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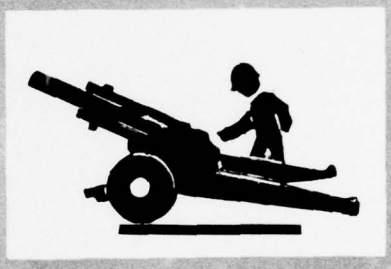
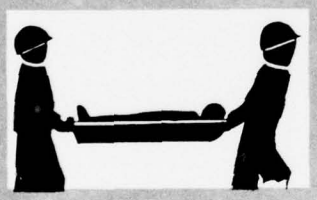
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JOB AND TASK ANALYSIS HANDBOOK






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Task Selection	Skill/Knowledges	Learning Hierarchy
Soft Skill Analysis	Surveys	
Task Inventory	Site Selection	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This handbook provides a ready reference in the day-to-day activities of a job/task analyst. It provides the analysis information in an organized way that was only described before in very general terms. Each chapter describes in detail its respective theme of the analysis process, and has a foldout at the end of the chapter that outlines the major points and delineates any sequential activities. The handbook describes the specific details of job/task analysis and the selection of tasks for training.

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It is a companion "how to" document to TRADOC Reg 351-4 which defines the management requirement and procedures. Included are auxiliary appendices that describe processes which occur closely together with analysis, i.e. Site Selection, Job Performance Measures, Job Aids and Learning Hierarchy. A task analysis worksheet is also provided as an organizing job aid for the job/task analysis.

DEPARTMENT OF THE ARMY
TRAINING DEVELOPMENTS INSTITUTE
FORT MONROE, VIRGINIA 23651

ATTNG-TDI-ORA

13 July 1979

SUBJECT: Job & Task Analysis Handbook

TO: Job & Task Handbook Users

1. One of the major missions of the Training Developments Institute is to assist service schools and training centers in the pursuit of a systematic approach to training developments.

2. Within the scope of this mission the Job and Task Analysis Handbook provides the procedural guidance heretofore lacking for the analysis phase of Instructional Systems Development (ISD). The guidance within this handbook will establish a common framework for the conduct of Job and Task Analysis and facilitate the transition from analysis to design and ultimately to evaluation.

3. This handbook is being published as a TRADOC pamphlet rather than a circular or regulation because it represents useful information rather than guidance or policy. Further, we expect to revise this handbook continuously over the next several years as we learn from your experiences.

4. The answer to every possible question that you may have is NOT necessarily found in this handbook. Many of these very cogent questions have not yet been raised. In these instances, the assistance and expertise of the Training Developments Institute are only a phone call away. This first handbook on Job and Task Analysis is a beginning. Together we, the training developers in the Army, can improve substantially the training in the Army. But it must begin with good analysis.

FRANKLIN A. HART
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DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY TRAINING AND DOCTRINE COMMAND
Fort Monroe, Virginia 23651

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No. 351-4

10 August 1979

Schools
JOB AND TASK ANALYSIS HANDBOOK

CHAPTER			Paragraph	Page
1.	The TRADOC Analysis Process			
		Purpose	1-1	1-1
		Organization of handbook	1-2	1-1
		Scope	1-3	1-1
		Glossary	1-4	1-2
		Training	1-5	1-2
2.	Overview of Job and Task Analysis			
		Army training mission	2-1	2-1
		Job orientation for individual skills	2-2	2-1
		Analysis base	2-3	2-1
		Job analysis purpose	2-4	2-2
		Resources	2-5	2-3
3.	Job and Task Analysis Plan			
		Purpose of plan	3-1	3-1
		Scope	3-2	3-1
		Deliverables	3-3	3-9
4.	Job Analysis			
		Purpose	4-1	4-1
		Scope	4-2	4-1
		New analysis vs revision	4-3	4-2
		Analysis for a new system	4-4	4-5
		Sequence of operations	4-5	4-6
		Task inventory preparation	4-6	4-6
		Job related information	4-7	4-7
		Target population information	4-8	4-9
		Job analysis process	4-9	4-12
		Conclusion	4-10	4-15

TRADOC Pam 351-4		Paragraph	Page
CHAPTER 5.	Task Inventory Development		
	General	5-1	5-1
	Inventory development	5-2	5-1
	Length of inventory	5-3	5-1
	Inventory preparation	5-4	5-1
	Review of preliminary inventory	5-5	5-3
	Revision of preliminary inventory	5-6	5-8
6.	Surveys		
	General	6-1	6-1
	AOSP	6-2	6-1
	Field sponsored surveys	6-3	6-11
	Officer job and task analysis survey procedures	6-4	6-19
7.	Select Tasks for Training		
	Purpose	7-1	7-1
	Background	7-2	7-1
	8 factor model	7-3	7-2
	4 factor model	7-4	7-3
	Training emphasis scale	7-5	7-4
	Comprehensive Occupational Data Analysis Program (CODAP)	7-6	7-5
	DIF model	7-7	7-5
	Wartime/peacetime model	7-8	7-8
	Procedure	7-9	7-8
	Task selection board	7-10	7-11
8.	Task Analysis		
	General	8-1	8-1
	Scope	8-2	8-1
	Data requirements	8-3	8-3
	Task analysis documentation	8-4	8-3
	Task analysis process	8-5	8-14
	Task analysis procedures	8-6	8-16
	Sequence for task analysis methods	8-7	8-24
	Conclusion	8-8	8-26
9.	Soft Skill Analysis	To Be Published	
10.	Collective/Individual Analysis Interface	To Be Published	
11.	Life Cycle Systems Management Model/Training Developments Interface	To Be Published	

Preface to Appendices	Paragraph	Page
APPENDIX A. 8/4 FACTOR MODELS		
Purpose	A-1	A-1
Percent performing	A-2	A-1
Percent of time spent performing	A-3	A-1
Consequences of inadequate performance	A-4	A-3
Task delay tolerance	A-5	A-4
Frequency of performance	A-6	A-5
Task learning difficulty	A-7	A-6
Probability of deficient performance	A-8	A-7
Immediacy of performance or time between job entry and Task performance	A-9	A-8
Procedure	A-10	A-9
Conclusion	A-11	A-9
Example of 8 factor task selection model	A-12	A-10
B. TASK ANALYSIS WORKSHEET		
C. DATA SOURCE LIST		
D. FLOWCHART FOR ASSESSING REQUIRED ABILITIES/SKILL		
E. INITIAL TRAINING SITE RECOMMENDATION		
Purpose	E-1	E-1
Background	E-2	E-1
Procedure	E-3	E-2
Mobilization	E-4	E-4
F. SITE SELECTION EXAMPLE		
General	F-1	F-1
63B10 MOS (wheel vehicle mechanic)	F-2	F-1
Procedure	F-3	F-1
Conclusions	F-4	F-2
G. JOB PERFORMANCE MEASURES		

5

	Paragraph	Page
Purpose	G-1	G-1
Scope	G-2	G-1
Preparation	G-3	G-1
Considerations	G-4	G-1
Sample JPM: protective mask	G-5	G-2
Design guidelines	G-6	G-4
Conclusions	G-7	G-4
APPENDIX H. LEARNING HIERARCHIES		
Purpose	H-1	H-1
Example learning hierarchy	H-2	H-1
I. JOB PERFORMANCE AIDS		
Definition	I-1	I-1
Examples	I-2	I-1
Characteristics	I-3	I-1
Data required to make the decision	I-4	I-1
Rules	I-5	I-1
J. MAIL BACK QUESTIONNAIRE		

Portions of this handbook relating to planning and conduct of job and task analysis are based upon or taken from Dr. Francis Mechner's process for the development of large scale training systems.

PREFACE

The art of job and task analysis is not an easy skill to acquire nor can it be learned overnight. Experience and judgment are essential factors in acquiring it. However, these two factors do not "just happen" when an individual gains a certain rank/grade nor merely by assignment to a position requiring an analyst. To assist in obtaining the basic and intermediate skills required to conduct a job and task analysis, the Training Developments Institute, HQ TRADOC (ATTN: ATTNG-TDI-ORA) developed a job and task analysis job training package for an "analyst." The initial target population for a TRADOC service school analyst is an enlisted soldier (Grade + E6/E7), officer (Grade: CPT) and civilian job classification 1710, 1712 (Grade GS-11). The intended (recommended) sequence that should be used to train the analysis staff is:

Analysts.

Phase I - Complete the self-pacing modules available through the Director of Training Developments (DTD) in each service school. If these are not obtainable, contact TDI (AV 680-3608) for a complete set. These modules are available for administering as a set (or) individualized modules for specific jobs (i.e., personnel assigned in the Analysis Division with responsibility for task inventory development need take only those modules directly relating to his/her job. As the individual progresses in proficiency and acquires more missions then the modules relating to the skills/knowledges required would be taken).

Phase II - Read this pamphlet (TRADOC Pam 351-4, Job and Task Analysis Handbook). Not all analysts will work in all areas addressed in this pamphlet. Being exposed to other areas may cause confusion. As the analyst's proficiency progresses and requirements dictate working in new areas then he/she should take the self-pacing module for his/her new duty and read/use the chapters relating to this new duty.

As Required - Analysts involved in interviewing should review the interviewing tape (TV) available as part of the job and task analysis job training package. Interviewing is a technique which some cannot master and which requires skills difficult to acquire through the written media. Although the self-pacing modules address the techniques

used in interviewing, it is always much easier to "watch" someone interviewing and "mimic" his/her techniques. Most studies show that the art of interviewing can best be obtained through a "one-on-one" teaching technique. This TV tape assists in this need by providing a series of events the analyst can relate to.

Chiefs of Analysis. Individuals assigned as managers of an analysis effort must understand the management requirements (TRADOC Reg 351-4, Job and Task Analysis) as well as the fundamental issues of conducting an analysis and the ramifications of each requirement. Therefore these managers must know the above regulation, this pamphlet, and participate in the periodic seminars to be held by the Occupational Research and Analysis Division, TDI.(AV 680-3608).

Evaluators. Personnel involved in evaluating the job and task analysis process, and their products, should be familiar with TRADOC Reg 351-4, this pamphlet, and complete the self-pacing modules.

Feedback System. The procedures described in this handbook have been compiled from the present state of the art in job and task analysis. This handbook has attempted to answer the real problems encountered during analysis. During your reading of this publication and later during your actual analysis activities, if you encounter problems, please contact us. Feedback sheets are provided at the end of this handbook. Jot down your ideas, comments, unresolved problems, and suggestions, your input will help polish this handbook and the TRADOC analysis system. The Occupational Research and Analysis Division, TDI is available to provide technical advice should questions arise with this pamphlet. If desired call and discuss your comments/problems with the following personnel:

LTC Brad Walton, Div Chief, AV 680-3608
CPT Bob Begland, Dep, AV 680-3608
SSG Jerry Hale, Project NCO, AV 680-3608

THE TRADOC ANALYSIS PROCESS



CHAPTER 1

TRADOC PAM 351-4(T)

CHAPTER 1

THE TRADOC ANALYSIS PROCESS

1-1. Purpose. This handbook should be utilized by the job and task analyst as a ready reference in the day-to-day analysis activities. It provides analysis information in an organized way that was only described before in very general terms. Each chapter describes in detail its respective theme of the analysis process, and has a foldout at the end of the chapter that outlines the major points and delineates any sequential activities. Before you begin to read each chapter, turn to this foldout, open it up, and glance over the topic areas. Then as you read each paragraph, refer to this outline and use it as an organizer of your thoughts. This handbook describes the specific details of job and task analysis and the selection of tasks for training. TRADOC Reg 351-4 defines the management requirements and procedures. By providing regulatory guidance with specific "how to" support, the job and task analysis system will become a viable force in the systems approach to training. Included within the appendices are several subjects that describe processes that occur simultaneous with or immediately after analysis, i.e., Site Selection, Job Performance Measures, Job Aids, and Learning Hierarchy. These appendices are included to relate them to the job and task analysis effort.

1-2. Organization of handbook. The organization of this handbook aids in understanding the job and task analysis process. It describes the steps necessary during the analysis phase. It will specify the job analysis process to include the compilation of the task inventory, how it is developed, and what sources are available to the analyst to collect data concerning the job. The procedure for selecting tasks for training will be described, to include the criteria and the composition of the task selection board. The task analysis process is defined, including suggested data that should be collected and the sources. Finally, recommendations will be made on how tasks can be relegated to different training sites.

1-3. Scope. Job and task analysis must always be perceived in the context of the total systems approach. The data collected during this front end analysis (FEA here being defined as job and task analysis) is valuable in its application to the training development process. The integration of several different job and task analysis events is portrayed in figure 1-1.

1-4. Glossary. (See TRADOC Circular 350-3).

1-5. Training.

a. The Army lacks a pool of trained analysts for its job and task analysis efforts. On the contrary, each service school must repeatedly develop its analysis personnel. Recognizing this periodic requirement, a set of instructional materials (Job and Task Analysis, Job Training Package) have been developed. These self-paced materials are for the novice analyst as an on-the-job training system.

b. This pamphlet is an aid to the analyst, but assumes that he has completed his portion of the job training package. Even though job and task analysis is all encompassing, the novice should not be expected to perform, conduct, or understand the entire process after "going through the materials and reading this handbook." Understanding of the process and competence in the variety of job and task analysis skills will come with time and effort. This handbook aids that understanding, but still requires time and experience on the job as an analyst.

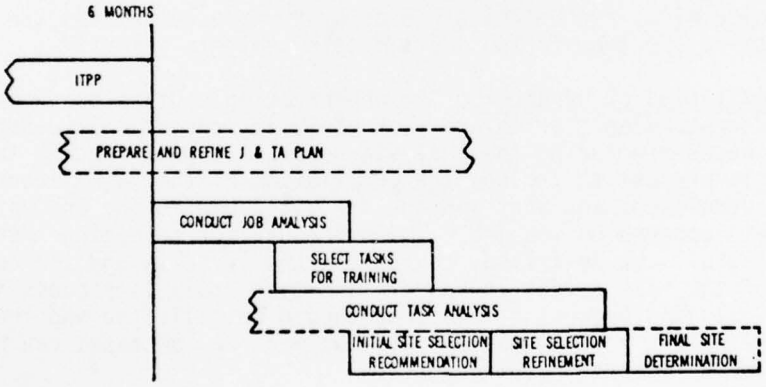


Figure 1-1 JOB AND TASK ANALYSIS PLANNING MODEL

KEY POINTS

CHAPTER 1

JOB AND TASK ANALYSIS

Paragraph

1-1 Purpose of Handbook

Analyst's ready reference
Interface with TRADOC Reg 351-4

1-2 Organization of Handbook

1-3 Scope

Relationship to systems approach
Job and task analysis plan model

1-4 Glossary

1-5 Training

Lack of trained analysts
Continual requirement to train new analysts
Job training package
Pamphlet not sufficient by itself

OVERVIEW OF JOB AND TASK ANALYSIS



CHAPTER 2

TRADOC PAM 351-4(T)

CHAPTER 2

OVERVIEW OF JOB AND TASK ANALYSIS

2-1. Army training mission. The Army must be an effective fighting force trained to a specified level of readiness and maintain that level of readiness. The strategy of identifying the different readiness requirements and developing training that will support them is called the systems approach. By defining these readiness requirements (collective and individual), the Army then trains to meet these needs.

2-2. Job orientation for individual skills. A systematic approach to the design of military instruction rests with a specific definition of the performance requiements of the job. Instructional Systems Development aids in training soldiers for performance in the real world. The systems approach to the design of instruction includes the definition of what is to be trained, in terms of job requirements. The systems approach to the design of training is based on an evaluation of what is expected of a soldier in a given specialty and a rational analysis as to what the soldier actually does on the job. Once job proficiency of specific tasks has been defined then the training developer can design training that will support job proficiency of task performance, inform the soldier of the required skills and develop appropriate test mechanisms to measure job proficiency. This process of job identification of specific tasks has developed into the field of job and task analysis.

2-3. Analysis base.

a. Job and task analysis form the foundation of the systems approach to training development. The entire process involves several activities each mutually supporting the other (fig 2-1).

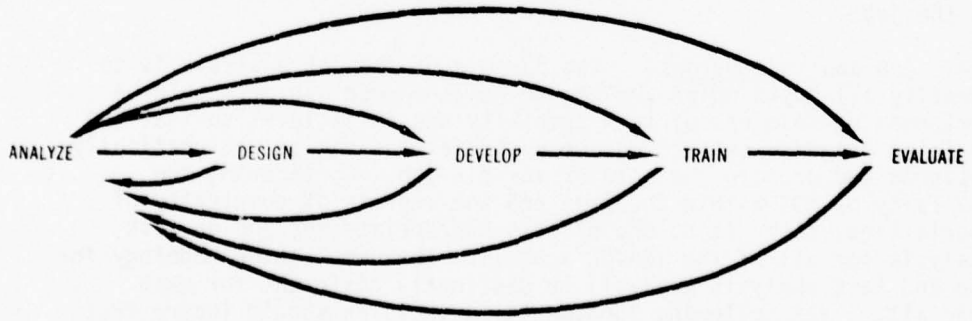


Figure 2-1 **SYSTEMS APPROACH**

These activities are portrayed in a linear (straight line) fashion, yet each may well have several parts occurring at the same time with other activities. The existing individual training system has several product systems that are designed to support individual proficiency. The interrelationship of each of these training products should evolve naturally from a common analysis base (fig 2-2).

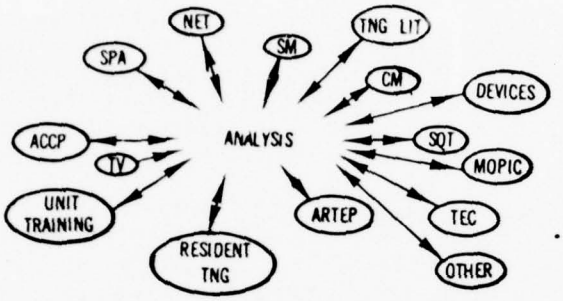


Figure 2-2. Fig. 2-2 **ANALYSIS BASE**

b. If this analysis base does not exist, is not used, or is used irregularly then the integration of these separate training products is difficult. Each system then conducts its own analysis and may well come up with an entirely different data base and conclusions. A common analysis base is a system prerequisite. Each of these programs should look to a consolidated analysis base which will facilitate the accomplishment of their mission. Without the assurance of job and task analysis, the training designer can not be certain that he is training or testing the appropriate skills. A training organization can develop training support packages and products which are systems designed," performance oriented, criterion referenced, self-paced, mastery based but which do not reflect true performance required on the job.

2-4. Job analysis purpose. The purpose of the job analysis is to identify all tasks which are now being performed and/or should be performed by soldiers of each specialty and skill level so that the training programs supporting these specialties can be systematically designed and prepare the soldier for his job. Considering the diversity of MOS within the Army and the degrees of complexity of specialties, there is no one process appropriate for job or task analysis for all of the TRADOC schools. The complete methodology for job and task analysis may well be distinctly different for each specialty. Yet following fundamental principles should insure that basic criteria are met and are available for the refinement/evaluation of the analysis effort.

2-5. Resources.

a. Job analysis and task analysis are a resource intensive investment that should be undertaken only when the management system makes a commitment to not only conduct the analysis but to subsequently utilize the data as part of the design or redesign of its training programs, instructional materials, training products, evaluation instruments and supporting products. For this reason, data collection, analysis, and documentation can not be undertaken purely for the sake of data collection, nor conducted to compile data for future design efforts. The decision as to which MOS are to have a job and task analysis conducted is a management decision.

b. The analysis of evaluation instruments such as ARTEP or SQT could indicate specific discrepancies, in terms of skills and knowledges that units or soldiers are lacking. Surveys administered to job incumbents and supervisors allowing them to evaluate previous training in terms of task competency and job performance preparation indicates areas requiring job and task analysis. Technical panels/training committees, etc., available to advise commanders can indicate potential training/performance discrepancies. These training management indicators point to specific performance discrepancies which may be resolved through a modification to the training program. The management decision to begin a job and task analysis would be occasioned by events similar to these.

c. The analysis process consumes resources. There is no way to accomplish a good cheap analysis in a short period of time. Accordingly, the training developer must schedule analysis efforts to collect the required data for the actual training products and training resource projections. If a Soldier's Manual is scheduled for production, then the analysis for that MOS must be planned and projected to provide data prior to the production.

d. The systems approach to training is not an end in itself. Its only purpose is to improve the effectiveness of units by producing, as efficiently as possible, men capable of doing their jobs. Training is not the only means of achieving this goal and the need for a critical approach to job analysis must be emphasized. The job analyst should not blindly pursue training as a cure all but should consider if job effectivensss could be improved by other means. This decision should be made when one of the following events occurs:

(1) EPMS conversions.

(2) RETO requirements.

(3) SM/CM revisions.

(4) Introduction of new equipment in a specialty (off-the-shelf, new acquisitions).

(5) TRADOC service school internal and/or external evaluation feedback.

(6) Job/task discrepency feedback from the field.

(7) Product Improvement Plan (PIP) implementation altering a functional system.

(8) Training Developments Information System (TDIS) requirements/ conversion.

(9) Creation of a new officer or enlisted specialty.

e. Choosing which specialties require a job and task analysis is a management decision. Considering budget constraints, the Army can not conduct a job analysis for all specialties/grades/skill levels. Management must decide which specialty will be analyzed. However, before deciding to conduct a job and task analysis, the management staff must be aware of the factors and establish priorities as to which jobs will be analyzed.

f. A needs assessment conducted before analysis determines if training is required and assesses skill deficiencies, both individual and organizational, along with their developmental needs. It obtains information required for developing training courses or programs (fig 2-3).

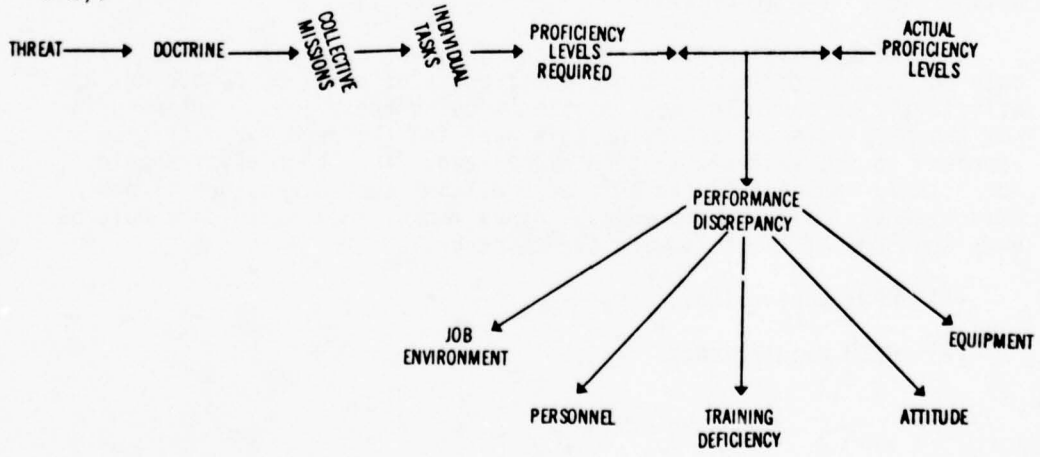


Figure 2-3. NEEDS ASSESSMENT

g. It is essential that the Army's limited training development resources be most effectively utilized in the resolution of real performance problems. The needs assessment approach to training development is designed to insure this. The basic guide in needs assessment is to FOCUS ON PERFORMANCE.

h. Considering the mission and nature of the Army, the minimal standards of performance are defined by Threat, Doctrine, and Collective Missions and Individual Tasks. Whenever the actual performance level does not meet or exceed this minimal proficiency, there is a real performance problem (fig 2-3).

i. The beginning point of a needs assessment is in the identification of the problem(s). There are a variety of symptoms or indicators that the analyst can use in this problem identification process:

- Field commander's comments
- Unit performance evaluations (ARTEP)
- Unit's maintenance readiness
- Individual soldier's comments
- Isolation of a new threat
- Introduction of a new piece of equipment
- Creation of a new specialty

Each of these elements may potentially indicate that there could be a performance problem present. The role of the analyst is to collect, group, analyze the symptoms, to completely identify the problem and to specify the actual performance discrepancy.

j. Once this has been done, the analyst is then ready to address the issue of causes of the problem and then isolate potential solutions for it. Performance problems oftentimes can be traced directly to a skills/knowledge deficiency. Yet, many performance problems are a function of either the work environment or the motivation of the soldier.

k. Training is an appropriate solution when the performance discrepancy is attributable to a skills/knowledge deficiency. But it has no positive impact if the problem is environmental or motivational. Evidence, such as the facts described below, would tend to suggest a skills/knowledge deficiency:

(1) Soldier cannot perform task correctly even when he knows he is being observed.

(2) There is no opportunity to practice the task while in training or while on the job.

(3) Task requires the application of concepts, rules, principles.

(4) The task is new to the target population.

(5) History of inadequate training in the unit or the school.

If the problem can be attributed to a skills and knowledge deficiency, then training is an acceptable solution. But if not, then an alternative solution must be explored.

l. the performance problem may be indicated by symptoms that suggest an environmental cause, e.g.:

(1) Required support equipment missing from a maintenance unit.

(2) Grumbling is widespread.

(3) Work facilities inadequate.

(4) Barriers to performance present.

(5) Work flow unclear.

(6) Supply and demand difficulties.

(7) Frequent supervisory changes.

These type of environmental symptoms indicate performance problems of a different nature, requiring a non-training solution.

m. Finally, the analyst may find that the performance problem is caused by motivational problems, characterized by:

(1) Soldiers not getting feedback on their performance.

(2) Punishment employed as a management technique.

(3) Soldiers unaware of their role in the unit's mission.

(4) Good performance being punished.

(5) Reward system for task accomplishment is minimal

(6) Tasks are distasteful

If these types of symptoms emerge during the analysis, then the traditional training solution is inappropriate.

n. The benefit of a needs assessment is achieved through a precise definition of performance discrepancies in terms of measurable, observable problem symptoms. Once specified, the analyst is able to focus on the appropriate solution(s) for the performance discrepancy. The analyst, using a systematic problem solving approach, can accomplish this needs assessment by raising questions like:

What is the real problem?

How do we know that it is a problem?

What symptoms are there that indicate the extent of this problem?

Who is deficient?

When is the problem present?

What precisely is the deficiency?

What impact does this problem have on unit performance?

Is this problem attributable to a skills/knowledge deficiency?

Is this an environmental or motivational problem?

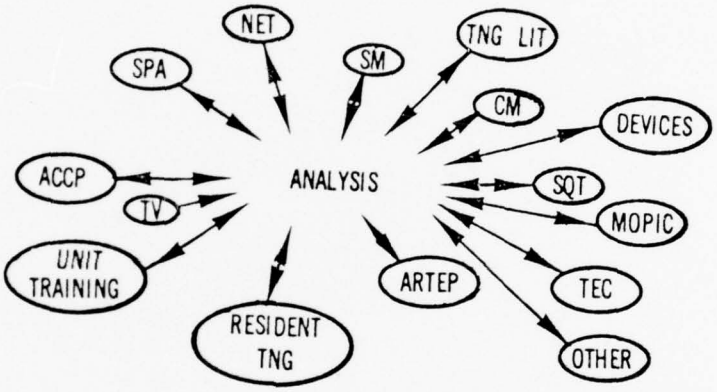
What is the major cause of this problem?

What are contributing causes to this problem?

o. The answers to these questions can isolate the essence of the performance discrepancy and analysis can suggest acceptable solutions.

Those problems requiring training as a solution can then be prioritized as candidates for training development resource expenditure. Thus, real performance problems will drive the Army's training system and insure that the training development resources are being committed to performance problems for which training is the appropriate solution.

p. There are four categories of data to collect prior to a job and task analysis. This data relates directly to the known and projected threats facing the Army, and to the doctrine that addresses these threats. It also relates to the collective missions assigned to units and to the capabilities of the individuals in those units. This top down analysis compares the performance requirements and actual competencies of individuals. If there is a difference in these two performances, then it can be systematically addressed. The four categories of data are: 1) data to define the performance discrepancy, 2) data to identify the solution, 3) data to specify individuals requiring training, 4) data to provide the planning details for delivery of training. The training developer must be able to identify the specific levels of performance required for each specialty and skill level. If this level of specificity is achieved, he can determine the present levels of proficiency and identify those areas where discrepancies exist. Training may be an obvious solution to many performance discrepancies, yet it is not the only one.



ANALYSIS BASE

KEY POINTS

CHAPTER 2

OVERVIEW OF JOB AND TASK ANALYSIS

Paragraph

2-1 Army Training Mission

Systems approach

2-2 Job Orientation

Performance requirements
Job proficiency
Derivation of job and task analysis

2-3 Analysis Base Products/Organizations Requiring Analysis Data

Soldier's Manuals
Commander's Manuals
Skill Qualification Tests
Training Extension Courses
ARTEPs
Army Training Literature
Training Devices
MOPIC
Resident training
Unit training
ACCP
Skill Performance Aid
New equipment training
Television
other

2-4 Job Analysis Purpose

Identify tasks now performed or that should be performed
No "single" TRADOC job and task analysis methodology

2-5 Resources

Job and task analysis - resource expensive
Job analysis dictated by discrepancies
Requirement for scheduling
Needs assessment

JOB AND TASK ANALYSIS PLAN



CHAPTER 3

TRADOC PAM 351-4(T)

CHAPTER 3

JOB AND TASK ANALYSIS PLAN

3-1. Purpose of plan.

a. The Job and Task Analysis Plan (J&TA Plan) is a management tool which insures efficient use of resources when conducting a job and task analysis. This plan is the responsibility of the Commandant of each school and should be approved at the highest level possible. The plan and its preparation insure that the management structure is aware of its goals, its data requirements, and the required resources. From these requirements, specific data collection procedures can be developed, resource expenditures projected, and specific product deliverables identified. During the analysis, the plan will be a ready-reference as to "where you are, where you're going, and where you've been."

b. The Job and Task Analysis Plan is a working document from the first day a specialty is identified as requiring a job and task analysis, until the training products have been completely revised or developed. As a planning document, it will provide the structure for detailed organization, tasking, and resource allocation, using the plans and forms identified in the Individual Training Plan (ITP), TRADOC Cir 351-3. As a record it will be a component part of the audit trail depicting the actual analysis progress. As an evaluation instrument, it will be the key in evaluating the planning, execution, and results of the analysis efforts. With justifications on any deviations from the original planning concept. If at this time you have not opened up the foldout for this chapter, please do so.

c. The Job and Task Analysis Plan is an effective management tool, capable of providing direction, insuring sufficient resource planning, and a constant feedback mechanism and of recording.

3-2. Scope.

a. The Job and Task Analysis Plan (J&TA Plan) will be part of the overall management plan for the training development process and will integrate all of the activities which occur early on in the systematic approach to the design and/or revision of MOS training. These activities include the job analysis, the selection of tasks for training, the task analysis, and the initial site-selection recommendation. Because of the inter-dependence and independence of each of these activities, the J&TA Plan should address each separately yet integrate all within the total plan.

b. The J&TA Plan provides the base for the analysis effort and for all training development and evaluation products relating to that specialty. Thus the data is available for actual developmental efforts during training, for the preparation of Soldier's Manuals, for the preparation of SQT, and interface with the resource management process. The minimum areas to be addressed in this plan are:

(1) Officer/enlisted specialty.

(2) Job description.

(3) Target population.

(4) Plan rationale.

(5) Implication of the job and task analysis.

(6) Resource requirements/constraints.

(7) Data sources.

(8) Deliverables.

c. Each of these sections provides structure to the plan and insures that the necessary details have been considered. The following examples of the components of a Job & Task Analysis Plan are provided only as a suggestion to indicate the type of information that may be included within each area. For the purpose of indicating that type of information, officer specialty code 11 is provided as a notional example and not to be perceived as all inclusive.

(1) Officer/enlisted specialty:

Infantry Captain

NOTE: In the Army, when an analysis is conducted of a specialty it is termed an occupational analysis, indicating that the analysis relates to the specialty, i.e., infantry and to a specific grade or status level, i.e., LT, CPT, MAJ. Within this specialty, there is the traditional grade progression of 01-02-03-04-05 and various duty positions by grade, e.g., platoon leader, company commander, S1, instructor, recruiting officer, etc. The analysis will isolate and define the specialty in terms of this grade progression and duty position distinctions. Though there are "jobs" within specialties, the focus of the analysis effort begins with the specialty, e.g., infantry captain, and then examines each of these duty positions in the context of the specialty.

(2) Job description.

An infantry lieutenant's first assignment might indicate the variety of assignments, ranging from rifle platoon leader, mortar platoon leader, support platoon leader, reconnaissance platoon leader, company executive officer, assistant staff officer (S1, S2, S3, S4), training officer at a training center, etc. The initial assignment pattern by geographic region might show 19 percent in Europe, 09 percent in Korea, 69 percent in CONUS, 02 percent in Alaska, 04 percent in Hawaii, and 02 percent in Panama. If there are typical career assignment patterns, these should be identified.
....

Note: The job description should define all relevant job data.

(3) Target population.

Note: Considering the example of an Infantry Captain, it becomes obvious that the target population definition encompasses several years and varied degrees of experience dependent upon whether the individual is a recently promoted captain going to Germany or a captain with 11 years service, two company commands and S3 experience. For that reason, the target population statement should be sufficiently precise to produce useful data.

Officers attending the Infantry Officers' Advanced Course.

Seventy percent of the students entering IOAC are Infantry Captains. Thirty percent of the students are infantry lieutenants. A small percentage of the students will be representatives of other branches.

The students' average age will be between 26 and 30. Seventy percent of the officers are married. Their average educational level is 16 years. Approximately 80 percent have a bachelors degree.

The source of commission by numbers is as follows:

a. ROTC 57%

b. OCS 11%

c. USMA 29%

d. Other 03%

All students have completed IOBC or an equivalent branch qualifying course. The students have at least a 110 GT score or equivalent. On the Nelson Deney Reading Comprehension Test, the following levels were determined:

97.8% of all captains tested scored above the 14th grade level. (vocabulary)

97.8% of all captains tested scored above the 12th grade level. (comprehension)

93.3% of all captains tested scored above the 14th grade level. (total reading score)

The lieutenants attending the course possess reading abilities comparable to those of the captains.

The majority of advanced course students are RA officers with just over 4 years time in service normally at platoon level. They will have served in job assignments such as rifle platoon leader, mortar platoon leader, antitank platoon leader, support platoon leader, reconnaissance platoon leader, company executive officer, assistant battalion and assistant brigade staff (S1, S2, S3, S4). About 10 percent of the officers will have commanded a company. Therefore, the students enter the course with vastly different experiences.

Less than 10 percent have combat experience.

80 percent of the students are airborne qualified.

50 percent of the students are ranger qualified..

All students have a SECRET security clearance.

All students have a one (1) year obligation upon course completion.

The students know that the purpose of the course is to train infantry officers to serve as commanders and battalion and brigade staff officers. They expect to receive instruction which will enable them to develop the skills, knowledges, and attributes required to successfully perform in these jobs.

The students will be very intolerable of any instruction which does not encompass current doctrine and technology or is poorly presented.

....

(4) Plan rationale.

Note: The plan rationale should indicate the basic premise for conducting the analysis of the specialty. The notional example provided herewith is extracted from the RETO study.

"There is no established commonality among the sources of commissioning in regard to the military skills and knowledge which their graduates should possess.

"The new lieutenant should leave the Basic Course with all the skills and knowledge to perform in his first assignment; this does not happen today.

"Officer education and training during the period between the Basic Course and the Advanced Course is haphazard at best."

....

(5) Implications of the Job and Task Analysis.

Note: A comprehensive analysis of a specialty may affect not only the training in that specialty, but also assignment progression, testing equipment modifications, recruitment standards, even the structure of the specialty. For that reason, it is important to identify potential areas affected by an analysis.

An analysis of the infantry lieutenant position potentially could suggest that the amount of training conducted in 10BC is insufficient for the real world requirements. One implication from this could be an expansion of the 10BC curriculum or perhaps the preparation of specific exportable training materials for use during the first six months after training.

....

(6) Resource requirements/constraints.

Note: The complexity of job and task analysis dictates that adequate resources be programmed to insure the availability of people, time, facilities, and money. In terms of analysis staff, subject matter experts, job incumbents, equipment, there must be detailed planning of the resources required. Whether it be for an on site visit, for a research effort into threat documents, for the task verification efforts, for the task selection board, or for the reproduction of survey questionnaires, it is essential that every possible resource be projected to include all staff and support elements, field units, equipment, TDY expenditures, and total mandays of effort. The resource section will describe each of these different resource categories and account for their expenditure by area.

Prepare Specialty Task List for Infantry Captain	STAFF	TDY	ETC
(1) Identify duty positions to be analyzed	4 staff 60 mandays	No	
(2) Collect job background data, ..	5 staff 150 mandays	15 trips	
(3) Identify duties of each duty position	2 staff 40 mandays	No	
(4) Identify tasks related to each duty	3 staff 45 mandays	No	
(5) Interview job incumbents...	5 staff 100 mandays	15 trips	
(6) Refine task list	2 staff 20 mandays	No	
(7)			
(8)			

(7) Data sources.

Note: To facilitate subsequent analysis efforts, to assure an institutional document that lists sources of data and most importantly to comprehensively review all appropriate data sources, each data requirement should have a list of possible data sources listed for examination.

DATA REQUIREMENTS	SOURCES
Job Descriptions (Inf CPT)	Table of Organization and Equipment
	Table of Distributions and Allowance
	RETO Study Data
	Army Regulations
	Directorate of Combat Development
	Directorate of Evaluations
	TAADS Data
	SME
	Job Incumbents/supervisors

(8) Deliverables.

Note: The deliverable products of the job and task analysis must be specified in the management plan if the total puzzle is to fit together. The variety of products is indicative of the amount of work required during job and task analysis.

A list of deliverables for the infantry specialty might include:

(A) Job background information for infantry officers.

  (1) Demographic data including population size/density.

  (2) Equipment configurations.

  (3) Supervision levels.

  (4) Job descriptions.

  (5) ....

(B) Target population data.

(C) Task inventories.

  (1) Common task lists.

  (2) Shared task lists.

  (3) Task lists by duty positions.

  (4) Infantry unique task lists.

  (5) Task list by grade.

(D) List of tasks selected for training.

  (1) Criteria.

  (2) SOP.

  (3) Board results.

(E) Task analysis documentation.

  (1) Worksheet prepared on all critical tasks.

  (2) All background information from above for empirical files.

(F) Lessons learned file.

(G) Audit trail.

d. From the beginning, responsible senior managers define the guidance to direct training development. Specifically, the goals and the performance expectations should be explicitly stated. If the need can be defined then the solutions are achievable. Once the goals and parameters are defined then the resources can be projected in terms of: salaries, travel, contracts, equipment, supplies, facilities, etc.

e. The specific components of job analysis, selection of tasks for training and task analysis is described in detail in their respective chapters. The J&TA Plan should contain the decisions and guidance on how each of these activities will be conducted. The role management has during the instructional systems development process is one of setting goals, setting priorities, approving plans, monitoring progress, and evaluating the product(s). The J&TA Plan is the document that will record each of these management inputs and provide the complete audit trail for the analysis effort.

3-3. Deliverables. Specific details for the preparation of the J&TA Plan are addressed in TRADOC Reg 351-4, Job and Task Analysis. Deliverables required for each analysis effort (in addition to the plan itself) are:

a. Completed target population description.

b. Job demographic data.

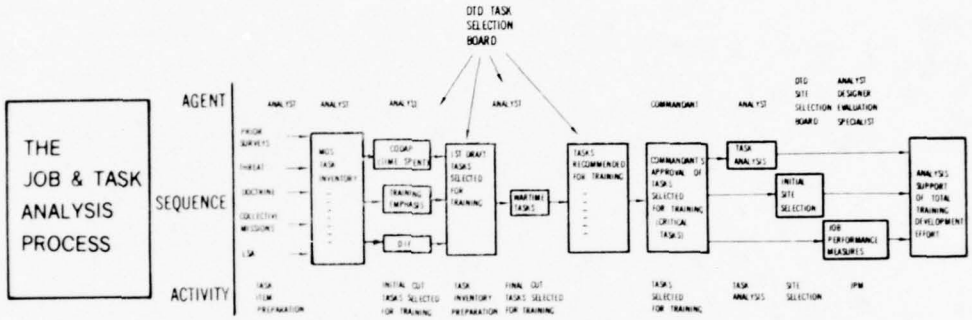
c. Task inventory (initial).

d. Task inventory (final).

e. Task selected for training (critical tasks) to include criteria for selection and rationale for each task selected.

f. Task Selection Board SOP.

g. Task analysis worksheet for each task selected for training, with initial site selection recommendation (app B).



Overview of JOTA process

KEY POINTS

CHAPTER 3
JOB & TASK ANALYSIS PLAN

Paragraph

3-1 Purpose of Plan

Management tool
Specifies: what, how, when
Basis for: resource projection
Working document
Ready reference
Part of Individual Training Plan
Component of audit trail

3-2 Scope

Job analysis
Selection of tasks for training
Task analysis
Initial site selection
Plan will provide the Empirical Base and the Guidelines for the J&TA Process
Data requirements:
- Officer/enlisted specialty
- Job descriptions
- Target population
- Plan rationale
- Implications of the J&TA
- Resource requirements/constraints
- Data sources
- Deliverables

Role of Management in ISD process
- Set goals
- Set priorities
- Approve plans
- Monitor progress
- Evaluate products

3-3 Deliverables

Target population description
Job data
Task inventory (initial and final)
Tasks selected for training, criteria, rationale
Task selection board
Task analysis worksheet

JOB ANALYSIS



CHAPTER 4

TRADOC PAM 351-4(T)

CHAPTER 4

JOB ANALYSIS

4-1. Purpose. The basic concept of the systems approach to instructional development is that once job proficiency is defined in measurable terms, then, these skills can be taught and post-training proficiency measured in job specific areas. Job analysis for training is the process of examining a job to identify its component tasks in the circumstances performed, and to obtain other information which will assist in the design and development of efficient and effective job training. This data defines the soldier's work environment, the type of equipment and soldier required for the position, and the specific tasks that make up the specialty.

4-2. Scope.

a. A job analysis attempts to define the job elements and their relationships to the Army. To accomplish this, the analyst should begin with the major potential threats confronting the Army, examine the doctrine and build down. Within every service school and major command there is a threat manager, who is responsible for the overall supervision/coordination of all threat activities at that school or command. Additionally, the Combined Arms Center, the Logistics Center, and Administration Center are responsible for the integration of threat data into the respective schools, and training programs. Through a single point of contact at each school, the system has attempted to insure validity in the threat data and consistency in its integration into the training system. The analyst should rely extensively upon this Threat Manager and the school's threat team. By integrating the threat and the collective (unit) missions, the analyst is able to identify individual tasks heretofore not isolated or considered for training. This strategy for the analysis places the job into its relative relationship to doctrine, threat, collective (unit) tasks, individual tasks and their interface with the training developments process (fig. 4-1).

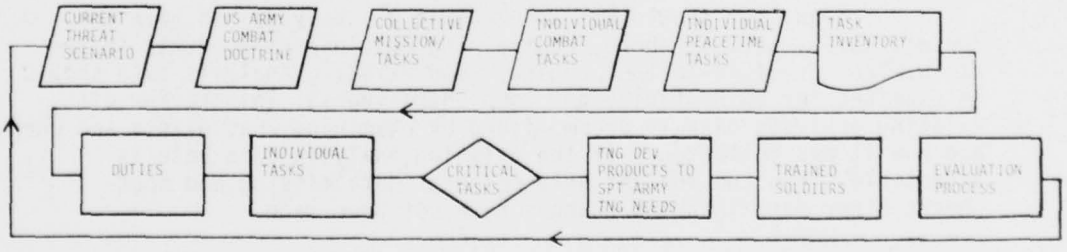


Figure 4-1. The analysis/training developments interface

b. The analyst examines the job history, develops an understanding of its past and investigates its future. Coordination with Combat Developments would indicate any replacement equipment/ systems that are forthcoming. The effect of these innovations upon the job and its related systems should be projected. The significance of this explanation or orientation to job analysis is that the analyst begins at the top and works down to the task.

