DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL

DS, GS, AND DEPOT MAINTENANCE MANUAL

OSCILLOSCOPE AN/USM-182A

This copy is a reprint which includes current pages from Change 1.

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Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual OSCILLOSCOPE AN/USM-182A

Section A.		INTRODUCTION	1-A1
	1.	CHARACTERISTICS	1-1.1
	2.	OPERATING INSTRUCTIONS	2-1
	3.	APPLICATIONS	3-1
	4.	CIRCUIT DESCRIPTION	4-1
	5.	MAINTENANCE	5-1
	6.	CALIBRATION PROCEDURE	6-1
		Abbreviations and Symbols	
		Parts Ordering Information	
	7.	ELECTRICAL PARTS LIST	7-1
	8.	MECHANICAL PARTS LIST	8-1
	9.	DIAGRAMS	
APPENDIX	A.	REFERENCES	A-1
	B.	BASIC ISSUE ITEMS LIST (BIIL) AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST (ITIAL) (Not applicable)	
	C	MAINTENANCE ALLOCATION	C-1

Change 1 I

SECTION A
INTRODUCTION

A-1. Scope

a. This manual contains instructions for operator's, organizational, direct support, general support, and depot maintenance for Oscilloscope AN/USM-182A. It includes operation, maintenance, and calibration of the equipment. Textronix Type 535A Oscilloscope, nomenclature as Oscilloscope AN/USM-182A, is referred to as Type 535A Oscilloscope in this manual.

b. The maintenance allocation chart (MAC) appears in appendix C.

NOTE

Appendix C is current as of 9 September 1968.

c. To order this technical manual requisition through pinpoint account number if assigned; otherwise, through nearest Adjutant General facilities.

A-2. Indexes of Publications

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

b. DA Pam 310-7. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

A-3. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with instructions given in TM 38-750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700-58/NAVSUP PUB 378/AFR 71-4/MCO P4030.29, and DSAR 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 4610.33/AFM 75-18/MCO P4610.19A, and DSAR 4500.15.

A-4. Reporting of Errors

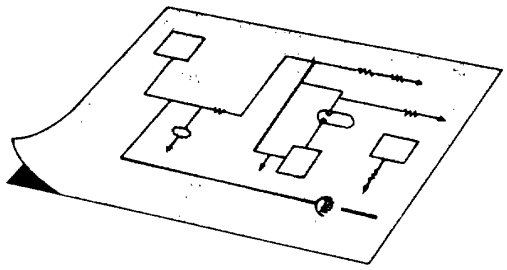
Report of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded direct to Commander, US Army Electronics Command ATTN: AMSEL-MA-C, Fort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

A-5. Items Comprising an Operable Equipment

FSN	QTY	Nomenclature, part No., mfr code	Fig. No.
6625-133-1196		Oscilloscope AN/USM-192A Consisting of:	
6625-738-6751	2	Lead Test CX-11982/U (3 ft 11 in.)	8-8
6625-832-9487	1	Lead Electrical CX-11983/U (1 ft 6 in.)	8-5
6625-832-9488	1	Lead Electrical CX-11984/U (1 ft 6 in.)	8-3
5935-087-3844	1	Adapter, Connector UG 1858/U	8-7
5935-087-9148	1	Adapter, Connector 103-0013-00; 80009	8-2
6150-133-1198	1	Cable Assembly, Power, Electrical CX-9067A/U (8 ft)	8-1
6625-168-0175	1	Filter, Light, Cathode-Ray Tube: 378-05674-0: 80009	8-9
6625-133-1197	1	Oscilloscope OS-155A/USM-182	

Note

The part number is followed by the applicable 5-digit Federal supply code for manufactures (FSCM) identified in SB 708-42 and used to identify manufacturer, distributor, or Government agency, etc.



SECTION 1

CHARACTERISTICS

General Information

The Type 535A Oscilloscope is a wide-range general-purpose laboratory instrument providing accurate measurements in the dc to 15 mc range. The Type 535A can be operated with any Tektronix letter-series plug-in to satisfy the requirements for virtually any application.
Special circuits incorporated in the Type 535A Oscilloscope permit an accurate, continuously variable delay in the presentation of the sweep from 1 microsecond to 10 seconds after receipt of a triggering impulse. This feature permits observation of a small portion of the normal sweep, accurate measurement of waveform jitter, precise time measurements, as well as many other uses.

