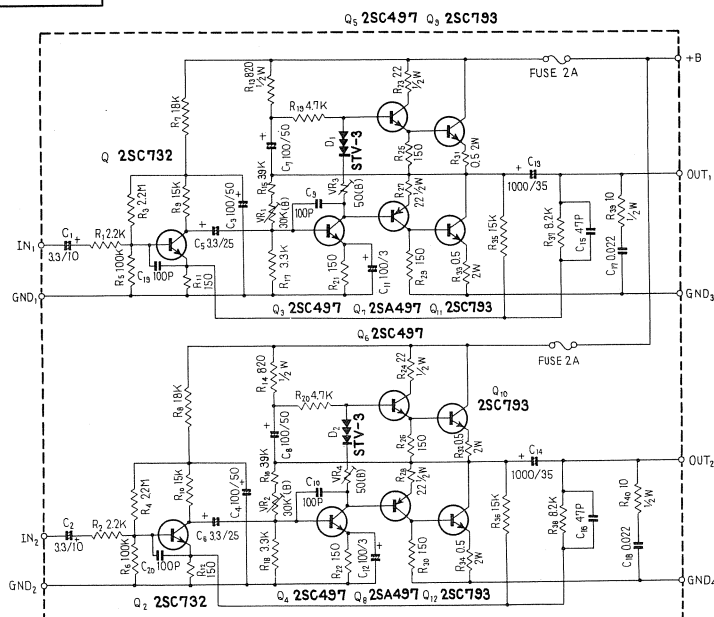
CIRCUIT DIAGRAMS

SM-700



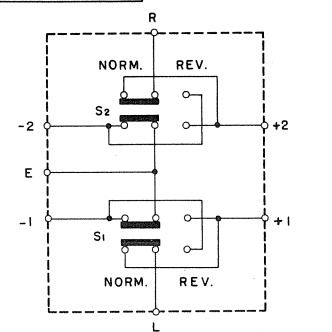
MAIN AMP UNIT

W15-060



PUSH SWITCH UNIT

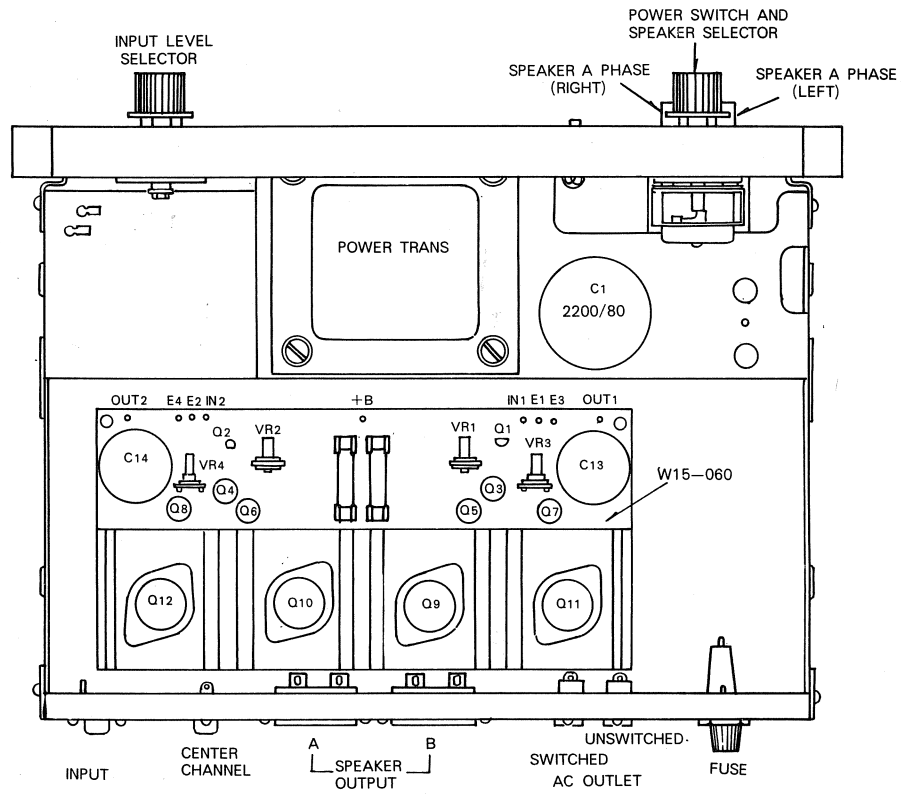
W15-074



SWITCHES (S₁, S₂) ---- PUSH SWITCH (S31-013-A)

PARTS LAYOUT

TOP VIEW



PIONEER ELECTRONIC CORPORATION

15-5, 4-Chome, Ohmori-nishi, Ohta-ku, Tokyo, Japan

PIONEER ELECTRONICS U.S.A. CORPORATION

140 Smith St., Farmingdale, L.I., N.Y. 11735, U.S.A.

PIONEER ELECTRONIC (EUROPE) NV

Frankrijklei 64-68, 2000 Antwerp, Belgium