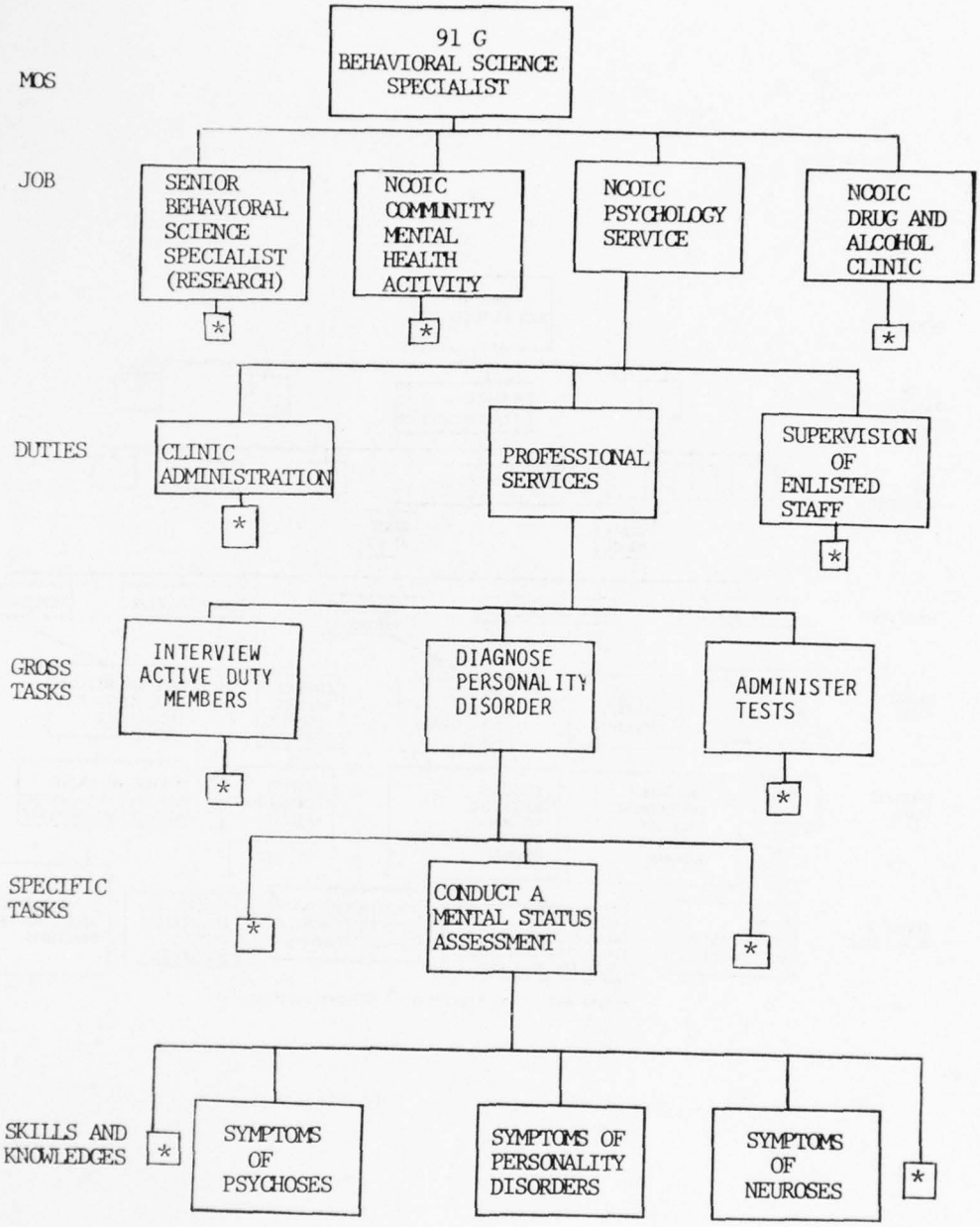
c. The job is defined and examined from several different perspectives. The analyst starts by reviewing threat scenarios, examining doctrine, and identifying the essence of the job as part of the collective mission. The analyst must look at these missions, and break out the role of the individual within each activity. Whether the mission is for a squad to conduct a night ambush, or for a task force movement to contact, the analyst must define the individual tasks, skills, and knowledges (for a detailed discussion of collective/individual analysis interface read Chapter 10). Once the "big" picture is understood, the analyst orients on the job, its major duties and tasks (for a graphic portrayal of this relationship, refer to figures 4-2 and 4-3, on the foldout following this page).

d. This approach to the job analysis insures the collection of all required data. The analyst will spend many days searching, reading, talking, and observing. In specific terms, the analyst examines various documents relating to threat, doctrine, missions, etc. Visiting the job site in several different geographic regions is essential including talking with incumbents, supervisors, instructors and commanders. The analyst should identify equipment found on the job. Finally, the analyst looks at the job in terms of the personnel. Does the job have unique requirements for the soldiers? Must the soldiers have unique qualifications for the job? The ways the analyst examines the job are a function of the analysis conducted and the amount of information collected.

4-3. New analysis vs revision.

a. If the analyst conducts a job analysis for a specialty not previously analyzed, then the analyst would take one approach. If the specialty has been previously analyzed a revision analysis would then be conducted with a different approach taken.

b. The analyst should not assume that an analysis has been conducted, simply because there are training development products in the field. The "proof is in the pudding," and existing analysis data should be examined for authenticity and comprehensiveness. This review of existing analysis data is accomplished by examining what exists and when and how it was collected. If the existing analysis data base is acceptable, then the analyst only collects data missing and spot-checks other data insuring changes have not been made.



*Excluded for brevity

Figure 4-2. TASK HIERARCHY OF ENLISTED MOS 91 G

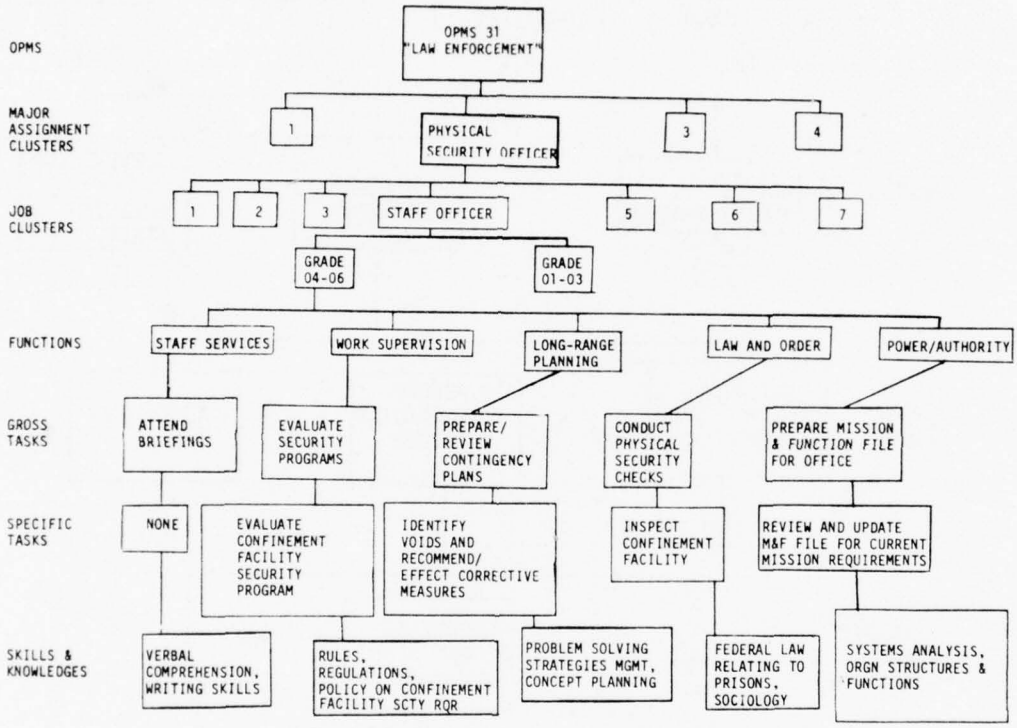


Figure 4-3. Task hierarchy of officer specialty 31

c. If however, the analysis data is suspect, or no analysis was previously conducted, then the analyst plans for a comprehensive analysis. In either case, the analysis resource requirements for a new analysis are extensive and more complex than a revision analysis.

4-4. Analysis for a new system.

a. If the specialty being analyzed is in existence and lacks new equipment, then the "traditional" job and task analysis procedures are acceptable. But if a new specialty is created, or a new piece of equipment significantly altered specialty, then the analyst is presented with some unique data requirements. Task inventory data for new systems is generally available for maintenance tasks and some operator tasks from the Logistics Support Analysis (LSA) performed under the Integrated Logistic Support (ILS) program. The data output forms (described in Chapter 11) should be obtained so that the tasks can be compared to the existing MOS inventory. The analysis then can be confirmed to "new" tasks that must be added to inventory. All units are affected by a significant number of new systems. Looking only at major weapon systems available by 1985 (fig. 4-4) it is obvious that a substantial number of the specialties, either operating or maintaining these systems, will be affected.

INFANTRY 5	ARMOR 5	AVIATION 5
FIELD ARTY 7	ENGINEER 6	SIGNAL 3
RSTA/EW 7	AIR DEFENSE 5	USAF SYSTEMS 1+

Figure 4-4. New systems.

b. It is important to determine if a new system will affect a specialty. In paragraph 4-8 (target population) specific requirements are addressed. An analyst will be indirectly involved with analysis for new equipment (Category 3, para 4-8), and directly involved with old specialties (Category 1), new specialties (Category 2), and finally officer specialties (Category 4). Even though developmental systems are now required to have a front end analysis (meaning equipment analysis,

functional analysis, task analysis, and behavioral task analysis) the analyst should closely monitor these analyses, thereby projecting any modifications to the specialty, training program, or entrance requirements (for a detailed discussion of the analysis activities relating to the interface of new equipment procurement off the shelf equipment acquisition, and skill performance aids (SPA) with the training development process see Chapter 11). A procedure that assists in this data analysis is described in Appendix D. This methodology insures the school analyst comprehensively examines front-end analysis data and recommends any potential changes to the piece of equipment, to a proposed training program, to the minimal competency levels, or to the specialty structure. This early analysis input is essential if the Army is to optimize developmental systems in terms of the soldiers, units, and future requirements.

4-5. Sequence of operations. Regardless of the job analysis conducted (new vs revision), the data requirements are basically the same. In terms of actual analysis activities, job analysis has three primary events:

a. the task inventory preparation for the specialty.

b. the collection of job related information.

c. the collection of target population related information.

Each of these distinct events will be discussed in subsequent paragraphs.

4-6. Task inventory preparation.

a. Purpose. A task inventory is prepared for each specialty to define the job in the specific terms of its tasks. Once this is done, the training system has a basis to develop training programs and materials. Accordingly, the preparation of the task inventory is the start of the entire analysis effort. Accurate, precise task statements are the foundation of the Army's training system. If the job analysis reveals that information contained in AR 611-201 (Enlisted Career Management Fields and Military Occupational Specialties) regarding the job is incorrect or incomplete, separate action must be taken to correct that directive. Changes to AR 611-201 are submitted in accordance with proposed contained in AR 611-1. Similar action is required if the job analysis reveals a new MOS is necessary.

b. Procedure. The analyst constructs the task inventory from a variety of different sources. As previously identified several approaches must be taken. The units that contain the specialty are studied, their missions examined, and their relationship to the specialty defined (Chapter 10). All of the equipment found at the job site is discussed and any performance requirements defined. The analyst visits with the operations officers within the G3 office to identify those individual tasks isolated as supporting and integral to battalion level unit proficiency. This approach tries to integrate the individual tasks into the collective task analysis process. The supporting individual tasks can be identified by exploring collective tasks. Previous CODAP reports and existing training programs should be studied. Finally the analyst observes, questions, and interviews the soldiers and their supervisors (for a detailed description of the task inventory preparation see chapter 5).

c. Task statements of a gross nature are derived from these various sources. As their statements are refined they become the task inventory. By using several verification methods the task inventory and task statements gradually begin to assume some organization and meaning. This process takes several weeks and cannot be hurried.

4-7. Job related information. The second type of analysis included within job analysis is the job description. Here the analyst attempts to capture all the relavent information relating to the job. This analysis would include information like:

a. Different duty positions - Description of the different duty positions within the specialty. List each duty position and provide a short narrative stating the responsibilities of the job incumbent. The duty positions and partial job descriptions may be found in AR 611-201 for enlisted personnel and in AR 600-101 for commissioned and warrant officers. Those positions not described must be defined and delineated to ensure a follow-on reader the capability of understanding the duty being analyzed.

b. Career progression - Provides a description of the soldier's career and professional development both in terms of assignments and training. Describe the points in the career development when additional specialties might be awarded or when additional responsibilities might be conferred.

c. Present training system - In addition to the career progression description, identify the training system that supports the career progression. Identify the method of instruction (self paced, correspondence course, etc.) course length, scope, location, and prerequisites. It is also important to identify which POI correctly supports the present training, its performance objectives, and the included skills and knowledges.

d. Demographic profiles Personnel and equipment.

(1) Personnel profiles. MILPERCEN produces a monthly report called COPO 45 that identifies personnel by pay grade, skill level, and MOS. The report is classified CONFIDENTIAL and must be requested through your local Adjutant General Office. The report is extremely large and only certain portions will apply to the job analyst. When you request the report you require only:

Part 1 (Identification by Command)
Part 2 (Summary)
Part 5 (CONUS vs overseas by PMOS)
Part 6 (Operating vs authorized by PMOS, pay grade)
Part 6, Section 4 (same as Part 6 above, however, it identifies female soldiers only).
Part 10 (Armywide projected strengths)

(2) Equipment profiles. DARCOM produces a quarterly report called Continuing Balance System Summary Report (Worldwide Asset Position Report). The report number is K600BBY1234Q. It contains approximately 9,000 items by Federal Stock Number and is classified CONFIDENTIAL. The standard distribution is to selected MACOM and all Material Readiness Commands (Commodity Commands). The report identifies the equipment by type and volume by MACOM, and identifies equipment down to unit level by unit identification code (UIC) on a selected basis. Due to the volume of the report and the potential number of users in TRADOC service schools, you must contact the commodity command which has proponency for the equipment and request data for specific FSN only. Do not ask for the entire report.

(3) Miscellaneous data. Varied information pertaining to human factors data, components or system safety problems, etc., can be acquired through the Government Industry Data Exchange Program (GIDEP). To acquire access to this program, installations should contact the Director, GIDEP Operations Center, Corona, CA 91720 (AV 933-4672).

e. Job environment.

(1) Physical conditions: Noise level, stress, crowding, travel requirements, physical location of duty performance.

(2) Behavioral factors: threats, incentives, rewards, times, pressures, and deadlines.

(3) Availability of help on the job - assistance in doing the job.

(4) Supervision conditions - how available or accessible is the first line supervisor, how closely is performance monitored?

(5) What are the likely physical settings, equipment, and materials that will be required in training?

(6) What variables are there that affect performance: local policies, training, etc.

(7) Equipment: What equipment is found on the job?

(8) Identify appropriate persons for information regarding functional differences between peacetime and wartime. If applicable, study possible differences between combat and noncombat conditions for the job being analyzed.

(9) One important category of related information that job analysis must always contain is the significance of the equipment and the impact of malfunctions. Backup measures in case of malfunction should be ascertained.

(10) Aspects of the job - Most difficult; critical; priority.

What is the most difficult part of the job?

What is the most trying part of the job?

What aspect of job performance can make the difference between success and failure?

What mistake do the soldiers most frequently make?

What aspect of the job is the hardest one to learn?

How important is it for the soldier to know how to operate the equipment he maintains?

In what aspect of performance is there the greatest need for training?

(11) Needs for simulation - List some of the job aspects or equipment that require simulation for training purposes.

(12) Is there any time limit on training relating to conditions? Identify any constraints of the training conditions, such as time constraints (e.g., training must be completed in x weeks) or logistical constraints (e.g., training must be carried out in the field).

4-8. Target population information.

a. The third area analysis included within job analysis is the target population description for the job. There are two major groups

of personnel with which the analyst works (i.e., the initial entry soldier, and the experienced soldier who has been in the Army some time). The Army's major training role concerns the development of civilians into soldiers while teaching them a job. The field soldiers have progressed beyond the stage of the initial entry soldier, their education and interest are considerably different and must be identified also. These two categories of personnel are the targets for the training development products and the end product of the TD system. They must be adequately identified to insure the training products produced are compatible with the personnel in the field or to establish the parameters for the baseline (skills and knowledges) entry point for any officer or enlisted specialty training requirement. To meet this requirement four categories have been identified and must be addressed at the beginning of each analysis:

(1) Category 1. Target population (TP) in the field; no anticipated changes in the specialty; required data items insure existing training products are compatible with existing TP.

(2) Category 2. New specialty being created, built upon an existing specialty; required data items insure training products currently provide the prerequisite skills and knowledges for newly created tasks or create a training package to provide this building block principle. Requirements for newly created job/task(s) must not exceed existing TP capabilities on which new specialty is built.

(3) Category 3. New system(s)/equipment being acquired through the acquisition process; identify base-line entry level to create new araining package. If entry level established by producer exceeds capebilities of available personnel for assignment to a new system/MOS, Htc., a requirement may be generated to alert the TRADOC systems manager, Human Factors personnel, etc., to this problem, which may require developer/user interface.

(4) Category 4. New analysis effort ascertains a detailed description of requirements included in an education/training system (e.g., officer job and task analysis).

b. Each category requires different data depending on the specific nature of the job and the required target population. An example is provided herewith (fig 4-5) to indicate this variance in data collection requirements.

		Field Cat # 1	New Specialty From Existing Cat # 2	New System Cat # 3	New Analysis Cat # 4
(1)	Which category does the analysis effort involve?	X	X	X	X
(2)	Grade or skill level of TP				
	o Existing	X	X		X
	o Proposed		X	X	
(3)	Specialty of TP				
	o Existing	X			X
	o Proposed		X	X	
(4)	Education Level				
	o Existing	X			X
	o Proposed		X		
	o Required			X	
(5)	Prerequisite Training				
	o Existing	X	X		X
	o Proposed		X	X	
	o Required	X		X	X
(6)	Prerequisite Education				
	o RGL Level	X	X	X	X
(Specialty dependent)	o Analytical Abilities	X	X	X	X
	o Math Level	X	X	X	X
(7)	English as second language	X	X		X
(8)	Performance Data				
	o Physiological limitation	X	X	X	X
	o J/T done in isolation	X	X	X	X
	o J/T part of collective task	X	X	X	X
	o Supervisor available	X	X	X	X
	o Supervisor accessible	X	X	X	X
	o Performance monitored	X	X	X	X
(9)	Current enlisted reenlistment rate	X			
(10)	Current officer extension rate				X
(11)	Average turnaround time for overseas tours	X			X

Figure 4-5. Target population data item checklist

4-9. Job analysis process.

a. Purpose. The purpose of job analysis is to define the scope and subject matter content of the analysis effort. For ease of reference, initially use the term "gross tasks" instead of the more cumbersome "knowledge, skills, job functions, and tasks" which are difficult to identify at the on-set of any analysis. All these terms refer to various forms of behavior and have that common denominator, even though they have somewhat different connotations/meanings. For the purpose of the discussion that follows call them "gross tasks." Skills and knowledges data will be identified later as the analysis process progresses.

b. The relationship between jobs and gross tasks. Jobs or duties consist of groups of gross tasks which are derived from functions, and include knowledges, skills, and tasks. Simple jobs may include no more than four or five gross tasks, while complex jobs may include many more identifiable gross tasks. For the purpose of developing a training system, it is not essential to define which jobs in an organization include which gross tasks. Job definitions are not as stable as task definitions. In other words, the definition of the gross tasks does not change as rapidly as the definition of the jobs they comprise. Organizations frequently redefine jobs by regrouping the functions that are included in the job and that define the job. But the gross tasks do not change nearly as frequently. Therefore, even when a given gross task is shifted to a different job, the behavioral analysis of the gross task and the training materials and techniques that are developed to teach it, remain useful and valid.

c. How job analysis is done.

(1) Identification of the gross tasks that might be included, parts and components of the job.

(a) Collect existing materials. Collect all available written matter regarding the job, such as job descriptions, specifications of duties, manuals, surveys, or other studies. Obtain similar information that may be available concerning the jobs of the supervisor's immediate subordinates. Obtain task inventories from Logistic Support Analysis output records for all systems not previously considered in surveys.

(b) Conduct interviews. Next interview several members of the TP and their supervisors for the purpose of arriving at a listing of the gross tasks. In the interviews use the job descriptions as a guide if they are available.

(c) Format of job description. Each of the gross tasks should be stated or described in approximately two lines. The important thing is to make it inclusive, not detailed. The detail will be supplied in the next step. This step insures that no important major function is left out.

(2) Future of the job. Determine who would be the best informant regarding the job's rate of obsolescence and future. In these interviews, ask whether any major gross tasks or functions previously listed may soon be eliminated or changed, and whether any gross tasks may be added in the near future. If such changes are forecast, always ask what implications these changes might have.

(3) Examine other related information.

(a) Identify information regarding differences in the specialties' functions between peacetime and wartime. If applicable, study possible differences between combat and noncombat conditions for the job being analyzed.

(b) One of the important categories of related information that must always be included in a job analysis is the plans and objectives of the organization--the larger organizational unit of which the subject unit is a part.

(c) Another category of related information is data about related jobs within the same organization. That means determining which jobs are most closely related, and then obtaining some information about such jobs. Related jobs could be supervisors of departments of groups that interact with the individual's supervisor on some regular basis. Related jobs can also be supervisors of groups the TPM supervisor's group overlaps in its functions, or whose work the TPM supervisor affects or depends upon.

(4) Selecting the most appropriate level of detail.

(a) In making this type of judgment, the analyst must look ahead to the subsequent steps of the job and task analysis process. Analyze in more detail the gross tasks identified in this step. Avoid using gross task statements that are too broad for accurate interpretation.

(b) Rationale for analysis. To understand what specificity level is most appropriate for specifying functions in this step, consider the purpose of dividing the process of job and task analysis. In principle, it would be quite feasible to combine these. Given only a statement of a task, no one can say whether it is a task or an element. They are relative terms like high and low, warm and cold, near and far. Such pairs of terms have meaning only in relation to each other. So, any task can be broken down into elements, and any elements can be broken down further into sub-elements. The decision regarding at what level of generality to begin in defining tasks, at what level of generality

to draw the line between tasks and elements, and up to what level of detail to analyze the elements into their sub-elements, requires the application of criteria and considerations external to the tasks themselves. Dividing the specification of tasks into two steps avoids expending unnecessary time and effort on skills not important or necessary for the training system. Writing down a task may take minutes, but analyzing it into elements may take hours (or days). Therefore, write down possible lists of tasks at a fairly gross level of detail, and then ask the subject-matter experts, and other consultants to review that list. They may suggest eliminating a number of items and adding others. In fact, deciding which tasks are included in the list usually involves many meetings, much discussion, and many cycles of listmaking and list-revision. In job analysis the time-consuming and difficult process should be not the writing of the tasks, but deciding which tasks are included.

(c) Allowing the job incumbent to evaluate the intended content. In judging whether a given task statement is sufficiently specific, the individual must, by reading the statement, obtain a clear understanding of what the analysis had in mind. For example, "monitoring performance" is too vague. On the other hand, "reviewing maintenance logs" or "observing work crews" is adequate for the purpose of gross task statements.

(d) Enabling SME to evaluate the correctness of the gross tasks. The problem is communicating the intended meaning to the SME. Different SME will sometimes interpret the same gross task statement in different ways. For example, a supervisory gross task statement such as "use a simulated case to teach job performance evaluation and review techniques" could mean either of two things:

1. That the trainee must learn to create simulated case material for this purpose, or

2. That he/she must learn to use simulated case material already developed by others and provided to him. The analyst must always review each gross task statement thoughtfully to find such hidden ambiguities.

(e) Communicating the intended content for task analysis. Gross task statements must be adequate from the standpoint of providing a good basis for the task analysis. At that time the analyst takes each statement and sub-divides it into component tasks and elements. Without having to resolve doubts or ambiguities as its contents. For example, "maintain good relations with others" could mean different things to different analysts, and any one else working with it would come up with different lists of tasks and elements.

(f) Avoiding expenditure of unnecessary effort. The overall purpose of job analysis permits making judgments and decisions regarding the inclusion or exclusion of gross tasks before investing more substantial effort of a task analysis. The level of detail should be the minimum that is consistent with the considerations discussed above. The idea is not to invest time and effort in performing detailed analyses of functions that might be eliminated or changed after review by the supervisor or the SME.

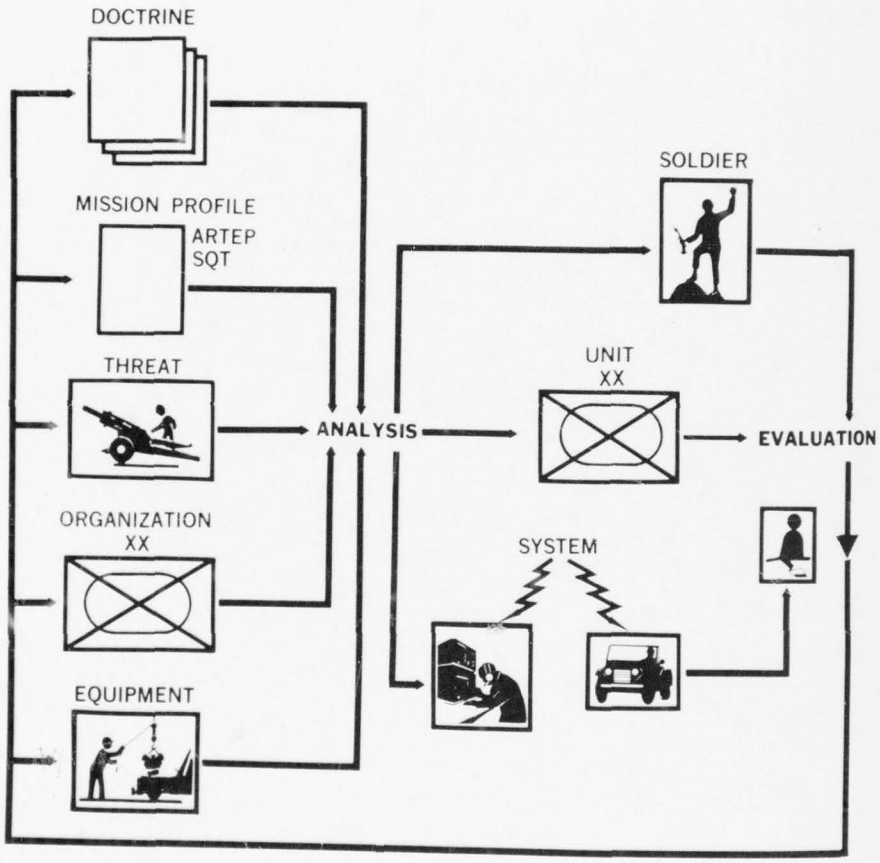
(5) Implications.

(a) The definition of the gross tasks comprising the job is very important for the training systems development effort. If an important gross task is overlooked and omitted, the final training system will not teach that component of the job. If that component is important, the trainees trained by that system will not perform to the full competence. If the omission is caught later during a subsequent development step of the process, inclusion of the task at that point may involve much back-tracking, patching, reorganizing, and inefficiency.

(b) Incorrect task identification. If gross tasks that are not real or important parts of the job are included, the loss incurred is twofold: First, the cost of developing the training system is correspondingly greater and the time required to complete it longer. Secondly, the trainees eventually trained with the system will waste time learning non-essential material. If perceived they are learning unimportant material, morale and respect for the training as a whole may suffer.

(c) For all these reasons, precise identification of the gross tasks required for effective job performance is important. The responsibility for precise and adequate gross tasks lists rests with the analyst, with the supervisor and with the incumbent(s).

4-10. Conclusion. The job analyst constructs an inventory of all tasks within the specialty, and develops an understanding of the scope and details of the job, including the target population. Each of these mutually supporting activities will both result in a given set of data, i.e., task inventory, job data, target population data and a greater understanding of the entire specialty. Building upon this knowledge base, the analyst is then ready to assist in an advisory role in the task selection process, and to subsequently conduct a task analysis of the tasks selected for training.



Relationship of analysis to the Army

KEY POINTS

CHAPTER 4

JOB ANALYSIS

Paragraph

4-1 Purpose of job analysis

Define job proficiency: measurable terms
Identify component tasks
Describe job history
Describe target population

4-2 Scope of Job Analysis

Threat ⟶ Doctrine ⟶ Collective Tasks ⟶ Individual Tasks
Top down analysis
History
Future

4-3 New analysis vs revision analysis

Always examine existing analysis data
New analysis requires much more effort

4-4 Analysis for a new system

Task hierarchies (enlisted and officer)
Several developmental systems
Data requirements vary

4-5 Sequence of operations

Task inventory
Job information
Target population information

4-6 Task inventory preparation

Job definition in terms of tasks
Procedures for modifying an MOS description
Analysis of threat
Analysis of doctrine
Analysis of units and missions
Analysis of equipment
Analysis of collective tasks
Review of previous CODAP surveys
Analysis of existing training
Observation, interview soldiers and superiors

4-7 Job related information

Duty positions
Career progression
Training system (present)
Demographic profiles
Job environment
Physical conditions
Behavioral factors
Assistance
Supervision
Training requirements
Simulation

4-8 Target population information

2 Groups for analysis
- Initial entry soldier
- Field soldier

Data items
- Time in service
- Time in grade
- Time in position
- Experience
- Education level
- Reading grade level
- Test scores
- English as a second language (percent)
- Age
- Sex
- Avocational interest
- Competitive nature
- Perception of Army training
- Self discipline
- Emotional maturity
- Reenlistment rate
- Additional skill identifiers

4 Categories
- Field - category 1
- New specialty - category 2
- New system - category 3
- New analysis - category 4

4-9 Job analysis process

Purpose
Gross task identification
How accomplished

4-10 Conclusions

TASK INVENTORY DEVELOPMENT



CHAPTER 5

TRADOC PAM 351-4(T)

CHAPTER 5

TASK INVENTORY DEVELOPMENT

5-1. General. The job and task analysis process rests squarely on the development of the task inventory. This phase of the job and task analysis can make or break the training developments process. Failure to produce this accurate task inventory can result in voids in training or training the wrong tasks and affect the job/mission accomplishment.

5-2. Inventory development. In developing a preliminary inventory of tasks, the analyst draws tasks from several data sources for a specialty (e.g., Army Regulations, CODAP, Previous and Related Task Lists, TOE, MTOE, LSA). As the analyst accumulates tasks, more tasks may be generated. The goal is a comprehensive task list.

5-3. Length of inventory. The length of an inventory depends upon the officer/enlisted specialty being analyzed. As the list progresses, reduction of the task list is accomplished through refinement, combining statements, distinguishing elements from tasks, etc. The level of specificity for each task statement is determined by good judgment, and understanding their interrelationship and experience on the job.

5-4. Inventory preparation. When the analyst completes his list based upon research efforts/interviews, it is refined to insure completeness and accuracy. This is accomplished by subject experts presently assigned to the analyzed jobs and by their superiors to insure all required tasks are identified. To facilitate this process, the following guidelines are provided to prepare the preliminary inventory for review.

a. Duty statements. Before assembling task statements into the preliminary inventory, select tentative duty categories to group task statement. Action words ending in "ing" (gerunds) designate duties. Supervisory duties are placed first in the inventory and include such activities as supervising, organizing, planning, directing, implementing, training, inspecting, and evaluating. Monitoring, controlling, coordinating, and communicating duties are sometimes used in officer job inventories.

Work performance duties follow the supervisory duties and include such activities as performing, maintaining, troubleshooting, repairing, removing and replacing, adjusting, and installing. An object is frequently used with these action words, e.g., maintaining forms. Functional or organizational charts suggest other duty headings in the source documents. An incumbent in a particular work area performs related tasks grouped together in the job inventory. For example, maintenance jobs are

sometimes divided into: quality control, maintenance analysis, repair shops, and other work sections. Duty statements describe known or hypothesized job types within a work section or which cut across several work areas. If 6 or less task statements are found for a particular duty category, tasks under related duties may be combined. Examples of such duty combinations are organizing and planning, directing and implementing, inspecting and evaluating. Thus, two or more action words designate a single duty category.

b. Task statements. In constructing, reviewing, and editing the task statements consider the purposes served by obtaining the information and the individual whose job is being surveyed.

(1) Purposes served by task information. Write each task statement consisting of the derived information. In general the statement should serve one or more of the following purposes:

(a) The task statement differentiates between officer groups such as staff and nonstaff officers or qualified and entry level officers, and between skill-level groups such as directors and supervisors, supervisors and journeymen, and journeymen and apprentices.

(b) The task statement differentiates among different job types. For example, the items "Interpret visual photographs" and "Interpret radarscope photos" would differentiate between the visual and radar job types in CMF 96. "Interpret photographs," however, would not differentiate, since members of both job types could say they perform the task.

(c) If the task statement elicits the proper responses, it could be used as a guide in SQT construction.

(2) The individual responding to the task statements. In considering the individual who responds to the job inventory, each task statement should conform with the following ground rules:

(a) Clear task statements are easily understood by the incumbent.

(b) Use terminology consistent with current usage in the career field.

(c) Brief task statements save reading time of the incumbent.

(d) The task statement avoids ambiguty so that it means the same for all incumbents in the career field.

(e) Use abbreviations cautiously since they may not be understood throughout the Army. It is good practice to spell out the term and follow it by the abbreviation in parentheses where it first appears in the inventory. In later tasks the abbreviation may stand alone. For example, Skill Performance Aids (SPA).

(f) Avoid vague or ambiguous words, such as "check," "assist," "coordinate," "recommend," "determine," "assure."

(g) Short words are prefered to long words or expressions, e.g., "Write production and control reports" NOT "Accomplish necessary reports involved in the process of maintaining production and control procedures."

(h) The worker's qualifications, such as intelligence, aptitude, knowledge, education, skill, training and experience are not tasks and are not included in the duty-task section of the inventory. Information regarding certain qualifications, such as training, education, and work experience, however, may be obtained by including appropriate items in the background information section of the inventory.

(i) Receiving instruction is not a duty or task unless actual useful work is performed during the training. Thus, classroom instruction, laboratory or shop instruction, and the coaching a person receives are not tasks. On-the-job training, however, may include the performance of tasks under a supervisor. These tasks are listed in the inventory the same as any other tasks. Giving instruction, which is a supervisory duty, is included under "Training."

(j) The task statement should begin with a present tense action word with the subject "I" understood, e.g., "Operate," "Write," "Clean," NOT "Operates," "Writes," "Cleans."

(k) Ideally task statements are arranged alphabetically under each duty. This order shortens the incumbent's reading time and assists him in recalling unlisted tasks. For example, the incumbent easily scans through tasks beginning with the word "Inspect" insuring that all the inspections are in the inventory. The alphabetical arrangement also helps the inventory constructor eliminate duplicate tasks.

5-5. Review of preliminary inventory.

a. Scheduling of interviews.

(1) After constructing the preliminary inventory interviews are conducted with experts in the career area to refine the inventory prior to field review. Interviews are held at various stages due to the complexity of the career area and the convenience with which interviews can be arranged.

(2) For simple and stable career ladders such as Cook, Carpenter, and Electrician, there is usually an abundance of published sources consistent in their descriptions of the job. For such career ladders, an essentially complete inventory can be made from the publications alone; and interviews are held when the preliminary form is completed.

(3) For newly established specialties, or for those with new types of equipment or procedures, few detailed publications may be available. In these cases schedule interviews at a very early stage in preliminary form construction. If a representative installation is close at hand, the job analyst arranges a visit for observation or interviews at the site. If all using posts are distant, gather initial information by telephone, letters, or special questionnaire forms. Each case may present unique problems. In all such early interviews and contacts, however, the job analyst establish a basic duty outline for the inventory; learns about or obtains other published sources; and gains a preliminary knowledge of problem areas to investigate in the job survey. Hold further interviews after the preliminary form has been developed.

b. Selection of technical advisers/SME. Although individuals vary, skill level 4 personnel and 03/04 officers are usually the best technical advisers. They typically have about 12 years' experience in the field, have been assigned to a number of posts, and perform both supervisory and worker tasks.

(1) Personnel at skill level 5 and fieldgrade officers may be able to provide more information by virtue of their longer experience. However, since these men fill relatively high-level management positions, some of the lower-level tasks and procedures may have changed since they were directly involved with them. In addition, in some fields, the skill level 5 personnel supervise MOS specialties, in which they have had no lower-level work experience.

(2) Personnel at the skill level 2 may provide the best information about tasks within their particular shop or office, especially if their skill level 4 supervisor supervises a number of shops or offices. Their knowledge of the entire career ladder and of supervisory tasks in particular, is usually more limited.

(3) Personnel at the skill level 1 are familiar with only a very limited number of tasks. The lowest-level soldier will provide the most complete information about extra work details such as window washing and lawn mowing, and about tasks officially assigned to other career areas. Higher-level personnel sometimes omit these tasks thinking the "extra" tasks may enter the official specialty descriptions. As stated before, inventory coverage is usually limited to central activities in the career area, unless a significant amount of work time is spent on other tasks.

(4) Whenever possible, interview representatives of different major commands. Within a command interview personnel working with different types of equipment or procedures, or assigned to different duty sections, depending upon the complexity of the field. Initial interviews are usually conducted with three to six senior NCO, each from a different command. These men should be selected as subject-matter experts by their command headquarters. Additional interviews are often conducted with personnel assigned to local posts. Depending upon the organization of the unit and the completeness of the preliminary inventory, several types of interviews may be arranged. (The interviews are scheduled to interfere as little as possible with the regular duties of the unit). If the unit consists of distinct work sections, hold an initial interview with the overall supervisor to validate the basic duty outline of the inventory. Following this review, either a group interview or a series of individual interviews are scheduled with supervisors of specialties in the separate work sections to review specific tasks.

(5) The analyst must be flexible in selecting SME. It is not possible to know at the onset which men will give the best and most complete information, nor precisely how many interviews will be required. The number needed is determined as the interviews progress. The analyst stops interviewing when he and authoritative advisers believe that the preliminary form is well structured and essentially complete. From three to seven interviews are adequate for most preliminary inventories. As a general rule, the more interviews, the better.

c. Individual versus group interviews. Satisfactory information is obtained from both individual and group interviews, but each method has some advantages and disadvantages. The following general observations have been independently reported by a number of interviewers.

(1) Individual interviews. A series of individual interviews takes more time but yields more new task statements than would a group interview with the same men. The interviewer is free to ask a large number of specific questions relating to each individual's area of special knowledge or experience, without requiring other group members to wait. Furthermore, no individual is overshadowed by other members of the group. One disadvantage is that the individuals occasionally give conflicting information which must somehow be reconciled. For example, they may use different terminology to describe the same tasks.

(2) Group interviews. Group interviews are clearly preferable when limited time is available. Another advantage is that consensus can be reached on conflicting terminology or other points of disagreement among group members. Also, information provided by one member often serves as a stimulus to the other members for recalling additional tasks. When

the interviewed personnel represent different commands, posts, or job types, the interviewer can insure that task statements are worded to discriminate effectively among their different jobs. Usually, little is gained by interviewing a supervisor and his subordinates in a group; the lower-level personnel add little information to that provided by their supervisor when he is present.

(3) Combination of individual and group interviews. When practicable, the best reviews are obtained by conducting a series of individual interviews followed by a group interview with either the same men or equally qualified men. The largest amount of information (new tasks and task statement revisions) is obtained from the individual interviews. In the group interview some new tasks are obtained and the information provided by individuals may be reviewed, reconciled, and corrected.

d. Instructions to interview reviewers. At the beginning of each interview the analyst introduces himself, identifies his organization, and explains the purpose of the review. The instructions are given informally, as in the following example.

"We have a preliminary form of an inventory for 19D which we would like you to review. It is basically a duty and task list, covering all skill levels, commands, and job types, and we want to make sure it is complete. The object is to collect up-to-date information about the kinds of work performed in the field."

"Here is the preliminary form. As you can see, we have a list of tasks broken out under major duty headings. For example, (interviewer shows examples briefly). This draft was made strictly from published source materials. It may be incomplete, and some items may need rewording. We would like you to review this inventory to make sure it is as complete and accurate as possible. Do you have any questions before we start?"

At this point the SME often ask for more details about how the information will be used, and some may ask about the validity of the survey method. All questions are answered freely.

e. Conducting the interview reviews. Before reviewing tasks begin with the duty outline. The SME are shown a list of the duty headings. Review them one by one for clarity and accuracy, and ask if any duties performed in the field are omitted from the list. If so, add the missing duties.

(1) Give each individual a copy of the inventory, and review individual tasks. The supervisory duties, such as Organizing and Planning, Inspecting, Evaluating, and Training, are postponed until last. Beginning with the first nonsupervisory duty in the inventory, the interviewer reads each task statement aloud and asks leading questions about particular items, as in the following examples:

(a) Will everyone know what this means, or is it a local term?

(b) Is this task covered by number 56 above?

(c) This one sounds pretty vague to me. Could we make it more specific?

(d) Would this fit better under Duty E?

(e) This task says "Maintain logs." What kinds of logs does it cover? Maybe we should list them separately.

(f) Are there any other tasks which should be under this duty but which are not listed?

(2) These questions produce task statements which eventually satisfy the rules discussed above. The interviewer does not seek perfectly polished task statement, but accurately records the main substance of the new statements and revisions in a form later edited.

(3) The SME are reminded periodically that a prime objective of the inventory is to discriminate among job types, skill levels, and other categories of workers. Stress that the inventory is not a test and that knowledge items should be omitted.

(4) Cover all the tasks in a duty section before going on to the next duty. When the nonsupervisory duties are completed, review the supervisory tasks. These are postponed until last for two reasons: (a) The ongoing nature of many supervisory activities makes it difficult to write specific, time-ratable supervisory items. The review becomes bogged down in these problems if supervisory duties are taken first. By taking them last, the men have some practice with easier items. (b) The nonsupervisory tasks are the central tasks of the career area and therefore comprise the main body of the inventory. If the nonsupervisory duties or tasks are changed in any important way during the review, it may be necessary to revise the supervisory sections accordingly. For example, if new non-supervisory duties are added, then parallel tasks should be added to cover the supervision of those duties.

(5) Background information may also be added during the reviews. Many of these items, such as name, grade, MOS, SSN, post, and months in career field, are standard for all inventories. Items specific to the career area which may require review or which may be added include the following:

(a) Types of equipment.

(b) Tools and test equipment.

(c) Assigned level of maintenance.

(d) Present major work area.

(e) Work areas in which you have had at least six months' experience.

(f) Training courses attended.

(g) Type of facility to which assigned.

(h) Bed capacity of hospital.

(i) Number of personnel in your career ladder assigned to your unit.

(j) Does your unit use a manual or mechanized system.

(k) Average typing speed.

(l) The major job types in your career ladder.

5-6. Revision of preliminary inventory.

a. Evaluation and classification of interview information.

(1) Interview summary. When the interviews are completed, all preliminary inventory instructions used in the reviews are assembled. The proposed new statements, revisions, and comments of the SME are copied from these sources into a single booklet called the Interview Summary. In this booklet, original task statements from the preliminary form are typed on the right-hand side of each double-page spread. The SME revisions and the interviewer's notes are written on the facing left-hand page. Information obtained in the interviews is coded to indicate the original task statement, and the SEM providing the item. All items referring to a particular task are grouped together. SME identification and background data are included in the first few pages of the booklet, together with a general description of the interview reviews.

(2) Initial classification of interview information. Interview information is initially classified using code designations. The initial classification organizes the SME suggestions but does not indicate the final disposition of the items. It aids in comparing the information yield of different interviews and in reporting the types of information obtained. The interview information helps in collating large amounts of interview information. This step is sometimes accomplished by clerical personnel. The codes, shown below, are entered in the left margin of the Interview Summary.

N - New task statement
R - Revision of rewording of an original task statement
D - Deletion of an original statement
F - Format revision, e.g., "This task should be listed under Duty B."
E - Explanation given by the technical adviser for one of the above items. For example, a code of ER means "Explanation for a revision."
C - All other comments

(3) Integration of interview information. Final decision to accept or reject the proposed changes are made by someone highly familiar with the preliminary inventory, since many of the task statements interrelate. Ideally, the same analyst makes the decisions that constructed the preliminary form and conducted the interviews. Some items may require consultation with SME. Most problems are resolved by referencing published sources or by a telephone call to the field. Some remaining questions can be asked in the field review. The job analyst codes his decision (✓) for accept or (—) for reject beside each item in the Interview Summary. He edits the approved revisions and adds any special typing instructions. Working from the Interview Summary, the typist then integrates every item marked (✓) into the preliminary inventory.

(4) Format of revised job inventory. The revised job inventory is typed in the same general format as the preliminary form, with task statements alphabetized under appropriate duty headings. Background and questionnaire items are arranged in any format convenient for the field reviewers.

Source document used in the development of this chapter included USAFHRL, PRL-TR-67-11, "Procedural Guide for Conducting Occupational Surveys in the USAF."

KEY POINTS

CHAPTER 5

TASK INVENTORY DEVELOPMENT

Paragraph

5-1 General. Inventory development very crucial to the J&TA process. Incomplete inventories can equal inadequate training.

5-2 Inventory Development. Development addresses the entire officer/enlisted specialty.

