

References

REQUIRED PUBLICATIONS

Required publications are sources that users must read in order to understand or comply with this publication.

Army Regulations (AR)

310-25 *Dictionary of United States Army Terms*

310-50 *Authorized Abbreviations, Brevity Codes, and Acronyms*

Department of the Army Forms (DA Form)

348 *Equipment Operator's Qualification Record*

1903 *Azimuth by Direction Method*

1905 *Azimuth by Hour Angle Method*

1907 *Azimuth by Altitude Method*

1916 *Abstract of Horizontal Directions*

1917 *List of Directions*

1923 *Position Computation Order Triangulation for Calculating Machine Computation*

1940 *Traverse Computation on the Universal Traverse Mercator Grid*

1942 *Computation of Levels*

1943 *Abstract of Zenith Distances*

1958 *Description or Recovery of Bench Mark*

1959 *Description or Recovery of Horizontal Control Station*

1962 *Tabulation of Geodetic Data*

2028 *Recommended Changes to Publications and Blank Forms*

2404 *Equipment Inspection and Maintenance Worksheet*

2496 *Disposition Form*

2544 *Intra-Amy Order for Reimbursable Services*

2847 *Comparison of Chronometer and Radio Signals*

4196 *Horizontal Distance Book*

4253 *Horizontal Direction or Angle Book*

4446 *Level, Transit, and General Survey Record Book*

4648 *Station Description Book*

4856 *General Counseling Form*

5817-R *Zenith Distance/ Vertical Angle*

5818-R *General Survey Notes*

5819-R *Field sheet, Infrared*

5820-R *Three- Wire Leveling*

5821-R *Airfield Compilation Report*

5822-R *Precision Approach Radar (GCA) Data*

5827-R *Instrument Landing System Data*

Department of Defense Forms (DD Form)

1351-2 *Travel Voucher*

1351-3 *Travel Voucher or Subvoucher*

1351-5 *Government Quarters and Mess*

1610 *Request and Authorization for TDY Travel of DOD Personnel*

Department of the Army Pamphlets (DA Pam)

25-30 *Consolidated Index of Army Publications and Blank Forms*

310-10 *The Standard Army Publications System (STARPUBS) Users Guide*

310-13 *Posting and Filing Publications*

310-15 *Forms Management and Standardization*

310-32 *Index of Graphic Training Aids (GTA)*

**Defense Mapping Agency Technical Manuals
(DMA-TM)**

2-5220 *Field Operation Manual, Doppler Geodetic Point Positioning*

80-001 *Operator's Manual for Analytical Photogrammetric Positioning Systems (HP-9825A) (Model) (May 1986)*

81-004 *Monumenting, Describing, and Recovery (February 1981)*

81-006 *Azimuth Determination*

81-007 *Distance Measuring Operations*

These publications are available through DMA-HTC, Technical Publications Program, 6500 Brookes Lane, Washington, DC 20315-0030.

**Defense Mapping School Special Text
(DMS ST)**

031 *Standards and Specifications for Geodetic Control Networks*

This publication is available from the Defense Mapping School, Fort Belvoir, VA 22060-5828. It is also available, including information updates, from the National Geodetic Information Branch, code N/CG17x2, NOAA, Rockville, MD 20852.

Department of Commerce Special Publications (SP)
(These publications are reprints of the US Coast and Geodetic Survey (USC&GS) Special Publications.)

64-1 *Second-Order Astronomic Position Determination*

193 *Manual of Plane Coordinate Computation*

235 *The State Coordinate Systems*

237 *Manual of Geodetic Astronomy*

240 *Manual of Leveling Computation and Adjustment*

241 *Natural Tables for the Computation of the Geodetic Position (Spheroid of 1866)*

Geodetic Glossary

These publications are available from the National Geodetic Survey, National Ocean Survey, NOAA, Rockville, MD 20852.

Department of Transportation, Federal Aviation Administration (FAA) Specifications, Publications, and Regulations

7350..5U *Location Identifiers*

8260.3 *US Standard for Terminal Instrument Procedures (TERPS)*

FAR-77 *Objects Affecting Navigable Airspace*

These publications are available from the US Department of Transportation, Federal Aviation Administration, 800 Independence Avenue SW, Washington, DC 20591.

