

STP 5-82D34-SM-TG

**MOS 82D, Topographic
Surveyor, Skill Levels 3/4,
Soldier's Manual and
Trainer's Guide**

OCTOBER 2002

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DEPARTMENT OF THE ARMY**

MOS 82D, Topographic Surveyor, Skill Levels 3/4, Soldier's Manual and Trainer's Guide

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PREFACE

This publication is for skill level (SL) 3 and 4 soldiers who hold a military occupational specialty (MOS) of 82D and their trainers or leaders. It contains standardized training objectives (in the form of task summaries) that may be used to train and evaluate soldiers on critical tasks that support unit missions during wartime. Trainers and leaders should actively plan for soldiers holding MOS 82D to have access to this publication.

Most tasks in this manual are applicable to active component (AC) and reserve component (RC) soldiers, which include the Army National Guard (NG) and the Army Reserve. However, some tasks are only for active duty soldiers due to the differences of equipment and missions. Tasks unique to RC soldiers are identified by RC following the task title and grouped into RC-unique subject areas.

Users of this publication are encouraged to recommend changes and submit comments for its improvement. Comments should be keyed to a specific page, paragraph, and line of text in which the change is recommended. Reasons should be provided for each comment to ensure understanding and complete evaluation. Comments should be prepared using a Department of the Army (DA) Form 2028 and forwarded directly to the Commander, United States (US) Army Maneuver Support Center, ATTN: ATZT-DT-WR-E, Building 3200, Directorate of Training Development, 320 MANSCEN Loop, Suite 210, Fort Leonard Wood, MO 65473-8929.

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

CHAPTER 1

Introduction

GENERAL

1-1. This manual identifies the individual military occupational specialty (MOS) training requirements for soldiers in MOS 82D. It is designed to be used by commanders, trainers, and soldiers to plan, conduct, and evaluate individual training in units. This manual is the primary reference for supporting self-development, evaluating MOS proficiency, and training of 82D soldiers. Commanders employ two primary methods to evaluate soldiers' proficiency:

- *Commander's evaluation.* Commander's evaluations are local tests or assessments of soldier's performance of MOS-specific and common tasks critical to the unit mission. They may be conducted year-round.
- *Common task test (CTT).* CTTs are hands-on tests used to evaluate proficiency on common tasks. Alternate written tests are provided if equipment is not available for hands-on testing.

1-2. This manual should be used along with Soldier Training Publications (STPs) 21-1-soldier's manual of common tasks (SMCT) and 21-24-SMCT; Army Training and Evaluation Programs (ARTEPs); and Field Manuals (FMs) 25-4, 25-5, 25-100, and 25-101 to establish effective training plans and programs that integrate individual and collective tasks.

TASK SUMMARIES

1-3. Task summaries contain information necessary to conduct training and evaluate soldier proficiency on tasks critical to the MOS. A separate task summary is provided for each critical task. These task summaries are, in effect, standardized training objectives that ensure that soldiers do not have to relearn a task on reassignment to a new unit. The format for the task summaries included in this manual is as follows:

- *Task Title.* The task title identifies the action to be performed.
- *Task Number.* A 10-digit number identifies each task or skill. Include this task number, along with the task title, in any correspondence relating to the task.
- *Conditions.* The task conditions identify all the equipment, tools, references, job aids, and supporting personnel that the soldier needs to perform the task in wartime. This section identifies any environmental conditions that could alter task performance, such as visibility, temperature, and wind. This section also identifies any specific cues or events (a chemical attack or identification of a threat vehicle) that triggers task performance.
- *Standards.* The task standards describe how well and to what level you must perform a task under wartime conditions. Standards are typically described in terms of accuracy, completeness, and speed.
- *Training and Evaluation.* This section may contain all or part of the following: the training information outline, the evaluation preparation subsection, and the evaluation guide. The training information outline includes detailed training information. The evaluation preparation subsection indicates the necessary modifications to the task performance in order to train and evaluate a task that cannot be trained to the wartime standard under wartime conditions. It may also include special training and evaluation preparation instructions to accommodate these modifications and any instruction that should be given

to the soldier before evaluation. The evaluation guide identifies the specific actions, known as performance measures, that the soldier must do to successfully complete the task. These actions are listed in a pass/fail format for easy evaluation. Each evaluation guide contains a feedback statement that indicates the requirements for receiving a GO on the evaluation.

- *References.* This section identifies references that provide more detailed and thorough explanations of task performance requirements than that given in the task summary description.

1-4. Additionally, some task summaries include safety statements and notes. Safety statements (danger, warning, and caution) alert users to the possibility of immediate death, personal injury, or damage to equipment. Notes provide a small, extra supportive explanation or hint relative to the performance measures.

SOLDIER'S RESPONSIBILITIES

1-5. Each soldier is responsible for performing individual tasks which the first-line supervisor identifies based on the unit's mission essential task list (METL). The soldier must perform the task to the standards listed in the soldier's manual (SM). If a soldier has a question about how to do a task or which tasks in this manual he must perform, it is the soldier's responsibility to ask the first-line supervisor for clarification. The first-line supervisor knows how to perform each task or can direct the soldier to the appropriate training materials.

NONCOMMISSIONED OFFICER SELF-DEVELOPMENT AND THE SOLDIER'S MANUAL

1-6. Self-development is one of the key components of the leader development program. It is a planned, progressive, and sequential program followed by leaders to enhance and sustain their military competency. It consists of individual study, research, professional reading, practice, and self-assessment. Under the self-development concept, the noncommissioned officer (NCO), as an Army professional, has the responsibility to remain current in all phases of the MOS. The SM is the primary source for the NCO to use in maintaining MOS proficiency.

1-7. Another important resource for NCO self-development is the Army Correspondence Course Program (ACCP). (See DA Pamphlet 350-59 for information on enrolling in this program and for a list of courses, or write to: Army Institute for Professional Development, US Army Training Support Center, ATTN: ATIC-IPS, Newport News, Virginia 23628-0001.)

1-8. Unit learning centers are valuable resources for planning self-development programs. They can help access enlisted career maps, training support products, and extension training materials.

TRAINING SUPPORT

1-9. This manual includes the following appendixes and information that provide additional training support information:

- *Appendix B, Department of the Army (DA) Form 5164-R (Hands-On Evaluation).* This appendix provides a copy of DA Form 5164-R. The NCO trainer can use this form to set up the leader book described in FM 25-101. The use of this form may help preclude writing the soldier tasks associated with the unit's METL and can become a part of the leader book.
- *Appendix C, Department of the Army (DA) Form 5165-R (Field Expedient Squad Book).* This appendix provides a copy of DA Form 5165-R. The NCO trainer can use this form to set up the leader book described in FM 25-101. The use of this form may help

preclude writing the soldier tasks associated with the unit's METL and can become a part of the leader book.

- *Appendix D, Conversion Factors (United States [US] and Metric Units).* This appendix provides an English to metric measurement conversion chart.
- *Glossary.* The glossary is a single comprehensive list of acronyms, abbreviations, definitions, and letter symbols.
- *References.* This section contains two lists of references, required and related, that supports the training of all tasks in this SM. Required references are listed in the conditions statement and are required for the soldier to do the task. Related references are materials that provide more detailed information and a more thorough explanation of task performance.

ENLISTED PERSONNEL MANAGEMENT SYSTEM

1-10. The enlisted personnel management system (EPMS) (AR 614-200) is the Army's overall system to improve the professionalism of the enlisted force. It integrates policies relating to training, evaluation, classification, and promotion into an overall system. It provides the soldier with a means to look to the future and see a realistic, clear, and viable career progression path from private to sergeant major (SGM). However, the EPMS is useless if the soldier does not understand and use it. Part of the trainer's job is to make sure the soldier understands and uses the EPMS. As an aid, Figure 1-1 provides the trainer with a career map for the 82D soldier. Along with information contained in AR 614-200, the soldier can use the career map to develop goals early in his career and plan accordingly.

NCOES	PLDC	BNCOC	ANCOC	USASM		
Civilian schools	High school, GED diploma	College*				
		1 year	2 years	3 years		
		A goal: troop assignments often preclude off duty education.				
Other schools	Drill Sergeant School Recruiting School		Battle Staff Course 1SG Course			
Encouraged assignments	CMF 81 staff assignments Operations/intelligence sergeant Instructor ----- Recruiter/ Drill sergeant----- Training Developer/Writer					
Key leadership assignments	Topographic Surveyor	Team ldr Sqd ldr	Sqd ldr Sec ldr	Opns sgt Sec Leader	1SG	CSM
Rank	PVT, PFC SPC, CPL	SGT	SSG	SFC	1SG MSG	SGM CSM
Years of service	1-4	3-8	6-14	10-18	16-22	20+

Figure 1-1. Career map, career management field (CMF) 81

SKILL PROGRESSION CHART

1-11. Similar or related education, training, and experience are grouped into career management fields (CMFs). The career progression path for MOS 82D, CMF 81, Topographic Surveyor, is shown in Figure 1-2.

E-9	00Z50 Command Sergeant Major
SL 5 E-8 through E-9	81Z50 Senior Topographic Ops Sgt. First Sergeant
SL 4 (E-7)	82D40 Section Leader Senior Survey Operations Sgt.
SL 3 (E-6)	82D30 Squad leader
SL 2 (E-5)	82D20 Topographic Survey Sergeant Survey Operations Sergeant
SL 1 (E-1 through E-4)	82D10 Topographic Surveyor
	Trainee

Figure 1-2. Career progression sequence for general engineering (CMF 81)

CHAPTER 2

Trainer's Guide

2-1. General. The MOS Training Plan (MTP) identifies the essential components of a unit training plan for individual training. Units have different training needs and requirements based on differences in environment, location, equipment, dispersion, and similar factors. Therefore, the MTP should be used as a guide for conducting unit training and not a rigid standard. The MTP consists of two parts. Each part is designed to assist the commander in preparing a unit training plan which satisfies integration, cross training, training up, and sustainment training requirements for soldiers in this MOS.

Part One of the MTP shows the relationship of an MOS skill level between duty position and critical tasks. These critical tasks are grouped by task commonality into subject areas.

Section I lists subject area numbers and titles used throughout the MTP. These subject areas are used to define the training requirements for each duty position within an MOS.

Section II identifies the total training requirement for each duty position within an MOS and provides a recommendation for cross training and train-up/merger training.

- **Duty Position Column.** This column lists the duty positions of the MOS, by skill level, which have different training requirements.
- **Subject Area Column.** This column lists, by numerical key (see Section I), the subject areas a soldier must be proficient in to perform in that duty position.
- **Cross Train Column.** This column lists the recommended duty position for which soldiers should be cross trained.
- **Train-Up/Merger Column.** This column lists the corresponding duty position for the next higher skill level or MOSC the soldier will merge into on promotion.

Part Two lists, by general subject areas, the critical tasks to be trained in an MOS and the type of training required (resident, integration, or sustainment).

- **Subject Area Column.** This column lists the subject area number and title in the same order as Section I, Part One of the MTP.
- **Task Number Column.** This column lists the task numbers for all tasks included in the subject area.
- **Title Column.** This column lists the task title for each task in the subject area.
- **Training Location Column.** This column identifies the training location where the task is first trained to soldier training publications standards. If the task is first trained to standard in the unit, the word "Unit" will be in this column. If the task is first trained to standard in the training base, it will identify, by brevity code (ANCOC, BNCOC, etc.), the resident course where the task was taught. Figure 2-1 contains a list of training locations and their corresponding brevity codes.

