

**TECHNICAL MANUAL**  
**OPERATOR'S**  
**ORGANIZATIONAL, DS, GS, AND DEPOT MAINTENANCE**  
**MANUAL**  
**ELECTRONIC MARKER GENERATOR AN/USM-271**  
**(NSN 6625-00-982-1543)**

This copy is a reprint which includes current pages from Changes 1 and 2.  
Title was changed by Change 2.

---

**HEADQUARTERS, DEPARTMENT OF THE ARMY**

**FEBRUARY 1971**

*This manual contains material reproduced by permission of Tektronix Inc.*

TECHNICAL MANUAL }  
 No. 11-6625-2383-15 }

HEADQUARTERS  
 DEPARTMENT OF THE ARMY  
 WASHINGTON, D. C. , 8 February 1971

**Operator's, Organizational, DS, GS, and  
 Depot Maintenance Manual  
 ELECTRONIC MARKER GENERATOR ANI/USM-271  
 (NSN 6625-00-982-1543)**

|  | Paragraph | Page |
|--|-----------|------|
| Section 1. INTRODUCTION  |           |      |
| Scope .....  | 1-1       | 1-1  |
| Indexes of publications .....                                    | 1-2       | 1-1  |
| Forms and records .....  | 1-3       | 1-1  |
| Destruction of Army electronics materiel .....                   | 1-4       | 1-1  |
| Administrative storage .....                                     | 1-5       | 1-1  |
| Reporting of errors .....  | 1-6       | 1-1  |
| Reporting equipment improvement recommendations (EIR) .....      | 1-7       | 1-1  |
| Purpose and use .....  | 1-8       | 1-1  |
| Operating data .....   | 1-9       | 1-1  |
| Mechanical specifications .....                                  | 1-10      | 1-2  |
| Items comprising an operable equipment .....                     | 1-11      | 1-2  |
| Test equipment cross-reference .....                             | 1-12      | 1-2  |
| 2. OPERATING INSTRUCTIONS  |           |      |
| General .....  | 2-1       | 2-1  |
| Functions of controls and connectors .....                       | 2-2       | 2-1  |
| 3. CIRCUIT DESCRIPTION   |           |      |
| Introduction .....   | 3-1       | 3-1  |
| Block diagram .....  | 3-2       | 3-1  |
| Oscillators and multipliers .....                                | 3-3       | 3-1  |
| Shaper and countdown circuits .....                              | 3-4       | 3-1  |
| Marker amplifier .....   | 3-5       | 3-2  |
| Power supply .....   | 3-6       | 3-3  |
| Marker and trigger selector switches .....                       | 3-7       | 3-3  |
| 4. MAINTENANCE   |           |      |
| Preventive maintenance data .....                                | 4-1       | 4-1  |
| Tube and transistor checks .....                                 | 4-2       | 4-1  |
| Corrective maintenance .....                                     | 4-3       | 4-1  |
| Switch replacement .....   | 4-4       | 4-2  |
| Troubleshooting aids .....                                       | 4-5       | 4-3  |
| Troubleshooting techniques .....                                 | 4-6       | 4-3  |
| 5. PERFORMANCE   |           |      |
| Introduction .....   | 5-1       | 5-1  |
| Recommended equipment .....                                      | 5-2       | 5-1  |
| General information .....  | 5-3       | 5-1  |
| Preliminary procedure .....                                      | 5-4       | 5-1  |
| Performance checks .....   | 5-5       | 5-1  |
| 6. ALIGNMENT AND ADJUSTMENT                                      |           |      |
| Introduction .....   | 6-1       | 6-1  |
| Equipment required .....   | 6-2       | 6-1  |
| Calibration procedure .....                                      | 6-3       | 6-4  |
| 7. PREVENTIVE MAINTENANCE INSTRUCTIONS                           |           |      |
| Scope of maintenance .....                                       | 7-1       | 7-1  |
| Materials required for maintenance .....                         | 7-2       | 7-1  |
| Preventive maintenance .....                                     | 7-3       | 7-1  |
| Preventive maintenance checks and services periods .....         | 7-4       | 7-1  |
| Daily preventive maintenance checks and services chart .....     | 7-5       | 7-2  |
| Weekly preventive maintenance checks and services chart .....    | 7-6       | 7-2  |
| Monthly maintenance .....  | 7-7       | 7-2  |
| Monthly preventive maintenance checks and services chart .....   | 7-8       | 7-2  |
| Quarterly maintenance .....                                      | 7-9       | 7-2  |
| Quarterly preventive maintenance checks and services chart ..... | 7-10      | 7-3  |
| Cleaning .....   | 7-11      | 7-3  |
| Touchup painting instructions .....                              | 7-12      | 7-3  |

