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RESERVE COMPONENT UNIT EVALUATION ANALYSIS (COST-EFFECTIVENESS)--ETC(U)
MAR 76 J BERCOS, J R CHIORINI, R C EAKINS DAAG39-75-C-0135

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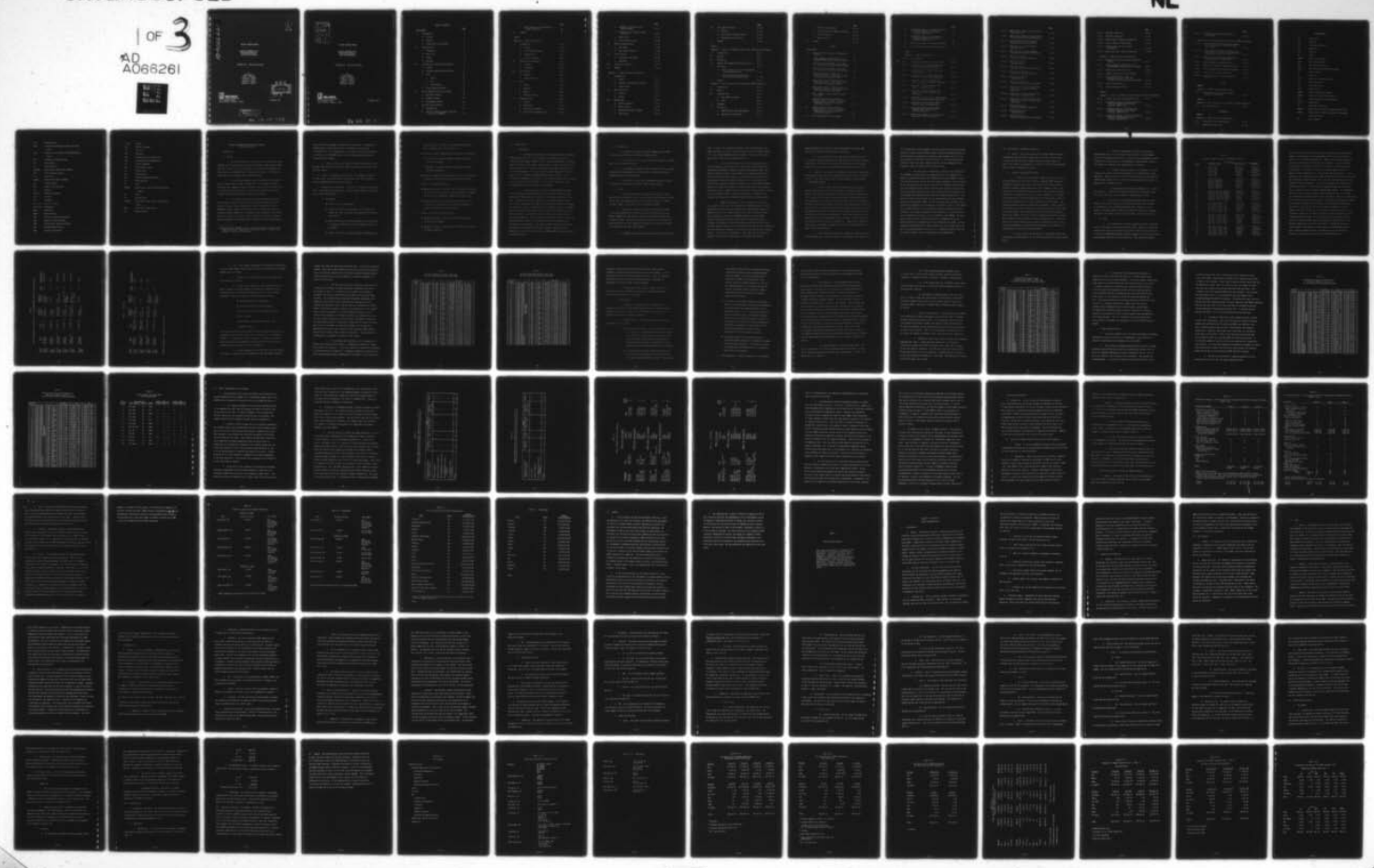

SECOND INTERIM REPORT

RESERVE COMPONENT UNIT EVALUATION ANALYSIS (COST-EFFECTIVENESS)

CONTRACT NO. DAAG 39-75-C-0135

by
James Bercos
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Falls Church, Virginia 22042

15 March 1976

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ABBREVIATIONS

AA	Active Army
Abn	Airborne
ADA	Air Defense Artillery
AM	Ammunition
Ambl	Airmobile
AR	Armor
ARCOM	Army Reserve Command
ARNG	Army National Guard
ARR	Army Readiness Region
ARTEP	Army Training and Evaluation Program
AT	Annual Training
at	Antitank
ATEP	Annual Training Equipment Pool
ATT	Army Training Test
C-E	Cost-Effectiveness
comm	Communications
CONARC	USA Continental Army Command
CONUSA	Continental United States Armies
COR	Contracting Officer's Representative
Co/Tm	Company/Team
DA	Department of the Army
DCSOPS	Deputy Chief of Staff for Operations and Plans
DCSRDA	Deputy Chief of Staff for Research, Development and Acquisition
DS	Direct Support

EC	Evaluation Cost
ECA3	Evaluation Cost Based on Actual Cost Data, Level 3
ECD2	Evaluation Cost Based on the ARTEP Document, Level 2
ECS	Equipment Concentration Site
EM	Enlisted Men
FA	Field Artillery
FORSCOM	United States Army Forces Command
FTX	Field Training Exercise
FY	Fiscal Year
GOCOM	USAR General Officer Command
GS	General Support
IDT	Inactive Duty Training
IN	Infantry
IN (M)	Mechanized Infantry
JP4	Jet Fuel
KM	Kilometer
L1, 2, 3	Levels 1, 2 and 3
Maint, MT	Maintenance
Mech	Mechanized
MOGAS	Motor Gasoline
MOS	Military Occupational Specialty
MTC	Maneuver Training Command
MUTA	Multiple Unit Training Assembly
NCO	Noncommissioned Officer
NGB	National Guard Bureau

O, OFF	Officer
OIC	Officer in Charge
PD	Per Diem
PER	Personnel
POL	Petroleum, Oils and Lubricants
POM	Program Objective Memorandum
RC	Reserve Component
SAG	Study Advisory Group
SC	Signal Corps
SO	Safety Officer
SOP	Standard Operating Procedure
SP	Self-Propelled
TK	Tank
TRADOC	United States Army Training and Doctrine Command
TVL	Travel
TY	Training Year
USACATB	United States Army Combat Arms Training Board
USAR	United States Army Reserve
WO	Warrant Officer

RESERVE COMPONENT UNIT EVALUATION ANALYSIS
(Cost-Effectiveness)

I. Introduction.

A. General.

1. This interim report is the second of two on the study Reserve Component Unit Evaluation Analysis (Cost-Effectiveness) under Contract Number DAAG 39-75-C-0135. It is duly submitted in accordance with paragraph 3 of Disposition Form, DAMO-ODU, dated 16 January 1976, subject: Study Advisory Group (SAG) Reserve Component Unit Evaluation Analysis.

2. The First Interim Report was duly submitted to the Contract Officer's Representative (COR) on 15 May 1975. It presented a detailed study plan and a summary of progress from the start of work, 18 February 1975. At a meeting with Litton-Mellonics on 10 June 1975 the SAG discussed and commented on the study methodology proposed in the report.

3. As a part of the discussion at the June meeting the point was made that the United States Army Forces Command (FORSCOM) and Litton-Mellonics "should exchange information to insure instructions issued by FORSCOM for Annual Training (AT) 76 utilization of the Army Training and Evaluation Program (ARTEP) are in consonance with developments in the study."[1] Toward this end, the SAG requested Litton-Mellonics to provide an informal report to FORSCOM in mid-November 1975, in advance of the next formal report

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[1]Disposition Form, DAMO-ODU, dated 13 June 1975, subject: Study Advisory Group (SAG) Reserve Component Unit Evaluation Analysis (10 June 1975); Inclosure: Minutes of the Meeting.

(the present one) programmed for submission in early 1976. Accordingly, an Informal Report of Preliminary Results was submitted to the COR on 17 November 1975. The recommendations in the present report were developed in consideration of FORSCOM comments on the informal report and related coordination with FORSCOM.

4. Delivery of the final report is planned for mid-October 1976, the end of the contract period, with a draft final report due at least sixty (60) days earlier.

B. Purpose. The purpose of this report is to document all aspects of work to date, to present findings based on this work, and to propose a plan for implementing and testing the findings.

C. Organization of the Report. The report is divided into three major parts: a Main Report and two Annexes. The main report comprises six sections and each annex two appendixes.

1. Main Report.

- Section I is this introduction.
- Section II reviews the background, lists the objectives, defines the scope and outlines the approach of the overall study effort.
- Section III presents the options found to be cost-effective in conducting evaluations of Reserve Component (RC) units with ARTEP.
- Section IV describes a suggested program for implementing

and testing the cost-effective options during the latter half of Training Year (TY) 76 and AT 76.