UNIT	Trained in the Unit
BNCOC	Basic NCO Course
OJT	On the Job Training

Figure 2-1. Training Locations

- **Sustainment Training Frequency Column.** This column indicates the recommended frequency at which the tasks should be trained to ensure soldiers maintain task proficiency. Figure 2-2 identifies the frequency codes used in this column.

BA	- Biannually
AN	- Annually
SA	- Semiannually
QT	- Quarterly
MO	- Monthly
BW	- Bi-weekly
WK	- Weekly

Figure 2-2. Sustainment Training Frequency Codes

- **Sustainment Training Skill Level Column.** This column lists the skill levels of the MOS for which soldiers must receive sustainment training to ensure they maintain proficiency to soldier's manual standards.

2-2. Subject Area Codes.

Skill Level 3

- 1 General
- 2 Automated Integrated Survey Instrument
- 3 Traverse
- 4 Level
- 5 Differential Global Positioning System

Skill Level 4

- 1 General

2-3. Critical Tasks List.

**MOS TRAINING PLAN
82D34**

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
Skill Level 3					
1. General	052-260-3512	Prepare a Field Reconnaissance Report	OJT	MO	3-4
	052-260-3620	Supervise Deployable Weapons Systems Survey	UNIT	QT	3-4
	052-260-3622	Supervise Aviation Support Survey	OJT	QT	3-4
	052-260-3624	Supervise Signal/Intelligence Support Survey	UNIT	QT	3-4
	052-260-3701	Prepare a Project Progress Report	UNIT	MO	3-4
	052-260-3712	Conduct a Project Briefing	UNIT	MO	3-4
	052-260-3803	Direct Operator Maintenance on Survey Equipment	UNIT	MO	3-4
2. Automated Integrated Survey Instrument	052-260-3711	Supervise Survey Drafting	UNIT	MO	3-4
3. Traverse	052-260-3411	Check Traverse Computations	BNCOC	QT	3-4
	052-260-3702	Plan a Traverse (Field Operations)	UNIT	MO	3-4
4. Level	052-260-3413	Check Leveling Computations	UNIT	MO	3-4
	052-260-3704	Plan a Level Line or Net (Field Operations)	UNIT	MO	3-4
5. Differential Global Positioning System	052-260-3412	Check DGPS Computations	UNIT	QT	3-4
	052-260-3630	Plan DGPS Survey Project	UNIT	MO	3-4
Skill Level 4					
1. General	052-260-4402	Plan Signal/Intelligence Support Survey	UNIT	QT	3-4
	052-260-4403	Plan Aviation Support Survey	UNIT	QT	3-4
	052-260-4404	Plan Deployable Weapons Systems Survey	UNIT	QT	3-4
	052-260-4411	Perform Quality Control Checks of Survey Data	UNIT	MO	3-4
	052-260-4412	Disseminate Survey Data	UNIT	QT	3-4

CRITICAL TASKS

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
	052-260-4413	Perform as Technical Authority in all Survey Matters	UNIT	QT	3-4
	052-260-4501	Perform Office Reconnaissance for a Survey Project	UNIT	QT	3-4
	052-260-4704	Check a Project Progress Report	UNIT	QT	3-4
	052-260-4705	Maintain a Deployable Data Base	UNIT	QT	3-4
	052-260-4714	Approve Field Operations Plans	UNIT	QT	3-4
	052-260-4715	Coordinate Administrative and Logistical Support for a Survey Project	UNIT	QT	3-4
	052-260-4717	Perform Staff Position Duties Essential To Unit Mission	UNIT	QT	3-4

CHAPTER 3
MOS/Skill Level Tasks

Skill Level 3
Subject Area 1: General

Prepare a Field Reconnaissance Report
052-260-3512

Conditions: You are assigned as either a squad leader or a survey operation sergeant in a secure field location, and given pertinent survey and logistical information, Department of the Army (DA) Form 1958 or DA Form 1959, Field Manual (FM) 3-34.331, and the unit standing operating procedure (SOP).

NOTE: The trainer will give information, as requested by the soldier.

Standards: Prepare the reconnaissance report according to FM 3-34.331, the unit SOP, and project specifications.

Performance Steps

NOTE: Refer to FM 3-34.331.

1. Prepare a sketch or an overlay of the area to be surveyed.
2. Ensure that DA Form 1958 or DA Form 1959 are completed.
3. Prepare the narrative report.
4. Compile the information and turn it in to the project chief.

Evaluation Preparation: Setup: The trainer will give the soldier pertinent survey and logistical information.

Brief Soldier: Tell the soldier that, upon request, the trainer will provide any additional needed information or forms.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Prepared a sketch or an overlay of the area to be surveyed.	—	—
2. Ensured that DA Form 1958 or DA Form 1959 were completed.	—	—
3. Prepared the narrative report.	—	—
4. Compiled the information and turned it in to the project chief.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required
DA FORM 1958
DA FORM 1959
FM 3-34.331

Related

Supervise Deployable Weapons Systems Survey
052-260-3620

Conditions: You are assigned as a squad leader or survey section sergeant in a field location, given survey project specifications, equipment, a map of the area, an overlay, a trig list, survey control recovery cards, the reconnaissance report, Field Manual (FM) 6-2.

Standards: Supervise the complete planning of deployable weapons systems survey operations in order to ensure that the survey crew has access to the area of the requested survey for the purpose of identifying, verifying, and transferring horizontal and vertical controls and establishing coordinates for the multiple-launch rocket-system, conventional and inertial field artillery survey teams, and for augmenting field artillery survey sections.

Performance Steps

1. Ensure that the survey crew chief obtains logistical support.
2. Ensure that the survey crew chief recovers the survey control points.
3. Ensure that the survey crew chief installs new monuments (if required).
4. Direct the survey crew chief to determine the scope of the project.
5. Direct the survey crew chief to distribute survey control points established for field artillery and air defense artillery to each corps's general-support units, inertial field artillery survey teams and survey sections, and other nondivisional assets in the corps area according to FM 6-2.
6. Ensure that the survey crew chief notifies the Operations and Training Officer (S3) of the various datums within the area of operation.
7. Ensure that the survey crew chief provides the S3 with the necessary parameters and instructions on how to transform local coordinates to a predefined common grid (for example, the World Geographic Coordinate System [WGS 84]).

Evaluation Preparation: Setup: In a field location, soldiers should be given the items listed in the conditions statement. The test project will be fictitious and relatively short, but should be structured in order to test the soldier's ability to perform all performance measures. This task is designed to be a preparation for actually supervising the field operations. It is a follow on to a deployable weapons systems survey. The evaluator will prepare equipment in advance in order to ensure that the task standards can be met. Ensure that all safety precautions are followed.

Brief Soldier: Identify all of the materials and data that will be used in this task.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Ensured that the survey crew chief obtained logistical support.	—	—
2. Ensured that the survey crew chief recovered the survey control points.	—	—
3. Ensured that the survey crew chief installed new monuments (if required).	—	—
4. Directed the survey crew chief to determine the scope of the project.	—	—
5. Directed the survey crew chief to distribute survey control points established for field artillery and air defense artillery to each corps's general-support units, inertial field artillery survey teams and survey sections, and other nondivisional assets in the corps area according to FM 6-2.	—	—

Performance Measures

	<u>GO</u>	<u>NO GO</u>
6. Ensured that the survey crew chief notified the S3 of the various datums within the area of operation.	—	—
7. Ensured that the survey crew chief provided the S3 with the necessary parameters and instructions on how to transform local coordinates to a predefined common grid (for example WGS 84).	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required

FM 6-2

Related

FM 3-34.331

Supervise Aviation Support Survey
052-260-3622

Conditions: You are assigned as a squad leader or survey operations sergeant in an airfield location, given survey project specifications, equipment, applicable references, and instrument operators, Department of the Army (DA) Form 1958, and DA Form 1959.

Standards: Supervise the survey crew performance of aviation support survey operations in order to ensure that the survey crew, after receiving project directives, performs office recon, field recon, field work, drafting and computation according to specifications and according to federal aviation regulations part 77 (FAR-77) obstructions.

Performance Steps

1. Assign soldiers to operate the instruments, computers, and recorders. Assign a soldier as a rodman.
2. Give the project directive to the survey crew.
3. Ensure that field reconnaissance is conducted.
 - a. Identify and verify the usefulness of existing survey control monuments in and around the airfield. These monuments are permanently established points with known horizontal and vertical components.
 - b. Ensure that all of the recovered stations have not been disturbed or moved.
 - c. Ensure that the newly selected station sites meet all of the project specifications.
 - d. Ensure that the crew writes a narrative report and includes all information pertinent to mission accomplishment such as the following:
 - (1) Project designation
 - (2) Reconnaissance-party personnel
 - (3) Names and titles of personnel contacted
 - (4) Access agreements concluded and access specifically denied
 - (5) Date signed and name of agency for all technical support agreements
 - (6) Names and locations of all logistical and medical support
 - (7) Funding agreements
 - (8) Hazard warnings
 - (9) Hostilities such as terrain and climatic restrictions
 - (10) Specific required actions not accomplished and the reason they were not accomplished
 - (11) Recommended methods
 - (12) Special equipment requirements
4. Establish the network of known points that will be used to observe the data needed for the project.
 - a. Ensure that the traverse routes are determined (if required).

NOTE: The routes must meet all project specifications and require the least amount of traverse legs and time to complete.

NOTE: The lines of site between traverse points must be cleared.

 - b. Ensure that the Global Positioning System (GPS), topographic, and level-lines requirements are determined.
 - c. Ensure that all of the airfield instrumentation is determined.
 - d. Check DA Form 1958 or DA Form 1959 for each recovered and established station.
5. Ensure that the survey crew prepares a reconnaissance sketch or overlay and includes all of the information pertinent to mission accomplishment.
 - a. Receive office reconnaissance and identify the points requiring control.
 - b. Determine the locations of survey control that are usable for proposed survey work, and plot them on a map overlay.
 - c. Safeguard the map overlay and any supporting documents according to Army regulation (AR) 380-5.

Performance Steps

6. Ensure that the field crew performs the necessary observations and all fieldwork.
 - a. Instruct the soldiers on specific drafting, sheet requirements, and scale.
 - b. Ensure that the drafting and the computing are done accurately and according to specifications during the project.
 - c. Spot-check the configuration, data import, drafting, and sheet creation.
7. Check to ensure that all required reports and charts are produced.
8. Verify that accuracy requirements in the requested criteria are met.

Evaluation Preparation: Setup: In an airfield location, soldiers should be given the items listed in the CONDITIONS statement. The test project will be fictitious and relatively short, but should be structured to test the soldier's ability to perform all performance measures. This task is designed to be a preparation for actually supervising the airfield operations. It is a follow on to an airfield survey. The evaluator will prepare equipment in advance to ensure that the task standards can be met. Ensure that all safety precautions are followed.