|   | Paragraph | Page |
|---|-----------|------|
| APPENDIX A. REFERENCES.....   |           | A-1  |
| B. BASIC ISSUE ITEMS LIST (BIIL) AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST (ITIAL)   |           | C-1  |
| C. MAINTENANCE ALLOCATION .....<br>(NOT APPLICABLE)   |           |      |
| D. ORGANIZATIONAL, DIRECT SUPPORT, GERAL SUPPORT, AND DEPOT MAINTENANCE<br>REPAIR PARTS AND SPECIAL TOOLS LIST (NOT APPLICABLE) |           |      |

Change 2 ii

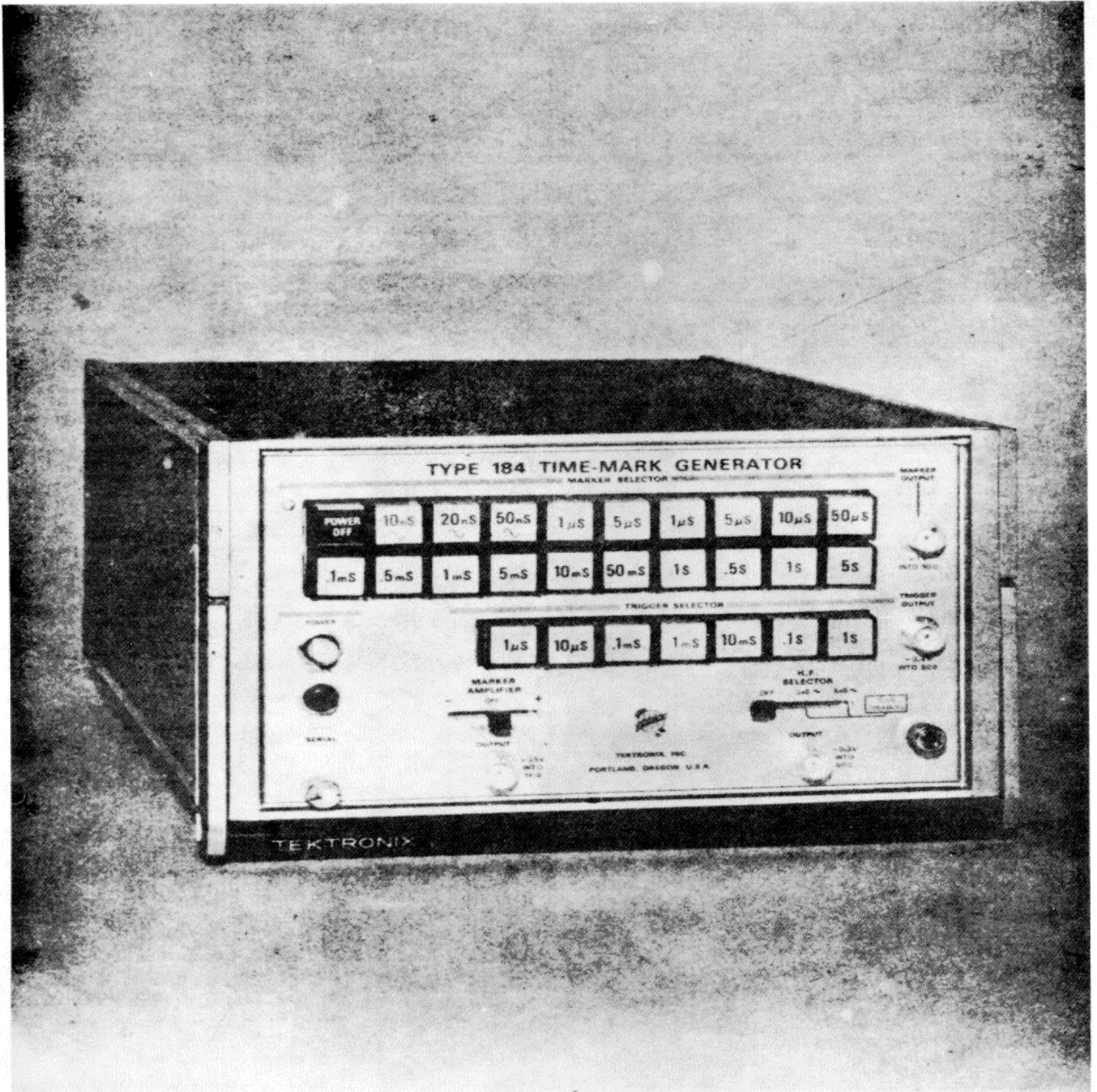


Fig. 1-1. TYPE 184 TIME-MARK GENERATOR

(A)

## SECTION 1 INTRODUCTION

### 1-1. Scope

a. This manual includes installation and operation instructions and covers organizational, general support, and depot maintenance. It describes Electronic Marker Generator AN/USM-271 and its major components, Electronic Marker Generator SG-767/U, Special Purpose Electrical Cable Assembly CX-10551/U, Radii Frequency Cable Assembly CG 3363/U, and Electrical Dummy Load DA463/U. The equipment is identified throughout this manual as the Tektronix Inc. Type 184.

b. 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 considered category of maintenance nor to include a formal section on depot maintenance. Refer to the maintenance allocation chart, appendix C, for maintenance functions allocated to each category of maintenance.

### 1-2. Indexes of Publications

a. *DA Pam 310-4.* Refer to the latest issue of DA Pam 3104 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 modifications work order (MWO's) pertaining to the equipment.

### 1-3. Forms and Records

a. *Reports of Maintenance and Unsatisfactory Equipment* Maintenance forms, records, and report; which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38750.

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

c. *Discrepancy in Shipment Report (DISREP).(SF361).* Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33A/AFR 75-18/MCO P4610.19B, and DSAR 4500.15.

