PIONEER®

# SD-1100

## A sophisticated Stereo Display unit for measurement and scoping of all audio components and stereo characteristics.

The serious audio enthusiast who has long sought a precise method of scoping and testing his stereo components, with the objective of achieving ultimate sound performance at all times, will find Pioneer's new Stereo Display, Model SD-1100, to be the most complete instrument of its kind for this purpose. Here, in one attractive, sensitive unit, is the capability for observation of the various stereo wave forms and a means of measuring the various characteristics possessed by all audio instruments, including amplifiers, tuners, speakers, cartridges, tape decks, etc. From every technical point of view, the Model SD-1100 is an advanced and truly versatile instrument. You may, for example, use the Stereo Display to observe and analyze the wave forms of the new 4-channel stereo systems while at the same time measure the sound field characteristics of your own listening room. You can observe a stereo display, measure a voltage level, measure a phase shift by means of a Lissajous pattern, measure stereo sound by observing a difference in level of output signals, even check the frequency response of a cartridge while playing a stereo test record. Much more, too. Pioneer's Stereo Display installs easily and with its handsome design will complement your existing stereo equipment. Most important, an investment in this unit will be an investment in unparalleled sound quality.

# The Pioneer Stereo Display:

# It makes your stereo sound better.

**FEATURES:**

**EASY-TO-READ CLEAR CATHODE-RAY TUBE** The SD-1100 is equipped with a 3-inch (75mm) electrostatic deflection-type brightness cathode-ray tube and easy-to-read scale to allow easy observation of wave forms. The pattern which you will read will always be bright and clean, even during rapid wave form changes. In addition, the SD-1100 features an automatic spot killer circuit which employs the automatic capability of reducing pattern brightness when the vertical and horizontal amplitude is extremely reduced. This will thus prevent degrading of fluorescent materials. For easy observation of Lissajous wave forms, the vertical and horizontal amplifiers of the unit possess the same gain.

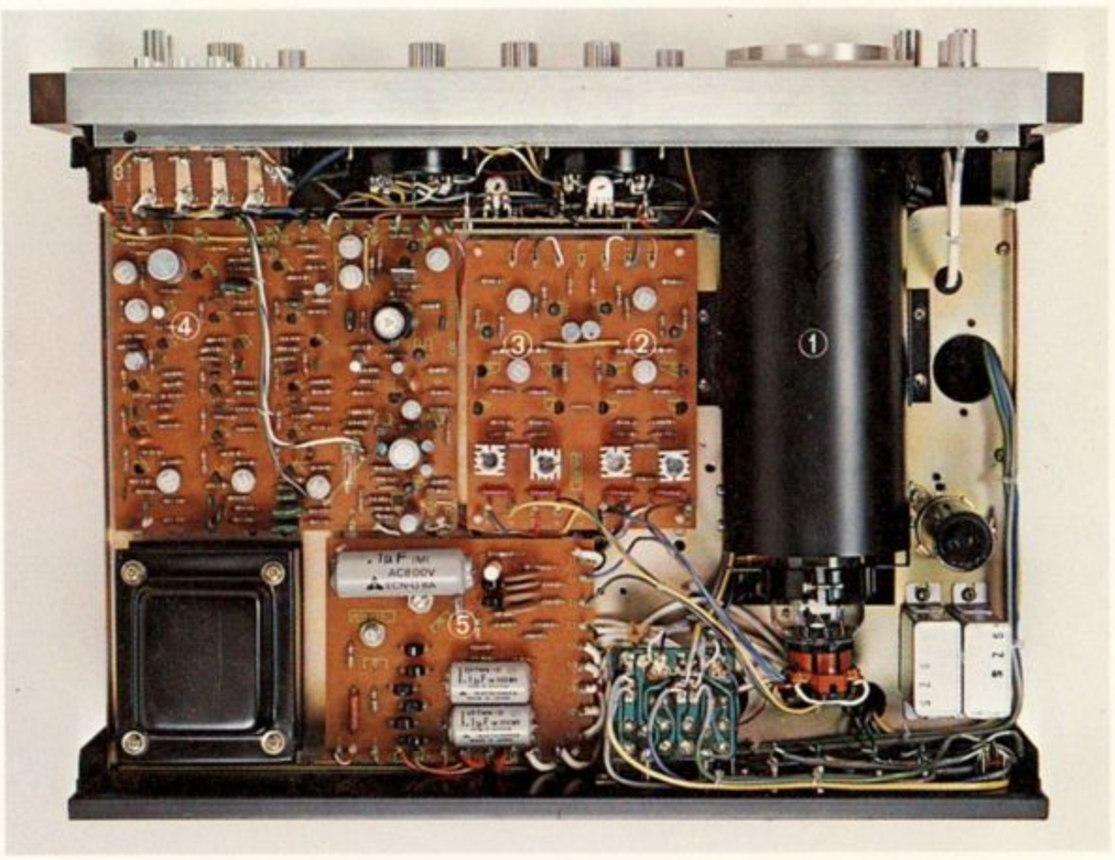
**BUILT-IN AUDIO OSCILLATOR AND WIDE FREQUENCY AMPLIFIER FOR MICROPHONE** The sweep-automatic audio oscillator built in to the SD-1100, when you set it to SWEEP AUTO, may be used exclusively in an automatic sweep within a 20—20,000Hz range in a period as short as about 25 seconds. Additionally, manual operation for sweeping the same range is permitted (except for the SWEEP AUTO position). The oscillator will operate on a free frequency within the 20—20,000Hz frequency range. And by varying the frequency of output from the calibrated audio oscillator, the oscillating frequency of the SD-1100 can be checked at each frequency within the same 20—20,000Hz frequency range. The unit is also equipped with a wide frequency amplifier for microphone. This enables you to check the sensitivity, acoustic frequency response and directional characteristics of your speaker system, using an electret condenser type wide frequency microphone (optional model CM-01) for the measurement and the sound field characteristics of your listening room.

