

TECHNICAL MANUAL
OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT,
AND GENERAL SUPPORT
MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS)

FOR

OSCILLOSCOPE, TEKTRONIX, MODEL 212
NSN 6625-01-061-5519

MULTIPLE LAUNCH ROCKET SYSTEM

DEPARTMENT OF THE ARMY

JUNE 1984

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HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 8 June 1984

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TABLE OF CONTENTS

			Page
		LIST OF ILLUSTRATIONS.....	iii
SECTION	0.	GENERAL INFORMATION	0-1
		Scope.....	0-1
		Indexes of publications	0-1
SECTION	1.	INTRODUCTION	1-1
		Option information	1-4
		Accessories	1-5
		Manual change information	1-6
		Calibration test equipment replacement	1-7
SECTION	2.	FUNCTIONS OF CONTROLS AND CONNECTORS	2-1
SECTION	3.	PREVENTIVE MAINTENANCE	3-1
		Disassembly instructions	3-1
		Cleaning.....	3-1
		Visual inspection.....	3-1
		Semiconductor checks	3-2
		Recalibration.....	3-2

This manual is, in part, authenticated manufacturer's commercial literature. A Maintenance Allocation Chart and Recommended Spare Parts List has been added to supplement the commercial literature. The format of this manual has not been structured to consider levels of maintenance.

SECTION	4.	CALIBRATION	4-1
		Test equipment required	4-1
		Preliminary procedure.....	4-3
		Preliminary control settings.....	4-3
		Procedure	4-4
SECTION	5.	TROUBLESHOOTING AIDS	5-1
		Component color-code	5-1
		Semiconductor lead configurations	5-2
		Equipment recommended	5-2
SECTION	6.	CIRCUIT DESCRIPTION.....	6-1
		Block	6-1
		Circuit operation.....	6-1
SECTION	7.	CORRECTIVE MAINTENANCE	7-1
		Obtaining replacement parts.....	7-1
		Component replacement	7-1
		Instrument repackaging	7-4
SECTION	8.	PARTS LIST, DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS	8-1
		Electrical parts list.....	8-2
		Mechanical parts list	8-12
		Exploded drawings.....	8-17
		Circuit board drawings and schematics.....	8-19
APPENDIX	A.	REFERENCES	A-1
	B.	MAINTENANCE ALLOCATION CHART (MAC).....	B-1
	C.	RECOMMENDED REPAIR PARTS LIST	C-1

LIST OF ILLUSTRATIONS

<i>Figure</i>	<i>Title</i>	<i>Page</i>
1-1	212 Oscilloscope.	0-1
1-2	212 Oscilloscope Accessories.	1-5
2-1	Side Panel Controls and Connectors.	2-1
3-1	Location of Screws Securing Bottom Cover and Side Panel.	3-1
3-2	Location of Circuit Boards Within the 212.	3-2
4-1	Location of Power Supply Test Points and CRT Grid Bias Adjustment.	4-4
4-2	Location of Trace Rotation Adjustment.	4-4
4-3	Location of Vertical Centering Adjustment and Test Point.	4-5
4-4	Location of Attenuator Compensation Capacitors.	4-7
4-5	Location of Horizontal Centering Adjustment and Test Point.	4-10
5-1	Color Code for Resistors, Ceramic Capacitors, and Dipped Tantalum Electrolytic Capacitors.	5-1
5-2	Lead Configuration of Semiconductors Used in this Instrument.	5-2
6-1	Vertical Input Amplifiers Detailed Block Diagram.	6-2
6-2	Vertical and Horizontal Output Amplifiers Detailed Block Diagram.	6-3
6-3	Trigger/Sweep Generator Detailed Block Diagram.	6-4
6-4	Power Supply Detailed Block Diagram.	6-5
6-5	CRT Circuit Detailed Block Diagram.	6-6
7-1	Selecting C210 and C212 Capacitance Values for 48 to 52 Hz Operation.	7-2
7-2	Selecting C210 and C212 Capacitance Values for 58 to 62 Hz operation.	7-3
8-0	Mechanical Parts, Exploded View.	8-17
8-1	Block Diagram.	8-19
8-1A	A1 Input Circuit Board (Front).	8-21
8-1B	A1 Input Circuit Board (Near).	8-21
8-1C	Waveform Conditions - Vertical Amplifier.	8-23
8-1D	Vertical Amplifier Schematic Diagram.	8-23
8-1E	Vertical Amplifier Schematic Diagram.	8-25
8-2	A2 Amplifier Circuit Board.	8-25
8-2A	Waveform Conditions - Horizontal and Vertical Output Sweep and Trigger.	8-27
8-2B	Horizontal and Vertical Output Sweep and Trigger Schematic Diagram.	8-27
8-3A	A3 Power Supply Circuit Board, SN B040000-up.	8-29
8-3B	A3 Power Supply Circuit Board, below SN B040000.	8-31
8-4	CRT Circuit Schematic Diagram.	8-33
8-5	Power Supply Schematic Diagram.	8-35

