Technical Report 683

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Training Program for Predicting Military Task Retention: Evaluation Report

Paul H. Radtke and Harris H. Shettel
American Institutes for Research

Training and Simulation Technical Area
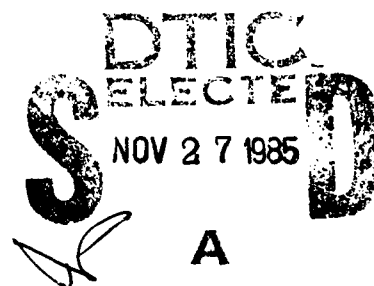**Training Research Laboratory**

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As the result of a 3-year research effort, a methodology was developed whereby unit commanders and trainers can estimate unit proficiency on individual tasks over period of no practice and thus enables persons making training decisions to organize training schedules to maximize unit readiness. The methodology consists of 10 rating questions concerning the characteristics of individual tasks: the presence and quality of job aids, the number of steps required to do the task, the requirement to complete all or part of the task in a specific sequence and/or within a time limit, the presence of (Continued)

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feedback for correct or incorrect performance, the character and level of mental demand, and the level of motor control required to do the task.

The purpose of this project is to transfer the knowledge and skills necessary to apply this methodology to Army representatives from the various Proponent Schools and other activities. Three training sessions were conducted for 65 U.S. Army personnel. Each session consisted of 3 days of classroom lecture, demonstration, and discussion, as well as individual or small-group practice on the use of the methodology under the guidance of facilitators.

The training sessions were conducted essentially as planned, although somewhat less time was required to complete the curriculum and topics relating to how program participants should subsequently train others on the use of the methodology were substantially reduced. By comparing participants' performance on applying the methodology before and after completing the training, it was found that the participants were able to apply the method more consistently as indicated by a decrease in the level of total group variance between the pre- and posttest. Similarly, average time to complete the method decreased between the pre- and posttests. However, on individual questions within the rating scheme, consistency (as measured by total variance) remained the same or, in one instance, increased between the pre- and posttests. Also, the participants' ratings varied from those of expert raters on overall score and individual rating questions. Based on their training experience, the majority of participants considered themselves to be able to use and to train others to use the methodology. Participants also generally recognized the potential usefulness of the methodology, but most foresaw barriers to its implementation in their organizations.

This report describes the process and impact evaluations of the training sessions. It also describes specific changes to be made in the Users' Manual which describes the rating method and in the curriculum to train others to use the method.

Technical Report 683

Training Program for Predicting Military Task Retention: Evaluation Report

Paul H. Radtke and Harris H. Shettel
American Institutes for Research

for

Contracting Officer's Representative
Joseph D. Hagman

Training and Simulation Technical Area
Robert J. Seidel, Chief

Training Research Laboratory
Harold F. O'Neil, Jr., Director

Education and Training

The decline in task performance caused by forgetting is a critical train-
ing problem in the Army. One of the trainer's primary responsibilities is to
ensure that his or her soldiers remain proficient on tasks they have already
learned. This means doing periodic refresher or sustainment training because
soldiers forget tasks not practiced in the unit on a regular basis. Unfortu-
nately, unit training resources are scarce, and no method is available for
helping the trainer identify tasks that either have been or are about to be
forgotten. Without such information it is difficult to target sustainment
training effectively, and thereby, obtain maximum payoff from the limited
training resources available.

In response to this need, the U.S. Army Research Institute for the Behav-
ioral and Social Sciences (ARI) has developed an easy-to-use method for pre-
dicting how rapidly individual tasks will be forgotten over no-practice inter-
vals of up to one year. The method has been developed in both paper-and-pencil
and computer-based format and is geared to help trainers decide what tasks are
most likely to be forgotten, how many soldiers will be able to perform a task
correctly after given intervals of no practice, and when and how often sustain-
ment training should be conducted.

This report provides the results of a program developed for training Army
MOS-proponent school personnel on use of the prediction method to derive accu-
rate task retention estimates.

EDGAR M. JOHNSON
Technical Director

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EXECUTIVE SUMMARY

Requirement:

To conduct a training program to prepare U.S. Army personnel to apply a methodology for estimating unit proficiency on individual tasks after periods of no practice.

Procedure:

This report describes the results of a process and impact evaluation of a training program. The evaluation examines how closely the training presented followed the original curriculum design; the participants' rating of the training process; the effectiveness of the training in improving the participants' ability to apply the methodology consistently, accurately, and expediently; the participants' self-assessment of their level of preparation to apply and train others to apply the methodology; and the participants' opinion regarding potential uses for the method and potential barriers to its implementation within their organization.

Findings:

Results indicated that the program was conducted essentially as intended. Less time was needed to conduct the training than estimated. Some secondary topics were substantially reduced due to lack of perceived usefulness to the participants. Participants rated the training process as adequate in the areas of amount of time for training, the organization of the course, clarity of training materials and instructions, the selection of task examples, and the size of class. The training improved the participants' ability to apply the methodology consistently and in less time. However, participants' ratings on individual rating questions and on overall rating score did not agree with the ratings of expert raters. Most participants considered themselves to be adequately prepared to apply the methodology, and to train others on its use. Participants also indicated potential uses for the methodology but anticipated barriers to its implementation in most cases.

Utilization of Findings:

The evaluation indicated areas where existing descriptions of the methodology requires revision or modification. The evaluation also suggested changes that should be made in the curriculum design if a similar training program were to be implemented.

TRAINING PROGRAM FOR PREDICTING MILITARY TASK RETENTION

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Background

Under contract to the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), the American Institutes for Research (AIR) has designed, developed, and validated a methodology for predicting the retention of military tasks over intervals of no practice (Rose, Czarnolewski, Gragg, Austin, Ford, Doyle and Hagman, in press). This methodology requires that tasks be rated on the basis of ten characteristics (e.g., cognitive and motor requirements; presence of job or memory aids; and the like) found to influence retention (Rose, McLaughlin, Felker, and Hagman, 1981; Rose, Allen, and Johnson, 1982).

In order to derive accurate retention ratings, raters should have detailed knowledge about the tasks to be rated, and possess the know-how required to use the rating methodology. This report describes the effectiveness of a training program designed and developed specifically to provide the Army with this necessary know-how.

The report is divided into separate sections devoted to program objectives, design and implementation, impact, and conclusions and recommendations. An appendix contains the complete set of training materials, including a User's Manual, Program of Instruction (POI), sample task summaries, and evaluation forms.

Objectives

The two major objectives of the training program were to provide

- skills and knowledge necessary for participants to use the rating methodology for deriving accurate task retention predictions,

- and information and materials needed to allow those being trained to train others in turn.

In addition to these major objectives, the training program was intended to demonstrate the applicability of the rating method over a wide range of tasks across different Military Occupational Specialties (MOS), and to reveal other

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potential areas, besides retention, for application of this
methodology. It was also hoped that any areas of the program
needing improvement would be identified by the participants.

Course Design and Implementation

This section describes the design of the training program as it was originally conceived and as it was actually presented. Included are the problems encountered, the issues raised pertaining to the conduct of the training, and the results of the survey completed by the participants pertaining to their perception of the training process.

The Course Design

The original program design envisioned a three-day course to be presented to a maximum of 30 participants. Total training time was estimated at 24 hours.

The breakdown of the training hours in this design was as follows:

o Administrative matters . . . . 2.0 hours
o Pre- and posttest and evaluation . . . . . 3.0 hours
o Lecture . . . . 5.5 hours
o Instructor-led practice . . . . 3.0 hours
o Independent practice . . . . 7.5 hours
o Group discussion . . . . 1.0 hour
o Demonstration of the computerized
  version of the rating method . . . . . . 2.0 hours

The need for three instructors was envisioned: two to conduct the training and practice sessions, and a third to keep notes and manage the logistics of the training.

The training course, as it was actually presented, differed in several respects from the course as planned. First, training took less than the 24 hours orginally scheduled, and was reduced from 24 to 21 hours. In addition, the distribution of the hours among the various activities was altered:

o Less time was devoted to administrative matters
  and the evaluation of the course

o Less time was devoted to straight lecture

o More time was devoted to instructor-led practice
  using the prediction method

o Less time was devoted to individual, small-group
  practice by the participants

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o Less time was spent on the final class
   discussion scheduled on the final day.

     Time devoted to a demonstration of the computerized
version of the prediction method presented by the Army
Training Board (ATB) remained as originally planned.

The Training Sessions

     Three training sessions were conducted. One at each of
the following locations:

o Ft. Gordon, Georgia   14-16 November 1984

o Ft. Bliss, Texas   4-6 December 1984

o Ft. Eustis, Virginia   11-13 December 1984

The Participants

     Participants included personnel from Army MOS proponent
schools and other activities. The schools and other
activities attending the training program, as well as the
number of participants at each location are shown in Table 1.
In all, 65 participants were counted during the three
sessions.

Table 1. Schools Attending Each Training Session.

Session	School	Number
Ft. Gordon 14-16 Nov 84		N=19
	o Missiles and Munitions Center Redstone Arsenal, Alabama	
	o Infantry Center Ft. Benning, Georgia	
	o Aviation Center Ft. Rucker, Alabama	
	o Military Police School Ft. McClellan, Alabama	

Table 1 continued

Session	School	Number
	o Special Warfare Center Ft. Bragg, North Carolina	
	o Signal Center Ft. Gordon, Georgia	
	o Chemical Center Ft. McClellan, Alabama	
Ft. Bliss 14-16 Nov 84		N=20
	o Field Artillery School Ft. Sill, Oklahoma	
	o Soldier Support Institute Ft. Benjamin Harrison, Indiana	
	o Defense Information School Ft. Benjamin Harrison, Indiana	
	o Military Intelligence School Ft. Huachuca, Arizona	
	o Soldier Support Center - National Capitol Region Alexandria, Virginia	
	o Armor School Ft. Knox, Kentucky	
	o Army Health Services School Ft. Sam Houston, Texas	
	o Air Defense Artillery School Ft. Bliss, Texas	

Table 1 continued

Session	School	Number
Ft. Eustis 11-13 Dec 84		N=26

o Engineering School
  Ft. Belvoir, Virginia

o Chemical Center
  Ft. Monmouth, New Jersey

o Quartermaster School
  Ft. Lee, Virginia

o Special Warfare Center
  Ft. Bragg, North Carolina

o Intelligence School
  Ft. Devens, Massachusetts

o Judge Advocate General School
  Charlottesville, Virginia

o Ordnance Center and School
  Aberdeen Proving Ground, Maryland

o Transportation and Aviation Logistics School
  Ft. Eustis, Virginia

o School of Music
  Norfolk, Virginia

o Soldier Support Center -
  National Capitol Region
  Alexandria, Virginia

o Army Training Support Center (ATIC-ITT)
  Ft. Eustis, Virginia

    Throughout all sessions, training activities were
conducted in the order planned. However, with successive
presentations, less emphasis was placed on the theoretical and
empirical basis for the rating method and more emphasis was
placed on presenting the rating method itself. Consequently,
more time was devoted to instructor-led group practice than
had been planned initially.

The instructor-led group practice consisted of a walk-through of the rating method using three examples of actual tasks. The tasks selected were:

o Operate Radio Set AN/PRC-77

o Evaluate the Conduct of Training

o Call for and Adjust Indirect Fire

Attention was focused on each of the ten rating questions in order to resolve potential problems of interpreting the questions, and to illustrate the versatility of the rating method.

Each task was selected to emphasize different aspects of the rating method. The first task, Operate Radio Set AN/PRC-77, was selected as an "easy" task in which there was little ambiguity about the task itself or how it should be rated. It served to familiarize the participants with the rating method.

The second task, Evaluate the Conduct of Training, was selected to illustrate the way the task rating method is influenced by the presence of job or memory aids and how the system works with tasks involving primarily cognitive components.

The third task, Call For and Adjust Indirect Fire, illustrated several issues concerning the use of the rating system. First, it represented an officer-level task. Second, the description was less detailed than the other tasks that were sampled. This encouraged the participants to make more judgments about such issues as the number of steps needed to do the task. It also underscored the importance of having an adequate task description when rating a task. Finally, the task illustrated how to rate tasks that involve interaction among several soldiers and that consist of repetitive procedures.

Participants were given a description of each task and a copy of the User's Manual. Participants rated each task one question at a time and submitted their ratings to the instructor on a slip of paper. The ratings were then tallied and presented on a blackboard. The instructor used the vote of the participants as the basis for a discussion of each rating question. Where differences in interpretation appeared the instructor asked the participants to explain the reasons for their ratings and attempted to clarify and resolve the differences. This provided an opportunity to point out some of the subtle distinctions made in the rating questions.

Following the instructor-led group practice sessions,
participants were divided into small groups. Those from the
same school were placed in the same group. The small groups
then applied the rating method to tasks specific to their
school with instructors serving as facilitators. Group
members were allowed to use their own strategies for rating
their tasks. Some continued to use the procedure used in the
large group session (i.e. answer one question, then
discussion), while others used a procedure where each member
completed the rating of every task alone. The group members
then discussed their ratings and reached a consensus on the
correct rating.

