

TECHNICAL MANUAL

**OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT,
AND GENERAL SUPPORT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS)
FOR
UNIVERSAL COUNTER/TIMER, TEKTRONIX MODEL 7D15
(NSN 6625-00-392-2604)**

HEADQUARTERS, DEPARTMENT OF THE ARMY

15 AUGUST 1980

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HEADQUARTERS
 DEPARTMENT OF THE ARMY
 WASHINGTON, DC, 15 August 1980

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REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703.

In either case, a reply will be furnished direct to you.

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This manual is an authentication of the manufacturer's commercial literature which, through usage, has been found to cover the data required to operate and maintain this equipment. Since the manual was not prepared in accordance with military specifications, the format has not been structured to consider levels of maintenance.

SECTION 0 INTRODUCTION

0-1. Scope

a. This manual contains instructions for the operation and organizational, direct support, and general support maintenance of Universal Counter/Tuner, Tektronix Model 7D15. Throughout this manual, Universal Counter/Timer, Tektronix Model 7D15 is referred to as the 7D15.

b. Calibration procedures for the 7D15 are provided in TB 9-6625-1963-35.

0-2. 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.

0-3. Forms, Records, and Reports

a. *Reports of Maintenance and Unsatisfactory Equipment*. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System.

b. *Report of Packaging and Handling Deficiencies*. Fill out and forward DD Form 6 (Packaging Improvement Report) as prescribed in AR 735-11-2/NAVSUPINST

4440.127E/AFR 400-54/MCO 4430.3E and DSAR 4140.55.

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.

0-4. Reporting Equipment Improvement Recommendations (EIR)

If your 7D15 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, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703. We'll send you a reply.

0-5. Administrative Storage

To prepare the 7D15 for administrative storage, perform the procedures described in Section 4, Maintenance, and Section 5, Calibration, or TB 9-6625-1963-35. Upon removal from administrative storage, perform the procedures described in Section 4, Maintenance, and Section 5, Calibration, or TB 9-6625-1963-35 to determine that the equipment is fully operational.

0-6. Destruction of Army Electronics Materiel

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

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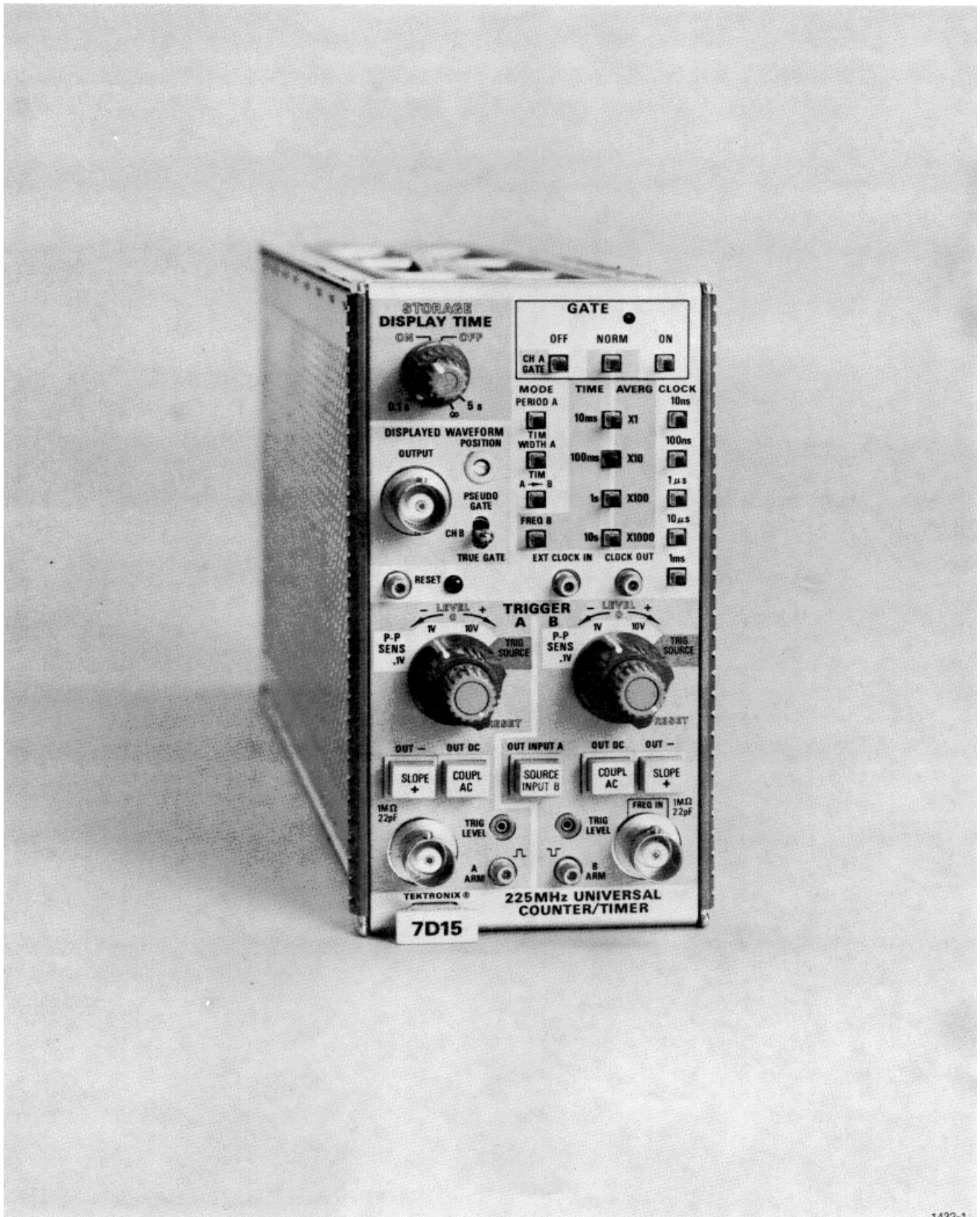