- Section V presents summaries of two ancillary investigations:
  - o Results of an analysis of ARTEP evaluator tasks and position assignments;
  - o Findings of a survey of major training sites suitable for ARTEP evaluations.
- Section VI summarizes the study progress to date and outlines the plan of the study effort to the end of the contract.

2. Annex A - Cost and Effectiveness.

- Appendix 1 discusses, in detail, the cost elements considered, the collection of cost data, and the development of estimates of total cost of evaluations conducted with each option.
- Appendix 2 discusses the definition of effectiveness, the collection of effectiveness data, and the development of indexes of effectiveness for each option.

3. Annex B - Evaluators and Training Sites.

- Appendix 1 presents an analysis of ARTEP evaluator tasks and position assignments.
- Appendix 2 presents a survey of major training sites suitable for ARTEP evaluations.

II. Study Overview.

A. Background.

1. The ARTEP was developed by the Training and Doctrine Command (TRADOC) during 1973-1974 as a continuation of efforts initiated by the Continental Army Command (CONARC) in 1971. First available were Test Edition ARTEP for infantry, armor (tank), field artillery, signal, and engineer units. These were used in the field by selected Active Army units during the fall of 1974 and throughout 1975 and by selected RC units during AT 75, all as a part of the joint TRADOC and FORSCOM ARTEP validation effort. Lessons learned and recommendations presented in the validation reports were considered in revising the field tested ARTEP as well as, where applicable, in the development of first edition other type unit ARTEP.

2. In developing and validating the ARTEP TRADOC and FORSCOM efforts primarily centered on demonstrating the concepts feasibility and improving the ARTEP utility as a guide for training and evaluation of Army units. Efforts were not made systematically to define the most suitable ways of fully implementing the ARTEP as a training and evaluation instrument. In particular, relative to implementing the evaluation portion of the ARTEP, questions of controller/evaluator source, frequency of evaluation, applicability to different type units, aggressor source, and the like were not specifically addressed. For the evaluation of RC units these were especially cogent questions because of the importance of effective evaluations in determining training readiness and planning remedial training as necessary. Accordingly, the Department of Army (DA) awarded a contract to Litton-Mellonics for this study entitled Reserve Component Unit Evaluation Analysis (Cost-Effectiveness).

B. Objectives.

1. To analyze alternative approaches implementing the ARTEP in assessing the effectiveness of Reserve Component units.

2. To identify the costs of each alternative approach to include money, men, and collateral impact.

3. To recommend assessment systems (frequency of testing, manner of application) from among those considered for use in periodic Reserve Component evaluations with the ARTEP.

4. To identify units (by type, deployment objectives, mission to be tested) with which the assessment systems should be used.

C. Scope.

1. In the main the title, background, and objectives of the study concisely defined its scope. They are specific that the study concern only RC units and implementation of the evaluation portion of the ARTEP, and that it employ cost-effectiveness (C-E) analysis methods.

2. Alternative approaches (options) for implementing ARTEP in assessing performance of RC units were derived from discussions with TRADOC, FORSCOM, and other agencies involved in defining unit proficiency assessment methods. The options considered in the study, as presented and discussed herein, are those approved by the SAG after a review of a larger list presented in the First Interim Report.

3. Six ARTEP (test editions) were available at the start of the

study. Of these, four (Mechanized Infantry, Tank, Field Artillery, and Combat Engineer) were used by nine RC battalions and one RC company during AT 75 in the TRADOC/FORSCOM validation program. These ten (10) were the only RC units evaluated using ARTEP during AT 75.

4. Cost and effectiveness data for the ten evaluations were collected through coordination with the United States Army Combined Arms Training Board (USACATB), FORSCOM, the National Guard Bureau (NGB), State Adjutants General concerned, and personnel of the participating RC units and the controller/evaluator groups. Cost data from this experience were extrapolated to options not employed during AT 75. Cost data also were developed for suggested evaluations outlined in the several ARTEP documents. Quantitative expressions (indexes) of option effectiveness were developed from expert military judgments obtained from branch school personnel involved in the development of ARTEP, evaluators/controllers, evaluated RC unit personnel, and cognizant DA, FORSCOM, TRADOC, USACATB, and SAG personnel.

5. ARTEP for approximately forty (40) different type units are available at this time. In accordance with FORSCOM guidance the three Continental United States Armies (CONUSA) have scheduled approximately one hundred RC units to be evaluated during AT 76 using ten different ARTEP. With coordinated assistance from FORSCOM, USACATB, the three CONUSA, cognizant Army Readiness Regions (ARR), NGB, State Adjutants General concerned, and personnel of the participating RC units and the controller/evaluator groups C-E data will be collected for sixty (60) of these evaluations. The sixty constitute a program to test initial selections of prime candidate options. (See section IV, paragraph B.) These data, the data collected during AT 75, and other relevant data to be obtained from available

planning documents and schedules, and from personnel at cognizant Army agencies will constitute the data base for the study.

6. The end product of the study will be identified sets of cost-effective options recommended for implementation in RC unit evaluations using ARTEP. If different options are more cost-effective for different types of units, unit-specific implementation programs will be described.

D. Approach. The work to be performed was divided into three phases corresponding to the three major tasks described in the contract statement of work: Collection of Data, Analysis of Alternatives, and Development of a Recommended Program.

1. The first phase consisted of planning actions and data collection necessary for the start and conduct of subsequent analytical efforts. The planning included the identification of data elements needed for C-E analysis, the review of existing potentially relevant data bases, the development of data collection materials, and visits to a large number of agencies involved with ARTEP to coordinate the foregoing and to facilitate data collection. The identification of data elements involved the definition of implementation options, the identification of major cost elements, and the definition of evaluation effectiveness. Most of the planning and some of the data activities accomplished during this phase were the subjects of sections III and IV of the First Interim Report. Some of this information, as necessary, is included in Appendixes 1 (Cost) and 2 (Effectiveness) to Annex A of the present report.

2. The second phase involved the completion of data collection, the final definition of analysis parameters and procedures, the analysis of

all collected data, the development of relative option cost and effectiveness measures to identify prime candidate ARTEP evaluation implementation options, and the design of a program for testing the prime candidate options in the field during the latter half of TY 76 and at AT 76. The work accomplished during this phase, the prime candidate options, and the recommended test program are the major subjects of the present report.

3. The third phase, already begun, involves close coordination with FORSCOM in planning the field implementation of the recommended test program, coordinated assistance from FORSCOM and the three CONUSA to collect cost and effectiveness data for the test program evaluations, and the analysis of all collected data to verify or revise the C-E estimates associated with the prime candidate options tested. The phase also involves the collection of cost and effectiveness data for selected evaluations (not included in the test program) using ARTEP not used in RC unit evaluations during AT 75, the analysis of these collected data, and the identification of prime candidate options for the pertinent ARTEP. Finally, the phase effort includes, where feasible and applicable, the extension of C-E analysis results to other ARTEP. For all data collection it is envisaged that materials developed and used in Phases 1 and 2 might be adapted and that additional or revised materials will be developed as necessary, all in coordination with FORSCOM. The phase and the study end with the identification of a recommended set of cost-effective options for implementing RC unit evaluations using ARTEP, and the preparation and submission of a final report of all work accomplished in the phase, all previous project activities (i.e., significant portions from the two interim reports), and final conclusions and recommendations.

III. Cost-Effective Implementation Options.

A. General. This section defines the candidate ARTEP evaluation implementation options finally considered in the study, discusses data collected and used, presents estimates of option cost and indexes of option effectiveness, and through a C-E analysis identifies prime candidate ARTEP evaluation implementation options.

B. Candidate Implementation Options.

1. In the First Interim Report seventy-two basic and a to-be-determined multiple of twenty-four composite candidate ARTEP evaluation implementation options were described in terms of five option variables - evaluation schedule, organizational level tested, aggressor source, test configuration, and controller/evaluator source. The first four variables, respectively, included three, two, two, and two alternatives. The fifth included three and a to-be-determined number of selected mixes (ratios of Active Army to RC personnel in a mixed controller/evaluator group). The evaluation schedule variable included three frequencies - annual, biennial, and triennial; the source of aggressor variable allowed for all Active Army or all RC personnel; the organizational level tested variable considered battalion or company size units; the test configuration variable delineated the evaluated unit pure from the evaluated unit combined (e.g., task force); and the controller/evaluator source variable allowed for all Active Army, all Reserve Component (all Maneuver Training Command or all other RC), or selected mixes of Active Army and RC personnel.

2. At the 10 June 1975 SAG meeting it was agreed to apply the following as a screening process to the options proposed in the First Interim Report.

a. Eliminate combined arms testing as an alternative. FORSCOM emphasis will be on testing pure units without cross attachments required for combined arms operation. (Since the test configuration variable included only two alternatives, the elimination of combined arms testing as one effectively eliminated test configuration as a variable.)

b. Eliminate aggressor source as an alternative. RC units tested at Active Army installations normally will be provided Active Army aggressors. However, RC units tested at other sites will have RC aggressors. FORSCOM cannot support the costs involved in providing Active Army units as aggressors for all ARTEP testing.

c. Expand frequency of testing alternatives to 2, 3, and 4 year intervals. Delete from consideration the one year alternative since even Active Army units are not required to undergo annual testing.

