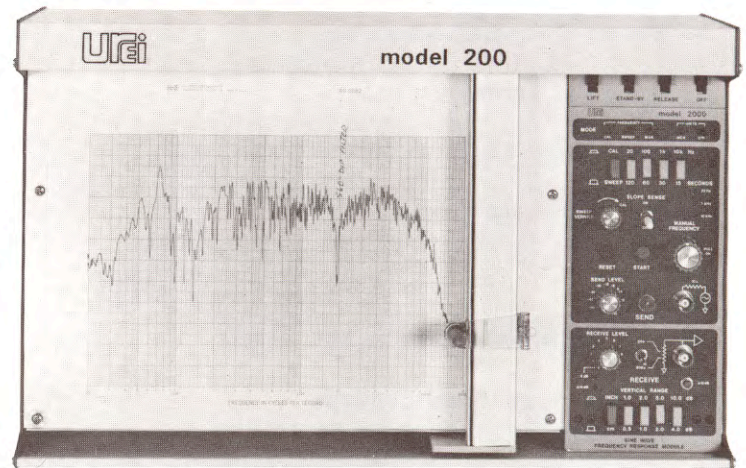


# AUTOMATIC RESPONSE PLOTTING SYSTEM

**MODEL  
200**  
(with 2000 plug-in module)

## APPLICATIONS:

- Equalizer and Filter Measurements.
- Tape Machine Response.
- Studio Maintenance.
- Sine Wave Loudspeaker & Microphone Response.
- Room Acoustics Analysis.
- Acoustic Transmission Measurements.
- Permanent Storage for EQ Settings.
- Telephone Line Measurements.



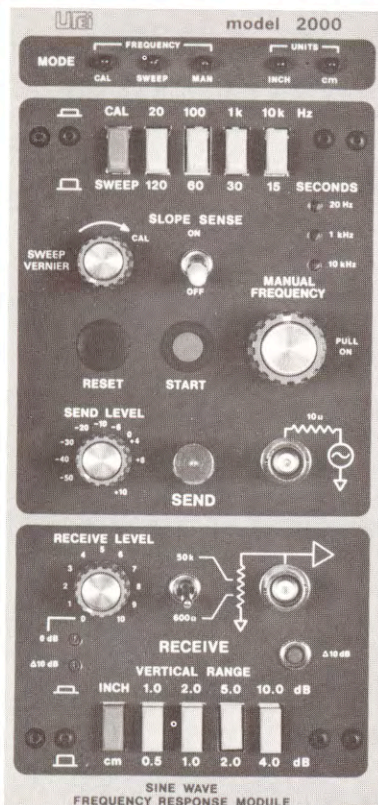
200 SYSTEM WITH PLUG-IN

The Model 200 frequency response plotting system is a result of the cooperative effort of UREI and the Hewlett-Packard Co. A basic Hewlett-Packard X-Y plotter is modified by UREI to accept our audio analysis plug-in modules.

The first module in what will become a series is an automatic sweep frequency generator and receiver (Model 2000) using state-of-the-art circuitry to achieve accuracy, resolution and dollar value previously unobtainable. With features and performance not available at twice the cost, the 200 system is well within the reach of any laboratory, audio manufacturer or studio.

An important feature of the Model 2000 plug-in is automatic rate sensing and control, which insures accurate tracing of steep amplitude excursions without the necessity of using very slow sweep rates. This circuitry automatically slows the sweep rate when rapid amplitude changes are encountered, resuming normal sweep rate following such excursions. In this way, unsuspected sharp dips or peaks in response are never missed or minimized.

The 200 system with 2000 plug-in module produces hard copy frequency response plots with 0.05 dB resolution and more than 60 dB dynamic range. Standard 3 cycle semi-log paper, K & E audio paper and DIN standard paper are easily accommodated. Vertical scaling can be changed from centimeters to inches with a front panel selector switch. Light emitting diodes indicate scaling units and system mode. Frequency may be manually adjusted with the plotter engaged to allow quick "dry runs" before committing to paper.



2000 PLUG-IN MODULE



**UNITED RECORDING ELECTRONICS INDUSTRIES**

8460 SAN FERNANDO RD., SUN VALLEY, CALIFORNIA 91352

(213) 767-1000

UREI SNVY TELEX 65-1389

MODEL  
200  
with 2000

## FEATURES:

- Low Cost.
- Plug-in Versatility.
- Hard Copy Readout.
- Simple Operation.
- Internal Calibration Standards.
- Metric and English Scaling.
- Sweeps from 15 Seconds to 20 Minutes.
- Automatic Sweep Speed Control.
- Automatic or Manual Frequency Control.
- Electrostatic Paper Holddown.
- Automatic Pen Drop and Lift.
- Rack Mount or Desk Top.
- Uses Standard Felt Tip Pens.
- 0.05 dB Resolution.
- 64 dB Dynamic Range.
- 20 — 20,000 Hz Sweep Range.

## SPECIFICATIONS — 200 MAIN FRAME

### GENERAL:

<b>Front Panel Controls</b>	:	Power on/off, servo standby, chart hold, and pen lift switch.
<b>Writing System</b>	:	Disposable pens and a universal pen holder to hold most fiber tip pens.
<b>Platen Size</b>	:	Holds 8½ x 11 in. or DIN A4 size chart paper.
<b>Dimensions</b>	:	10 15/32 in. high, 17 - 1/16 in. wide, 5 - 5/16 in. deep (226 x 437 x 135mm). Provided with rack mounting kit for 19-inch or DIN size rack.
<b>Power</b>	:	Switch selectable for 100, 115, 200, 230, VAC, 47.5-440 Hz. Power consumption 70W maximum.
<b>Weight</b>	:	Net 16 lb. (7.2 kg); shipping, 22 lb. (10 kg).