Fig. 1-1. 7D15 Universal Counter/Timer.

7D15

REV. A, APR. 1975

SPECIFICATIONS

Introduction

The 7D15 is a digital counter plug-in designed for use with all readout-equipped 7000-Series Oscilloscope mainframes.

It will function in any plug-in compartment; however, in the vertical compartment, a selectable display is internally connected to the oscilloscope. When used in the horizontal compartment, mainframe triggers are available to the 7D15.

The 7D15 has eight modes of operation: Frequency-DC to 225 MHz direct, Frequency Ratio-0 to 10^5 : 1, Period - 10 ns to 10^5 s, Period Averaging - 10^5 s resolution, TIM - 10 ns to 10^5 s, TIM Averaging-1 ns accuracy, Totalize-1 to 10^8 events, Manual Stop Watch-to - 10^5 s.

The electrical specifications listed in the Performance Requirement column are valid over the stated environmental range for instruments calibrated at an ambient temperature of $+20^\circ\text{C}$ to $+30^\circ\text{C}$ and after a five minute warm-up unless otherwise noted. The information listed in the Supplemental Information column indicates typical instrument operation and is not to be construed as a requirement for proper instrument operation.

TABLE 1-1
ELECTRICAL CHARACTERISTICS

Characteristics	Performance Requirements
MEASUREMENT MODES Frequency Mode	
Range	DC to 225 megahertz
Resolution	0.1 hertz minimum
¹ Accuracy	$E_{\text{freq.}} \text{ (hertz)} = \pm TB \times F_{\text{in}} \pm 1/T$ $E_{\text{freq.}} \text{ (%) } = 100\% \left[TB \pm \frac{1}{T \times F_{\text{IN}}} \right]$
Period Mode	
Range	10 nanoseconds to 10^5 seconds with averaging times of X1 to X1000 in decade steps.
Resolution	10 picoseconds maximum.
¹ Accuracy	$E_{\text{per}} \text{ (sec)} = \left[\pm TB \times P_{\text{in}} \pm \frac{1 \times 10^{-9} \pm K \pm P_{\text{CK}}}{M} \right]$ $E_{\text{per}} \text{ (%) } = 100\% \left[\pm TB + \frac{\pm 1 \times 10^{-9} \pm K \pm P_{\text{CK}}}{P_{\text{IN}} \times M} \right]$
Time Interval Mode	
Range	6 nanoseconds to 10^5 seconds with averaging times of X1 to X1000.
Resolution	0.1 nanosecond usable.
¹ Accuracy (nominal)	$E_{\text{TI}} \text{ (sec)} = TB \times P_{\text{in}} \pm (P_{\text{ck}}/\sqrt{M}) + 10^{-9} \pm K$ $E_{\text{TI}} \text{ (%) } = 100\% + TB \times \pm \frac{(P_{\text{ck}}/\sqrt{M}) + 10^{-9} \pm K}{P_{\text{in}}}$ <p>The complete expression for Time Interval averaging depends on signal to noise ratio and statistical distribution factors.</p>

¹ Refer to Figs. 1-2 through 1-7 at the rear of this section for additional accuracy information.