Vertical-Deflection System
All specifications for the Vertical-Deflection System of the Type 535A depend upon the plug-in unit used with the instrument. The following specifications are given assuming that a Type K Plug-In Unit is used.

Bandpass	DC to 15 mc (≤3-db down at 15 mc)
Risetime	≤0.024 microseconds

Triggering Modes
Time Base A--Automatic, AC, DC, AC Low Frequency Reject, and High Frequency Sync.

Time Base B--Automatic, AC, and DC.

Triggering Signal Requirements
Internal triggering -- a signal producing 2 millimeters of vertical deflection except 4 millimeters is required in the DC mode.
External triggering -- a signal of 0.2 volts to 10 volts. Sweep will trigger on larger signals, but TRIGGERING LEVEL control operates over a +10 volt range.
High Frequency Sync.--Assures a stable display of sine wave signals to approximately 30 mc. Requires a signal producing 2 centimeters of vertical deflection or an external signal of more than 2 volts.

Sweep Rates

Time Base A--0.1 microseconds to 5 seconds per centimeter in 24 accurately calibrated steps. An uncalibrated control permits sweep rates to be varied continuously between 0.1 microseconds and approximately 12 seconds per centimeter. Calibrated sweep rates are typically within 1 %, and in all cases within 3%, of the indicated sweep rate.

Time Base B--2 microseconds to 1 second per centimeter in 18 accurately calibrated steps. Sweep rates are typically within 1%, and in all cases within 3%, of the indicated sweep rate.

Magnifier
Provides a 5-times magnification of the center 2-centimeter portion of the oscilloscope display. Extends the fastest Time Base A sweep rate to 0.02 microseconds per centimeter and the fastest Time Base B sweep rate to 0.4 microseconds per centimeter.

External Horizontal Input
Deflection factor -- approximately 0.2 to 20 volts per centimeter, continuously variable.

Frequency response -- from dc to 350 kHz. Response down 3 db at 350 kHz.

Delayed Sweep
Sweep delay continuously variable from 1 microsecond to 10 seconds. Actual delay steps (between 1.00 and 10.00) are within 1% of the indicated delay from 2 µsec/cm to 0.1 sec/ cm; within 3% from 0.2sec/cm to 1 sec/cm. Incremental delay accuracy is within 1% -4 minor divisions.

Time jitter-1 part in 20,000.

Cathode-Ray Tube
T533P2
Phosphors-Type P2 phosphor normally supplied; P1, P7, and P11 phosphors optional. Other phosphors available on special order.

Unblanking -- dc coupled.
Accelerating potential -- 10,000 volts.
Usable viewing area: -- 6 by 10 centimeters.

Characteristic-Type 535A

Graticule

Illumination-variable edge lighting.

Marked in 6 vertical and 10 horizontal 1-centimeter divisions with 2-millimeter markings on the centerlines.

Amplitude Calibrator

Waveform-square-waves at approximately 1,000 cycles.

Output voltage -- 0.2 millivolts peak-to-peak to 100 volts peak-to-peak in 18 steps.
Accuracy -- peak-to-peak amplitude of square-waves within 3% of indicated voltage.

Power Supplies

Electronically regulated for stable operation with widely varying line voltages and loads.

Line voltage requirements-108, 115, 122, 216, 230 or 244 volts (±9% on each range).

Power – approximately 500 watts with a Type CA Plug-In Unit installed.

Line frequency-50 to 60 cycles.

Output Waveforms Available

Delayed trigger pulse -- approximately 5 volts in amplitude, occurring at the end of the delay period.

Positive Gate B -- approximately 20 volts peak-to-peak with some duration as sweep B Positive Gate A-approximately 20 volts peak-to-peak with same duration as sweep A.

Sawtooth A -- sweep A sawtooth waveform, approximately 130 volts peak.