5-3 Length of Inventory. Depends on officer or enlisted specialty.

5-4 Inventory Preparation. Refinements necessary. Personnel currently assigned to subject position best source of feedback.

a. Duty statements.

- o Designated in "ing" words
- o Supervisory duties placed first on inventory
- o Work performance duties follow
- o Other duty heading, suggested by functional or organizational duties

b. Task statements - Two major consideraticns to keep in mind:

- o The purposes to be served by the information obtained
- o The individual whose job is being surveyed

5-5 Review of Preliminary Inventory

a. Scheduling of interviews - Before field review inventory interviews with experts in the career field should be held to refine the list. Stable career fields (e.g., cook, carpenter) could possibly be finalized without interviews, new specialties, or those associated with equipment or procedures, should involve interviews at a very early stage in development.

b. Selection of technical advisors/SMEs - Skill level 4 personnel and 03/04 advisors/SMEs. SL5 and most fieldgrade officers are usually too far removed from the worker to provide task data on technical fields. SL2 personnel may provide the best information about tasks within their shop/office. SL1 personnel are familiar only with a very limited number of tasks and have a tendency to provide more information desirable to obtain feedback from personnel from all commands using the subject specialty.

c. Individual vs. group interviews -

- o Individual interviews take more time but yield more task statements.
- o Group interviews are preferred if there is limited time available.
- o Group interviews should never include supervisors and workers
- o Best approach is to conduct individual interviews followed by group interviews with same personnel from individual interviews

d. Instructions to interview reviewer - Individual conducting interview must set the stage for the review and "walk" the SMEs through the process.

e. Conducting the interview reviews -

- o Sequence the review by reviewing the duty outline then the tasks.
- o Provide copy of inventory to the individual and solicit (draw) statements from the SME to insure the list is complete (or) to obtain details to create any (needed) additional tasks (or) equipment used, etc.

5-6 Revision of Preliminary Inventory

- o Proposed new statements, revisions, and comments of SMEs are assembled in a single booklet.
- o Audit trail will reflect old data and updated version with SME identification/background information
- o Final decisions made to alter inventory listing

SURVEYS



CHAPTER 6

TRADOC PAM 351-4(T)

CHAPTER 6

SURVEYS

6-1. General.

a. Surveys can be cost effective means of collecting data for the analysis effort when properly designed, administered and analyzed. Those presently available to the TRADOC system are:

(1) Army Occupational Survey Program (AOSP) (AR 611-3 and C1).

(2) Field Sponsored Surveys (AR 6113 C1, and AR 600-46).

b. This chapter will acquaint you with survey procedures and varied data that can assist in the job and task analysis process. The specific procedures and TRADOC policy are discussed in TRADOC supplement 1 to AR 611-3 (to be published).

c. A survey can be the follow-on phase of final inventory development in either of the forms mentioned at 1a, above. Depending on the lead time available for surveys, a "hand-carried" version using respondants who possess the proper officer or enlisted specialty, may be substituted for a mailed version. In any case the inventory requirement as addressed in the previous chapter, is essential to collect valid information.

d. Data obtained from surveys provide information needed to determine:

(1) Critical task input (for any/all models).

(2) Task analysis (specific) data.

(3) Usage data (equipment, etc.).

(4) Training utilization/effectiveness.

(5) Additional occupational data.

(6) Miscellaneous data.

6-2. AOSP.* The AOSP enlisted questionnaires are directed to the duty MOS (DMOS) incumbent. This program is conducted by MILPERCEN

*Discussion of AOSP and CODAP has been extracted from "The CODAP Information Guide," DA, MILPERCEN, July 1977.

and collects varied personnel data determining qualitative personnel requirements, force structure requirements, doctrine, materiel, and effective assignment and use of personnel. The AOSP provides findings and conclusions to support MOS development, job evaluation and determination of training requirements. However, AOSP is limited at the present time to providing primarily percent performing data (as described later). A TRAINING EMPHASIS scale will assist the analysis effort in collecting data from supervisors for training development evaluation. It will collect data from supervisors about tasks required of personnel whom they supervise (i.e., which tasks require training and how much emphasis should be given). This helps the training developer to design training to overcome performance deficiencies. More information on this process is in Chapter 7, Selecting Task for Training.

a. AOSP surveys are conducted on a scheduled basis with MOS selected on a priority basis. The priority of the year's surveys are determined by need submissions for all TRADOC service schools and prescribed by TRADOC (TDI) in coordination with MILPERCEN. Questions pertaining to either should be directed to the Training Developments Institute (AV 680-3608) and/or MILPERCEN (AV 221-9560). Upon completion of a survey the proponent school will receive the AOSP Standard Package (i.e., 3 character MOS and EPMS skill level report, CODAP reports by group difference, group summary and variable summary). (Note: These are discussed in follow-on paragraphs). These reports are in no way exhaustive of the CODAP system's capability. They represent a starting point for analytical efforts. In addition "cluster" analysis, data can help divide an MOS. If two or more MOS are surveyed using the same inventory, this same procedure can apply to possible consolidations.

b. AOSP questionnaire design.

(1) The AOSP enlisted questionnaire is separated into six areas, which allows respondents to address all aspects of their MOS and job assignment on both a long-term and day-to-day basis. Respondents highlight or elaborate upon work and training areas requiring special attention or emphasis.

(2) The questionnaire format is:

(a) BACKGROUND INFORMATION SECTION.

(b) TASK SECTION.

(c) EQUIPMENT SECTION.

(d) SPECIAL REQUIREMENTS SECTION.

(e) JOB SATISFACTION SECTION.

(f) PERSONAL COMMENT PAGES.

c. AOSP questionnaire development (fig 6-1).

(1) The TRADOC service school with training proponency for selected MOS survey provides MILPERCEN with initial input to the questionnaire. This input should cover all skill levels, paygrades, duty positions and Additional Skill Identifiers (ASI) in the MOS, including duty and task statements, a list of MOS equipment and special MOS job requirements. The service school must include all "critical tasks" in the initial task submission.

(2) Step two in the questionnaire cycle is the action taken by MILPERCEN survey questionnaire developers. Each service school questionnaire item is reviewed by the questionnaire developer until they are modified and finalized into a complete survey questionnaire. Assurance is made that each questionnaire includes duties and tasks performed by enlisted personnel in each skill level, paygrade, and duty position shown in AR 611-201. Additional duty and task items not covered by doctrine or training may be added to the questionnaire. At the same time, special job requirements, job and worker satisfaction indicators and individual and job background information items are placed in the questionnaire, thus assisting in preparing job and task analysis final recommendations and conclusions about the collected occupational data.

(3) The third step in the development cycle is the review and coordination effort. Draft copies of each questionnaire circulate within MILPERCEN, TRADOC (to include the proponent service school), USAHSC and other DA or DOD staff agencies or activities interested in the particular surveyed MOS. Staffing of the draft questionnaire provides MILPERCEN with a professional review and critique service to ensure the questionnaire's content and language are accurate and adequate. Draft copies of the questionnaire are sent to senior NCO in the particular MOS or its CMF for their technical review and personal comments. Whenever significant changes are made in the questionnaire during the review and coordination cycle, the proponent service school action officer is contacted by the MILPERCEN questionnaire developer to review the modification.

(4) After completion of the review and coordination cycle the questionnaire is given a final edit for format and clarity of items before being printed and distributed to Army commands and activities for field administration.

d. Questionnaire administration and data reduction:

(1) Occupational survey questionnaires are printed and distributed by MILPERCEN. For MOS with populations of 1000 or less, a questionnaire is printed for each incumbent. This accounts for approximately 75 percent of the enlisted MOS in the structure. The distribution size for MOS with populations greater than 1000 depends on the range of pay grades, number of duty positions, number of Additional Skill Identifiers, male versus female mix, overseas versus CONUS requirements, and the expected return rate.

(2) Questionnaires and answer booklets are distributed worldwide and completed by qualified DMOS incumbents under the supervision of questionnaire administrators as prescribed in DA Pamphlet 611-3. All AOSP surveys are conducted by Duty rather than Primary MOS. Completed answer booklets are returned to MILPERCEN and screened for completeness and validity. The overall return rate, based on the number of questionnaires accepted into the data bank (as opposed to those distributed), is approximately 70 percent. Acceptable answer booklets are scanned by an optical character reader and the data are transferred to magnetic tapes. These tapes are processed by the Personnel Information Systems Directorate of MILPERCEN and the data are merged into the occupational data base.

(3) Figure 6-2 depicts the flow of job data from completed questionnaire through report production.

e. Army Occupational Survey Program (AOSP) Reports.

(1) The AOSP is a computerized respository of job related questions (the occupational survey questionnaire items), and answers (the responses from each incumbent completing a questionnaire), by 3-character MOS. Collected data is merged into the data bank from some 350,000 enlisted personnel representing approximately 450 MOS. Occupational survey questionnaires are under development at MILPERCEN, or in the field being administered.

(2) Information about duties and tasks is provided in CODAP format. Detailed descriptions and explanations of AOSP reports and their format are available upon request. Information about background, equipment, special requirements and job satisfaction is also produced. Reports are automatically provided to service school Training Development and Training Evaluation elements.

f. CODAP analysis system.

(1) Background.

(a) Conceptually CODAP provides occupational data essential to the analysis of innumerable job related management problems. The system provides managers at all levels with an organized method of processing, presenting, and analyzing large quantities of job data.

(b) A basic understanding of the computations and methodology employed by CODAP is essential to interpreting and analyzing output reports. To facilitate this understanding the following example has been prepared. This example will cover a "questionnaire" of 20 tasks divided into three duty areas, for the hypothetical MOS 99X, "Widget Repairer." Assume that these 20 tasks cover everything a Widget Repairer does on the job and cover 100 percent of the repairer's time. The responses to these 20 tasks from a sample of 10 MOS incumbents or cases will be used. Keep in mind that this is a hypothetical situation and that at no time would a questionnaire or CODAP output report be this simple. Normally an occupational survey questionnaire will contain between 300 and 800 tasks with the number of duties determined by the method used to categorize these tasks (CODAP permits a maximum of 26 duties).

(2) Example duty/task list. The 20 task statements or task descriptions are grouped under duty headings of "Perform Supervisory Duties," "Perform Widget Maintenance Duties," and "Perform Maintenance Administrative Duties" are listed below.

DUTY A	PERFORM SUPERVISORY DUTIES
Task	
A1	EVALUATE SUBORDINATES WORK PERFORMANCE
A2	INSTRUCT PERSONNEL IN WIDGET MAINTENANCE
A3	PLAN WORK SCHEDULES
A4	COORDINATE MAINTENANCE SCHEDULE WITH SUPPORTED UNIT
A5	DIRECT PERSONNEL PERFORMING WIDGET MAINTENANCE
DUTY B	PERFORM WIDGET MAINTENANCE DUTIES
Task	
B1	TEST WIDGETS
B2	TROUBLESHOOT WIDGETS
B3	REPAIR WIDGETS
B4	INSPECT REPAIRED WIDGETS
B5	OVERHAUL WIDGETS
B6	TEST OPERATE WIDGETS
B7	REVIEW/INTERPRET TM
B8	CLEAN TOOLS
B9	CALIBRATE TEST EQUIPMENT
B10	CLEAN WORK AREA

DUTY C PERFORM MAINTENANCE ADMINISTRATIVE DUTIES

Task	
C1	REQUISITION REPAIR PARTS
C2	PREPARE MAINTENANCE REQUESTS
C3	MAINTAIN TECHNICAL PUBLICATIONS
C4	REQUISITION MAINTENANCE PUBLICATIONS
C5	PREPARE EXCHANGE TAGS

(3) Description of sample incumbents. Consider the following group of 10 job incumbents (cases) for MOS 99X working in the indicated authorized paygrades and duty positions.

CASE	DUTY MOSC	AUTHORIZED PAYGRADE	DUTY POSITION
1	99X30	6	Widget Repair Supervisor
2	99X10	4	Widget Repairer
3	99X20	5	Senior Widget Repairer
4	99X10	3	Widget Repairer
5	99X20	5	Senior Widget Repairer
6	99X10	4	Widget Repairer
7	99X10	3	Widget Repairer
8	99X1P	4	Widget Repairer
9	99X3P	6	Widget Repair Supervisor
10	99X10	3	Widget Repairer

(4) Relative time spent scale and estimated percent time spent. Research indicates that most workers cannot provide reliable information on the exact percentage of time they spend on any given task. However, they can state with some confidence the most time consuming tasks. This resulted in a "relative time spent" scale which allows a job incumbent to rate each task performed in terms of time spent on that task, regardless of other soldiers' tasks or the incumbent's expectations. Each incumbent rates only the tasks performed, operationally or in training or exercise for operational employment, using the following scale:

1 = very much below average time spent
2 = below average time spent
3 = slightly below average time spent
4 = average time spent
5 = slightly above average time spent
6 = above average time spent
7 = very much above average time spent

Table 6-1 displays the relative time spent ratings given by the 10 MOS 99X incumbents for the 20 task inventory.

(5) Special job descriptions.

(a) CODAP can produce consolidated descriptions of the work performed by any specific group of individuals in terms of background information, equipment, or special requirements of the occupational survey questionnaire. The CODAP program, which produces these job descriptions, is Job Special (JOBSPEC). Job descriptions are produced for authorized grades corresponding to EPM skill levels, duty positions in a particular skill level, command, or location, male and female incumbents, individuals maintaining a particular piece of equipment, individuals going to reenlist or individuals with or without school training.

(b) Producing JOBSPC reports is the first step in evaluating the work performed by various groups. The Group Summary (GRPSUM), Group Difference (GRPDIF), and Variable Summary (VARSUM) reports which assist in the evaluation, are dependent upon the output of the JOBSPC program.

(c) Table 6-4 provides the individual and composite task level job description for authorized grades E3 through E4 corresponding to EPMS skill level 1 for MOS 99X (Reference paragraph C, Section IV). Table 5 displays the duty level job description for this same group.

g. Selected CODAP program description, explanations and examples.

(1) Job Special (JOBSPC).

(a) Description. This program calculates and prints composite job descriptions for "special" groups according to background or computed variables. Both duty and task job descriptions are reported in high to low sequence of either "percent of members performing" or "average percent time spent by all members." (A duty is a major subdivision of a job comprising a number of tasks and, hence, is a summary report.) A job description provides duty/task number (and title; percent of members performing; average percent time spent by all members; cumulative average percent time spent by all members; and, for the task level reports, the task sequence number.

(b) Explanation. The JOBSPC program computations, with the exception of the cumulative average percent time spent by all members and the task sequence number, are covered in Section V of this guide. These two items are self-explanatory.

1. Cumulative average percent time spent by all members. The cumulative average percent time spent by all members is computed beginning with the first duty/task in the job description report and simply adding the value for average percent time spent by all members

lar items, as in the following examples:

on the given duty/task to that of the previous duty/task. The sum of the average percent time spent by all members will be approximately 100.00, the difference being due to rounding and truncation.

2. Task sequence number. The task sequence number is merely a count of the number of tasks included in the JOBSPC report at a given point in time. If a duty/task is not performed by at least one member of the group, it will not appear in the JOBSPC report. To ascertain whether all duties/tasks were performed by at least one member, compare the number of duties/tasks in a given report to the summary line of the JOBSPC report which provides information on the number of cases (the total sample for the MOSO, duties and tasks in the questionnaire) and member incumbents in the sample meeting the selective criteria). NOTE: JOBSPC information forms the basis for the Group Summary, Group Difference, and Variable Summary Reports, and therefore must be generated before these reports.

(c) Examples. JOBSPC reports sorted from high to low on percent members performing for the MOS 99X sample are provided for the 3-character MOS (fig 6-3 and 6-4) and authorized grades 3-4 which equate to EPMS skill level 1 (fig 6-5 and 6-6). For clarification the 3-character report should be compared with Table 2 (at the task level) and Table 3 (at the duty level). The report based on authorized grades 3-4 may be compared with Tables 6-4 and 6-5 at the task and duty level respectively.

(2) Group summary (GRPSUM).

(a) Description. This program calculates and prints three different types of reports: (1) the percent of members performing each duty and/or task in the job inventory; (2) the average percent time spent on each duty and/or task by all members in the inventory; and (3) a report that reflects both the percent of members performing and the percent time spent of all members in the inventory. GRPSUM will print data for groups whose composite job descriptions were computed by JOBSPC. The summarized data is printed in duty and/or task number order and the group descriptions are ordered according to the sequence of the input request cards.

(b) Explanation. The data contained in the GRPSUM output is almost identical to that provided in the JOBSPC reports on which it is based. This allows the manager to make duty/task comparisons based on percent members performing and/or percent time spent by all members across various groups without having to consult several JOBSPC reports. This is useful in comparing the duty/task performance by skill level, by duty position within a skill level, by command or location, by pay grade, by years of active Federal service, etc. The maximum number

of groups displayed at one time is 10. These 10 groups can all be based on percent members performing, on percent time spent, or a combination of both. These groups are presented in optional order and may be altered to suit the user's needs. All duties and tasks appear in the GRPSUM report whether or not they are performed by any member of the groups presented. The output is provided in duty/task order.

(c) Examples. The following examples of GRPSUM reports are provided for the "Widget Repairer."

1. Three character MOS, EPMS skill level 1, EPMS skill level 2, and EPMS skill level 3 by percent members performing (fig 6-7 and 6-8) and by percent time spent (fig 6-9 and 6-10).

2. Duty positions for the Widget Repairer, Senior Widget Repairer, and Widget Repair Supervisor by percent members performing (fig 6-11 and 6-12) and by percent time spent (fig 6-13 and 6-14).

3. Three character MOS, EPMS skill level 1, EPMS skill level 2, and EPMS skill level 3 by both percent members performing and percent time spent (fig 6-15, and 6-16).

(3) Group difference (GRPDIF).

(a) Description. This program calculates and reports the difference between two job descriptions in terms of percentage of members performing each task and/or average percent time spent. Difference values are presented in descending or ascending order on either value (from largest negative to largest positive difference or vice versa) or in task number order.

(b) Explanation. Once the manager/analyst has reviewed the GRPSUM output, a program computes the differences in task performance between two groups. GRPDIF is the CODAP program which performs this function. The output immediately identifies task performance differences and sorts these differences to readily identify maximum deviations. The data may be presented in the following configurations:

1. Based on the differences in both percent members performing and average percent time spent by all members performing. This output may be presented in task order, or sorted in either descending or ascending order based on either the difference in percent members performing or the average percent time spent by all members.

2. Based on the differences in percent members performing. This output may be presented in task order or sorted in either descending or ascending order.

3. Based on the differences in average percent time spent by all members. This output may be presented in task order or sorted in either descending or ascending order.

4. The program also presents the information on only those tasks whose difference exceeds a predetermined (by the manager/analyst) absolute value for either percent members performing or average percent time spent by all members. For example, you may wish to look at only those differences in percent members performing which exceed 10 percent. This report could be presented in task order, or sorted in either descending or ascending order based on the differences.

(c) Examples. The following two examples of GRPDIF display:

Difference of percent members performing between EPMS skill level 1 and EPMS skill level 2, ranked in task order. (fig 6-17).

- Difference of percent members performing between EPMS skill level 2 and EPMS skill level 3 where the difference exceeds 20.00 percent, sorted in descending order based on difference. (fig 6-18).

(4) Variable Summary (VARSUM).

(a) Description. This program computes and reports frequency distributions within specified intervals, makes total frequency counts, and calculates means and standard deviations on selected background and computed variables for any group of individuals whose job description has been generated by JOBSPC.

(b) Explanation. The VARSUM output displays the data collected in the background, equipment, and special requirements sections of occupational survey questionnaires. Computing means and standard deviations is optional and should only be done when the scaled intervals make these computations meaningful. Although there is no restriction on the number of groups handled by VARSUM, only 10 groups can be reported at a time.

1. To interpret the VARSUM output, obtain a list of variable interval definitions. For example the VARSUM output displaying the 3-character MOS and EPMS skill levels for MOS 99X by duty positions would look like:

VARIABLE NUMBER = V006 = DUTY POSITION

INTERVAL	3CHMOS	SL1	SL2	SL3
1	6	6	0	0
2	2	0	2	0
3	2	0	0	2

2. Interpretation of the intervals depends on having the duty position titles for intervals 1 through 3 which are "Widget Repairer," "Senior Widget Repairer," and "Widget Repair Supervisor." The lists of variable titles necessary for interpretation is provided the user by MODD with the VARSUM reports.

(c) Examples. Example VARSUM reports for three character MOS and EPMS skill levels for the variables of sex (V008) and authorized pay-grade (V019) are provided at figures 6-19 and 6-20.

6-3. Field sponsored surveys. A field sponsored survey may be tailored to meet the user's needs. Depending on the need, a survey can be mailed or directly administered to small or large groups. A disadvantage since surveys of this type are prepared by the originating agency/school, they are only as good as the drafter of the document. Quality of information is also a function of scales, sample size, administrative instructions, elimination bias, etc. Utility and usefulness can vary widely. Guidelines for questionnaire development are provided below but only experience determines an individual's ability to prepare an effective survey. All intercommand surveys (outside TRADOC) must be submitted in accordance with AR 600-46 or Change 1, AR 611-3 for required MILPERCEN review and approval (for a detailed discussion of questionnaire preparation, see Questionnaire Construction Manual by Army Research Institute, 1976 (DDC number ADA 037815)).

a. Demographic item guidelines.

(1) Each demographic data item collected should have potential usefullness. Demographics are not collected simply to gather statistical information, but rather to help sort survey results into different categories such as skill level, sex, or rank. The data needs of the manager/analyst help determine which demographics to use. Find a balance between collecting only those demographics needed at the moment (risk loosing demographic information to evaluate the data according to someone's needs) and collecting all the demographic variables that come to mind. In selecting demographic variables, ask yourself, "Do I expect different responses from various kinds of people (e.g., soldiers at different pay grades)?," "Do major differences matter among these various people (e.g., people of different heights)?," and "If there are differences, can they be addressed by training?"

(2) There should be a demographic choice for every respondent. Each person is categorized somewhere in each demographic question. Thus, scalar demographics, such as income, should have no cutoff at the bottom or at the top. Nonscalar demographics should include the entire known field, or utilize "other" as the last category.

(3) Each demographic question should have closed-ended responses. Provide an entire range of categories for the respondents and let them fit themselves into a group in accordance with your plans. If you wish to discover unknown categories of respondents leave an open-ended demographic question. Most demographic categories, however, are identified. Coding open-ended demographic items involves unnecessary time, confusion and possible errors.)

(4) Divide the demographic range to best utilize the number of choices, on the answer sheet if one is to be used. Initially, estimate the proportion of persons falling into each category and try to group them evenly into the number of available categories (e.g., five categories on a 5-point scale). If in doubt, use demographics made by other survey writers. Having ran a survey once, you should know how many persons fall into each demographic category, and group according to this information (e.g., perhaps there were not enough E-8 or E-9 to justify separating them from E-7, or not enough Warrant Officers to justify a category separate from Lieutenants, etc.).

NOTE: If you must separate a specific category, do not include it with another category simply because the group is under-represented (e.g., E-4 living in on-post housing, persons with doctoral degrees, etc.).

(5) Two different demographics can occasionally be combined into one question if they are mutually exclusive and space is short. This is poor practice, however, unless you are quite sure of the data analysis capabilities of your processing system and you know you can isolate responses. Occasionally, two dichotomous (i.e., having two possible choices only) demographics can be combined to provide all the required information. For example, if you need to know "sex" and "supervisory status" you could save a question (thus allowing another demographic to be added to the survey) in the following manner:

Original Questions:

1. Sex:

    1. Male
    2. Female

2. Supervisory status:

    1. I am not a supervisor
    2. I am a supervisor

Combined Question:

1. Sex and supervisory status:

    1. Male--non-supervisory position
    2. Male--supervisory position
    3. Female--non-supervisory position
    4. Female--supervisory position

b. Need guidelines.

(1) The information must not already be available from other sources. Field sponsored surveys are a fairly expensive way to collect information. They should not be used to collect information which is already available as statistics, as reports, previous survey results, or in other forms. Think carefully about where information might already be located before collecting it through your own survey. Many forms of statistical information may be compiled somewhere. The key to demographics is utility to the study. Information on paygrade, sex, etc., may be available for the population. The manager/analyst compares the sample with the population to determine the reliability or representativeness of the data collected.

(2) Each question should have an identifiable purpose. Each question must have a purpose. While it is acceptable to include a question because the results "might" be useful to "X Directorate," it is not justifiable to ask a question because "it would be nice to know how a group feels about something." Avoid "gee whiz" questions which serve no useful purpose other than satisfying someone's curiosity.

c. Question guidelines (general).

(1) Try to limit each question to a single purpose. Avoid use of multiple subjects, multiple adjectives, etc., in a question. Be especially critical of the words "and," "or" and slashes which indicate multiples. For example, satisfaction with "the way women and minority members are treated in this organization" gives a response about both women and minority members. Since there is no way to know whether "treatment" refers to only women, only minority members, or both groups, the usefulness of the data is limited. Trying to measure "satisfaction with the physical condition or location of our workplace" poses a similar problem. Some multiples, however, are acceptable because they may be closely associated in meaning to the respondent, or make an acceptable composite value for the analyst/manager. For example, response to "the places to eat and drink on post" do not necessarily limit the quality of information feedback. However, "the level of racial and ethnic discrimination" may be an unacceptable combination.

(2) The question should be a valid measure of what you intend to measure. "Valid" in this case, means measuring your intended target. If the writer asks about one thing and some persons respond with something else in mind, the results will look OK, but they will not be valid. For example, asking "what is the size of your household" usually married or older persons respond according to the number of children in their household. But young trainees or young unmarried soldiers may respond with the number of persons in their parents' household size as a measure of "number of dependents" is not valid.

(3) The question should be general enough to apply to most current and future respondents. Avoid asking questions which only pertain to a select portion of the entire group, or which refer to an uncommon experience. Many persons will respond to questions they do not understand. For example, asking if "the facilities at the airport are in need of improvement" or that "the food in the maternity ward is satisfactory" can be answered by all respondents, but few persons sampled could give meaningful answers. If there is a possibility that the questionnaire will be used again at a later time, specialized questions which are meaningful to the first population being surveyed may not be applicable to later groups. For example, "Do you agree with the way the 1974 conservation program was handled in your unit? is meaningless in a 1979 survey. If the survey is only given once, or repeated only within the same specialized group, then specialized questions may be used. Example: questions relevant only to drill sergeants, or to motor pool personnel, etc.

(4) Phrase each question in a neutral manner. Avoid value judgements. Avoid phrasing which might lead respondents to respond the way they think the question writer wants them to respond. For example, asking whether a person believes in "legalizing that horrible drug, marijuana" or if soldiers are satisfied with "the great way we reorganized the supply room" biases the question. The writer has already made a value judgement and does not need to ask others to back up that judgement. Sometimes bias is very subtle. For example: "How do you feel about the "pay inversion problem?"

(5) Avoid double negatives. Double negatives most often occur by using a negatively phrased question with a scalar answer, for example, "there is no discrimination in my unit" might be answered with "I disagree that...." or "it is not true." The response validity of questions phrased this way are in doubt, since the respondent may be trying to disagree about the existence of discrimination but marks the answer sheet to indicate that there is discrimination (i.e., I disagree that there is no discrimination).

(6) Do not deliberately avoid negative subject matter. Surveys are often designed to determine negatively perceived subject areas so that managers may deal with them, but managers are often hesitant to address negative areas. For example, questions with the concept of "hurry up and wait," "Mickey Mouse activities," or "lack of meaningful work," may seem easier to avoid, but failing to address the issues only prolongs the problem. A topic, however, may be of sufficient importance that it is worthwhile to try to collect data by approaching the information obliquely. One approach could be to "soften" negative questions by using euphemisms. For example: "Mickey Mouse" might be called "busy work" or "busy work" might be called "work just to keep me busy." (The end result is the same since the euphemism only soothes the manager. The respondee already knows what negative things occur).

If a manager does not feel threatened, and has definite reasons for wanting straightforward information about a specific subject area, then even a highly-charged area or terminology can be used in a questionnaire. (Review Question Guideline 4).

(7) Use up-to-date concepts. Avoid using terms or ideas which might cause the respondent to doubt the question writer's knowledge about the subject. Avoid errors (such as outdated unit designations) in the demographics, the use of the term "Coloreds" to denote minority races, the use of "Volar" to denote the all-volunteer Army, and so on. Such errors alienate some survey participants and have an unknown (and unnecessary) negative effect on survey results. Whenever possible, let several persons outside of your area of expertise read draft questions and make suggestions. A person with a high school GED can catch errors missed by a Ph.D.

(8) Be correct in terminology, grammar and spelling. Avoid the risk of "turning off" participants by "needless" errors or oversights in proofreading. Use correct terminology. For example, do not call FAD the "Finance and Accountant's Division." Use correct grammar. For example, do not say "they isn't very high morale in our unit." Spell correctly. For example, do not permit errors such as "morale level of the personal in the Provost Marshall's Office." Watch punctuation meticulously. For example, "troops of ours" compared to "theirs."

d. Wording guidelines (questions and response choices).

(1) Keep the language simple. Questions must be keyed to the reading level of the respondents. Avoid using complicated or less common words. For example, asking about "the milieu and decor of the EM club" or "the convergence of jobs and job descriptions" might not be understood by a substantial portion of military or civilian personnel.

(2) Keep the questions concise. Keep each question as short as possible. Do not, however, shorten a question or response to the extent that it is unclear. For example, "The work group I belong to really wants to meet our group's objectives successfully" might be cut to "My work group really wants to meet its objectives." It could not meaningfully be shortened to "My group wants its objectives."

(3) Use specialized terminology or abbreviations with caution. Avoid terms that may be unclear to some respondents. If respondents do not know what you are asking they cannot provide valid answers. For example, "MISO's 360-50 is doing a much better job" and "DAC make insufficient use of the Standard Form 63" are absolutely clear to some persons, "gobbleygook" to others.

(4) Avoid ambiguity. A statement which appears to be clear may have one meaning to one person and a different meaning to another. Such situations occur fairly easily and need to be avoided. For example, "If an NCO is determined to be an alcoholic ..." may mean " results showed he was an alcoholic" to one person; but "he really sets his mind to becoming an alcoholic" to another person. In this case, use of the phrase "is identified as" rather than "is determined to be" will clear up the situation. Words may have built-in ambiguity, for example "use" (both noun and verb), "read" (both present and past tense), "tear" (both noun and verb), "invalid" (both noun and adjective), etc. Someone unfamiliar with the questionnaire should read the draft to identify ambiguous words and meanings.

(5) Avoid redundancy and superflous words. If words or phrases do not add anything to the question, cut them out. Example: "Do not keep on continually repeating yourself over and over." (Review Wording Guideline 2).

e. Answer choice guidelines.

(1) The meaning of each choice must be clear to the respondent. The respondent must be able to understand what is involved in each choice, even when "filler" responses have been used.

(2) Choices must be mutually exclusive. There should be no confusion as to whether two responses include part or all of the same thing. Even scalar responses may be confusing. For example, the following pairs are not mutually exclusive: "no" and "no, not really;" "seldom: and "hardly ever;" "often" and "very frequently."

(3) Each respondent must be provided a choice among the answers. All possible answers to the question should be exhausted if practicable, otherwise some respondents will be unable to answer one or more of the questions. This may reduce their instruction completing the remainder of the questionnaire. The use of "other," "I don't know," "no opinion," etc., provides a choice for everyone (but is not always the most satisfactory choice).

(4) A respondent should find only one answer choice which is appropriate for each question. Two items which seem mutually exclusive may be relevant to one person. The respondent will either answer both or feel uncomfortable not doing so. For example, "I am acquainted with 'X' questionnaire," "I have taken the 'X' survey several times," and "I assist in the administration of 'X' questionnaire" could be answered in the affirmative by one person. An extreme case might be categories "married" and "divorced," both apply to many persons;

fortunately, most persons respond with their present condition or attitude. Instructions must stress that answers be for the present situation (if that is the desire of the writer) to minimize the likelihood of two or more applicable responses.

(5) Limit the number of choices to the number of response blocks on the scannable answer sheet. The scannable answer sheet usually limits you to five or seven choices per question. Holding all the response choices within these limits takes considerable ingenuity. Offering at least five important choices plus an "other" choice helps to exhaust the whole field of possibilities, yet only a 5-point scale may be available. A "sixth choice" can sometimes be "Manufactured" after the question placing a parenthetical phrase like "(Leave blank if you have no opinion in this area)," or "(Leave blank if you do not know)", etc. Caution: Respondents who follow directions and intentionally leave all responses blank cannot be differentiated from those who stopped before that part of the questionnaire or from those who skipped that particular question.

(6) Avoid providing a great many choices to one question, even if hand scoring permits an unlimited number of response choices. If possible, break up a large number of responses into several questions, so the choices are easy to overview. Such reduction in choices per question, however, is not mandatory if the questions will be hand-scored. (The DA "quarterly survey" has frequently used 15 or 20 mutually exclusive choices without difficulty; SURVEY, the available computer program, can handle a maximum of 10 choices.)

(7) Avoid leaving "unused" responses. Occasionally, if the questionnaire writer provides only four choices to a question on a scan answer sheet having a 5-point scale, a respondent will mark #5 (the last choice on the scan sheet) when he should have marked #4 (the last choice in the question). This is minor, but to prevent such "mis-marking" provide five choices. You might use a "filler" such as "other," though there may not be an "other" category.

f. Sequencing guidelines.

(1) Go from general subject matter to more specific subject matter. General questions are less likely to affect more detailed questions whereas the details cause reaction to the general questions. Therefore, use the more general questions ahead of the more specific questions if the sequence seems correct. For example, if the attitude toward details of living conditions such as "degree of privacy," "kind of furniture," "freedom to decorate" were asked before asking the attitude about "the overall pleasantness and comfort of living quarters,"

dissatisfaction with any one of the detailed aspects could affect the response to "overall comfort." On the other hand, you might want an attitudinal response after you had asked about (i.e., reminded the respondent of) all the details. For example, you might ask for a person's attitude about "the Army as a career" after asking about many different (more detailed) career aspects.

(2) Separate similar-looking questions. Physical separation of similar questions helps reduce respondent confusion and increases different answering patterns. For example, "the accuracy of information provided by employees at the Civilian Personnel Office" should be placed away from "the accuracy of civilian personnel information provided in my organization." Underlining "my" can also help reduce respondent confusion.

(3) Separate statements if the first might cause an emotional response to the next one(s). For example, asking for level of satisfaction with "the efficiency with which Finance handles my pay" before asking about satisfaction with "the amount of pay I receive in the Army" could have an adverse effect on the second question. Try to first ask those questions which are most likely to be influenced by others. (The guidelines about "general" questions before "specific" questions is also important in this context.).

(4) Group all demographics together. Sorting, by demographic items and preparing control cards for the computer, are facilitated when demographics are all located together. The demographic section should be at the beginning of the questionnaire. This permits respondents to indicate things they feel comfortable revealing, before answering topical questions. If respondents answered the questions first and then discovered they were to provide information about themselves, they might feel "tricked" into having given answers and either leave out all demographic data or throw away the answer sheet.

(5) Try to avoid contingency questions requiring that one or more questions be skipped. An example of a contingency question is, "Answer only if you live on Post, otherwise skip to question 24." If you decide you must use contingency questions provide clear, concise instructions to limit the amount of confusion and error.

(6) Start the questionnaire with an interesting set of questions. If you fail to catch respondent attention and interest at the beginning, they may throw away the entire questionnaire or leave it blank except for a note about the technical competence of questionnaire writers. The first group of questions should be based on logical overall sequence, and should capture respondent interest.

6-4. Officer job and task analysis survey procedures.

a. MILPERCEN conducts Armywide officer occupational surveys using the Army Occupational Survey Program (AOSP) computer programs. The task section of the questionnaire referred as "Activity Section" in surveys sent to the field) will be designed to verify if a task is performed by incumbents in a particular duty position, and to determine the relative task importance or degree of involvement of the officer with each task. A skills and knowledge section, equipment section and personnel comment section are also included. Demographic data will be collected to permit partition of data to support routine or unique information requests.

b. Specialty training proponents will forward task inventories to the appropriate integrating center in accordance with established milestones. Integrating centers review the lists and resolve problems. TDI in turn reviews the list for task structure and format and forward to MILPERCEN. MILPERCEN assists throughout the task inventory development process and works with the training proponent to finalize the inventories into questionnaire format. After final staffing by MILPERCEN with the training proponent, DA staff proponent, and others if required, and a final technical review, questionnaires will be administered to an appropriate population of job incumbents in each specialty.

c. Classified tasks cannot be included in survey questionnaires. Proponents who require information on classified tasks from job incumbents should contact TDI to make arrangements for alternate survey procedures.

d. Before large scale operational surveying is initiated, two pilot survey programs will insure that survey methodology is correct and that realistic milestones are established. The first pilot will survey company grade officers (W1-03) in selected specialties. A second pilot program will survey field grade officers in selected basic and advanced entry specialties. Results of the pilot surveys will be used to improve methodology and adjust milestones as necessary.

e. A phased survey program will follow the pilot efforts. Initial surveys will include only company grade questionnaires. Surveying for all officer grades will follow the second pilot program.

f. Survey data is analyzed by MILPERCEN and TRADOC utilizing the Comprehensive Occupational Data Analysis Program (CODAP) system. Other software may be developed specifically for officer survey analysis. General information on use of CODAP output is found in the "CODAP Information Guide." During the first pilot survey program a number of "rating scales" will be tested. Based on this test the most successful scale(s) will be selected for use in the phased operational surveying program. Analyzed survey data will assist training developers in selecting tasks for training and in determining the site where training will take place.

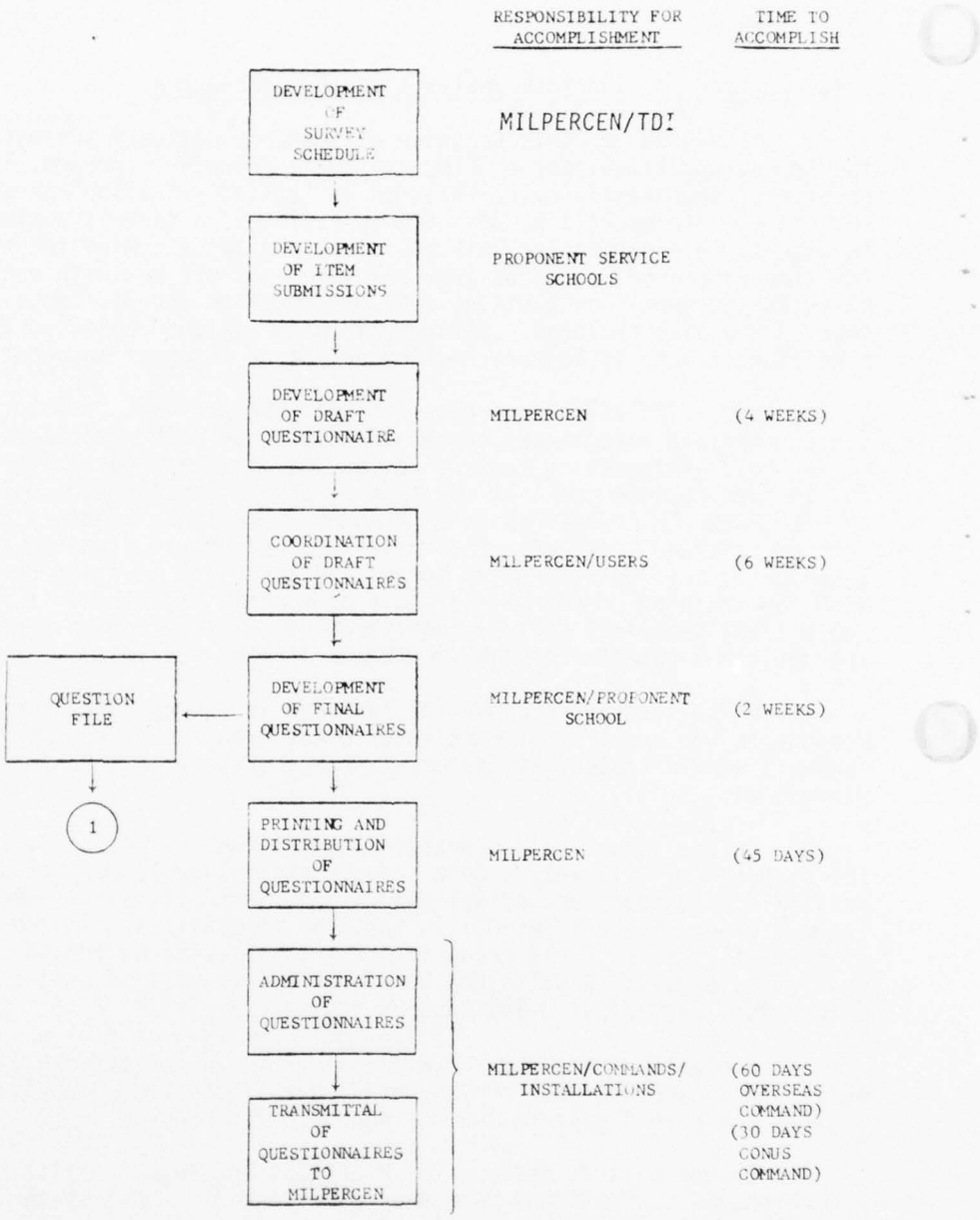


Figure 6-1. AOSP questionnaire sequencing

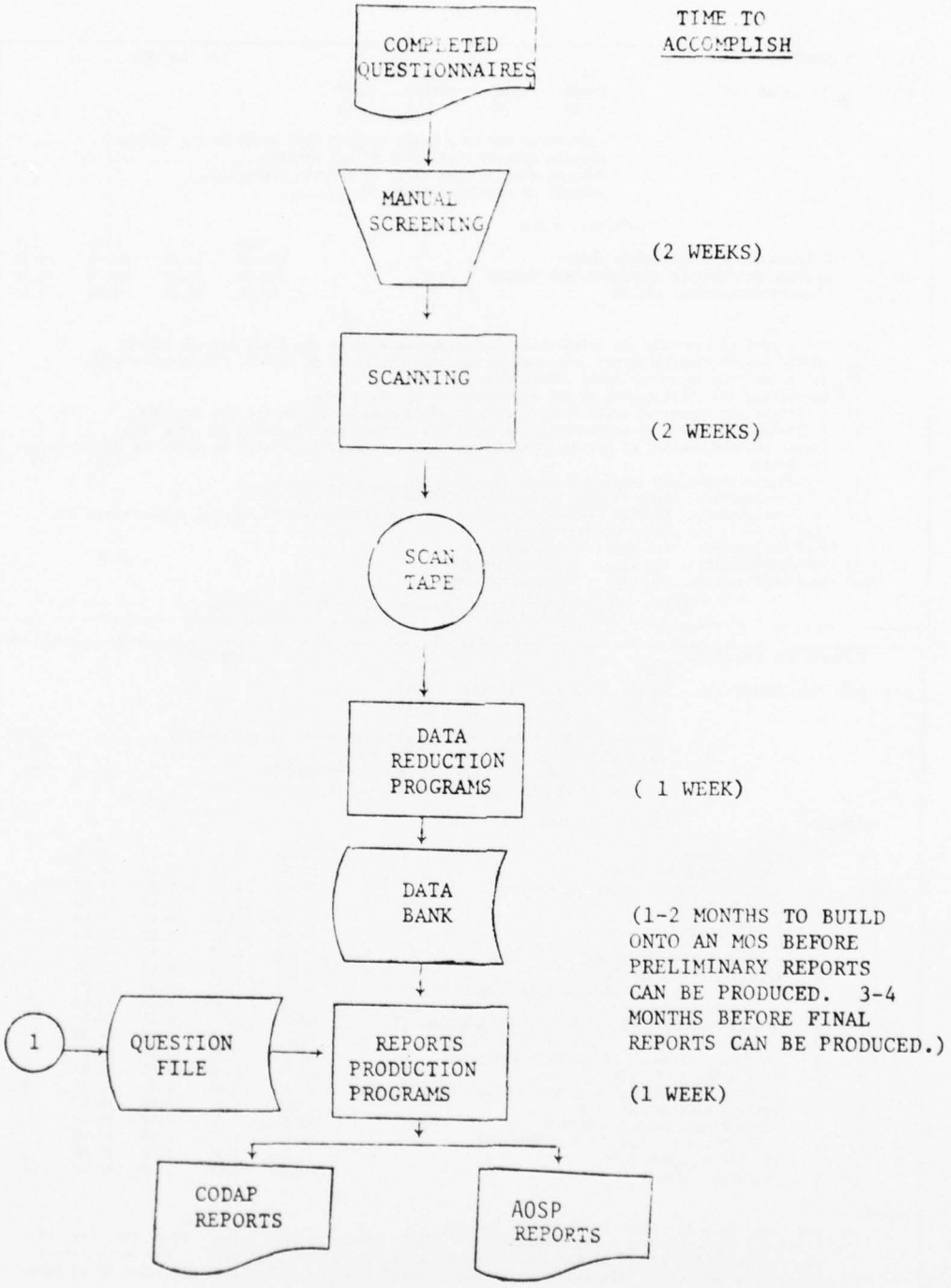


Figure 6-2. AOSP questionnaire processing

(1) 3 CHARACTER MOS REPORT (2) 3CH MOS

(3) DUTY JOB DESCRIPTION	(4) CASES	(5) TASKS	(6) DUTIES	(7) MBRS
	10	20	3	10

	D-TSK	DUTY/TASK TITLE		(10)	(11)	(12)	(13)
		CUMULATIVE SUM OF AVERAGE PERCENT TIME SPENT BY ALL MEMBERS.....					
		AVERAGE PERCENT TIME SPENT BY ALL MEMBERS.....					
		AVERAGE PERCENT TIME SPENT BY MEMBERS PERFORMING...					
		PERCENT OF MEMBERS PERFORMING.....					
(8)	B	PERFORM WIDGET MAINTENANCE DUTIES	(9)	100.00	70.50	70.50	70.50
(8)	C	PERFORM MAINTENANCE ADMINISTRATIVE DUTIES	(9)	100.00	13.40	13.40	83.90
(8)	A	PERFORM SUPERVISORY DUTIES	(9)	70.00	23.00	16.10	100.00

NOTES:

(1) Title used to identify the group whose job performance forms the basis for the report.
(2) JOBSPC report identification code used to identify the group in GRPSUM, GRPDIF and VARSUM.
(3) Indicates this is a duty level JOBSPC report.
(4) Identifies the total number of MOS incumbents in the data bank.
(5) Indicates the number of tasks in the occupational survey questionnaire for this MOS.
(6) Indicates the number of duties in the occupational survey questionnaire for this MOS.
(7) Identifies the number of MOS incumbents meeting the selective criteria on which the JOBSPC report was based.
(8) Identifies duty areas performed by at least one incumbent in this group.
(9) Self-explanatory. Duty or task titles (descriptions).
(10) Self-explanatory. In this example the duties are presented based on sorting these values from high to low. See page for computations.
(11) Self-explanatory. See page for computations.
(12) Self-explanatory. See page for computations.
(13) Self-explanatory. See page for computations.