The original course design called for 7.5 hours of
small-group practice. During the actual training, however,
the participants required somewhat less small-group practice
time than planned. For some participants the rating method
was relatively easy to understand and apply. Thus, after a
few practice attempts they felt they had learned the method.
For others, the task summaries which they had brought with
them were incomplete or inappropriate; that is, the
information needed to apply the rating method was missing or
the task was not described in enough detail. Some
participants felt that they were not sufficiently familiar
with the MOS to interpret the task summaries. This prevented
them from rating their tasks or resulted in their using up
their task list quickly.

An additional change in the program design was the
gradual elimination of the unit on how to train others to use
the method and how the method might be used in the schools.
Following the first training session at Ft. Gordon, it became
apparent that the instructors could not offer much useful
guidance to the participants on these two points. Persons
attending the training were, in most cases, trainers
themselves or were familiar with the training process.
Consequently, there was little need to deal with the technical
aspects of teaching the rating method to others. However, a
more important reason for eliminating this unit was that the
participants came from a broad variety of organizations with
very different procedures, structures and missions. This made
it very unrealistic to advise them on either how the rating
method could be used or to whom it should be taught.

A final change to be noted is the shorter amount of time
devoted to class discussion at the end of the course. The
amount of class discussion generated during the instructor-led
group practice segments, and the informal discussions provided
during the small-group practice segments, reduced the time
needed for a discussion of issues with the entire class.

Despite these changes, the overall direction of the
course was maintained throughout the three training sessions.
The intent to expose the rating method to a variety of tasks

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representing different kinds of potential rating issues was successful. Most participants were able to apply the rating method to their tasks with a minimum of help from the instructors. Consequently, the rating method appeared to gain considerable face validity in the eyes of many participants. In addition, the participants pointed out areas where definitions and explanations in the User's Manual were vague or inadequate. This feedback provided the basis for subsequent revisions of the training materials.

The Process Evaluation

At the end of the training program the participants were asked to complete a questionnaire consisting of multiple-choice items that addressed the following aspects of the program:

o   the length of the program

o   how the program was organized,

o   the clarity of the materials,

o   the selection of tasks used in the instructor-led practice,

o   the adequacy of the training facilities, and

o   the size of the class.

In addition, participants were encouraged to provide written comments concerning each question.

Table 2 presents the results pertaining to program length. In general the participants thought the program was the right length or a little too long. All participants, who commented on this question, indicated that the program should be shortened. Specific suggestions included reducing the course to 2 or 2.5 days. Several participants suggested that the practice sessions were repetitious.

Table 3 presents the results pertaining to organization. The vast majority of participants in all three sessions said that the program was "very well organized" or "adequate." There were no consistent comments in this area; individual suggestions were made to shorten the program, use only one instructor and use simpler tasks for the instructor-led practice segments.

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Table 2. Participant Assessment of the Amount of Time
          Devoted to Training, by Session.

	Gordon		Bliss		Eustis		Total	
	N	%	N	%	N	%	N	%
Much too Long	4	21	1	5	3	12	8	12
A little too long	5	26	9	45	7	27	21	32
The right length	8	42	10	50	14	54	32	49
A little too short	2	11	0	0	2	8	4	6
Much too short	0	0	0	0	0	0	0	0
Total	19	100	20	100	26	100	65	100

(Percentages may not add to 100 percent due to rounding.)

Table 3. Participant Assessment of the Organization of the
          Course, by Session.

	Gordon		Bliss		Eustis		Total	
	N	%	N	%	N	%	N	%
Very well organized	6	32	11	55	14	54	31	48
Organization adequate	12	63	8	40	12	46	32	49
Not well organized	1	5	1	5	0	0	2	3
Total	19	100	20	100	26	100	65	100

Table 4 presents the participants' assessment of the
clarity of the training materials and instructions. The
responses here are mixed. Almost all of the comments
mentioned confusion over one or more of the definitions and
explanations in the User's Manual. Indeed, the group
discussions pointed out several areas where these materials
needed to be clarified. The instructors attempted to
supplement or refine the definitions during the group practice
segments. This presumably contributed to the perceived lack
of clarity in the definitions.

Table 4. Participant Assessment of the Clarity of the
          Training Materials and Instructions, by Session.

	Gordon		Bliss		Eustis		Total	
	N	%	N	%	N	%	N	%
All very clear	5	26	1	5	4	15	10	15
Most very clear	8	42	12	60	18	69	38	58
Some very clear	6	32	7	35	4	15	17	26
None very clear	0	0	0	0	0	0	0	0
Total	19	100	20	100	26	100	65	100

(Percentages may not add to 100 percent due to rounding.)

Table 5 summarizes the participants' responses with
respect to the selection of tasks for instructor-led group
practice. The distribution of responses is mixed but
generally favorable. Assessment of the tasks' adequacy
improved with each session. Since the same three tasks were
used at each session, this difference probably was due to the
way the tasks were presented and discussed by the
instructors.

Specific comments on the selection of tasks tended to
question the adequacy of the task summaries provided, the
representativeness of the tasks, and whether sufficient
emphasis was placed on cognitive tasks.

Table 5. Participant Assessment of the Example Tasks Used
          for Practice, by Session.

	Gordon		Bliss		Eustis		Total	
	N	%	N	%	N	%	N	%
Good	5	26	7	35	13	50	25	38
Adequate	11	58	11	55	10	38	32	49
Poor	3	16	2	10	3	12	8	12
Total	19	100	20	100	26	100	65	100

(Percentages may not add to 100 percent due to rounding.)

Table 6 presents the participants' assessment of the training facilities provided. With few exceptions they were considered "good" or "adequate." The size of the class was also considered "OK" by virtually all of the participants, as shown in Table 7.

Table 6. Participant Assessment of the Training Facilities, by Session.

	Gordon		Bliss		Eustis		Total	
	N	%	N	%	N	%	N	%
Good	10	53	18	90	22	95	50	77
Adequate	7	37	2	10	4	15	13	20
Poor	2	10	0	0	0	0	2	3
Total	19	100	20	100	26	100	65	100

Table 7. Participant Assessment of Size of the Class, by Session.

	Gordon		Bliss		Eustis		Total	
	N	%	N	%	N	%	N	%
Okay	19	100	20	100	25	98	64	98
A Little Too Big	0	0	0	0	1	2	1	2
Much Too Big	0	0	0	0	0	0	0	0
Total	19	100	20	100	26	100	65	100

Conclusion

In general, the training program was conducted as originally designed with a few exceptions. It was conducted in a shorter time than had been planned, and could have been shortened further yet.

A second change was the reallocation of training hours away from lecture toward greater large-group, instructor-led practice. Less time was needed for administrative matters, evaluation, and final discussion.

The only topics almost entirely eliminated were how to train others on the method and how to use the method for purposes other than predicting retention. These topics were reduced primarily because of the diversity of the training audiences' experience and level of responsibility.

During training the rating method came under close scrutiny. In general, the rating method held up well under this examination. Participants were able to apply the method to their tasks, and thus, were persuaded that the rating method could be used in their schools and for their tasks. However, some areas were identified where the rating method needed clarification. Unfortunately, this tended to decrease the perceived validity of the method among some of the participants. This also made the course more instructor-dependent than intended and thus, less readily transferable to the schools. The User's Manual, however, has been extensively revised and clarified and is now more self-contained than it was during the training sessions.

The next section examines the impact of the program on participants'performance and discusses the areas where the training procedure and material should be revised.

Course Impact

This section discusses the impact of the training program on the participants in terms of the program's two major objectives:

o   to provide skills and knowledge necessary to effective use of the rating method; and to

o   provide information and materials needed to allow those being trained to in turn train others.

In addition, it was necessary to know if participants were convinced of the validity and usefulness of the rating system. A final objective was to identify areas where the rating system required further explanation or elaboration.

Pre-Posttest

The first objective, to teach participants how to use the rating method, was evaluated through use of a pre- and posttest. Before the participants had received any training, they were given a copy of the User's Manual and a summary of the task, "Prepare a Range Card for the M60 Machine Gun." They were then asked to rate the task using the User's Manual for guidance.

At the end of training, participants were again asked to rate the same task. It was expected that (a) with instruction on use of the method participants would tend to produce more reliable ratings and that differences on both their final ratings and on individual questions would be reduced, (b) the amount of time required for rating the task would decrease from the pre- to the posttest, and (c) participants' final ratings would coincide with those of expert raters who had previously rated the same task.

To measure interrater agreement we used the total variance of the individual ratings from the group mean. It was assumed that a higher level of variance meant a lower level of rater agreement. Conversely, it was also assumed that the greater the level of agreement the lower would be the total variance. Finally, it was expected that average group scores would tend to move toward the average scores of the expert raters from the pre- to the posttest.

Table 8 presents the results of the pre- and posttests in terms of the mean and variance of the raters' ratings. This information is presented separately for each training session and for all sessions combined.

For total sessions, virtually no change in the average participant's ratings were found between the pre- and posttests. Total variance, however, was more than halved, indicating a substantial increase in rater agreement.

Table 8.   Mean and Variance of Ratings, by Session Pre- and Posttest.

	Mean	Variance	N
Total			
Pretest	107.4	1376.4	66
Posttest	107.9	670.8	65
Ft. Gordon			
Pretest	130.4	1738.9	20
Posttest	101.4	475.2	20
Ft. Bliss			
Pretest	105.3	1004.9	19
Posttest	108.1	585.6	19
Ft. Eustis			
Pretest	91.9	729.0	27
Posttest	112.9	817.9	26

Examination of the individual sessions revealed that rating score variance decreased in two of the three sessions. At the the Ft. Eustis session, however, variance increased slightly between the pre- and posttests. Comparison of the average participant's rating with that of a set of expert raters revealed a substantial difference. Whereas the participants, as a group, gave the task a rating of about 107, the expert raters gave the task an overall score of 79 -- a substantial difference which we will explore later in this section.

Table 9 presents the total variance for the rating method's 10 questions completed during the pre- and posttests. A decrease in variance between the pre- and posttest was expected.

Table 9.   Total Variance for Each Rating Question, by
           Session, Pretest and Posttest.

Question/Test	Total	Gordon	Bliss	Eustis
1 Pretest	.25	.25	.19	.23
1 Posttest	.18	.16	.05	.24
2 Pretest	.80	.77	.96	.35
2 Posttest	.22	.25	.00	.16
3 Pretest	.49	.63	.36	.40
3 Posttest	.14	.09	.16	.15
4 Pretest	.40	.54	.16	.38
4 Posttest	.93	.75	.67	.71
5 Pretest	.74	.75	.86	.55
5 Posttest	.57	.62	.52	.56
6 Pretest	.17	.23	.13	.15
6 Posttest	.04	.00	.09	.04
7 Pretest	.33	.24	.23	.33
7 Posttest	.31	.24	.35	.31
8 Pretest	.73	1.16	.35	.38
8 Posttest	.25	.18	.25	.24
9 Pretest	.50	.75	.26	.34
9 Posttest	.48	.22	.24	.44
10 Pretest	.67	.66	.59	.61
10 Posttest	.32	.30	.30	.33

Before discussing the table, a word regarding the
measurement of variance on individual questions is required.
First, the variance statistic presented in Table 9 is measured
in terms of deviation from the mean response category rather
than scale score. For example, Question 5 of the rating
method asks the rater to indicate the extent the steps within
a task provide logical feedback to the soldier that the steps
were performed correctly. A task may be rated as providing
feedback for all steps, most steps, only a few steps, or not
at all. Each of these responses has an assigned weight that
is used to compute the final scale score for the task (the
weights are 22, 19, 11, and 0 points, respectively). The
uneven intervals between the response category weights tend to
distort the differences among raters. Consequently, for this
analysis interval weights were assigned to each response
category (the weights are 1, 2, 3, and 4, respectively). This

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approach maximizes differences in how raters interpreted and applied the rating method, rather than net differences in scale scores.

Turning to the table , for all sessions variance decreased, or remained essentially the same, on all but one question -- Question 4, relating to the necessity of performing the steps of the task in sequence. The same pattern was found for individual sessions. Only in the case of Question 4 was there an actual increase in variance following training. The difficulty with this question is discussed later in this section.

Table 10 shows the participants' average posttest rating scores for each question, along with the ratings provided by the experts.

Table 10.   Comparison of the Participants Average
             Posttest Rating with Expert Rating, by Session.

Mean Rating

Question	Expert Rating	Total	Gordon	Bliss	Eustis
1	1.0	1.8	1.8	2.0	1.6
2	4.0	2.3	2.5	3.0	2.2
3	4.0	3.0	2.9	3.1	3.1
4	1.0	2.1	2.5	2.5	1.5
5	3.0	3.2	3.2	3.1	3.2
6	1.0	1.1	1.0	1.1	1.0
7	3.0	2.6	2.6	2.5	2.6
8	3.0	3.6	3.8	3.5	3.4
9	4.0	2.3	2.9	2.5	2.9
10	2.0	2.0	2.0	2.1	1.9

Substantial differences between participant and expert ratings were present on questions 1,2,3,4,8, and 9. The differences are reviewed below.