THE OPTIONAL PIONEER ELECTRET CONDENSER TYPE WIDE FREQUENCY MICROPHONE (MODEL: CM-01)

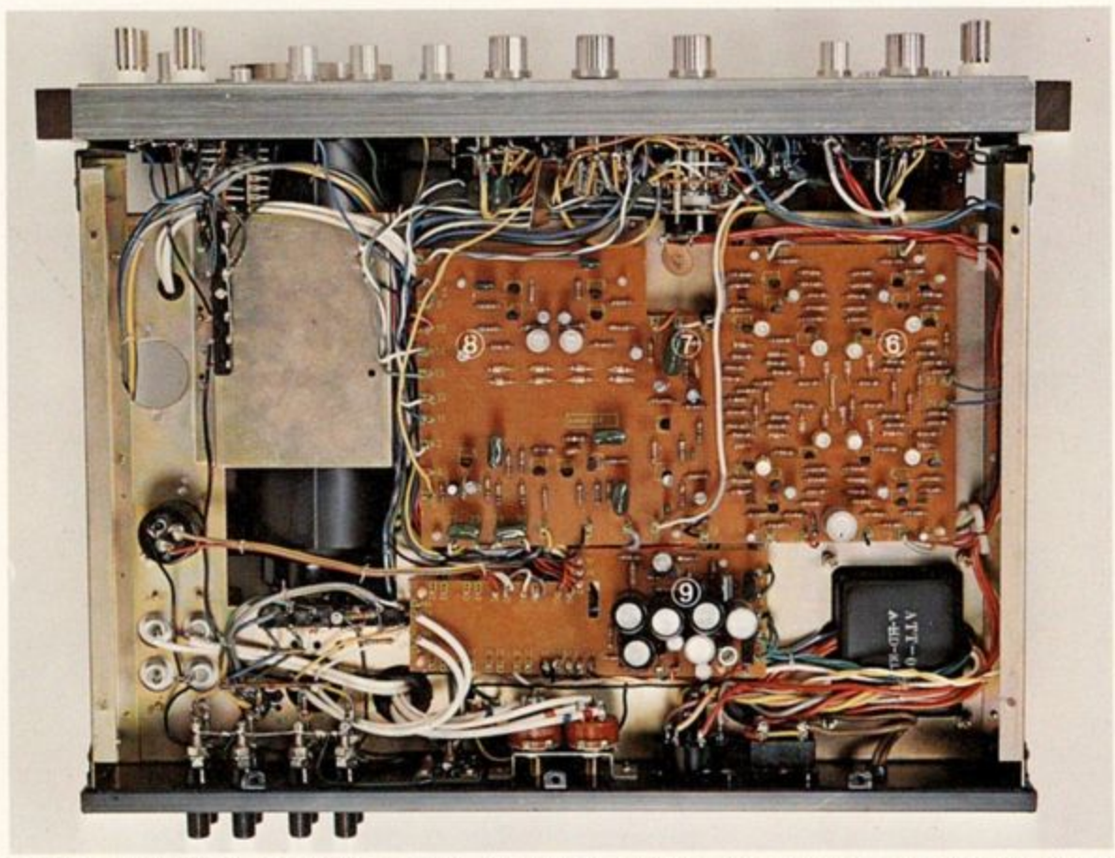
**EASY-TO-READ, SENSITIVE LEVEL METERS** The unit has a pair of large-size level meters prominently situated in the center of the front panel for ease of direct reading of dB values signals. Each has a 10dB-step attenuator and a pair of different sensitivity input terminals on front and rear panels to enable a measurable signal to cover a range from 3mV to 30V. These meters may be used as output level meters or volt meters.