Figure 6-3. 3 character MOS report: duty/job description

3 CHARACTER MOS REPORT 3CH MOS

(1) TASK JOB DESCRIPTION

CASES	TASKS	DUTIES	MBRS
10	20	3	10

	D-TASK		DUTY/TASK TITLE					
			CUMULATIVE SUM OF AVERAGE PERCENT TIME SPENT BY ALL MEMBERS.....					TASK
			AVERAGE PERCENT TIME SPENT BY ALL MEMBERS.....					SEQ
			AVERAGE PERCENT TIME SPENT BY MEMBERS PERFORMING....					NO
			PERCENT OF MEMBERS PERFORMING.....					
	B	1	TEST WIDGETS	90.00	7.44	6.70	6.70	
	B	2	TROUBLESHOOT WIDGETS	90.00	9.22	8.30	15.00	
	B	7	REVIEW/INTERPERT TECHNICAL MANUALS	90.00	10.89	9.80	24.80	
	B	3	REPAIR WIDGETS	80.00	16.12	12.90	37.70	
	B	8	CLEAN TOOLS	80.00	13.00	10.40	48.10	5
	B	10	CLEAN WORK AREA	80.00	14.00	11.20	59.30	
	B	9	CALIBRATE TEST EQUIPMENT	60.00	6.00	3.60	62.90	
	C	1	REQUISITION REPAIR PARTS	60.00	7.67	4.60	67.50	
	A	1	EVALUATE SUBORDINATES WORK PERFORMANCE	50.00	6.00	3.00	70.50	
	A	3	PLAN WORK SCHEDULES	50.00	6.40	3.20	73.70	10
(3)	A	5	DIRECT PERSONNEL PERFORMING WIDGET MAINTENANCE	50.00	10.00	5.00	78.70	
	C	3	MAINTAIN TECHNICAL PUBLICATIONS	50.00	7.60	3.80	82.50	
	A	2	INSTRUCT PERSONNEL IN WIDGET MAINTENANCE	40.00	7.75	3.10	85.60	
	B	6	TEST OPERATE WIDGETS	40.00	10.50	4.20	89.80	
	A	4	COORDINATE MAINTENANCE SCHEDULE WITH SUPPORTED UNIT	30.00	6.00	1.80	91.60	15
	B	4	INSPECT REPAIRED WIDGETS	30.00	7.22	2.20	93.80	
	C	2	PREPARE MAINTENANCE REQUESTS	30.00	8.00	2.40	96.20	
	C	4	REQUISITION MAINTENANCE PUBLICATIONS	30.00	5.22	1.60	97.80	
	C	5	PREPARE EXCHANGE TAGS	30.00	3.33	1.00	98.80	
	B	5	OVERHAUL WIDGETS	10.00	12.00	1.20	100.00	20

NOTES: *

(1) Indicates this is a task level JOBSPC report.
(2) Indicates the number of tasks comprising the JOBSPC report to this point. Thus, the first 10 tasks account for 73.70% of the total time spent by this group. See page for computations.
(3) Identifies duty areas (alphabetic) and tasks (numeric) within a duty area performed by at least one incumbent of the group.

* See Example 1 for additional item identification

Figure 6-4. 3 character MOS report: task/job description

AUTHORIZED PAYGRADES 3 AND 4 (1) PG 3-4

DUTY JOB DESCRIPTION	CASES	TASKS	DUTIES	(2) MBRS
	10	20	3	6

D-TSK	DUTY/TASK TITLE	CUMULATIVE SUM OF AVERAGE PERCENT TIME SPENT BY ALL MEMBERS	AVERAGE PERCENT TIME SPENT BY ALL MEMBERS	AVERAGE PERCENT TIME SPENT BY MEMBERS PERFORMING	PERCENT OF MEMBERS PERFORMING
B	PERFORM WIDGET MAINTENANCE DUTIES	100.00	85.83	85.83	65.83
C	PERFORM MAINTENANCE ADMINISTRIVE DUTIES	100.00	11.22	11.33	97.17
A	PERFORM SUPERVISORY DUTIES	50.00	5.67	2.83	100.00

NOTES: *
(1) JOBSPC report identification code for this group - authorized grade E3 and E4.
(2) Indicates that six of the ten cases meet the selective criteria.

* See Example 1 for additional item identification.

Figure 6-5. Authorized pay grades: duty/job description

AUTHORIZED PAYGRADES 3 AND 4 PG 3-4

TASK JOB DESCRIPTION	CASES	TASKS	DUTIES	MBRS
	10	20	3	6

D-TSK		DUTY/TASK TITLE	CUMULATIVE SUM OF AVERAGE PERCENT TIME SPENT BY ALL MEMBERS	AVERAGE PERCENT TIME SPENT BY ALL MEMBERS	AVERAGE PERCENT TIME SPENT BY MEMBERS PERFORMING	PERCENT OF MEMBERS PERFORMING	TASK SEQ NO
B	1	TEST WIDGETS	100.00	8.50	8.90	8.50	
B	2	TROUBLESHOOT WIDGETS	100.00	10.50	10.50	19.00	
B	3	REPAIR WIDGETS	100.00	18.17	18.17	37.17	
B	8	CLEAN TOOLS	100.00	15.33	15.33	52.50	
B	10	CLEAN WORK AREA	100.00	17.67	17.57	70.17	5
B	7	REVIEW/INTERPRET TECHNICAL MANUALS	83.33	10.80	9.00	79.17	
C	1	REQUISITION REPAIR PARTS	83.33	8.00	6.67	85.83	
B	6	TEST OPERATE WIDGETS	50.00	9.33	4.67	90.50	
B	9	CALIBRATE TEST EQUIPMENT	33.33	6.00	2.00	92.50	
C	5	PREPARE EXCHANGE TAGS	16.67	4.00	1.33	93.83	10
A	1	EVALUATE SUBORDINATES WORK PERFORMANCE	16.67	2.00	.33	94.17	
A	2	INSTRUCT PERSONNEL IN WIDGET MAINTENANCE	16.67	5.00	.83	95.00	
A	3	PLAN WORK SCHEDULES	16.67	4.00	.67	95.67	
A	5	DIRECT PERSONNEL PERFORMING WIDGET MAINTENANCE	16.67	6.00	1.00	96.67	
C	2	PREPARE MAINTENANCE REQUESTS	16.67	10.00	1.67	98.33	15
C	3	MAINTAIN TECHNICAL PUBLICATIONS	16.67	10.00	1.67	100.00	(1)

NOTES: *
(1) Indicates that this group performs only 16 of the 20 tasks in the questionnaire.

* See example 1 for additional item identification.

Figure 6-6. Authorized pay grades: task/job description

(1) SUMMARY OF 3CH MOS & EPMS SKILL LEVEL
(3) DUTY GROUP SUMMARY
(4) PERCENT MEMBERS PERFORMING

(2) GPSUM1

(6)	DUTY (7)	(5) 3CH MOS	EPMS SL1	EPMS SL2	EPMS SL3
A	PERFORM SUPERVISORY DUTIES	70	50	100	100
B	PERFORM WIDGET MAINTENANCE DUTIES	100	100	100	100
C	PERFORM MAINTENANCE ADMINISTRATIVE DUTIES	100	100	100	100

(8)

NOTES:

(1) Title used to identify the groups whose job performance forms the basis for this report.

(2) GRPSUM report identification code.

(3) Identifies this as a duty level GRPSUM report.

(4) Indicates that the percent members performing option has been used.

(5) Identifies the four groups (3-character MOS, EPMS skill level 1, EPMS skill level 2 and EPMS skill level 3) for which data is presented in this report.

(6) Identifies the duty area code. GRPSUM reports are always presented in the order in which they appear in the questionnaire.

(7) The titles used to identify each duty area.

(8) The percent members performing each duty area by each group.

Figure 6-7. Group summary report: 3 character MOS, MOS/SL, percent performing (task group)

(1) SUMMARY OF 3CH MOS & EPMS SKILL LEVELS
(3) TASK GROUP SUMMARY
(4) PERCENT MEMBERS PERFORMING

(2) GPSUM2

(6)	(7)	DY-TSK (8)	(5) 3CH MOS	EPMS SL1	EPMS SL2	EPMS SL3
A	1	EVALUATE SUBORDINATES WORK PERFORMANCE	50	17	100	100
A	2	INSTRUCT PERSONNEL IN WIDGET MAINTENANCE	40	17	50	100
A	3	PLAN WORK SCHEDULES	50	17	100	100
A	4	COORDINATE MAINTENANCE SCHEDULE WITH SUPPORTED UNIT	30	0	50	100
A	5	DIRECT PERSONNEL PERFORMING WIDGET MAINTENANCE	50	17	100	100
B	1	TEST WIDGETS	90	100	100	50
B	2	TROUBLESHOOT WIDGETS	90	100	100	50
B	3	REPAIR WIDGETS	80	100	100	0
B	4	INSPECT REPAIRED WIDGETS	30	0	50	100
B	5	OVERHAUL WIDGETS	10	0	0	50
B	6	TEST OPERATE WIDGETS	40	50	50	0
B	7	REVIEW/INTERPRET TECHNICAL MANUALS	90	83	100	100
B	8	CLEAN TOOLS	80	100	100	0
B	9	CALIBRATE TEST EQUIPMENT	60	33	100	100
B	10	CLEAN WORK AREA	80	100	100	0
C	1	REQUISITION REPAIR PARTS	60	83	50	0
C	2	PREPARE MAINTENANCE REQUESTS	30	17	50	50
C	3	MAINTAIN TECHNICAL PUBLICATIONS	50	17	100	100
C	4	REQUISITION MAINTENANCE PUBLICATIONS	30	0	50	100
C	5	PREPARE EXCHANGE TAGS	30	33	50	0

(9)

NOTES:

(1) Title used to identify the groups whose job performance forms the basis for this report.
(2) GRPSUM report identification code.
(3) Identifies this as a task level GRPSUM report.
(4) Indicates that the percent members performing option has been used.
(5) Identifies the four groups (3-character MOS, EPMS skill level 1, EPMS skill level 2 and EPMS skill level 3) for which data is presented in this report.
(6) Identifies the duty area code.
(7) Identifies the task number within the duty.
(8) Describes the task being performed.
(9) Identifies the percent members performing each task.

Figure 6-8. Group summary report: 3 character MOS, MOS/SL, percent time spent performing (duty group)

(1) SUMMARY OF 3CH MOS & EPMS SKILL LEVELS (2) GPSUM3
(3) DUTY GROUP SUMMARY
(4) PERCENT TIME SPENT

(6)	DUTY (7)	(5) 3CH MOS	EPMS SL1	EPMS SL2	EPMS SL3	(8)
A	PERFORM SUPERVISORY DUTIES	16.1	2.8	25.0	47.0	
B	PERFORM WIDGET MAINTENANCE DUTIES	20.5	85.8	61.0	34.0	
C	PERFORM MAINTENANCE ADMINISTRATIVE DUTIES	13.4	11.3	14.0	19.0	

NOTES:

(1) Title used to identify the groups whose job performance forms the basis for this report.

(2) GRPSUM report identification code.

(3) Identifies this as a duty level GRPSUM report.

(4) Indicates that percent time spent option was used.

(5) Identifies the four groups (3-character MOS, EPMS skill level 1, EPMS skill level 2 and EPMS skill level 3) for which data is presented in this report.

(6) Identifies the duty area code. GRPSUM reports are always presented in the order in which they appear in the questionnaire.

(7) The titles used to identify each duty area.

(8) Indicates the percent time spent in each duty area by each group.

Figure 6-9. Group summary report: 3 character MOS, MOS/SL, percent time spent (duty group)

(1) SUMMARY OF 3CH MOS & EPMS SKILL LEVELS (2) GPSUM4
(3) TASK GROUP SUMMARY
(4) PERCENT TIME SPENT

(6)	(7)	(8) DY-TSK	(5) 3CH MOS	EPMS SL1	EPMS SL2	EPMS SL3	(9)
A	1	EVALUATE SUBORDINATES WORK PERFORMANCE	3.0	0.3	6.0	8.0	
A	2	INSTRUCT PERSONNEL IN WIDGET MAINTENANCE	3.1	0.8	2.0	11.0	
A	3	PLAN WORK SCHEDULES	3.2	0.7	7.0	7.0	
A	4	COORDINATE MAINTENANCE SCHEDULE WITH SUPPORTED UNIT	1.8	0.0	1.0	8.0	
A	5	DIRECT PERSONNEL PERFORMING WIDGET MAINTENANCE	5.0	1.0	9.0	13.0	
B	1	TEST WIDGETS	6.7	8.5	6.0	2.0	
B	2	TROUBLESHOOT WIDGETS	8.3	10.5	9.0	1.0	
B	3	REPAIR WIDGETS	12.9	18.2	10.0	0.0	
B	4	INSPECT REPAIRED WIDGETS	2.2	0.0	2.0	9.0	
B	5	OVERHAUL WIDGETS	1.2	0.0	0.0	6.0	
B	6	TEST OPERATE WIDGETS	4.2	4.7	7.0	0.0	
B	7	REVIEW/INTERPRET TECHNICAL MANUALS	9.8	9.0	11.0	11.0	
B	8	CLEAN TOOLS	10.4	15.3	6.0	0.0	
B	9	CALIBRATE TEST EQUIPMENT	3.6	2.0	7.0	5.0	
B	10	CLEAN WORK AREA	11.2	17.7	3.0	0.0	
C	1	REQUISITION REPAIR PARTS	4.6	6.7	3.0	0.0	
C	2	PREPARE MAINTENANCE REQUESTS	2.4	1.7	4.0	3.0	
C	3	MAINTAIN TECHNICAL PUBLICATIONS	3.8	1.7	5.0	9.0	
C	4	REQUISITION MAINTENANCE PUBLICATIONS	1.6	0.0	1.0	7.0	
C	5	PREPARE EXCHANGE TAGS	1.0	1.3	1.0	0.0	

NOTES:

(1) Title used to identify the groups whose job performance forms the basis for this report.
(2) GRPSUM report identification code.
(3) Identifies this as a duty level GRPSUM report.
(4) Indicates that percent time spent option was used.
(5) Identifies the four groups (3-character MOS, EPMS skill level 1, EPMS skill level 2 and EPMS skill level 3) for which data is presented in this report.
(6) Identifies the duty area code. GRPSUM reports are always presented in the order in which they appear in the questionnaire.
(7) Identifies the task number within the duty.
(8) Describes the task being performed
(9) Identifies the percent time spent on each task by each group.

Figure 6-10. Group Summary Report: 3 character MOS, MOS/SL percent time spent (task group)

(1) SUMMARY OF DUTY POSITONS FOR MOS 99X (2) GPSUM5
(3) DUTY GROUP SUMMARY
(4) PERCENT MEMBERS PERFORMING

(6)	DUTY (7)	(5) DPC 01	DPC 02	DPC 03	(8)
A	PERFORM SUPERVISORY DUTIES	50	100	100	
B	PERFORM WIDGET MAINTENANCE DUTIES	100	100	100	
C	PERFORM MAINTENANCE ADMINISTRATIVE DUTIES	100	100	100	

NOTES:
(1) Title used to identify the groups whose job performance forms the basis for this report.
(2) GRPSUM report identification code.
(3) Identifies this as a duty level GRPSUM report.
(4) Indicates that the percent members performing option has been used.
(5) Identifies the three groups (DPC 01 = Widget Repairman - DPC 02 = Senior Widget Repairman - DPC 03 = Widget Repair Supervisor) for which data is presented in this report.
(6) Identifies the duty area code. GRPSUM reports are always presented in the order in which they appear in the questionnaire.
(7) The titles used to identify each duty area.
(8) The percent members performing option has been used.

Figure 6-11. Group summary report: duty position, percent performing (duty)

(1) SUMMARY OF DUTY POSITIONS FOR MOS 99X (2) GPSUM6
(3) TASK GROUP SUMMARY
(4) PERCENT MEMBERS PERFORMING

(6)	(7)	(8) DY-TSK	(5) DPC 01	DPC 02	DPC 03	(9)
A	1	EVALUATE SUBORDINATES WORK PERFORMANCE	17	100	100	
A	2	INSTRUCT PERSONNEL IN WIDGET MAINTENANCE	17	50	100	
A	3	PLAN WORK SCHEDULES	17	100	100	
A	4	COORDINATE MAINTENANCE SCHEDULE WITH SUPPORTED UNIT	0	50	100	
A	5	DIRECT PERSONNEL PERFORMING WIDGET MAINTENANCE	17	100	100	
B	1	TEST WIDGETS	100	100	50	
B	2	TROUBLESHOOT WIDGETS	100	100	50	
B	3	REPAIR WIDGETS	100	100	0	
B	4	INSPECT REPAIRED WIDGETS	0	50	100	
B	5	OVERHAUL WIDGETS	0	0	50	
B	6	TEST OPERATE WIDGETS	50	50	0	
B	7	REVIEW/INTERPRET TECHNICAL MANUALS	83	100	100	
B	8	CLEAN TOOLS	100	100	0	
B	9	CALIBRATE TEST EQUIPMENT	33	100	100	
B	10	CLEAN WORK AREA	100	100	0	
C	1	REQUISITION REPAIR PARTS	83	50	0	
C	2	PREPARE MAINTENANCE REQUESTS	17	50	50	
C	3	MAINTAIN TECHNICAL PUBLICATIONS	17	100	100	
C	4	REQUISITION MAINTENANCE PUBLICATIONS	0	50	100	
C	5	PREPARE EXCHANGE TAGS	33	50	0	

NOTES:
(1) Title used to identify the groups whose job performance forms the basis for this report.
(2) GRPSUM report identification code.
(3) Identifies this as a task level GRPSUM report.
(4) Indicates that the percent members performing option has been used.
(5) Identifies the three groups (DPC 01 = Widget Repairman - DPC 02 = Senior Widget Repairman - DPC 03 = Widget Repair Supervisor) for which data is presented in this report.
(6) Identifies the duty area code.
(7) Identifies the task number within the duty.
(8) Describes the task being performed.
(9) Identifies the percent members performing each task.

Figure 6-12. Group summary report: duty position, percent performing (task)

(1) SUMMARY OF DUTY POSITIONS FOR MOS 99X (2) GPSUM 7
(3) DUTY GROUP SUMMARY
(4) PERCENT TIME SPENT

(6)	DUTY	(7)	(5) DPC 01	DPC 02	DPC 03	(8)
A	PERFORM SUPERVISORY DUTIES		2.8	25.0	47.0	
B	PERFORM WIDGET MAINTENANCE DUTIES		85.8	61.0	34.0	
C	PERFORM MAINTENANCE ADMINISTRATIVE DUTIES		11.2	14.0	19.0	

NOTES:

(1) Title used to identify the groups whose job performance forms the basis for this report.

(2) GRPSUM report identification code.

(3) Identifies this as a duty level GRPSUM report.

(4) Indicates that percent time spent option was used.

(5) Identifies the three groups (DPC 01 = Widget Repairman - DPC 02 = Senior Widget Repairman - DPC 03 = Widget Repair Supervisor) for which data is presented in this report.

(6) Identifies the duty area code. GRPSUM reports are always presented in the order in which they appear in the questionnaire.

(7) The titles used to identify each duty area.

(8) Indicates the percent time spent in each duty area by each group.

Figure 6-13. Group summary report: duty position, percent time spent (duty)

(1) SUMMARY OF DUTY POSITIONS FOR MOS 99X (2) GPSUM8
(3) DUTY GROUP SUMMARY
(4) PERCENT TIME SPENT

(6)	(7)	(8) DY-79X	(5) DPC 01	DPC 02	DPC 03	(9)
A	1	EVALUATE SUBORDINATES WORK PERFORMANCE	0.3	6.0	8.0	
A	2	INSTRUCT PERSONNEL IN WIDGET MAINTENANCE	0.8	2.0	11.0	
A	3	PLAN WORK SCHEDULES	0.7	7.0	7.0	
A	4	COORDINATE MAINTENANCE SCHEDULE WITH SUPPORTED UNIT	0.0	1.0	8.0	
A	5	DIRECT PERSONNEL PERFORMING WIDGET MAINTENANCE	1.0	9.0	13.0	
B	1	TEST WIDGETS	8.5	6.0	2.0	
B	2	TROUBLESHOOT WIDGETS	10.5	9.0	1.0	
B	3	REPAIR WIDGETS	18.2	10.0	0.0	
B	4	INSPECT REPAIRED WIDGETS	0.0	2.0	9.0	
B	5	OVERHAUL WIDGETS	0.0	0.0	6.0	
B	6	TEST OPERATE WIDGETS	4.7	7.0	0.0	
B	7	REVIEW/INTERPRET TECHNICAL MANUALS	9.0	11.0	11.0	
B	8	CLEAN TOOLS	15.3	6.0	0.0	
B	9	CALIBRATE TEST EQUIPMENT	2.0	7.0	5.0	
B	10	CLEAN WORK AREA	17.7	3.0	0.0	
C	1	REQUISITION REPAIR PARTS	6.7	3.0	0.0	
C	2	PREPARE MAINTENANCE REQUESTS	1.7	4.0	3.0	
C	3	MAINTAIN TECHNICAL PUBLICATIONS	1.7	5.0	9.0	
C	4	REQUISITION MAINTENANCE PUBLICATIONS	0.0	1.0	7.0	
C	5	PREPARE EXCHANGE TAGS	1.3	1.0	0.0	

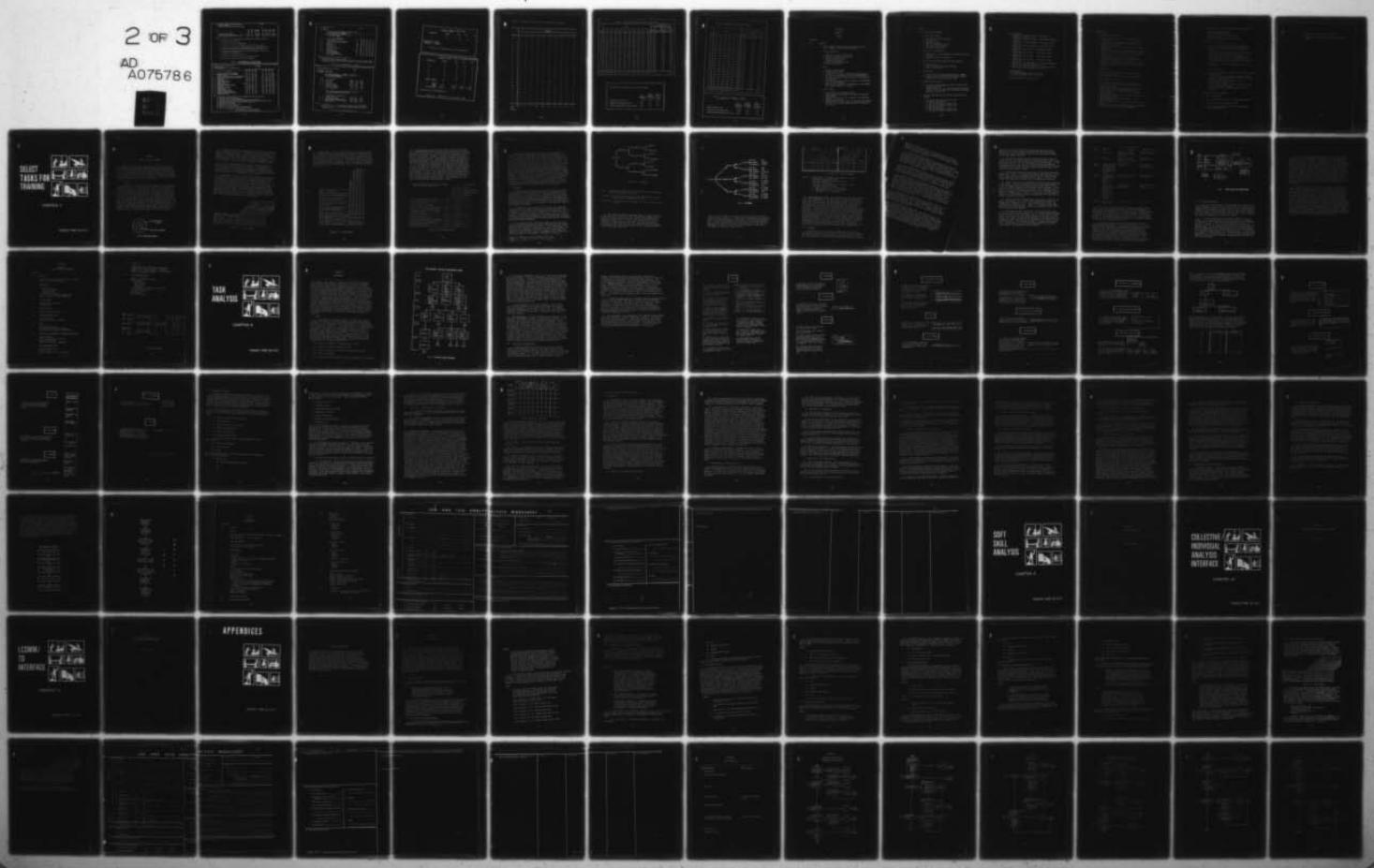
NOTES:

(1) Title used to identify the groups whose job performance forms the basis for this report.
(2) GRPSUM report identification code.
(3) Identifies this as a duty level GRPSUM report.
(4) Indicates that percent time spent option was used.
(5) Identifies the three groups (DPC 01 = Widget Repairman - DPC 02 = Senior Widget Repairman DPC 03 = Widget Repair Supervisor) for which data is presented in this report.
(6) Identifies the duty area code. GRPSUM reports are always presented in the order in which they appear in the questionnaire.
(7) Identifies the task number within the duty.
(8) Describes the task being performed.
(9) Identifies the percent time spent on each task by each group.

Figure 6-14. Group summary report: duty position, percent time spent (duty)

AD-A075 786 ARMY TRAINING AND DOCTRINE COMMAND FORT MONROE VA F/G 5/9
JOB AND TASK ANALYSIS HANDBOOK.(U)
JUL 79 B L WALTON , R R BEGLAND
UNCLASSIFIED TRADOC-PAM-351-4(T) NL

2 OF 3
AD A075786



(1) SUMMARY OF 3CH MOS AND EPMS SKILL LEVELS (2) GPSUM9
(3) DUTY GROUP SUMMARY
(4) PERCENT MEMBERS PERFORMING & PERCENT TIME SPENT

(6)	DUTY	(7)	(8) 3CH MOS	EPMS SL1	EPMS SL2	EPMS SL3	(5) 3CH MOS	EPMS SL1	EPMS SL2	EPMS SL3	(9)
A	PERFORM SUPERVISORY DUTIES		70	50	100	100	16.1	2.8	25.0	47.0	
B	PERFORM WIDGET MAINTENANCE DUTIES		100	100	100	100	70.5	85.8	61.0	34.0	
C	PERFORM MAINTENANCE ADMINISTRATIVE DUTIES		100	100	100	100	13.4	11.3	14.0	19.0	

NOTES:

(1) Title used to identify the groups whose job performance forms the basis for this report.

(2) GRPSUM report identification code.

(3) Identifies this as a duty level GRPSUM report.

(4) Indicates that percent members performing and percent time spent option was used.

(5) Identifies the three groups (DPC 01 = Widget Repairman - DPC 02 = Senior Widget Repairman - DPC 03 = Widget Repair Supervisor) for which data is presented in this report.

(6) Identifies the duty area code. GRPSUM reports are always presented in the order in which they appear in the questionnaire.

(7) The titles used to identify each duty area.

(8) Identifies percent members performing in each duty area by each group.

(9) Identifies percent time spent in each duty area by each group.

Figure 6-15. Group summary report: 3 character MOS/SL: percent performing and time spent (duty)

(1) SUMMARY OF 3CH MOS & EPMS SKILL LEVELS (2) GPSUM10
(3) TASK GROUP SUMMARY
(4) PERCENT MEMBERS PERFORMING & PERCENT TIME SPENT

(6)	(7)	(8) DY-TSK	(9) 3CH MOS	EPMS SL1	EPMS SL2	EPMS SL3	(5) 3CH MOS	EPMS SL1	EPMS SL2	EPMS SL3	(10)
A	1	EVALUATE SUBORDINATES WORK PERFORMANCE	50	17	100	100	3.8	0.3	6.0	8.0	
A	2	INSTRUCT PERSONNEL IN WIDGET MAINTENANCE	40	17	50	100	3.1	0.8	2.0	11.0	
A	3	PLAN WORK SCHEDULES	50	17	100	100	3.2	0.7	7.0	7.0	
A	4	COORDINATE MAINTENANCE SCHEDULE WITH SUPPORTED UNIT	30	0	50	100	1.8	0.0	1.0	8.0	
A	5	DIRECT PERSONNEL PERFORMING WIDGET MAINTENANCE	50	17	100	100	5.0	1.0	9.0	13.0	
B	1	TEST WIDGETS	90	100	100	50	6.7	8.5	6.0	2.0	
B	2	TROUBLESHOOT WIDGETS	90	100	100	50	8.3	10.5	9.0	1.0	
B	3	REPAIR WIDGETS	80	100	100	0	12.9	18.2	10.0	0.0	
B	4	INSPECT REPAIRED WIDGETS	30	0	50	100	2.2	0.0	2.0	9.0	
B	5	OVERHAUL WIDGETS	10	0	0	50	1.2	0.0	0.0	6.0	
B	6	TEST OPERATE WIDGETS	40	50	50	0	4.2	4.7	7.0	0.0	
B	7	REVIEW/INTERPRET TECHNICAL MANUALS	90	83	100	100	9.8	9.0	11.0	11.0	
B	8	CLEAN TOOLS	80	100	100	0	10.4	15.3	8.0	0.0	
B	9	CALIBRATE TEST EQUIPMENT	60	33	100	100	3.6	2.0	7.0	5.0	
B	10	CLEAN WORK AREA	80	100	100	0	11.2	17.7	3.0	0.0	
C	1	REQUISITION REPAIR PARTS	60	83	50	0	4.6	6.7	3.0	0.0	
C	2	PREPARE MAINTENANCE REQUESTS	30	17	50	50	2.4	1.7	4.0	3.0	
C	3	MAINTAIN TECHNICAL PUBLICATIONS	50	17	100	100	3.8	1.7	5.0	9.0	
C	4	REQUISITION MAINTENANCE PUBLICATIONS	30	0	50	100	1.6	0.0	1.0	7.0	
C	5	PREPARE EXCHANGE TAGS	30	33	50	0	1.0	1.3	1.0	0.0	

NOTES:

(1) Title used to identify the groups whose job performance forms the basis for this report
(2) GRPSUM report identification code.
(3) Identifies this as a task level GRPSUM report.
(4) Indicates that percent members performing & percent time spent option was used.
(5) Identifies the three groups (DPC 01 = Widget Repairman - DPC 02 = Senior Widget Repairman - DPC 03 = Widget Repair Supervisor) for which data is presented in this report.
(6) Identifies the duty area code.
(7) Identifies the task number within the duty.
(8) Describes the task being performed.
(9) Identifies percent members performing each task by each group.
(10) Identifies percent time spent by each group for each task.

Figure 6-16. Group summary report: 3 character MOS/SL: percent performing and time spent (gp summary)

(1) DIFFERENCE BETWEEN SL 1 and SL 2 (2) GPDIF1

(3) SL 1 MEMBERS = 6
SL 2 MEMBERS = 2

(4)

			AVERAGE PERCENT TIME BY ALL GROUP MEMBERS --- DIFFERENCE, SL 1 MINUS SL 2	PERCENT MEMBERS PERFORMING --- DIFFERENCE, SL 1 MINUS SL2	SL 2 PERCENT MEMBERS PERFORMING	SL 1 PERCENT MEMBERS PERFORMING	SL 2 AVERAGE PERCENT TIME BY ALL GROUP MEMBERS	SL 1 AVERAGE PERCENT TIME BY ALL GROUP MEMBERS
D-TSK		TASK TITLE						
A	1	EVALUATE SUBORDINATES WORK PERFORMANCE	33	100	83	83	8.0	5.7
A	2	INSTRUCT PERSONNEL IN WIDGET MAINTENANCE	17	100	83	0.0	2.0	1.7
A	3	PLAN WORK SCHEDULES	17	50	33	0.7	3.0	2.3
A	4	COORDINATE MAINTENANCE SCHEDULE WITH SUPPORTED UNIT	17	100	83	0.0	1.0	1.0
A	5	DIRECT PERSONNEL PERFORMING WIDGET MAINTENANCE	0	50	50	1.0	9.0	8.0
B	1	TEST WIDGETS	100	100	0	8.5	6.0	-2.5
B	2	TROUBLESHOOT WIDGETS	100	100	0	10.5	9.0	-1.5
B	3	REPAIR WIDGETS	100	100	0	18.2	10.0	-8.1
B	4	INSPECT REPAIRED WIDGETS	0	50	50	0.0	2.0	2.0
B	5	OVERHAUL WIDGETS	0	0	0	0.0	0.0	0.0
B	6	TEST OPERATE WIDGETS	50	50	0	4.7	7.0	2.3
B	7	REVIEW/INTERPRET TECHNICAL MANUALS	83	100	33	9.0	11.0	2.0
B	8	CLEAN TOOLS	100	100	0	15.3	6.0	-9.3
B	9	CALIBRATE TEST EQUIPMENT	33	100	67	2.0	7.0	5.0
B	10	CLEAN WORK AREA	100	100	0	17.7	3.0	-14.7
C	1	REQUISITION REPAIR PARTS	83	50	-33	6.7	3.0	-3.7
C	2	PREPARE MAINTENANCE REQUESTS	17	50	33	1.7	4.0	2.3
C	3	MAINTAIN TECHNICAL PUBLICATIONS	17	100	83	1.7	5.0	3.3
C	4	REQUISITION MAINTENANCE PUBLICATIONS	0	50	50	0.0	1.0	1.0
C	5	PREPARE EXCHANGE TAGS	33	50	17	1.3	1.0	-0.3

NOTES:
(1) Report title identifying the two groups upon which the report is based.
(2) GRPDIF report identification
(3) Identifies the two groups and their respective sample sizes.
(4) Column headings identifies the percent members performing each task by group, the difference by task in percent members performing, the average percent time spent on each task by all group members for each group and the difference in average percent time spent on each task.

Figure 6-17. Group difference report: SL1/SL2

DIFFERENCE BETWEEN EPMS SL 2 and EPMS SL3 GPDIF2

SL 2 MEMBERS = 2 SKILL LEVEL 2
SL 3 MEMBERS = 2 SKILL LEVEL 3

			PERCENT MEMBERS PERFORMING --- DIFFERENCE, SL 2 MINUS SL 3	SL 3 PERCENT MEMBERS PERFORMING	SL 2 PERCENT MEMBERS PERFORMING
D-TSK		TASK TITLE			
B	3	REPAIR WIDGETS	100.00	0.00	100.00
B	8	CLEAN TOOLS	100.00	0.00	100.00
B	10	CLEAN WORK AREA	100.00	0.00	100.00
B	1	TEST WIDGETS	100.00	50.00	50.00
B	2	TROUBLESHOOT WIDGETS	100.00	50.00	50.00
B	6	TEST OPERATE WIDGETS	50.00	0.00	50.00
C	1	REQUISITION REPAIR PARTS	50.00	0.00	50.00
C	5	PREPARE EXCHANGE TAGS	50.00	0.00	50.00

TASKS OMITTED WHERE THE ABSOLUTE DIFFERENCE IN PERCENT MEMBERS PERFORMING IS LESS THAN 20.00 (See Note 1)

A	4	COORDINATE MAINTENANCE SCHEDULE WITH SUPPORTED UNIT	50.00	100.00	-50.00
B	4	INSPECT REPAIRED WIDGETS	50.00	100.00	-50.00
C	4	REQUISITION MAINTENANCE PUBLICATIONS	50.00	100.00	-50.00
A	2	INSTRUCT PERSONNEL IN WIDGET MAINTENANCE	50.00	100.00	-50.00
B	5	OVERHAUL WIDGETS	0.00	50.00	-50.00

NOTES:
(1) This GRPDIF report presents the same data for SL2 and SL3 as the previous example, ordered high to low based on the differences in task performance, however, those tasks where the absolute difference in percent members performing is less than 20.00% are omitted.

Figure 6-18. Group difference report: SL2/SL3

VARIABLE NUMBER = V008 = SEX

INTERVAL*	3CHMOS	SL1	SL2	SL3
1	10	6	2	2
2	0	0	0	0

*Interval 1 = male
Interval 2 = female

Figure 6-19. VARSUM report for 3 character MOS

VARIABLE NUMBER = V019 - PAY GRADE AUTHORIZED

INTERVAL**	3CHMOS	SL1	SL2	SL3
1	0	0	0	0
2	0	0	0	0
3	3	3	0	0
4	3	3	0	0
5	2	0	2	0
6	2	0	0	2
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
TOTAL COUNTED	10	6	2	2
OTHER	0	0	0	0
MEAN	4.3000	3.5000	5.0000	6.0000
STD DEVIATION	1.1000	.5000	.0000	.0000

**Intervals are self explanatory.

Figure 6-20. VARSUM report for 3 character MOS

Table 6-1. Relative time spent ratings for MOS 99X incumbents

	CASE #									
TASK	1	2	3	4	5	6	7	8	9	10
A1	3	1	2	0	4	0	0	0	5	0
A2	6	0	0	0	2	0	0	2	5	0
A3	4	0	4	0	3	1	0	0	3	0
A4	3	0	1	0	0	0	0	0	5	0
A5	7	3	5	0	4	0	0	0	6	0
B1	0	4	4	2	2	3	2	2	2	2
B2	1	6	4	1	5	2	4	4	0	3
B3	0	7	6	4	4	4	7	6	0	4
B4	4	0	2	0	0	0	0	0	5	0
B5	6	0	0	0	0	0	0	0	0	0
B6	0	3	0	0	7	3	0	4	0	0
B7	5	4	7	0	4	4	2	4	6	3
B8	0	3	5	4	1	4	4	4	0	6
B9	2	4	2	0	5	0	1	0	3	0
B10	0	2	1	7	2	3	4	6	0	6
C1	0	6	0	2	3	1	0	4	0	1
C2	0	0	4	0	0	0	0	4	3	0
C3	4	5	2	0	3	0	0	0	5	0
C4	5	0	1	0	0	0	0	0	2	0
C5	0	2	0	0	1	0	1	0	0	0
TOTAL CASE RATINGS	50	50	50	20	50	25	25	40	50	25

Table 6-2. Individual and composite task level job descriptions

TASK	CASE # 1	2	3	4	5	6	7	8	9	10	TASK LEVEL MOS 99X Job Description % of Members Performing	Avg % Time Spent By Members Performing	Avg % Time Spent By All Members
A1	6.00	2.00	4.00	0.00	8.00	0.00	0.00	0.00	10.00	0.00	50.00	6.00	3.00
A2	12.00	0.00	0.00	0.00	4.00	0.00	0.00	5.00	10.00	0.00	40.00	7.75	3.10
A3	8.00	0.00	8.00	0.00	6.00	4.00	0.00	0.00	6.00	0.00	50.00	6.40	3.20
A4	6.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	30.00	6.00	1.80
A5	14.00	6.00	10.00	0.00	8.00	0.00	0.00	0.00	12.00	0.00	50.00	10.00	5.00
B1	0.00	8.00	8.00	10.00	4.00	12.00	8.00	5.00	4.00	8.00	90.00	7.44	6.70
B2	2.00	12.00	8.00	5.00	10.00	8.00	16.00	10.00	0.00	12.00	90.00	9.22	8.30
B3	0.00	14.00	12.00	20.00	8.00	16.00	28.00	15.00	0.00	16.00	80.00	16.12	12.90
B4	8.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	30.00	7.33	2.20
B5	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	12.00	1.20
B6	0.00	6.00	0.00	0.00	14.00	12.00	0.00	10.00	0.00	0.00	40.00	10.50	4.20
B7	10.00	8.00	14.00	0.00	8.00	16.00	8.00	10.00	12.00	12.00	90.00	10.89	9.80
B8	0.00	6.00	10.00	20.00	2.00	16.00	16.00	10.00	0.00	24.00	80.00	13.00	10.40
B9	4.00	8.00	4.00	0.00	10.00	0.00	4.00	0.00	6.00	0.00	60.00	6.00	3.60
B10	0.00	4.00	2.00	35.00	4.00	12.00	16.00	15.00	0.00	24.00	80.00	14.00	11.20
C1	0.00	12.00	0.00	10.00	6.00	4.00	0.00	10.00	0.00	4.00	60.00	7.67	4.60
C2	0.00	0.00	8.00	0.00	0.00	0.00	0.00	10.00	6.00	0.00	30.00	8.00	2.40
C3	8.00	10.00	4.00	0.00	6.00	0.00	0.00	0.00	10.00	0.00	50.00	7.60	3.80
C4	10.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	4.00	0.00	30.00	5.33	1.60
C5	0.00	4.00	0.00	0.00	2.00	0.00	4.00	0.00	0.00	0.00	30.00	3.33	1.00
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	--	--	100.00

Table 6-3. Duty Level Job Description for MOS 99X Incumbents

	% of Members Performing	Avg % Time Spent By Members Performing	Avg % Time Spent By All Members
PERFORM SUPERVISORY DUTIES	70.00	23.00	16.00
PERFORM WIDGET MAINTENANCE DUTIES	100.00	70.50	70.50
PERFORM MAINTENANCE ADMINISTRATIVE DUTIES	100.00	13.40	13.40

Table 6-4. Individual and Composite Job Description for Authorized Grades 3 through 4 (EPMS Skill Level 1)

	CASE #						E3 - E4 Job Description		
TASK	2	4	6	7	8	10	% of Members Performing	Avg % Time Spent By Members Performing	Avg % Time Spent By All Members
A1	2.00	0.00	0.00	0.00	0.00	0.00	16.67	2.00	0.33
A2	0.00	0.00	0.00	0.00	5.00	0.00	16.67	5.00	0.83
A3	0.00	0.00	4.00	0.00	0.00	0.00	16.67	4.00	0.67
A4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A5	6.00	0.00	0.00	0.00	0.00	0.00	16.67	6.00	1.00
B1	8.00	10.00	12.00	8.00	5.00	8.00	100.00	8.50	8.50
B2	12.00	5.00	8.00	16.00	10.00	12.00	100.00	10.50	10.50
B3	14.00	20.00	16.00	28.00	15.00	16.00	100.00	18.17	18.17
B4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B6	6.00	0.00	12.00	0.00	10.00	0.00	50.00	9.33	4.67
B7	8.00	0.00	16.00	8.00	10.00	12.00	83.33	10.80	9.00
B8	6.00	20.00	16.00	16.00	10.00	24.00	100.00	15.33	15.33
B9	8.00	0.00	0.00	4.00	0.00	0.00	33.33	6.00	2.00
B10	4.00	35.00	12.00	15.00	16.00	24.00	100.00	17.67	17.67
C1	12.00	10.00	4.00	0.00	10.00	4.00	83.33	8.00	6.67
C2	0.00	0.00	0.00	0.00	10.00	0.00	16.67	10.00	1.67
C3	10.00	0.00	0.00	0.00	0.00	0.00	16.67	10.00	1.67
C4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	4.00	0.00	0.00	4.00	0.00	0.00	33.33	4.00	1.33
Σ %	100.00	100.00	100.00	100.00	100.00	100.00	--	--	100.01

Table 6-5. Duty Level Job Description for MOS 99X Authorized Grades 3 - 4 (EPMS Skill Level 1)

	% of Members Performing	Avg % Time Spent By Members Performing	Avg % Time Spent By All Members
PERFORM SUPERVISORY DUTIES	50.00	5.67	2.83
PERFORM WIDGET MAINTENANCE DUTIES	100.00	85.83	85.83
PERFORM MAINTENANCE ADMINISTRATIVE DUTIES	100.00	11.33	11.33

KEY POINTS

CHAPTER 6

SURVEYS

Paragraph

6-1 General

a. Final (complete) task inventory necessary to obtain valid feedback for AOSP and field surveys

b. Surveys useful for:

- o Input for critical task analysis
- o Specific input for task analysis
- o Varied occupational data
- o Equipment useage data
- o Training effectivensss data
- o Miscellaneous data

c. AOSP:

- o Conducted by MILPERCEN
- o TRADOC HQ POC is TDI
- o Priorities for conduct of AOSP established by need of school in coordination with TDI and MILPERCEN
- o Requires considerable turnaround time from inception to completion
- o Substitutions can be made to schedule in coordination with TDI and MILPERCEN
- o Results could indicate in recommendation to MILPERCEN for change in MOS (re: AR 611-1)

d. Field surveys:

- o Responsibility of proponent school
- o Inter-command surveys must be reviewed and approved by MILPERCEN
- o Results of survey are only as good as the questions/ approach in a survey
- o Implementation can be by mail or interview (individual, small and large groups) depending upon the nature of the survey

6-2 AOSP.

a. Conducted by MILPERCEN

b. Questionnaire design:

- o Background information section
- o Task section
- o Equipment section
- o Special requirements section
- o Job satisfaction section
- o Personnel comment pages

c. Questionnaire development

- o TRADOC service school proponent responsible for task inventory
- o Sequencing shown in Figure 6-1

d. Questionnaire administration and data reduction

- o Mailed surveys
- o Administered by AOSP project officer
- o Process at Figure 6-2

e. AOSP reports

- o Formerly Military Occupational Data Bank (MODB)
- o Comprehensive Occupational Data Analysis Program (CODAP) used to collect data for AOSP

f. CODAP analysis system

- o Used to provide occupational data for job related management problems
- o Limited useage for training effectiveness feedback, relative time spent data only information available (Tables 6-1, 6-2, 6-3)

g. Selected CODAP program description, explanations and examples

- o Job special program (Table 6-4, 6-5)
- o 3 character MOS report
  - o Duty job description (Figure 6-3)
  - o Task job description (Figure 6-4)
- o Authorized pay grades
  - o Duty job description (Figure 6-5)
  - o Task job description (Figure 6-6)

- Group summary
  - Summary of 3 character MOS/SL % performing (task gp) (Fig 6-7)
  - Summary of 3 character MOS/SL % performing (duty gp) (Fig 6-8)
  - Summary of 3 character MOS/SL % time spent (duty) (Fig 6-9)
  - Summary of 3 character MOS/SL % time spent (task) (Fig 6-10)
  - Summary of duty position: % performing (duty) (Fig 6-11)
  - Summary of duty position: % performing (task) (Fig 6-12)
  - Summary of duty position: % time spent (duty) (Fig 6-13)
  - Summary of duty position: % time spent (duty) (Fig 6-14)
  - Summary of 3 character MOS/SL: % member performing and % time spent (duty) (Fig 6-15)
  - Summary of 3 character MOS/SL: % member performing and % time spent (gp summary) (Fig 6-16)

- Group difference
  - Difference between SL1/SL2 (Fig 6-17)
  - Difference between SL2/SL3 (Fig 6-18)

- Variable summary (Fig 6-19, 6-20)

6-3 Field surveys

a. Demographic item guidelines.