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o Question 1: Participants tended to rate the task as having no job aid whereas the experts rated the task as having a job aid.

o Question 2: Among those participants who said that the task had a job aid, the aid was rated "very good" whereas the experts rated the job aid "poor."

o Question 3: Participants assigned the task six to ten steps; the experts said it had more than 10 steps.

o Question 4: Participants said that all of the steps had to be performed in sequence, whereas the experts rated the task as having no built-in sequence .

o Question 8: Participants said that the task had "very many" (more than 8) facts, terms, names, rules or ideas to be remembered, whereas the experts said that there were only "some" of the items (4 to 8) to remember.

o Question 9: Participants tended to rate the difficulty of the items to be remembered as "not hard at all" to remember whereas the experts rated them as "very hard" to remember.

To summarize, the differences in the final scale scores is due to the the participants' tendency to rate the task as having fewer counter-retention characteristics than the experts. Several reasons can be offered to explain these differences. The participants were not subject matter experts on the task selected for the pre- and posttesting. They varied in their knowledge of the task or of other similar tasks. The documentation provided to the participants was not complete. It consisted only of a task summary taken from the Common Task Soldier's Manual. Finally, the participants were given a relatively short time to read and digest the information before applying the rating method. In short, some of the variance between the participants' ratings and those of the expert raters may be due to the conditions under which the two groups worked.

The results also indicate a need to revise and clarify many of the questions and response categories as defined in the User's Manual. For example, a particularly difficult question for the participants was the item relating to need to perform task steps in sequence. Despite considerable discussion of this question by the instructors and the participants at each of the three sessions, this question was not clarified sufficiently to produce consistent ratings by the participants. Among themselves participants disagreed, or failed to be persuaded that sequence, as defined in the rating method, did not mean merely a pr rred way of performing a task, or an order of performance dictated by the nature of the

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task. In the form presented to the participants, the User's Manual left the rater a certain amount of subjective judgement on this question. Since the instructors were unable to resolve the matter during the training, this question was targeted for revision in the current User's Manual. This Question should also be clarified in any future training of the rating method.

The User's Manual has been revised by removing the need for the rater to make any subjective evaluation of the sequence requirement. Instead, the Manual now states that unless the task is tested with sequence as a criterion, the rater should not make an independent judgement about the need to perform any or all of the task steps in a particular sequence. Substantial improvements in the consistency and accuracy of ratings will result from similar changes that have been made in the clarity of instruction for Item 1 (existence of job aids), 3 (number of steps), and 8 (number of facts, etc., to remember). The revised User's Manual also makes a strong point for the necessity of having complete and accurate task documentation before attempting to use the rating method.

Table 11 presents the amount of time needed by the participants to complete the task rating during the pre- and posttest. Time to completion was measured as the time the participants needed to actually do the rating. Time needed to read the preliminary instructions during the pretest was not counted. The participants were asked to indicate when they started and stopped the rating process. The times flect changes in time needed to apply the rating system a recorded by the participants themselves.

Table 11. Mean Completion Times for Pre- and Posttests, by Session.

	Mean Time to Complete Test	N=
Total: All Sessions		
Pretest	21.5 minutes	59
Posttest	12.3 minutes	59
Ft. Gordon		
Pretest	18.8 minutes	19
Posttest	7.7 minutes	19
Ft. Bliss		
Pretest	27.2 minutes	16
Posttest	19.3 minutes	18

As a result of training, participants improved their ability to rate tasks quickly and consistently, but not necessarily more accurately. Apparently, considerable subjective interpretation is still left to the individual rater, and thus, further clarification is needed on how to use the rating method.

Self Report Response

A final piece of evidence regarding the preparation of the participants to apply the rating method is their response to a question asking them to rate how well prepared they felt themselves to be. Their responses, summarized in Table 12, indicates that despite misgivings, participants considered themselves to be "very well prepared" or "fairly well prepared" in almost every case. As Table 13 shows, the participants were almost equally certain of their ability to teach others to use the system. Written comments concerning these questions, although few in number, were consistent in pointing to inconsistent, unclear or subjective definitions as a source of uncertainty in either using or teaching others to use the ratings.

Table 12. Participants' Perception of Their Preparation to Use the Rating Method, by Session.

	Total		Gordon		Bliss		Eustis	
	N	%	N	%	N	%	N	%
Very Well Prepared	33	51	12	63	11	58	10	38
Fairly Well Prepared	27	42	7	37	6	32	14	54
Somewhat Prepared	2	3	0	0	1	5	1	4
Not Prepared	2	3	0	0	1	5	1	4
Total	65	100	19	100	19	100	26	100

(Percentages may not add to 100 percent due to rounding.)

Table 13. Participants' Perception of Their Preparation
to Train Others On the Rating Method,
by Session.

	Total		Gordon		Bliss		Eustis	
	N	%	N	%	N	%	N	%
Very Well Prepared	27	42	8	42	9	45	10	38
Somewhat Prepared	33	51	9	47	9	45	15	58
Somewhat Unprepared	4	6	1	5	2	10	1	4
Not At All Prepared	1	1	1	5	0	0	0	0
Total	65	100	19	100	20	100	26	100

(Percentages may not add to 100 percent due to rounding.)

Use of the Rating Method by Participants

The participants also answered questions about potential uses
for the rating method and potential barriers to its use.
Table 14 presents the results.

Table 14. Participants' Perception of Potential Uses for
the Rating Method, by Session.

	Total		Gordon		Bliss		Eustis	
	N	%	N	%	N	%	N	%
Yes	56	88	17	89	16	84	23	88
No	5	8	1	5	2	10	2	8
Not Sure	3	5	1	5	1	5	1	4
Total	64	100	19	100	19	100	2o	100

(Percentages may not add to 100 percent due to rounding.)

Written comments elaborated on the potential uses to which the rating method should be put. Among those uses mentioned were:

- o Planning of training (N=20)

- o Preparation of Plans of Instruction, Skill Qualification Tests, Soldier Manuals, and Trainer's Guides (N=20)

- o Task Analysis (N=8)

- o Task Summary Development (N=8)

- o Evaluation of Courses (N=3)

- o Critical Task List (N=2)

- o STP Products (N=2)

Individual comments suggested that the system should be used in the field rather than the school; or should be used to budget training costs and identify weak tasks or task descriptions.

Participants were also asked if there were barriers to the use of rating method. Their responses are shown in Table 15. Over half of the participants saw such barriers.

Table 15. Participants' Perception of Potential Barriers to the Use of the Rating Method, by Session.

	Total		Gordon		Bliss		Eustis	
	N	%	N	%	N	%	N	%
Yes	37	57	10	53	12	63	15	58
No	27	42	9	47	6	32	11	42
Not sure	1	1	0	0	1	15	0	0
Total	65	100	19	100	19	100	26	100

While some respondents pointed to the method itself as a barrier (N = 6), the majority of written comments related to

procedural, bureaucratic or resource matters as being the source of difficulty. The most frequently mentioned barriers were:

o Lack of staff (N = 14)

o Lack of time (N = 11)

o Incompatibility with existing policies (N = 8)

o Lack of acceptance (N = 4)

o Lack of information (N = 4)

Thus, while potential interest in the rating method is high, the method may not be widely utilized at first because of internal barriers and limitations in the method itself.

Conclusion

While the stated objectives of the course were reasonably well met, the results of the evaluation were mixed, pointing to a need to revise the User's Manual. These results also suggest that changes should be made in the way the method was presented, or the sample of tasks used to demonstrate the rating method if a similar program were to be presented in the future.

Conclusions and Recommendations

The objectives of the training program presented in the curriculum design were substantially met. Participants were taught how to use the rating method system with a reasonable degree of consistency. The majority of participants finished the training program convinced of the validity and potential usefulness of the rating method. Most also felt that they could teach others how to use the method.

In addition, necessary changes in the training support materials, particularly in the Users' Manual, were identified. These changes, will be incorporated into the revision of the User's Manual (Rose, Radtke, Shettel and Hagman, in press). The changes are summarized as follows:

o All examples and definitions used in the Manual will be reviewed to determine if they adequately describe the concepts as intended.

o Where necessary, examples and definitions will be amended or revised.

o The wording of some rating questions will be revised to cover circumstances identified by the participants not already covered by current explanations.

o Forms, tables or other materials used to help perform the ratings will be reviewed and revised to improve or ease the rating process.

o Inconsistent terms and obsolete references will be revised or eliminated.

o More emphasis will be placed on information needed to support the task rating method, with specific reference to the nature and location of the needed information.

With respect to future training sessions, in addition to revisions of the materials the following changes should be made:

o The length of the course should be reduced

o   More emphasis should be placed on the importance of
    adequate task descriptions as a prerequisite
    for accurate task rating.

o   The tasks used in the instructor-led rating
    practice sessions be better
    documented.

Finally, it is recommended that an effort be made to
follow-up on the actual use of the rating method by program
participants. Several participants made informal comments
indicating that they intended to adopt the rating method:

o   As a subject of the formal school curriculum for
    task analysis;

o   As a device to identify inadequate task documentation
    in Soldiers Training Publication or other materials.

These efforts should be monitored to determine if they
are carried out, their success in meeting the participants'
needs, and the reasons for any problems encountered.

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APPENDIX A

User's Manual for Predicting Military
Task Retention

TABLE OF CONTENTS

USER'S MANUAL FOR PREDICTING

MILITARY TASK RETENTION

I. Introduction

One of the primary responsibilities of training
managers is to make sure soldiers stay trained on tasks
they've already learned. This means doing periodic
refresher training, because soldiers will forget tasks not
practiced in the unit on a regular basis. Unfortunately,
unit resources for refresher training are scarce. The
problem in the field is to make best use of these limited
resources to get the biggest payoff.

The payoff obtained depends in part on the tasks
selected for refresher training. Ideally, time should be
spent only on tasks that have been or are about to be
forgotten. Until recently, this has not been easy to do.
Trainers have had to rely on "best guess" estimate in
determining what and when to train. Until now there was no
method to help the trainer estimate how quickly different
tasks are likely to be forgotten.

The Army Research Institute (ARI) has been investigating the problem of forgetting over the past few years and now has come up with some answers to help the trainer. Under contract to ARI, the American Institutes for Research has developed an easy-to-use method for predicting how rapidly individual tasks are forgotten when they are not practiced. This method is geared to help those at the Squad, Platoon, Company, or Battalion level who have to decide what to retrain and when to give refresher training.

The method requires that each task of interest be rated on how difficult it is to remember. This rating depends on the extent to which a task contains certain characteristics known to influence memory, such as whether or not it is job aided, and how many performance steps it requires. Each task is rated by answering questions about a maximum of ten characteristics. Each answer is then given a numerical score which, when totaled across questions, is used to predict retention. The lower the total score (i.e., the more difficult a task is judged to be), the quicker the task is predicted to be forgotten.

The method has been developed in both a paper-and-pencil manual version and a computer-based automated version, with the latter designed for the Apple II+ or IIe microcomputer. Both paper-and-pencil and computer versions are designed to be used by subject matter experts who have knowledge of the tasks to be rated and of the task characteristics used to derive the ratings.

If used properly, either version of the rating procedure can help with planning individual task sustainment or refresher training. While it cannot predict the performance of any individual soldier, or the mission criticality of any specific task, it can answer some important questions for effective training management: How quickly are specific tasks forgotten? Which tasks are most likely to be forgotten or retained? How many soldiers can perform a task correctly at any point in time? When and how often should refresher training be conducted? Since it is not possible to continually refresh every soldier on every task, choices must be made. The ratings produced by this method will help training managers in the field make these choices with minimum effort and with better than "best guess" accuracy.

The next section of this manual describes how to use the paper-and-pencil version of the method to derive the task ratings. The last section does the same for the computer-based version of the method. The Appendix to this manual contains task difficulty ratings for all Common Soldier tasks, and all tasks in MOS 11B, 13B, and 19E. If more help is needed, call the American Institutes for Research at 202-342-5000.

II. Instructions for Paper-and-Pencil Version

The paper-and-pencil version contains ten questions. Each question has from two to four choices of answers. There is a **"Definitions"** section designed to clarify the meaning of each question. It is important that you read all of the **"Definitions"** information **before** selecting your answers.

The paper-and-pencil version also contains a Task Difficulty Rating Form ANSWER SHEET (following p. 29), on which you will record your answers for each question on each task.

Here is the step-by-step procedure to follow:

1. List the names of all of the tasks you are going to rate in the first column of the ANSWER SHEET. You may shorten the title or use abbreviations. Also enter the Military Occupational Specialty (MOS) designation at the top. If you are doing more than one MOS, use separate ANSWER SHEETS for each MOS.

2. The purpose of this material is to give all raters the same basis on which to make their ratings and to avoid the possibility of missing any of the steps required to perform each task. Refer to the Soldier Training Publicati_ (STP), formerly called the Soldier's Manual (SM), to obtain a description of each task you have listed. You may also use task descriptions found in Technical Manuals or copies of the Skill

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Qualification Test (SQT), if these descriptions are consistent with those found in the STP.