Field Manuals (FM)

5-30 *Engineer Intelligence*

5-36 *Route Reconnaissance and Classification*

5-105 *Topographic Operations*

5-233 *Construction Surveying*

21-26 *Map Reading and Land Navigation*

25-2 *Unit Training Management*

25-3 *Training in Units*

National Oceanic and Atmospheric Administration (NOAA) Manuals

NOS NGS 3 *Geodetic Leveling*

NOS NGS 5 *State Plane Coordinate System of 1983*

These publications are available from the National Geodetic Survey, National Ocean Survey, NOAA, Rockville, MD 20852.

Soldier Training Publications (STP)

5-82D14-SM-TG *Soldier's Manual and Trainer's Guide: 82D, Topographic Surveyor (Skill Level 1/2/3/4)*

Technical Manuals (TM)

5-232 *Elements of Surveying*

5-235 *Special Surveys*

5-237 *Surveying Computer's Manual*

5-241-1 *Grids and Grid References*

5-241-8 *Universal Transverse Mercator Grid*

C1 ~~5-441 *Geodetic and Topographic Surveying*~~

- 5-6675-213-15 *Operator's Organizational, Direct Support, General Support, and Depot Maintenance Manual for Theodolite Directional; 1 Sec Graduation 5.9-Inch Length Telescope w/Tripod, Carrying Case and Accessories (Wild Heerbrugg Instruments Models T-2), and (Model T-2-56)*
- 5-6675-224-24 *Organizational, Direct Support, General Support, and Maintenance Manual (Including Repair Parts and Special Tools List): Level Surveying; Dumpy, Telescopic, 32 Power w/Accessories and Tripod*
- 5-6675-230-15 *Operator's Organizational Field and Maintenance Manual: Level Surveying: Precise Tilt- ing; 3-Level Screws, Electric Illumination, 10-Inch Telescope (Military Model 10-X) w/Tripod*
- 5-6675-231-15 *Operator's, Organizational, Field and Depot Maintenance Manual: Theodolite, Surveying, Directional: 2/10 Second Degree Graduation 10.2- Inch Long Telescope w/Accessories (Wild Heerbrugg Model T-3) and (Wild Heerbrugg Model T-3-1969)*
- 5-6675-233-20P *Organizational Maintenance Repair Parts and Special Tools Lists: Theodolite: Directional; 0.002 Mil Graduation; 5.9-Inch Long Telescope: Detachable Tribrach w/Accessories and Tripod (Wild Heerbrugg Models T2-63 Mil) (Model T2-67-Mil) and (Model T2-66-C-Mil)*
- 5-6675-238-24P *Organization, Direct Support, General Support, and Depot Maintenance Repair Parts and Special Tools List for Test Set, Position and Azimuth Determining System, AN/USM-427, Part-No. 877400-1*
- 5-6675-239-15 *Organizational, Direct Support, General Support, and Depot Maintenance Manual Including Repair Parts for Light, Signal Surveying; 5-Inch Diameter Reflector; Grille Housing for Carrying Case (Military Design)*
- 5-6675-244-15 *Organizational, Direct Support, General Support and Depot Maintenance Manual (Including Repair Parts and Special Tools List); Target Set, Surveying, Circular Level and Optical Plummet in Tribrach w/Quick Release Mechanism (Wild Heerbrugg Model T-2)*
- 5-6675-284-15 *Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual for Theodolite, Directional; 2/10 Sec Graduation, First- Order w/Accessories, Trivet, Tripod, and Cases (Kein Model DKM3M)*
- 5-6675-296-14 *Operator's, Organizational Direct Support, General Support and Maintenance Manual for Theodolite, Directional: 0.002-Mil Graduation, 5.9- Inch LG Telescope, Detachable Tribrach w/ Acces- sories and Tripod (Wild Heerbrugg Models T-2-56-C Mil) (Model T-2-56-M-Mil) (Model T-2-63-Mil) (Model T-2-66-C-Mil) (Model T-2-68-Mil); Theodolite, Directional (Reference) (Wild Heerbrugg Models (T-2-56-C-Mil, T-2-56-M-Mil, T-2-63 Mil, T- 2-66-C-Mil, T-2-67 Mil and T2-68 Mil)*
- 5-6675-298-15 *Operator, Organizational, Direct Support and General Support and Depot Maintenance Manual: Theodolite, Surveying Directional, 0.002 Mil Graduation w/Extension Leg Tripod (Keuffel and Esser Model KE-2 Special)*
- 5-6675-304-12 *Operator's and Organizational Main- tenance Manual for Survey Electronic Distance Measuring Equipment, Infrared Model DM-60 (M-1)*
- 5-6675-306-14 *Operator's, Organizational, Direct Sup- port and General Support Maintenance Manual: Theodolite, Directional; 1-Second Graduation, 5.9- Inch Long Telescope, Detachable Tribrach w/Acces- sories and Tripod (Wild Heerbrugg Model T2-74 Deg)*
- 5-6675-308-12 *Operator's and Organizational Main- tenance Manual for Position and Azimuth Determin- ing System, AN/USQ-70, Part No. 880500-1 (TM-08837A-12/1)*
- 5-6675-312-14 *Organizational, Direct Support and General Support Maintenance Manual for Theodolite, Surveying Directional, One-Minute (Wild Heerbrugg Model T16-75 Deg)*
- 5-6675-318-14-1&2 *Operator's, Organizational, Direct Support and General Support Maintenance Manual for Topographic Support System, Survey Section, Model ADC-TSS-6*
- 5-6675-328-14 *Operator's, Organizational, Direct Sup- port and General Support Maintenance Manual for Topographic Support System, Maintenance Section, Model ADC- TSS-7*
- 5-6675-329-13&P-*HR Hand Receipt Manual Covering Contents of Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List*