- o Each demographic collected should have potential usefulness.
- o There should be a demographic choice for every respondent. Leave no gaps at the bottom, in the middle, or at the top.
- o Each demographic question should have closed-ended responses.
- o Divide up the demographic range so as to best utilize the number of choices on the answer sheet (if this number is fixed). Do not make the range too large or too small.
- o Two different demographics can occasionally be combined into one question if they are mutually exclusive and you are short of space.
- o In choices, or questions, the "less careful" person's response should precede the "more careful" person's response.

b. Need guidelines.

- o The information should not already be available (e.g., as statistics).
- o Each question should have an identifiable purpose.

c. Question guidelines (general).

- o Try to limit each question to a single purpose.
- o The question should be a valid measure of what you intend it to measure.
- o The question should be general enough to apply to most current and future respondents (usually).
- o Phrase each question in a neutral manner. Avoid value judgments.
- o Avoid double negatives (special caution needed when responses are scalar).
- o Avoid negative subject matter, unless it has a definite purpose.
- o Use up-to-date concepts. Know what you are talking about.
- o Be correct as far as terminology, grammer and spelling are concerned. But do not be too pedantic!

d. Wording guidelines (for questions and response choices).

- o Keep the language simple.
- o Keep the questions concise.
- o Do not use specialized terminology.
- o Avoid ambiguity.
- o Avoid redundancy and superfluous words.

e. Answer choice guidelines.

- o Each choice must be clear as to what it means.
- o Choices must be mutually exclusive of each other.
- o Each person must be provided a choice among the answers.
- o Each person should not be able to find more than one choice which is appropriate to himself.
- o Limit the number of choices to the number on the scan answer sheet. (There is one exception.)
- o Avoid having many choices to one question, even if hand scoring permits an unlimited number of response choices.
- o Avoid leaving "unused" responses when using a scan answer sheet.

f. Sequencing guidelines.

- o Go from general subject matter to more specific subject matter (usually).
- o Separate similar-looking questions from each other.
- o Separate statements when one might cause an emotional response to the next one(s).
- o Group all demographics together (for ease of processing and sorting).
- o Try to avoid contingency questions requiring that one or more questions be skipped.
- o Start the questionnaire with an interesting set of questions.

6-4 Officer J&TA Survey Procedures

a. Done by MILPERCEN.

b. Task inventories will be sent to integrating centers.

c. Classified tasks will not be included.

d. Pilot Program (W1 thru O3) will be conducted before large scale operators.

e. Phased survey will follow pilot survey.

f. MILPERCEN will analyze data using CODAP software system.

SELECT TASKS FOR TRAINING



CHAPTER 7

TRADOC PAM 351-4(T)

CHAPTER 7

SELECT TASKS FOR TRAINING

7-1. Purpose. Once the analyst has compiled a task inventory that describes the specialty, that information then is used in the task selection process. Realizing any MOS is composed of several hundred tasks, it is inappropriate to even consider training all of these tasks. The Army can not formally train the individual soldier on all of the tasks required for job proficiency. Even if the resources were available, it would not be a cost efficient strategy considering the present percentages of retention and career progression.

7-2. Background.

a. The process of selecting tasks for training is a difficult and complex activity. It is not a pure science which can be refined and quantified in terms of so many formulas. If the process were to be graphically portrayed it might look like figure 7-1. In terms of the total task inventory for a given MOS, the total number of tasks composing an MOS is viewed as the largest circle labeled Circle "A". The smaller Circle "B," are all of the tasks selected for training within that MOS. All tasks within Circle "B," Tasks Selected for Training," will be trained formally either in the institution or the unit. These tasks form the basis for: Soldier's Manuals, Commander's Manuals, Job Books, SQT, and are the primary focus of the training effort for a given specialty. Recognizing the variety of specialties within the Army (combat, combat support and combat service support) the "correct" ratio of Circle "A" to "B" does not exist. Each school must determine by specialty, what is the appropriate number of tasks to be trained.

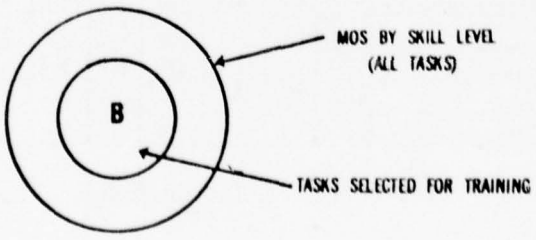


FIGURE 7-1. TOTAL TASKS IN MOS

b. The Army presently has approximately 345 different enlisted MOS with 5 different skill levels. Specifying the precise criteria to be used by each proponent agency in selecting tasks to be trained is not possible. Deciding what tasks to train for each specialty is a management decision, that can only be made on a decentralized basis. The training manager at the service school can obtain information to assist in this decision. There are several task selection models available.

c. There is no 100 percent correct way of selecting tasks for training. This step of instructional design is a management area, where informed decisions are based on the best data available to the training manager. In the following paragraphs are methods that have been used, have merit and, depending on the specific specialty analyzed, may apply separately or in combination to task selection.

7-3. 8 factor model. The factors described in TRADOC Pam 35030 provide a substantial basis for decision making: Percent performing, percent time spent performing, consequences of inadequate performance, task delay tolerance, frequency of performance, task learning difficulty, probability of deficient performance, and immediacy of performance. The information contained in these eight factors can be obtained directly from actual job incumbents or from questionnaires distributed in the form of a survey by the Army Occupational Survey Program of MILPERCEN supplemented by field surveys (fig 7-2). Several of these factors are important during the design stage, and should be collected even if other task selection models are used. For a detailed description of each of these factors and how the model works see appendix A.

#	TASK	Percent Performing	Percent Time Spent Performing	Consequence of Inadequate Performance (1-low, 7-high)	Task Delay Tolerance (1-low, 7-high)	Frequency of Performance (1-low, 7-high)	Task Learning Difficulty (1-low, 7-high)	Probability of Deficient Performance (1-low, 7-high)	Immediacy of Performance (1-low, 7-high)
1	Employ unarmed defense techniques	40.0	2.0	6.2	1.0	2.0	5.3	2.0	2.6
2	Search PW/CI	6.0	1.0	5.7	2.0	1.0	2.0	1.4	0.3
3	Employ riot control agents	30.0	1.0	3.4	4.0	1.0	2.5	1.6	1.2
4	Protect a crime scene	90.0	5.0	6.4	1.0	4.0	3.5	3.0	3.5
5	Warn suspects of their rights	100.0	5.0	6.7	1.0	5.0	3.5	3.0	6.0

Figure 7-2. 8 factor model.

7-4. 4 factor model. Four of the eight factors: task delay tolerance, task learning difficulty, consequences of inadequate performance, and percent performing may more accurately define the tasks that should be trained (fig 7-3). The problem is, combining these criteria to prioritize the tasks selected for training. Formulating specific values that would weigh each factor is arbitrary. Accordingly, the 4-factor model, though relevant to the task selection process, has not been completely accepted as the selection methodology. For this methodology see appendix A also.

#	Task Title	Percent Performing	Task Delay Tolerance 1=low,7=high	Consequence of Inadequate Performance (1=low,7=high)	Task Learning Difficulty 1=low,7=high
1.	Apply first aid for 2d degree burns	83	6	6	6
2.	Recognize NBC hazzard markers	96	4	7	7
3.	Perform the duties of a sentry of the guard.	24	3	5	2
4.	Perform before operation maintenance on a 10KW generator.	07	2	6	4
5.	Defuse a "dead" 500 lb bomb	17	2	7	6
6.	Disassemble/assemble the .45 caliber pistol	39	1	6	4
7.	Troubleshoot an integrated circuit board	4(	5	5	3
8.	Install field telephone TA 312/	61	4	3	2

Figure 7-3. 4 factor model.

7-5. Training emphasis scale. Recently research has been conducted into a procedure that would incorporate several factors into a simple one-factor rating scale. This scale requires the supervisor to estimate whether a task requires training. The supervisor when determining whether a task requires training, actually may combine various factors such as task delay tolerance, task learning difficulty, consequences of inadequate performance, etc., and formulate a single answer that correlates well with rankings developed by using the 4-factor methodology. This single rating scale has been well received and is relatively easy to use. The supervisor's determination is based upon his evaluation of the task importance as to whether the task should be trained somewhere as part of the MOS (fig 7-4). This training emphasis scale produces a rank ordering of the tasks based upon the prioritization derived from the supervisor's ratings. This program will soon be available from the Army Occupational Survey Program and does not require a large survey sample. A prerequisite for this survey is a valid/current task inventory currently stored in AOSP data bank. These inventories are the basis of both CODAP and training emphasis surveys.

Check (✓) and rate each task for which you recommend formal training (either school or OJT)

TRAINING EMPHASIS

1 Very Low
2 Low
3 Less than moderat
4 Moderate
5 More than moderat
6 High
7 Very High

	(✓)	1 2 3 4 5 6 7
1. Act as training advisor at staff level	✓	3
2. Assign personnel to details		
3. Assign personnel to duty positions	✓	2
4. Assign sponsors for newly assigned personnel		
5. Determine requirements for space, personnel, equipment, or supplies	✓	2
6. Determine work priorities	✓	3
7. Develop organizational charts		
8. Develop or improve work methods or procedures	✓	4
9. Draft budget or financial requirements	✓	4
10. Draft work order requests	✓	3

Figure 7-4. Training emphasis model.

7-6. Comprehensive Occupational Data Analysis Program (CODAP). Traditionally, the Army Occupational Survey Program has produced a rank ordering of tasks depending upon the prioritization scheme established by the Comprehensive Occupational Data Analysis Program (CODAP). This CODAP data prepared by the rank order of tasks is based upon percent of soldiers performing the task, and the relative time spent scale. This data indicates the tasks that require an extensive amount of time on the job in terms of actual performance. Some tasks not performed on the job, fall at the bottom of the ranking in terms of percent performing, yet are true combat tasks and would be performed in a wartime environment. Not all jobs require the same tasks to be performed even though they are within the same MOS (e.g., MOS 63G Fuel and Electrical Systems Repairman). Although this MOS, as described in AR 611-201, requires the incumbent to perform duties on both type systems in peacetime/garrison activities , the incumbent may concentrate in one area on the job and concentrate in one sub-specialty, i.e., clean carbureter, replace armature, etc.). For these reasons, percent performing as a criteria for task selection must be employed with caution in that it does not accommodate combat tasks, nor address other relevant factors.

7-7. DIF MODEL

a. Another strategy for selecting tasks for training is a scheme proposed by the British* called the DIF (Difficulty, Importance, Frequency) Analysis. This methodology is a simple approach to a complex problem, in that it integrates several different criteria during the task selection process separately. The supervisor and incumbent are asked three distinct questions concerning each task. They are asked to determine the difficulty of the task in terms of learning and performing, then asked to comment on the importance of the task, and finally on the frequency of the task.

b. In determining the "difficulty" of the task, these responses encompass both task learning difficulty and probability of deficient performance. For the decision on "importance" the respondents conscious or unconscious responses may well include factors such as: the consequences of inadequate performance, the task delay tolerance, percent performing, and time spent performing. When determining the "frequency," consideration would include both the frequency data and the time between job entry and task performance.

c. This approach to task selection, implies that by asking the supervisor and the incumbent three simple questions, that their answer will facilitate the task selection process. This approach has merit because of its simplicity yet degree of precision it may achieve. The survey would be conducted by the service school (field surveys) and requires a relatively small sample (40 incumbents and 40 supervisors). A graphic portrayal of this sequence is described in figure 7-5.

*Army School of Instructional Technology, Royal Army Education Corps, Pamphlet No. 2, "Job Analysis for Training." Army Code No. 70670 (Pam 2).

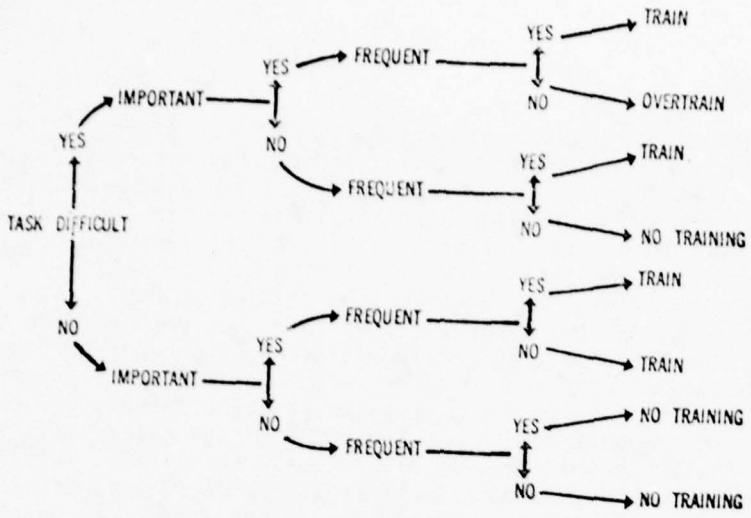


Figure 7-5. DIF model

Train - Trainee must be able to demonstrate proficiency in performing task at speed required on the job.

Overtrain - Trainee must be trained to a high standard of retention. Accomplished by reinforcement training.

No Training - Formal training not required. Skills can be acquired on the job.

d. After going through this branching process it can be seen that at one end of the scale are difficult, important and frequently performed tasks while at the other end is the easy, unimportant and infrequently performed tasks. Each of these instances has a different rationale for whether to train the tasks. The sophistication and sensitivity of this technique can be increased by incorporating degrees of importance, difficulty, and frequency, and by using more detailed levels of training, figure 7-6.

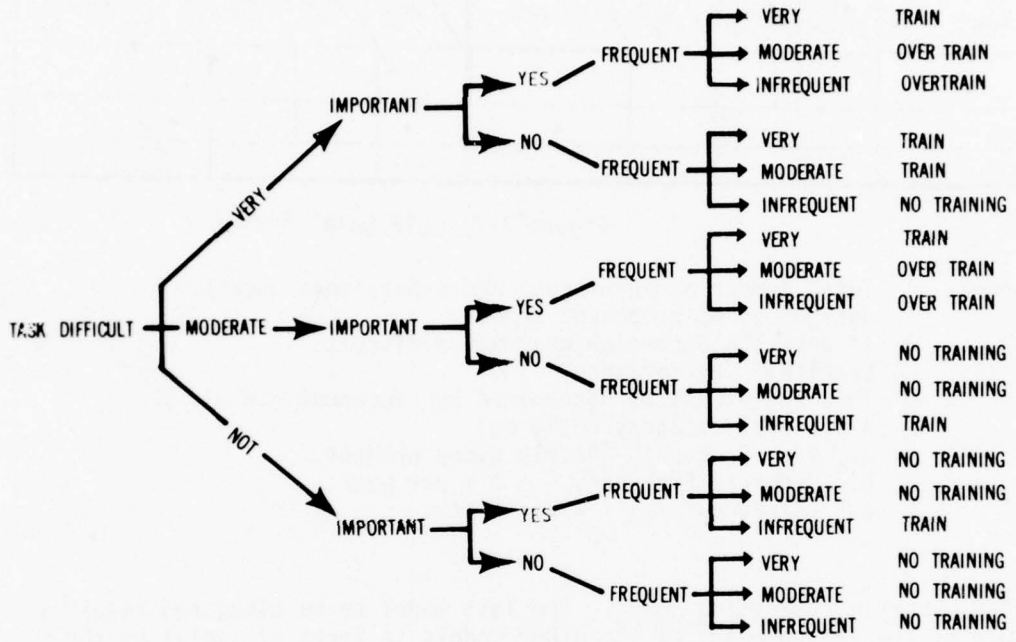


Figure 7-6. **DIF MODEL**

Examples of a type format style useful in collecting data for the DIF model are shown in figure 7-7. Format should be created by each proponent school to meet specific needs if this model is used to collect training data. It should be noted that any data collection instrument should be chosen for the needs of the school. DIF may or may not meet that need. Consideration should be given to develop combinations of collection instruments to insure all "needs" are met.

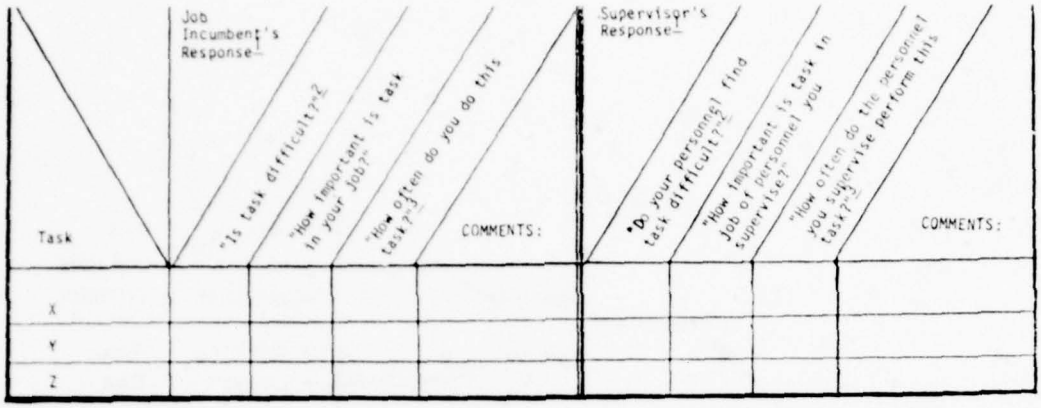


Figure 7-7. DIF Data Format

Notes: 1 Total number of incumbents and supervisors must be designated by proponent school.
2 If possible determine what was difficult: Learning? Performance?
3 This scale must be determined by proponent school. A notional category could be:
a. Very Frequent - Nearly every project.
b. Moderate Frequency - ± 1 x per week.
c. Infrequent - ± 1 x per month.

7-8. Wartime/peacetime model. The last model to be discussed resolves some of the inadequacies of the other models in terms of isolating the tasks performed in combat. This model simply proposes that a training manager must know what tasks are performed in combat, since many of these tasks will never be performed in peacetime. An example of this peacetime/wartime distinction is found in the Special Forces medic specialty. In combat, the medic is authorized to perform surgery, even amputations. While in peacetime, this medic is not authorized to perform such tasks. This example can be contrasted with the Signal specialties, where the peacetime and wartime tasks are very similar. This grouping of wartime and peacetime tasks would be prepared by a group of senior officers and NCO familiar with the specialty, combat, and the potential threat of the future. This group would take the task inventory for the specialty and group all tasks into one of three categories: performed in wartime only, peacetime/wartime, peacetime only. Once this is accomplished, the training manager can be provided a perspective on the task list not available by any of the previously described models.

7-9. Procedure.

a. Selecting tasks for training is probably the most important management decision early in the design of training. The tasks selected for training provide the specialty base, drive the production of training, the preparation of extension training materials, writing of Soldier's

Manuals, SQT, and are the basis of the specialization within each specialty. If all tasks cannot be trained, then the tasks that are trained must be the right ones in terms of job proficiency, transferability, and combat criticality.

b. Each of these models requires a different amount of analysis effort and time. If an approved task inventory was used by AOSP in the surveying of the MOS, then the CODAP data is readily available. If this data does not exist, or if the task inventory was not screened and coordinated with the school by the analyst from MILPERCEN, then the rank ordering of tasks by CODAP should be viewed as being a minimum of one year away from the date of request.

c. The training emphasis scale utilizes the inventory and computer capabilities of AOSP. If the MILPERCEN approved task inventory is in a CODAP format, then training emphasis data can be collected, compiled, and analyzed within 80 to 90 days after the request. If not in this format, then rank ordering capabilities are probably one year away.

d. The DIF analysis can be conducted in-house and can be responsive to the system. The questionnaire, distribution, and data management are within the capabilities of the TRADOC service schools (NOTE: Visits/surveys to FORSCOM, USAREUR, and Eighth Army must be programmed to avoid disruption in the visited units and to obtain area clearance). Note that this document is not advocating the use of the DIF methodology over CODAP, or training emphasis, rather, it is essential that the training manager must recognize the real world, nonnegotiable time constraints of analysis, and plan accordingly.

e. There are varying approaches that can be taken in selecting the tasks to be trained. Each of the methods described has certain advantages and limitations: ease of use, acceptability by field, comprehensiveness, timeliness, etc. (Table 7-1). Together, these models provide the Task Selection Board a variety of empirical data to facilitate the task selection process.

f. Selecting tasks will not be easy. Even with the right information it is still a complex process. The Task Selection Board can make informed decision on a task-by-task basis. The best task selection ess for any given specialty must be decided by the specific service l staff. What is an appropriate procedure for selecting tasks in a enance career field, may not be acceptable to the infantry, armor, itary police. The following strategy is suggested for considerrealizing the unique application required within the combat, support, and combat service support areas.

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Table 7-1. Task selection models

MODEL	ADVANTAGES	DISADVANTAGES	MAJOR ATTRIBUTES
8 Factor	Very Comprehensive	Data Collection - Difficult Data Analysis - Difficult Weighting of Factors - Awkward Time consuming	extensive data collection data useful in design
4 Factor	Fairly Comprehensive	Data Collection - Difficult Data Analysis - Difficult Weighting of Factors - Awkward Time consuming	More manageable than 8-factor model
Training Emphasis Scale	1 factor rating scale, combines several factors, high correlation with 4-factor model, well received by the field, administered to supervisors, small sample (40)	Data Not Collected from Incumbents	Single factor ease of administration simple rank ordering
CODAP (time spent)	Rank orders tasks on % time performing, conducted by AOSP, large sample - surveys MOS additional data available	Prioritizes tasks on one factor (percent performing)	Surveys MOS (whole Army) simple rank ordering
DIF	3 straightforward factors ease of administration small sample (40) acceptable analysis of data - simple utilizes input from supervisors & incumbents degree of complexity - adjustable	Crude instrument with Gross Task Selection Recommendation	Simple rank ordering (by category) Little time required
Wartime/ Peacetime	Isolates combat and peacetime tasks Data easily obtained	Ignores other relevant job analysis data	Keys on combat tasks

g. Once this list of tasks has been compiled using these three models, then it is compared against the list of tasks performed in wartime, and peacetime/wartime. This comparison will highlight whether the emphasis of the task selection process is towards training the soldier for his wartime tasks, or for something else. This additional comparison insures that the tasks selected for training have a direct correlation with the tasks performed in wartime. A flowchart depiction of this process is described in fig 7-8.

h. There are no hard and fast rules that indicate the "best" task selection methodology for selecting or rejecting a task. The methodology described above is one approach but certainly not the only approach. Each school must determine its best methodology for a given specialty, acknowledging that the methodologies may differ between specialties. Schools should anticipate changes to the "critical task list" even after publication, because the Directors of Evaluation and the MACOM will identify equally important tasks that "must" be trained, and are not included on the list. This refinement to the tasks selected for training should be anticipated and encouraged, thereby striving to continually improve training.

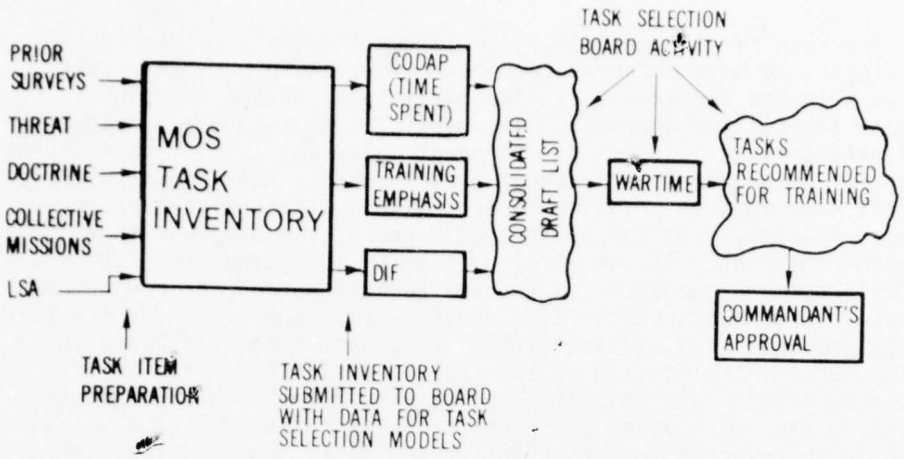


Figure 7-8 **TASK SELECTION PROCEDURE**

7-10. Task selection board.

a. The Task Selection Board is the management tool available to the school commandant to serve a quality control function in task selection. Through it, the instructional system is built upon a rationale analysis of what should be trained by specialty and skill level. The participants should be familiar with the specialty, and the career field. Additionally, they should be familiar with the instructional systems development approach and knowledgeable of the analysis process.

b. If the size of the board is too large or small it will be useless. It is recommended that the board be composed of 5-8 members. The composition of the board is equally important to achieve interaction and free discussion. If one member dominates the board either by position or personality, then the value of the board's contribution has been decreased. For this reason, the president of the board should not be in a command/supervisory relationship with any of the board members. The time schedule (set aside) for the board is critical. It should not be "squeezed" in between meetings or "partitioned" over many days, which would result in a lack of continuity. A block of days designated on the milestone schedule permits a concerted and devoted period of time for this critical process.

c. The role of the participant is to use the analysis data selection criteria and make informed recommendations as to whether a task should be selected for training. The participant should thoroughly understand the systems approach. The participants should not produce data by rating tasks in terms of different criteria, i.e., task learning difficulty, consequences of inadequate performance, task delay tolerance, etc. This data must be provided to the board by the analysis branch, allowing sufficient time for the board to review the data and then to make recommendations. At the first meeting of the board, the DTD should provide the command guidance and set the parameters for the conduct of the board. Structure and direction are essential components of the task selection process. The requirement to use a Task Selection Board is indicative of the imprecision of the task selection models. The informed, experienced experts on the board, provided with analysis data and participating with other managers through a consensus process insure that the tasks selected for training are the tasks required for job proficiency.

d. The proposed task selection model is actually a combination of several different approaches. The four models have been selected because of their complimentary nature. 1) The CODAP report produces a rank ordering of tasks based on the perception of job incumbents as to the time spent performing a task. 2) The training emphasis scale asks the supervisor to judge whether a task requires training, a slightly different perspective. 3) The DIF analysis asks the supervisor and job incumbent if the task is difficult, important, and frequently performed. These three procedures each collect different data, manipulate it in different ways, and rank order all tasks according to the specific model. By combining these distinct rank orderings, the training managers (on the Task Selection Board) can more efficiently and effectively select the tasks for training. If a task ranks high on these three different scales (indicating a requirement for training) then perhaps it should be trained. If a task does not account for much time within a specialty, ranked low on training emphasis, and categorized by DIF as requiring no training, then this may be a good candidate for rejection.

KEY POINTS

CHAPTER 7
SELECT TASKS FOR TRAINING

Paragraph

7-1 Purpose

Army not able to train all tasks in a specialty.
Tasks selected from inventory

7-2 Background

Task selection
    Difficult/complex
    Not a science
    Management decision
Tasks selected - Soldier's Manual tasks
Several selection criteria available

7-3 8 factor model

Data obtained from surveys
Comprehensive

7-4 4 factor model

Combining values difficult

7-5 Training emphasis scale

Supervisor based
Does the task require training?

7-6 CODAP

MILPERCEN administered
Time consuming (requires planning)
Rank orders tasks on percent performing

7-7 Difficulty - Importance - Frequency (DIF) model

Simple questions
Given to supervisor and soldier
Requires little time
Degree of complexity - adjustable

7-8 Wartime/peacetime model

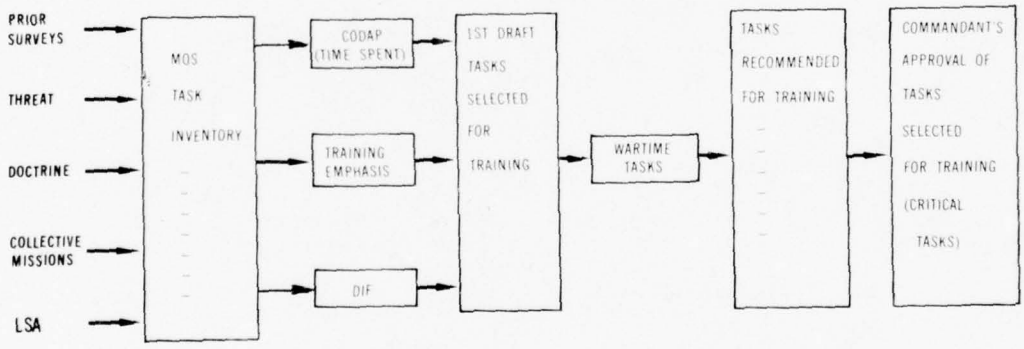
Isolates wartime tasks
Easy to obtain
Relevant double check on other models

7-9 Procedure

Models described: advantages/disadvantages
Combination of selected models - suggestion
CODAP + DIF + training emphasis = recommendation
Comparison to wartime tasks

7-10 Task selection board

Process = management decision
Participants:
    Qualifications
    Size of board
    Composition
    Relationship of members and president
Task selection criteria
    Analysis input
Time schedule
Role of participant



Task Selection Model

TASK ANALYSIS



CHAPTER 8

TRADOC PAM 351-4(T)

CHAPTER 8

TASK ANALYSIS

8-1. General. Task analysis is the process in the training developments cycle in which the analyst obtains and classifies information/data about the accomplishment of tasks/work units within a job/duty. As discussed in Chapter 2, an established common analysis base supports the many training developments products in the Army. Such a task analysis can be time consuming and every effort expended must be productive. In the past a problem existed that TD product developers (e.g., SM, CM, SQT, ACCP, TEC) have initiated their own analysis efforts for varied reasons. Considerable time has been lost in the TD process. When new equipment is involved, a separate analysis was performed under contract for LSA. To avoid this, a task analysis worksheet (foldout at end of chapter and appendix B) prescribing a common form/format evolved to provide a common document identifying pertinent data items usable by all TD developers in producing their product. In some cases, the LSA data (D sheets) can be used as the primary data source for completion of the worksheet. Should these agencies require data items not addressed in the noted worksheet, then their recommendations (if valid, justified, and required) should be identified when the analysis effort begins (NOT after the analysis is completed).

8-2. Scope.

a. A task analysis is conducted on all of the tasks selected for training. The precision in a task statement to a great degree affects the quality of the task analysis data. Understanding the interrelationship of a task to a duty and to its job is essential. This interrelationship is portrayed in figure 8-1. Job and task analysis is oriented towards the specialty. From there, the analyst works down to the task and, as appropriate, the element level. The example described in figure 8-1 describes the MOS "63B Wheel Vehicle Mechanic." This MOS is composed of three different jobs at skill level 1. Further analysis of one of the duties within a job results in the identification of tasks. A task can be loosely defined as the lowest level of behavior in a job under consideration that describes the performance of a meaningful function. A task may have the following characteristics:

(1) A task is a statement of a highly specific action.

(2) A task has a definite beginning and end.

(3) A task is performed in a relatively short period of time.

(4) A task is measurable.

(5) In the eyes of the job holder, a task is performed for its own sake.

THE WHEEL VEHICLE MECHANIC MOS

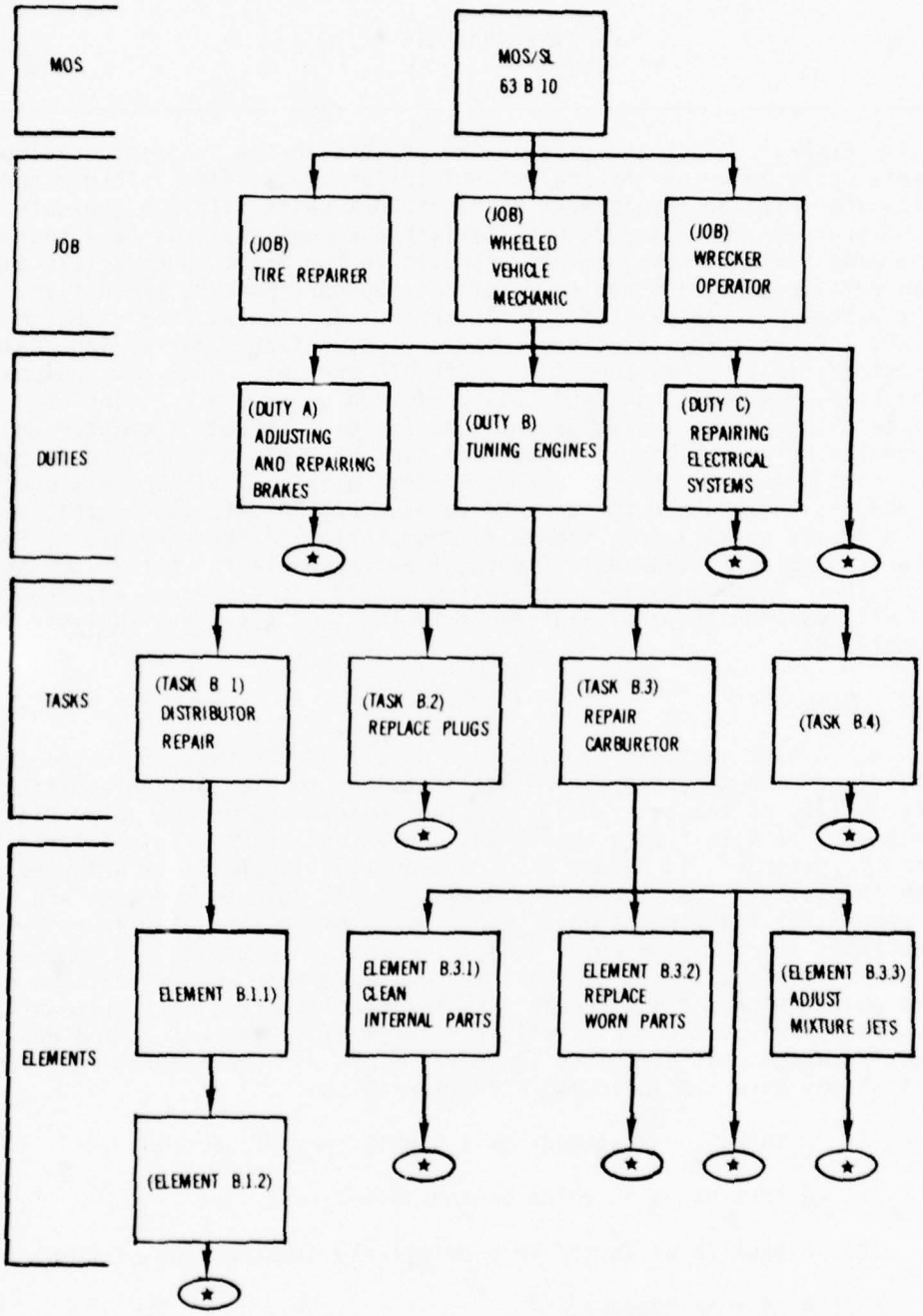


Figure 8-1 THE WHEEL VEHICLE MECHANIC

b. Given only a statement of a task, it is difficult to determine a task from an element. These are relative terms like high and low, warm and cold, near and far. Such pairs of terms have meaning only in relation to each other. So, any task can be broken down into elements and any element can be broken down further into sub-elements and into skills and knowledges. The decision regarding what level of generality/specificity to begin in defining a task, at what level to draw the line between duties, tasks, and elements, and up to what level of detail to analyze the elements into their subelements requires the application of criteria and considerations external to the tasks themselves. Writing down a task may take minutes but analyzing it into elements may take hours or days. First write down possible lists of tasks at a fairly gross level of detail, and then ask a subject matter expert to review that list. They may suggest eliminating a number of items and adding others. Deciding which tasks are included in the list usually involves many meetings and much discussion.

c. In judging whether a given task statement is sufficiently specific, the job holder after reading the statement, must obtain a clear understanding of what the analyst had in mind. For example, "checking the equipment" is too vague. On the other hand, "reviewing maintenance logs" or "checking motor" is adequate for the purpose of gross task statements.

8-3. Data requirements. The analyst conducts a task analysis of only those tasks selected for training. The actual data collected is a combination of all of the task specific information required and any additional data identified by the follow-on TD developers. For each critical task, the designer determines the how, the where, and the how well each task is performed. Task analysis closely examines each task and documents all of the variables affecting performance. Although a thorough examination of the important factors affecting task performance is a time consuming process, once obtained this information can be used by many agencies. A properly prepared task analysis will save countless hours by avoiding duplication of effort among designers, writers and producers. Even more important, this common analysis base provides continuity among the various training products. The goal is to insure that the soldier is trained and tested under conditions that accurately reflect job performance and result in job/mission proficiency.

8-4. Task analysis documentation.

a. The analyst conducting the analysis will spend days/weeks collecting the information required. The analyst gathers all the information specified below, but never fabricates information purely for the completion of the form. Although many experienced analysts may have "professional judgment" it is better to leave sections of the task analysis worksheet incomplete until evidence documents the data.

However, ideas/judgment should be recorded (MFR, working notes in notebook, etc.) to avoid these ideas/thoughts from being lost, especially if a possibility may exist for excessive personnel turbulence. The minimum essential information, that must be documented to provide for this information exchange at a task level of specificity, is described below. Worksheet format is provided in appendix B, and will be completed for each task selected for training. Because of personnel turbulence, constant assignments and reassignments of Army personnel a documented institutional memory must be prepared to record the analysis process. Each analysis should produce a list of data requirements (see app. C). This table assists subsequent analysis efforts and supports the audit trail.

b. To understand where each of the following items are inserted into the form, pull out the foldout worksheet at the end of this chapter and follow it with each item's description. Note this form is partitioned according to the different data requirements and so numbered. This worksheet is designed to be used as a "stubby pencil worksheet" to record specific data. If a school chooses to not use this suggested form, the school must at least conform to the format as defined by the paragraph notation, and specified sequence. If you have, as yet, not unfolded the worksheet, do so now.

c. This worksheet is to be annotated by the analysts/designers (where applicable) and filled in as the information is compiled. Each section will now be described in detail. As you read each block's description, look at the example next to it, and then glance at the worksheet that you have folded out at the end of this chapter. This process will make you familiar with the format of the worksheet. Yet the only way to really "get confortable" with the worksheet will be to use it.

1. TASK DATA

1A. Task Title - The name of the task. Usually taken from the task inventory, but may be a modification of the task statement.

1B. Number - The number assigned the task. Based on TRADOC Circular 351-28 and local school policy.

1C. Condition - A brief description of the conditions under which the task is performed on-the-job. This statement may include such items as tools, equipment, facilities, environment, operational dictates, etc.

1D. Standard - A brief statement of how well the soldier must perform the task on-the-job. It may include such things as procedures to be followed, time limit, errors permitted, production rate, tolerances.

1E. Job Title - The name of the duty position in which the task is performed.

1F. Supervisory Job? Indicate (yes) or (no) if the task is part of a supervisory function.

1G. Supervision Required to Perform This Task? Indicate (yes) or (no) if the soldier requires direct supervision in order to perform the task.

1H. ARTEP Derivative? Indicate (yes) or (no) if the task was derived from an ARTEP collective task. Comment (as required) on any associated task that may be relevant to the ARTEP task from which the task was derived.

1I. SQT Candidate? Indicate (yes) or (no) if the task is to be used or should be considered, in an SQT.

1. Task Data

A. Title: Install Telephone Set TA-341/TT or TA-341A/TT

B. Number: 113-600-1003

C. Condition: All weather conditions, indoors, outdoors Using 2 ea TA-341/TT or TA-341A/TT, 4 ea TA-42, 2 ea 1K resistors, TK-101/G, TM 11-5805-384-12

D. Standard: Telephone set installed in accordance with the procedure outlined in Block #16, Performance Elements.

E. Job Title: Tactical Wire Operations Specialist

F. Supervisory Job? (Yes) (No)✓

G. Supervision Required to Perform this Task? (Yes)✓ (No)
Comments: NCOIC must inspect operation of telephone set

H. ARTEP Derivative? (Yes)✓ (No)
Comments: Derived from ARTEP 7-45

I. SQT Candidate? (Yes)✓ (No)
Comments: Program for 1980 SQT revision

J. MOS Candidate? (Yes) (No)✓
Comments:

K. Common Task? (Yes) (No)✓ Proponent: Signal School

L. Shared Task? (Yes) (No)✓ Proponent:

1J. MOS Candidate? Indicate (yes) or (no) if the task is to be used, or should be considered, in the Military Qualification Standard (MOS). See Review of Education and Training for Officers (RETO), 30 Jun 78, and TRADOC Cir 350-2, for more information.