3. Read the first question (Questions begin on page 7), the choices and the **Definitions**. Review the description of each task as needed. Select the best answer for Task 1. Note the Scale Value for the choice you selected. Write that Scale Value in the box in the ANSWER SHEET corresponding to that task and question.

4. Continue in this manner until you have answered all of the questions for Task 1 and have entered the Scale Values on the ANSWER SHEET. Depending on your answer, you may be asked to skip certain questions. Follow the instructions in that case.

5. Add the individual Scale Values for Task 1 and enter the total in the "Total Score" column of the ANSWER SHEET.

6. Follow the same procedure for any additional tasks you wish to rate.

If you wish to convert the ratings to performance estimates, use the instructions on page 28.

Remember to rate the tasks as they would be <u>tested</u>, not as they would be performed in an operational situation. The reason for this is that proficiency will be measured by a test; the predictions are related to <u>test</u> performance.

Question 1. Are job or memory aids intended to be used in performing this task?

Answer Choice	Scale Value
● Yes	1
● No	0

┌ finitions

Job and memory aids are designed to assist the soldier in doing a task correctly. Examples include:

- Memory joggers learned in school, such as S - A - L - U - T - E.

- The Soldier's Manual **as used on the job** to help do the task properly.

- Labels or instructions that are printed on equipment or containers.

- Manuals published by manufacturers to be used **while performing** check-out or maintenance tasks on equipment.

The key to accurately answering this question lies in the way the task is <u>intended</u> to be performed. For example, it is <u>intended</u> that the STP or Technical Manual be used while performing most maintenance tasks. That is the way these tasks are taught and the way they are <u>tested</u>. So, if a job or memory aid is used while performing a task, you

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should answer this question "YES," and answer the remaining

questions in this form as if such a manual will be

available and used. If a job or memory aid is not used

while performing a task, and none is used in testing that

task, then the answer to this question would be "NO."

Write the Scale Value ("1" or "0") for the answer you

select in the first column, labeled "Job/Memory Aid," of

the ANSWER SHEET. If you selected a "No" answer ("0") to

this question, skip the next question and go to Question 3

on page 12.

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Question 2. How would you rate the <u>quality</u> of the job or

memory aid?

Answer Choice	Scale Value
● Excellent. Using the job/memory aid, a soldier can do the task correctly with <u>no</u> additional information or help.	56
● Very Good. With the job/memory aid, a soldier would need only a little additional information to complete the task.	25
● Marginally Good. Even with the job/ memory aid, a soldier would need some additional information to complete the task.	2
● Poor. Even with the job/memory aid, a soldier would need a great deal of additional information in order to complete the task.	1

Definitions

This question requires you to think about the ability

of the job or memory aid to actually lead the soldier

through the task without error. Some aids may be

technically accurate but very difficult to understand and

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to follow. Their reading level may be far too difficult for the average soldier to comprehend. They should be rated "Poor." Some may be helpful, but are incomplete - there is important information missing. For example, they may tell the soldier _what_ to do, but not _how_ to do it. They should be considered "Marginally Good."

"Very Good" aids are generally easy to understand and are mostly complete. A soldier would need to know or remember relatively little additional information to complete the task successfully. "Very Good" aids would tell _how_ to do the task, not just _what_ to do. The difference between "Marginally Good" and "Very Good" is in the _amount_ of information given or the **ease of finding** that information.

"Excellent" aids cover all the steps in a careful and easy to understand way and the reading level is matched to the level of those using it. For example, they tell you what, where, how, what tools to use and what safety steps to look out for. Pictures and diagrams are often used in "Excellent" or "Very Good" aids.

The following examples for the task "Turn On Electrical Test Panel" may help in making your choice:

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"Excellent" job aid — Easy to read instructions
printed clearly on the electrical test panel telling
you what to do, how to do it, and in what order to do
it.   Pictures are used.

"Very Good" job aid — A booklet that tells you
basically the same information but it does not show
where the knobs and switches are located.   Errors are
possible.

"Marginally Good" job aid — Printed technical
instructions that contain other information about the
test system mixed in with the needed information.   No
pictures or diagrams.

"Poor" job aid — Technical reference manuals in which
general principles of operation are given using
complex language — you must try to determine the
actual procedure for yourself.

Choose your answer.   Now enter the Scale Value for

that answer on the ANSWER SHEET under the column labeled 2,

"Job/Memory Aid Quality."   If you select "Excellent" as the

answer to this question, skip to Question 6 on page 18.

NOTE: IF YOU RATED THE JOB AID AS "EXCELLENT,"

DO NOT ANSWER THIS QUESTION.

Question 3. How many steps are required to do the task?

Answer Choice	Scale Value
● One step	25
● Two to five steps	14
● Six to ten steps	12
● More than ten steps	0

Definitions

For purposes of this rating you should use the number of performance steps listed in the technical materials you have (for example, the STP).

If the reference manual does not provide sufficient information, or if you feel that a task has not been broken down accurately into performance steps, the following guidance may be helpful:

- A step is a separate physical or mental activity within a task, which has a well defined, observable beginning and ending point. It must be performed to complete a task correctly. Thus, identifying a tank is considered one step, even though a number of decisions are needed to arrive at the correct

answer (for example, note location of turret, count
number of road wheels, etc.). These decisions,
however, are not observable.

- A task may consist of only one, a few, or many
  steps.

- Tasks involving assembling or disassembling a piece
  of equipment tend to be multi-step tasks.
  Assembling the M16 rifle would be an example of a
  multi-step task.

Determine your answer. Enter the Scale Value for this
answer on the ANSWER SHEET in the third column labeled
"Number of Steps."

If you select the first answer ("One step"), skip to
Question 6 on page 18.

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Question 4. Are the steps in the task required to be performed in a definite sequence?

Answer Choice	Scale Value
● None are	10
● All are	5
● Some are and some are not	0

Definitions

Some tasks are composed of steps that can be performed in <u>any</u> sequence. For example, "Employ Phonetic Alphabet" is a task that is not scored for sequence. Such tasks should be given a Scale Value of "10."

Other tasks, such as "Splint a Fracture," are made up of steps that have only one correct sequence. Failure to follow the particular sequence results in a "NO GO" on that task. These tasks should be given a Scale Value of "5".

A task that is a <u>mixture</u> of sequenced and non-sequenced steps should be given a Scale Value of "0".

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Use the information that is contained in the STP to help you answer this question.

Choose your answer. Enter the Scale Value for your answer in the fourth column (labeled "Sequence") of the ANSWER SHEET.

NOTE: IF THE TASK HAS ONLY 1 STEP,

SKIP THIS QUESTION AND GO TO

QUESTION 6 ON PAGE 18

Question 5. Does the task have a built-in logic so that you can tell if you are doing it correctly?

Answer Choice	Scale Value
● Has built-in logic for all steps	22
● Has built-in logic for most steps	19
● Has built-in logic for only a few steps	11
● Has no built-in logic	0

Definitions

Examples of tasks that have built-in logic are:

● Disassembling a piece of equipment in which removing one section automatically uncovers the next section (e.g., opening up a container to remove contents).

● Equipment operation in which the steps form a logical progression (e.g., "power-up" comes first).

● Assembling a sub-part that does not fit the larger assembly, thus indicating that some earlier step was incorrect.

● The completion of the task provides an automatic check on the correctness of it. For example, changing a tire would have some of these

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characteristics (e.g., parts left over, wheel does not turn).

Tasks that have the least built-in logic tend to have many branching steps that could be taken ("If this, then that" types of steps), or have safety checks that break the flow of a task's steps (e.g., checking the backblast area when correcting a malfunction on an M72A2 LAW).

Choose your answer and enter the Scale Value for your answer in the column headed "Logical."

Question 6. Does the task have a time limit for its completion?

Answer Choice	Scale Value
• There is no time limit.	40
• There is a time limit, but it is fairly easy to meet under test conditions.	35
• There is a time limit and it is difficult to meet under test conditions.	0

Definitions

The time allowed to complete a task is a dimension of task difficulty.

The first choice above means that no time limit has been established for the task (in the STP) so that a "GO" may be achieved even though one soldier may take much longer to do the task than another soldier. This choice is also appropriate when a time limit is so liberal that no one ever fails to meet it.

The second choice above applies to those tasks, such as assembling the M60 machinegun, that have a time limit that some soldiers may find difficult to meet. In this case, the STP has set a time limit that "pressures" the average soldier a bit, but only a few would get a "NO GO" because of it.

The third choice above is for tasks that have a time limit that is difficult to meet. Safety and combat-related tasks, such as "Sight a target through the gunner's telescope within 10 seconds" would fall into this category. Soldiers being tested on this kind of task often get a "NO GO" on the basis of time alone.

Select your answer and then enter the Scale Value for that answer under the column labeled "Time."

Question 7. What are the mental or thinking requirements of this task?

Answer Choice	Scale Value
● Almost no mental requirements	37
● Simple mental requirements	28
● Complex mental requirements	3
● Very complex mental requirements	0

Definitions

This question gets at the difficulty of the thought processes that a soldier must go through during task performance.

A task requires almost <u>no</u> mental processing if it is essentially physical, or highly repetitive (e.g., marching in line, saluting).

A task requires <u>simple</u> mental processing if it involves making gross comparisons; estimating relative size, weight, or distance; performing simple computations; or memorizing one or two names, terms or facts.

<u>Complex</u> mental processes require the soldier to make a choice or decision based on subtle but discrete clues (e.g., prioritizing fixed targets, identifying different types of aircraft or vehicles).

A task requires **very complex** mental processes if it requires rapid decisions based on detailed, technical information (e.g., planning an attack, troubleshooting complex equipment).

In answering this question, consider the impact of a job or memory aid (if an aid is supposed to be used) on the thinking requirements of this task. However, note that job aids are generally less helpful in the area of higher thought processes than they are in the areas of rote memory or proceduralized tasks.

Choose your answer and then enter the Scale Value on the ANSWER SHEET in the column labeled "Mental Requirements."

Question 8. How many facts, terms, names, rules or ideas must a soldier memorize in order to do the task?

Answer Choice	Scale Value
● None (or the job/memory aid provides all necessary information)	20
● A few (1 - 3)	18
● Some (4 - 8)	13
● Very many (more than 8)	0

Definitions

This question gets at the amount of material a soldier must remember in order to do the task.

Examples of the types of information that may have to be remembered are:

- ● Military nomenclature (terms)

- ● Conversion formulas

- ● Codes or call numbers

- ● Technical names, specifications or tolerances

- ● Doctrinal principles or rules of thumb

Remember to consider the impact of the job or memory aid (if an aid is supposed to be used) in answering this question. If there are facts, terms, etc., that are needed

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in order to do the task, but some or all are covered in the job aid, your answer should reflect this. (Thus a potential "Very many" rating may be reduced to "A few" rating by a "Very Good" job aid.)

Select your answer and then enter the Scale Value for that answer in the column labeled "Number of Facts."

Question 9. How hard are the facts, terms, etc., to remember?

Answer Choice	Scale Value
● Not applicable – there are none to remember or the job or memory aid provides all of the needed information.	34
● Not hard at all – the information is simple.	31
● Somewhat hard – some of the information is complex.	12
● Very hard – the facts, rules, terms, etc., are technical or specific to the task and must be remembered in exact detail.	0

Definitions

This question rates the difficulty of the facts, terms, etc., needed to do the task.

The more common and general the information soldiers must remember, the more likely they are to recall it. The more specific, detailed or technical the information the less likely they are to recall it. Also, unorganized facts and terms (e.g., much military nomenclature) are more likely to be forgotten than facts and terms that are part of a system (e.g., the phonetic alphabet).

The amount of help provided by job and memory aids applies to this question.

Choose your answer and then enter the Scale Value for your answer in the column labeled "How Hard to Remember."

25

Question 10. What are the motor skill demands of the task?

Answer Choice	Scale Value
● None.	2
● Small but noticeable amount of motor skill required.	0
● Considerable amount of motor skill needed.	16
● Very great demand for motor skill.	3

Definitions

This question has to do with the skill level of finger, hand and arm movements, not with large body movements. Thus a task would be given a "None" if it involves only sheer physical strength or simple, reflexive actions (e.g., pushing, lifting, carrying).

A small but noticeable amount of skill is required by tasks such as driving a nail or adjusting a carburetor screw.

A considerable amount of motor skill is needed for tasks such as driving a manual transmission car or tracking a moving target.

A task requiring very great skill demands would be the repair of a very delicate piece of equipment, such as a microcircuit chip.

Some tasks may combine both a strength component and a motor skill component. For example, a fairly heavy piece of equipment may have to be positioned in a precise location. In such cases, a value of "considerable" or even "very great" would be appropriate, depending on the amount of skill required.

Select your answer and then enter the Scale Value for your answer in the column labeled "Motor Skill Requirements."

Calculating a Total Score

This completes the rating procedure. Check back to make sure you answered all the questions that applied to this task. The questions you skipped (if any) would be blank on the ANSWER SHEET. All others should have a 0 or a number written in on the ANSWER SHEET.

