

TECHNICAL BULLETIN

**CALIBRATION PROCEDURE
FOR
OSCILLOSCOPE, HEWLETT-PACKARD
MODELS 175A, HO-175A, AND H12-175A
(AN/USM-186 AND OS-157/U)
(AN/USM-215 AND OS-170/USM-215)
VERTICAL AMPLIFIER
MODELS 1750A, 1750B, (AM-4031A/U) 1752A, AND 1754A; AND
DELAY GENERATOR MODELS 1781A AND 1781B;
SWEEP GENERATOR SG-988/U**

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HEADQUARTERS
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GENERATOR MODELS 1781A AND 1781B;
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SECTION I

INTRODUCTION AND DESCRIPTION

1. Purpose and Scope. This bulletin provides information for the periodic calibration of Oscilloscope, Hewlett-Packard Models 175A and H12-175A (AN/USM-186 and OS-157/U); Vertical Amplifier Models 1750A, 1750B, 1752A and 1754A; and Delay Generator Models 1781A and 1781B. It is to be used by personnel trained and qualified in the use of calibration equipment.

2. Reporting of Technical Bulletin Improvements.

The reporting of errors, omissions, and recommendations for improving this bulletin is authorized and encourages. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-Q, Fort Monmouth, NJ 07003.

3. Descriptive Data. a. Identification

(1) Oscilloscope:

Nomenclature -----OSCILLOSCOPE
 Military designation -----AN/USM-186 and OS-157/U
 Manufacturer -----Hewlett-Packard Co.
 Model numbers -----175A and H12-175A
 Reference -----Manufacturer's instruction manual.

(2) Vertical amplifier:

Nomenclature -----VERTICAL AMPLIFIER
 Manufacturer -----Hewlett-Packard Co.
 Model numbers -----1750A, 1750B, 1752A, and 1754A.
 Reference -----Manufacturer's instruction manual.

(3) Delay generator:

Nomenclature -----DELAY GENERATOR
 Manufacturer -----Hewlett-Packard Co.
 Model numbers -----1781A and 1781B
 Reference -----Manufacturer's instruction manual.

b. Specifications

(1) Oscilloscope:

Power requirements-----115 or 230 vac, $\pm 10\%$, 50 to 60 Hz, approx 425 w.
 Internal sweep -----24 ranges, 0.1 $\mu\text{sec/cm}$ to 5 sec/cm, $\pm 3\%$. Continuous vernier adjustment to 12.5 sec/cm.
 Sweep magnification -----X10, $\pm 5\%$
 Triggering:
 Internal-----Vertical input signal (from 2 mm at 1 MHz or below to approx 2 cm at 50 MHz).

External-----0.5 v pp or more, direct or capacitive coupling.

Triggering point:

Internal-----Any level of positive or negative going signal displayed on graticule.
 External-----Any level of positive or negative going signal between -5 and +5v.

Horizontal band-

width-----Dc to 500 kHz

Horizontal sensi-

tivity -----2 ranges, 0.1 v/cm and 1 v/cm.
 Continuous vernier adjustment to 10 v/cm.

Horizontal input

impedance* -----1 megohm shunted by 30 pf

Vertical bandwidth---Dc to greater than 50 MHz (less than 7 nsec rise time).

Internal calibrator:

Signal-----Approx 1 kHz square wave
 Voltage-----2 ranges, 1 v and 10 v pp. $\pm 1\%$.

(2) Vertical amplifier, Models 1750A and 1754A:**

Sensitivity each channel:

Range -----0.05 to 20 v/cm in nine calibrated ranges. Vernier extends range to 50 v/cm and provides continuous control between ranges.

Accuracy----- $\pm 3\%$

Band pass-----Dc coupled, dc to 40 MHz; ac coupled, 2 Hz to 40 MHz.

Rise time-----9 nsec or less

(3) Vertical amplifier, Model 1750B:

Sensitivity each channel:

Range -----0.05 to 20 v/cm in nine calibrated ranges. Vernier extends range to 50 v/cm and provides continuous control between ranges.

Accuracy----- $\pm 3\%$

Band pass - Dc to at least 50 MHz

Rise time-----8 nsec or less

B trigger output -----Will trigger Model 175A oscilloscope sweep with approx 0.5-cm on crt when connected to Model 175A external trigger input.