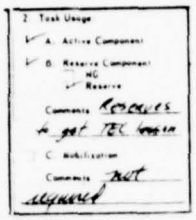
1K. Common Task? Indicate (yes) or (no) if the task is common across several MOS or specialties. See TRADOC Circular 351-1 for more information. Include the proponent school.

1L. Shared Task? Within the RETO effort and TRADOC Circular 350-2, shared tasks are used. Refer to these documents for useage factor.

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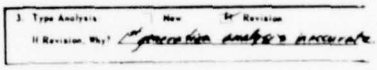
2. TASK USAGE

2. Task Usage - Indicate if the task is performed by soldiers in Active Component, Reserve Component and/or during mobilization. Any comments/justifications should be annotated, as required.



3. TYPE ANALYSIS

3. Type Analysis - Indicate if the current analysis is a new (first-time) or revision of a previous analysis. Give a breif statement of rationale as it pertains to a revision of a previous analysis (e.g., change in target population, new equipment useage).



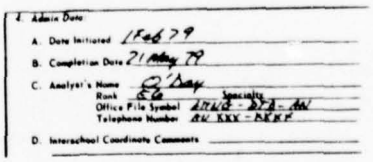
4. ADMIN DATA

4A. Date Initiated - Date the current analysis project was started.

4B. Completion Date - Date the analysis project is completed.

4C. Analyst's Name - Indicate the person with primary responsibility for the analysis; his or her rank; specialty/ MOS; file symbol and AUTOVON phone number. If a succession of POCs are involved each should be listed in this block and/ or in block 15.

4D. Interschool Coordination Comments - Names and phone numbers of persons contacted at other service schools in order to complete the analysis of the task.

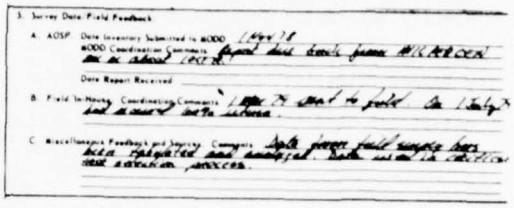


5. SURVEY DATA/FIELD FEEDBACK

5A. AOSP - Indicate date the task inventory was submitted to MODD. Also indicate when the AOSP report was received from MODD. Include any brief notes on coordination done with MODD and/or TDI (e.g., survey year, priority, coordination).

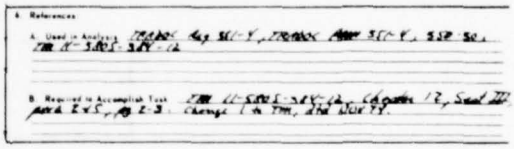
5B. Field/In-House - Include a brief statement about any coordination made with DCST and MODD. Intercommand survey fall within the purview of AR 611-3, CH 1.

5C. Miscellaneous Feedback and Sources - Include any feedback received from DCST, MODD, field units, personal comments from troops, letters to editor, PM Magazine, comments, etc.



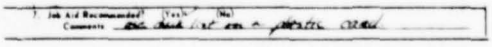
6. REFERENCES

6. References - List separately all resource documents used in the analysis and all references needed to perform the task. If additional room is required use Block 15 or add additional sheet of paper.



7. JOB AID RECOMMENDED

7. Job Aid Recommended - Indicate (yes) or (no) if it is recommended that a job aid be designed for the task. Provide comments/perceptions/recommendations as appropriate.



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8. HAZARD POTENTIAL

8A. Training - State if performance of the task under training conditions presents a hazard to personnel and/or equipment. Specify hazard for designer's knowledge.

8B. Job Performance - State if there is a hazard potential to personnel or equipment when this task is performed under actual job conditions. Again, be specific. This is very essential to the designers.

8. Hazard Potential
A. Training Low - danger of electrical small due to low volts
B. Job Performance Low - med voltage - minimal shock hazard

9. SAFETY CERTIFICATION REQUIREMENTS

9. Safety Certification Requirements - State if soldiers performing this task are required to hold a specific certification. Include the agency issuing the certification.

9. Safety Certification Requirements
Repairmen must hold current FCC first class certificate

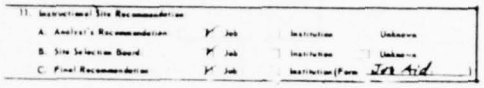
10. TRAINING MATERIALS

10. Current Training Materials Identified and Those Affected by Job/Task Revision (to include title, media, number, type devices or aids, etc.). - List all training material identified during the analysis and indicate those which must be modified due to the analysis. This is necessary for modification/update actions to ensure commonality of training guidance/instruction.

10. Current Training Materials Identified and Those Affected by Job Task Revision (to include title, media, number, type devices or aids, etc.) TEC Lesson "Wire Splicing", TEC Lesson on installation of TM-541/TT or TM-5418/TT

11. INSTRUCTIONAL SITE RECOMMENDATION

11. Instructional Site Recommendation - Space is provided for the analyst to make a site recommendation based on local school policy. Site selection board's recommendation should be recorded as should be the final decision on training site made by the designer and the form (e.g., self-study, SOJT) to be used.


11. Instructional Site Recommendation

A. Analyst's Recommendation	Y	Job	Institution	Unknown
B. Site Selection Board	Y	Job	Institution	Unknown
C. Final Recommendation	Y	Job	Institution (Form	Job Aid)

12. EQUIPMENT USED WITH/TO PERFORM TASK

12. Equipment Used with/to Perform Task - List all equipment and/or hardware needed by the soldier to perform the task on-the-job. This readily identifies equipment needs for designers, course developers and SQT developers.

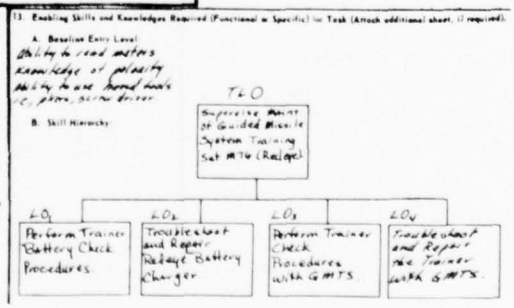
12. Equipment Used with to Perform Task

2 ea. TA-341/TT or TA-341A/TT
4 ea. BA-42
2 ea. Receiver (IR), RCR 6TG1 6ZJM
1 ea. TK-101/G

13. ENABLING SKILLS AND KNOWLEDGES

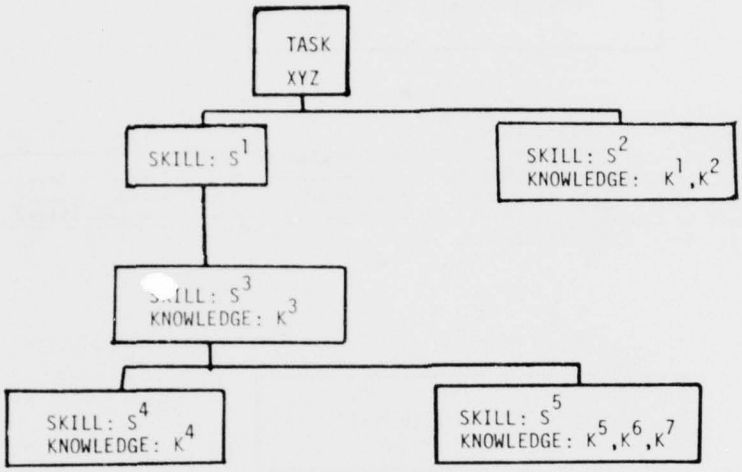
13A. Baseline Entry Level - List those prerequisite skills and knowledges the soldier must have to learn to perform the task.

13B. Skill Hierarchy - Indicate graphically and in writing the relationship of all skills and knowledges required to perform this task. Attach additional sheets if more space is needed.



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NOTE: It is expected that the skills and knowledges required for the performance of tasks be analyzed so as to identify subordinate (clear-cut enabling) relationships, meaning those relationships that require the learning of one skill, or bit of knowledge, before learning another (e.g., before a typist can produce a typewritten document they must be able to read handwritten materials). A simple but useful approach for this process is depicted below (fig):



Skills and knowledges required for the performance of one job or task are often required for the performance of others as well. In testing for proficiency, a task encompassing many skills and knowledges can provide more return for the testing dollar than those of fewer numbers. Those skills and knowledges derived from the process above can/should be examined for commonality. A key here is that the derived skills are not just similar (requiring separate testing) but are truly identified (requiring only a single testing). An easy means to cross-reference those derived for commonality is depicted below (Table).

TASKS	SKILL				KNOWLEDGE			
	S1	S2	S3	S4	K1	K2	K3	K4
T1	X		X					
T2	X		X		X			
T3	X		X			X		
T4	X		X				X	
T5	X		X	X	X	X	X	
T6		X	X					X

14. TASK SELECTION DATA

14. Task Selection Data - Indicate the task selection model used. Annotate the data collected for each factor used in the model. If a Likert type scale was used for any factors, annotate the range of that scale. Should additional justification or comments be required to portray the full picture use block 15 or add an additional sheet of paper.


14. Task Selection Data (Fill in only those used)

A. S & E Factor Data

(1) Percent Performing 13%

(2) Time between Training and Task Performance 3-6 Months

(3) Frequency of Performance Daily

(4) Time Spent Performing Task 5

(5) Consequences of Inadequate Performance Serious (5)

(6) Probability of Inadequate Performance Low (7)

(7) Task Delay Tolerance Low (7)

(8) Task Difficulty Very Easy (1)

Uses 2-8, scale uses Likert type - Range of scores 1-7

B. Training Emphasis Data

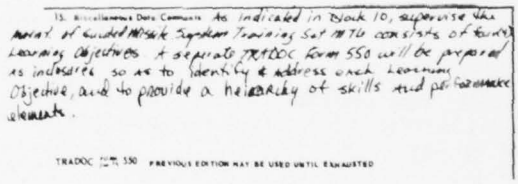
C. DIF Data

D. Proponent Position Data

E. Other

15. MISCELLANEOUS DATA/COMMENTS

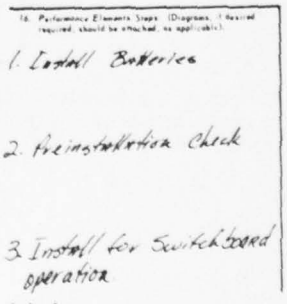
15. Miscellaneous Data/Comments - Add any data or comments that have bearing on the analysis, but for which there is no specific block for entry or which overflowed from other blocks on this form.


15. Miscellaneous Data Comments As indicated in Block 10, supervise the manual of Guided Missile Supplies Training Set MTG consists of twenty Learning Objectives. A separate TRADOC Form 550 will be prepared as indicated so as to identify & address each Learning Objective, and to provide a hierarchy of skills and performance elements.

TRADOC FORM 550 PREVIOUS EDITION MAY BE USED UNTIL EXHAUSTED

16. PERFORMANCE ELEMENTS/STEPS

16. Performance Elements/Steps - Record all elements or steps necessary to perform the task. These should be listed in a logical sequence based on actual job performance. Attach any diagrams or flow charts needed to complete the task analysis.


16. Performance Elements Steps (Diagrams, if desired required, should be attached, as applicable)

1. Install Batteries

2. Pre-installation Check

3. Install for Switchboard operation

. . .

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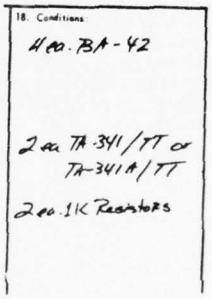
17. CUES

17. Cues - List all cues that cause the soldier to start performing the task. Include ones that cause the soldier to continue (sustain) or stop performing the task.



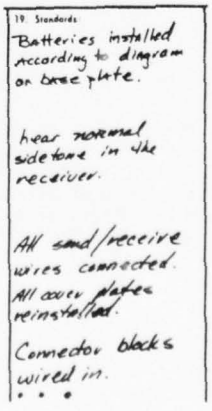
18. CONDITIONS

18. Conditions - List the specific conditions (tools, test equipment, forms, references, etc.) necessary to perform a step or element of the task.



19. STANDARDS

19. Standards - List any standard that relates to the performance of a particular element or step of the task.



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20. SKILLS/KNOWLEDGES

20. Skills/Knowledges - List any skills or knowledges the soldier must have to perform a step or element of a task.

20. Skills Knowledges
Ability to read meters
Knowledge of polarity
ability to use hand tools
i.e, pliers, screwdriver

21. JPM DATA

21. JPM Data - A JPM is a measure used to denote a form of simulation from the real-world application (for whatever reason may exist). List any tradeoffs in the actual performance of the task that are required for testing purposes and/or the actual written JPM (see Appendix G).

21. [illegible] -NONE.

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8-5. Task analysis process.

a. Generalized (or gross) task statements created in the job analysis are broken down to specific tasks in task analysis (as appropriate). This process of breaking down the job analysis tasks into further task statements is continued until the desired level of detail and specificity has been reached. The criteria that are used to decide what constitutes a sufficient level of detail and specificity will be discussed later. They are different from the criteria that were applied in deciding what constituted adequate level of detail for the tasks developed previously.

b. The following gross task is provided as an example of the way in which one can be broken down. Consider the task of "Examine an unconscious victim." This gross task could be broken down into several more refined tasks:

(1) Conduct emergency life saving steps

(2) Determine pulse

(3) Determine state of consciousness

(4) Determine painful areas

(5) Observe for bleeding

(6) Observe breathing habits

(7) Question patient (if conscious) on movement of limbs and sensations

(8) Observe for deformities

(9) Cover the wound

(10) Others

Each of these refined tasks can be broken down into their components, e.g., (2) Determine pulse:

(a) analyze pulse

(1) identify weak rapid pulse (SHOCK)

(2) ...

(3) ...

If the pulse is weak, this can be a signal that the individual is in shock; if this is the case then the next element would be to determine the type of shock and then to "treat the shock." There can be many different types of shock:

1. Olegemic (blood loss)
2. Neurogemic (pain)
3. Cardiorespiratory (breathing)
4. Anaphylactic (stings)
5. Systic (infection)
6. Metabolic (body disturbance)
7. Combination of

The skills and knowledge necessary to perform the task (treat for shock) relates to several areas and affects the ability to perform the task satisfactorily. If the type of shock is identified to be anaphylactic (caused by the sting of a bee) the procedures for treatment are different than for shock induced by blood loss. Yet the skill and knowledge requirements for the task are basically the same. This example of the process of breaking down a gross task is suggestive of the level of detail that should be achieved in a detailed task analysis, so as to provide the basis for training requirements.

c. The terminology of tasks, and elements. Previously, it was explained that tasks and elements are relative terms. They have meaning only with respect to each other, like such terms as hot and cold, large and small, or low, lower, lowest. Any task can be broken down into elements. Conversely, a set of sequenced tasks can sometimes be redefined to become a larger task. In the section that follows, we shall consider how far the process of subdivision should be carried, and what criteria should be applied in deciding how far to carry it.

d. Criteria and considerations to apply in deciding how much to subdivide.

(1) Considerations. During the job analysis, the decisions regarding the level of detail to which the process of breaking down and subdividing tasks into elements requires the application of criteria and considerations external to the tasks and elements themselves. The decisions cannot be made by merely examining the tasks and elements. During job analysis, the considerations in deciding on the appropriate level of detail were presented and discussed. Now we shall discuss the criteria and considerations in deciding the appropriate level of detail to conduct a task analysis. The principal criteria to apply are:

(a) Is the subdivision or breakdown of the task so detailed that the resulting task is insignificant/vague/trivial. A task may specify an element that is too easy for the members of the target population, and that should be considered as a known prerequisite. As such it would be considered too trivial. Deciding if an element is trivial is a matter of judgment that takes into account the educational level and prior skill or experience of the members of the target population (see chapter 4).

(b) Are all significant tasks included?

(c) Is the task statement so abstract or general as to be unpredictable or ambiguous? If it is, further subdivision into more specific items may be required.

(d) Unpredictable/ambiguous tasks. If an element is not specific enough, it may also be ambiguous. A similar point was discussed during the job analysis. There, the emphasis was on communicating clearly what task was being referred to, so that different task analysts analyzing the same task would come up with similar elements.

8-6. Task Analysis Techniques. The techniques described in the following paragraphs are suggestive of the varied approaches that should be used during your task analysis efforts. Each analysis could well utilize a different set of data sources and procedures. The considerations that may effect the procedures selected include: type of specialty, experience of the analyst, status of previous analyses, variations in task performance in wartime, etc. An appropriate consideration to include is the sex of the soldiers. For some specialties, it matters little whether the incumbent is a man or a woman. But in light of the increased number of women in the Army and specifically in previously all male positions, sex could well be an essential consideration in the selection of analytic procedure. If female soldiers occupy a substantial number of positions in a specialty, then the analysis should accommodate this consideration both in terms of the incumbents and supervisors who are interviewed, in terms of any physiological/physical considerations, and by having female soldiers participate actively in the analysis even so far as being an analyst. The results of this approach could be design consideration of tools and safety considerations for women (e.g., weight restriction, physiological restrictions, procedures required to perform a task). The analyst must select the techniques best suited for the analysis about to be conducted. Each technique has its place, its unique requirements and feedback. Figure 8-2 provides a matrix that may be useful in identifying those task analysis techniques to be used. Considering the varied purposes for which task analytic data can be collected, the analyst should insure that the appropriate techniques have been utilized and that all required information is collected. The detailed discussion that follows, is an attempt to organize the advantages and disadvantages of each technique, so as to facilitate the selection of the best technique(s) to use.

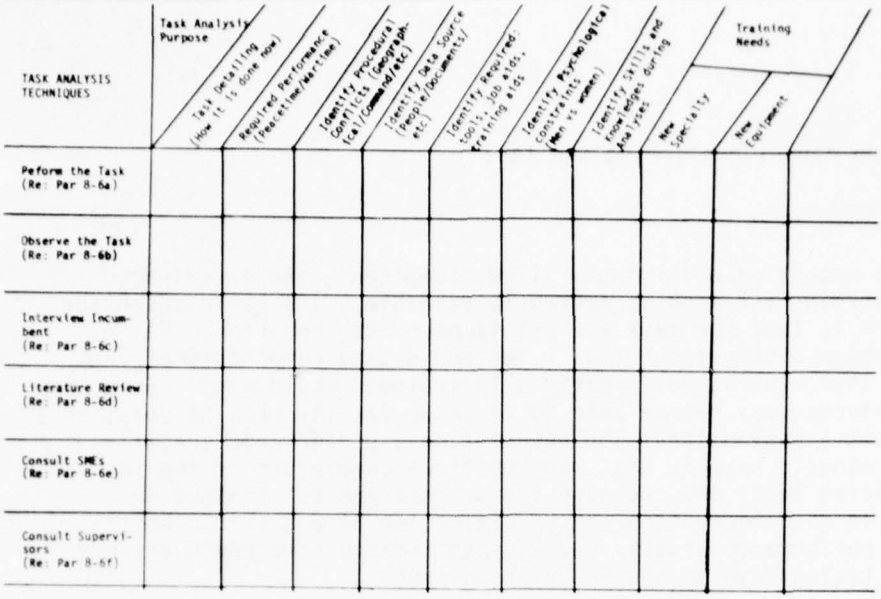


Figure 8-2 Analysis Techniques

a. Analyst learning to perform the task. It is useful for the task analyst to perform the task himself before he conducts the analysis of a task. This technique has advantages and pitfalls. The advantages are, by doing the task the analyst gains an intimate knowledge of the task and its detailed components. He makes contact with task components not visible when merely observing someone performing the task. The usual invisible task components are the decisions, the reasoning processes, and thought processes used by the skilled and experienced worker performing the task. In certain kinds of tasks, the decisions and reasoning processes, which are invisible to the observer, are the most important parts of the task.

(1) Advantages. Performs the task itself to gather additional information.

(2) Pitfalls. This method applies only to tasks easily learned and performed by the analyst regardless of how well he performs them. When other individuals are involved, as in supervision, or when damage to equipment or operations is a possibility, this method cannot be used.

(3) Applicable situations. Here is a partial list of task types where it is both useful and practical for the task analyst to learn, at a basic level of competence, to perform the task: simple routine tasks, troubleshooting type tasks, tasks that can be learned in one hour or less, operations of simple equipment.

(4) Situations in which not applicable. The next list includes tasks where it is not practical or safe for the task analyst to learn the task before doing the task analysis: operate complex vehicles or equipment, operate expensive equipment, sophisticated troubleshooting. Whenever it is practical, safe, and feasible, the task analyst should learn the task he is analyzing at a rudimentary level and how to perform it. Doing so will greatly improve the quality of this task analysis and will bring him into contact with the invisible components of the tasks that may escape his attention.

b. Observing others performing the task.

(1) Advantages.

(a) The method of observing skilled, competent, and experienced persons performing the task is extremely valuable. The basic advantage of the method is that the task analyst is observing behavior. Being trained to observe behavior, he will see and notice components of the performance that others, not behaviorally trained, would miss. Even the observed performer may not be able to describe exactly what he does, or how he does it. Conventional job descriptions, performance specifications, or manuals usually omit many critical components of the task supposedly being described, because the writers are not trained or experienced in the observation and specification of behavior. Observation of a performance usually reveals performance components visible only to the trained eye of the behavior analyst.

(b) The second important advantage observing the performance prompts the analyst to ask the performer about the invisible components of the performance. The analyst observing a performance must ask such questions as, "How did you decide to do this and not that?"; "Why did you do it this way and not that way?"; "Why did you do this now and not later (or before)?"; "What were you thinking about when you paused at that point?"; "What reasoning process do you go through in deciding to do X?"; "What caused you to make this error?"; "What were you looking at when you looked at that table (or display, or dial, or chart, or diagram)?" Questions of this type usually bring the invisible components of the performance out into the open, and make the performer aware of actions never before realized.

(c) A third significant advantage of observing performance. The task analyst is exposed to several different individuals, all skilled, competent, and experienced. He sees several alternative ways of performing the task. This permits him to identify the critical and essential elements of the performance, and the elements that are stylistic, individual, and possibly nonessential. By observing several different performances, the task analyst can develop a level of objectivity and perspective greater than that of an expert who is himself a competent and experienced performer. The task analyst need not always eliminate the stylistic, individualistic components of a performance. He may discover one performer does something better or more efficiently because of a unique step. In such a case, the task analyst has the opportunity of upgrading the generally accepted method of performing the task, by including an improvement or technique previously restricted to that one performer.

(2) Pitfalls of the method of observation.

(a) There are two dangerous pitfalls of the method of observation of experienced performers. The task analyst may fail to note or identify significant invisible components of the performance and will confine himself to a simplistic description of the easily visible components.

(b) A second pitfall of the method of observation is that every task or performance contains components that occur more rarely than others. The rarest components may not appear at all during the limited period of time that the task analyst spends observing. For example, when the operator of a piece of equipment is being observed, there may not be any occasion on which he is observed in a maintenance procedure. The task analyst may never see the steps taken during an equipment malfunction. When a maintenance engineer is observed troubleshooting a piece of machinery, the task analyst may never get to see what the engineer does after finding a rare, but important, type of malfunction. In general, the rare and exceptional situations should be included in the task analysis, but may not be readily observable by the method of observation. This becomes a pitfall only if the task analyst does not recognize this limitation and does not make provisions for supplementing the method. He has several ways of collecting this information. One is by interviewing the performer and asking him to think of rare or exceptional situations that are important but were not observed during the observation period. Having identified rare tasks in this manner, the performer could either demonstrate what he does in these situations or describe it verbally, as best he can. A second way of correcting this limitation is to use the other methods of task analysis to complement the method of observation. Generally, no one method of task analysis by itself is adequate. Several methods must be used.

(3) Importance of observation. Observation is basic to task analysis and should be used whenever feasible. The use of the method always requires effort, planning, and time, but that investment is usually justified. There is always a great qualitative difference between a task analysis that included the method of observation and task analyses that did not. The quality of the task analysis based on observation, is reflected in the quality of the training system produced.

c. Interviewing individuals on the job.

(1) When applicable. Interviewing is an important part of observation, and should always be carried out in conjunction with observation. Interviewing is applicable whenever there are skilled performers available. The only time incumbents are not interviewed in connection with task analysis is when there are, as yet, no trained or experienced performers.

(2) Importance of the method of interviewing. In several areas (maintenance, troubleshooting areas, etc.) interviewing is the most important method for discovering the covert task performance components such as decision processes, the reasoning processes and the judgments that the job holder makes. These are the behavior components that provide the under pinnings for the observed actions.

(3) Techniques of interviewing.

(a) Selecting the individuals to be interviewed generally it is wise to interview several supervisors of the job incumbents and several incumbents. The more experienced they are, the better.

(b) Briefing the interviewee The interviewee must understand the purpose of the interview. He must be told that he is not being evaluated; that the purpose is to conduct a job and task analysis that will lead to a training system for others; that the analyst is trying to obtain an understanding of the job and its component tasks; that he is trying to collect realistic examples and cases.

(c) Describe the job and task analysis process being used. The interviewee will be more helpful if he understands what the analyst is trying to accomplish.

(d) Probes are often productive the analyst will often elicit useful information when he asks questions during the interview such as: What are the most common malfunctions you encounter? How often does this occur? Is that the most common terminology in use on the job?

(4) Pitfalls of interviewing. The interviewee may not know exactly what he does or how he does it. He may have distorted perceptions of what is important or how he does his job. The job holder may not know how he decides what to do or what reasoning and decision processes he employs. One important resource the interviewer uses to avoid these pitfalls is to cross check the information with different individuals.

d. Examination of existing documents.

(1) Types of existing documents. When a task analysis of an existing job is undertaken, it is often possible to find descriptions of the job that have previously been developed. Such descriptions may be contained in the following kinds of documents:

(a) The job description that was given to the individual or the performer on the job at the time he started working at the unit (desk SOP, continuity folder, etc.).

(b) A job description in the Personnel Office.

(c) A task analysis or occupational analysis that was conducted on a previous occasion.

(d) Training manuals, POI, or guides that were used on a previous occasion to train people for the same job or similar jobs, even in other services.

(e) When equipment is involved the task analyst may discover that there are technical manuals, instructions, or guidebooks on the operation and maintenance of the equipment.

(f) When institutional procedures are involved, as in documentation of maintenance activities and filling out forms, the task analyst may discover that there are regulations, manuals, rules, or guidebooks that describe how it should be done.

(2) Purposes of examining existing documents.

(a) Existing documents can provide the task analyst with instructions and procedures that will help him perform the task in question. Existing documents may also provide him with criteria for evaluating his own level of competency, so that he will be less likely to think that he has identified and mastered all of the significant performance components of the task when in reality he has not. When the method of observation is used, supplemental examination of existing documents can sometimes help identify the invisible components of the performance being observed. Documents will often make references to decisions that must be made, reasoning processes that are to be used, and errors that must be avoided. Most equipment has maintenance procedures and manuals produced for it. Examination of documents can also help in the identification of the rare but important performance components that do not appear during the observation period.

(b) A second purpose of examining existing documents is to obtain an overview of the job quickly. Existing documents may be limited or inaccurate but provide the analyst a quick overview of the job and its component duties and tasks.

(c) A third purpose of examining existing documents is that they may contain valid and useful statements and descriptions of the tasks in question. Depending upon the quality of the existing documents and the care that was invested in their preparation such statements and descriptions may easily be converted into task statements.

(3) Pitfalls of using existing documents. The main pitfall of existing documents is that they are usually too general and undetailed,

incomplete, or not fully descriptive of the performance being analyzed. Available documents usually are not produced with a task analysis in mind. They are usually produced for other purposes. Accordingly, existing documents must always be viewed in the spirit of suggestion lists or guides, and never as exhaustive lists of topics or tasks.

e. Consultation with subject matter experts.

(1) Types of subject matter experts. Subject matter experts are individuals knowledgable in the area or the performance to be analyzed. Subject matter experts should be recognized as an authority by the organization, and be accepted as an expert by the task analyst. Subject matter experts should have recent practical experience of the type of work or the task for which the training is to be provided and be readily available to the task analyst for frequent and short notice access.

(2) Purposes of consulting with experts.

(a) The main purposes of consulting with subject matter experts are to obtain their description of how the job and the tasks comprising the job should be carried out. This description is compared with any previously examined task analyses and observations of how the tasks are actually performed. The experts are questioned regarding any discrepancies between their description of the task and the actual performance, and attempts are made to reconcile any differences discovered.

(b) To correct inaccuracies in the task analyst's task statements. He may have made technical errors, errors of emphasis, or errors of omission.

(3) Pitfalls of consulting with experts. The experts may be expert in certain aspects of the task without being expert in the best ways to do the task. Therefore evaluate the kind of expertise the expert brings to the task, and the kinds of bias he is likely to manifest, and use subject matter experts with ample practical experience in performing or supervising the analyzed task.

(4) How to use subject matter experts. Subject matter experts should never be asked to write things or produce materials, no matter how short or easy it may be for them. SME should be interviewed by the analyst. Long discussion meetings are often productive. When the information being provided by an SME has important potential consequences, the information should be crosschecked and double checked with other SME or other sources.

(5) Conflicts of opinion. Conflicts of opinion between experts are the rule rather than the exception. Experts normally disagree on all matters where disagreement is possible. The task analyst when confronted with such disagreements should follow the following procedures.

(a) Try to understand the nature of the disagreement.

(b) Try to determine the degree to which the disagreement is semantic.

(c) Sidestep the areas of disagreement by focusing the discussion on the operational aspects (tasks, actions, what to do, when) of the analysis, referring to previously obtained observations.

(d) When such sidestepping is not possible and resolution of the disagreement appears essential, ask a third more authoritative expert to resolve it by fiat. The greatest danger of disagreement among experts is loss of time. It is common for such disagreements to delay projects for months when permitted by inexperienced task analysts.

f. Interview supervisors of job incumbents.

(1) Purpose of consulting with supervisors. The supervisor sets the objectives of the job. The tasks are the means for obtaining the objectives. The supervisor may know the task from direct personal experience, if he once performed the task himself, or from the experience of having supervised others doing it, with the consequent benefit of having seen it done well, poorly, and in different ways.

(2) Methods for consulting with supervisors. A supervisor will often have a great deal of knowledge regarding the tasks but be unable to list them in an open-ended question from an analyst. He will need prompting. Near the beginning of the task analysis process, the supervisor (or several supervisors) should indicate to the task analyst who the best task performers are, so the task analyst may observe these performers at work and interview them. Having obtained a list of tasks from the observation sessions (or from other sources such as documents), the analyst can present that list of tasks to the supervisor for comment. At that point, the supervisor will normally be able to help the task analyst in several ways: by adding tasks that were not observed or recorded, by pointing out the invisible tasks that were observed, by suggesting that certain tasks be omitted. The supervisor may even suggest that the performer observed by the analyst was doing the job incorrectly or in the best possible way. When this happens, the task nalysis process creates a previously missing communication channel between the supervisor and his subordinates, concerning the performance of the job. This can be very valuable independently of the task analysis.

(3) Pitfalls of consulting with the supervisor. The supervisor may have an unrealistic concept of the tasks. Here are some types of mistaken ideas that supervisors sometimes have.

(a) They may in the past, have defined the job and its tasks in a certain way. This way may have been impractical or inefficient. However, the subordinates may have discovered or worked out a practical way of doing the task but failed to tell the supervisor. The supervisor may, all this time, have believed the task was performed the way he originally suggested, while in reality it was not being done like that at all, and perhaps could not or should not have been done that way. When this has happened the supervisor, upon being confronted by the task analyst with the way his subordinates are doing the task may say that it is the wrong way (when the subordinate's way is really the better way). The resulting conflict of views may take a long time to resolve.

(b) The supervisor may not know the job and tasks very well, and may define the tasks on the basis of his idealized conception, or on the basis of theoretical considerations as to how it should be done.

(c) The supervisor may be very competent at the job being analyzed. As a result he may specify performance of the tasks in a way that is beyond the average subordinate. He may do the task faster, or in a more sophisticated way than his subordinates could learn in a reasonable time. In other words, the supervisor may define the task in terms that only he can use. For the average subordinate, the task may require simpler terms or more easily learned elements that can be mastered in a reasonable time and with an amount of training that is economically feasible.

(d) The way to avoid all three of these common pitfalls is to not rely on interviews with the supervisor to the exclusion of other tasks analysis methods. The supervisor's opinions must be checked against the results of other task analysis methods, and reconciliation must be achieved with the greatest weight given to the observation and interview of actual job incumbents.

8-7. Sequence for task analysis methods.

a. Why sequence matters. There are two reasons why sequence matters. One reason relates to efficiency. It is more efficient to use the sequence proposed below than other possible sequences, because the task analyst can obtain an understanding of the task more rapidly, with less expenditure of time and effort. The second consideration relates to bias. The task analyst must protect himself against obtaining a biased view of the job. He may obtain a biased view if he does not follow a certain logical sequence.

b. Sequence to be followed.

(1) Review of literature. The analyst before conducting his actual task analysis would begin by conducting a review of literature relating to the actual job, the duties and the tasks contained within the job. By getting a feel for the tasks, the analyst thinks about the tasks and how they interrelate. This review of literature is not considered the basis of information, but rather the starting point for a more detailed data collection effort. The review of literature is only that-a beginning point.

(2) Learning how to do it. As appropriate, the task analyst may wish to perform the task that he is going to analyze. This first hand knowledge of procedures, skills, and knowledges required in the performance of a task can aid later analysis efforts.

(3) Observation and interview of incumbents. Observation of the job incumbents at work, in conjunction with interviews is an important methodology. After reviewing the literature and learning how to do it, the task analyst through observations and interviews obtains a concrete and vivid concept of what the job entails, and not an imagined or erroneous picture. Even if on subsequent analysis, it is identified that incumbents were performing the task incorrectly, the analyst still has a concrete and operational frame of reference to judge his concept of the task.

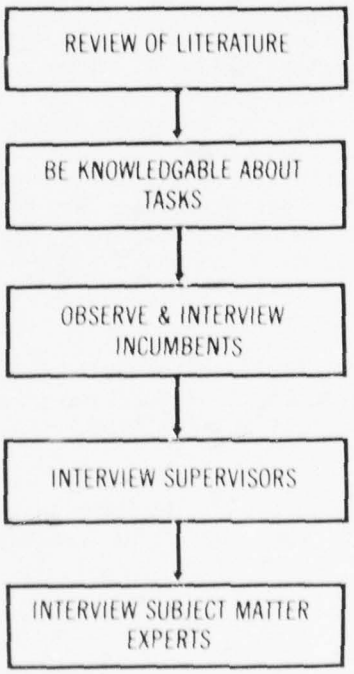
(4) After the field observation sessions, the task analyst should speak with the supervisor of the performers who were observed and interviewed. The analyst now has a basis for such a meeting. He asks the supervisor if he agrees with the way the job is performed and to critique the task analyst's analysis of the task already achieved, as far as he has gone.

(5) Next the analyst consults with the subject matter experts at the service school to obtain their perspective on accomplishing tasks and to verify this data against that derived from the field.

(6) Audit trail. At the end of the task analysis a complete audit trail is assembled, put in order, and made a permanent part of the documentation.

8-8. Conclusion. Task analysis is the comprehensive collection of task specific data, derived from a variety of sources, and collected in a variety of ways. Task analysis data forms the basis for all training development efforts. Task analysis is expensive and time consuming. Once the analysis is completed, all too often the data is treated as if it were etched into granite. Recalling that analysis is seen as data collection, then if the analyst comes across some new data or if the field shows that earlier data was incorrect, attach the new/modified data, along with its justification, to the old task analysis worksheet. By establishing this common analysis basis, the service school integrates all its training products. REMEMBER: A task analysis worksheet will be prepared for each task selected for training/critical task.

TASK ANALYSIS SEQUENCE



TASK ANALYSIS WORKSHEET INITIATED

↓

CONDUCT OBSERVATION/ INTERVIEW

↓

TASK ANALYSIS WORKSHEET (DRAFT) COMPLETED

↓

TA WORKSHEET REVIEW BY SUPERVISORS

↓

REVISIONS (AS RQD) FROM SUPV REVIEW

↓

SME REVIEW OF TA WORKSHEET (REVISIONS AS REQUIRED)

↓

TASK ANALYSIS WORKSHEET COMPLETED

↓

TA WORKSHEET PROVIDED TO FOLLOW-ON TD USERS

TASK ANALYSIS

Key Points

Chapter 8
Task Analysis

Paragraph

8-1 General

8-2 Scope

Interrelationship of MOS ⟶ JOB ⟶ DUTY ⟶ TASK ⟶ ELEMENT
Task definition
Task specificity - level of generality

8-3 Data Requirements

For each task: how, where, how well, etc.
One analysis for many systems

8-4 Documentation

Task number
Task title
Conditions
  Tools, equipment, facilities, environment, personnel, references, job aids
Standards
  Criteria, time, origin
Element
Cues
  Initiating, sustaining, terminating
Task references
Training materials
Specialty skill identifiers
Weapon system categorization
Supervision
Performance data
  % performing, time between training and performance, frequency, time spent performing, consequences of inadequate performance, probability of deficient performance
  Task delay tolerance, task difficulty
Safety and emergency requirements
Analyst information
Reviewer information

8-5 Task analysis process

8-6 Task analysis procedures

8-6a Learn to do it
- Advantages
- Pitfalls
- When applicable
- When not applicable

b Observation
- Advantages
- Pitfalls
- Importance

c Interviewing
- When applicable
- Importance
- Techniques
- Pitfalls

d Documents Examined
- Types
- Purpose
- Pitfalls

e SME consultation
- Types
- Purposes
- Pitfalls
- Use of
- Conflicts of opinion

f Supervisor interviews
- Purpose
- Methods
- Pitfalls

8-7 Sequence for Task Analysis Methods

Why it matters
First - Review of Literature
Second - Learn how to do it
Third - Observe and interview incumbents
Fourth - Interviewing supervisor
Fifth - Consult SME
Sixth - Audit Trail

8-8 Conclusion

Worksheet - Required for each task selected for training/critical task

JOB AND TASK ANALYS

(TRADOC Reg 351-4)

Task Number:

Task Title:

1. Task Data:

A. Title: _____

_____

B. Number: _____

C. Condition: _____

_____

_____

D. Standard: _____

_____

_____

E. Job Title: _____

F. Supervisory Job? (Yes) (No)

G. Supervision Required to Perform this Task? (Yes) (No)
Comments _____

H. ARTEP Derivative? (Yes) (No)
Comments _____

I. SQT Candidate? (Yes) (No)
Comments _____

J. MQS Candidate? (Yes) (No)
Comments _____

K. Common Task? (Yes) (No) Proponent _____

L. Shared Task? (Yes) (No) Proponent _____

2. Task Usage

A. Active

B. Reser
N
R

Comments

C. Mobili

Comments

5. Survey Data

A. AOSP.

B. Field In

C. Miscell

6. References:

A. Used in

B. Require

7. Job Aid Recommended? (Yes) (No)
Comments _____

8. Hazard Potential:

A. Training: _____

B. Job Performance: _____

9. Safety Certification Requirements:

_____

10. Current Tra
type device

11. Instructional Site Recommendation:

A. Analyst's Recommendation: ☐ Job ☐ Institution ☐ Unknown

B. Site Selection Board: ☐ Job ☐ Institution ☐ Unknown

C. Final Recommendation: ☐ Job ☐ Institution/Form

ALYSIS WORKSHEET

2

g 351-4)

2. Task Usage:

☐ A. Active Component

☐ B. Reserve Component
☐ NG
☐ Reserve

Comments _____

☐ C. Mobilization

Comments _____

3. Type Analysis: ☐ New ☐ Revision

If Revision, Why? _____

4. Admin Data:

A. Date Initiated _____

B. Completion Date _____

C. Analyst's Name _____
Rank _____ Specialty _____
Office File Symbol _____
Telephone Number _____

D. Interschool Coordinate Comments _____

5. Survey Data/Field Feedback:

A. AOSP. Date Inventory Submitted to MODD _____
MODD Coordination Comments _____

Date Report Received _____

B. Field/In-House. Coordination Comments _____

C. Miscellaneous Feedback and Sources. Comments _____

. References:

A. Used in Analysis _____

B. Required to Accomplish Task _____

. Current Training Materials Identified and Those Affected by Job/Task Revision (to include title, media, number, type devices or aids, etc.).

12. Equipment Used with/to Perform Task:

13.

14. Task Selection Data (Fill in only those used):

A. 8/4 Factor Data:

(1) Percent Performing _____

(2) Time between Training and Task Performance _____

(3) Frequency of Performance _____

(4) Time Spent Performing Task _____

(5) Consequences of Inadequate Performance

_____

(6) Probability of Inadequate Performance

_____

(7) Task Delay Tolerance _____

(8) Task Difficulty _____

B. Training Emphasis Data:

_____

C. DIF Data:

_____

_____

D. Peacetime/Wartime Data:

_____

_____

E. Other:

_____

_____

15. Miscellaneous Data/Comments:

3

13. Enabling Skills and Knowledges Required (Functional or Specific) for Task (Attach additional sheet, if required).

A. Baseline Entry Level:

B. Skill Hierarchy:

4

16. Performance Elements/Steps: (Diagrams, if desired/required, should be attached, as applicable).	17. Cues:	18. Conditions:

8-31

2

	19. Standards:	20. Skills/Knowledges:

SOFT SKILL ANALYSIS



CHAPTER 9

TRADOC PAM 351-4(T)

CHAPTER 9

SOFT SKILL ANALYSIS

To Be Published

COLLECTIVE/ INDIVIDUAL ANALYSIS INTERFACE



CHAPTER 10

TRADOC PAM 351-4(T

CHAPTER 10

COLLECTIVE/INDIVIDUAL ANALYSIS INTERFACE

To Be Published

LCSMM/ TD INTERFACE



CHAPTER 11

TRADOC PAM 351-4(T)

CHAPTER 11

LIFE CYCLE SYSTEMS MANAGEMENT MODEL/ TRAINING DEVELOPMENTS INTERFACE

To Be Published

APPENDICES



TRADOC PAM 351-4(T)

PREFACE TO APPENDICES

The systems approach to training development requires that many activities occur in both a simultaneous and/or sequential fashion. The front end analysis activities certainly form the basis for all subsequent training development activities. This handbook has described the major elements of job and task analysis. There are several related activities (Site Selection, Job Performance Measures, Learning Hierarchies and Job Performance Aids) that because they occur simultaneous to analysis have been associated with it. These activities may not be the direct responsibility of analysts, but because they are important and not adequately addressed elsewhere, a brief synopsis of the key point of each is provided to integrate these activities into the total systems process.

APPENDIX A

8/4 FACTOR MODELS

A-1. Purpose. The eight and four factor models are derived from an analysis of relevant factors that might influence the performance or training of a task. When systematically selecting tasks for training, there must be a basis for selections. You need some important facts to make the selection decisions. You would not choose to train a task that was not critical to the mission, was not difficult to learn, that was performed by only a small percentage of job incumbents, and was rarely performed at all. However, you could not know these facts if you failed to select meaningful criteria, or obtain responses from job incumbents and others as to what degree each task met your selected criteria. The descriptions of each factor and examples have been extracted from TRADOC Pam 350-30. It is important to note that several of the eight factors have direct application during the design phase of training development, and may be collected for that purpose as opposed to a factor used in a task selection plan.

A-2. Percent performing.

a. The criterion, "percentage of job incumbents who perform the task" indicates the tasks that are most often performed on the job.

EXAMPLE

One task for a weather technician is "answer telephone inquiries about the weather." If you found that 96 percent of all weather technicians performed this task, the implications for training would be different than if you found that only 10 percent performed it.

b. In the above example, if only 10 percent of job incumbents perform a task, there is a strong probability that 90 percent of your training resources would be wasted if you trained all weather technicians to perform the task. To obtain data for determining the percentage of job incumbents performing each task, simply ask on the questionnaire, "Do you perform this task?" Or calculate the percentage performing from answers to other related questions. If, for example, in collecting "frequency of task performance" data one of the possible responses is "never" or "do not perform," you will have the basic data for determining the percent performing.

A-3. Percent of time spent performing.

a. The percent of time spent performing a task is a criterion suggesting that training be provided to assist job incumbents in efficiently performing their most time consuming tasks.

EXAMPLE

> In the Protective Equipment/Pressure Suit Specialty, 6.67 percent of average time of all members is spent performing the task of "maintain rigid survival kits." Only 0.16 percent of average time is spent on the task of "install microphones in oxygen masks." If more effective training could increase productivity 50 percent in the first task, 3.33 percent of the total time of all members might be saved. This would be a significant savings. However, if productivity were increased 50 percent for the second task, only 0.08 percent of the total time would be saved. This represents a much smaller savings opportunity.

b. To obtain data for determining the percentage of time spent performing the tasks in a specialty, inputs are required from a large number of job incumbents. Usually they are not asked to state the percentage of their time spent on each task because such a question would be very difficult to answer. Instead, they are usually asked to rate each task as to the amount of time spent performing it as compared to their other tasks.