As a final step for each task that you have rated, add the scale values assigned to the ten questions. Record this sum in the column labeled "Total Score." This is the

Task Difficulty Rating that will be used to help estimate
task retention performance of soldiers in the field.

Using the Performance Prediction Tables

The two attached Performance Prediction Tables
(following the ANSWER SHEET) provide the performance
estimates for tasks that have already been rated. They
show the estimated <u>unit</u> proficiency -- the expected
proportion of soldiers in a unit able to perform a task
correctly -- after different amounts of time since the task
was last performed correctly.

The first Performance Prediction Table gives these
estimates at weekly intervals, up to 26 weeks. The second
Table gives these estimates at monthly intervals, up to 12
months.

To find a specific task performance estimate, first
locate the line (row) corresponding to the score closest to
the obtained Total Score. Then read across either Table
until you reach the time interval you are concerned about.
The Table entry will be the proportion of soldiers that
could be expected to perform the task correctly at that
time interval.

EXAMPLE: Total Score from ANSWER SHEET = 140. You want to know what percentage of soldiers can still perform the task 16 weeks after they last practiced it. The entry in the table for 16 weeks is 36(%). The entry in the table for four months is also 36(%).

Task Difficulty Rating Form
Answer Sheet

Scale Questions

MOS: Task Name/ Description:	Question 1 Job/ Memory Aid	Question 2 Job/ Memory Aid Quality	Question 3 Number of Steps	Question 4 Sequence	Question 5 Logical	Question 6 Time	Question 7 Mental Require- ments	Question 8 Number of Facts	Question 9 How Hard to Remember	Question 10 Motor Control Require- ments	Total Score

Performance Prediction Table — Weeks

Total Score from Answer Sheet	Weeks Since Last Performance																									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
180+	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
175	99	98	98	97	96	96	95	95	94	93	93	92	92	91	90	90	89	89	88	87	87	86	86	85	85	84
170	98	97	96	94	93	92	91	90	88	87	86	85	84	83	82	81	79	78	77	76	75	74	73	72	71	71
165	97	96	94	92	90	88	88	85	83	81	79	78	76	75	73	72	70	69	67	66	65	63	62	61	60	58
160	97	94	91	89	86	84	82	80	77	75	73	71	69	67	65	64	62	60	58	57	55	54	52	51	49	48
155	96	93	89	86	83	80	77	75	72	69	67	64	62	60	58	56	54	52	50	48	46	45	43	42	40	39
150	95	91	87	83	80	76	73	70	66	64	61	58	56	53	51	49	46	44	42	40	39	37	35	34	32	31
145	94	89	85	80	76	72	68	65	61	58	55	52	49	47	44	42	40	37	35	34	32	30	28	27	26	24
140	93	88	82	77	72	68	63	60	56	52	49	46	43	40	38	36	33	31	29	27	26	24	23	21	20	19
135	92	86	79	74	68	63	59	55	51	47	43	40	37	35	32	30	28	26	24	22	20	19	17	16	15	14
130	91	84	77	70	64	59	54	50	45	42	38	35	32	29	27	25	22	21	19	17	16	14	13	12	11	10
125	90	81	74	67	60	54	49	45	40	36	33	30	27	24	22	20	18	16	15	13	12	11	10	9	8	7
120	89	79	70	63	56	50	44	40	35	31	28	25	22	20	17	16	14	12	11	10	9	8	7	6	5	5
115	87	76	67	59	51	45	39	35	30	26	23	20	18	15	13	12	10	9	8	7	6	5	4	4	3	3
110	86	74	63	54	47	40	34	29	25	22	19	16	14	12	10	8	7	6	5	4	4	3	3	2	2	1
105	84	70	59	50	42	35	29	25	21	17	14	12	10	8	7	6	5	4	3	3	2	2	1	1	1	1
100	81	66	54	44	36	29	24	20	16	13	10	8	7	5	4	4	3	2	2	1	1	1	0	0	0	0
95	78	62	49	38	30	24	19	15	11	9	7	5	4	3	2	2	1	1	1	0	0	0	0	0	0	0
90	74	56	42	31	23	17	13	10	7	5	4	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0
85	68	47	32	22	15	10	7	5	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	42	17	7	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70 or less	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Performance Prediction Table — Months

Total Score from Answer Sheet	Months Since Last Performance											
	1	2	3	4	5	6	7	8	9	10	11	12
180 +	100	100	100	100	100	100	100	100	100	100	100	100
175	97	95	92	90	87	85	83	81	79	77	75	73
170	94	90	85	81	76	72	69	65	62	59	56	53
165	92	85	78	72	66	61	56	52	48	44	40	37
160	89	80	71	64	57	51	45	40	36	32	29	26
155	86	75	64	56	48	42	36	31	27	23	20	17
150	83	70	58	49	40	34	28	24	20	16	14	11
145	80	65	52	42	34	27	22	17	14	11	9	7
140	77	60	46	36	27	21	16	12	10	7	6	4
135	74	55	40	30	22	16	12	9	6	5	3	2
130	70	50	35	25	17	12	8	6	4	3	2	1
125	67	45	30	20	13	9	6	4	2	1	1	0
120	63	40	25	16	10	6	4	2	1	1	0	0
115	59	35	20	12	7	4	2	1	0	0	0	0
110	54	29	16	8	4	2	1	0	0	0	0	0
105	50	25	12	6	3	1	0	0	0	0	0	0
100	44	20	8	4	1	0	0	0	0	0	0	0
95	38	15	2	0	0	0	0	0	0	0	0	0
90	31	10	3	1	0	0	0	0	0	0	0	0
85	22	5	1	0	0	0	0	0	0	0	0	0
80 or less	3	0	0	0	0	0	0	0	0	0	0	0

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APPENDIX B

Program of Instruction

Program of Instruction

COURSE NUMBER:

COURSE TITLE: Task Retention Prediction Course

COURSE LENGTH:

      PEACETIME: 3 days

      MOBILIZATION: None

APPROVAL DATE:

APPROVING AUTHORITY:

SUPPRESSION INFORMATION: This is a new Program of Instruction
                           (POI) for those who need to predict
                           MOS task retention times.

PROPONENT SCHOOL: All

TABLE OF CONTENTS

PREFACE

COURSE NUMBER:

TITLE: Task Retention Prediction Course

PURPOSE: To train proponent school personnel to
                        use a method for predicting the retention
                        period of military tasks.

PREREQUISITES: Detailed subject matter knowledge of the
                        tasks to which the method is applied.

SCOPE: Apply the method to a variety of military
                        tasks and use the appropriate tables to
                        predict their retention levels over time.

COURSE LENGTH: PEACETIME MOBILIZATION

                        3 Days   None

TRAINING LOCATION: Fort Gordon, GA;
                        Fort Bliss, TX
                        Fort Eustis, VA

TRAINING START DATE: 12 November 1984

COURSE SUMMARY

COURSE: Task Retention Prediction Course

HOURS: PEACETIME   MOBILIZATION

ACADEMIC TIME   21

Mandatory Tng Annex   Not Required

Examination Annex   Not Required

    SUBTOTAL   21

ADMINSTRATIVE TIME   PEACETIME

IN-PROCESSING   .5

OUT-PROCESSING   .5

PHYSICAL FITNESS TNG   0

COMMANDANT'S TIME   0

OPEN TIME   0

    SUBTOTAL: 1

TOTAL COURSE HOURS   22

HOURS OF SECURITY

    CLASSIFICATION

All material in this POI is

Unclassified.

TOTAL: 22

<u>CLASS SIZE:</u>

MAXIMUM   30 (2 course mgrs)

Optimum   15 (1 course mgr)

Minimum   3

COURSE:: Task Retention Prediction Course

PURPOSE: To (1) teach selected proponent school personnel how to use a system for rating tasks and predicting their retention over time, and (2) to provide these personnel with the skills and materials needed to teach the system to others in proponent schools.

TOTAL HOURS: PEACETIME - 22 MOBILIZATION - None

POI FILE NO. TITLE/SECURITY CLASSIFICATION	ACADEMIC HOURS		SCOPE
	PEACETIME HOURS/ TYPE	MOBILIZATION HOURS/ TYPE	
Block 1 Introcuction (U)	.5 C		Set the stage for the course and cover the administrative and procedural matters relating to its conduct. The course schedule will be distributed and discussed. The course objectives will be presented to group.
Block 2 Pretest (U)	1.5 E2		Each participant will be asked to rate a Common Soldier Task, using the Task Retention Decision Aid as their only source of guidance.
Block 3 Introduction to Task Rating Procedure (U)	1.5 C		The background and purpose of the rating procedure will be presented.

The process by means of which the rating procedure was developed and validated will be summarized. The way in which the rating procedure can be used by the schools will be discussed. Questions from participants will be answered. |

| POI FILE NO. TITLE/SECURITY CLASSIFICATION | ACADEMIC HOURS | | SCOPE |
	PEACETIME HOURS/ TYPE	MOBILIZATION HOURS/ TYPE	
Block 4 Walk-thru of the Rating Procedure (U)	1.5 D		Using the Task Retention Decision Aid, each of the ten questions will be gone over in turn, discussing its overall meaning, the scale values and their interpretation, and the definitions that accompany each question. The use of the Rating Form will be discussed as well as the way in which the final Task Retention Score can be obtained and used to predict unit performance.
Block 5 Group Task Rating Practice-Easy Task (U)	1 PE 3		The class will be asked to rate a simple task. The ratings given by the class to each question will be discussed before going on to the next question.
Block 6 Computer Demonstration I(U)	1 D		The computer-aided version of the rating procedure will be demonstrated.
Block 7 Group Task Rating Practice-Difficult Tasks (U)	3 PE 3		Two tasks representing higher skill levels will be rated and discussed, as in Block 5.
Block 8 Individual Task Rating Practice – Small Groups (U)	3 PE3		Each school team will select tasks for their independent rating practice. Each team member will work alone on a task after which the facilitator will discuss each question and rating in turn. Differences in ratings will be discussed.

POI FILE NO. TITLE/SECURITY CLASSIFICATION	ACADEMIC HOURS PEACETIME HOURS/ TYPE	MOBILIZATION HOURS/ TYPE	SCOPE
Block 9 Large Group - Discuss Results of Individual Practice on School Tasks (U)	1 C		The purpose of this session is to share ideas with the group at large so that everyone can benefit equally from the points that were brought out by individual teams.
Block 10 Computer Demonstration II (U)	1 D		The computer demonstration will be repeated (Block 6).
Block 11 Continue Individual Rating Practice - Small Groups (U)	3.5 PE3		The rating of school-selected tasks will continue. Each team will work through as many tasks as it can in the time available. The purpose of this exercise is to develop competency and proficiency with the procedure as applied to tasks relating to each teams' area of expertise.
Block 12 Posttest (U)	1.5 E2/C		Each participant will re-rate the same task he or she rated on the pretest. Posttest results will be analyzed and presented to the class. A comparison with pretest results will be made.
Block 13 Course Summary (U)	.5 C		Provide opportunity for discussion and final questions.
Block 14 Final Course Evaluation (U)	.5 E3		A course evaluation questionnaire will be administered to the group.

APPENDIX C

Overheads

Predicted and Actual Performance: Percent 13B10 Soldiers "GO"

Task	Predicted	Actual
Function Check Breech	94%	95%
Install Stakes	80	77
Establish Communication	75	77
Assemble Breech	69	72
Select Ammunition	61	63
Record Information	55	53
Micrometer Test	33	32

Question 1.

Are job or memory aids intended to be used in performing this task?

Scale Value

1   • Yes

0   • No

Question 2.

How would you rate the **quality** of the job or memory aid?

Scale Value

56 • Excellent

25 • Very Good

2 • Marginally Good

1 • Poor

Question 3.

How many steps are required to do the task?

Scale Value

25   • One step

14   • Two to five steps

12   • Six to ten steps

0   • More than ten steps

Question 4.

Are the steps in the task required to be performed in a definite sequence?

Scale Value

10   • None are

5   • All are

0   • Some are and some are not

Question 5.

Does the task have a built-in logic so that you can tell if you are doing it correctly?

Scale Value

22   • Has built-in logic for all steps

19   • Has built-in logic for most steps

11   • Has built-in logic for only a few steps

0   • Has no built-in logic

Question 6.

Does the task have a time limit for its completion?

Scale Value

40 • There is no time limit.

35 • There is a time limit, but it is fairly easy to meet under test conditions.

0 • There is a time limit and it is difficult to meet under test conditions.

Question 7.

What are the mental or thinking requirements of this task?

Scale Value

37 • Almost no mental requirements

28 • Simple mental requirements

3   • Complex mental requirements

0   • Very complex mental requirements

Question 8.

How many facts, terms, names, rules or ideas must a soldier memorize in order to do the task?

Scale Value

20 • None

18 • A few (1 - 3)

13 • Some (4 - 8)

0 • Very many (more than 8)

Questions 9.

How hard are the facts, terms, etc., to remember?