**SIMPLE INPUT SIGNAL SELECTION** Push-button signal selecting switches located on the front panel permit wave form observation of input signals fed from input terminals when observing a stereo display. By setting the switch to 4-CHANNEL DISPLAY, you can easily obtain the four-channel sound field on the cathode-ray tube screen by using 4-channel input terminals on the back panel.

**OTHER FEATURES** The Stereo Display is all-transistorized, and will thus generate only little heat. The design of the unit is attractive. All controls, meters and the cathode-ray tube screen are esthetically placed for maximum readibility and operation. The SD-1100 is handsomely finished in wooden case.

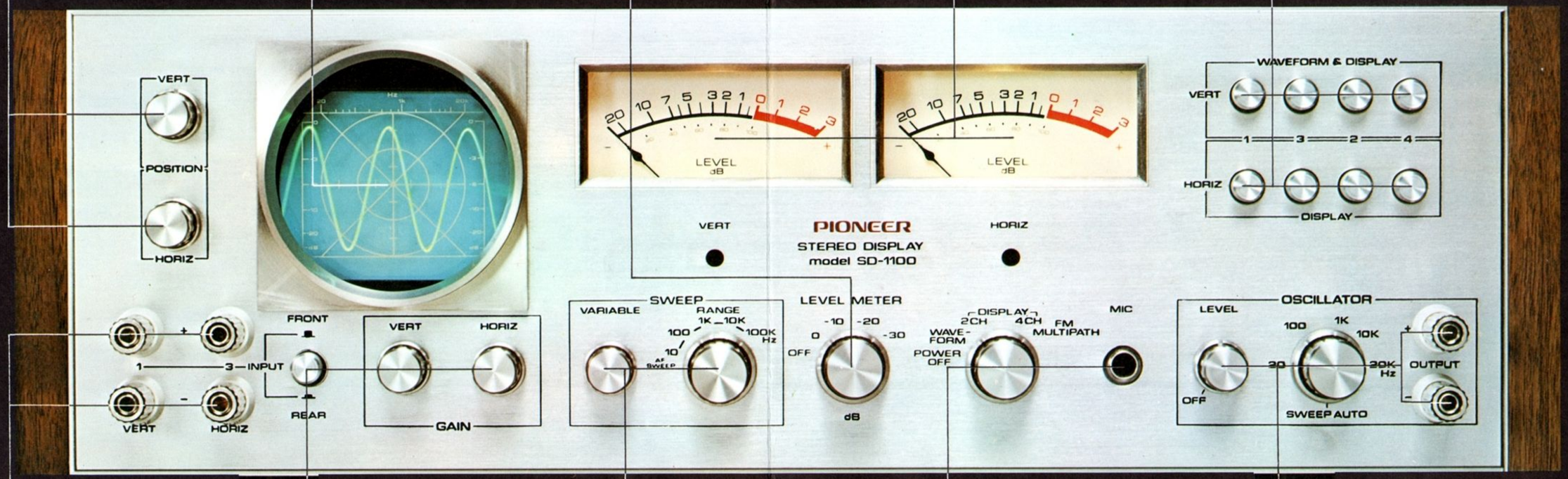



TOP VIEW: ① CATHODE-RAY TUBE ② VERTICAL AMP. SECTION ③ HORIZONTAL AMP. SECTION ④ AUDIO OSCILLATOR SECTION ⑤ SPOT KILLER & POWER SUPPLY CIRCUIT