(AAL) for Self-Leveling Surveying Level (Wild Heerbrugg Model NA 2-80)

95-226 *United States Standard for Terminal Instrument Procedures (TERPS)*

95-228 *United States Interagency Ground Inspection Manual Air Traffic Control and Navigational Aids Facilities*

Miscellaneous

US Government Publications

Department of Defense

Glossary of Mapping, Charting, and Geodetic Terms (Fourth Edition, 1981)

Prepared by Defense Mapping Agency, Hydrographic/Topographic Center, 6500 Brookes Lane, Washington, DC 20315

National Oceanic and Atmospheric Administration (NOAA)
Products and Services of the National Geodetic Survey

Geodetic and Charting Publications

These publications are available from the National Geodetic Information Branch, (NOAA) Rockville, MD 20852.

Nautical Almanac Office,
United States Naval Observatory
Astronomical Almanac (current year)

This publication is available from the Superintendent of Documents, US Government Printing Office, Washington, DC 20402.

Nongovernment Publications

Apparent Places of Fundamental Stars (APFS) (current year)

Published by Verlag G. Braun, Karl-Friedrichstrasse 14-18, 7500 Karlsruhe 1, Germany

RELATED PUBLICATIONS

Related publications are sources of additional information. They are not required in order to understand this manual.

Army Regulations (AR)

95-14 *Army Aviation Aeronautical Information and Terminal Instrument Procedures*

95-50 *Airspace and Special Military Operation Requirements*

115-11 *Army Topography*

210-20 *Master Planning for Army Installations*

380-5 *Department of the Army Information Security Program*

385-95 *Army Aviation Accident Prevention*

405-10 *Acquisition of Real Property and Interests Therein*

420-90 *Fire Protection*

Defense Mapping Agency Technical Manuals (DMA-TM)

80-002 *Land Gravity Surveys*

81-001 *JMR-1 Operations*

81-002 *JMR Supplement*

81-003 *Magnetic Surveys*

8358-1 *Datums, Ellipsoids, Grids, and Grid Reference System*

These publications are available through DMA-HTC, Technical Publications Program, 6500 Brookes Lane, Washington, DC 20315-0030.

Department of the Army Pamphlets (DA Pam)

310- 17 *Joint Interest List of Technical Manuals*

310-20 *Administrative Publications: Action Officers Guide*

310-35 *Index of International Standardization Agreements*

Department of Commerce Special Publications (SP)

(These publications are reprints of the US Coast and Geodetic Survey (USC&GS) Special Publications.)