### 1-4. Destruction of Army Electronics Materiel.

Destruction of Army electronics materiel to preventing enemy use shall be in accordance with TM 750244-2.

### 1-5. Administrative storage

For procedures, forms and records, and inspections -

required during-administrative storage of this equipment,

refer to TM 740-90-1.

### 1-6. 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: DRSEL-MA-Q, Fort Monmouth, NJ 07703.

### 1-7. Reporting Equipment Improvement Recommendations (EIR)

EIR 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 directly to Commander, US Army Electronics Command, ATTN: DRSEL-MAQ, Fort Monmouth, NJ 07703. A reply will be furnished directly to you.

### 1-8. Purpose and Use

The Type 184 is a compact, precision-built instrument capable of producing accurate time markers for applications in the laboratory, production line, or field. Sixteen time-marker selections and five sine-wave marker intervals provide time-marker selections from 2 nanoseconds to 5 seconds. Seven trigger pulse selections provide a triggering pulse rate from 1 up to 5 seconds. All outputs of the Type 184 are frequency controlled by a stable 10-MHz crystal oscillator.

### 1-9. Operating Data

a. *Marker Output* Provides positive time marks of 1-volt minimum amplitude (into 50). Marker periods are established by pushbutton MARKER SELECTOR switches.

b. *Marker Periods.*

(1) *Sinusoidal* 10, 20, and 50 nanoseconds (ns) (H.F. SFTECTOR) must be off for 10 ns markers.

(2) *Periodic Pulses.*

(a) 0.1, 0.5, 1, 5, 10, 50 As.

(b) 0.1, 0.5, 1, 5, 10, 50 ms.

(c) 0.1, 0.5, 1, 5 S.

c. *Hf Output.* Provides 2 ns or 5 ns sine-wave markers of 0.3-volt minimum amplitude (into 50).

d. *Marker Amplifier* Output Provides positive or negative time marks of 25-volt minimum amplitude (into 1). Marker intervals are from 1 microsecond (i s) to 5 seconds (s) established by the pushbutton MARKER SELECTOR switches.

e. *Trigger Output.* Provides positive triggers of 0.4-volt minimum amplitude (into 50). Period is established