Brief Soldier: Identify all materials and data that will be used in this task. Explain that scoring will be GO or NO GO, based upon the successful completion of all performance measures.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Assigned soldiers to perform as instrument operators, rodman, computers, and recorders.	—	—
2. Gave project directive to survey crew.	—	—
3. Ensured field reconnaissance was conducted.	—	—
4. Established the network of known points that will be used to observe the data needed for the project.	—	—
5. Ensured that the survey crew prepared the reconnaissance sketch or overlay and included all information pertinent to mission accomplishment.	—	—
6. Ensured that the field crew performed the necessary observations and all fieldwork.	—	—
7. Checked to ensure that all required reports and charts were produced.	—	—
8. Verified that accuracy requirements in the requested criteria were met.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required
 DA FORM 1958
 DA FORM 1959

Related
 AR 380-5
 DMS ST 005
 DMS ST 031
 DMS ST 032
 DMS ST 045
 EM 1110-1-1003
 FM 3-34.331

**Supervise Signal/Intelligence Support Survey
052-260-3624**

Conditions: You are assigned as a senior survey topographic sergeant or a survey section sergeant in a field location, given survey project specifications, equipment, a map of the area, an overlay, a trig list, survey control recovery cards, and the reconnaissance report.

Standards: Supervise the preparation for the survey. Execute the survey plan in order to ensure that the survey crew has access to the area of the requested survey in order to identify, verify, and transfer horizontal and vertical controls; and to establish coordinates for remote-operated vehicles, remote sensing-and-imaging systems' geolocation and direction, inertial navigation initialization, situation awareness, and combat identification.

Performance Steps

1. Ensure that the survey crew chief:
 - a. Acquires logistical support.
 - b. Recovers the survey control points.
 - c. Installs new monuments (if they are required).
 - d. Determines the scope of the project.
 - e. Distributes the survey control points established for field artillery and air defense artillery to the operations and training officer of each intelligence and signal battalion's operation section.
 - f. Notifies the Operations and Training Officer (S3) of the various datums within the area of operation.
 - g. Supplies the S3 with the necessary parameters and instructions on how to transform local coordinates to a predefined common grid (for example, the World Geographic Coordinate System [WGS 84]).

Evaluation Preparation: Setup: In a field location, soldiers should be given the items listed in the conditions statement. The test project will be fictitious and relatively short, but should be structured to test the soldier's ability to perform all performance measures. This task is designed to be a preparation for actually planning the field operations. It is a follow on to a signal/intelligence survey. The evaluator will prepare equipment in advance to ensure that the task standards can be met. Ensure that all safety precautions are followed.

Brief Soldier: Identify all materials and data that will be used in this task.

Performance Measures

GO NO GO

- | | |
|--|---------------------------|
| <ol style="list-style-type: none"> 1. Ensured that the survey crew chief: <ol style="list-style-type: none"> a. Acquired logistical support b. Recovered the survey control points. c. Installed new monuments (if they were required) d. Determined the scope of the project. e. Distributed the survey control point established for field artillery and air defense artillery to the operations and training officer of each intelligence and signal battalion's operation section. f. Notified the S3 of the various datums within the area of operation. g. Supplied the S3 with the necessary parameters and instructions on how to transform local coordinates to a predefined common grid (for example WGS 84). | <p>_____</p> <p>_____</p> |
|--|---------------------------|

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

**References
Required**

Related
FM 3-34.331

Prepare a Project Progress Report
052-260-3701

Conditions: You are assigned as a squad leader or survey operations sergeant in a secure field operations location, given topographic maps, reconnaissance reports, observation reports, computations, station description cards, trig lists, aerial photography, vehicle and equipment status reports, weather records and forecasts, project work order specifications, and Field Manual (FM) 3-34.331.

Standards: Compile all factual data related to the project and its specifications, to include a narrative in chronological order and statistical supporting data according to the unit standing operating procedure (SOP).

Performance Steps

NOTE: Refer to FM 3-34.331.

1. Spot-check the field notes and compute the final data for accuracy.
2. Check the field and operation section procedures for conformity to the unit SOP and project specifications.
3. Compare the work performed and its accuracy to the project schedule in order to determine if the project is on schedule.
4. Prepare a written report in detail. Include statistical data in the report, a descriptive narrative of work accomplished, other events affecting the project, and recommendations that would improve productivity or the project.

Evaluation Preparation: Setup: Have on hand all available data on either a simulated or an actual survey project. Ensure that work order specifications are available because they dictate project requirements and outcome. Ensure that any standardized report formats currently used in the field are available.

Brief Soldier: Identify all of the data sources to the soldier.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Spot-checked field notes and computed final data for accuracy.	—	—
2. Checked the field and operation section procedures for conformity to the unit SOP and project specifications.	—	—
3. Compared the work performed and its accuracy to the project schedule in order to determine if the project was on schedule.	—	—
4. Prepared a written report in detail. Included statistical data in the report, a descriptive narrative of work accomplished, other events affecting the project, and recommendations that would improve productivity or the project.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required
FM 3-34.331

Related

Conduct a Project Briefing

052-260-3712

Conditions: You are assigned as a squad leader or survey operation sergeant in a secure field location, given all compiled data, including the survey project work order, a map overlay, weather data, a reconnaissance report, and a project progress report.

Standards: Brief the commander either on a proposed survey project or a project currently in progress. The project will include the extent of proposed work, manpower and material requirements, all time factors involved, specific recommendations or project status, all factors causing project delays, changes to original project requirements and specific recommendations.

Performance Steps

1. Present the status of the proposed project or the project in progress.
2. Present the detailed requirements of manpower, equipment, materials, and the time needed or used for project.
3. Present the details of any changes to the original project work order request.
4. Present any specific recommendations that will change the proposed project or project in progress.
5. Summarize the project briefing and answer questions about the project.
6. Provide supporting materials with written documentation, maps, map overlays, charts, and sketches.

Evaluation Preparation: Setup: The testing of this task may be structured for either a proposed project or one that is in progress. The materials listed in the conditions statement corresponding to the type of briefing should be on hand. After the soldier has prepared the brief, it may be presented to the evaluator orally with supporting written text for evaluation of effectiveness and accuracy.

Brief soldier: Tell the soldier which materials to use.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Presented the status of the proposed project or the project in progress.	—	—
2. Presented the detailed requirements of manpower, equipment, materials, and the time needed or used for the project.	—	—
3. Presented the details of any changes to the original project work order request.	—	—
4. Presented any specific recommendations that would change the proposed project or the project in progress.	—	—
5. Summarized the project briefing and answered questions about the project.	—	—
6. Provided supporting materials.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required

Related

FM 101-5
FM 3-34.331

Direct Operator Maintenance on Survey Equipment
052-260-3803

Conditions: You are assigned as a squad leader or survey operations sergeant in a secure field location during daylight hours with no precipitation, given the assigned equipment and accessories, Technical Manual (TM) 5-6675-244-15, TM 5-6675-332-10, appropriate cleaning materials, a blank Department of the Army (DA) Form 2404, a pen with black ink, and an instrument operator.

Standards: Ensure that the instrument operator performs preventive maintenance checks and services (PMCS) in order to correct all operator level faults. The operator will record all uncorrectable faults on DA Form 2404. The instrument will be inspected for maintenance performed and serviceability.

Performance Steps

1. Assign soldiers to perform PMCS on equipment according to the instrument operator's manual.
2. Instruct the soldiers to perform checks in order and to annotate any uncorrected faults.
3. Spot-check the maintenance and instrument tests.
4. Verify that the uncorrected faults are annotated on DA Form 2404.

Evaluation Preparation: Setup: Have available the assigned equipment and accessories, the applicable TM or maintenance manual, appropriate cleaning materials, and a blank DA Form 2404 and an assistant to act as instrument operator.

Brief Soldier: Identify the equipment and the instrument operator.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Assigned soldiers to perform PMCS on equipment according to the instrument operator's manual.	—	—
2. Instructed the soldiers to perform checks in order and to annotate any uncorrected faults.	—	—
3. Spot-checked the maintenance and instrument tests.	—	—
4. Verified that the uncorrected faults were annotated on DA Form 2404.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier a NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required

DA FORM 2404
TM 5-6675-244-15
TM 5-6675-332-10
TRIMNET PLUS

Related

DA PAM 738-750
FM 3-34.331

Subject Area 2: Automated Integrated Survey Instrument

Supervise Survey Drafting

052-260-3711

Conditions: You are assigned as a squad leader or survey operations sergeant in a secure field location using a microprocessor loaded with TerraModel software and a connected plotter, given automatic integrated survey instrument (AISI) data and instruction on project requirements, Technical Manual (TM) 5-6675-332-10, TRIMNET PLUS.

Standards: Supervise the operators configuration of the software, post processing of data from AISI and Global Positioning System (GPS) using a microprocessor, and the production of the required drafted product. Processing must be in accordance with the standards set forth in the manufacturer's operation manual. The data will be encased in the prescribed borders with legend and title block, and plotted to the indicated scale.

Performance Steps

1. Assign soldiers to perform software and hardware configuration according to the instrument operator's manuals.
2. Instruct the soldiers on defined drafting, sheet requirements, and scale.
3. Spot-check the configuration, import, drafting, and sheet creation.
4. Verify that accuracy and requested criteria are met.

Evaluation Preparation: Setup: Have available the assigned equipment and data, TM 5-6675-332-10 and the manufacturers manual, appropriate support documentation, and a defined drafting and sheet requirement, and an assistant to act as instrument operator.

Brief Soldier: Identify the equipment and the instrument operator.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Assigned soldiers to perform software and hardware configuration according to the instrument operator's manuals.	—	—
2. Instructed the soldiers on defined drafting, sheet requirement, and scale.	—	—
3. Spot-checked configuration, import, drafting, and sheet creation.	—	—
4. Verified that accuracy and requested criteria were met.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier a NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required
 TM 5-6675-332-10
 TRIMNET PLUS

Related
 FM 3-34.331

Subject Area 3: Traverse

Check Traverse Computations

052-260-3411

Conditions: You are assigned as a squad leader or survey operations sergeant in a secure field location, given completed Department of the Army (DA) Form 1940, the project directive, completed DA Form 1916 for all traverse angles, reduced distances (S) for each traverse leg, completed DA Form 1943, completed elevation computations, completed T azimuth computations, a scientific calculator, National Oceanic and Atmospheric Administration (NOAA) Specifications, and DA form 1945.

Standards: Spot-check all abstracts, distances, elevations, azimuths, and final traverse computations to ensure they conform with the references and the standing operating procedure (SOP) and are neat and legible. When errors or omissions are found, take corrective action.

Performance Steps

1. Spot-check DA Form 1916 and note all errors and omissions. Ensure that:
 - a. Administrative data is correct.
 - b. Book and page references are at the top of each abstract and are correct.
 - c. All angular entries and computations are correct.
 - d. All items are entered neatly and legibly.
2. Spot-check DA Form 1943 and note all errors and omissions. Ensure that:
 - a. Administrative data is correct.
 - b. Book and page references are at the top of each abstract and are correct.
 - c. All angular entries and computations are correct.
 - d. All items are entered neatly and legibly.
3. Spot-check the computation of T distance. Note all errors and omissions.
4. Spot-check DA Form 1945. Note all errors and omissions.
5. Spot-check the computation of S distance. Note all errors and omissions.
6. Spot-check the computation of starting and closing azimuths and astronomic azimuths, if applicable. Note all errors and omissions.
7. Spot-check computations and entries on DA Form 1940. Note all errors/omissions.
8. Ensure that the two independent computations agree and meet specifications.