62-3 *Bilby Steel Tower for Triangulation*

247 *Manual of Geodetic Triangulation*

These publications are available from the National Geodetic Survey, National Ocean Survey, NOAA, Rockville, MD 20852.

Department of Defense Regulations (DOD Reg)
5040-2-C-1 *Catalog of Audiovisual Productions—Army*

5040-2-C-4 *Catalog of Audiovisual Productions – DOD Productions Cleared for Public Release*

Department of Transportation, Federal Aviation Administration (FAA) Publications
7400.2C *Procedures for Handling Airspace Matters*
This publication is available from the US Department of Transportation, Federal Aviation Administration, 800 Independence Avenue SW, Washington, DC 20591.

Field Manuals (FM)

1-100 *Combat Aviation Operations*

1-400 *Aviator's Handbook*

5-553 *General Drafting*

6-2 *Field Artillery Survey*

21-31 *Topographic Symbols*

24-1 *Combat Communications*

34-85 *Conversion of Warsaw Pact Grids to UTM Grids*

55-10 *Movement Control in a Theater of Operations*

101-5 *Staff Organization and Operations*

101-5-1 *Operational Terms and Symbols*

National Oceanic and Atmospheric Administration (NOAA) Manual

NOS NGS 1 *Geodetic Bench Marks*

Technical Manuals (TM)

5-240 *Compilation and Color Separation of Topographic Maps*

5-330 *Planning and Design of Roads, Airbases, and Heliports in the Theater of Operations*

5-803-4 *Planning of Army Aviation Facilities*

5-803-7 *Civil Engineering Programming: Airfield and Heliport Planning Criteria*

5-9413 *Tower, Triangulation Structural Aluminum 103-foot*

95-225 *United States Standard: Flight Inspection*

Tables of Organization and Equipment (TOE)

05335H600 *Engineer Topographic Battalion, Theater Army*

05338H600 *Survey Company, Engineer Topographic Battalion, Theater Army*

05540H3LA *Topographic Planning and Control Team*

05540H31B *Geodetic Survey Team*

05540H31C *Survey Team*

05540H31D *Survey Team (Airborne)*

05540H31L *Survey Platoon*

05540LB00 *Survey Squad*

05606L000 *Headquarters and Headquarters Company, Engineer Topographic Battalion, Theater Army (Army of Excellence)*

Miscellaneous

US Government Publications

Federal Geodetic Control Committee, NOAA
Input Formats and Specifications of the National Geodetic Survey Data Base (Volume 1 Horizontal Control Data, Volume 2 Vertical Control Data, Volume 3 Gravity Control Data)

This publication is available from the National Geodetic Information Branch, NOAA, Rockville, MD 20852.

National Flight Data Digest

Published daily (except weekends and Federal holidays) by the National Flight Data Center, Federal Aviation Administration, US Department of Transportation, 800 Independence Avenue SW, Washington, DC 20591.

Nongovernment Publications

Chauvenet, William

Manual of Spherical and Practical Astronomy (2 volumes) (Dover Publications, 180 Varick Street, New York, NY 10014 (c.1960). Unabridged and unaltered republication of the Fifth revised and corrected edition, 1891.)

This publication is held by certain government and university libraries in the United States. It is available on interlibrary loan service through base or post,

service school, or local public libraries. This service may not be available overseas.

Moffitt, Francis H. and Bouchard, Harry
Surveying, Harper and Row Publishers Inc., 10 East 53rd Street, New York, NY 10022 (Eighth edition, 1987). (Solutions manual available)

Davis, Foote, Anderson, and Mikhail
Surveying Theory and Practice, (Sixth edition, 1981)
McGraw-Hill Book Company, 1221 Avenue of the Americas, New York, NY 10022

Zumberge, Mark Andrew
“*A Portable Apparatus for Absolute Measurements of the Earth's Gravity.*” Author’s copyright, 1981.
PH.D. thesis. University of Colorado at Boulder, CO (1981)
This publication is available on interlibrary loan service from the University of Colorado at Boulder Library, Boulder, CO 80309.