Scale Value

34	• Not applicable
31	• Not at all hard
12	• Somewhat hard
0	• Very hard

Question 10.

What are the motor skill demands of the task?

Scale Value

2   • None

0   • Small but noticeable amount of motor skill required

16   • Considerable amount of motor skill needed

3   • Very great demand for motor skill

APPENDIX D

Task Descriptions

071-312-3007

PREPARE A RANGE CARD FOR
AN M60 MACHINE GUN

CONDITIONS

During daylight, in a defensive fighting position, you are given a tripod-mounted M60 machine gun with components, a designated primary sector of fire (final protective line (FPL) or principle direction of fire (PDF)) and secondary sector of fire (both with recognizable targets), paper and pencil, and lensatic compass.

STANDARDS

Prepare a range card that includes a data section and a sketch section containing both sectors of fire, with appropriate sketches and military symbols.

TRAINING/EVALUATION

Training Information Outline
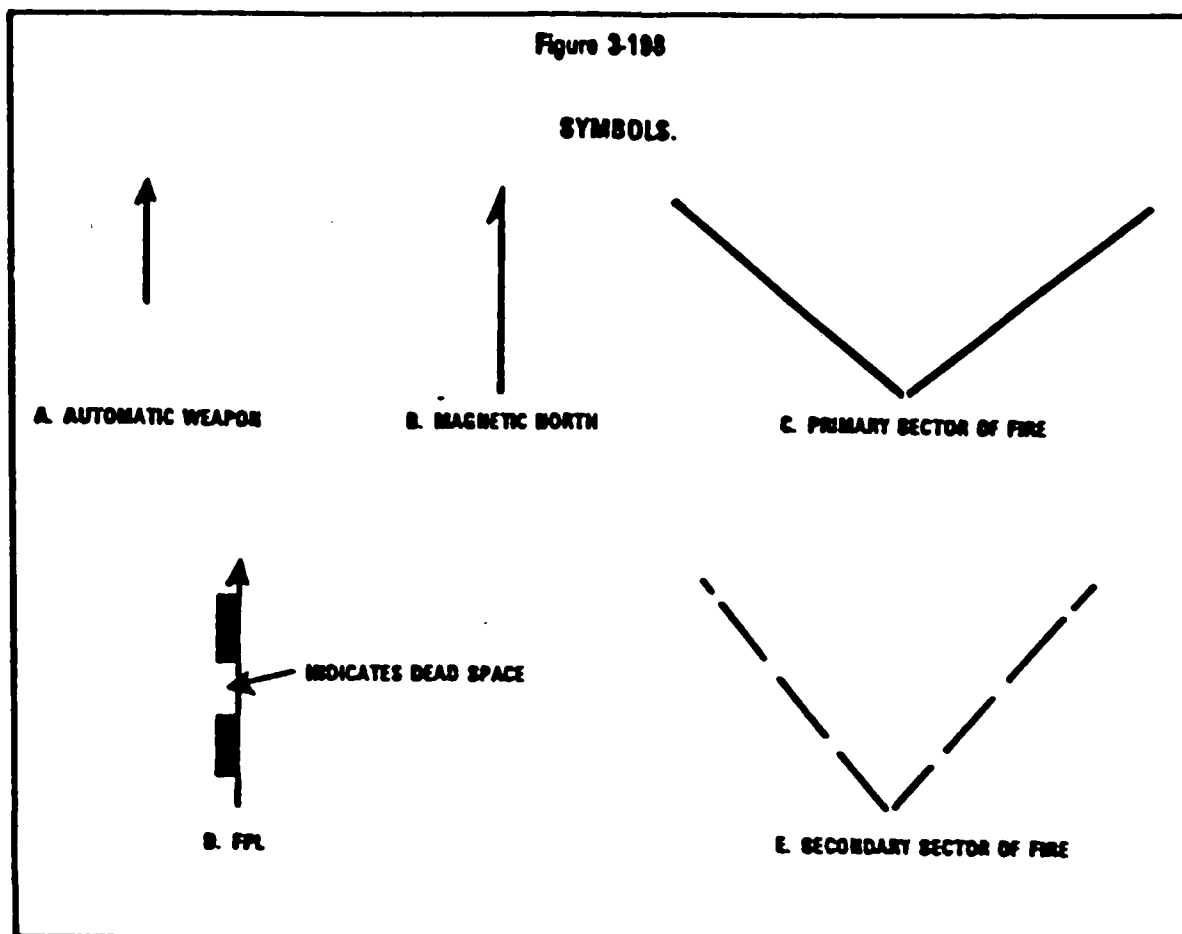
Notes:

    a. The range card—

        (1) Permits you to place fires on designated targets during periods of limited visibility (night, fog, smoke, etc.).

        (2) Facilitates a relief in place by providing the relieving gunner all the information needed to respond immediately to enemy action.

        (3) Provides information to the platoon leader and company commander for inclusion in their fire planning.

    b. Range cards are prepared in duplicate. One copy stays at the machine gun position, and the other is sent to the platoon headquarters. Complete range cards are prepared for primary positions, and partially complete range cards are prepared for alternate and supplementary positions. The gunner, assisted by the assistant gunner, must prepare the range card. Range cards are prepared immediately upon arrival in a position, regardless of the anticipated length of stay, and should be continually revised throughout the occupation of a position. The military symbols in figure 3-198 are used in preparing a range card.

Figure 3-198

SYMBOLS.

A. AUTOMATIC WEAPON

B. MAGNETIC NORTH

C. PRIMARY SECTOR OF FIRE

INDICATES DEAD SPACE

9. FPL

E. SECONDARY SECTOR OF FIRE

1. *Prepare the range card.*

a. Draw a rough sketch of the terrain to the front of the position. Include prominent natural and manmade features that could be likely targets, and center the machine gun position at the bottom of the sketch.

b. Fill in the lata section, to include—

(1) Gun number (or squad).

(2) Unit designation (platoon and company).

(3) Date.

(4) Magnetic north arrow.

c. Use the lensatic compass to determine magnetic north, and sketch in the magnetic north symbol (figure 3-198, symbol B) in the magnetic north block (figures 3-199 and 3-200).

d. Determine the location of the gun position in relation to a prominent terrain feature, such as a hilltop, road junction, or building. If no feature exists, place the eight-digit map coordinates of your position near the point where you determined your gun position to be (figure 3-199). If there is a prominent terrain feature within 1,000 meters of the gun, use that feature (figure 3-200).

3-131

Figure 3-131

RANGE CARD
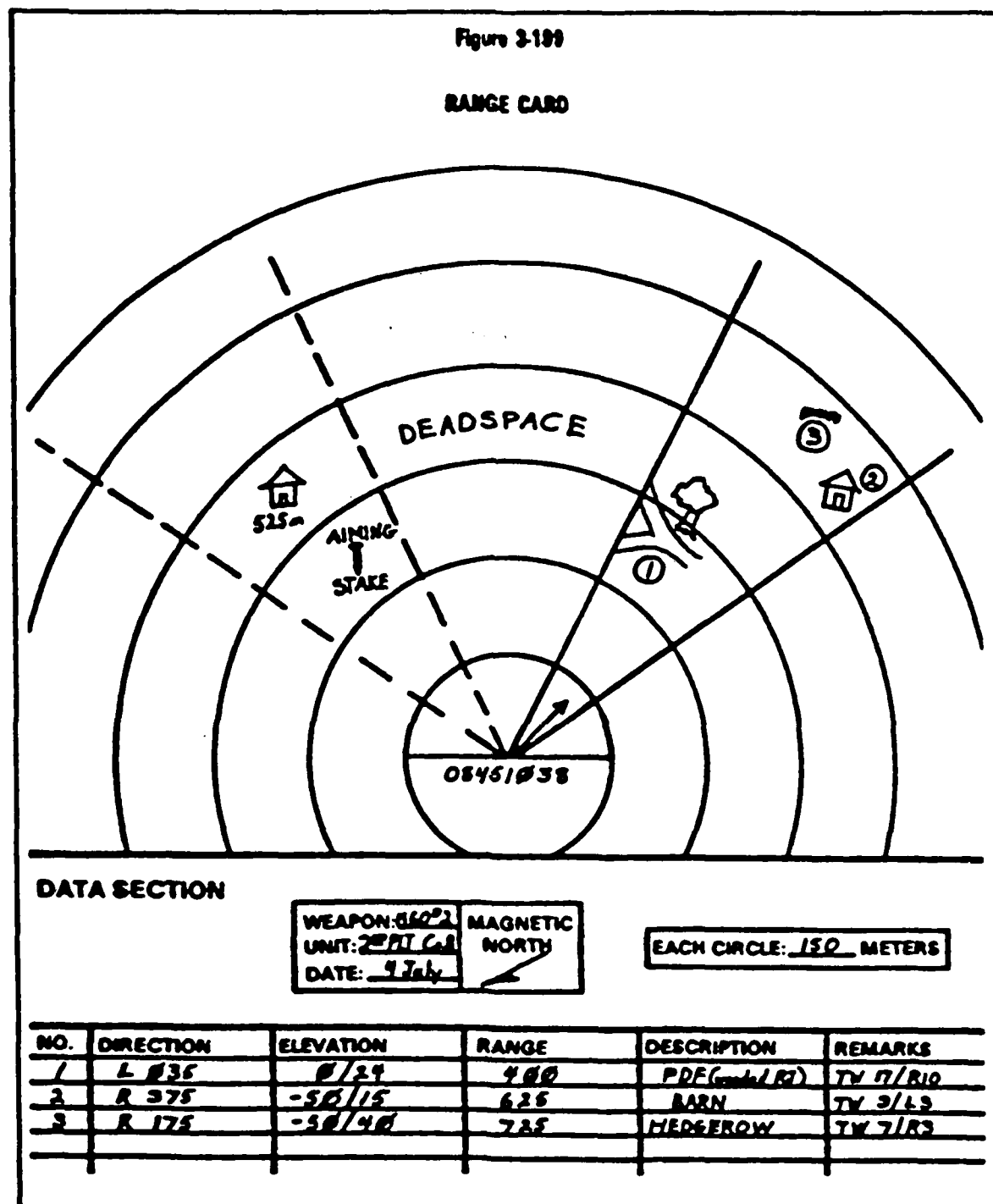
(1) Using a compass, determine the azimuth in mils or degrees from the terrain feature to the gun position, or from the gun position to the terrain feature. (Compute the back azimuth from the gun to the feature by adding or subtracting 3,200 mils or 180 degrees.)

(2) Determine the distance between the gun and the feature by pacing or from a map.

3-132

(3) Sketch in the terrain feature on the card in the lower left- or right-hand corner (whichever is closest to its actual direction on the ground) and identify it.

(4) Connect the sketch of the position and the terrain feature with a barbed line extending from the feature to the gun or from the gun to the feature.

(5) Record above the line the distance in meters.

(6) Record below the line the azimuth in mils or degrees from the terrain feature to the gun. The arrow's barbs indicate the direction the azimuth was taken.

e. Sketch in primary sector of fire (figure 3-198, symbol C) with a PDF or an FPL.

(1) Sketch primary sector with PDF (figure 3-199).

(a) Sketch in the limits of the primary sector of fire as assigned. (Sector should not exceed 875 mils, the maximum traverse of the tripod-mounted M60).

(b) Sketch in the symbol for an automatic weapon (figure 3-198, symbol A) oriented on the most dangerous target within your sector (as designated by your platoon leader).

(2) Sketch primary sector with an FPL (figure 3-200).

(a) Sketch in the limits of the primary sector of fire as assigned. (Sector should not exceed 875 mils.)

(b) Sketch in FPL (figure 3-198, symbol D) on sector limit as assigned by your leader. Have someone walk the FPL (if enemy situation permits) and determine dead space (sections of FPL where individual drops below line of sight). Reflect dead space on sketch by a break in the symbol for an FPL, and write in the range to the beginning and end of the dead space. Write in maximum range of graze (600 meters if no sharp rise or fall in terrain at a closer range). The FPL should be assigned to you only if a good distance of graze can be obtained. When such a line of fire exists, the primary sector will be assigned, based on it, with the FPL being the sector limit closest to friendly troops. If an FPL cannot be identified, a PDF must be assigned.

f. Label targets in primary sector in order of priority. FPL or PDF will be labeled as 1 (figures 3-199 and 3-200).

g. Sketch in secondary sector of fire (figure 3-198, symbol E) and label targets within the secondary sector with the range in meters from the gun to each. (The secondary sector will be fired into, when necessary, by using the bipod. The tripod, once emplaced for fire into the primary sector, should not be moved.) Sketch in aiming/elevation stakes.

