TM 11-6625-2482-14

TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, AND
GENERAL SUPPORT MAINTENANCE MANUAL
(INCLUDING DEPOT REPAIR PARTS AND SPECIAL TOOLS LIST)

HEWLETT-PACKARD OSCILLOSCOPE 141A AND DUAL TRACE AMPLIFIER 1402A (AN/USM-320(V)1)

HEADQUARTERS, DEPARTMENT OF THE ARMY
JUNE 1973

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HEWLETT-PACKARD OSCILLOSCOPE 141A AND DUAL TRACE AMPLIFIER 1402A (AN/USM-320(V)1)
(NSN 6625-00-181-1956)

This technical manual is an authentication of the manufacturer's commercial literature and does not conform with the format and content specified in AR-319-3, Military Publications. This technical manual does, however, contain available information that is essential to the operation and maintenance of the equipment.

LIST OF ILLUSTRATIONS

LIST OF ILLUSTRATIONS (Cont.)

LIST OF TABLES

Table 1-1. Specifications

PLUG-INS:

Accepts all Model 1400-series plug-ins; upper compartment for horizontal axis and lower compartment for vertical axis. Center shield may be removed to provide a double-sized compartment for a single dual-axis Model 1400-series unit.

CATHODE-RAY TUBE:

Type:

Post-accelerator storage tube; 7300 v accelerating potential; aluminiz d P31 phosphor; etched safety glass face plate reduces glare.

Graticule:

10 x 10 divisions (approx. 9.4 x 9.4 cm), parallax-free internal graticule; 5 subdivisions per major division on major horizontal and vertical axes, and on second and tenth horizontal graticule lines.

Intensity Modulation:

ac coupled, +20 volt pulse will blank trace of normal intensity; input terminals on rear panel.

Warranty:

CRT specifications (persistence, writing rate, brightness, storage time) warranted for one year.

PERSISTENCE:

Normal :

Natural persistence of P31 phosphor (about 40 u sec).

Variable :

NORMAL Writing Rate Mode: Continuously variable from less than 0.2 second to more than one minute (typically to two or three minutes).

MAX W riting Ra ite Mode: Typically varible from 0.2 second to 15 seconds.

ERASE

Manual; erasure takes approximately 200 msec. scope ready to record immediately after erasure (see options for remote erase).

WRITING RATE:

Conventional operation (using an hp 197A camera with f/1 .9 lens and Polaroid 3000 speed film): 100 cm/u sec.

Storage:

NORMAL Mode: greater than 20 cm/ms.
MAX Mode: greater than 1 cm/u sec.

STORAGE TIME:

	NORMAL Writing Rate Mode	MAX Writing Rate Mode
STORE Mode (dim display)	longer than 1 hour	typically 15 minutes
VIEW Mode (bright display)	longer than 1 minute (typically 2 or 3 minutes)	typically 15 seconds

Brightness:

Greater than 100 foot-lamberts in NORMAL or VIEW; typically 5 foot-lamberts in STORE.

CALIBRATOR:

Type:

Line-frequency rectangular signal, approximately 0.5 μsec rise time.

Voltage:

Two outputs: 1 volt and 10 volts pk-pk ±1% from 15° C to 35° C, ±3% from 0° C to 55° C.

BEAM FINDER:

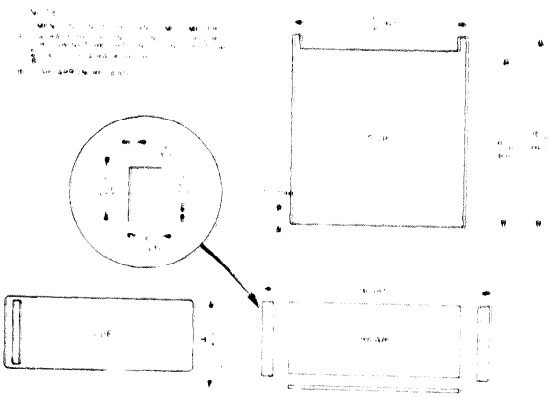
Pressing BEAM FINDER control brings trace on screen regardless of setting of horizontal, or vertical position controls.

GENERAL:

Power Requirements:

115 or 230 volts, ±10%, 50 to 60 Hz, normally less than 285 watts (varies with plug-in units).

Dimensions:



Weight:

Net, 40 lbs. (18 kg) (without plug-ins).
Shipping, 51 lbs. (23 kg).

OPTIONS: (Specify by option number.)

09: Remote erase. BNC input on rear panel: shorting to ground for at least 50 msec erases screen, with oscilloscope ready for use 200 msec after ground is removed; input draws 20 ma from ground through a 600-ohm impedance to a -12 volt supply.

CHAPTER 1
HEWLETT-PACKARD OSCILLOSCOPE 141A

Section I. INTRODUCTION

1-A.1. SCOPE

This manual describes Hewlett-Packard Oscilloscope 141A with serial numbers prefixed 832- and 844-, and Dual Trace Amplifier 1402A with serial numbers prefixed 709- and 716-. It covers their operation, organizational, and direct and general support. Refer to TM 11-6625-2390-15 for information on Sweep Generator 1421A.

1-A.2. INDEXES OF PUBLICATIONS

a. Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to this equipment.

b. Refer to the latest issue of DA Pam 310-7 to determine if there are current, applicable modification work orders (MWO's) pertaining to this equipment.

1-A.3. FORMS AND RECORDS

a. Reports of' Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Packaging Improvement Report) as prescribed in AR 700-58/NAVSUPINST 4030.29/AFR 71-13/MCO P4030.29A, and DLAR 4145.8.

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward. Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38 NAVSUPINST 4610.33B/AFR 75-18/MCO P4610.19C and DLAR 4500.15.