BOTTOM VIEW: ⑥ 4-CH. DISPLAY AMP. SECTION ⑦ MICROPHONE AMP. SECTION ⑧ METER AMP. SECTION ⑨ POWER SUPPLY UNIT

# SD-1100 STEREO DISPLAY FRONT PANEL FACILITIES




**1 VERTICAL POSITION KNOB:**
Turned clockwise, this knob moves the pattern on the cathode-ray tube screen upward. Turned counterclockwise, the knob moves the pattern downward.

**2 HORIZONTAL POSITION KNOB:**
Turned clockwise, the knob moves the pattern on the cathode-ray tube screen to the right. Turned counterclockwise, the pattern moves to the left.

**3 INPUT TERMINALS 1 (VERT):**
These high sensitivity input terminals for a vertical amplifier are used when a low level input signal is observed. Upper is for positive (+), lower is for negative (−) (ground).

**4 INPUT TERMINALS 2 (HORIZ):**
A high sensitivity input terminal for a horizontal amplifier. Other terminal is same as INPUT TERMINAL 1.

**5 CATHODE-RAY TUBE (CRT) SCREEN:**
All patterns, wave forms or stereo displays appear on this screen. Signal level may be read by scale from the amplitude of the wave form on the screen.

**6 FRONT-REAR SELECTOR SWITCH:**
Set this push-button switch to FRONT when the INPUT TERMINALS 1 or 2 are used; to REAR when the AUDIO INPUT TERMINALS on rear panel are used. When switch is depressed, it locks and is set to REAR. When depressed again, it is released and set to FRONT.

**7 VERTICAL GAIN KNOB:**
This knob, turned clockwise, permits increase of the vertical amplitude of the wave form on the cathode-ray tube screen.

**8 HORIZONTAL GAIN KNOB:**
This knob, turned clockwise, permits increase of horizontal amplitude of the wave form on the screen.

**9 SWEEP RANGE SWITCH AND SWEEP VARIABLE CONTROL KNOB:**
These are horizontal sweep frequency controls. Sweep frequency is selected, matched to visible wave form cycle. If vertical input frequency and horizontal sweep frequency are same, you will observe one cycle pattern. If sweep is lower than VERT input frequency CRT indicates number of cycle. Switch and knob are activated only when the FUNCTION SWITCH is set to WAVE FORM.

**10 LEVEL METER SELECTOR SWITCH:**
**OFF:** The LEVEL METERS will not function.
**-0:** When signal of 2V (rms) is applied to the INPUT TERMINALS "1" or "2", LEVEL METERS will indicate 0dB.
**-10:** When signal of 0.63V (-10dB to 2V) is applied to the INPUT TERMINALS "1" or "2", LEVEL METERS will indicate 0dB.
**-20:** When signal of 0.2V (-20dB to 2V) is applied to the INPUT TERMINALS "1" or "2", LEVEL METERS will indicate 0dB.
**-30:** When signal of 0.06V (-30dB to 2V) is applied to the INPUT TERMINALS "1" or "2", LEVEL METERS will indicate 0dB.

**11 LEVEL METERS:**
A direct reading of input levels for decibel units when measuring input signals through the AUDIO INPUT TERMINALS.
On the front panel, low level input terminals are provided. Low/high sensitivity selector is attached on the back panel for rear input terminals.

**12 FUNCTION SWITCH:**
**POWER OFF:** Turns power off.
**WAVEFORM:** For observing wave forms selected with the WAVE FORM & DISPLAY SELECTOR SWITCH.
**DISPLAY: (2CH., 4CH.)** For observing a Lissajous pattern selected with the WAVE FORM & DISPLAY SELECTOR SWITCH and the DISPLAY SWITCH.
**FM MULTIPATH:** For observing FM multipath reflection.

