

Tactics, Techniques, and Procedures for
FIELD ARTILLERY SURVEY**Table of Contents**

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PREFACE

This publication is a guide for commanders, survey officers, and all personnel whose duties include planning, supervising, and performing field artillery (FA) surveys or training in those areas. The material presented herein applies without modification to both nuclear and nonnuclear warfare. This manual provides—

- Doctrine for instruction and employment of survey sections.
- Guidance and reference in survey principles.
- Procedures used in operating and maintaining equipment.

This manual discusses the survey personnel and equipment available to FA units. It describes and discusses—

- Measurement of angles and distances.
- Techniques of recording field data as they are determined.
- Different methods used to extend survey control.
- Basic astronomy and the methods and techniques used in astronomic observation to determine direction.
- Determination of relative locations on a rectangular grid system by using conventional survey methods, the position and azimuth determining system (PADS), and the global positioning system (GPS).
- Survey requirements and techniques used for different FA weapon and fire support systems.
- Survey planning required at all echelons.
- Standardized procedures relevant to survey operations (Appendix A) (denoted in text by a large asterisk [*]).
- Survey standards and specifications (Appendix B).
- Training for the FA surveyor (Appendix C).
- ★|Locally reproducible forms for use with the backup computer system (BUCS), the forward entry device meteorological/survey (FED MSR), and for recording survey control point (SCP) data. (See Appendix D for a list of these forms and the back of this publication for copies of the reproducible forms.)

★ It also includes the ellipsoid and datum tables (Appendix E), a grid zone chart (Appendix F), star cards (Appendix G), and extracts from the standardization agreements (STANAGs) and quadripartite standardization agreement (QSTAG) implemented by this book (Appendix H).

This publication implements the following international agreements:

- ★ STANAG 2934, *Artillery Procedures--AArtyP-1*. (This STANAG combines STANAGs 2865 and 2373.)
- QSTAG 269, *Survey Accuracy Requirements for Surface-to-surface Artillery*.

The proponent of this publication is HQ TRADOC. Send comments and recommendations on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to the following:

★Commandant
US Army Field Artillery School
ATTN: ATSF-GCS
Fort Sill, OK 73503-5600
DSN 639-6616/2805
Commercial (405) 442-616/2805

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

CHAPTER 1

MISSION, RESPONSIBILITIES, AND DUTIES

★ *The mission of FA survey is to provide a common grid that will permit the massing of fires, delivery of surprise observed fires, delivery of effective unobserved fires, and transmission of target data from one unit to another to aggressively neutralize or destroy enemy targets. The establishment of a common grid, and the single operational datum within the common grid is a command responsibility.*

★ **NOTE:** *Common grid* refers to all firing and target-locating elements within a unified command located and oriented, to prescribed accuracies, with respect to a single three-dimensional datum.

1-1. SURVEY PLANNING

a. Field artillery survey must provide indirect fire assets and target-locating assets with a common grid. Common survey control allows the maneuver commander to employ fire support resources with a guarantee of accurate and timely fire support. Survey planning within the force is based on the following tactical considerations:

- The commander's target adjustment policy (that is, if the element of surprise is an important aspect of his tactical plan).
- The requirement for transfer of adjusted target locations to higher and lower echelons.
- The required attack of deep high-payoff targets onto which fire cannot be adjusted (or if surprise is a factor).
- The planned positioning of indirect fire units during each phase of the operation.
- The planned tasking of target acquisition (TA) sensors and the processing of targets to an attack system.

b. The maneuver headquarters (HQ) establishes survey time lines and accuracy requirements in the initial planning stages of an operation. The maneuver commander gives the artillery commander (fire support coordinator [FSCOORD]) targeting priorities and the effects he requires on high-payoff targets. This information translates into survey requirements for the TA sensors and the designated attack systems, which must be on a common grid by the time required. The effects required on the target and inherent system inaccuracies determine the survey accuracy requirement (hasty, fourth-order, or fifth-order survey).

1-2. SURVEY OPERATIONS IN THE AIRLAND BATTLE

AirLand Battle (ALB) doctrine describes the Army's approach to generating and applying combat power at the operational and tactical levels. Surveyors must adapt this doctrine to their mission.

a. AirLand Battle Surveyor. The ALB surveyor understands the principles of all survey methods. His attitude is that some kind of survey is always possible, and some survey is better than no survey at all. He is a thinker with an open mind, an expert in land navigation, and confident in himself and his leaders. He takes the initiative to ensure a successful survey mission. Using initiative and ability, he makes good use of the available time and resources to provide accurate survey control when and where it is needed.

b. Survey Mission Under AirLand Battle. The mission of FA survey—provide a common grid—does not change under ALB doctrine. However, the use of split battery operations, composite units, intelligence and electronic warfare (IEW) sensors, new systems, and greater dispersion and displacements have increased the survey workload. During the first 2 or 3 days of battle, artillery units expect to make many moves. The number of survey points required will depend on the type of unit and the intensity of battle. Prior planning is essential. Before hostilities begin, units should survey a network of artillery positions in their area of operation.

c. AirLand Battle Basic Tenets. The ALB basic tenets of initiative, depth, agility, and synchronization are the foundation of the Army operational concept. Survey leaders and planners must understand how the ALB basic tenets relate to the survey mission.

(1) Initiative equates to the importance of speed. It means making things happen more quickly than the enemy can respond. Early planning enables commanders to take the initiative by ensuring that acquisition and firing units are located by common reference in relation to each other and that the data are timely and to the required accuracy. This provides for the rapid transfer of target data to and between firing elements without degrading accuracy.

(2) Depth is important to the survey planner. It directly relates to the need for accurate and responsive common survey control for deep strikes against the enemy and for accurate fire support in close and rear operations. A combination