SECTION 0 GENERAL INFORMATION

O-1. Scope. This manual contains instructions for the operator, organizational, direct support, and general support maintenance of and calibration procedures for Tektronix Oscilloscope, Model 212. Throughout this manual, Tektronix Oscilloscope, Model 212 is referred to as the 212.

O-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 Tektronix Oscilloscope, Model 212.

b. DA Pam 310-7. Refer to the latest issue of DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to Tektronix Oscilloscope, Model 212.

O-3. Forms, Records, and Reports. Department of Army forms and procedures used for equipment maintenance and calibration are those prescribed by TM 38-750, The Army Maintenance Management System. Accidents involving injury to personnel or damage to materiel will be reported on DA Form 285, Accident Report, in accordance with AR 385-40.

O-4. Reporting Equipment Improvement Recommendations (EIR). If your 212 needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, U.S. Army Missile Command, ATTN: DRSMI-SNEM, Redstone Arsenal, AL 35898. We'll send you a reply.

O-5. Administrative Storage. To prepare the Tektronix Oscilloscope, Model 212 for placement into and removal from administrative storage, refer to Section 3, Chapter 4, AR 750-25-1, Maintenance of Equipment and Supplies. Temporary storage should be accomplished in accordance with TB 750-25-1, Section 2, Maintenance of Supplies and Equipment.

O-6. Destruction of Army Electronics Materiel. Destruction of Tektronix Oscilloscope, Model 212 to prevent enemy use shall be in accordance with TM 43-0002-26, Organizational Maintenance Manual, Destruction of Equipment to Prevent Enemy Use for Launcher, Rocket, Armored Vehicle Mounted: XM270, Multiple Launch Rocket System.