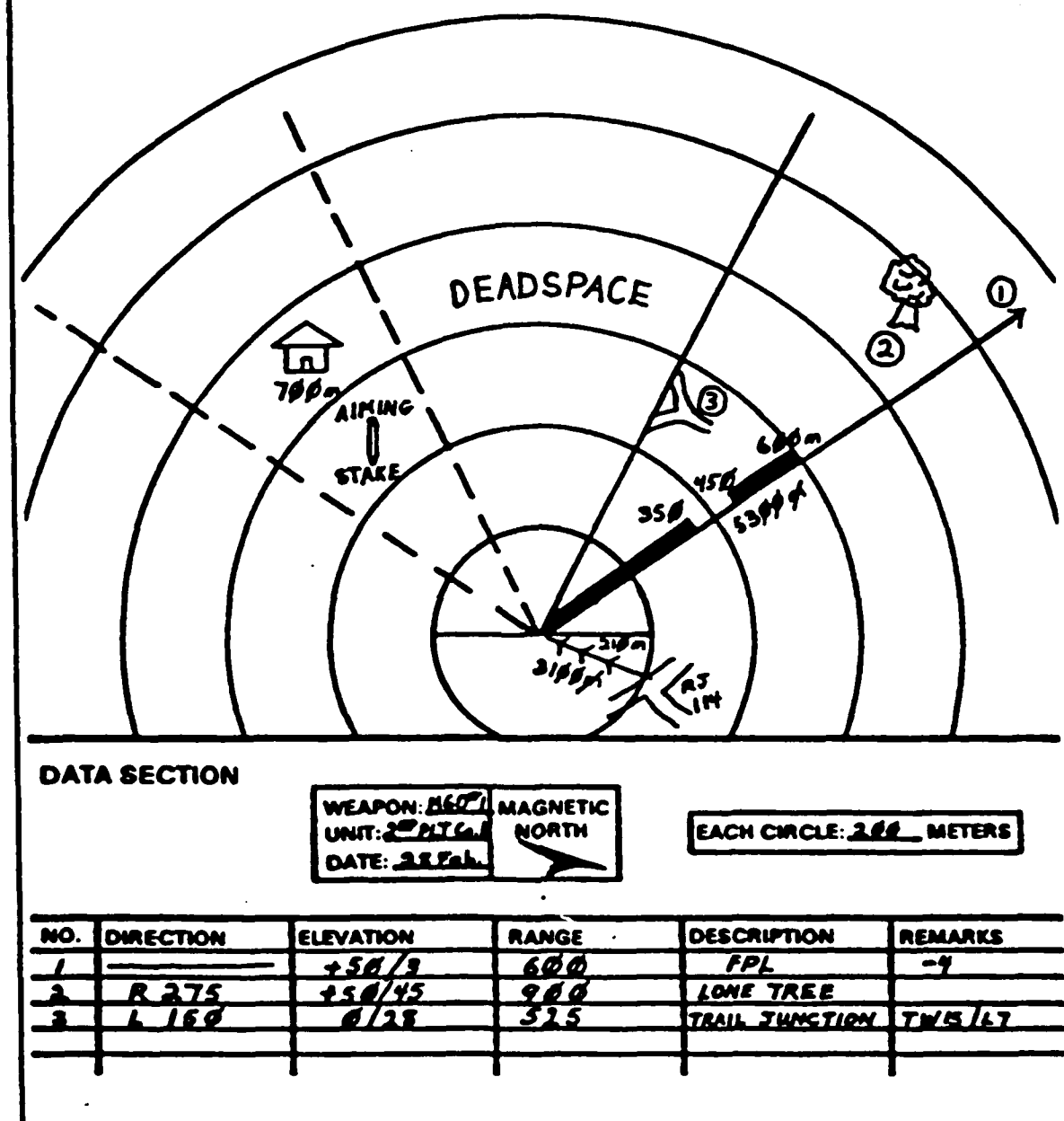(1) Aiming/elevation stakes will be used only in the secondary sector of fire.

(2) Aiming stakes will be solidly emplaced at the gun position so that the gun barrel can be placed on top of the aiming stake, thereby aligning the gun on the target. The stake will also be driven in the ground to the

correct height to provide the correct elevation of the gun barrel to engage the target when the barrel is placed on the stake.

(3) When aiming stakes are used, they will be shown on the range card between the gun position and the target they represent, as shown in figures 3-199 and 3-200.

Figure 3-200

RANGE CARD

DATA SECTION

WEAPON: _____ MAGNETIC
UNIT: 2 PLT C.A NORTH
DATE: 22 Feb.

EACH CIRCLE: 200 METERS

NO.	DIRECTION	ELEVATION	RANGE	DESCRIPTION	REMARKS
1		+50/3	600	FPL	-9
2	R 275	+50/45	900	LONE TREE	
3	L 160	0/28	325	TRAIL JUNCTION	TW5/L7

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2. *Prepare the data section using the traversing and elevating (T&E) mechanism (figure 3-201).*

　　a. On the same side of the card and below the sketch, complete the data section block (figures 3-199 and 3-200).

　　b. The preliminary steps are to

　　　　(1) Center traversing handwheel.

　　　　(2) Lay gun for direction.

　　　　　　(a) When assigned an FPL, lock traversing slide on extreme left or right of bar, depending on which side of primary sector FPL is on. Then align barrel on FPL by moving tripod legs. (No direction entry is needed in data section.)

　　　　　　(b) When assigned a PDF, align on primary sector by traversing slide to one side and then move tripod to align barrel on sector limit. Align on PDF by traversing the slide until machine gun is aimed on the center of the target.

　　　　(3) Fix tripod legs in place by digging in or sandbagging.

　　c. Read direction to each target.

　　　　(1) Lay your gun on the base of the target.

　　　　(2) Read the direction directly off the traversing bar at the left edge of the traversing bar slide (figure 3-201).

　　　　(3) Right or left reading is determined by direction of barrel (just the opposite of the slide).

　　d. Read elevation for each target.

　　　　(1) Lay gun on base of target by rotating elevating handwheel (figure 3-201).

　　　　(2) Read the number (to include + or - sign except for 0) above the first visible line on the elevating scale (figure 3-201 is -50).

　　　　(3) Read the number in line with the indicator off the elevating handwheel (figure 3-201 reading is 3).

　　　　(4) Enter that reading under the ELEVATION column of the range card data section, separating the two numbers with a slash (/). Always enter the reading from the upper elevating bar first (figure 3-201 reading is -50/3).

　　e. Enter the range to each target under appropriate column in the data section.

　　f. Enter the description of each target under appropriate column in data section.

　　g. Fill in the REMARKS column for each target as needed.

　　　　(1) Enter the width and depth (in mils) of linear targets. (The 4 in figure 3-200, REMARKS column, indicates that depressing the barrel 4 mils will cause the strike of the rounds to go down to ground level along the FPL.)

　　　　(2) When entering the target width (TW) in the REMARKS column, be sure to give the width in mils and express it as two values. For instance,

3-13!

Figure 3-201

TRAVERSING
HANDWHEEL

TRAVERSING SCREW

UPPER ELEVATING SCREW
AND PLATE WITH SCALE

ELEVATING HANDWHEEL
WITH SCALE

LOWER ELEVATING
SCREW

TRAVERSING BAR SLIDE
(USE LEFT EDGE TO OBTAIN
DIRECTION READINGS)

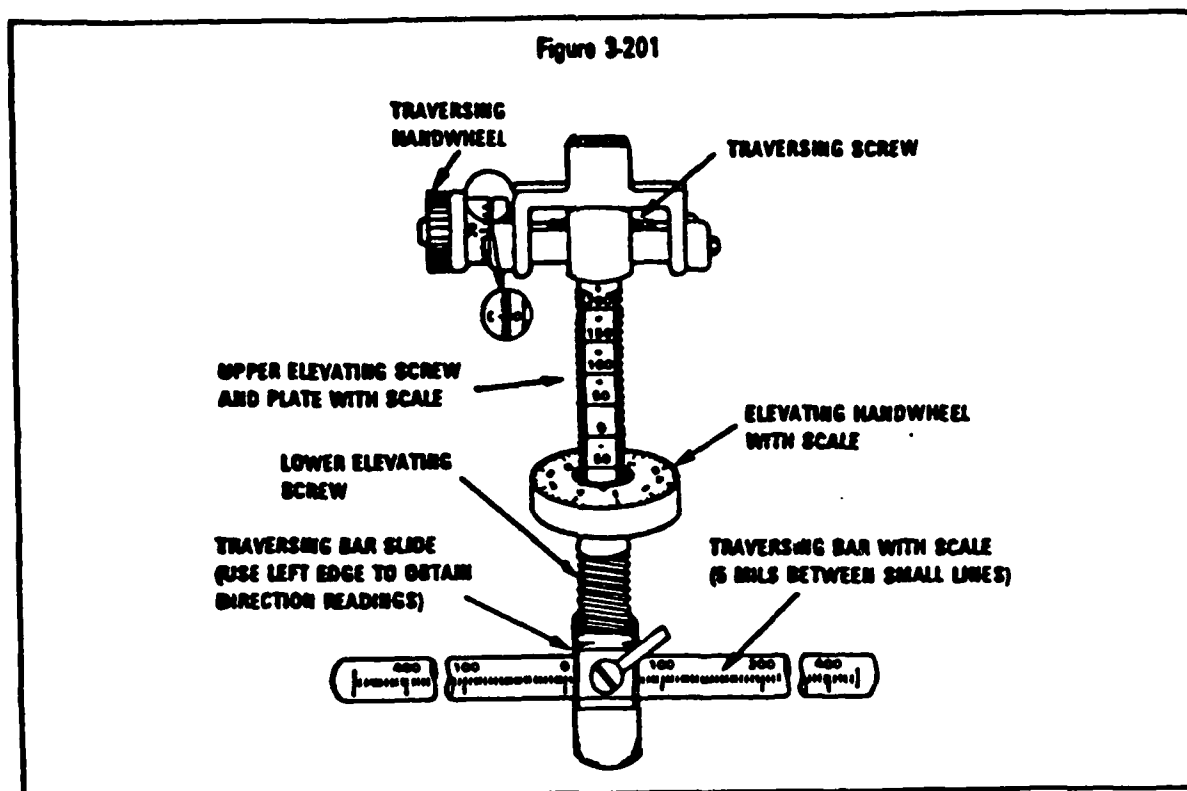TRAVERSING BAR WITH SCALE
(5 MILS BETWEEN SMALL LINES)

figure 3-199 shows target 3 has a width of 7 mils. The second value, R3, means that once the gun is laid on the target, traversing 3 mils to the right will lay the gun on the right edge of the target. Figure 3-200, target 3, shows the width of the target as 15 mils; traversing 7 mils to the left will lay the gun on the left edge of the target.

(3) Draw in aiming stakes if used for the target.

(4) No data for the secondary sector will be determined, since the gun will be fired in the bipod role.

Evaluation Preparation

Setup: Place a tripod-mounted M60 machine gun, a lensatic compass, pencil, and paper at the gun position.

Brief Soldier: Tell the soldier the left and right limits of the primary sector of fire. Point out either a principal direction of fire (PDF) or an FPL.

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Evaluation Guide: 071-312-3007
Prepare a Range Card for an M60 Machine Gun

Performance Measures	Results	
1. Orients the range card.	P	F
2. Draws a sketch of the terrain to the front of the position (prominent and man-made).	P	F
3. Fills in or constructs the marginal data section.	P	F

    a. Gun (or squad) number.

    b. Unit designation (platoon is all that is required).

    c. Date.

    d. Magnetic north arrow properly oriented.

| 4. Sketches machine gun symbol. | P | F |
| 5. Specified gun location in relation to prominent terrain feature or 8-digit grid coordinate. | P | F |

    a. Determines azimuth in mils from the terrain feature to the gun.

    b. Determines distance between the terrain feature and the gun.

    c. Sketches and identifies the terrain feature on the card.

    d. Connects the feature and gun with a barbed line.

    e. Writes the distance in meters above the line.

    f. Writes the azimuth in mils from the feature to the gun below the line.

| 6. Sketches in the primary sector with a PDF or an FPL. | P | F |
| 7. Labels targets in primary sector. | P | F |

Feedback

Score the soldier GO if all steps are passed. Score the soldier NO-GO if any step is failed. If the soldier fails any step, show what was done wrong and how to do it correctly.

REFERENCES

FM 23-67

Task
Operate Radio Set AN/PRC-77
(Task 113-587-2001)

Instructions to the soldier: You will be required to assemble the radio AN/PRC-77 so that it can transmit a message. You must make sure the radio is ready for operation at the end of 2 minues. The frequency that you must set on the radio is on a 3" x 5" card taped to the radio. If you damage the battery, you will be given a no go on this station.

Task	Pass	Fail
Performance Measures: (Sequence is not scored.)		
1. Install battery and lock battery box.	_____	_____
2. Attach handset.	_____	_____
3. Install antenna and antenna base.	_____	_____
4. Set the correct frequency.	_____	_____
5. Turn the radio on so that the radio can transmit.	_____	_____
6. Turn the volume up so that the radio can receive.	_____	_____
7. Complete performance measures 1 through 6 in 2 minutes.	_____	_____

	Go	No Go
Standard: To receive a GO on this test you must pass all performance measures.	☐	☐

874-896-3030

EVALUATE THE CONDUCT OF TRAINING

CONDITIONS

Given: You are required to evaluate a trainer conducting training on a given task. You should use the "Evaluation of Training Guide" checklist shown in table 3030-1.