Evaluation Preparation: Setup: The soldier should be tested by using a completed traverse of at least five legs. The project directive should mention the requested 3d order class II specifications.

Brief Soldier: Tell the soldier that the angle field notes have been checked and that the distance forms have been checked to uncorrected distance; mean uncorrected slope distance (UD).

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Spot-checked DA Form 1916 and noted all errors and omissions.	—	—
2. Spot-checked DA Form 1943 and noted all errors and omissions.	—	—
3. Spot-checked the computation of T distance. Noted all errors and omissions.	—	—
4. Spot-checked DA Form 1945. Noted all errors and omissions.	—	—
5. Spot-checked the computation of S distance. Noted all errors and omissions.	—	—

Performance Measures

	<u>GO</u>	<u>NO GO</u>
6. Spot-checked the computation of starting and closing azimuths and astronomic azimuths, if applicable. Noted all errors and omissions.	—	—
7. Spot-checked computations and entries on DA Form 1940. Noted all errors and omissions.	—	—
8. Ensured that the two independent computations agreed and met specifications.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required

DA FORM 1916
 DA FORM 1940
 DA FORM 1943
 DA FORM 1945
 NOAA SPECIFICATIONS

Related

FM 3-34.331

Plan a Traverse (Field Operations)

052-260-3702

Conditions: You are assigned as a squad leader or survey operations sergeant in a field location, given survey project specifications, a military map and overlay, a trig list, survey control recovery cards, Field Manual (FM) 3-34.331, and the reconnaissance report, including the friendly unit's areas of operations.

Standards: Complete the planning of traverse field operations in order to ensure that the traverse crew has access to the area of the requested traverse. Employ usable existing control; determine all needed monumentation, tower construction, and line-of-sight clearing; plot the planned traverse on an overlay; develop a schedule of work progress; and eliminate or reduce to a minimum any delays due to field operations.

Performance Steps

NOTE: Refer to FM 3-34.331.

1. Determine what existing recovered survey control is usable and meets the project specifications from the reconnaissance reports and trig lists.
2. Determine the starting stations, number of temporary stations, and length of lines and/or loops.
3. Determine the amount and location of line-of-sight clearing and tower construction.
4. Determine the security requirements to be used in order to enter restricted areas and/or the friendly unit's areas of operation.
5. Select the location of permanent monuments.
6. Plot the planned traverse project on a map overlay.
7. Prepare a timetable of project events using reverse planning.

Evaluation Preparation: Setup: In a field location, soldiers should be given the items listed in the conditions statement. The test project will be fictitious and relatively short, but should be structured to test the soldier's ability to perform all performance measures. This task is designed to be a preparation for actually supervising the field operations. It is a follow-on to office and site reconnaissance. The evaluator must use discretion in selecting and designing the test site.

Brief Soldier: Identify all materials and data that will be used in this task.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Determined what existing recovered survey control was usable and met project specifications from the reconnaissance reports and trig lists.	—	—
2. Determined the starting stations, number of temporary stations, and length of lines and/or loops.	—	—
3. Determined the amount and location of line-of-sight clearing and tower construction.	—	—
4. Determined the security requirements to be used in order to enter restricted areas and/or the friendly unit's areas of operation.	—	—
5. Selected the location of permanent monuments.	—	—
6. Plotted the planned traverse project on a map overlay.	—	—
7. Prepared a timetable of project events using reverse planning.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required
FM 3-34.331

Related

Subject Area 4: Level

Check Leveling Computations

052-260-3413

Conditions: You are assigned as a squad leader or survey operations sergeant in a secure location, given completed Department of the Army (DA) Form 1942, field notes for a completed level line/loop, scratch paper, a calculator, a pen with black ink or a pencil, elevations of the starting/ending stations, and project specifications.

Standards: Compare the completed DA Form 1942 for accuracy. Both computations will agree to + or - 1 in the last decimal place. Computed closures will agree with project specifications.

Performance Steps

1. Ensure that the administrative data is entered correctly onto DA Form 1942.
2. Check the field records for completeness and accuracy. Both of the computations must agree + or - 1 in the last decimal place.
3. Check the computation procedures.
4. Check the section lengths.
5. Check the section, loop, or line closures.

NOTE: All of the closures will meet the specifications for geodetic surveys.

Evaluation Preparation: Setup: Trainer will obtain field notes for a completed level line/loop and two completed DA Forms 1942. The trainer will find the errors on the computation.

Brief Soldier: Tell the soldier to check the level line errors including those on the administrative data. Tell the soldier that project specifications will be met.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Ensured that the administrative data was entered correctly onto DA Form 1942.	—	—
2. Checked the field records for completeness and accuracy. Both of the computations must have agreed + or - 1 in the last decimal place.	—	—
3. Checked the computation procedures.	—	—
4. Checked the section lengths.	—	—
5. Checked the section, loop, or line closures.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required
DA FORM 1942

Related
FM 3-34.331
NOAA SPECIFICATIONS

Plan a Level Line or Net (Field Operations)

052-260-3704

Conditions: You are assigned as a squad leader or survey operations sergeant in a field location, given survey project specifications, a military map and overlay, a trig list, survey control recovery cards, Field Manual (FM) 3-34.331, and the reconnaissance report, including the friendly unit's areas of operations.

Standards: Complete the plan for leveling field operations in order to ensure that the leveling crew has access to the area of requested leveling; that all usable existing control is employed, that the line-of-sight clearing is determined; that the planned level line or net is plotted on an overlay; and that a schedule of work progress is made.

Performance Steps

NOTE: Refer to FM 3-34.331.

1. Determine what existing recovered vertical control is usable.
2. Meet project specifications from reconnaissance report and trig lists.
3. Determine the starting benchmarks and the length of lines.
4. Determine the amount and location of the line-of-sight clearing.
5. Determine the security requirements that will allow entrance into restricted areas or the friendly unit's areas of operation.
6. Select the location of the permanent monuments and the temporary benchmarks.
7. Plot the planned level line or net on a map overlay.
8. Prepare a timetable of project events by using reverse planning.

Evaluation Preparation: Setup: In a field location, provide soldiers with all of the items listed in the conditions statement. The test project will be fictitious and relatively short, but should be structured to test the soldier's ability to successfully complete all performance measures. This task is designed to prepare for the actual supervision of the field operations. It is a follow-on to office and site reconnaissance. The evaluator must use discretion in selecting or designing the test site.

Brief Soldier: Identify all of the materials and data to be used.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Determined what existing recovered vertical control was usable.	—	—
2. Met project specifications from reconnaissance report and trig lists.	—	—
3. Determined the starting benchmarks and the length of lines.	—	—
4. Determined the amount and location of the line-of-sight clearing.	—	—
5. Determined the security requirements that would allow entrance into restricted areas or the friendly unit's areas of operation.	—	—
6. Selected the location of the permanent monuments and the temporary benchmarks.	—	—
7. Plotted the planned level line or net on a map overlay.	—	—
8. Prepared a timetable of project events by using reversed planning.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required
FM 3-34.331

Related

Subject Area 5: Differential Global Positioning System

Check DGPS Computations

052-260-3412

Conditions: You are assigned as a squad leader or a survey operations sergeant in a secure field location, using a microprocessor loaded with adjustment software, given postprocessed and adjusted Global Positioning System (GPS) data, instruction on project requirements, Defense Mapping School (DMS) Special Text (ST) 005, and TRIMNET PLUS.

Standards: Verify the GPS adjustment by using a microprocessor. Processing must be in accordance with the standards set forth in the manufacturer's software manual. Adjust the data in accordance with the standards set forth in DMS recommended procedures, and using DMS ST 005.

Performance Steps

1. Check the data logging sheets and verify the naming convention.
2. Verify that the loop closure and connection requirements are met.
3. Verify the configuration of the adjustment software for the assigned level of confidence.
4. Verify the absence of outliers and excessive weighting.
5. Verify that the Tai Square test was passed.
6. Review the covariant values in order to certify that accuracy of the criteria is met.
7. Check the datum, and coordinate the system in order to confirm the output coordinate system.
8. Turn in the coordinates of unknown points to the project supervisor in a timely manner.

Evaluation Preparation: Setup: Have available the coordinate of the point(s) that the GPS survey is to determine.

Brief Soldier: Tell the soldier how many points were surveyed, their locations, time, and accuracy constraints. Also tell the soldier how many ties to a known control are needed to each point.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Checked the data logging sheets and verified naming convention.	—	—
2. Verified that the loop closure and connection requirements were met.	—	—
3. Verified the configuration of the adjustment software for the assigned level of confidence.	—	—
4. Verified the absence of outliers and excessive weighting.	—	—
5. Verified that the Tai Square test was passed.	—	—
6. Reviewed the covariant values in order to certify that accuracy of the criteria was met.	—	—
7. Checked the datum, and coordinated the system in order to confirm the output coordinate system.	—	—

Performance Measures

GO **NO GO**

8. Turned in the coordinates of unknown points to the project supervisor in a timely manner.

— —

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier a NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required

DMS ST 005
TRIMNET PLUS

Related

EM 1110-1-1003
FM 3-34.331

**Plan DGPS Survey Project
052-260-3630**

Conditions: You are assigned as a squad leader or survey operations sergeant in a secure field location, given a survey mission to determine coordinates with the Trimble 4000 MSGR, qualified personnel, operational equipment, and TRIMNET PLUS.

Standards: Collect and process sufficient data in order to obtain high precision, second- and third-order accuracy point positions for unknown points.

Performance Steps

1. Assign tasks to the appropriate personnel.
2. Supervise the site reconnaissance and scheduling.
3. Ensure that the survey plan criteria is met and briefed.
4. Ensure that the equipment is issued and synchronized.
5. Ensure that the soldiers know what datum the final positions are in.
6. Supervise the survey execution
7. Supervise the processing of the data.
8. Turn in the coordinates of unknown points to the project supervisor in a timely manner.

Evaluation Preparation: Setup: Have available the coordinate(s) of the point(s) that the Global Positioning System (GPS) survey is to determine.

Brief Soldier: Tell the soldier how many points are to be surveyed, their locations, time and accuracy constraints. Also tell the soldier how many ties to the known control are needed to each point.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Assigned tasks to the appropriate personnel.	___	___
2. Supervised the site reconnaissance and scheduling.	___	___
3. Ensured that the survey plan criteria was met and briefed.	___	___
4. Ensured that the equipment was issued and synchronized.	___	___
5. Ensured that the soldiers knew what datum the final positions were in.	___	___
6. Supervised the survey execution.	___	___
7. Supervised the processing of the data.	___	___
8. Turned in the coordinates of unknown points to the project supervisor in a timely manner.	___	___

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier a NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required
TRIMNET PLUS

Related
DMS ST 031

STP 5-82D34-SM-TG

**References
Required**

Related
EM 1110-1-1003
FM 3-34.331

Skill Level 4

Subject Area 1: General

Plan Signal/Intelligence Support Survey
052-260-4402

Conditions: You are assigned as a senior survey topographic sergeant or survey section sergeant in a field location, given survey project specifications, equipment, a map of the area, overlay, a trig list, survey control recovery cards, the reconnaissance report, and Department of the Army (DA) Form 1959 or DA Form 1958.