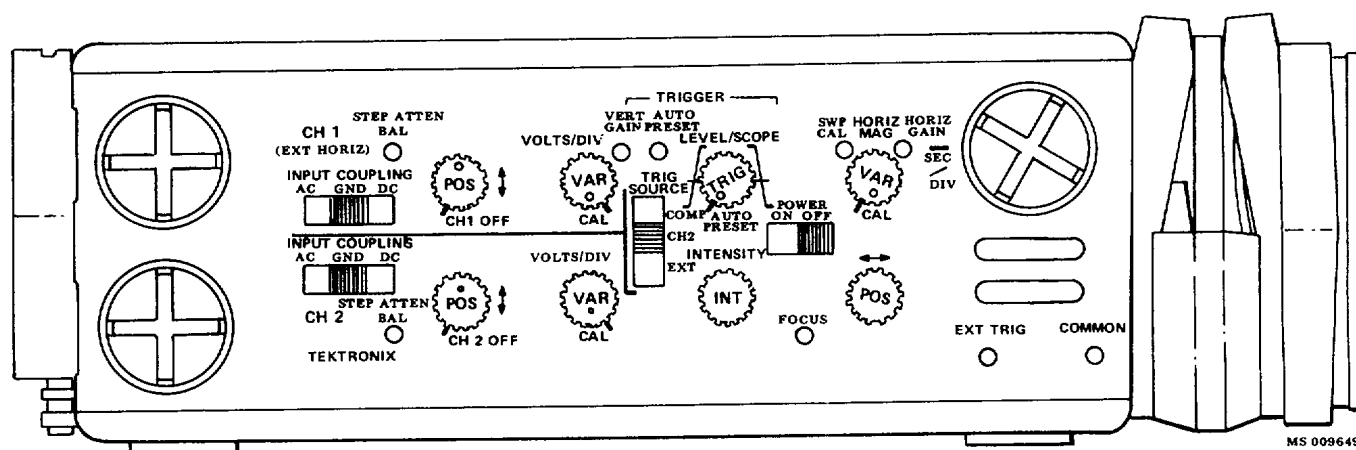


Figure 1-1. 212 Oscilloscope.

SECTION 1 INTRODUCTION

The 212 Oscilloscope is a dual-channel portable oscilloscope using all solid state and integrated circuitry (except the CRT). The small size of the 212 makes it an extremely portable oscilloscope for on-location maintenance in many fields of application.

The 500 kilohertz vertical system provides vertical deflection factors from one millivolt (at a reduced bandwidth) to 50 volts/division at the tip of either of the two integral high-impedance probes. Both single-trace and dualtrace modes of operation are offered. Single-trace displays are achieved by turning off either vertical channel with its position control. In the dual-trace mode, the instrument automatically chops or alternates, depending upon the sweep rate. The trigger circuits provide stable triggering over the full bandwidth capabilities of the vertical system.

The horizontal deflection system provides calibrated sweep rates from 500 milliseconds to five microseconds/division. It also provides uncalibrated sweep rates, via a variable sweep magnifier, to at least five times the indicated sweep rate for a maximum of at least one microsecond/division. In addition, X-Y operation is provided. Channel 1 supplies the horizontal (X) deflection, with a range from less than one millivolt to 50 volts/division (at a reduced bandwidth of 50 kilohertz), and Channel 2 the vertical (Y) deflection. The resultant CRT display is presented on a 6 X 10 division graticule (each division equals 0.203 inch).

The 212 is operated either from AC line voltage or from internal rechargeable batteries. The internal batteries are recharged from the AC power line by the integral battery charger.

This instrument will meet the following electrical characteristics after complete instrument calibration. These characteristics apply over an ambient temperature of -15°C to $+55^{\circ}\text{C}$ ($+5^{\circ}\text{F}$ to $+131^{\circ}\text{F}$), except as otherwise indicated. Warmup time for given accuracies is five minutes.

VERTICAL DEFLECTION SYSTEM

DEFLECTION FACTOR:

Calibrated Range: One millivolt to 50 volt/division. 15 steps in 1-2-5 sequence.

Accuracy: Within 5% with VOLTS/DIV VAR control in CAL position and gain correctly set at 5 mV/div.

Uncalibrated (variable) Range: Continuously variable between calibrated settings. Extends maximum deflection factor to at least 125 volts/division.

BANDWIDTH (with six-division reference):

10 mV/DIV to 50 V/DIV: DC to at least 500 kilohertz.

5 mV/DIV: DC to at least 400 kilohertz.

2 mV/DIV: DC to at least 200 kilohertz.

1 mV/DIV: DC to at least 100 kilohertz.

Lower Bandwidth Limit, AC (capacitively) Coupled: about 2 hertz at all deflection factors.

INPUT RESISTANCE:

Approximately one megohm.

INPUT CAPACITANCE:

1 mV/DIV to 50 mV/DIV: Approximately 160 picofarads.

100 mV/DIV to 50 V/DIV: Approximately 140 picofarads.

MAXIMUM USABLE INPUT VOLTAGE:

50 V/DIV to .1 V/DIV: 600 volts (DC + peak AC). 600 volts peak-to-peak AC (five megahertz or less).

50 mV/DIV to 1 mV/DIV: 600 volts (DC + peak AC). AC not over 2 kilohertz or risetime not less than 100 nanoseconds.

CHOPPED MODE:

From 500 ms/DIV to 2 ms/DIV of time base at approximately 50 kilohertz.

ALTERNATE MODE:

From 1 ms/DIV to 5ps/DIV of time base.

INPUT IMPEDANCE MATCHING:

Matched to within approximately 10%.