**13 MIC JACK:**
By connecting a quality microphone into this JACK, wave form of the sound picked up by the microphone can be observed. At the same time, the LEVEL METER (VERT) will be activated and will show sound level. When microphone is not used, it should be removed.

**14 WAVE FORM & DISPLAY SELECTOR SWITCHES (VERT):**
Switch numbers 1 to 4 correspond to the input terminal numbers. The switch corresponding to the input terminals in use should be depressed.

**15 DISPLAY SWITCHES (HORIZ):**
Switch numbers 1 to 4 correspond to the input terminal numbers. When you observe a Lissajous pattern on the screen, the switch corresponding to the input terminals in use should be depressed.

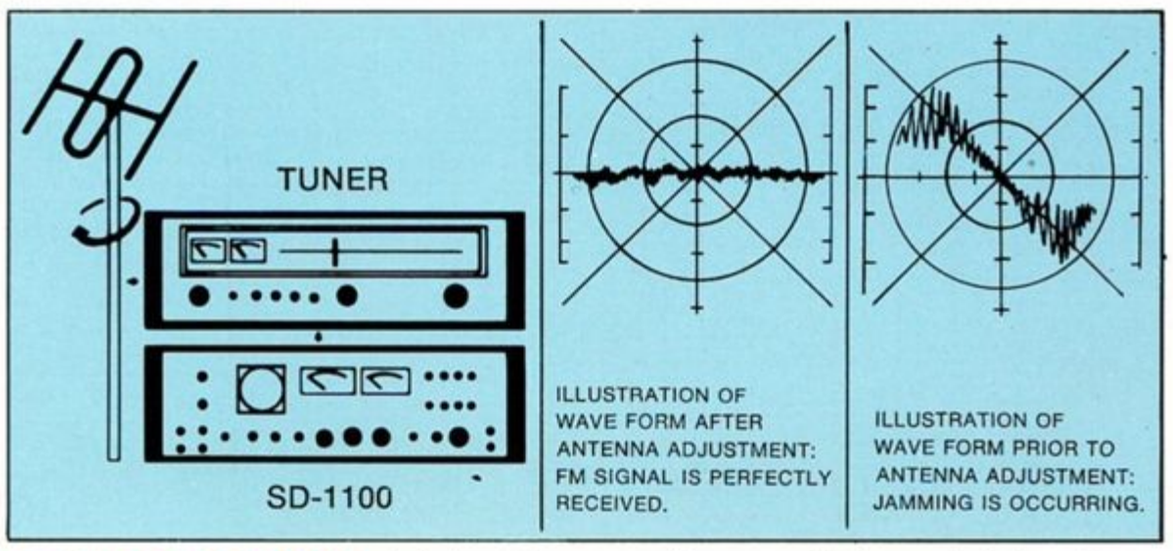
**16 OSCILLATOR OUTPUT TERMINALS:**
Terminals for the built-in audio oscillator. Upper terminal is for positive (+); lower terminal is for negative (−) (ground).

**17 OSCILLATOR FREQUENCY CONTROL KNOB:**
This knob selects any frequency from 20Hz to 20KHz. With the knob set to SWEEP AUTO, the oscillator will continuously sweep frequencies from 20Hz to 20KHz automatically at approximately 25 seconds per one sweep cycle.

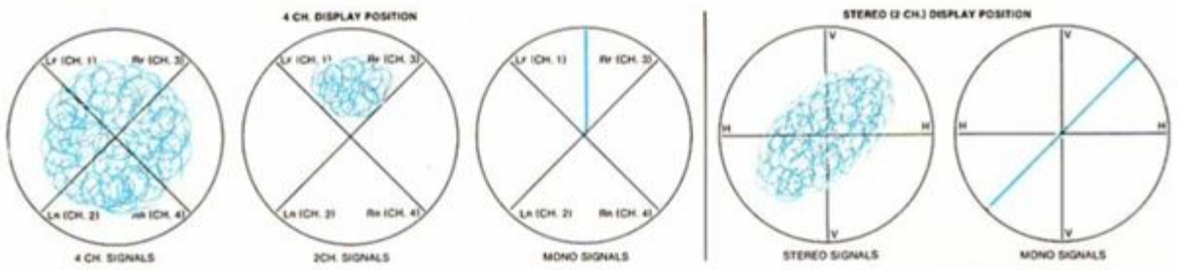
**18 OSCILLATOR LEVEL CONTROL KNOB:**
Turned clockwise, this knob increases oscillator output. With the knob turned off, the oscillator stops. When oscillator is not in use, the knob should be set to OFF.