Standards: Complete the planning of signal or intelligence support survey operations in order to ensure that the survey crew has access to the area of the requested survey for the purpose of identifying, verifying, and transferring horizontal and vertical controls and establishing coordinates for remote-operated vehicles, remote sensing-and-imaging systems' geolocation and direction, inertial navigation initialization, situation awareness, and combat identification.

Performance Steps

1. Obtain logistical support
 - a. Determine the soldier actions requirements for the survey project personnel, and coordinate support with the unit's soldier actions center.
 - b. Determine the requirements for equipment and material, and coordinate with the supply supervisor and any other appropriate activity in order to ensure that equipment and materials are available or on hand.

NOTE: This information should be in the reconnaissance report.

- c. Determine what equipment and material must be acquired from other units or the local economy and whether this equipment and material is available.

2. Recover survey control points.
 - a. Collect the information on the stations to be recovered.
 - b. Locate the survey control station and navigate safely to it.
 - c. Describe and make a sketch of the survey control station on DA Form 1959 or DA Form 1958.

NOTE: Use DA Form 1958 when you are performing a benchmark recovery.

3. Install new monuments (if required)
 - a. Select the tools that are needed so that the monument may be emplaced or marked.
 - b. Position the survey control point so that it cannot be destroyed or moved.
 - c. Emplace the survey monument.
4. Determine the scope of the project.
 - a. Plan the Global Positioning System (GPS) survey project.
 - b. Plan the level line or net (field operations) (if required).
 - c. Plan the traverse network (if required).

5. Distribute the survey control points that have previously been established for field artillery and air defense artillery to the operations and training officer of each intelligence and signal battalion's operation section.

6. Notify the Operations and Training Officer (S3) of the various datums within the area of operation.

7. Provide the S3 with the necessary parameters and instructions on how to transform local coordinates to a predefined common grid (for example, the World Geographic Coordinating System [WGS] 84).

Evaluation Preparation: Setup: In a field location, soldiers should be given the items listed in the conditions statement. The test project will be fictitious and relatively short, but should be structured to test the soldier's ability to perform all performance measures. This task is designed to be a preparation for actually planning the field operations. It is a follow on to a signal/intelligence survey. The evaluator will prepare equipment in advance in order to ensure that the task standards can be met. Ensure that all safety precautions are followed.

Brief Soldier: Identify all materials and data that will be used in this task.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Obtained logistical support.	—	—
2. Recovered survey control points.	—	—
3. Installed new monuments (if required).	—	—
4. Determined the scope of the project.	—	—
5. Distributed the survey control points that had previously been established for field artillery and air defense artillery to the operations and training officer of each intelligence and signal battalion's operation section.	—	—
6. Notified the S3 of the various datums within the area of operation.	—	—
7. Provided the S3 with the necessary parameters and instructions on how to transform local coordinates to a predefined common grid (for example, WGS 84).	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required
 DA FORM 1958
 DA FORM 1959

Related
 FM 3-34.331

Plan Aviation Support Survey
052-260-4403

Conditions: You are assigned as a senior survey topographic sergeant or survey section sergeant in an airfield location, given survey project specifications, equipment, a map of the area, an overlay, a trig list, survey control recovery cards, the reconnaissance report, and Department of the Army (DA) Form 1958 or DA Form 1959.

Standards: Complete the planning of the aviation support survey operations in order to ensure that the survey crew has access to the area of the requested aviation survey for identifying, verifying, and transferring horizontal and vertical controls and establishing coordinates for runways and stop ways; navigational aids; federal aviation regulations part 77 (FAR-77) obstructions; aircraft movement and apron areas; prominent airport buildings; selected roads and other traverse ways; cultural and natural features of landmark value and miscellaneous and special-request items.

Performance Steps

1. Obtain logistical support.

- a. Determine the requirements for transportation, medical, messing, and housing facilities. Coordinate with the unit motor pool, medical facility, mess supervisor, and supply supervisor.

NOTE: If the project is at a distant location, this coordination should have already been done by the reconnaissance party. In this case, only verification is required.

- b. Determine the soldier-actions requirements for the survey project personnel, and coordinate support with the unit's soldier actions center.
- c. Determine the requirement for equipment and material, and coordinate with the supply supervisor and any other appropriate activity in order to ensure that equipment and materials are available or on hand.

NOTE: This information should be in the reconnaissance report.

- d. Determine what equipment or material must be acquired from other units or the local economy and whether this equipment/material is available.

NOTE: This information should be in the reconnaissance report.

- e. Determine the total cost estimate for the project, including support costs, such as petroleum, oils, and lubricants (POL) supplies and temporary duty (TDY) funds.

2. Recover the survey control points.

- a. Collect the information on the stations to be recovered.
- b. Locate the survey control station and navigate safely to it.
- c. Describe and make a sketch of the survey control station on DA Form 1959 or DA Form 1958.

NOTE 1: Use DA Form 1958 when you are performing a benchmark recovery.

3. Install new monuments (if required).

- a. Select the tools that are needed in order for the monument to be emplaced or marked.
- b. Position the survey control point so that it cannot be destroyed or moved.
- c. Emplace the survey monument.

4. Determine the scope of the project.

- a. Locate the airfield instrumentation.
- b. Lay out the baseline for the intersection.
- c. Lay out the baseline for topographic.
- d. Plan the Global Positioning System (GPS) survey project.
- e. Plan the level line or net (field operations).
- f. Obtain accessibility of the runway(s).
- g. Plan the traverse network (if required).

Evaluation Preparation: Setup: In an airfield location, soldiers should be given the items listed in the CONDITIONS statement. The test project will be fictitious and relatively short, but should be structured to

test the soldier's ability to perform all performance measures. This task is designed to be a preparation for actually planning the field operations. It is a follow on to an airfield survey. The evaluator will prepare equipment in advance to ensure that the task standards can be met. Ensure that all safety precautions are followed.

Brief Soldier: Identify all materials and data that will be used in this task. Explain that scoring will be GO or NO GO, based upon the successful completion of all performance measures.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Obtained logistical support.	_____	_____
2. Recovered the survey control points.	_____	_____
3. Installed new monuments (if required).	_____	_____
4. Determined the scope of the project.	_____	_____

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required

DA FORM 1958
DA FORM 1959

Related

DMS ST 005
DMS ST 031
DMS ST 032
DMS ST 045
EM 1110-1-1003
FM 3-34.331

Plan Deployable Weapons Systems Survey

052-260-4404

Conditions: You are assigned as a senior survey topographic sergeant or survey section sergeant in a field location, given survey project specifications, equipment, a map of the area, an overlay, a trig list, survey control recovery cards, the reconnaissance report, Field Manual (FM) 6-2, and Department of the Army (DA) Form 1958 or DA Form 1959.

Standards: Complete the planning of the deployable weapons systems survey operations in order to ensure that the survey crew has access to the area of the requested survey for identifying, verifying, and transferring horizontal and vertical controls and establishing coordinates for the multiple-launch rocket system, conventional and inertial field artillery survey teams, and augmenting field artillery survey sections.

Performance Steps

1. Obtain logistical support.
 - a. Determine the soldier-actions requirements for the survey project personnel, and coordinate support with the unit's soldier actions center.
 - b. Determine the requirements for equipment and material, and coordinate with the supply supervisor and any other appropriate activity in order to ensure that equipment and materials are available or are on hand.

NOTE: This information should be in the reconnaissance report.

- c. Determine what equipment and material must be acquired from other units or the local economy and whether this equipment and material is available.

2. Recover the survey control points.
 - a. Collect the information on the stations to be recovered.
 - b. Locate the survey control station and navigate safely to it.
 - c. Describe and make a sketch of the survey control station on DA Form 1959 or DA Form 1958

NOTE: DA Form 1958 is used when performing a benchmark recovery.

3. Install new monuments (if required).
 - a. Select the tools that are needed for the monument to be emplaced or marked.
 - b. Position the survey control point so that it cannot be destroyed or moved.
 - c. Emplace the survey monument.
4. Determine the scope of the project.
 - a. Plan the Global Positioning System (GPS) survey project.
 - b. Plan the level line or net (field operations) (if required).
 - c. Plan the traverse network (if required).
5. Distribute the survey control points established for field artillery and air defense artillery to each corps's general-support units, inertial field artillery survey teams and survey sections, and other nondivisional assets in the corps area according to FM 6-2.
6. Notify the Operations and Training Officer (S3) about the various datums within the area of operation.
7. Provide the S3 with the necessary parameters and instructions on how to transform local coordinates to a predefined common grid (for example, World Geographic Coordinate System [WGS] 84).

Evaluation Preparation: Setup: In a field location, soldiers should be given the items listed in the conditions statement. The test project will be fictitious and relatively short, but should be structured to test the soldier's ability to perform all performance measures. This task is designed to be a preparation for actually planning the field operations. It is a follow on to a deployable weapons systems survey. The

evaluator will prepare equipment in advance to ensure that the task standards can be met. Ensure that all safety precautions are followed.

Brief Soldier: Identify all of the materials and data that will be used in this task.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Obtained logistical support.	—	—
2. Recovered survey control points.	—	—
3. Installed new monuments if required.	—	—
4. Determined the scope of the project.	—	—
5. Distributed the survey control points established for field artillery and air defense artillery to each corps's general-support units, inertial field artillery survey teams and survey sections, and other nondivisional assets in the corps area according to FM 6-2.	—	—
6. Notified the S3 about the various datums within the area of operation.	—	—
7. Provided the S3 with the necessary parameters and instructions on how to transform local coordinates to a predefined common grid (for example, WGS 84).	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required
 DA FORM 1958
 DA FORM 1959
 FM 6-2

Related
 FM 3-34.331

Perform Quality Control Checks of Survey Data
052-260-4411

Conditions: You are assigned as a senior topographic survey sergeant in a secure field location, given a set of field recording notes and/or final computed data, and project specifications.

Standards: Check the survey field procedures in order to verify that the procedures produced the correct field data. Field recording notes will be checked in order to verify that correct recording procedures were used. All computed data will be spot-checked in order to verify that correct computing procedures were used and that all maps, map overlays, sketches, computed data, and other items in the final product were done correctly and meet specifications.

Performance Steps

1. Verify that correct field procedures are used.
2. Verify that correct field-recording and station-description procedures are used.
3. Spot-check the field recording notes, abstract, maps, map overlays, station description cards, and any other related documents, in order to ensure that they have been completed and are accurate.
4. Verify that the final product is accurate and meets project specifications.

Evaluation Preparation: Setup: Have a complete survey project from field notes and station descriptions through the final product available for testing. The evaluator should create errors in various stages of the project, from incorrect field procedures through computing errors in the final product.

Brief Soldier: Tell the soldier which materials to use.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Verified that correct field procedures were used.	—	—
2. Verified that correct field-recording and station-description procedures were used.	—	—
3. Spot-checked the field recording notes, abstract, maps, map overlays, station description cards, and any other related documents in order to ensure that they were completed and were accurate.	—	—
4. Verified that the final product was accurate and met project specifications.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References
Required

Related
DMS ST 005
DMS ST 031
DMS ST 032

Disseminate Survey Data

052-260-4412

Conditions: You are assigned as a senior topographic survey sergeant in a secure field location, given a deployable database, Army Regulation (AR) 380-5, a request for deployable database materials, and an authenticated access roster.