### PERFORMANCE SPECIFICATIONS:

<b>Input Ranges</b>	:	Vertical range 1 V/inch, horizontal range 0.1 V/inch.
<b>Type of Input</b>	:	Connectors to accept UREI plug-in modules.
<b>Accuracy</b>	:	±0.3% of full scale at 25°C (includes linearity and deadband). Temperature coefficient ±0.02%/°C.
<b>Deadband</b>	:	0.2% of full scale.
<b>Overshoot</b>	:	2% full scale maximum.
<b>Slewing Speed</b>	:	20 in./sec. (50 cm/sec) minimum.
<b>Peak Acceleration</b>	:	X-axis, 500 in./sec <sup>2</sup> (1270 cm/sec <sup>2</sup> ) minimum. Y-axis, 1000 in./sec <sup>2</sup> (2540 cm/sec <sup>2</sup> ) minimum.
<b>Zero Conditions</b>	:	Resolution — pen positioned within ±0.005 inch of any point on chart. Zero drift — pen will not move more than 0.1 in/day (2.5 mm/day) independent of temperature.
<b>Environmental Conditions</b>	:	+10°C to +40°C, 0 to 80% relative humidity.

# TECHNICAL SPECIFICATIONS

## 2000 FREQUENCY RESPONSE PLUG-IN

### ELECTRICAL

(Send Signal Section):

<b>SIGNAL</b>	:	Sine Wave.
<b>FREQUENCY RANGE:</b>	:	20 Hz to 20 kHz.
<b>SIGNAL LEVEL</b>	:	-50 dBm to +14 dBm.
<b>DISTORTION</b>	:	<0.5% THD at + 10 dBm, 1 kHz.
<b>OUTPUT IMPEDANCE</b>	:	10 ohms resistive.
<b>OUTPUT FLATNESS</b>	:	20 Hz to 20 kHz, $\pm 0.05$ dB.
<b>CALIBRATED DISCRETE FREQUENCIES</b>	:	20 Hz, 100 Hz, 1 kHz, 10 kHz; $\pm 1\%$ .
<b>CALIBRATION STABILITY</b>	:	$\pm 0.25\%$ /24 hours (after warm-up).
<b>FREQUENCY CONTROL</b>	:	Automatic Sweep or manually selected.
<b>SWEEP TIME</b>	:	15 sec, 30 sec, 1 min, 2 min; 20 Hz to 20 kHz.
<b>SWEEP VERNIER</b>	:	Continuously variable up to 10 times the selected sweep time.
<b>START-RESET</b>	:	Pushbutton controls.
<b>SLOPE SENSE</b>	:	Automatically adjusts sweep speed depending on vertical slope of response curve.

(Receive Section):

<b>SENSITIVITY</b>	:	50 mV for 0 dB reference at center of Y-axis.
<b>INPUT IMPEDANCE</b>	:	50 kohm or 600 ohm switch selectable.
<b>INPUT ATTENUATOR RANGE</b>	:	>60 dB, continuously variable.
<b>DYNAMIC RANGE</b>	:	64 dB (displayed).
<b>VERTICAL RANGE</b>	:	1 dB, 2 dB, 5 dB, 10 dB/INCH metric 0.5 dB, 1 dB, 2 dB, 4 dB/cm.
<b>VERTICAL RANGE CHECK</b>	:	$\Delta$ 10 dB, calibrated to $\pm 0.1$ dB.
<b>PEN LIFT</b>	:	Automatic at frequencies < 20 Hz and > 20 kHz, automatic retrace blanking.

# TECHNICAL SPECIFICATIONS

## 2000 FREQUENCY RESPONSE PLUG-IN

(Continued)

### CONTROLS

<b>SEND-RECEIVE SIGNAL</b>	:	BNC-connectors.
<b>PEN SWITCH</b>	:	A two-position slide switch controls the lowering and raising of the pen.
<b>SERVO SWITCH</b>	:	A two position slide switch controls the servo actuation for both axes.
<b>CHART SWITCH</b>	:	A two position slide switch, RELEASE and HOLD, controls the chart holding function of the Autogrip table (electrostatic).
<b>LINE SWITCH</b>	:	A two-position slide switch applies the line voltage to the recorder.
<b>CAL-SWEEP</b>	:	Push-push button selecting either SWEEP function or CALIBRATION mode.
<b>4 PUSHBUTTONS</b>	:	Interlocked to select calibrated frequencies or calibrated sweep times.
<b>SWEEP VERNIER</b>	:	Continuous control extends the selected sweep time up to 10 times.
<b>MANUAL FREQUENCY</b>	:	When pulled this control selects any frequency from 20 Hz to 20 kHz.
<b>SLOPE SENSE</b>	:	Toggle switch that controls the automatic sweep speed circuit.
<b>RESET</b>	:	Momentary push-button returns the servo mechanism to left starting position and resets oscillator to $< 20$ Hz.
<b>START</b>	:	Momentary push-button starts frequency sweep.
<b>SEND LEVEL</b>	:	Adjusts level of send signal.
<b>RECEIVE LEVEL</b>	:	Adjusts input sensitivity.
<b>50k/600 ohm</b>	:	Toggle switch to select input load impedance.
<b><math>\Delta</math> 10 dB</b>	:	Momentary push-button to change the input sensitivity 10 dB to check receive range calibration.
<b>inch/cm</b>	:	Push-button to select inch or metric vertical scaling.
<b>VERTICAL RANGE</b>	:	4 interlocked pushbuttons to select calibrated vertical ranges.