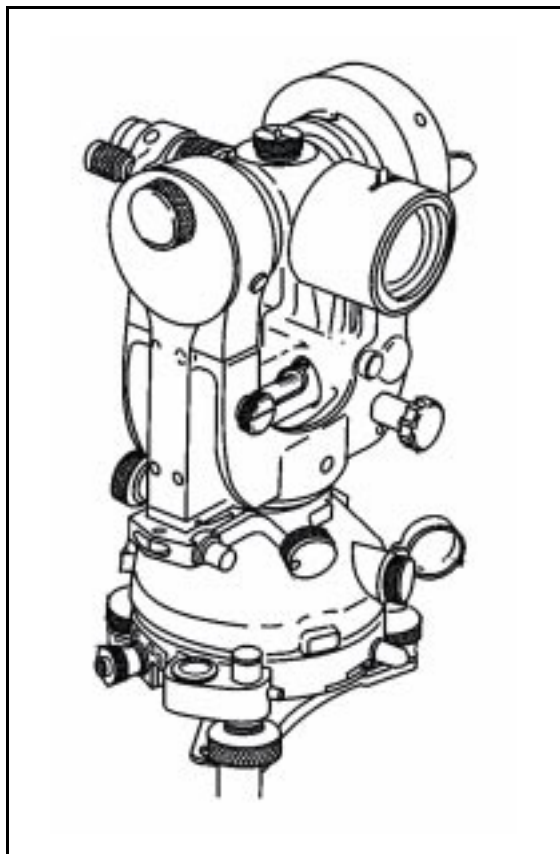


**FM 3-34.331**  
( FM 5-232)

# Topographic Surveying



**HEADQUARTERS, DEPARTMENT OF THE ARMY**

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# Topographic Surveying

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\*This Field Manual (FM) supersedes FM 5-232, 27 September 1989, and Technical Manuals (TMs) 5-232, 1 June 1971, and 5-237, 30 October 1964. It also supersedes DA Forms 1904, 1 February 1957; 1906, 1 February 1957; 1908, 1 February 1957; 1910, 1 February 1957; 1912, 1 February 1957; 1913, 1 February 1957; 1919, 1 February 1957; 1926, 1 February 1957; 1946, 1 February 1957; 1950, 1 February 1957; 1951, 1 February 1957; 1952, 1 February 1957; 1961, 1 October 1964; 1964, 1 February 1957; 2840, 1 October 1964; 2842, 1 October 1964; 2843, 1 October 1964; 2844, 1 October 1964; 2845, 1 October 1964; 2846, 1 October 1964; 2848, 1 October 1964; 2849, 1 October 1964; 2851, 1 October 1964; 2852, 1 October 1964; 2853, 1 March 1968; 2858, 1 March 1968; 2859, 1 March 1968; 2860, 1 October 1964; 2861, 1 October 1964; 2862, 1 October 1964; 2865, 1 March 1968; and 4727, 1 September 1978.

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## Preface

This FM is a guide for military occupational specialty (MOS) 82D (Topographic Surveyor). It provides techniques not found in any commercial text concerning the precise determination of position, azimuth, or elevation of a point. Additionally, this publication describes and standardizes procedures for performing recons, preparing station descriptions, and reporting and briefing of survey projects.

The material in this manual is applicable, without modification, to all geodetic survey projects in all environments (prebattle, conventional war [nuclear and nonnuclear], low intensity conflicts, and postbattle). The contents comply with Army doctrine and international precision surveying practices. This manual does not provide previously published surveying doctrine or theory and may be supplemented with commercially available texts or previous editions of technical literature.

Appendix A contains mensural conversion charts.

The proponent of this publication is HQ, TRADOC. Send comments and recommendations on Department of the Army (DA) Form 2028 directly to United States (US) Army Engineer School (USAES), Attention: ATSE-DOT-DD, Directorate of Training, 320 Engineer Loop, Suite 336, Fort Leonard Wood, Missouri 65473-8929.

Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.



## Chapter 1

# Missions, Operations, and Duties

Surveyors determine horizontal and vertical distances between objects, measure angles between lines, determine the direction of lines, and establish points of predetermined angular and linear measurements. After completing field measurements, surveyors use these measurements to compute a final report that is used for positioning by field artillery (FA), air-defense artillery (ADA), aviation, intelligence, communications, or construction control points. Appendix B summarizes the standards for control surveys, Appendix C details the recommended procedures for basic survey computations, and Appendix D includes a list of survey forms.

### **SURVEY MISSIONS**

1-1. Army topographic surveyors support multiple types of survey missions. These missions can be peacetime or wartime oriented.

### **SUPPORT DEPLOYABLE WEAPONS SYSTEMS**

1-2. Army topographic surveyors support FA and ADA deployable weapons systems by acquiring position and azimuth data as follows:

- **FA.** FA is a primary user of precise positioning and orientation information in a wartime environment. Topographic-survey support is provided to the multiple-launch rocket-system (MLRS) units, the corps's general-support (GS) units, and other nondivisional assets in the corps area according to FM 6-2. FA requires that topographic surveyors provide monumented survey control points (SCPs) (horizontal and vertical) and azimuthal references for conventional and inertial FA survey teams. FA sometimes requires topographic surveyors to augment FA survey sections.
- **ADA.** ADA requires positioning and orientation information for ADA systems. ADA and FA have an agreement that FA surveyors (MOS 82C) will provide direct ADA survey support.

### **SUPPORT THE NATIONAL IMAGERY AND MAPPING AGENCY**

1-3. The National Imagery and Mapping Agency's (NIMA's) geodetic survey division maintains US Army topographic surveyors as part of their survey force structure. These surveyors are involved as team leaders, as team members, and in the data-reduction process. In addition, these Army personnel are used in areas or situations where NIMA civilian personnel are not authorized (Saudi Arabia, Somalia, and so on). NIMA has the responsibility to provide earth-orientation data for the Navigation-Satellite Timing and Ranging (NAVSTAR) Global-Positioning System (GPS). NIMA