Standards: Provide to authorized supported units all available materials in the deployable database that are pertinent to a specific request for survey support from the deployable database.

Performance Steps

1. Determine whether a request for deployable database materials is from a unit authorized to receive support.
2. Determine that the soldiers receiving deployable database materials are on a valid access roster in order to receive materials.
3. Provide the requested materials if they are available in the deployable database.

Evaluation Preparation: Setup: Supported units must provide an access roster including name, grade, and social security number of soldiers authorized to receive deployable database materials. The evaluator will create a scenario in order to test the soldier's ability to use access rosters in order to determine authorization for dissemination of deployable database materials.

Brief Soldier: Tell the soldier which materials to use.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Determined that a request for deployable database materials was from a unit authorized to receive support.	—	—
2. Determined that the soldiers receiving deployable database materials were on a valid access roster in order to receive materials.	—	—
3. Provided requested materials if they were available in the deployable database.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required
AR 380-5

Related
FM 101-5
FM 5-33

Perform as Technical Authority in all Survey Matters
052-260-4413

Conditions: You are assigned as a section leader or survey operations sergeant in a field location.

Standards: Serve as the technical authority in all of the survey matters, so that you can provide accurate information on the survey to your superiors and subordinates.

Performance Steps

1. Verify or acquire all of the required references.
2. Acquire a clear understanding of all of the survey's missions from requesters and commanders, and make recommendations if they are necessary.
3. Spot-check the survey fieldwork, computations, and final products for accuracy and standards.
4. Provide information on survey capabilities to potential users of the precise-positioning data.
5. Maintain technical proficiency in all of the survey tasks.
6. Keep informed of new survey technology, information, and procedures through technical publications from engineer topographic laboratories, the National Geospatial Intelligence School (NGS), and the National Oceanic and Atmospheric Agency (NOAA).

Evaluation Preparation: Setup: Testing of this task may be structured for either a proposed project or one that is in progress. After the soldier has performed as the technical authority in all survey matters, the evaluator will grade each step for effectiveness and accuracy.

Brief Soldier: Explain that scoring will be GO or NO GO, based upon the successful completion of all performance measures.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Verified or acquired all of the required references.	—	—
2. Acquired a clear understanding of all of the survey's missions from requesters and commanders, and made recommendations if they were necessary.	—	—
3. Spot-checked the survey fieldwork, computations, and final products for accuracy and standards.	—	—
4. Provided information on survey capabilities to potential users of the precise-positioning data.	—	—
5. Maintained technical proficiency in all of the survey tasks.	—	—
6. Kept informed of new survey technology, information, and procedures through technical publications from engineer topographic laboratories, NGS, and NOAA.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References
Required

Related
 FM 3-34.331

Perform Office Reconnaissance for a Survey Project
052-260-4501

Conditions: You are assigned as a senior topographic survey sergeant in a secure field location, given trig lists, Department of the Army (DA) Form 1958 or DA Form 1959, Army Regulation (AR) 380-5, Field Manual (FM) 3-34.331, FM 6-2, aerial photos, maps, and weather/climate data of an area to be surveyed.

Standards: Complete the office reconnaissance in order to ensure that all of the known survey controls that are usable on the project are determined and plotted on an overlay, that the proposed survey lines are plotted to the best advantage of the terrain, that the friendly unit's areas of operations are plotted, that forecasted long-range weather data is determined, and that all sensitive materials are safeguarded.

Performance Steps

NOTE: Refer to FM 3-34.331 and FM 6-2.

1. Plot all of the known controls on a map overlay.
2. Determine the locations or routes of the proposed survey work. Plot the locations or routes on a map overlay. Use terrain and weather data.
3. Determine the locations of the survey controls that are usable for the proposed survey work and plot them on a map overlay.
4. Determine the friendly unit's areas of operations and the restricted areas. Plot them on a map overlay.
5. Safeguard the map overlay and any supporting documents according to AR 380-5.

Evaluation Preparation: Setup: Preparation of this task for testing allows considerable flexibility because any of a number terrain, survey control, proposed route, or weather combinations may be used. Trig lists and DA Form 1958 or DA Form 1959 may be created, if they are not readily available.

Brief Soldier: Identify all materials the soldier will use to perform the task.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Plotted all of the known controls on a map overlay.	—	—
2. Determined the locations or routes of the proposed survey work. Plotted the locations or routes on a map overlay. Used terrain and weather data.	—	—
3. Determined the locations of the survey controls that were usable for the proposed survey work and plotted them on a map overlay.	—	—
4. Determined the friendly unit's areas of operations and the restricted areas. Plotted them on a map overlay.	—	—
5. Safeguarded the map overlay and any supporting documents according to AR 380-5.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required	Related
AR 380-5	
DA FORM 1958	
DA FORM 1959	

References

Required

FM 3-34.331

FM 6-2

Related

Check a Project Progress Report
052-260-4704

Conditions: You are assigned as a senior topographic survey sergeant in a secure field location, given a survey project work order, a reconnaissance report, a map overlay, and a survey project progress report.

Standards: Check the project progress report in order to ensure that it complies with the project work order; that approved changes to the work order are being implemented; that factors which can or are causing delays are being compensated for; that all available manpower, equipment, and materials are being employed; and that any recommendations are evaluated.

Performance Steps

1. Determine, by comparing the project progress report to the project work order, whether the project is in compliance with the work requested.
2. Determine if approved changes to the original work request are being implemented.
3. Determine if factors that can cause or are causing delays are being compensated for.
4. Determine if all available manpower, equipment, and materials are being employed.
5. Determine the value of any recommendations for the project.
6. Prepare a memorandum for record of any action taken on the project progress report.

Evaluation Preparation: Setup: Given the materials listed in the conditions statement, the tested soldier may present either an oral or a written demonstration of all performance measures. The evaluator will create a variety of scenarios to test this task.

Brief Soldier: Tell the soldier which materials to use.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Determined, by comparing the project progress report to the project work order, whether the project was in compliance with the work requested.	—	—
2. Determined if approved changes to the original work request were being implemented.	—	—
3. Determined if factors that could cause or were causing delays were being compensated for.	—	—
4. Determined if all available manpower, equipment, and materials were being employed.	—	—
5. Determined the value of any recommendations for the project.	—	—
6. Prepared a memorandum for record of any action taken on the project progress report.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References
Required

Related
FM 101-5
FM 3-34.331

**Maintain a Deployable Data Base
052-260-4705**

Conditions: You are assigned as a senior topographic survey sergeant in a secure field location, given Army Regulation (AR) 380-5, an approved security container, and deployable database materials in a topographic support system (TSS) van.

Standards: Assign a security classification and a document account number to all deployable database materials. They will be stored in an approved security container according to AR 380-5 and the unit standing operating procedure (SOP). When materials are in use, they will be controlled according to AR 380-5 and the unit field SOP. Only soldiers on an authorized access roster may have access to classified deployable data base materials. Armed guards and other security measures will be used when required by AR 380-5 and the unit SOP.

Performance Steps

1. Assign all deployable database materials a security classification and a document account number according to AR 380-5.
2. Store all of the classified deployable database materials in an approved security container.
3. Control the use and access of all of the classified deployable database materials according to AR 380-5 and the unit SOP.
4. Ensure that installation security is employed according to AR 380-5 when SECRET and TOP SECRET materials are present.

Evaluation Preparation: Setup: Any materials in a deployable database that are used in a tactical situation are considered sensitive and must be safeguarded accordingly. The evaluator should test the soldier's ability to use AR 380-5, the unit SOP, security containers, and access rosters in order to control all sensitive material.

Brief Soldier: Tell the soldier which materials to use.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Assigned all deployable database materials a security classification and a document account number according to AR 380-5.	—	—
2. Stored all of the classified deployable database materials in an approved security container.	—	—
3. Controlled the use and access of all of the classified deployable database materials according to AR 380-5 and the unit SOP.	—	—
4. Ensured that installation security was employed according to AR 380-5 when SECRET and TOP SECRET materials were present.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required
AR 380-5

Related
FM 101-5
FM 3-34.331
FM 5-33

**Approve Field Operations Plans
052-260-4714**

Conditions: You are assigned as a senior topographic survey sergeant in a command post, given a survey project work order, a map with a prepared overlay, a survey reconnaissance report, and a set of field operations plans.

Standards: Review and approve all of the field operations plans for implementation, including the correct selection and use of soldiers, equipment, and materials; timeliness of the project schedule; and usability of the final survey product.

Performance Steps

1. Review all of the field operations plans for completeness.
2. Compare the field operations plans to the survey project work order request, and ensure that the field operations plans correspond to the work order request.
3. Ensure that all of the required changes to the work order request are incorporated into the field operations plans.
4. Review the project timetable and ensure that all of the work is scheduled with sufficient time allowed in order to complete the work.
5. Review the field operations plans and ensure that the final product will meet the standards required in the work order request.
6. Give the final approval, either in writing or orally, after ensuring that the field operations plans are satisfactory.

Evaluation Preparation: Setup: The evaluator will need to create a set of field operations plans. This allows for a variety of scenarios for use in testing. A set of field operations plans may or may not contain all items listed in the standards statement, depending upon whether the evaluator wants to test for completeness of the plans.

Brief Soldier: Tell the soldier which materials to use.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Reviewed all of the field operations plans for completeness.	—	—
2. Compared the field operations plans to the survey project work order request, and ensured that the field operations plans corresponded to the work order request.	—	—
3. Ensured that all of the required changes to the work order request were incorporated into the field operations plans.	—	—
4. Reviewed the project timetable and ensured that all of the work was scheduled with sufficient time allowed in order to complete the work.	—	—
5. Reviewed the field operations plans and ensured that the final product met the standards required in the work order request.	—	—
6. Gave the final approval, either in writing or orally, after ensuring that field operations plans were satisfactory.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

**References
Required**

Related
AR 380-5
FM 101-5

Coordinate Administrative and Logistical Support for a Survey Project
052-260-4715

Conditions: You are assigned as a senior topographic survey sergeant in a secure field location, given a survey project work order, a reconnaissance report, an approved set of field operations plans, a schedule of all survey projects, and Field Manual (FM) 3-34.331.

Standards: Plan all administrative and logistic support in order to ensure that soldiers are provided personnel actions support; housing, medical, and mess facilities; and transportation. Ensure that all of the required equipment and materials needed in order to perform the survey projects are available or on hand, can be acquired from the project unit, or can be purchased on the local economy.

Performance Steps

NOTE: Refer to FM 3-34.331.

1. Determine the soldier actions requirements for the survey project personnel, and coordinate support with the unit's soldier actions center.
2. Determine requirements for transportation, and for medical, messing, and housing facilities. Coordinate with the unit motor pool, the medical facility, the mess supervisor, and the supply supervisor.

NOTE: If the project is at a distant location, this coordination should have already been done by the reconnaissance party. In this case, only verification is required.

3. Determine the requirements for equipment and material, and coordinate with the supply supervisor and any other appropriate activity in order to ensure that equipment and materials are available or on hand.

NOTE: This information should be in the reconnaissance report.