1-A.3.1. REPORTING OF ERRORS

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms), and forwarded direct to Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-MA-Q, Fort Monmouth, NJ 07703.

1-A.3.2. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

EIR's will be prepared using DA Form 2407, (Maintenance Request). Instructions for preparing EIR's are provided in TM 38-750, the Army Maintenance Management System. EIR's should be mailed direct to Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-MA-Q, Fort Monmouth, NJ 07703. A reply will be furnished direct to you.

1-A.3.3. ADMINISTRATIVE STORAGE

There are no administrative storage instructions for this equipment.

1-A.3.4. DESTRUCTION OF ARMY MATERIEL

Destruction of Army materiel to prevent enemy use shall be as prescribed in TM 750-244-2.

1-A.4. ITEMS COMPRISING AN OPERABLE EQUIPMENT.

NSN	Item	Quantity	Dimensions (in.)			Weight (lbs)
			Height	Depth	Width	
6625-00-181-1956	Oscilloscope AN/USM-320(V)1	1	9	18-3/8	16-3/4	40
6625-00-181-1957	Hewlett-Packard Oscilloscope 141A	1	9	18-3/8	16-3/4	40
6625-00-249-4432	Hewlett-Packard Dual Trace Amplifier 1402A (PL1244/U)	1	4.062	13.5	8.812	6
6625-00-930-8119	Hewlett-Packard Sweep Generator 1421A (PL1245/U)	1	4.062	13.5	8.812	6

1-1. DESCRIPTION.

The hp Model 141A, Figure 1-1, is a conventional, general purpose Oscilloscope with the added features of variable persistence (duration of trace afterglow) and storage of CRT displays. Persistence is variable from 0.2 to more than 60 seconds; a display may be stored (at reduced intensity) for more than 1 hour or displayed at normal intensity for up to 1 minute. Stored displays can be erased in 100 milliseconds.

Variable persistence is especially useful for viewing slow-sweep signals. The persistence of the signals from electrocardiograms or other bio-chemical phenomena can be adjusted to provide a complete trace, yet to fade fast enough to prevent interference with the next trace. Display persistence of swept frequency and time domain reflectometry measurement readouts can be adjusted to eliminate flicker and still provide high resolution.

The storage feature of the Model 141A can be used to store single-shot waveforms and to later view or photograph the phenomena. Comparison of waveforms can be accomplished by storing several displays separately and then viewing them simultaneously.

The Model 141A accepts all hp Model 1400-series plug-in units. Amplifiers with bandwidths up to 20 MHz and sensitivities to 10 microvolts per centimeter are available as well as time domain reflectometry and swept frequency indicator units. Complete specifications for the Model 141A Oscilloscope are given in Table 1-1.

1-2. CATHODE RAY TUBE.

The Model 141A uses an internal graticule, P31 aluminized phosphor CRT with additional internal elements to provide the variable persistence and storage features. The tube is equipped with a nonglare safety face plate and the internal graticule eliminates parallax error in observing the display.

1-3. ASSOCIATED EQUIPMENT.

The Model 141A is normally operated

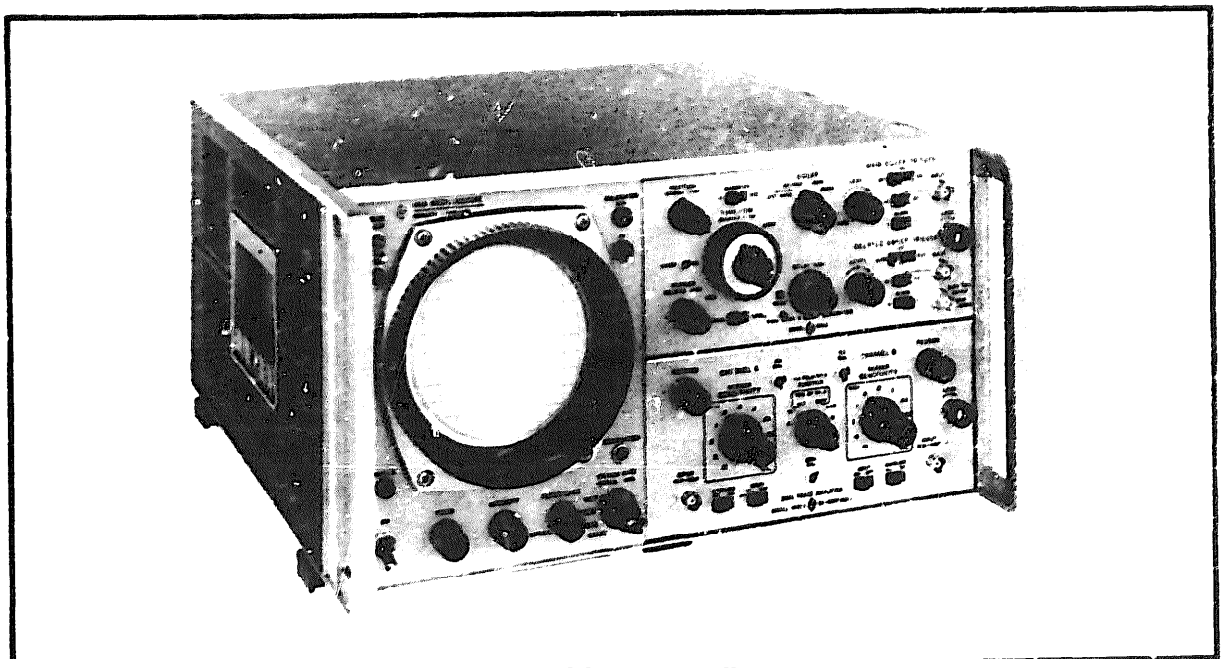


Figure 1-1. Model 141A Oscilloscope