3. On the basis of the foregoing SAG guidance and the Litton-Mellonics study team's selection of three specific mixes to be included as alternatives in the controller/evaluator source variable, a set of thirty-six candidate ARTEP evaluation implementation options was developed. The options, described in terms of three variables, are listed in Table 1.

C. Data.

1. It was infeasible to design a program of RC unit evaluations for AT 75 especially to provide data for the study. Therefore, all the data used for this report were collected during AT 75 relative to the RC portion of the joint FORSCOM/TRADOC ARTEP validation program. The RC portion involved four different ARTEP and ten affiliated units - four Mechanized Infantry,

Table 1.

Candidate ARTEP Evaluation Implementation Options

Number	Description		
	Evaluator Source	Level Tested	Frequency
1	Active Army	Battalion	Biennial
2	Active Army	Battalion	Triennial
3	Active Army	Battalion	Quadrennial
4	Active Army	Company	Biennial
5	Active Army	Company	Triennial
6	Active Army	Company	Quadrennial
7	Reserve Component	Battalion	Biennial
8	Reserve Component	Battalion	Triennial
9	Reserve Component	Battalion	Quadrennial
10	Reserve Component	Company	Biennial
11	Reserve Component	Company	Triennial
12	Reserve Component	Company	Quadrennial
13	Maneuver Training Command	Battalion	Biennial
14	Maneuver Training Command	Battalion	Triennial
15	Maneuver Training Command	Battalion	Quadrennial
16	Maneuver Training Command	Company	Biennial
17	Maneuver Training Command	Company	Triennial
18	Maneuver Training Command	Company	Quadrennial
19	Mix (Active Army > RC)	Battalion	Biennial
20	Mix (Active Army > RC)	Battalion	Triennial
21	Mix (Active Army > RC)	Battalion	Quadrennial
22	Mix (Active Army > RC)	Company	Biennial
23	Mix (Active Army > RC)	Company	Triennial
24	Mix (Active Army > RC)	Company	Quadrennial
25	Mix (RC > Active Army)	Battalion	Biennial
26	Mix (RC > Active Army)	Battalion	Triennial
27	Mix (RC > Active Army)	Battalion	Quadrennial
28	Mix (RC > Active Army)	Company	Biennial
29	Mix (RC > Active Army)	Company	Triennial
30	Mix (RC > Active Army)	Company	Quadrennial
31	Mix (Active Army ≅ RC)	Battalion	Biennial
32	Mix (Active Army ≅ RC)	Battalion	Triennial
33	Mix (Active Army ≅ RC)	Battalion	Quadrennial
34	Mix (Active Army ≅ RC)	Company	Biennial
35	Mix (Active Army ≅ RC)	Company	Triennial
36	Mix (Active Army ≅ RC)	Company	Quadrennial

three Tank, and two 155 mm (SP) Field Artillery battalions, and one Engineer company. Litton-Mellonics study team members were on site at all but one evaluation (a Field Artillery battalion). Table 2 lists the ten evaluations, and outlines the context in which they were conducted. For each the data include dates of evaluation, identity of evaluated unit, name and location of evaluation site, identity of controller/evaluator group, identity of aggressor, ARTEP evaluation level, and evaluated unit configuration. Seven evaluations were conducted at Active Army installations; five of the seven where the controller/evaluator personnel were stationed. The remaining three were conducted at ARNG installations. In all the evaluations all evaluators were Active Army personnel. Seven evaluations employed elements of Active Army units as aggressor forces, and three employed ARNG elements. All evaluations but one (a Field Artillery battalion) were conducted at level 3. Two Tank and two Mechanized Infantry battalions were evaluated in task force configuration; all other battalions were evaluated pure. The platoons of the Engineer company were attached to companies of the Mechanized Infantry battalion undergoing evaluation at the same time. Because the Engineer company was the only company in the AT 75 RC portion of the validation program and because it was evaluated in support of an infantry battalion (so that the infantry exercise scenario dominated the play, and to a large extent precluded and overrode some of the engineer ARTEP evaluation requirements), data pertinent to the Engineer company were not used for this report. Although the variations in the conduct of the battalion evaluations for each type ARTEP rendered each evaluation somewhat distinct, the differences were not considered inimical to pooling data for analysis by type ARTEP evaluation.

Table 2.

Reserve Component Evaluations, AT 75, FORSCOM/TRADOC ARTEP Validation Program

Dates	Unit	Site	Evaluator Source	Aggressor Source	Level	Configuration
23-26 March 1975	1/123 AR (KY-ARNG)	Ft Hood, TX	2/67 AR Ft Hood, TX	2nd Sqdrn 1st Cav 2 Co's	L-3	Task Force
9-12 June 1975	1/168 FA (NE-ARNG)	Cp Guernsey, WY	1/19 FA Ft Carson, CO	1/19 FA	L-3	Pure
16-18 June 1975	3/117 IN (M) (TN-ARNG)	Ft Hood, TX	2/50 IN (M) Ft Hood, TX	C Co, 2/67 IN (M)	L-3	Task Force
28-31 July 1975	1/195 AR (NE-ARNG)	Ft Carson, CO	1/70 AR Ft Carson, CO	Trp E, 167 Cav 67 Bde (NE-ARNG)	L-3	Task Force
11-14 July 1975	2/134 IN (M) (NE-ARNG)	Ft Carson, CO	1/12 IN (M) Ft Carson, CO	2 Co's, Co - 170 AR Co - 112 AR	L-3	Task Force
23-26 June 1975	2/146 FA (WA-ARNG)	Ft Lewis, WA	1/11 FA Ft Lewis, WA	1/11 FA	L-1	Pure

Table 2. (continued)

Dates	Unit	Site	Evaluator Source	Aggressor Source	Level	Configuration
3, 7-9 July 1975	1/303 AR (WA-ARNG)	Yakima Firing Center, WA	2/77 AR Ft Lewis, WA	2/77 AR	L-3	Pure
23-25 June 1975	1/161 IN (M) (WA ARNG)	Yakima Firing Center, WA	2/2 IN Ft Lewis, WA	2/2 IN	L-3	Pure
18-20 Aug 1975	1/134 IN (M) (NE-ARNG)	Cp Ripley, MN	1/11 IN (M) Ft Carson, CO	A Co, 1/134 IN (M) (NE-ARNG)	L-3	Pure
18-20 Aug 1975	867 EN Co (NE-ARNG)	Cp Ripley, MN	4th EN Co Ft Carson, CO	A Co, 1/134 IN (M) (NE-ARNG)	L-3	*

*Platoons attached to companys of 1/134 IN (M).

2. Cost. Data element requirements for investment and operational costs to conduct ARTEP evaluations were identified in conferences with FORSCOM, USACATB, and at III Corps.

a. During AT 75 no investment costs were incurred for the ten evaluations of interest.

b. In the area of operational costs a general effort was made to exclude costs judged common to all type unit evaluations (such as Army Training Tests, and Operational Readiness Tests, as well as ARTEP). Accordingly, only costs relative to the following were collected:

- Personnel required for evaluations,
- Travel necessary for personnel support,
- Per diem for personnel conducting evaluations,
- POL consumed,
- Maintenance (including repair parts), and
- Ammunition used.

All six were collected for Active Army, and only the latter three for RC in recognition of the fact that the RC unit's presence at AT is independent of whether it is scheduled for any type evaluation. Of course, per diem and travel costs were not attributable to Active Army for RC unit evaluations conducted at Active Army home station installations.

c. Actual evaluation cost (as the sum of the data element costs above, as appropriate) was developed for each type ARTEP evaluation -

Infantry (M), Tank, and 155 mm (SP) Field Artillery - in the AT 75 validation program. These three actual evaluation costs are one year costs and pertain only to evaluations conducted with Active Army controller/evaluator groups. A detailed explication of their development is included in Appendix 1 to Annex A of this report.

d. The three evaluation costs referred to above were used to develop cost estimates for ARTEP evaluations implemented with each of the options in Table 1. Two different cost estimates were developed: evaluation cost based on actual (ECA) and evaluation cost based on ARTEP documents. The estimated ECA were developed using POL, maintenance, and ammunition costs from the actual evaluation cost experience of AT 75, combined with personnel, travel, and per diem costs calculated for assumed numbers of personnel, distances, and days using commercial air and standard military rates as applicable. For these estimates variations in cost relative to the frequency of evaluation variable were assumed linear (e.g., ECA for a biennial evaluation is twice that for a quadrennial evaluation). The same method was used to estimate ECD, except that all evaluation requirements (such as the number of controllers/evaluators and the amount of ammunition) were exactly those suggested in the applicable ARTEP document. ECA and ECD are shown in Tables 3 and 4, respectively. Their derivation is explained fully in Appendix 1 to Annex A of this report.

e. In considering only evaluation cost, an inspection of Tables 3 and 4 discloses that option 12 - quadrennial evaluation at company level with all RC evaluators - is the best (lowest cost) option for evaluating all three type units; and option 30 - quadrennial evaluation at company level with a mixed evaluator group, predominantly RC personnel - is the second best

Table 3.