4. Determine what equipment and material must be acquired from other units or the local economy and whether this equipment and material is available.

NOTE: This information should be in the reconnaissance report.

5. Determine the total cost estimate for the project, including support costs such as petroleum, oils, and lubricants (POL) supplies and temporary duty (TDY) funds.

Evaluation Preparation: Setup: A specific type of survey project will have to be identified in order to plan according to project requirements. This should be stated in the survey project work order, with further specification in the field operations plans and the schedule of survey projects. This allows for more than one scenario to be developed, if desired.

Brief Soldier: Tell the soldier which materials to use.

Performance Measures	<u>GO</u>	<u>NO GO</u>
1. Determined the soldier actions requirements for the survey project personnel, and coordinated support with the unit's soldier actions center.	—	—
2. Determined requirements for transportation and for medical, messing, and housing facilities. Coordinated with the unit motor pool, the medical facility, the mess supervisor, and the supply supervisor.	—	—
3. Determined the requirements for equipment and material, and coordinated with the supply supervisor and any other appropriate activity in order to ensure that equipment and materials were available or on hand.	—	—
4. Determined what equipment and material needed to be acquired from other units or the local economy and whether this equipment and material was available.	—	—

Performance Measures**GO** **NO GO**

5. Determined the total cost estimate for the project, including support costs such as petroleum, oils, and lubricants (POL) supplies and temporary duty (TDY) funds. — —

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References**Required**

FM 3-34.331

Related

FM 101-5

FM 6-2

Perform Staff Position Duties Essential To Unit Mission
052-260-4717

Conditions: You are assigned as a section leader or survey operations sergeant in a field location.

Standards: Perform staff position duties essential to the unit mission so that the commander is kept well informed of the survey capabilities, projects and the precise-positioning user requirements. Verify that all of the battle plans have met precise positioning requirements, and inform the commanders of any potential shortcomings.

Performance Steps

1. Verify all of the present survey requirements.
2. Keep the commanders informed of possible future survey requirements.
3. Notify potential users about the precise positioning data of the survey capabilities.
4. Maintain contact with the other theater survey elements.

Evaluation Preparation: Setup: Preparation of this task for testing involves close communication with commanders and other theater survey elements.

Brief Soldier: Identify all of the materials and equipment that the soldier will use to perform the task.

Performance Measures

	<u>GO</u>	<u>NO GO</u>
1. Verified all of the present survey requirements.	—	—
2. Kept the commanders informed of possible future survey requirements.	—	—
3. Notified potential users about the precise positioning data of the survey capabilities.	—	—
4. Maintained contact with the other theater survey elements.	—	—

Evaluation Guidance: Score the soldier GO if all steps are passed (P). Score the soldier NO GO if any step is failed (F). If the soldier fails any step, show him how to do it correctly.

References

Required

Related
FM 101-5

APPENDIX A - DEPARTMENT OF THE ARMY (DA) FORM 5164-R (HANDS-ON EVALUATION)

A-1. This appendix provides a copy of DA Form 5164-R. Locally reproduce DA Form 5164-R on 8 1/2-by 11-inch paper.

A-2. The use of this form is optional, but highly encouraged. This evaluation allows you to maintain and track the soldier's proficiency at the performance level.

A-3. Use the following instructions to complete DA Form 5164-R:

- Enter the title and number of the task to be evaluated at the top of the form.
- Enter in column "a" the number of each performance step from the evaluation guide.
- Enter in column "b" each performance step from the evaluation guide that corresponds to the number in column "a." Abbreviate the information, if necessary.
- Locally reproduce the partially completed DA Form 5164-R if more than one soldier will be evaluated on the specific task or the same soldier will be evaluated more than once.
- Enter the date, the evaluator's name, and the soldier's name and unit before starting the evaluation.
- Enter a check in column "c" (PASS) or column "d" (FAIL) for each performance step evaluated, as appropriate.
- Check the status block GO or NO-GO.

HANDS-ON EVALUATION For use of this form, see AR 350-57; the proponent agency is ODCSOPS		DATE	
TASK TITLE		TASK NUMBER	
ITEM a	PERFORMANCE STEP TITLE b	SCORE (Check One)	
		PASS c	FAIL d
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
		<input type="checkbox"/> P	<input type="checkbox"/> F
EVALUATOR'S NAME		UNIT	
SOLDIER'S NAME		STATUS <input type="checkbox"/> GO <input type="checkbox"/> NO GO	

DA FORM 5164-R, SEP 85

EDITION OF DEC 82 IS OBSOLETE

USAPPC V2.00

APPENDIX B - DEPARTMENT OF THE ARMY (DA) FORM 5165-R (FIELD EXPEDIENT SQUAD BOOK)

B-1. This appendix provides a copy of DA Form 5165-R. Blank reproducible forms may be obtained in Army Regulation (AR) 350-41. All forms may be reproduced locally on 8 1/2- by 11-inch paper.

B-2. Trainers should use the following instructions when completing DA Form 5165-R.

- Make all entries in pencil.
- Enter the task number and a short title in the appropriate column.
- Record the date in the GO block if the soldier demonstrates task proficiency to the soldier's manual standards. Keep this form current by always recording the most recent date on which the soldier demonstrated task proficiency.
- Record the date in the NO-GO block if the soldier failed to demonstrate task proficiency to the soldier's manual standards. Soldiers who fail to perform the task should be retrained and evaluated until they can do the task. Once the soldier performs the task correctly, enter the date in the GO block and erase the previous entry from the NO-GO block.
- Read down each column (GO/NO-GO) to determine the training status of that individual. This will give the trainer a quick indication of tasks on which the soldier needs to be trained or evaluated.
- Read across the rows for each task to determine the training status of all the soldiers. The trainer can readily see on which tasks training should be focused.
- Add the names of newly assigned soldiers to one of the blank columns.
- Line through the training status column of any soldier who departs from the unit.

NOTE TO THE TRAINING MANAGER: The training status of groups can be maintained (such as team, squad, or platoon) in key critical military occupational specialty (MOS) at any level by entering the level (such as 1st platoon, 2nd platoon, or 3rd platoon) in the column headings. Simply have the trainers report the percentage of their soldiers who have (GO blocks) and have not (NO-GO blocks) demonstrated proficiency on each task and record this information for each level.

APPENDIX C - CONVERSION FACTORS (UNITED STATES [US] AND METRIC UNITS)**Table C-1. Metric conversion chart**

US Units	Multiplied By	Equals Metric Units
Length		
Feet	0.30480	Meters
Inches	2.54000	Centimeters
Inches	0.02540	Meters
Inches	25.40010	Millimeters
Area		
Square inches	6.45160	Square centimeters
Square feet	0.09290	Square meters
Volume		
Cubic inches	16.38720	Cubic centimeters
Cubic feet	0.02830	Cubic meters
Metric Units	Multiplied By	Equals US Units
Length		
Centimeters	0.39370	Inches
Meters per second	2.23700	Miles per hour
Millimeters	0.03937	Inches
Meters	3.28080	Feet
Meters	39.37000	Inches
Area		
Square centimeters	0.15500	Square inches
Square meters	10.76400	Square feet
Volume		
Cubic centimeters	0.06100	Cubic inches
Cubic meters	35.31440	Cubic feet

GLOSSARY

ACCP

Army Correspondence Course Program

Accuracy

The degree of conformity with a standard, or the degree of perfection attained in a measurement. Accuracy relates to the quality of a result. It is distinguished from precision which relates to the quality of the operation by which the result was obtained.

AISI

automatic integrated survey instrument

AIT

advanced individual training

Allowable error

The amount of error that can be introduced in a survey measurement of distance, elevation, or position and still meet the prescribed specifications.

AN

annually

ANCOC

Advanced Noncommissioned Officers Course

AR

Army regulation; armor; angle of repose

ARTEP

Army Training and Evaluation Program

Azimuth

The direction of one object from another, usually expressed as an angle in degrees relative to true north (azimuths are usually measured in the clockwise direction, thus an azimuth of 90° indicates that the second object is due east of the first).

Azimuth (grid)

The angle in the plane of projection between a straight line and the central meridian (axis of Y) of a plane-rectangular coordinate system.

Azimuth mark

The azimuth to a marked point or adjacent station that is visible from an occupied station, which is determined for use in dependent surveys.

Back station

Last station occupied or the station initialed on to begin a survey operation, such as a traverse.

Backsight (BS)

In traversing, a backsight is a sight on a previously established traverse or triangulation station, which is not the closing sight on the traverse; in leveling, a backsight is a reading on a rod that is held on a point whose elevation has been previously determined and is not the closing sight of a level line.

BGS

Basic Geodetic Survey (Course)

BM

bimonthly; benchmark

BT

basic training; blade team

BTC

Basic Technical Course

CMF

career management field

Coordinates

Linear and/or angular quantities, which designate the position of a point in relation to a given reference frame; there are two general divisions of coordinates used in surveying--polar and rectangular; these may be further subdivided into three classes--plane coordinates, spherical coordinates, and space coordinates.

DA

Department of the Army; Denmark; direct action

DA Form

Department of the Army Form

DA Pam

Department of the Army Pamphlet

Datum

1. (general). Any numerical or geometrical quantity or set of such quantities which may serve as a reference or base for other quantities. 2. (geodetic). A reference surface consisting of five quantities: the latitude and longitude of an initial point, the azimuth of a line from this point, and the parameters of the reference ellipsoid. It forms the basis for the computation of horizontal-control surveys in which the curvature of the earth is considered. 3. (leveling). A level surface to which elevations are referred, usually mean sea level.

DE

directed energy; difference in elevation; difference in easting

Declination

In a system of polar or spherical coordinates, the angle at the origin between a line to a point and the equatorial plane, measured in a plane perpendicular to the equatorial plane; the arc between the equator and the point measured on a great circle, which is perpendicular to the equator; as it relates to astronomy, the angular distance to a body on the celestial sphere that is measured north or south through 90° from the celestial equator along the hour circle of the body. Comparable to latitude on the terrestrial sphere and often used as a shortened term for magnetic declination.

Defense Mapping Agency (DMA)

The Department of the Defense agency responsible for worldwide mapping and topographic sciences for military use.

DMA

Defense Mapping Agency

DMS

Defense Mapping School

Electronic distance-measuring equipment (EDME)

Any measuring device which employs electronics to measure distances, such as microwave and infrared.

Elevation

Vertical distance from a datum, usually mean sea level, to a point or object on the earth's surface. Not to be confused with altitude which refers to points or objects above the earth's surface.

EM

electronic media; engineer manual; earthmoving; enlisted member

Error

1. The difference between an observed value and the true value of a quantity. 2. A class of small inaccuracies due to imperfections in equipment or techniques, surrounding conditions, or human limitations; not to be confused with blunders or mistakes.

F

frequency; fail; failed; Fahrenheit; full

FAR

federal aviation regulation

FM

field manual; frequency modulated/modulation

Geodesy

The science which treats the figure and size of the earth mathematically. The term geodesy is often used to include both the science which must depend upon determinations of the figure and size of the earth from direct measurements made on its surface (triangulation, leveling, astronomic and gravity determinations), and the art which utilizes the scientific determinations in a practical way and is usually termed geodetic surveying or geodetic engineering.

Geodetic distance

The distance between two points obtained by computations and adjusted by a scale factor to mean sea level.