STANDARDS

Evaluate the trainer's performance following, in order, the actions described in the performance measures below.

PERFORMANCE MEASURES

1. *Refresh your knowledge/skills of the task to be trained.* Practice the task, if necessary.

2. *Observe the training session(s) on the task.* Training should include the preparation, presentation, practice and performance evaluation phases.

3. *Evaluate the trainer's performance against the checklist at table 3030-1.* The preparation phase should be evaluated last. Base your judgments of preparation on what you observe during the training session(s). You may make notes, but don't score the evaluation.

EVALUATION OF TRAINING GUIDE

PRESENTATION SHOULD PROVIDE ONLY ENOUGH INFORMATION TO PREPARE SOLDIERS FOR PRACTICE.

- PERSONNEL AND EQUIPMENT SAFETY/SECURITY CAUTIONS STATED AND OBSERVED.
- TRAINING OBJECTIVE STATED CORRECTLY AND IN TERMS SOLDIERS UNDERSTAND.
- PRETEST USED TO IDENTIFY SOLDIERS NEEDING TRAINING (IF NOT CONDUCTED EARLIER).
- SOLDIERS TOLD WHY THEY MUST LEARN THE TASK.
- TASK AND STEPS CORRECTLY EXPLAINED.
- TASK AND STEPS CORRECTLY AND SAFELY DEMONSTRATED.
- APPROPRIATE TRAINING METHODS SELECTED AND USED.
- TAINING AIDS AND DEVICES USED TO INTEREST (NOT DISTRACT) SOLDIERS.
- PRESENTATION INCLUDED ONLY MATERIAL SOLDIERS NEED TO PERFORM THE TASK.
- PRESENTATION TECHNICALLY AND TACTICALLY CORRECT.
- RESOURCES USED EFFECTIVELY AND EFFICIENTLY.

Table 3030-1

EVALUATION OF TRAINING GUIDE CONTINUED

PRACTICE SHOULD DEVELOP SKILL TO THE DEGREE REQUIRED BY THE TRAINING OBJECTIVE.

- TASK EXPLAINED OR DEMONSTRATED AGAIN, AS NEEDED, UNTIL SOLDIERS UNDERSTOOD IT.
- PEER TRAINERS (IF USED) PROPERLY SUPERVISED.
- PRACTICE COACHED AND CRITIQUED BY THE TRAINER.
- PRACTICE BEGUN AT SOLDIERS' SKILL/KNOWLEDGE LEVEL, WITH MORE REALISTIC CONDITIONS AND TOUGHER STANDARDS ADDED UNTIL SOLDIERS MET THE STANDARD.
- PRACTICE TACTICALLY AND TECHNICALLY CORRECT.
- ENOUGH TIME FOR PRACTICE ALLOWED.
- SUFFICIENT TRAINING AIDS, RESOURCES, AND MATERIALS AVAILABLE.
- PRACTICE ENDED WHEN SOLDIERS COULD PERFORM THE TASK TO STANDARDS.

PERFORMANCE SHOULD BE EVALUATED TO DETERMINE WHETHER SOLDIERS CAN MEET THE TRAINING OBJECTIVE AFTER TRAINING.

- STANDARDS ENFORCED DURING EVALUATION.
- SOLDIERS GIVEN ONLY AUTHORIZED CUES AND HELP.
- SOLDIERS PERFORMED TO STANDARDS SAFELY.
- SOLDIERS WHO DID NOT PERFORM TO STANDARDS GIVEN EXTRA PRACTICE, TIME PERMITTING.
- GO OR NO-GO RECORDED IN JOB BOOKS.

TRAINERS, SOLDIERS, AND RESOURCES SHOULD BE PREPARED FOR THE TRAINING.

- TRAINER WAS KNOWLEDGEABLE, ORGANIZED, CONFIDENT, AND ENTHUSIASTIC.
- TRAINER USED ALL EQUIPMENT AND AIDS EFFECTIVELY.
- SOLDIERS WERE PRESENT AT THE TRAINING SITE WITH THE CORRECT UNIFORM AND EQUIPMENT.
- ADEQUATE RESOURCES AND EQUIPMENT WERE ON HAND.
- EQUIPMENT WAS COMPLETE AND SERVICEABLE.
- FACILITY/SITE WAS ADEQUATELY PREPARED FOR TRAINING.
- FACILITY/SITE AS FREE AS POSSIBLE FROM DISTRACTIONS.

THE TRAINER SHOULD BE SUPPORTED BY PERFORMANCE-ORIENTED TRAINING MANAGEMENT. (REPORT RESULTS IN THESE AREAS TO THE CHAIN OF COMMAND.)

- TRAINER WAS GIVEN ENOUGH GUIDANCE AND TIME TO PLAN AND PREPARE FOR TRAINING.
- TRAINER WAS PROVIDED WITH AN ADEQUATE TRAINING OBJECTIVE
- SOLDIERS WERE GIVEN NECESSARY PRELIMINARY TRAINING.
- FACILITY/SITE PROVIDED WAS ADEQUATE.

Table 3030-1 continued

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4. *Critique the trainer after the training has been completed.*

5. *Report your evaluation findings to the chain of command.*

REFERENCES

FM 25-3

Note: FM 25-3 will replace FM 21-6, Nov 75, How to Prepare and Conduct Military Training. (FM 25-3 is expected to be available by mid-1982.)

CONTEXT

Enemy direct and indirect fires can delay and destroy your unit. Your ability to request accurate and responsive artillery fires will help your unit to survive and to accomplish its mission.

CUES

- You encounter an enemy platoon that will hinder the accomplishment of your unit's mission.

- Your unit is unable to maneuver because of enemy direct fire weapon systems.

CONDITIONS

MATERIEL

- Binoculars.

- Compass.

- Map sheet, 1:50,000.

- Coordinate scale.

PERSONNEL

None.

CONSTRAINTS

Communications with a battery or battalion fire direction center (FDC) are required.

STANDARDS

- The completed initial call for fire must be made within 3 minutes after target identification.

- Adjustments must be sent within 30 seconds after the impact of each round.

- Observer must neutralize the target (round must impact within 50 meters of the target) with no more than five adjustments.

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PERFORMANCE MEASURES

- Determine target location to an accuracy of 100 meters (six-place grid).

- Determine target location using the polar-plot method.

  - Determine the observer-target (OT) direction.

NOTE: Direction is measured to an accuracy of 10 mils.

  - Estimate the distance to the target (nearest 100 meters).
    Example: Direction 4,800 mils; distance 3,100 meters.

NOTE: In the polar-plot method, the FDC must know the observer's location.

- Determine target location using the **shift from a known-point method.**

  - Identify a known point (point whose location is known to the observer and the FDC).

  - Determine the OT direction.

  - Determine the lateral shift from the known point to the target. (Lateral shift is expressed to the nearest 10 meters).

  - Determine the difference in distance between the target and the known point. (Difference is expressed to the nearest 100 meters).
    Example: Direction 430 mils; left 320 meters; add 400 meters.

- Locate a target by determining the cardinal direction (N, NE, E, etc.) and distance from a readily identifiable natural or man-made feature.
  Example: Machine gun position 500 meters northeast of Thompson's Bridge.

- Locate a target by providing the FDC with a direction along a linear, natural, or man-made object. (Distance from the terrain feature or man-made object is also required.)
  Example: Patrol moving along Route 20 towards Emmersonville, 300 meters from the intersection of Route 20 and Route 81.

- Send the initial call for fire according to the following:
  - Transmit first portion of the call for fire by—

    - Identifying observer (call sign of FDC followed by observer call sign).

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- Identifying target location method (grid, polar, or shift from a known point).
  Example: D99 THIS IS R51, ADJUST FIRE, OVER. (GRID)
  A57 THIS IS F82, ADJUST FIRE, POLAR, OVER. (POLAR)
  N16 THIS IS H34, FIRE FOR EFFECT, SHIFT AA7750, OVER. (SHIFT)

NOTE: The word "grid" is not announced in this portion of the call for fire.

- Transmit target location.
  Example: GRID 698327, OVER. (GRID)
  DIRECTION 5210, RIGHT 260, ADD 400, OVER. (SHIFT)

- Transmit final segment of the call for fire to include:

  - Target description. (This may include type, size, activity, and degree of protection).

  - Method of engagement. (This may include type of trajectory, type of ammunition, distribution of fire, volume of fire, and type of fuze.)

WARNING

If the target is within 600 meters of friendly troops, the term "DANGER CLOSE" must be included in this portion of the call for fire.

- Method of fire control. (This may include information, such as at my command, cannot observe, or time on target.)
  Example: INFANTRY COMPANY IN OPEN, ICM, CANNOT OBSERVE, OVER.

- Submit suppression or immediate suppression calls for fire in one transmission. The information above is delegated.

- Adjust round impact for deviation according to the following:

- Determine and submit OT direction before or with the first correction.

- Determine deviation correction to the nearest 10 meters.

NOTE: Deviation corrections of 20 meters or less are ignored except for final corrections.

- Transmit the deviation correction as LEFT or RIGHT (so many meters) in conjunction with the large range correction.

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- Adjust to establish a bracket and attack the target according to the following:

  - Determine range corrections that will result in alternate range spottings of over and short by using successive bracketing.

  - Transmit corrections to FDC as LEFT or RIGHT (so many meters) and ADD or DROP (so many meters).
    Example: LEFT 100; ADD 200; OVER.

WARNING

When the target is within 500 meters of friendly troops, creeping procedures must be used. (Range adjustments do not exceed 200 meters, and a bracket is not established).

- End the fire mission according to the following:
  - Continue adjustments until the burst is within 50 meters of the target and either request FIRE FOR EFFECT or announce END OF MISSION.
    Example: RIGHT 30; DROP 50; FIRE FOR EFFECT; OVER.

  - Observe and report results of fire for effect.
    Example: END OF MISSION; 20 CASUALTIES; INFANTRY DISPERSED.

REFERENCES

FM 6-30.

FM 6-40.

~~TEC Lesson 949-061-0005F.~~

~~TEC Lesson 949-061-0006F.~~

PROPONENT

US Army Field Artillery School
ATTN: ATSF-DP
Fort Sill, OK 73503

13 January 1984

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APPENDIX E

Evaluation Questionnaire

QUESTIONNAIRE FOR TRAINING COURSE

"PREDICTING MILITARY TASK RETENTION"

Your answers to the following questions will provide us with evaluation information about the course you have just taken. Your name on the form is optio 3l. However, we would appreciate your indicating your job title in the space provided at the end of the form. Thank you for your assistance.

1. Based on the training you have just completed, how well prepared do you think you are to use the task rating system?

_____ Very well prepared - I feel that I can rate almost any task.

_____ Fairly well prepared - but I could use some additional practice before I feel comfortable with the system.

_____ Somewhat prepared - I have gaps in my understanding of how to use the system.

_____ Not prepared - I would have difficulty applying the system.

If you answered "Somewhat" or "Not prepared", please indicate the areas where you feel you are inadequately prepared. _____
_____
_____
_____
_____

2. Based on the training you have just completed, how well prepared do you think you are to train others on the use of the rating system?

_____ Very well prepared - I feel I could train almost anyone to use the system.

_____ Fairly well prepared - but I would need some additional study and guidance before I could train anyone else to use the system.

_____ Somewhat prepared - there are some areas where I would have difficulty training others.

_____ Not prepared - I do not think I could train anyone else to use the rating system.

If you answered "Somewhat" or "Not prepared", please indicate the areas where you would have difficulty training others to use the rating system. _____

_____

_____

_____

_____

3. Do you see any potential uses for the task rating system in your school? ____yes ____no

If you answered "yes", please indicate the areas where you feel the system could be used. _____

_____

_____

_____

_____

4. Do you see any potential barriers to the use of the task rating system in your school? ____yes ____no

If you answered "yes", please indicate the barriers you feel would hinder the use of the system (e.g. the system itself is not useful; the system will not work with the tasks for which the school is responsible; lack of information; lack of time to do the ratings, etc.) _____

_____

_____

_____

_____

5. Please indicate the quality of the course itself by selecting the appropriate response for each area. Additional comments would be appreciated to help explain your answers.

    a. Length of course:

        ____ Much too long

        ____ A little too long

        ____ The right length

        ____ A little too short

        ____ Much too short

        Comment: _____
        _____

    b. Organization of course:

        ____ Very well organized

        ____ Organization adequate

        ____ Not well organized

        Comment: _____
        _____

    c. Clarity of materials and instructions:

        ____ All very clear

        ____ Most very clear

        ____ Some very clear

        ____ None very clear

        Comment: _____
        _____

    d. Use of task examples for practice:

        ____ Good selection of tasks

        ____ Adequate selection of tasks

        ____ Poor selection of tasks

        Comment: _____
        _____

e. Facilities:

_____ Good facilities for training

_____ Adequate facilities for training

_____ Poor facilities for training

Comment: _____
_____

f. Size of class:

_____ Class size OK

_____ Class a little too big for this type of training

_____ Class much too big for this type of training

Comment: _____
_____

Name (optional) _____

Job Title _____

Date _____