ECA for Mechanized Infantry, Tank, and
155 (SP) Field Artillery Battalion ARTEP

Option Number	Eval. Source	Level	Freq.	ECA ($)		
				IN (M)	TK	FA
1	Act Army	BN	Bi	40,105	31,533	59,154
2	Act Army	BN	Tri	30,078	23,649	44,365
3	Act Army	BN	Quad	20,053	15,766	29,577
4	Act Army	CO	Bi	39,425	26,467	42,213
5	Act Army	CO	Tri	29,569	19,850	31,660
6	Act Army	CO	Quad	19,713	13,234	21,107
7	Res Comp	BN	Bi	20,013	18,355	47,248
8	Res Comp	BN	Tri	15,009	13,766	35,436
9	Res Comp	BN	Quad	10,006	9,178	23,624
10	Res Comp	CO	Bi	19,605	14,232	27,844
11	Res Comp	CO	Tri	14,704	10,674	20,883
12	Res Comp	CO	Quad	9,803	7,116	13,922
13	Man Tng Cmd	BN	Bi	37,577	31,128	58,931
14	Man Tng Cmd	BN	Tri	28,182	23,346	44,198
15	Man Tng Cmd	BN	Quad	18,788	15,564	29,463
16	Man Tng Cmd	CO	Bi	36,583	26,634	41,400
17	Man Tng Cmd	CO	Tri	27,437	19,976	31,050
18	Man Tng Cmd	CO	Quad	18,291	13,317	20,700
19	Mix AA+	BN	Bi	37,463	30,294	58,099
20	Mix AA+	BN	Tri	28,097	22,720	43,574
21	Mix AA+	BN	Quad	18,732	15,147	29,049
22	Mix AA+	CO	Bi	36,771	25,189	40,778
23	Mix AA+	CO	Tri	27,578	18,892	30,584
24	Mix AA+	CO	Quad	18,386	12,595	20,389
25	Mix RC+	BN	Bi	25,036	21,650	50,225
26	Mix RC+	BN	Tri	18,777	16,237	37,668
27	Mix RC+	BN	Quad	12,518	10,825	25,113
28	Mix RC+	CO	Bi	24,560	17,291	31,436
29	Mix RC+	CO	Tri	18,420	12,968	23,557
30	Mix RC+	CO	Quad	12,280	8,645	15,718
31	Mix Equal	BN	Bi	34,804	28,995	57,019
32	Mix Equal	BN	Tri	26,103	21,746	42,764
33	Mix Equal	BN	Quad	17,402	14,497	28,510
34	Mix Equal	CO	Bi	34,087	23,824	39,317
35	Mix Equal	CO	Tri	25,565	17,868	29,488
36	Mix Equal	CO	Quad	17,043	11,912	19,659

Table 4.

ECD for Mechanized Infantry, Tank, and
155 (SP) Field Artillery Battalion ARTEP

Option Number	Eval. Source	Level	Freq.	ECD ($)		
				IN (M)	TK	FA
1	Act Army	BN	Bi	49,832	31,288	35,300
2	Act Army	BN	Tri	37,374	23,466	26,475
3	Act Army	BN	Quad	24,916	15,644	17,650
4	Act Army	CO	Bi	46,836	22,423	29,560
5	Act Army	CO	Tri	35,127	16,817	22,170
6	Act Army	CO	Quad	23,418	11,211	14,780
7	Res Comp	BN	Bi	29,440	18,209	23,409
8	Res Comp	BN	Tri	22,080	13,656	17,557
9	Res Comp	BN	Quad	14,720	9,104	11,705
10	Res Comp	CO	Bi	28,782	14,129	17,670
11	Res Comp	CO	Tri	21,586	10,596	13,252
12	Res Comp	CO	Quad	14,391	7,064	8,835
13	Man Tng Cmd	BN	Bi	47,661	30,760	34,284
14	Man Tng Cmd	BN	Tri	35,745	23,070	25,713
15	Man Tng Cmd	BN	Quad	23,830	15,380	17,142
16	Man Tng Cmd	CO	Bi	44,802	23,067	28,544
17	Man Tng Cmd	CO	Tri	33,602	17,300	21,408
18	Man Tng Cmd	CO	Quad	22,401	11,533	14,272
19	Mix AA+	BN	Bi	47,315	29,927	33,867
20	Mix AA+	BN	Tri	35,486	22,445	25,400
21	Mix AA+	BN	Quad	23,657	14,964	16,934
22	Mix AA+	CO	Bi	44,605	21,628	28,128
23	Mix AA+	CO	Tri	33,454	16,221	21,096
24	Mix AA+	CO	Quad	22,303	10,814	14,064
25	Mix RC+	BN	Bi	34,539	21,480	26,381
26	Mix RC+	BN	Tri	25,904	16,110	19,786
27	Mix RC+	BN	Quad	17,269	10,740	13,191
28	Mix RC+	CO	Bi	33,297	16,203	20,642
29	Mix RC+	CO	Tri	24,972	12,152	15,481
30	Mix RC+	CO	Quad	16,648	8,101	10,321
31	Mix Equal	BN	Bi	44,754	28,515	32,434
32	Mix Equal	BN	Tri	33,566	21,386	24,325
33	Mix Equal	BN	Quad	22,377	14,257	16,217
34	Mix Equal	CO	Bi	42,332	20,781	26,694
35	Mix Equal	CO	Tri	31,749	15,586	20,021
36	Mix Equal	CO	Quad	21,116	10,391	13,347

option for evaluating Tank and Field Artillery units, while option 9 - quadrennial evaluation at battalion level with all RC evaluators - is the second best option for evaluating Infantry (M) units. Thus, if evaluation effectiveness were discounted these options would be recommended for employment in an RC unit ARTEP evaluation program.

f. The ECA and the ECD in Tables 3 and 4 were used in the selection of prime candidate (cost-effective) ARTEP implementation options, discussed later in this section.

3. Effectiveness.

a. Definition. Effectiveness was considered to be a function of the extent to which ARTEP evaluation meets its stated objectives and fulfills the implicit functions of an evaluative system, namely, to provide valid and useful feedback information.

b. ARTEP Objectives. The objectives presented following are common to all type ARTEP.

- "To evaluate the ability of a [type] battalion to serve as a nucleus of a combined arms task force performing specified missions under simulated combat conditions." For this objective effectiveness determination was concerned with the accuracy and completeness of the information rendered through conduct of the evaluation.

- "To evaluate the efficiency and the effectiveness of past training of all echelons of the battalion from crew/squad through battalion/task force." Effectiveness

with regard to this objective rested upon the extent to which the evaluation yielded information which reflected changes in unit (or sub-unit/element) performance through a test-train-retest cycle. (Because the units evaluated during AT 75 will not be evaluated during AT 76, and because records of previous evaluations cannot be matched to ARTEP information the aim of this objective cannot be quantitatively assessed.)

- "To provide an assessment of future training needs." Relative to this objective effectiveness determination was concerned with the diagnostic ability of the evaluation process, i.e., its ability to convey the causes of mission failure or unit/element training deficiencies to the end that evaluation results are translatable into corrective training recommendations. (The ARTEP used during AT 75 and guidance for the validation program did not include specific requirements for written diagnostic reports.)

- "To provide a guide for training objectives by specifying minimum standards of performance for combat-critical missions and tasks." This objective relates to training only and therefore was not a concern for effectiveness of evaluation.

c. Data Requirements. Accuracy, timeliness, and usefulness

were selected as three essential characteristics of evaluation feedback, and therefore the bases of data necessary for the development of an index of option effectiveness.

d. Data Collection. It was determined that all data needed for the conduct of effectiveness analysis would be obtained from on-going (AT 75) and future (AT 76) activities, to include observation of ARTEP evaluation and validation exercises, surveys and interviews of personnel involved, mailings of questionnaires, and a review and analysis of ARTEP results and evaluator comments. Not all these data collection efforts were planned for AT 75, nor were all feasible. Some interview and survey activity was obviated because all AT 75 evaluations were conducted by Active Army evaluators. With the planned use of other evaluators during AT 76, in addition to Active Army personnel, and with the larger number of evaluations to be conducted during AT 76 there will be increased opportunity for surveys and interviews with the prospect of significant results. During AT 75 on site observation of eight of the nine RC battalion evaluations was accomplished, and mailed questionnaires were used. The visits and the questionnaires provided the effectiveness data for this report. Since all AT 75 ARTEP evaluations of RC units involved Active Army controller/evaluators only the questionnaire data were applicable to all candidate implementation options.

(1) The questionnaire consisted of three pages: the first, instructions; the second, a rating data matrix; the third, a list of the 36 candidate implementation options and a ranking table. (A copy is at Enclosure A-2-1 at Annex A.)