## USES OF THE STEREO DISPLAY :

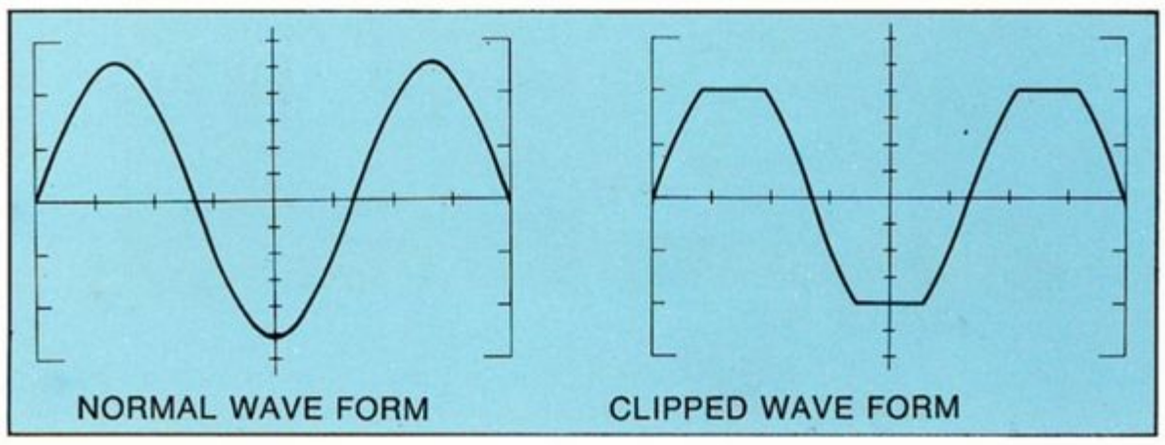
**FM MULTIPATH OBSERVATION** Jamming of original FM waves and reflection waves by high-rise buildings or other elevated structures is a main cause of distortion and deterioriation of FM stereo separation and signal-to-noise ratio. As one of the key features of the SD-1100 you will be able to determine the direction of the original FM waves and antenna direction and thus adjust your tuner for optimum reception of all FM stereo signals. This information is obtained by connecting the SD-1100's FM multipath terminal to your tuner's FM multipath terminal. The pattern that will appear on the cathode-ray tube of the Stereo Display will be a guide in determining FM antenna direction so that adjustments may be made for clarity of reception.