Vertical signal output -- output from vertical deflection system.

Approximately 1.5 volts peak-to-peak per centimeter of vertical deflection.

Ventilation

Forced filtered air. Thermal relay interrupts instrument power in the event of overheating.

Construction

Aluminum-alloy chassis and three-piece cabinet. Anodized panel, blue wrinkle-finished cabinet.

Dimensions -- see Figure 1-2.

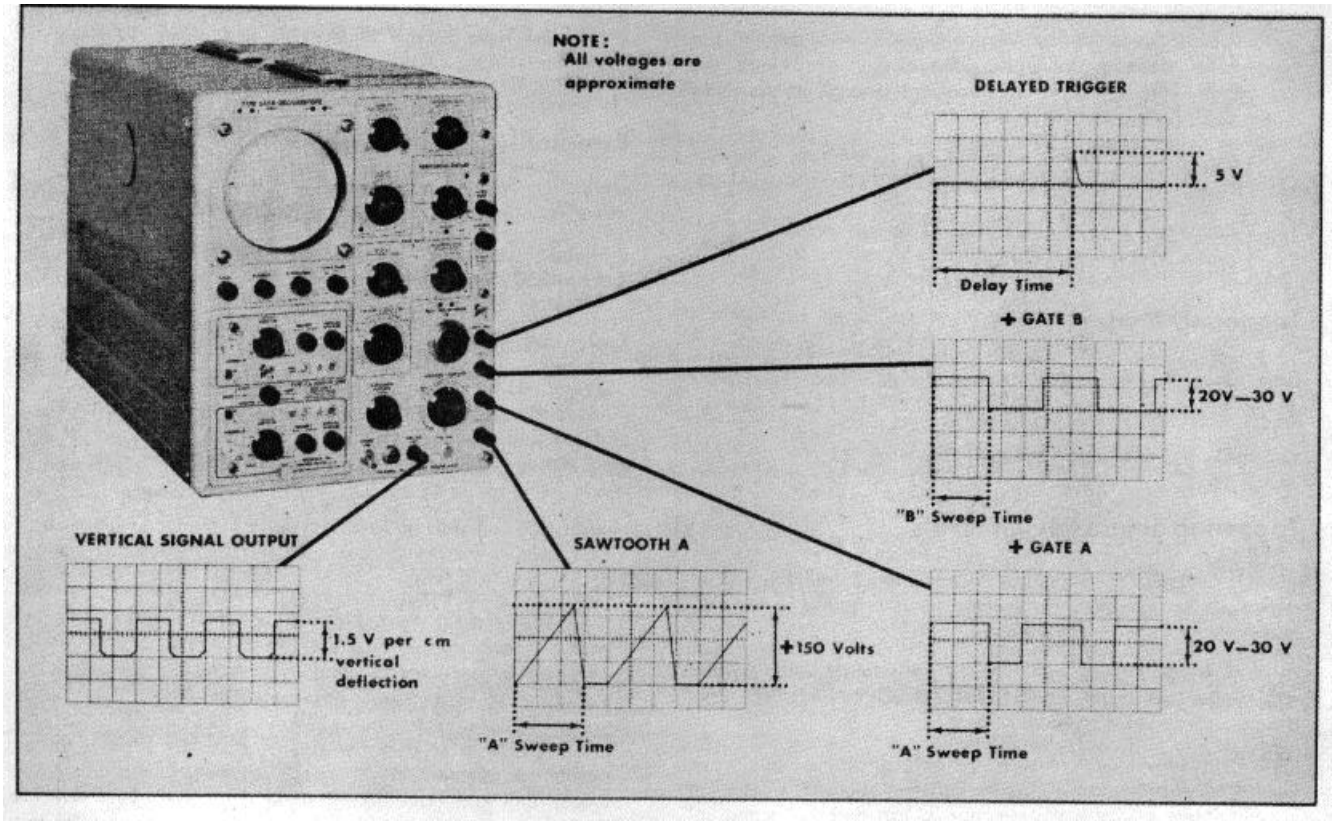


Fig. 1-1. Output waveforms available at the oscilloscope front panel.