(2) In the rating data matrix respondents used a 1-5 point scale to rate the three option variables and their associated alternatives separately relative to accuracy, timeliness, and usefulness.

(3) In the ranking table the respondents simply ranked, from best down, their choices of ten options overall deemed most feasible and potentially effective.

(4) Respondents included personnel from all RC units and all evaluator groups that participated in the RC portion of the ARTEP validation program; branch schools staff personnel who were involved in developing ARTEP; cognizant DA, FORSCOM, TRADOC, USACATB personnel; members of the SAG.

e. Indexes of Effectiveness. The rating data were combined in an effectiveness formula (developed as a part of this study) to produce candidate implementation option scores. For each option associated scores were grouped and averaged to produce that option's index of effectiveness. The detailed procedure and qualifying discussions are presented in Appendix 2 to Annex A of this report. Table 5 lists the indexes of effectiveness for all options for Mechanized Infantry, Tank, and Field Artillery evaluations.

f. Comparisons of the index results with the rank information - paragraph d(3), above - yielded positive coefficients of correlation, statistically significant at the five percent level. Thus, the two kinds of data were mutually supportive. The rank data, however, because of their ordinal characteristic, were not adaptable to computations for C-E analysis, so they were dropped from further use in the study. The effectiveness indexes, on the other hand, were retained.

Table 5.

Option Effectiveness Indexes
for Mechanized Infantry, Tank, and
155 (SP) Field Artillery Battalion ARTEP

Option Number	Eval. Source	Level	Freq.	Indexes		
				IN (M)	TK	FA
1	Act Army	BN	Bi	138.6	151.9	135.5
2	Act Army	BN	Tri	121.8	133.9	125.4
3	Act Army	BN	Quad	109.7	125.3	117.7
4	Act Army	CO	Bi	137.4	157.7	141
5	Act Army	CO	Tri	120.6	140.6	130.8
6	Act Army	CO	Quad	108.5	131	121.7
7	Res Comp	BN	Bi	119	126	114.5
8	Res Comp	BN	Tri	102.2	110.1	104.3
9	Res Comp	BN	Quad	90.2	83.7	95.3
10	Res Comp	CO	Bi	117.9	131.7	119.9
11	Res Comp	CO	Tri	101.3	114.6	109.8
12	Res Comp	CO	Quad	89.0	105.1	100.7
13	Man Tng Cmd	BN	Bi	123.8	128.6	123.2
14	Man Tng Cmd	BN	Tri	106.6	112.7	113.1
15	Man Tng Cmd	BN	Quad	94.6	102	103.9
16	Man Tng Cmd	CO	Bi	122.3	134.4	128.6
17	Man Tng Cmd	CO	Tri	105.4	117.3	118.5
18	Man Tng Cmd	CO	Quad	93.3	107.7	109.4
19	Mix AA+	BN	Bi	133.0	145	127.6
20	Mix AA+	BN	Tri	116.2	128.8	117.5
21	Mix AA+	BN	Quad	104.2	118.4	108.3
22	Mix AA+	CO	Bi	131.8	150.8	133.1
23	Mix AA+	CO	Tri	115	133.7	122.9
24	Mix AA+	CO	Quad	103	124.1	113.8
25	Mix RC+	BN	Bi	122.5	132.1	120.3
26	Mix RC+	BN	Tri	105.6	115.7	110.2
27	Mix RC+	BN	Quad	93.6	105.5	101.1
28	Mix RC+	CO	Bi	118.3	137.9	125.1
29	Mix RC+	CO	Tri	104.5	120.5	114.9
30	Mix RC+	CO	Quad	92.4	111.3	105.8
31	Mix Equal	BN	Bi	126.8	142.1	126.5
32	Mix Equal	BN	Tri	110	122.8	116.4
33	Mix Equal	BN	Quad	98.0	112.4	107.3
34	Mix Equal	CO	Bi	127	144.8	131.9
35	Mix Equal	CO	Tri	110.2	127.5	121.8
36	Mix Equal	CO	Quad	98.1	118.1	112.7

g. In considering only evaluation effectiveness, an inspection of Table 5 discloses that option 4 - biennial evaluation at company level with Active Army evaluators - is the best (largest effectiveness index) option for evaluating Tank and Field Artillery units, while option 1 - biennial evaluation at battalion level with Active Army evaluators - is the best option for evaluating Infantry (M) units; and that option 1 is the second best option for evaluating Tank and Field Artillery units while option 4 is the second best option for evaluating Infantry (M) units. The third best option for evaluating Tank and Field Artillery units is option 22 - biennial evaluation at company level with a mixed evaluator team, predominantly Active Army personnel; and the third best option for evaluating Infantry (M) units is option 19 - biennial evaluation at battalion level with a mixed evaluator team, predominantly Active Army personnel. Thus, if evaluation cost were discounted these options would be recommended for employment in an RC unit ARTEP evaluation program.

D. Prime Candidate Options.

1. The prime candidate options are those from among the candidate implementation options selected to be recommended as a part of the AT 76 program of evaluating Reserve Component units using ARTEP.

2. Since neither a maximum acceptable option cost nor a minimum acceptable option effectiveness index was ascertainable, the full list of thirty-six candidate implementation options remained for review. This is not to say, however, that the analysis was formidable. The procedure was straightforward. It involved the formation and calculation of the ratios

of option effectiveness index to option cost for all options for each of the three ARTEP, using the data in Tables 3 and 5 together and the data in Tables 4 and 5 together. Thus, Table 6 shows the ratios based on ECA for the Mechanized Infantry, Tank, and Field Artillery unit ARTEP, and Table 7 shows the ratios based on ECD for the same three type unit ARTEP. Also in Tables 6 and 7 for each type ARTEP ranks were assigned, 1 to the option with the largest ratio, 2 to the option with the next largest ratio, continuing through the thirty-six options. The options with rank 1 are the optimal efficiency candidate options for their respective type ARTEP evaluations. They are the "best buys" in the sense that they are estimated to provide the most evaluation effectiveness per dollar cost. It follows that the options with ranks 2, 3, to 36 are successively the next best buys.

3. To effect a selection of prime candidate options a cutoff at rank 10 was established. Thus, with the rank data in Table 6 fourteen options were selected across the three type ARTEP; and similarly, from Table 7 thirteen options were selected. Twelve options were common to the two sets. (Options 7 and 35 were only in the first set, and option 21 was only in the second.) Table 8 lists the twelve options and shows their respective ranks for each type ARTEP for relative comparisons. It is clear that options 12 and 30 are first and second choices, respectively. Also, overall, it is clear that quadrennial evaluations of company size units with either all RC or mixes of RC and Active Army personnel for evaluator groups are the key to a cost-effective ARTEP evaluation program.

4. The next section presents a suggested program of RC unit evaluations for AT 76 to test the prime candidate options.

Table 6.

Effectiveness Index to ECA Ratios for
Mechanized Infantry, Tank, and
155 (SP) Field Artillery Battalion ARTEP

Option Number	Eval Source	Level	Freq	IN (M)		TK		FA	
				Ratio	Rank	Ratio	Rank	Ratio	Rank
1	Act Army	BN	Bi	3.46	34	4.82	34	2.29	33
2	Act Army	BN	Tri	4.05	26	5.66	29	2.83	27
3	Act Army	BN	Quad	5.47	16	7.95	14	3.98	15.5
4	Act Army	CO	Bi	3.49	33	5.96	26	3.34	22
5	Act Army	CO	Tri	4.08	25	7.08	19.5	4.13	10.5
6	Act Army	CO	Quad	5.50	15	9.90	5	5.77	3
7	Res Comp	BN	Bi	5.95	8	6.87	21	2.42	31
8	Res Comp	BN	Tri	6.81	6	8.00	12	2.94	25
9	Res Comp	BN	Quad	9.02	2	9.12	10	4.03	12.5
10	Res Comp	CO	Bi	6.01	7	9.25	9	4.31	9
11	Res Comp	CO	Tri	6.89	5	10.74	3	5.26	7
12	Res Comp	CO	Quad	9.08	1	14.77	1	7.23	1
13	Man Tng Cmd	BN	Bi	3.30	36	4.13	36	2.09	36
14	Man Tng Cmd	BN	Tri	3.78	28	4.83	33	2.56	30
15	Man Tng Cmd	BN	Quad	5.04	18	6.55	22	3.53	20
16	Man Tng Cmd	CO	Bi	3.34	35	5.05	31	3.11	24
17	Man Tng Cmd	CO	Tri	3.84	27	5.87	27	3.82	17
18	Man Tng Cmd	CO	Quad	5.10	17	8.09	11	5.29	6
19	Mix AA+	BN	Bi	3.55	32	4.79	35	2.20	35
20	Mix AA+	BN	Tri	4.14	24	5.67	28	2.69	29
21	Mix AA+	BN	Quad	5.56	14	7.82	15	3.73	19
22	Mix AA+	CO	Bi	3.58	31	5.99	25	3.26	23
23	Mix AA+	CO	Tri	4.17	23	7.08	19.5	4.02	14
24	Mix AA+	CO	Quad	5.60	13	9.85	6	5.58	5
25	Mix RC+	BN	Bi	4.89	19	6.10	23	2.40	32
26	Mix RC+	BN	Tri	5.62	12	7.13	18	2.93	26
27	Mix RC+	BN	Quad	7.48	4	9.75	7	4.03	12.5
28	Mix RC+	CO	Bi	4.82	20	7.98	13	3.98	15.5
29	Mix RC+	CO	Tri	5.67	10	9.29	8	4.88	8
30	Mix RC+	CO	Quad	7.52	3	12.88	2	6.73	2
31	Mix Equal	BN	Bi	3.64	30	4.90	32	2.22	34
32	Mix Equal	BN	Tri	4.21	22	5.65	30	2.72	28
33	Mix Equal	BN	Quad	5.63	11	7.75	16	3.76	18
34	Mix Equal	CO	Bi	3.73	29	6.08	24	3.36	21
35	Mix Equal	CO	Tri	4.31	21	7.14	17	4.13	10.5
36	Mix Equal	CO	Quad	5.76	9	9.91	4	5.73	4

Table 7.