EXAMPLE

> You are to rate the relative amount of time you spend performing each task in your present job. Relative time spent means the total time you spend doing the task compared with the time you spend on each of the other tasks in your present job.
>
> Use a rating of "1" if you spend a "very much below average" amount of time on a task.
>
> Use a rating of "2" for "below average time."
>
> Use a rating of "3" for "slightly below average time."
>
> Use a rating of "4" for "about average time."
>
> Use a rating of "5" for "slightly above average time."
>
> Use a rating of "6" for "above average time."
>
> Use a rating of "7" for "very much above average time."

From the above information, a computer program such as MILPERCEN's Comprehensive Occupational Data Analysis Program (CODAP) can compute and print out the average percent of time spent by members of the specialty who perform the task, and the average percent of time spent by all members of the specialty.

A-4. Consequences of inadequate performance.

a. The criterion of consequences of inadequate performance points to the need for selecting tasks for training that are essential to job performance, when needed, even if they are seldom performed. The consequences of inadequate performance on certain tasks could result in injury to personnel, loss of life, or damage to equipment. Inadequate performance could have a serious impact on the mission, the operation, the product, the equipment, or the operator.

EXAMPLES

(1) More and more electronic equipment is being transistorized and is therefore less subject to malfunction. This fact should reduce the amount of maintenance training that an operator requires. However, there may be a number of malfunctions that, although occurring very infrequently, would be extremely critical if immediate corrective action were not taken by the operator. Severe damage to the equipment, materials, or products might result. Under such circumstances, the criticality of the infrequently used tasks is so great that it must be considered in choosing tasks for training.

(2) The probable consequences of inadequate performance of such combat tasks as "identify enemy aircraft" could be loss of life and equipment.

(3) The probable consequence of inadequate performance of the task of "write trip report" is negligible. If this task were selected for training, it would be on the basis of factors other than probable consequences of inadequate performance.

b. To obtain data on this criterion, individuals familiar with the job are asked to rate probable consequences of inadequate performance of each task according to all or a subset of such categories as those listed below.

(1) Extremely low if performed inadequately, consequences are negligible.

(2) Low.

(3) Somewhat below average.

(4) Average.

(5) Somewhat above average.

(6) High.

(7) Extremely high inadequate performance may result in mission failure, injury, death, or damage to important equipment.

A-5. Task delay tolerance.

a. The delay tolerance of a task is a measure of how much delay can be tolerated between the time the need for task performance becomes evident and the time the actual performance begins. There are some tasks normally encountered by job incumbents in which no delay can ever be tolerated between the time the need for task performance becomes evident and the time the actual performance must begin. The job incumbent who encounters the task must be capable of doing it, then and there, without needing to read task procedures, or find someone to advise him or take over completely. For other tasks, a delay of a few minutes or perhaps half an hour might be quite acceptable, or even mandatory, while the job incumbent gets advice, checks technical orders, regulations, etc. And for some tasks, there might be time to assemble a group of experts to confer before proceeding. The delay tolerance of a task is a measure of how much delay can be tolerated between the time the need for task performance becomes evident and the time the actual performance begins. The following are examples of low delay tolerance tasks requiring immediate performance:

EXAMPLES

1. Use artificial respiration to restore the breathing of an accident victim.

2. Pull ripcord of emergency parachute if main parachute fails.

3. Warn suspect of his legal rights before questioning.

4. Film historic occasion for official records.

5. Extinguish fire in aircraft engine during startup on flight line.

b. Tasks determined to have a low delay tolerance should be given relatively high priority for selection for training. Examples of tasks having a higher delay tolerance, thereby permitting performance delay, would include:

EXAMPLES

1. Review books for unit library.

2. Refill fire extinguisher after use.

3. Advise major command of unit manning problem.

4. Fit microphones in aircrew oxygen masks.

c. A high delay tolerance does not exclude a task from training, but indicates that other factors will be more of a basis for acceptance or rejection. To obtain data on this criterion, individuals who are familiar with the job are asked to rate the amount of delay that can be tolerated before task performance begins, according to all or a subset of such categories as those listed below.

(1) Extremely low - performance can be put off indefinitely: almost never urgent.

(2) Low.

(3) Somewhat below average.

(4) Average.

(5) Somewhat above average.

(6) High.

(7) Extremely high task performance must begin instantly.

A-6. Frequency of performance.

a. While the probable consequences of inadequate performance of a particular task are serious and the task delay tolerance is low, the task might still rate low for training priority if it is rarely performed.

EXAMPLE

For a medical corpsman, the task of "deliver baby" is so rarely performed that it probably would not be trained in spite of the serious consequences of inadequate performance and the relatively low task delay tolerance.

b. On the other hand, if a task is performed frequently, the pay-off in terms of return on training dollars expended is likely to be great particularly if there is a known "best way" to perform the task. A practical way to collect frequency of performance data on tasks is to rate their frequency of performance on a scale such as the following:

(1) Never perform.

(2) Less than once per month.

(3) At least monthly, but less than twice per week.

(4) Twice per week or more.

A-7. Task learning difficulty.

a. The learning difficulty of a task refers to the time, effort, and assistance required to achieve performance proficiency. Some tasks encountered in each specialty are so easy or so familiar that they can be readily "picked up" on the job without formal training. At the other extreme, some tasks are so complicated that a job incumbent can perform them adequately only after lengthy, formal training. Other tasks lie somewhere between these extremes and require different levels of training. Tasks easy enough to be "picked up" on the job without training might be:

EXAMPLES

(1.) Sweep floors.

(2.) Collect food trays from patients in hospital wards.

(3.) Distribute unclassified correspondence in an office.

Tasks requiring lengthy, formal training might be:

EXAMPLES

(1.) Diagnose malfunction in an airborne radar weapons system.

(2.) Defuse unexploded enemy bombs.

(3.) Identify parasites in clinical specimens.

b. To obtain data on the factor of task learning difficulty, job incumbents or others might be asked to rate tasks they perform as to the training time required to achieve proficiency, or as to the difficulty of "picking up" the task on the job without formal training. The following rating scale might be used:

(1) Extremely low - extremely easy to "pick up" without systematic training.

(2) Low.

(3) Somewhat below average.

(4) Average.

(5) Somewhat above average.

(6) High.

(7) Extremely high - extremely difficult to learn without systematic training.

A-8. Probability of deficient performance.

a. The criterion of probability of deficient performance insures that training is given in those essential job skills in which job incumbents frequently perform poorly. In any job, some tasks are more difficult to accomplish (or easier to bungle) than others. By tabulating the judgments of knowledgeable personnel regarding the probability of deficient performance, a list of these poorly performed tasks can be produced. Training of these tasks, regardless of their criticality, must be given serious consideration.

EXAMPLES

1. If equipment downtime is often caused by faulty soldering, this skill may require additional emphasis in a list of tasks selected for training of repairmen.

2. If widespread theft of items guarded by military police is a problem, the tasks of "guard packages, materials, and property" and "prepare physical security plans" may require additional emphasis.

b. To obtain data on the criterion of probability of deficient performance, supervisors of job incumbents might be asked to rate each task as to how often, according to the scale below, subordinates in the DOS perform the task in an unacceptable manner:

(1) Rarely if ever.

(2) Less often than other tasks.

(3) About as often as other tasks.

(4) More often than other tasks.

(5) Very often.

A-9. Immediacy of performance or time between job entry and task performance.

a. The criterion of the time interval between completion of training and performance of the task on the job has some significance in selecting tasks for training. Here, the determining factors are:

(1) Whether or not there is a high probability of the graduate encountering the task on the job fairly soon after completing training. "Fairly soon" means, in this context, that tasks encountered within the first year after training would, everything else being equal, be weighed more heavily for selection than those not encountered until one to two years later.

(2) The predicted or measured amount of decay of the skill that will take place during the time interval.

EXAMPLE

The ability to send and receive Morse Code is a relatively difficult skill to acquire. If the skill is not used, a considerable amount of decay is certain to occur. If the skill is only rarely needed by personnel, it may be wise to exclude the task in the training given to all trainees. However, if the skill is likely to be used immediately after graduation by most graduates, it probably should be included in the training for all trainees.

b. To obtain data on this criterion job incumbents and others might be asked to rate the time between job entry and task performance on a scale such as the following:

(1) Task not yet performed.

(2) Task first performed more than 4 years after assignment.

(3) Task first performed between 2 and 4 years after assignment.

(4) Task first performed between 1 and 2 years after assignment.

(5) Task first performed between 6 months and 1 year after assignment.

(6) Task first performed between 3 months and 6 months after assignment.

(7) Task performed during first 3 months of assignment.

A-10. Procedure. Because of the comprehensiveness and complexity of the factors, it is not easy to just combine all factors and pick the most important tasks. In fact the combination of all eight values is not recommended. For this reason the four factor model emerged, as being the four most important factors. Still the combination of different factors is difficult. One strategy involves the command designating the most important factor(s). Then an arbitrary value is specified as a cut point. If a task is above that cut point, it is selected for training, below it--rejected. Then the factors can be combined, with respective cut scores indicating the most important tasks.

EXAMPLE

For combat tasks, the factor of Consequences of Inadequate Performance may be important. Thus any task over 6.0 (serious) would be selected. Perhaps the commander might also feel that a large percentage of performers indicates a task should be trained. Thus only tasks with over 50% of the incumbents performing would be selected. Combining these two cut scores would mean that all tasks performed by 50% of the soldiers and scoring 6.0 or higher on Consequences of Inadequate Performance would be selected for training. In this way, the commander can influence what are the important factors for selecting tasks. (Note that the establishment of the cut point is arbitrary and as the number of significant factors increases, the model becomes more difficult to manage).

A-11. Conclusion. The eight factor model is the most comprehensive task selection model. Yet its comprehensiveness is its shortfall. Combining the factors is difficult and awkward. It is important to note that the data collected as part of this model may be very valuable to the designer of training products or lessons that this data should be made available and even provided to the designers.

A-12. Example of 8 factor task selection model.

a. The following example has been developed to demonstrate how the 8 factor model could be utilized in the task selection for training process. The sample 5 tasks are tasks that could be derived from a 95B10 military policeman task inventory. Recognize that the total inventory of tasks for 95B10 could be 500 different tasks and the task selection board would have to select the subset of these tasks that will be formally trained. The five tasks listed were just "pulled" out of the inventory to provide a manageable example (fig A-1).

#	TASK	Percent Performing	Percent Time Spent Performing	Consequence of Inadequate Performance (1=low, 7=high)	Task Delay Tolerance (1=low, 7=high	Frequency of Performance (1=low, 7=high)	Task Learning Difficulty (1=low, 7=high)	Probability of Deficient Performance (1=low, 7=high	Immediacy of Performance (1=low, 7=high
1	Employ unarmed defense techniques	40.0	2.0	6.2	1.0	2.0	5.3	2.0	2.0
2	Search PW/CI	6.0	1.0	5.7	2.0	1.0	2.0	1.4	0.3
3	Employ riot control agents	30.0	1.0	3.4	4.0	1.0	2.5	1.6	1.2
4	Protect a crime scene	90.0	5.0	6.4	1.0	4.0	3.5	3.0	3.5
5	Warn suspects of their rights	100.0	5.0	6.7	1.0	5.0	1.5	1.0	6.0

Figure A-1. 8 Factor model

b. Using the fabricated data that has been placed in each block, it is obvious that using the 8 factor model without some command guidance is impossible. Someone must specify which of the 8 factors are most important. Assuming that the commandant of the MP school has stated that the factors that he feels are most important are: percent performing, consequences of inadequate performance, and task delay tolerance, and that task learning difficulty and immediacy are less important, then the task selection board can use this data. Establishing cut scores is arbitrary, for these factors the following cut scores were stated:

Percent Performing - 40%
Consequences of Inadequate Performance - 5
Task Delay Tolerance - 3
Task Learning Difficulty - 4
Immediacy - 5

c. Using the 3 primary factors specified by the Commandant, and the respective cut scores established (note that Task Delay Tolerance is an inverted scale, with low being most important) the following tasks met each criteria: Tasks #1, 4, 5 (fig A-2).

	TASK	Percent Performing	Percent Time Spent Performing	Consequence of Inadequate Performance (1=low, 7=high)	Task Delay Tolerance (1=low, 7=high)	Frequency of Performance (1=low, 7=high)	Task Learning Difficulty (1=low, 7=high)	Probability of Inefficient Performance (1=low, 7=high)	Immediacy of Performance (1=low, 7=high)
1	Employ unarmed defense techniques	40.0	2.0	6.2	1.0	2.0	5.3	2.0	2.0
2	Search PW/CI	6.0	1.0	5.7	2.0	1.0	2.0	1.4	0.3
3	Employ riot control agents	30.0	1.0	3.4	4.0	1.0	2.5	1.6	1.2
4	Protect a crime scene	90.0	5.0	6.4	1.0	4.0	3.5	3.0	3.5
5	Warn suspects of their rights	100.0	5.0	6.7	1.0	5.0	1.5	1.0	6.0

Figure A-2. 8 Factor model

In this way the commandant has directly influenced the tasks that are selected for training, yet data has been collected on a variety of factors and will be available throughout subsequent design efforts.

APPENDIX B

JOB AND TASK ANAL

(TRADOC Reg 351-4)

Task Number:

Task Title:

1. Task Data:

A. Title: _____

_____

B. Number: _____

C. Condition: _____

_____

_____

D. Standard: _____

_____

_____

E. Job Title: _____

F. Supervisory Job? (Yes) (No)

G. Supervision Required to Perform this Task? (Yes) (No)
Comments _____

H. ARTEP Derivative? (Yes) (No)
Comments _____

I. SQT Candidate? (Yes) (No)
Comments _____

J. MQS Candidate? (Yes) (No)
Comments _____

K. Common Task? (Yes) (No) Proponent _____

L. Shared Task? (Yes) (No) Proponent _____

7. Job Aid Recommended? (Yes) (No)
Comments _____

8. Hazard Potential:

A. Training: _____

B. Job Performance: _____

9. Safety Certification Requirements:

_____

11. Instructional Site Recommendation:

A. Analyst's Recommendation: ☐ Job ☐ Institution ☐ Unknown

B. Site Selection Board: ☐ Job ☐ Institution ☐ Unknown

2. Task

☐ A.

☐ B.

Con

☐ C.

Con

5. Surve

A. A

B. F

C. M

6. Refe

A. U

B. F

10. Curr
type

IX B

ALYSIS WORKSHEET

2

eg 351-4)

2. Task Usage:

- ☐ A. Active Component
- ☐ B. Reserve Component
  - ☐ NG
  - ☐ Reserve

Comments _____

- ☐ C. Mobilization

Comments _____

3. Type Analysis: ☐ New ☐ Revision

If Revision, Why? _____

4. Admin Data:

A. Date Initiated _____

B. Completion Date _____

C. Analyst's Name _____
Rank _____ Specialty _____
Office File Symbol _____
Telephone Number _____

D. Interschool Coordinate Comments _____

5. Survey Data/Field Feedback:

A. AOSP. Date Inventory Submitted to MODD _____
MODD Coordination Comments _____

Date Report Received _____

B. Field/In-House. Coordination Comments _____

C. Miscellaneous Feedback and Sources. Comments _____

6. References:

A. Used in Analysis _____

B. Required to Accomplish Task _____

. Current Training Materials Identified and Those Affected by Job/Task Revision (to include title, media, number, type devices or aids, etc.).

C. Final Recommendation: ☐ Job ☐ Institution (Form ____)

12. Equipment Used with/to Perform Task:

13.

14. Task Selection Data (Fill in only those used):

A. 8/4 Factor Data:

(1) Percent Performing _____

(2) Time between Training and Task Performance _____

(3) Frequency of Performance _____

(4) Time Spent Performing Task _____

(5) Consequences of Inadequate Performance

_____

(6) Probability of Inadequate Performance

_____

(7) Task Delay Tolerance _____

(8) Task Difficulty _____

B. Training Emphasis Data:

_____

C. DIF Data:

_____

_____

D. Peacetime/Wartime Data:

_____

_____

E. Other:

_____

_____

15. Miscellaneous Data/Comments:

3

ng Skills and Knowledges Required (Functional or Specific) for Task (Attach additional sheet, if required).

seline Entry Level:

ill Hierarchy:

4

16. Performance Elements/Steps: (Diagrams, if desired/required, should be attached, as applicable).	17. Cues:	18. Conditions:

	19. Standards:	20. Skills/Knowledges:

2

-2

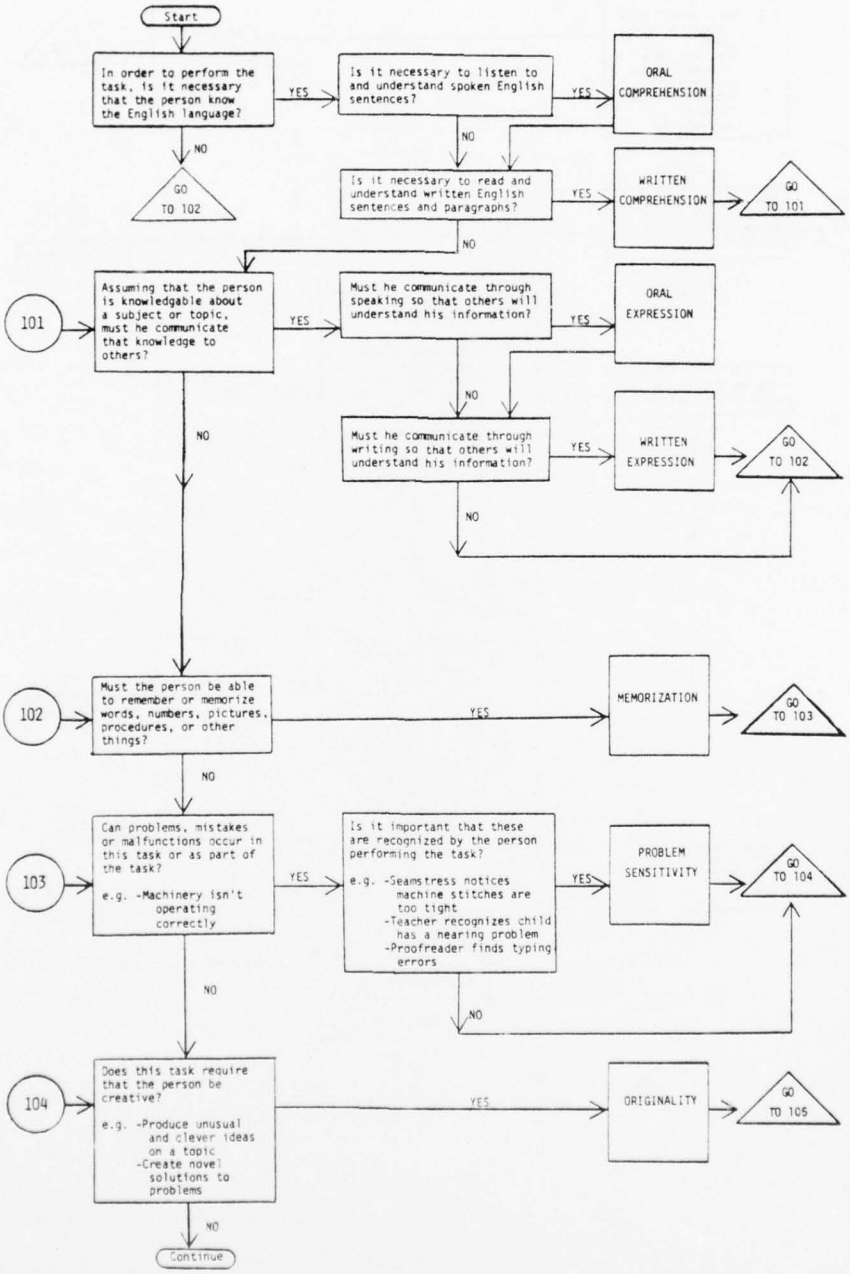
APPENDIX C

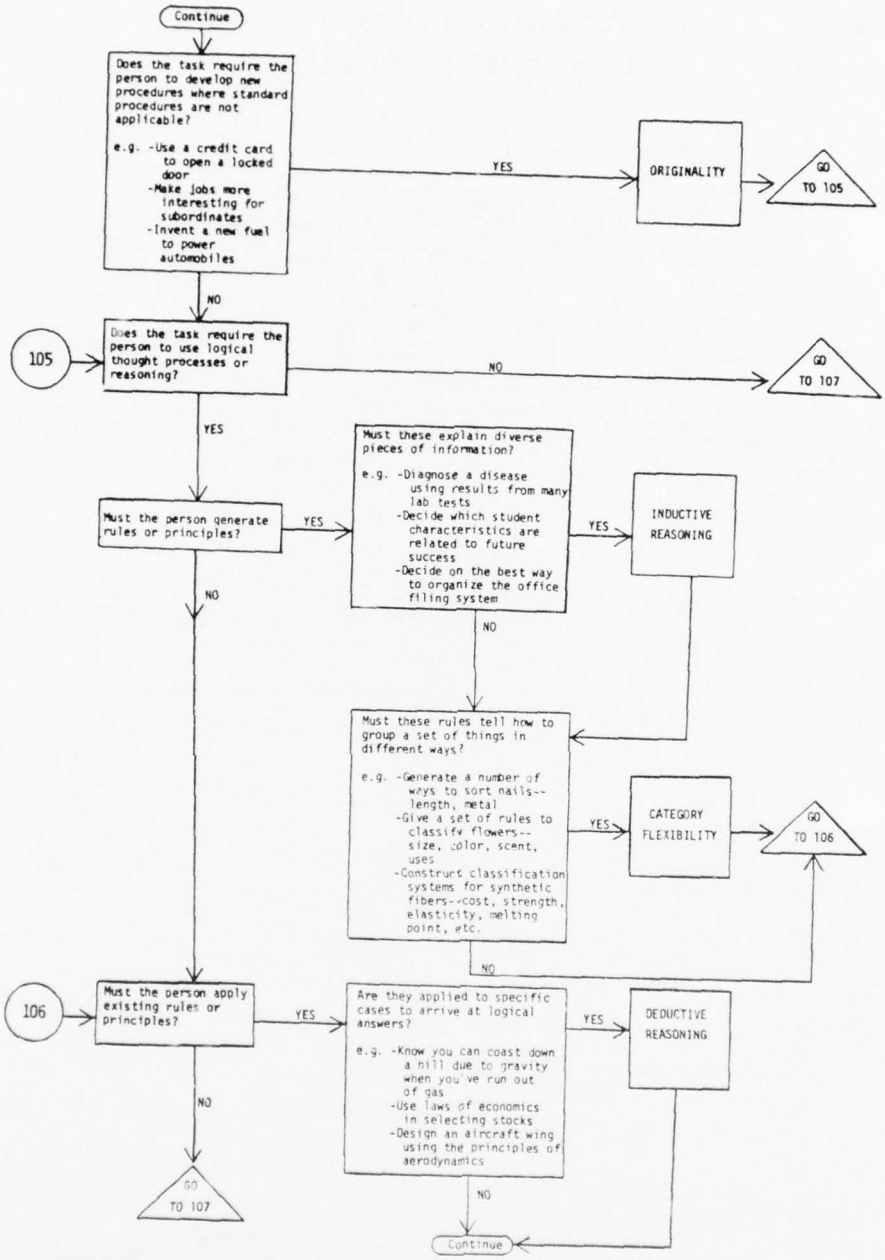
DATA SOURCE LIST

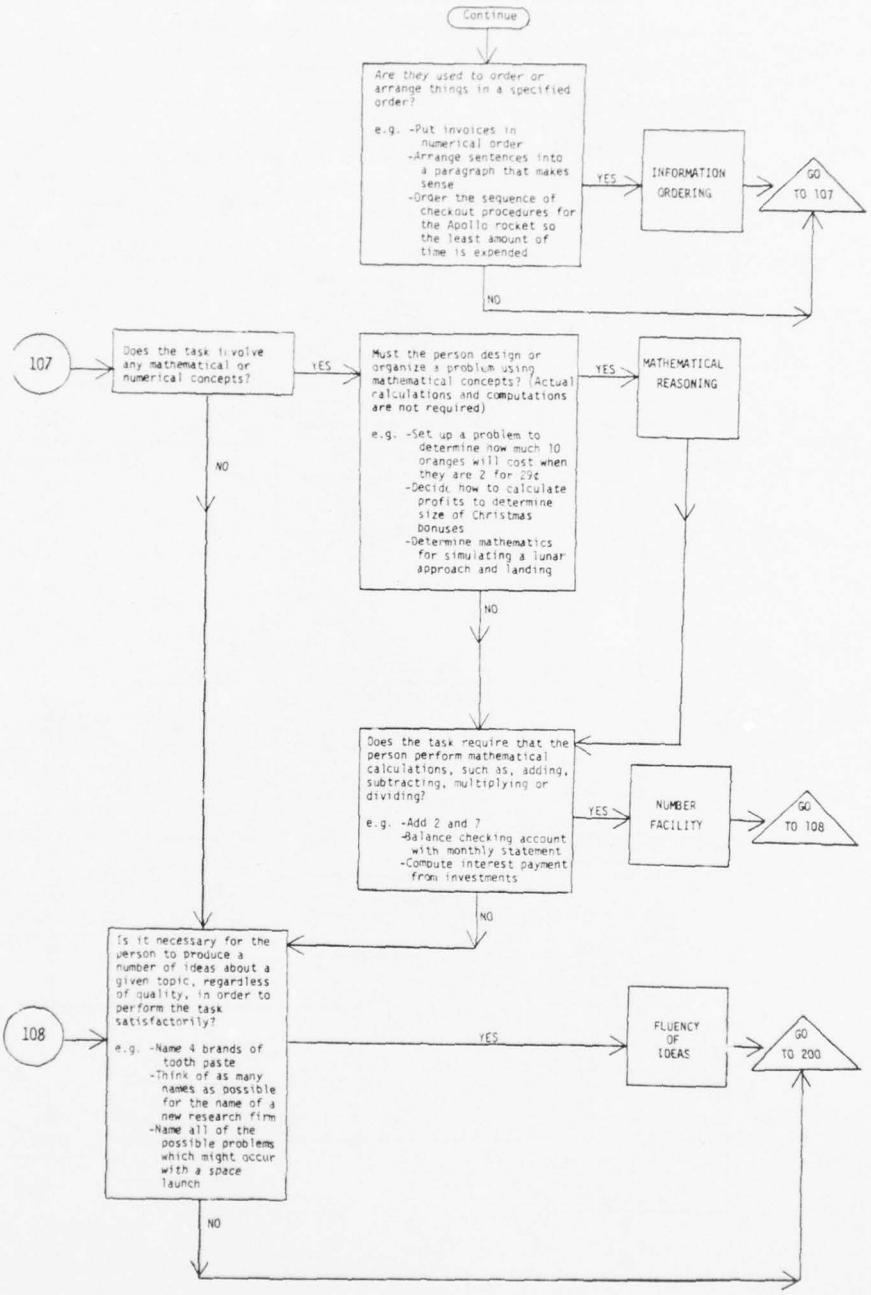
Data Requirement	Where Obtained
1. Job analysis	
Task inventory preparation	
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Job data	
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.	
Duty positions	AR 611-201 and CODAP survey
.	
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Target Population Data	
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.	
% soldiers in MOS by skill level with English as second language	survey of units Aug 79
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2. Task analysis	
Equipment on job	.
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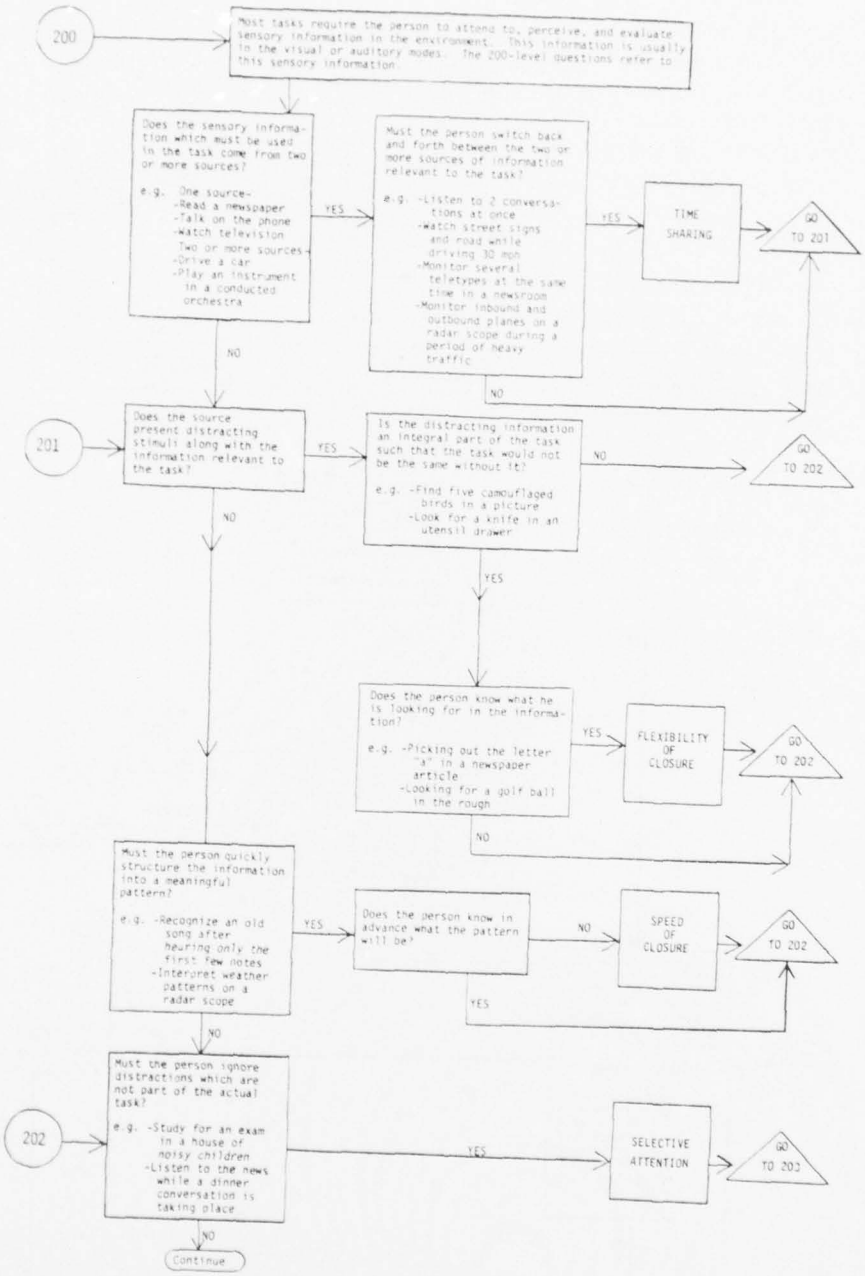
APPENDIX D

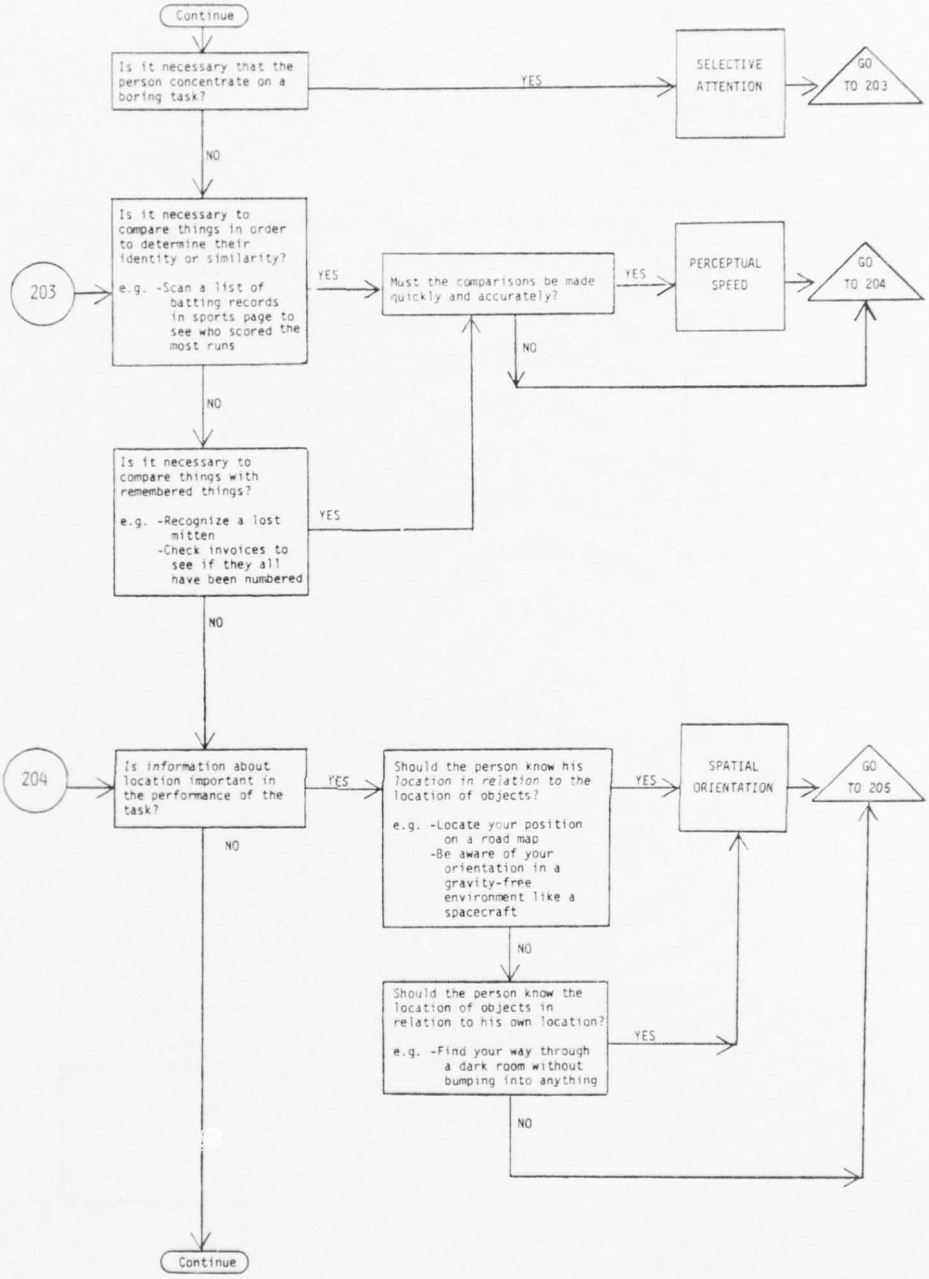
FLOWCHART FOR ASSESSING REQUIRED ABILITIES/SKILLS

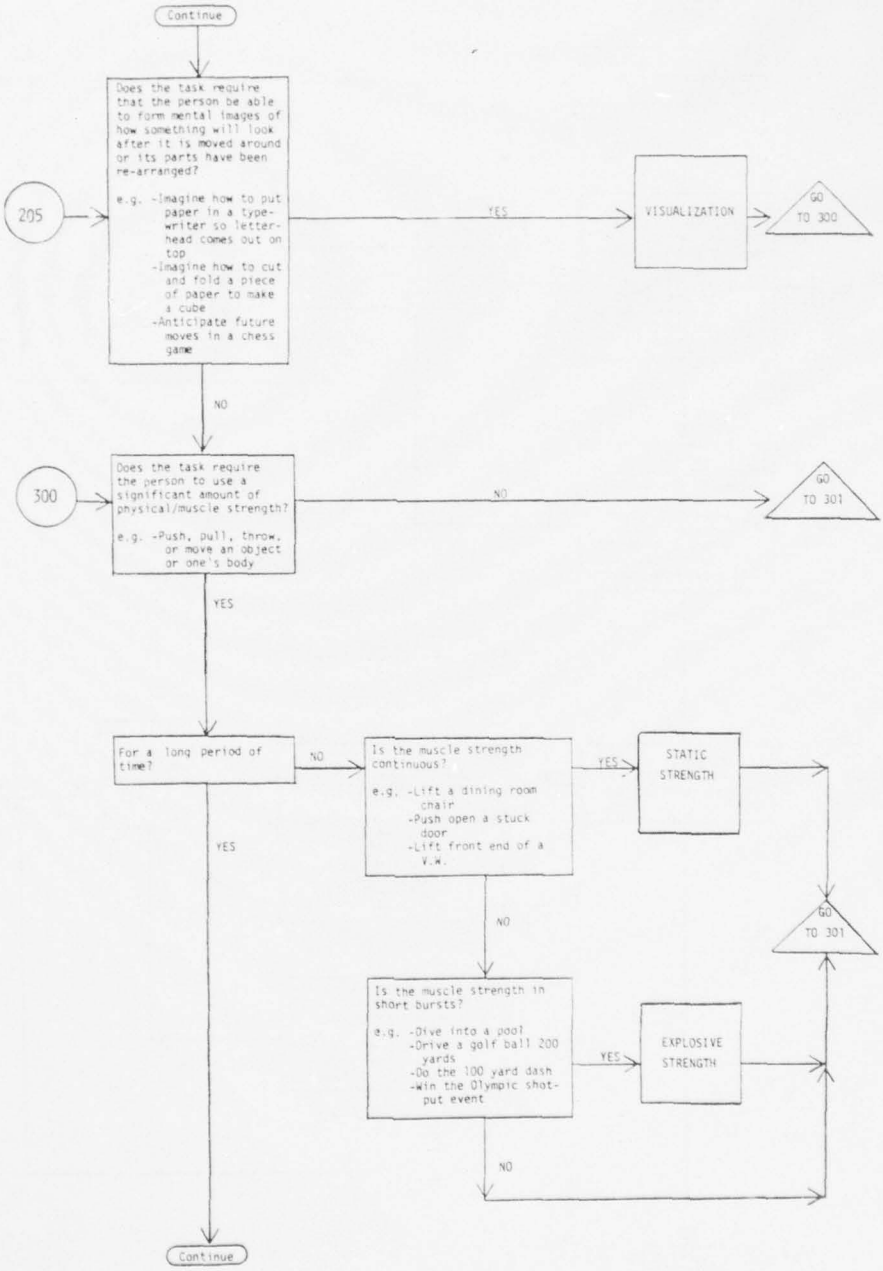



Continue
Does the task require the person to develop new procedures where standard procedures are not applicable?
e.g. -Use a credit card to open a locked door
-Make jobs more interesting for subordinates
-Invent a new fuel to power automobiles
YES
ORIGINALITY
GO TO 105
NO
105
Does the task require the person to use logical thought processes or reasoning?
NO
GO TO 107
YES
Must the person generate rules or principles?
YES
Must these explain diverse pieces of information?
e.g. -Diagnose a disease using results from many lab tests
-Decide which student characteristics are related to future success
-Decide on the best way to organize the office filing system
YES
INDUCTIVE REASONING
NO
NO
Must these rules tell how to group a set of things in different ways?
e.g. -Generate a number of ways to sort nails--length, metal
-Give a set of rules to classify flowers--size, color, scent, uses
-Construct classification systems for synthetic fibers--cost, strength, elasticity, melting point, etc.
YES
CATEGORY FLEXIBILITY
GO TO 106
NO
106
Must the person apply existing rules or principles?
YES
Are they applied to specific cases to arrive at logical answers?
e.g. -Know you can coast down a hill due to gravity when you've run out of gas
-Use laws of economics in selecting stocks
-Design an aircraft wing using the principles of aerodynamics
YES
DEDUCTIVE REASONING
NO
GO TO 107
NO
Continue


Continue
Are they used to order or arrange things in a specified order?
e.g. -Put invoices in numerical order
-Arrange sentences into a paragraph that makes sense
-Order the sequence of checkout procedures for the Apollo rocket so the least amount of time is expended
YES
INFORMATION ORDERING
GO TO 107
NO
107
Does the task involve any mathematical or numerical concepts?
YES
Must the person design or organize a problem using mathematical concepts? (Actual calculations and computations are not required)
e.g. -Set up a problem to determine how much 10 oranges will cost when they are 2 for 29¢
-Decide how to calculate profits to determine size of Christmas bonuses
-Determine mathematics for simulating a lunar approach and landing
YES
MATHEMATICAL REASONING
NO
Does the task require that the person perform mathematical calculations, such as, adding, subtracting, multiplying or dividing?
e.g. -Add 2 and 7
-Balance checking account with monthly statement
-Compute interest payment from investments
YES
NUMBER FACILITY
GO TO 108
NO
108
Is it necessary for the person to produce a number of ideas about a given topic, regardless of quality, in order to perform the task satisfactorily?
e.g. -Name 4 brands of tooth paste
-Think of as many names as possible for the name of a new research firm
-Name all of the possible problems which might occur with a space launch
YES
FLUENCY OF IDEAS
GO TO 200
NO


200
Most tasks require the person to attend to, perceive, and evaluate sensory information in the environment. This information is usually in the visual or auditory modes. The 200-level questions refer to this sensory information.
Does the sensory information which must be used in the task come from two or more sources?
e.g. One source-
-Read a newspaper
-Talk on the phone
-Watch television
Two or more sources-
-Drive a car
-Play an instrument in a conducted orchestra
YES
Must the person switch back and forth between the two or more sources of information relevant to the task?
e.g. -Listen to 2 conversations at once
-Watch street signs and road while driving 30 mph
-Monitor several teletypes at the same time in a newsroom
-Monitor inbound and outbound planes on a radar scope during a period of heavy traffic
YES
TIME SHARING
GO TO 201
NO
NO
201
Does the source present distracting stimuli along with the information relevant to the task?
YES
Is the distracting information an integral part of the task such that the task would not be the same without it?
e.g. -Find five camouflaged birds in a picture
-Look for a knife in an utensil drawer
NO
GO TO 202
NO
YES
Does the person know what he is looking for in the information?
e.g. -Picking out the letter "a" in a newspaper article
-Looking for a golf ball in the rough
YES
FLEXIBILITY OF CLOSURE
GO TO 202
NO
Must the person quickly structure the information into a meaningful pattern?
e.g. -Recognize an old song after hearing only the first few notes
-Interpret weather patterns on a radar scope
YES
Does the person know in advance what the pattern will be?
NO
SPEED OF CLOSURE
GO TO 202
YES
NO
202
Must the person ignore distractions which are not part of the actual task?
e.g. -Study for an exam in a house of noisy children
-Listen to the news while a dinner conversation is taking place
YES
SELECTIVE ATTENTION
GO TO 203
NO
Continue


Continue
Is it necessary that the person concentrate on a boring task?
YES
SELECTIVE ATTENTION
GO TO 203
NO
203
Is it necessary to compare things in order to determine their identity or similarity?
e.g. -Scan a list of batting records in sports page to see who scored the most runs
YES
Must the comparisons be made quickly and accurately?
YES
PERCEPTUAL SPEED
GO TO 204
NO
NO
Is it necessary to compare things with remembered things?
e.g. -Recognize a lost mitten
-Check invoices to see if they all have been numbered
YES
NO
204
Is information about location important in the performance of the task?
YES
Should the person know his location in relation to the location of objects?
e.g. -Locate your position on a road map
-Be aware of your orientation in a gravity-free environment like a spacecraft
YES
SPATIAL ORIENTATION
GO TO 205
NO
NO
Should the person know the location of objects in relation to his own location?
e.g. -Find your way through a dark room without bumping into anything
YES
NO
Continue