Geographic coordinates

An inclusive term generally used to designate both geodetic coordinates and astronomical coordinates.

GPS

Global Positioning System

Grid distance

The distance between two points obtained by computations from grid coordinates of the points.

Height of instrument

In spirit leveling, it is the height of the line of sight of a leveling instrument above the adopted datum. In stadia surveying, it is the height of the center of the telescope (horizontal axis) of the transit or telescopic alidade above the ground or station mark. In trigonometric leveling, it is the height of the center of the theodolite (horizontal axis) above the ground or station mark.

Height of target

Same as height of instrument except a target is mounted on the tripod.

HI
height of instrument; high

Horizontal control
The survey control points on which the horizontal coordinates have been determined. The coordinates may be either geographic (latitude and longitude) or grid.

IAW
in accordance with

IGS
Intermediate Geodetic Survey (Course)

Intersection
A method of determining the horizontal position of a point by observations from two or more points of known position, thus measuring directions that intersect at the station being located. A station whose horizontal position is located by intersection is known as an intersection station.

ITEP
Individual Training Evaluation Program; Integrated Test/Evaluation Program

km
kilometer

Latitude
The angular distance for a specific spot on the earth's surface from 0° to 90° north or south of the equator.

Level net
Lines of spirit leveling connected together to form a system of loops or circuits extending over an area.

Longitude
The angular distance for a specific spot on the earth's surface from 0° to 90° north or south of the Equator.

m
manual; meter(s); minute; mechanized (graphics); monthly

mm
millimeter(s)

Monument
Any object or collection of objects that indicate the position on the ground of a survey station. In military surveys the term monument usually refers to a stone or concrete station marker containing a special bronze plate on which the exact station point is marked.

MOS
military occupational specialty; minimum operating strip

MTP
mission training plan; MOS training plan

NA
not applicable; nation assistance

NGS

National Geospatial Intelligence School

NOAA

National Oceanic and Atmospheric Administration

Observed angles

An angle which has been measured with an angle measuring instrument.

Occupied station

A traverse or triangulation station over which a theodolite or an engineer transit is set up for the measurement of angles. Also, a station at which angles have been measured.

OT

observer target

P

needs practice; pass; passed; barometric pressure; mean radius of curvature

PMCS

preventive-maintenance checks and services

POL

petroleum, oils, and lubricants

PTC

Primary Technical Course

QT

quarterly

RA

Regular Army

S

sand; safe; secret; grid distance; geodetic distance; second; slope distance; start

S3

Operations and Training Officer (US Army)

SA

semiannually; situational awareness

SL

skill level; side lap

Slope distance

The straight line distance between two points of unequal height. Normal usage is associated with electronic distance measuring equipment. (Do not use slant distance.)

SM

soldier's manual

SNCOC

Senior NCO Course

SOJT

supervised on-the-job training

SOP

standing operating procedure

SQT

skill qualification test

ST

SEAL team; special text

station angle

Angle measured from the rear station to the forward station in a traverse.

STP

soldier training publication

Survey net

1. (horizontal control). Arcs of triangulation, sometimes with lines of traverse, connected to form a system of loops or circuits extending over an area. 2. (vertical control). Lines of spirit leveling connected to form a system of loops or circuits extending over an area.

T

trained; slab thickness; deck thickness; crown thickness; geodetic azimuth; grid azimuth; slope distance; telescope above station; time; tracked

Target

Any object or point toward which something is directed; also an object which reflects a sufficient amount of a radiated signal to produce an echo signal on detection equipment.

Target station

The survey point being observed on which a target has been erected.

TDY

Temporary Duty

TEC

Training Extension Course

TG

trainer's guide

TM

team; technical manual; trademark

topo

topographic

Traverse

To turn a weapon to the right or left on its mount; a method of surveying in which lengths and directions of lines between points on the earth are obtained by or from field measurements and used in determining positions of the points.

TSS

topographic support system

UD

uncorrected distance; mean uncorrected slope distance

Universal transverse Mercator (UTM)

A series of 120 coordinate systems that are based on the transverse Mercator projection, which was originally developed by the US Army for a worldwide mapping project. Sixty zones are used to map the northern hemisphere, and the remaining zones apply to the southern hemisphere. Each zone is 6° wide and is numbered. Zone 1 covers longitudes of 180° W through 174° W. The remaining zones are numbered sequentially as they move east. All zones have their origin at the equator, use the meter as the system unit, and have a false easting of 500,000 meters and a false northing of zero. A scale reduction factor of 0.9996 is used on all zones. Zones for the southern hemisphere are identical to their northern counterpart except that the false northing is set to 10,000,000 to eliminate negative Y coordinates.

USASMA

United States Army Sergeants Major Academy

USC&GS

United States Coastal and Geodetic Survey

UT

universal time

UTM

universal transverse Mercator

UTO time

Uncorrect universal time.

Vertical angle

See zenith distance.

Vertical control

The survey control points for which the elevation of the point has been determined by leveling.

WGS

World Geographic Coordinate System

REFERENCES

Required Publications

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

Army Regulations

AR 380-5 Department of The Army Information Security Program. 9 September 2000

Department of Army Forms

DA FORM 1905	Azimuth by Hour Angle Method (This item is included on EM 0001). 1 February 1957
DA FORM 1909	Longitude by the Altitude of Stars near the Prime Vertical. 1 February 1957
DA FORM 1916	Abstract of Horizontal Directions. 1 July 2001
DA FORM 1917	List of Directions. 1 February 1957
DA FORM 1920	Triangle Computation (for calculating machine). 1 February 1957
DA FORM 1923	Position Computation - Order Triangulation (for calculating machine computations). 1 February 1957
DA FORM 1933	Geographic Coordinates From UTM Grid Coordinates. 1 July 2001
DA FORM 1934	Grid Azimuths (T and T) and (T - T) Correction from UTM Grid Coordinates (This item is included on EM 0001). 1 February 1957
DA FORM 1936	List of Directions--UTM Grid (This item is included on EM 0001). 1 February 1957
DA FORM 1937	Computation of Triangles (UTM Grid) (This item is included on EM 0001). 1 February 1957
DA FORM 1938	Position Computation (UTM Grid). 1 February 1957
DA FORM 1940	Traverse Computation on the Universal Transverse Mercator Grid. 1 February 1957
DA FORM 1942	Computation of Levels. 1 May 2001
DA FORM 1943	Abstract of Zenith Distances. 1 July 2001
DA FORM 1945	Computation of Elevations and Refractions from Reciprocal Observations (by calculating machine). 1 February 1957
DA FORM 1947	Computation of Elevations from Nonreciprocal Observations (by calculating machine). 1 February 1957
DA FORM 1953	Universal Polar Stereographic Transformations. 1 February 1957
DA FORM 1958	Description or Recovery of Bench Mark. 1 October 1964
DA FORM 1959	Description or Recovery of Horizontal Control Station. 1 October 1964
DA FORM 2404	Equipment Inspection And Maintenance Worksheet. 1 April 1979
DA FORM 2847	Comparison of Chronometer and Radio Signals. 1 October 1964
DA FORM 2856	Field Sheet Tellurometer Data Entries (MRA3, MKII) (This item is included on EM 0001). 1 October 1964
DA FORM 2857	Field Sheet Micro--Chain Data Entries. 1 October 1964
DA FORM 4196	Horizontal Distance Book. 1 January 1974
DA FORM 4253	Horizontal Direction or Angle Book. 1 June 1974
DA FORM 4648	Station Description Book. 1 September 1977

Field Manuals

FM 3-34.331 Topographic Surveying. 16 January 2001
FM 6-2 Tactics, Techniques, and Procedures for Field Artillery Survey. 23
September 1993

Other Product Types

AENA American Ephemeris and Nautical Almanac US Naval Observatory 24th
& E St., N.W. Washington, DC 20402
APFS Apparent Places of Fundamental Stars* Verlag G. Braun 7500 Karlsruhe
1, Germany
DIA INDEX Defense Mapping Agency Office of Distribution Services Washington, DC
20315
NOAA SPECIFICATIONS Specifications to Support Classification, Standards of Accuracy, and
General Specifications of Geodetic Control Surveys (S/T 82-232)* and
Classification, Standards of Accuracy, and General Specifications of
Geodetic Control Surveys . . .
SC 5445-97-CL-E01 Tower erection set, Topographic
TRIMNET PLUS Survey Network Software User's Manual w/ Revision A1. 1 November
1992
USC&GS SP 241 Natural Tables for the Computation of Geodetic Positions--Clarke
Spheroid of 1866
USC&GS SP 58 Natural Tables for the Computation of Geodetic Positions - International
Spheroid

Special Texts

DMS ST 005 Geometric Geodetic Accuracy Standards and Specifications for using
GPS Relative Positioning Techniques. 1 July 1997

Technical Manuals

TM 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 Tribach w/Quick
Release Mechanism. . . 12 April 1966
TM 5-6675-306-14 Operator's, Organizational, Direct Support, and General Support
Maintenance Manual: Theodolite, Directional: 1-second graduation, 5.9-
inch long Telescope, Detachable Tribach w/Accessories and Tripod
(Wild Heerbrugg Model T2-74DEG) 23 July 1975
TM 5-6675-332-10 Operator's Manual, Automated Integrated Survey Instrument (AISI), Type
I, Topographic Part Number 571146150, NSN 6675-01-372- 0047, Type
II, Construction Part Number 571146152, NSN 6675-01-371- 4961. 30
June 1994
TM 5-9413 Tower, Triangulation Structural Aluminum, 103-foot. 15 September 1953

Related Publications

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

Army Regulations

AR 380-5 Department of The Army Information Security Program. 9 September 2000

Department of Army Pamphlets

DA PAM 738-750 Functional Users Manual for the Army Maintenance Management System (TAMMS). 1 August 1994

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FM 101-5 Staff Organization and Operations. 31 May 1997
 FM 3-34.331 Topographic Surveying. 16 January 2001
 FM 5-33 Terrain Analysis. 11 July 1990
 FM 6-2 Tactics, Techniques, and Procedures for Field Artillery Survey. 23 September 1993

Other Product Types

EM 1110-1-1003 Navstar Global Positioning System Surveying. 01 Aug 96.
 NOAA SPECIFICATIONS Specifications to Support Classification, Standards of Accuracy, and General Specifications of Geodetic Control Surveys (S/T 82-232)* and Classification, Standards of Accuracy, and General Specifications of Geodetic Control Surveys . . .

Special Texts

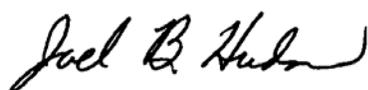
DMS ST 005 Geometric Geodetic Accuracy Standards and Specifications for using GPS Relative Positioning Techniques. 1 July 1997
 DMS ST 031 Standards and Specifications for Geodetic Control Networks. 1 July 1997
 DMS ST 032 Standards of Accuracy and Specifications of Geodetic Surveys. 1 October 1997
 DMS ST 045 UTM Grid Tables Clarke 1866 (Vol I and II). 1 April 2000

STP 5-82D34-SM-TG
11 OCTOBER 2002

By Order of the Secretary of the Army:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff

Official:

A handwritten signature in black ink, reading "Joel B. Hudson", is written over a thin red vertical line.

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0228201

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