Effectiveness Index to ECD Ratios for
Mechanized Infantry, Tank, and
155 (SP) Field Artillery Battalion ARTEP

Option Number	Eval Source	Level	Freq	IN (M)		TK		FA	
				Ratio	Rank	Ratio	Rank	Ratio	Rank
1	Act Army	BN	Bi	2.78	34	4.86	34	3.84	34
2	Act Army	BN	Tri	3.26	26	5.71	31	4.74	27
3	Act Army	BN	Quad	4.40	12	8.01	17	6.67	12
4	Act Army	CO	Bi	2.93	31	7.03	21	4.77	26
5	Act Army	CO	Tri	3.43	23	8.56	12	5.90	19
6	Act Army	CO	Quad	4.63	7.5	11.69	3	8.23	5
7	Res Comp	BN	Bi	4.04	17	6.92	24	4.89	24
8	Res Comp	BN	Tri	4.63	7.5	8.06	16	5.94	18
9	Res Comp	BN	Quad	6.13	2	9.19	11	8.14	6
10	Res Comp	CO	Bi	4.10	15	9.32	10	6.79	11
11	Res Comp	CO	Tri	4.69	5	10.82	6	8.29	4
12	Res Comp	CO	Quad	6.18	1	14.88	1	11.40	1
13	Man Tng Cmd	BN	Bi	2.60	36	4.18	36	3.59	36
14	Man Tng Cmd	BN	Tri	2.98	29	4.88	33	4.40	32
15	Man Tng Cmd	BN	Quad	3.97	18	6.63	26	6.06	16.5
16	Man Tng Cmd	CO	Bi	2.73	35	5.83	28	4.51	31
17	Man Tng Cmd	CO	Tri	3.14	27	6.78	25	5.54	22
18	Man Tng Cmd	CO	Quad	4.17	14	9.34	9	7.67	8
19	Mix AA+	BN	Bi	2.81	33	4.85	35	3.77	35
20	Mix AA+	BN	Tri	3.28	24.5	5.73	30	4.63	29
21	Mix AA+	BN	Quad	4.41	10	7.91	18	6.40	14
22	Mix AA+	CO	Bi	2.96	30	6.97	22.5	4.73	28
23	Mix AA+	CO	Tri	3.44	22	8.24	14	5.83	20
24	Mix AA+	CO	Quad	4.62	9	11.48	4	8.09	7
25	Mix RC+	BN	Bi	3.55	19.5	6.15	27	4.56	30
26	Mix RC+	BN	Tri	4.08	16	7.18	20	5.57	21
27	Mix RC+	BN	Quad	5.42	4	9.82	8	7.66	9
28	Mix RC+	CO	Bi	3.55	19.5	8.51	13	6.06	16.5
29	Mix RC+	CO	Tri	4.19	13	9.92	7	7.42	10
30	Mix RC+	CO	Quad	5.55	3	13.74	2	10.25	2
31	Mix Equal	BN	Bi	2.83	32	4.98	32	3.90	33
32	Mix Equal	BN	Tri	3.28	24.5	5.74	29	4.79	25
33	Mix Equal	BN	Quad	4.38	11	7.88	19	6.62	13
34	Mix Equal	CO	Bi	3.00	28	6.97	22.5	4.94	23
35	Mix Equal	CO	Tri	3.47	21	8.18	15	6.08	15
36	Mix Equal	CO	Quad	4.65	6	11.37	5	8.44	3

Table 8.

Prime Candidate Options, Ranks
for Each Type ARTEP

Option Number	Description			Ranks, Table 6			Ranks, Table 7		
	Eval. Source	Level	Freq.	IN (M)	Tank	FA	IN (M)	Tank	FA
6	Act Army	CO	Quad	-	5	3	7	3	5
8	Res Comp	BN	Tri	6	-	-	8	-	-
9	Res Comp	BN	Quad	2	10	-	2	-	6
10	Res Comp	CO	Bi	7	9	9	-	10	-
11	Res Comp	CO	Tri	5	3	7	5	6	4
12	Res Comp	CO	Quad	1	1	1	1	1	1
18	Man Tng Cmd	CO	Quad	-	-	6	-	9	8
24	Mix AA+	CO	Quad	-	6	5	9	4	7
27	Mix RC+	BN	Quad	4	7	-	4	8	9
29	Mix RC+	CO	Tri	10	8	8	-	7	10
30	Mix RC+	CO	Quad	3	2	2	3	2	2
36	Mix Equal	CO	Quad	9	4	4	6	5	3

IV. Option Implementation Test Program.

A. A most important part of the study effort was the design of an option implementation test program to be a coordinated integral part of the FORSCOM overall program for evaluating RC units using ARTEP during AT 76.

1. In designing a program to test the prime candidate options it was immediately evident that the frequency variable of an option could not be tested in one year. In effect, therefore, a test program would directly concern only the evaluator source and unit size variables, and analyses relative to the frequency variable would be extrapolative.

2. Manifest in Table 8 (page 28) all six possible alternatives for evaluator source were included among the twelve prime candidate options. Since all ten RC unit ARTEP evaluations during AT 75 employed only Active Army evaluators it was decided that additional evaluations of that kind were not needed for the study. It was further decided that to facilitate valid comparisons (including augmentation and revision of data) of evaluations to be conducted by alternative type evaluator groups with the evaluations conducted by Active Army evaluator groups during AT 75, the AT 76 evaluations would be conducted with battalion size units. Finally, to design an AT 76 test program to a manageable size without impairment to the study objectives, it was decided that a minimum of two evaluations of each type would be required.

3. On the basis of the foregoing a test program was designed involving a requirement for thirty-eight battalions - thirty-two to be evaluated at ARTEP level 3 and six to be evaluated at ARTEP level 2. The thirty-two included ten Infantry (M), six Tank, eight Field Artillery, and

eight Engineer units; and the six included three, one, one, and one of the same type units, respectively. The suggested program is presented in Tables 9 and 10. This program was included as a part of the Informal Report of Preliminary Results submitted to the COR on 17 November 1975. A copy was forwarded from DA to FORSCOM for coordination.

B. In February 1976 FORSCOM published a "Tentative Schedule for ARTEP Evaluations, TY 75-76." The schedule designated slightly more than one hundred RC companies to be evaluated variously by Maneuver Training Command (MTC), Active Army, and RC personnel. No mixed (Active Army and RC) evaluator groups were designated nor indicated. Only company units were included in the schedule, in accordance with guidance for scheduling AT provided by FORSCOM to the three CONUSA.

1. From the "Tentative Schedule for ARTEP Evaluations, TY 75-76" an alternate option implementation test program was designed, involving sixty RC companies - six to be evaluated at ARTEP level 1, forty-six at level 2, and eight at level 3. Similarly, as in the battalion test program summarily described above at least two of each type evaluation were selected. Unlike the battalion test program the alternate test program includes evaluations employing all Active Army evaluators, since the AT 75 validation program included no company size unit evaluations and since the Tentative Schedule includes ARTEP not used in the AT 75 validation program. The alternate test program is detailed in Table 11 in terms of AT dates, evaluator source, designated unit, site, and ARTEP evaluation level. This suggested alternate program includes no evaluations employing mixed evaluator personnel groups (Active Army and RC) since the tentative schedule included none. This point is discussed further below. The program was fully coordinated with FORSCOM,

Table 9.

Suggested ARTEP Evaluation Program, Battalion Level 3, for AT 76,
Reserve Component Unit Evaluation Analysis (Cost-Effectiveness)

Implementation Option (Evaluator Source)	ARTEP				
	Infantry 7-15, 7-45	Tank 17-35	Field Artillery 6-155, 6-365	Engineer 5-25, 5-35 5-115, 5-145	Total
Reserve Component	2	2	2	2	8
Maneuver Training Command	2	2	2	2	8
Mix-predominantly Active Army	2	-	-	2	4
Mix-predominantly Reserve Component	2	2	2	2	8
Mix-essentially equal, AA and RC	2	-	2	-	4
Total	10	6	8	8	32

Table 10.