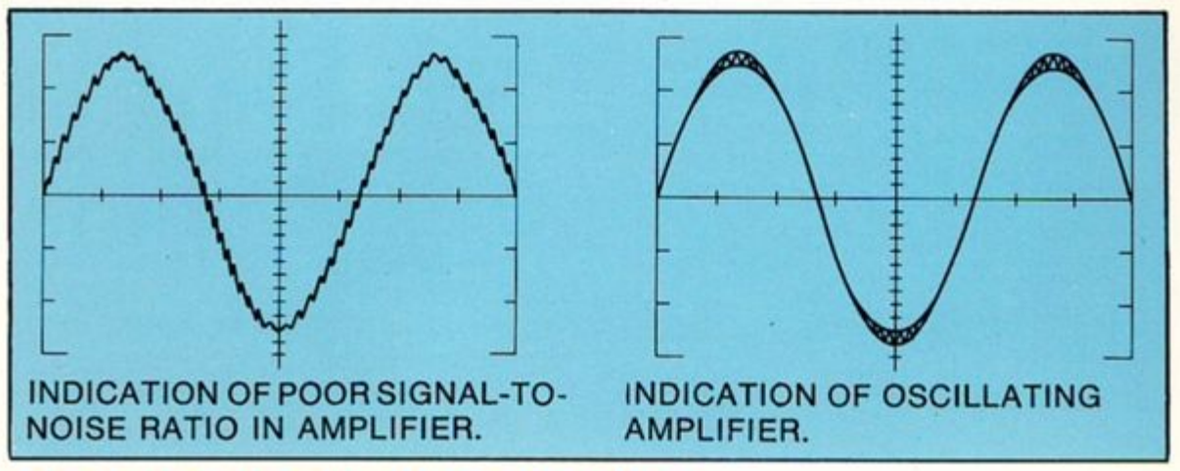



**STEREO DISPLAY** A Lissajous pattern will be obtained on the CRT screen when the four-channel signals are fed into the SD-1100 from your four-channel amplifier or receiver. This will allow you to observe simultaneous construction of four-channel stereo sounds as well as "sound" patterns for conventional stereo or mono signals, and peak levels. If your speaker system is connected to the output terminals of your stereo amplifier, you may view the stereo display while listening to music. By connecting the output terminals of your four speakers to the SD-1100, four channel stereo display is observed.




**OBSERVATION OF OUTPUT WAVE FORM** Wave forms of the amplifier output signal, or of music, may be observed when the signal from your amplifier is fed into the SD-1100. This observation may be made with the built-in oscillator by feeding the input of your amplifier into the CRT until perfectly-shaped wave forms appear on the screen. In this way, too, any performance malefactions of your amplifier will appear on the screen and allow you to instantly make corrections or modifications.



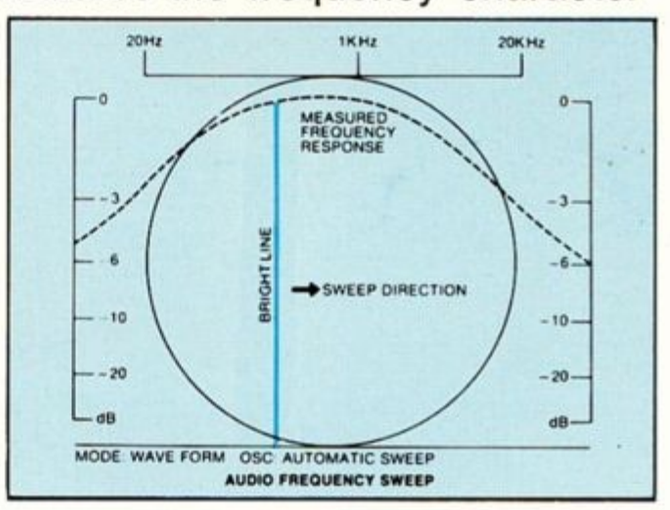

**OSCILLATING FREQUENCY CHECK** The oscillating frequency of the SD-1100 can be checked at each frequency from 20 to 20,000Hz with the use of either a calibrated audio oscillator or a test record or test tapethat has a signal of predetermined frequency recorded.

**STEREOPHONIC BALANCE AND ACOUSTIC CHARACTERISTICS** Stereo balance and room acoustic characteristics can be measured by connecting a quality microphone for measurement to the SD-1100. This test is also possible for multi-amplifier stereo units, enabling you to observe the frequency corresponding to each speaker.

**PHASE SHIFT ANGLE MEASUREMENT** The Lissajous pattern may be used to check the phase shift characteristics of a stereo receiver or amplifier. The pattern on the CRT screen will reflect the output and input signals of either a preamplifier or stereo amplifier.

**VOLTAGE AND POWER MEASUREMENT** Low level voltage and power may be measured by the SD-1100 by first calibrating the amplitude, then referring to the wave form that will appear on the CRT screen. To measure high level signals, the measuring signal can be directly fed to the Audio Input Terminals of the SD-1100 if that signal is from 0.63V to 20V or 50mW to 50W on an 8-ohm load.

**AUDIO FREQUENCY SWEEP FOR MEASURING THE FREQUENCY RESPONSE CURVE OF YOUR EQUIPMENT** With the Oscillator Frequency Control Knob set to "SWEEP AUTO", your oscillator's output terminals connected to the input of your equipment (amplifier, receiver, etc.), and the output terminals of the equipment fed into the input terminals of the SD-1100, it is possible to measure the frequency characteristics curve of your equipment (tone control characteristics, filter characteristics, etc). This measurement will be shown by reading the movement of the bright line on the screen as it moves from left to right (20—20,000Hz) within 25 seconds.