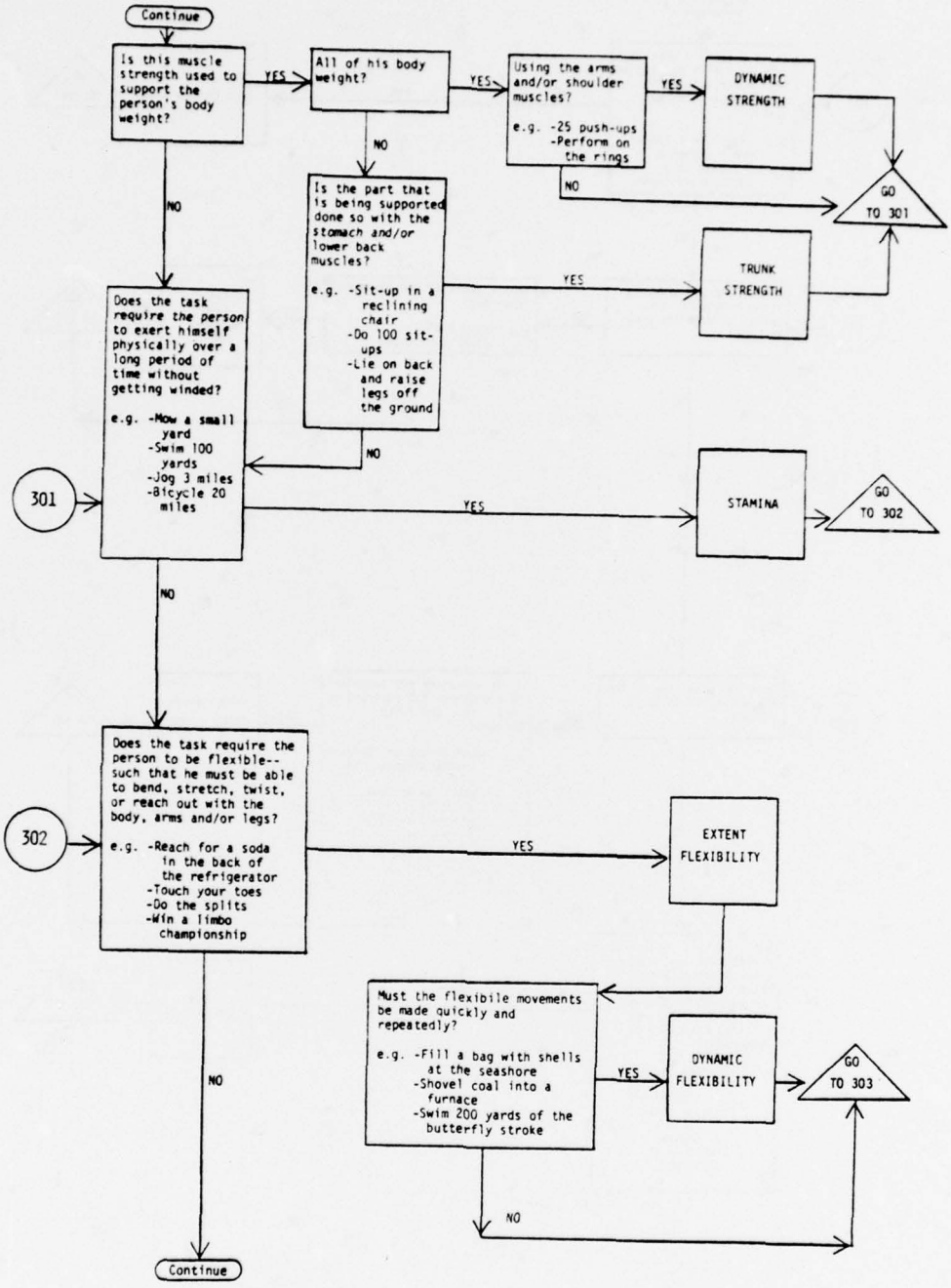

Continue
Does the task require that the person be able to form mental images of how something will look after it is moved around or its parts have been re-arranged?
e.g. -Imagine how to put paper in a typewriter so letterhead comes out on top
-Imagine how to cut and fold a piece of paper to make a cube
-Anticipate future moves in a chess game
205
YES
VISUALIZATION
GO TO 300
NO
Does the task require the person to use a significant amount of physical/muscle strength?
e.g. -Push, pull, throw, or move an object or one's body
300
NO
GO TO 301
YES
For a long period of time?
NO
Is the muscle strength continuous?
e.g. -Lift a dining room chair
-Push open a stuck door
-Lift front end of a V.W.
YES
STATIC STRENGTH
YES
NO
GO TO 301
Is the muscle strength in short bursts?
e.g. -Dive into a pool
-Drive a golf ball 200 yards
-Do the 100 yard dash
-Win the Olympic shot-put event
YES
EXPLOSIVE STRENGTH
NO
Continue

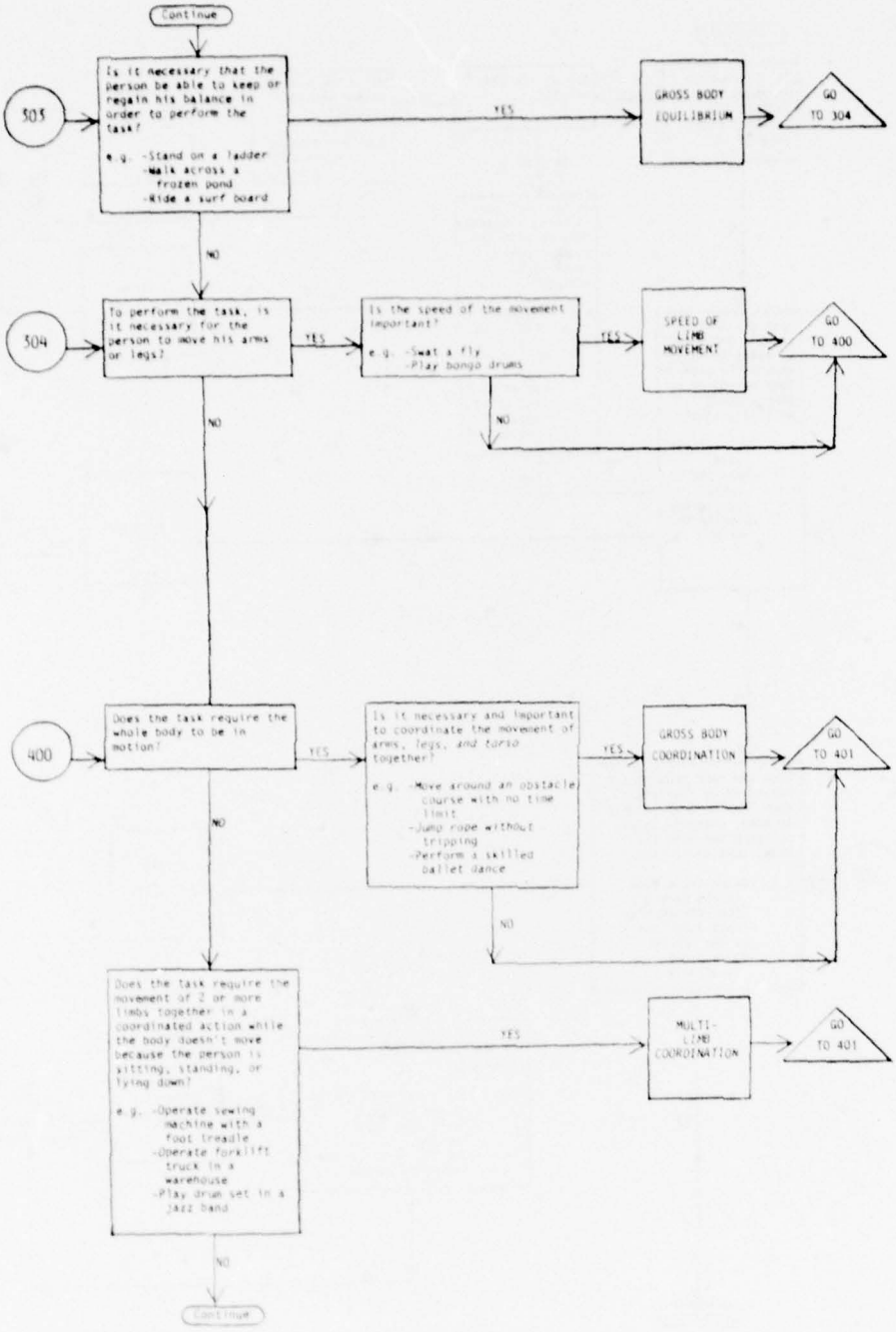
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JOB AND TASK ANALYSIS HANDBOOK.(U)
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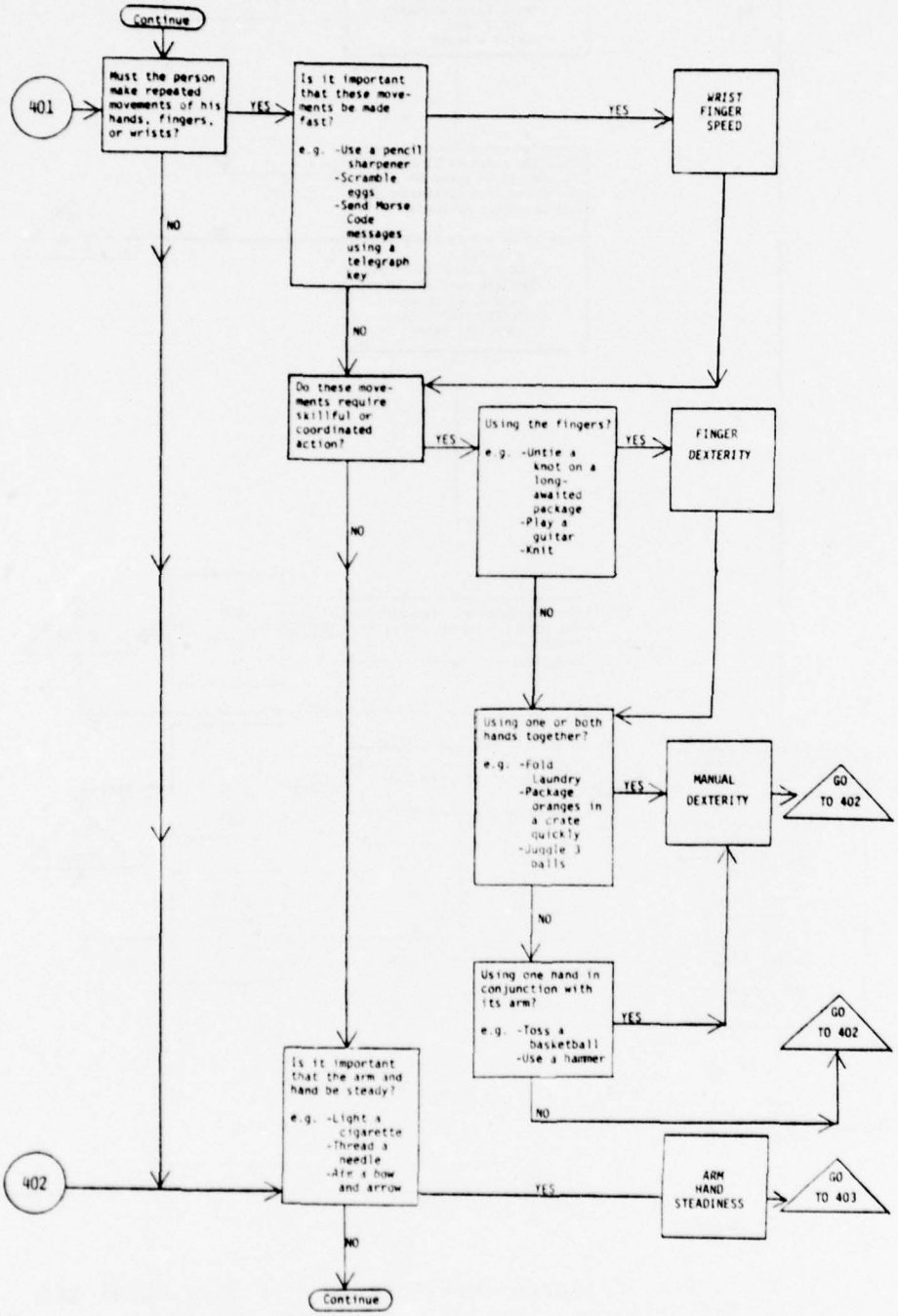
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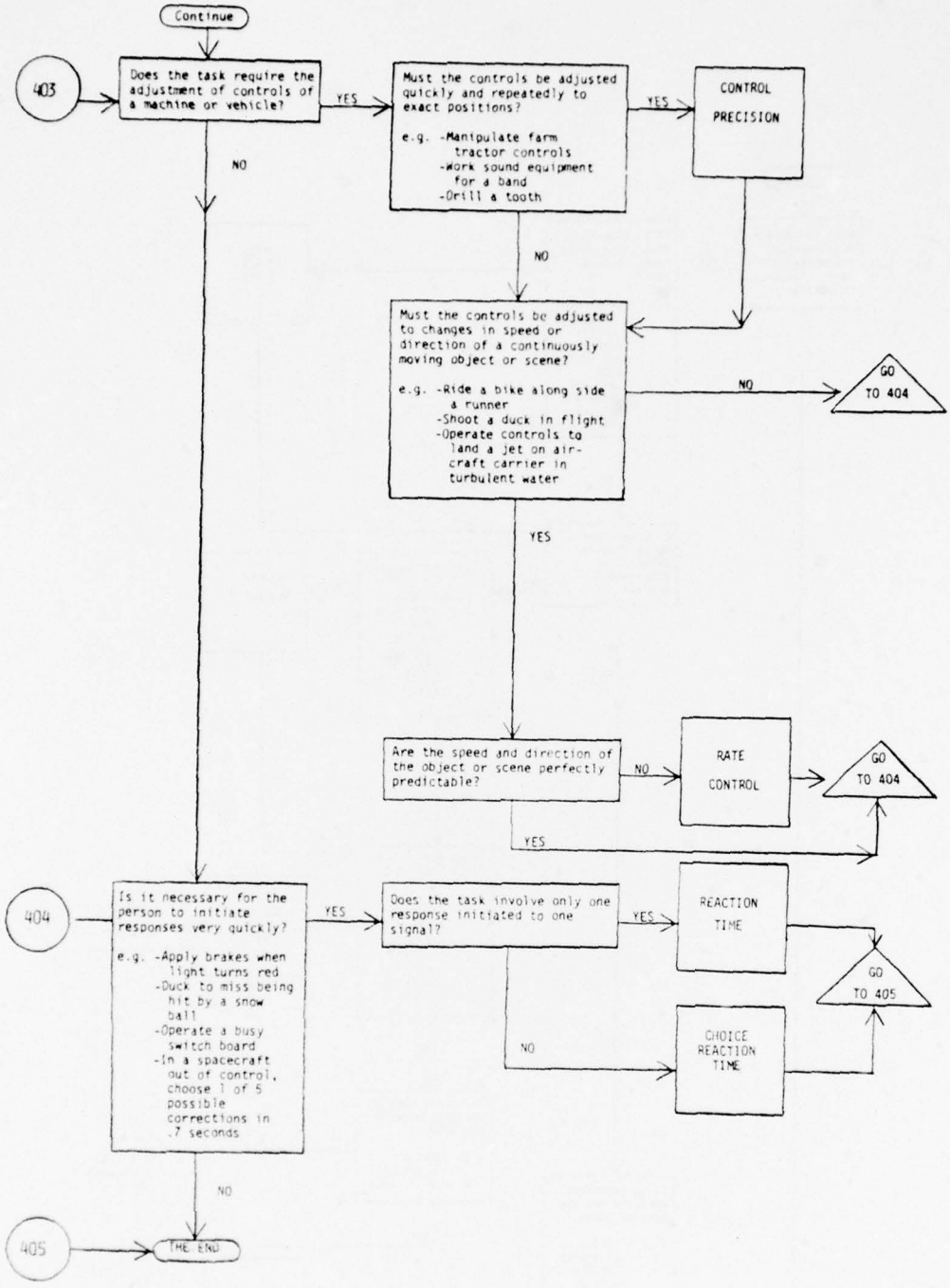


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Continue
Is this muscle strength used to support the person's body weight?
YES
All of his body weight?
YES
Using the arms and/or shoulder muscles?
e.g. -25 push-ups
-Perform on the rings
YES
DYNAMIC STRENGTH
NO
GO TO 301
NO
Is the part that is being supported done so with the stomach and/or lower back muscles?
e.g. -Sit-up in a reclining chair
-Do 100 sit-ups
-Lie on back and raise legs off the ground
YES
TRUNK STRENGTH
NO
Does the task require the person to exert himself physically over a long period of time without getting winded?
e.g. -Mow a small yard
-Swim 100 yards
-Jog 3 miles
-Bicycle 20 miles
301
YES
STAMINA
GO TO 302
NO
Does the task require the person to be flexible--such that he must be able to bend, stretch, twist, or reach out with the body, arms and/or legs?
e.g. -Reach for a soda in the back of the refrigerator
-Touch your toes
-Do the splits
-Win a limbo championship
302
YES
EXTENT FLEXIBILITY
Must the flexibile movements be made quickly and repeatedly?
e.g. -Fill a bag with shells at the seashore
-Shovel coal into a furnace
-Swim 200 yards of the butterfly stroke
YES
DYNAMIC FLEXIBILITY
GO TO 303
NO
NO
Continue


Continue
305
Is it necessary that the person be able to keep or regain his balance in order to perform the task?
e.g. -Stand on a ladder
-Walk across a frozen pond
-Ride a surf board
YES
GROSS BODY EQUILIBRIUM
GO TO 304
NO
304
To perform the task, is it necessary for the person to move his arms or legs?
YES
Is the speed of the movement important?
e.g. -Swat a fly
-Play bongo drums
YES
SPEED OF LIMB MOVEMENT
GO TO 400
NO
NO
400
Does the task require the whole body to be in motion?
YES
Is it necessary and important to coordinate the movement of arms, legs, and torso together?
e.g. -Move around an obstacle course with no time limit
-Jump rope without tripping
-Perform a skilled ballet dance
YES
GROSS BODY COORDINATION
GO TO 401
NO
NO
Does the task require the movement of 2 or more limbs together in a coordinated action while the body doesn't move because the person is sitting, standing, or lying down?
e.g. -Operate sewing machine with a foot treadle
-Operate forklift truck in a warehouse
-Play drum set in a jazz band
YES
MULTI-LIMB COORDINATION
GO TO 401
NO
Continue


Continue
401
Must the person make repeated movements of his hands, fingers, or wrists?
YES
Is it important that these movements be made fast?
e.g. -Use a pencil sharpener
-Scramble eggs
-Send Morse Code messages using a telegraph key
YES
WRIST FINGER SPEED
NO
Do these movements require skillful or coordinated action?
YES
Using the fingers?
e.g. -Untie a knot on a long-awaited package
-Play a guitar
-Knit
YES
FINGER DEXTERITY
NO
Using one or both hands together?
e.g. -Fold Laundry
-Package oranges in a crate quickly
-Juggle 3 balls
YES
MANUAL DEXTERITY
GO TO 402
NO
Using one hand in conjunction with its arm?
e.g. -Toss a basketball
-Use a hammer
YES
GO TO 402
NO
Is it important that the arm and hand be steady?
e.g. -Light a cigarette
-Thread a needle
-Aim a bow and arrow
402
YES
ARM HAND STEADINESS
GO TO 403
NO
Continue



Source:

U. S. Army Research Institute for the Behavioral and Social Sciences. Prototype Handbook for the Human Resources Test and Evaluation System (HRTES), Working Draft, November 1978.

APPENDIX E

INITIAL TRAINING SITE RECOMMENDATION

E-1. Purpose. The Army has the option of training soldiers before they are sent to the unit, while in the unit, or choosing to not train on a given set of tasks. Most MOS have several different duty positions within each skill level and require different skills, knowledges, and abilities. Due to the size of the Army and the nature of the system, it is presently not possible to predict while in training which of these specific duty positions the soldier will occupy after training. The service school must identify where every task selected for training in an MOS will be trained. This training development decision requires extensive management input. It is an evolutionary process that begins with a suggestion from the analyst, progresses to a Site Selection Board that recommends a training site, and ends with the designer refining and selecting the actual training site. The process to be proposed in this pamphlet is designed to be simple, yet provide a reasonable estimate of where to train a given set of tasks. It is not directive in nature, rather it is suggested as a quality control measure for this management decision.

E-2. Background.

a. The procedure in determining where a task is trained, does not begin with the task, but with the officer or enlisted specialty. The systems approach to training is derived from its orientation towards the job. If in the decision of where to train a task, the orientation is down to the task, then the value of that decision is highly suspect.

b. The analyst develops an opinion about the specialty and how it should be trained. Although this opinion may not be empirically derived it should be made a matter of record. This initial recommendation is derived from a gut feeling about the job that normally develops during analysis. It should be provided to the Site-Selection Board (as noted on the task analysis worksheet) for each task that the analyst desires to make a site recommendation on. This handbook defines the role of the job analyst and/or task analyst in terms of the data to be collected. The analyst is the collector of this information, rather than the user. For this reason, the first formal recommendation of where a task should be trained is made by a Site-Selection Board (note: this board is suggested but not a requirement of the site selection process).

c. This Board formulates recommendations describing where the task "selected for training" will be trained. No selection board will ever have a 100 percent correct "selection record." The goal is to be as accurate as possible considering the present state of adoption by the Site-Selection Board.

E-3. Procedure.

a. The Site Selection Board begins by examining the specialty in terms of its various job/duty positions. The first decision on whether to train in the institution or in the unit is based upon the percent of people in the MOS, in each duty position. If a specific duty position accounts for a substantial percentage of the personnel within an MOS, then that duty position is identified to be trained in the institution. For example, for MOS 95B, Military Police, at Skill Level 1, there are several different duty positions, to list just a few military police, desk clerk, radio dispatch clerk, fingerprint clerk, machinegunner, investigator, prisoner-of-war processing specialist, etc. The majority of these duty positions account for a relatively small percent of the total MOS strength . In this example,the decision is easy because the position of military police accounts for approximately 60 percent of the MOS for Skill Level 1. Not all MOS are that obvious. (See appendix F for another example, MOS 63B.)

b. What is a substantial percentage of personnel within an MOS in a duty position that would justify institutional training? This answer must be determined by the training managers within each service school. It would be ill advised to establish a TRADOC-wide cut level (Yet as a guideline for reference purposes, 40 percent of an MOS in a duty position could be defined as substantial).

c. Because a duty position is designated for institutional training, not all of its tasks "selected for training" have to be trained in the institution. Similarly, all tasks which are part of a duty position designated for unit training, may not be trained in the unit. The decision of where tasks are to be trained is the second phase of site selection (e.g., limited availability of simulators, costs, or other identified management/resource limitations). These factors must be identified and explained early on in the commandant's training strategy/ philosophy for use by analysts and the site selection board.

d. Once a duty position has been designated for either institution or unit training, then each task is reviewed by the Site-Selection Board. The Board should utilize the following factors in deciding whether the task is to be retained in its present site: percent performing, performed within the first 6 months after training, and not constrained by site.

e. For institutional training, if a task is performed by a large percentage of the duty position, and within the first six months, it would be retained for training within the institution, provided there are no constraints. If there are constraints or if it is not performed within the first 6 months, then that task would be moved to unit training. For those duty positions designated for unit training, the same guidelines apply, only reversed. If a task is performed by a small percentage of the specialty but not within the first 6 months after training, then it is retained for training in the unit, provided there are no constraints. If there are constraints, or if it is performed within the first 6 months after training, then on a task-by-task basis a decision will have to be made weighing the constraints of training in either environment, the inclusion of a task in institutional training (everyone trained), and training in the unit, acknowledging that the task is performed soon after assignment.

f. There will be common tasks between duty positions. If a task is part of a duty position scheduled for institutional training, and placed there then all other duty positions with that task can assign it to institutional training automatically. This process has a weakness in its simplicity. Certainly, more factors could be incorporated such as, complexity of task, transferability of knowledge, safety, etc. The goal of site selection at the end of job and task analysis is to have a simple procedure that can be followed and provide reasonable site recommendations to the designer and concurrently to the resource manager (A simplified portrayal of the process is shown in figure E-1). As the complexity of the process increases, its functionality may deteriorate.

g. The Army has a problem in projecting or identifying the specific job that a person will occupy upon completion of training. If the job can be identified, then the imprecision of the present site selection process can be improved. Until that day, the training manager has a challenging mission in allocating training resources to the appropriate training site. The Site Selection Board must make its best recommendation as to where specific tasks should be trained. This estimate becomes the projection, in training dollars, that is fed into the resource management cycle.

h. Because of the similarity of the Task Selection for Training Board and the Site Selection Board, the guidelines suggested in Chapter 7 regarding: composition, size, and chairmanship should apply. The boards do have dissimilar products but should not be composed of the same members.

i. At the completion of the task analysis, as the final data is acquired, the designer makes the final decision on the training site for each task. Whenever a site selection board is held (school/agency dependent), it must be understood that the final decision can not be made until after the task analysis process is complete.

E-4. Mobilization. A consideration introduced, after the task has been tentatively designated to a training site, is the potential for war. During peacetime the Army trains soldiers on the critical tasks both in the institution and/or the unit. However during a mobilization the Army may not have this extended training opportunity and it may have to conduct all of its training in basic and AIT under a compressed time schedule. The training managers must address the potential implications of a mobilization and how it would affect the training base in terms of tasks to be trained, amount of additional time required, and other resource implications.

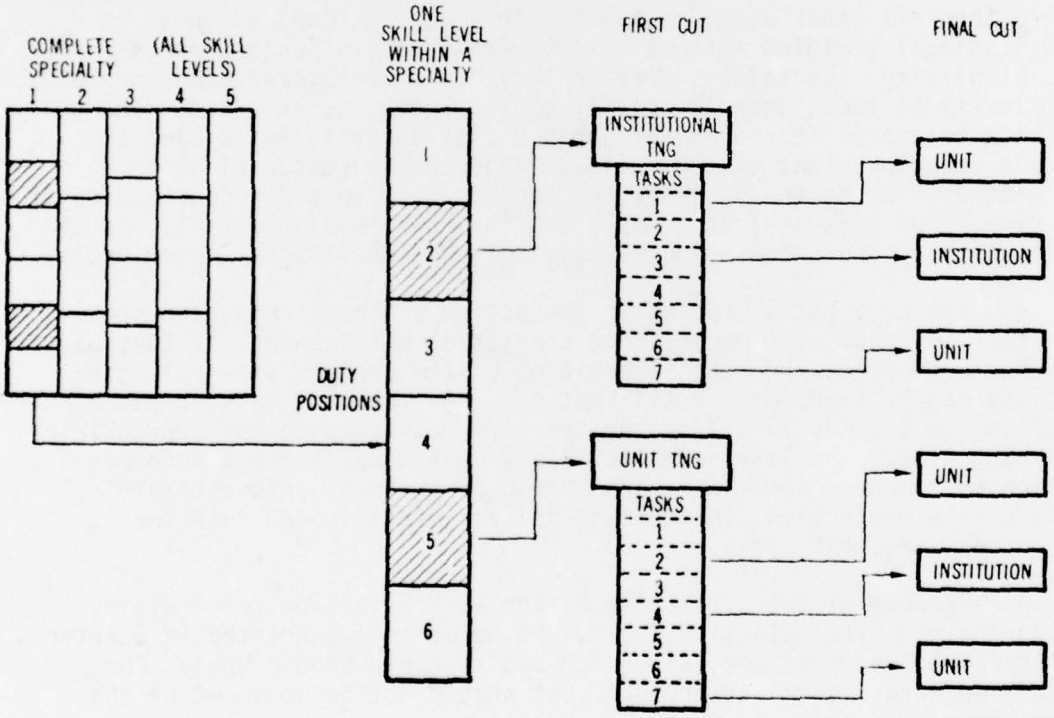


Figure E-1 INITIAL SITE SELECTION PROCESS

APPENDIX F

SITE SELECTION EXAMPLE

F-1. General. The process of selecting tasks for training (critical tasks) and recommending a site selection for each task is complex. The following example shows how the process might be adapted to the MOS (63B) wheel vehicle mechanic. This MOS has been selected as an example to show the entire process of selecting tasks for training and recommending where each task is trained. This example is placed in the context of the whole job analysis, task analysis process. The job to be analyzed is MOS 63B (Skill Level 1).

F-2. 63B10 MOS (wheel vehicle mechanic). This job has three different duty positions: Tire Repairer, Mechanic, and Wrecker Operator. Contained within this job there are approximately 18 different duties, ranging from: perform power train component maintenance, perform gasoline/diesel engine electrical system maintenance, perform brake maintenance, perform tire repairer duties, and perform wrecker operator/recovery operation duties.

F-3. Procedure.

a. The task inventory of these different duty positions is composed of approximately 633 tasks. The Task Selection Board (hypothetically) selected 167 of these tasks for training, using the procedures described in chapter 7. The task analysis effort was then directed to these 167 tasks. The task analysis was conducted in accordance with the procedures described in chapter 8.

b. The site selection recommendation was made by a Site Selection Board using the procedures described in Appendix E. Considering the total MOS and all skill levels, approximately 70 percent of the total authorized force was found in the first skill level of this MOS. For that skill level, approximately 50 percent of the soldiers were tire repairers, 43 percent were wheel vehicle mechanics, and 7 percent were wrecker operators. Using the hypothesized cutoff score of 40 percent to designate whether a duty position is trained institutionally or in the unit, the tire repairer and mechanic duty positions were both initially designated to be trained at the institution, and the wrecker operator duty position trained in the unit.

c. A detailed analysis of each duty position showed that of the 167 critical tasks, the position of tire repairer had 85 critical tasks, the position of wheel vehicle mechanic had 82 critical tasks, and the wrecker operator position had 67 critical tasks (fig F-1).

To help understand this analysis of how tasks would be given an initial training site, look at figure F-1 and follow each step.

d. Considering first the institutional training, the position of tire repairer had 85 critical tasks. On a task-by-task basis, each task was examined in terms of the percent of soldiers performing it and whether the task was performed within the first 6 months after training. Sixty tasks had a relatively high percent performance and were performed within the first 6 months after training. Of these 60 tasks, 7 tasks could not be trained institutionally because of resource constraints. Of the 25 tasks not performed within the first 6 months after training, only 2 could not be trained in the unit. Accordingly, for the duty position of tire repairer: 85 tasks were originally identified as critical, 55 tasks were finally recommended for institutional training, and 30 for unit training.

e. The analysis for the wrecker operator duty position is built upon site recommendations made for the other duty positions; tire repairer, mechanic. If a task is performed by more than one duty position, then the decision on where to train it has to be made only once. For the wrecker operator, because of its low percentage of personnel, the duty position was designated for training in the unit. Yet of the 67 critical tasks, 15 were already identified for training in the institution. Thus only 52 tasks would have to be reviewed. Of these, the Site Selection Board identified 16 that were performed within the first 6 months after training and which had no constraints for training in the institution. The remaining 36 tasks all could be trained in the unit. Accordingly, for the wrecker operator duty position: 67 tasks were identified as critical, 31 tasks were recommended for training at the institution, and 36 were recommended for unit training.

F-4. Conclusions.

a. Through this iterative process, on a task-by-task basis each task receives an initial recommendation as to where it should be trained. The first site decision is made on a duty position basis, thereby designating the primary training site for each duty position as either institutional or unit training.

b. Although a duty position has been designated for training at either the institution or in the unit, not all tasks are trained within the institution or within the unit. Tasks within each duty position could be shared between institution and unit depending upon the initial requirement for performance, the amount of constraints precluding training, and the percentage of personnel performing the task.

c. This example delineates the task selection and site selection process showing how a set of tasks would be designated for training within a duty position into either institutional training or unit training. The Site Selection Board gives this initial recommendation to the designers. They elaborate on it and then make a final decision on where each task should be trained.

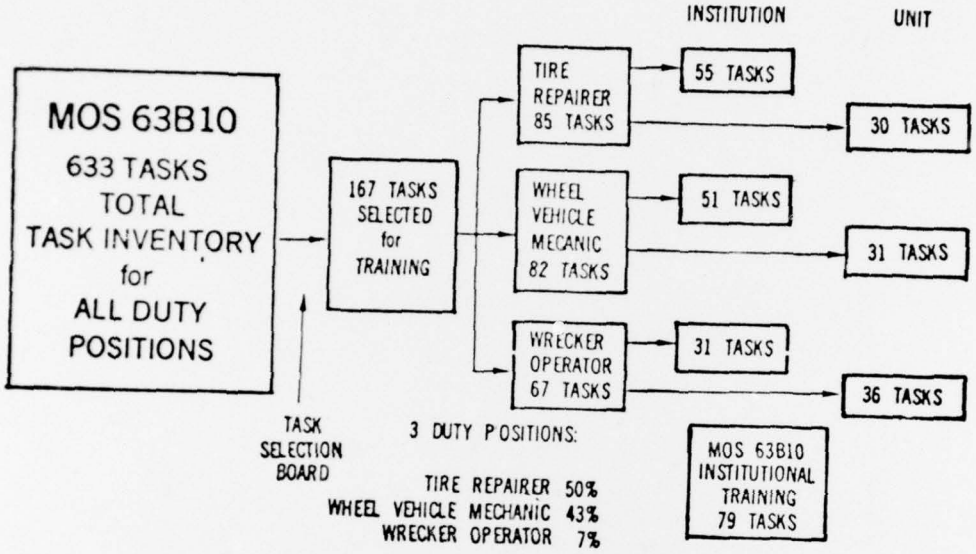


Figure F-1

SITE SELECTION EXAMPLE

APPENDIX G

JOB PERFORMANCE MEASURES

G-1. Purpose. The Job Performance Measure (JPM) provides an assessment of the soldier's competence in a specific task. Prepared at the task level, it represents the best approximation of how the soldier is evaluated on the job while performing the task.

G-2. Scope. The Job Performance Measure is the single reference that the total training system can use as the indicator of competence. Because of the importance of JPM, considerable emphasis is placed on their development and validation. The JPM forms the basis for the training development process, is equivalent with the Soldier's Manual task statement and could easily be identified as an SQT test item.

G-3. Preparation. The preparation of the Job Performance Measure is the responsibility of several individuals. Though the JPM is prepared during the analysis effort, it is NOT the responsibility of the analyst. Rather, the analyst will provide input to the actual writer of the JPM. This individual would be a member of the developmental team, or perhaps an evaluation specialist, or even a combined effort of all three (analysis, development, evaluation). Through the integrated efforts of analysis, development, and evaluation personnel JPM can assist in the assessment/evaluation process.

G-4. Considerations. The analyst, because of his involvement in the data collection effort (Job Analysis and Task Analysis) is able to project whether a task is testable. The professional recommendation of the evaluation specialist further qualifies the JPM in terms of cost, time, equipment, practicality, reliability, and validity of the test.

a. Is the task testable on the job? Because of constraints, i.e., people, equipment, facilities, ranges, etc., a task may not be able to be tested on the job.

b. If the task is not testable, what simulation of the task is possible?

c. Considering the variance in degree of fidelity that JPM may have, what approximation to real world capability can be predicted from the JPM administered on the job, or in the school environment?

G-5. Sample JPM: protective mask.

a. Job performance measures, which are measures of task performance, become the official Army technique for saying what adequate task performance is. The task statement contains the behavior, conditions, and standards of performance. The JPM converts these statements of behavior, conditions, and standards into a procedure for measuring a soldier's performance. Simple tasks like putting on the protective mask can be readily seen (figure G-1).

TASK: Put on the protective mask after detecting the presence of gas in the area or hearing the warning "GAS" shouted by another. Within nine seconds.

Job Performance Measure

Put on the Protective Mask

Condition: When detecting gas in the area or hearing the warning "GAS."

Standard: Within 9 seconds

Initiating Cue: "GAS."

	GO	NO GO	REMARKS
Stop breathing (can not observe this unless in gas chamber)			
Stows or secures weapons or equipment promptly			
Removes helmet			
Opens carrier and removes mask promptly			
Grasps facepiece with both hands			
Slides thumbs under lower head harness straps			
Seats chin firmly in pocket of facepiece			
Pulls harness over head			
Closes hand over outlet valve to clear mask			
Blows hard to clear mask			
Places palms over air inlets to block air supply			
Inhales to collapse mask			

Time_____

Comments_____

_____

Figure G-1. Job performance measure.

b. While the correct form of a task statement communicates what is to be done, the correct procedure is not spelled out. Normally, a procedural task is detailed so that each step is documented according to the process or action, the order, the discriminations and necessary decisions. The JPM is taken from the task detail. In the JPM for putting on the protective mask, the JPM administrator can not, with the equipment provided, tell whether the soldier stopped breathing--that can only be observed in a special room. That item is not administered except when in a gas-present area. An artificial initiating cue must be substituted. Here, the test administrator might yell "GAS" loudly or provide some other clear cue. The administrator must memorize the procedure, and fill out the JPM Checklist form after the performance is complete, and note the reasons for any bad performance after the performance is complete. There is not enough time in the 9 second limit for test administrators to move their eyes from the soldier.

G-6. Design guidelines

a. In designing the JPM, locate critical performances and decision blocks performed correctly by experienced personnel and incorrectly by nonmasters. These should be clearly observable by the administrator either by seeing the soldier actually do something or by watching an indicator or signal which occurs when the procedure is clearly correct or clearly incorrect. Some tasks are more complicated because they depend on a correct action or output from another soldier or supervisor. If a gunner calls for a three bag charge and the loader inserts only two, the scoring will be incorrect. Sometimes a tape recording or video tape of the task performance makes the scoring more reliable. It is critical that the procedure and order of performance be standard for all JPM administrators. Further, experts must agree whether the task has been performed correctly.

b. If there is no known way to develop a standard procedure for measuring the performance, it must be further analyzed for observables or redefined so that objectively verifiable indicators can be reliably judged or rated. When there is no general consensus as to how a performance should be conducted or rated, develop an arbitrary procedure which can be clearly rated. A salute is arbitrary, but, in the U.S. Army, there is one clearly accepted procedure. The British and Germans do it differently but they serve the same tradition. Some tasks may be done correctly by more than one sequence. When this situation occurs, it must be clearly indicated on the JPM so that everyone will get full credit.

G-7. Conclusions. The JPM provides the means to assess job performance through measuring performance on each task. It is a critical element in the training development cycle and certainly the subject of much debate. Recognizing its significance and relevance, the preparation of JPM's is a vital training development step and a crucial event that occurs during the front end analysis efforts.

APPENDIX H

LEARNING HIERARCHIES

H-1. Purpose. The creation of a learning hierarchy involves the movement from the analysis phase of training development to the design phase. It is here that the course designer, using the task analysis data on each task worksheet provided by analysis, lays out the skills that will be taught and begins to deal with their relationships. A learning hierarchy, or shorthand pyramid of objectives is a quick and efficient way of showing a working draft of the skills, knowledges, and their relationships to one another, necessary for performing the terminal objective. Through such a hierarchy, the designer creates a visual representation of the relationship between a terminal objective and its subordinate objectives (fig H-1).

H-2. Example learning hierarchy. In this hierarchy, the designer has taken one specific task from the task list provided by the analyst (navigate from point A to point B) and has written a task statement (task/condition/standard) for that portion of the course. From the terminal objective, he has derived the major subordinate skills (orient map and compass/hike with pack), and then further broken down those subordinate skills into lower level prerequisite skills and knowledges. Further, he has shown, by drawing prerequisite lines, the relationships between all subordinate skills and knowledges and the terminal objective. Thus, for purposes of course design, he can now determine which specific skills must be learned before the student can master higher level skills. With the completed learning hierarchy there is a graphic representation of the essential content of this particular portion of the course.

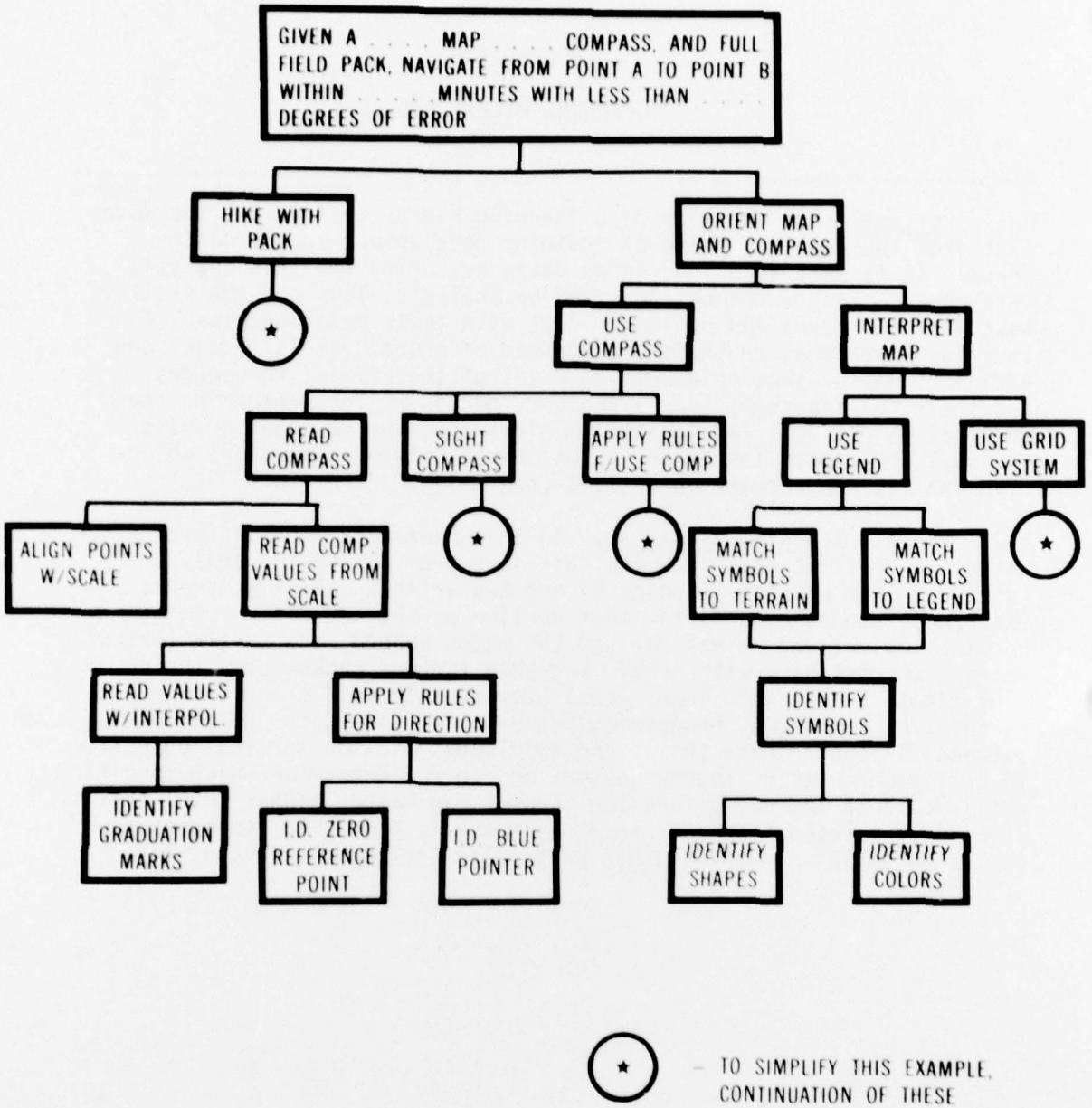


Figure H-1 **LEARNING HIERARCHY**

APPENDIX I

SELECTING TASKS FOR JOB PERFORMANCE AIDS

I-1. Definition. A job aid provides information that guides or facilitates on-the-job performance. It is used in the actual work situation.

I-2. Examples. Checklists, flowcharts, worksheets, decision tables, system-fault tables, etc., are all forms of job aids.

I-3. Characteristics. A job aid reduces or eliminates the need for recall by providing: a) when a task is performed, b) what is to be done, c) how it is to be done.

I-4. Data required to make the decision.

Task delay tolerance
Rate of performance
Frequency of performance
Consequences of error
Number of steps in task
Physical constraints (to using job aids)
Complexity (number of decisions, discriminations)
Task done in variety of situations
Parts of the task are common or facilitate other tasks
Type of stimulus (visual, auditory)

I-5. Rules.

a. Tasks which cannot be job aided because there is little time to use a job aid, are those having:

low task delay tolerance
high rate of performance

b. Tasks which should be job aided, are those having:

low frequency
many steps
many decision points
high consequences of error

c. Practice must be provided in using the job aid. Other reasons for a combination of job aids and training are when the task:

must be applied in a variety of situations
has parts that are common skills or facilitate other tasks
has stimuli that are difficult to discriminate (e.g., detective, vibration, etc.)

APPENDIX J

MAIL BACK QUESTIONNAIRE FOR TRADOC PAM 351-4 JOB & TASK ANALYSIS

You are asked and encouraged to comment upon this handbook and its application to the job and task analysis process. Since the methodology for job and task analysis progresses faster than training developments products are capable of responding, it is essential that TRADOC receive comments on areas within the realm of job and task analysis so that future job and task analysis training and guidance can be refined to meet the user's needs. Your assistance in this refinement effort is essential to the TRADOC training developments process. Please provide us your candid feedback, name, AUTOVON number, etc. so as to assist us in understanding your comments. If you prefer discussing this information on the telephone instead of writing, call AV 680-3608 and discuss your comments with personnel of the Occupational Research and Analysis Division of the Training Developments Institute, Fort Monroe, VA.

NAME:_____ AUTOVON:_____
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1. Is this document useful to you? (YES) (NO)
2. As you use this document are there areas that you feel require EXPANDING? (YES) (NO) REDOING? (YES) (NO)
COMMENTS:_____

3. Have you completed the J&TA training course (or portions thereof)? (YES) (NO)
COMMENTS:_____

4. Did this training material provide the skills and knowledges you needed to do your job? (YES) (NO) If NO what was missing?
COMMENTS:_____

5. Did this pamphlet provide enough information to assist you in doing your job? (YES) (NO)
COMMENTS:_____

6. Are there any areas/subjects in this handbook that caused you any problems? (YES) (NO)
7. What would you do to improve this handbook if you were to republish it (i.e., format, content, etc.)?
COMMENTS:_____

8. Have you any suggestions on refining the J&TA process? Procedures? (YES) NO)
COMMENTS:_____

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