Suggested ARTEP Evaluation Program, Battalion Level 2, for AT 76,
Reserve Component Unit Evaluation Analysis (Cost-Effectiveness)

Implementation Option (Evaluator Source)	ARTEP				
	Infantry 7-15, 7-45	Tank 17-35	Field Artillery 6-155, 6-365	Engineer 5-25, 5-35 5-115, 5-145	Total
Active Army	1	-	-	1	2
Reserve Component	1	-	-	-	1
Mix-predominantly Reserve Component	1	1	1	-	3
Total	3	1	1	1	6

Table 11.

Option Implementation Test Program

ARTEP 19-77, MP Company

Evaluators	Unit	Location	Date	ARTEP Level
80th MTC	211th MP Co	Pickett	12-26 June	2
78th MTC	307th MP Co	Pickett	12-26 June	2

ARTEP 29-17 (Maintenance)

76th MTC	D, 726	Edwards	5-19 June	1
85th MTC	D, 747	Ripley	21-24 June	2
49th Div (RC)	HQ, D, 949	Hood	10-12 June	2
49th Div (RC)	A, 949	Hood	10-16 June	2
28th Div (RC)	B, 728	Pickett	11-24 July	1

ARTEP 5-145, 5-25, Engineer

49th Div (RC)	HQ Co, 111 Engr	Hood	14-16 June	2
2nd MTC	890 Engr Co	Shelby	5-19 June	2
76th MTC	B/242 Engr	Edwards	24 July-7 Aug	2
27th Engrs (AA)	A, B, C, D, 122d Engrs	Bragg	22 May-5 June	3

ARTEP 6-365, 6-155, Field Artillery

78th MTC	A, B, 5/112	Drum	16-29 May	2
4th Div (AA)	A, C, 1/147 FA	Ripley	7-9 June	2
III Corps (AA)	3/83 FA	Sill	25 July-7 Aug	2
11th Corps (RC)	A, B, C, 1/49th	Guernsey	14-15 June	2
28th Div (RC)	1/229 FA (105)	Pickett	11-24 July	1

Table 11. (continued)

ARTEP 17-35, Armor

Evaluators	Unit	Location	Data	ARTEP Level
28th Div (RC)	B, C, 1/103	Drum	13-26 June	2
1st CAV Div (AA)	2/252	Hood	11-24 July	2

ARTEP 7-15, Infantry

76th MTC	C, 1/101	Edwards	5-19 June	2
85th MTC	B, 2/135	Ripley	21-24 June	2
28th Div (RC)	A, 2/111	Indiantown Gap	27 June-10 July	2
28th Div (RC)	A, 2/109	Pickett	11-24 July	2
101st Div (AA)	2/153	Chaffee	27-29 July	2
101st Div (AA)	3/153	Chaffee	27-29 July	2

ARTEP 7-45, Infantry (M)

2nd MTC	A, B, C, 4/117	Shelby	5-19 June	2
218th Bde (RC)	B, 1/118	Stewart	6-19 June	3
218th Bde (RC)	B, 4/118	Stewart	6-19 June	3
1st CAV Div (AA)	2/120	Hood	11-24 July	2
1st IN (M) Div (AA)	C, CSC, 2/136	Ripley	12-26 June	3
76th MTC	C, 1/169 IN (M)	Edwards	24 July-7 Aug	2

and it is anticipated that its adoption and implementation will facilitate data collection for the study.

2. Litton-Mellonics found the predominant emphasis on company size unit evaluations practical. To be sure, evaluation of only company size units precludes direct comparisons of AT 76 data with AT 75 battalion evaluation data (a requirement in paragraph A2, above). However, all indications are that RC units in general are ready for only company ARTEP evaluations. It seems, therefore, prudent that the study effort be directed in the analyses of company evaluation data. Since the study is planned for completion in October 1976, data from the test program in Table 11 coupled with data from the AT 75 evaluations would provide analyses for both battalion size and company size unit ARTEP evaluations, whereas an AT 76 test program involving only battalions would provide comparative analyses for battalion evaluations at the expense of having no data for company evaluations - where the latter appear as the immediate need. Also, some battalion data might be obtained from AT 76 company evaluations if it is feasible to appropriately aggregate company data for those cases where four or five companies of a battalion are designated in the schedule for separate evaluations. There are seven such groups of companies in the suggested alternate option implementation test program.

3. At first awareness, the exclusion of mixed evaluator groups from the tentative schedule was viewed as a serious shortcoming for the study. However, a considered review of the facts tempered the concern. During AT 75 the ten evaluations employed only Active Army evaluator personnel. All data in this report relative to options involving evaluators from sources other than Active Army were satisfactorily extrapolated. Consequently, since during AT 76 in addition to evaluations employing all Active Army evaluators

there also will be evaluations employing all MTC and all RC evaluator groups, any extrapolations for those options involving mixed evaluator groups (Active Army and RC personnel) will be based on MTC and RC evaluator data as well as Active Army evaluator data (a gain over AT 75 data analyses). A second, equally important consideration, was that for company size unit ARTEP evaluations evaluator groups are small. In some ARTEP as few as six evaluators are recommended. It appears, therefore, that significant differentiations in cost-effectiveness of evaluations using options involving mixed evaluator groups of twelve or fewer members would be difficult to achieve, and if achieved, suspect.

C. In summary of this section, although initially a test program of battalion unit evaluations was desired for the study, in full consideration of practical matters the alternate option implementation test program listed in Table 11 is recommended as suitable for satisfactory completion of the study. Data collection is planned as outlined in section II paragraph C5. The cost data will be the same kind (same elements) as that collected during AT 75, with the addition that much of the data will concern evaluations conducted using Reserve Component and Maneuver Training Command (MTC) personnel as evaluators as well as Active Army personnel. The effectiveness data also will be the same, with the addition of rationale and explanatory information obtained through a greater emphasis on personal interviews than was possible during AT 75. If there is FORSCOM or ARTEP guidance requiring formal reports of unit performance deficiencies or training recommendations it might be possible to collect more objective data relative to timeliness, accuracy, and usefulness of evaluation feedback. The cost and effectiveness data collected during AT 76 will serve to verify, supplement, or revise C-E estimates developed from AT 75 data, shown herein.

V. Ancillary Investigations.

A. Introduction. At the 10 June 1975 SAG meeting to review the First Interim Report one discussion concerned the importance of differentiating between requirements for officer evaluators versus enlisted evaluators/data collectors in constituting evaluator groups for RC unit evaluations using ARTEP. Another discussion concerned the recognition that the choice of implementation options for ARTEP could be affected by the facilities available. On the basis of these discussions it was agreed that the study effort would include a survey of major training sites and an analysis of ARTEP evaluator tasks and position assignments. The two investigations are presented separately and completely at Annex B to this report. Summaries of this work are presented in this section of the main report.

B. Analysis of ARTEP Evaluator Tasks and Position Assignments.

1. Purpose. To review recommended evaluator officer assignments to determine the feasibility of using qualified noncommissioned officers (NCO) in lieu of officers in selected positions.

2. Methodology. Analysis was made of the individual judgments required to accomplish assessment of performance of ARTEP mission tasks. Standards listed in the training and evaluation outlines for Infantry (ARTEP 7-45), Tank (ARTEP 17-35), and Field Artillery (ARTEP 6-365) battalion ARTEP were used in this analysis. Evaluator requirements for assessing performance of various tasks during tactical operations at ARTEP evaluation levels 1, 2, and 3 were identified for each suggested evaluator position. The requirements were then compared with the major duties and tasks of

appropriate senior NCO military occupational specialty (MOS) descriptions contained in AR 611-201, 3 February 1975.

3. Results. A significant number of officer evaluator positions were identified as candidates for NCO substitution at evaluation levels 1, 2, and 3 for both Infantry and Tank battalion ARTEP evaluations, and one officer position was so identified for the 155 mm (SP) Field Artillery battalion ARTEP evaluation.

a. For the Infantry (M) battalion evaluation nine substitutions are recommended at level 1, and twelve are recommended at levels 2 and 3. The positions, the recommended substitutions, and the changes in evaluator group totals are shown in Table 12.

b. For the Tank battalion evaluation six substitutions are recommended at all levels. The positions, the recommended substitutions, and the changes in evaluator group totals are shown in Table 13.

c. For the Field Artillery battalion evaluation only the substitution of a senior communications NCO (tactical communications chief, MOS 31G40, E-7 or MOS 31G50, E-8) for the battery communications evaluator (CPT/LT) is recommended. No other artillery officer evaluators were selected for possible NCO substitution because they evaluate either positions with peer counterparts or positions for which there are no NCO equivalents.

C. Major Training Sites Suitable for ARTEP Evaluations.

1. Purpose. The purpose of the survey was to determine which sites are suitable for ARTEP evaluations and to identify the type ARTEP which may be employed at each such site.

Table 12.