**CHECKING CARTRIDGE CHARACTERISTICS** Frequency response, trackability and channel separation of a cartridge can be checked by the SD-1100 by connecting a turntable to a standard preamplifier and the SD-1100, and then playing a test record with the cartridge to be checked. (A number of recommended test records are listed in the SD-1100's operation manual.)


## SPECIFICATIONS

### SEMICONDUCTORS

| | |
|---|---|
| FETs: | 7 |
| Transistors: | 68 |
| Diodes: | 50 |
| Cathode-ray Tube: | 3-inch (75mm) electrostatic deflection type |

### OSCILLOSCOPE SECTION

| | |
|---|---|
| Vertical and Horizontal Amplifier: | Deflection sensitivity;<br>20mV P-P/cm (Low level input),<br>200mV P-P/cm (High level input)<br>Frequency Response;<br>5 to 250,000Hz (within −3dB)<br>Input impedance; 190 kohms at 1KHz<br>Input capacitance; 100pF |
| Sweep Frequency Range: | 10 to 100,000Hz (4-range) |
| Synchronous Circuit: | Synchronous level; more than 1cm on scope<br>Synchronized system; internal |

### AUDIO OSCILLATOR SECTION

| | |
|---|---|
| Frequency Range: | 20 to 20,000Hz (automatic sweep, manual sweep ±10% or less) |
| Output Voltage: | 2V or more, variable continuously |
| Output Stability: | 20 to 20,000Hz ±1dB or less |
| Output Impedance: | 4.7 Kohms or less (at 1KHz) |
| Distortion: | 1% or less (at 100 to 10,000Hz)<br>2% or less (at 20 to 20,000Hz) |
| Sweep Time: | 25 seconds (from 20 to 20,000Hz) |

### 4-CHANNEL DISPLAY SECTION

Input:

FRONT; CH. 1 and CH. 3 / REAR; CH. 2 and CH. 4 } LOW; pin jack, HIGH; binding post

Input Sensitivity:

LOW; 15mV RMS / HIGH; 150mV RMS } 4-CH. DISPLAY VOLUME set at MAX.

LOW and HIGH; switchable

### AF SWEEP SECTION

| | |
|---|---|
| AF Sweep Frequency Response: | 20 to 20,000Hz ±1dB (1KHz; 0dB) |

### LEVEL METERS SECTION

| | |
|---|---|
| Reference Level: | 0dB; 2V (Low level), 20V (High level) |
| Input Sensitivity: | 0dB, −10dB, −20dB, −30dB |
| Response Time: | Within 0.3 second; necessary for indicating 0dB at 1KHz |
| Frequency Response: | 20 to 20,000Hz ±1dB |

### INPUT TERMINALS

| | |
|---|---|
| Front Panel: | VERT INPUT (CH. 1)<br>HORIZ INPUT (CH. 3)<br>MIC (monophonic); sensitivity, 0.2mV RMS/cm, impedance, 50 Kohms at 1KHz |
| Rear Panel: | CH. 1 INPUT / CH. 3 INPUT: LOW, pin jack; HIGH; binding post<br>CH. 2 INPUT / CH. 4 INPUT: LOW and HIGH; switchable<br>FM MULTIPATH; VERT and HORIZ |
| AF OSC OUTPUT | 2V (Max.) on the front panel |

### POWER SUPPLY SECTION

| | |
|---|---|
| Power Requirements and Frequency: | 110, 120, 130, 220, 240V, 50–60Hz |
| Power Consumption: | 25 watts (Max.) |
| Dimensions: | 16-15/16(W) x 5-7/16(H) x 13-11/16(D) inches<br>430(W) x 138(H) x 349(D)mm |
| Weight: | Without package; 19 lb. 13oz./9kg<br>With package; 26 lb. 3oz./11.9kg |
| Furnished Parts: | Connection cords with pin plug ... 4<br>Connection cords with banana tip ... 4<br>Polishing cloth ... 1<br>Operating instruction ... 1 |

**NOTE:** Specifications and design subject to possible modification without notice.

PIONEER®

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