Recommended Changes in Infantry Battalion Evaluator Team Officer Personnel Positions (ARTEP 7-45)

EVALUATOR PERSONNEL	LEVEL 1	LEVEL 2	LEVEL 3
Battalion/Task Force HQ			
Senior Evaluator, COL/LTC	1	1	0
Deputy Senior Eval, LTC/MAJ	1	1	0
Fire Support Coordination Evaluator, CPT (Arty)	1	1	0
Chief Aggressor Controller, MAJ	1	1	0
Chief Crew/Plt Evaluator, MAJ	1	1	1
*Asst Crew/Plt Evaluator, CPT	1	1	1
NCO Crew/Plt Evaluator, E7	1	1	1
Company/Teams			
Co/Team Evaluator, MAJ/CPT	1 per(3 total)	1 per(3 total)	1 per(3 total)
*Asst Co/Team Evaluator, LT	1 per(3 total)	1 per(3 total)	1 per(3 total)
Asst Co/Team Evaluator, Senior NCO (E7/E6)	1 per(3 total)	1 per(3 total)	1 per(3 total)
Rifle Platoons			
Plt Evaluator, MAJ/CPT	1	2	2
*Asst Plt Evaluator, LT	1	2	2
Asst Plt Evaluator, 1 NCO	1	2	2
Rifle Squads			
*Squad Evaluator(s), LT	1	3	3
Asst Sqd Evaluators, Senior NCO (E7/E6)	3	9	9
Weapons and Surveillance Proficiency			
CPT	1	1	1
**LT	7	7	7
NCO (E7/E6/E5)	8	8	8
TOTAL	23 Officers 16 NCO	27 Officers 23 NCO	23 Officers 23 NCO
Change	14 (-9) OFF	15 (-12) OFF	11 (-12) OFF
Totals	25 (+9) NCO	35 (+12) NCO	35 (+12) NCO

*Senior NCO Substitution

**Three of the seven lieutenants are recommended for substitution by senior Infantry NCO, SFC (E-7). The weapons and surveillance personnel evaluate the Scout Platoon, Ground Surveillance, Redeye Team, AT Squad, Heavy Mortar Platoon, and 81 mm Mortar Section.

Table 13.

Recommended Changes in Tank Battalion Evaluator Team Officer Personnel Positions (ARTEP 17-35)

EVALUATOR		LEVEL 1	LEVEL 2	LEVEL 3
Task Force HQ				
Senior Evaluator, COL/LTC		1	1	0
Deputy Senior Evaluator, LTC/MAJ		1	1	0
Fire Support Coordination Evaluator, CPT (Arty)		1	1	0
HQ & CBT SPT CO EVAL				
HQ Co Eval MAJ/CPT		1	1	0
Comm Plt Eval CPT/LT		1	1	0
Maint Plt Eval CPT		1	1	0
Medical Plt Eval CPT/LT		1	1	0
Support Plt Eval CPT/LT		1	1	0
Teams				
Tm Evaluator, MAJ/CPT		1 per TM	1 per TM	1 per TM
*Asst Tm Evaluator, LT		1 per TM	1 per TM	1 per TM
Asst Tm Evaluator NCO (E7/E6)		1 per TM	1 per TM	1 per TM
Tank Platoons				
Plt Evaluator CPT/LT		1	1	1
*Asst Plt Eval LT		1	1	1
Tank Crew				
**Crew Evaluators CPT/LT		2	2	2
Asst Crew Evaluators NCO (E7/E6)		2	2	2
Scout Plt				
Plt Eval CPT/LT		1	1	1
Asst Plt Eval NCO (E7/E6)		2	2	2
Mort Plt				
Plt & FDC Evaluator CPT/LT		1	1	1
FO Eval NCO (E6)		3	3	3
Mort Posit Eval (E6)		1	1	1
Redeye Tms				
*Team Evaluator LT		1	1	1
Ground Surveillance				
Crew Evaluator NCO (E7/E6)		1	1	1
AVLB NCO (E7/E6)		1	1	1
TOTALS	Officer	21	21	13
	NCO	13	13	13
*Senior NCO Substitutions				
**Senior NCO Substitution for one crew evaluator				
Change Totals	Officer	15 (-6)	15 (-6)	7 (-6)
	NCO	19 (+6)	19 (+6)	19 (+6)

2. Scope. The survey included most Active Army, Army National Guard, and United States Army Reserve major training sites in the United States. The type ARTEP applicable to Infantry (M), Tank, Field Artillery, and Engineer RC units were given priority in the survey. Data used were derived from available published materials and through telephone interviews with operations and training staff personnel at the sites.

3. Approach. The approach involved a simple comparison of maneuver area requirements for each type ARTEP evaluation with the training areas available at the individual major training sites to identify those sites that have adequate areas. Additionally, where applicable the approach included similar comparisons of ARTEP requirements for firing range facilities and equipment with firing range facilities and equipment available at the individual sites.

4. Results. In accordance with the outlined approach major training sites were separated into three categories. Table 14 lists seventeen (17) Annual Training Equipment Pool (ATEP) sites or Equipment Concentration Sites (ECS) with equipment, live fire facilities, and maneuver areas capable of supporting ARTEP as indicated. These ATEP sites also have requisite training acreage to support any other type ARTEP field exercise. Table 15 lists thirty-seven (37) sites with training areas capable of supporting some ARTEP evaluations, especially light infantry battalion. The ECS in this table do not have sufficient equipment to support all ARTEP evaluations. In addition to providing for necessary equipment before the sites may be used for ARTEP evaluations, the range facilities at each site must be reviewed. The third category of sites includes those judged unsuitable for ARTEP evaluations. (A list of these sites is available in

Appendix 2 to Annex B to this report.) On the basis of a comparison of the major training site data, ARTEP evaluation requirements data, and the geographical distribution of priority early deployment units by type it was concluded that a sufficient number of adequate training sites exist in each of the CONUSA areas for ARTEP evaluations.

Table 14.

ATEP Sites Suitable for ARTEP Evaluations

First U. S. Army

ATEP	Training Acreage	Type ARTEP
*Fort Drum, NY	90,000	Tank INF (Mech) FA 8 IN (SP) FA 155 (SP) Engineer
*Camp Pickett, VA	35,000	Tank INF (Mech) FA 155 (SP) Engineer
*Fort Bragg, NC	125,000	INF (Mech) FA 155 (SP) FA 8 IN (SP) Engineer
*Camp Shelby, MS	100,000	Tank INF (Mech) FA 155 (SP) Engineer
Fort Stewart, GA	278,000	Tank INF (Mech) FA 8 IN (SP) FA 155 (SP) Engineer
	Fifth U. S. Army	
Camp Ripley, MN	54,000	Tank INF (Mech) Engineer
*Fort McCoy, WI	43,000	Tank INF (Mech) FA 155 (SP) Engineer
Camp Grayling, MI	123,000	Tank INF (Mech) FA 155 (SP) Engineer

*USAR Equipment Concentration Site co-located with ATEP.

Table 14. (continued)

ATEP	Training Acreage	Type ARTEP
*Fort Hood, TX	140,000	Tank INF (Mech) FA 155 (SP) FA 8 IN (SP) Engineer
*Fort Sill, OK	86,000	FA 155 (SP) FA 8 IN (SP)
	Sixth U. S. Army	
Yakima Range, WA	263,000	Tank INF (Mech) FA 155 (SP) Engineer
Gowen Field, ID	173,000	Tank FA 155 (SP)
Camp Guernsey, WY	26,000	FA 155 (SP) FA 8 IN (SP)
Camp Williams, UT	21,000	FA 155 (SP)
*Fort Carson, CO	105,000	Tank INF (Mech) FA 155 (SP) FA 8 IN (SP) Engineer
Camp Roberts, CA	39,000	INF (Mech) Engineer
Fort Irwin, CA	470,000	Tank INF (Mech) FA 155 (SP) FA 8 IN (SP)

*USAR Equipment Concentration Site co-located with ATEP.

Table 15.

Sites with More Than 10,000 Training Acres*

SITE	STATE	ACREAGE TOTAL/TRAINING
Atterbury	IND	33,500/33,500
Badlands Bombing Range	SD	42,240/42,240
Beauregard	LA	13,290/12,500
Blanding	FLA	72,397/51,500
Custer	SD	71,680/71,680
Gunpowder Rifle Range	MD	240,023/240,023
Natchez Trace	TN	24,000/18,000
Robinson	ARK	32,900/30,000
Roswell	NM	12,334/12,000
Shadehill	SD	25,600/25,600
Swift	TX	11,777/11,777
Gruber	OK	66,000/26,000
McCoy	WI	60,000/44,000
Dona Ana Range (Fort Bliss)	NM	1,054,156/65,290
Farmington	NM	10,240/10,240
Belle Fourche Reservoir	SD	17,920/17,920
Dugway	UT	841,000/50,000
Wind Cave National Park	SD	30,000/30,000
Yuma Proving Grounds	AR	903,000/901,000
Hunter Liggett Reservation	CA	168,000/168,000
Imperial Valley Unit Training	CA	38,000/38,000
**Indiantown Gap	PA	18,500/11,300

* Sites with more than 35 thousand training acres are suitable for Tank battalion ARTEP evaluation.

**ECS

Table 15. (continued)

SITE	STATE	ACREAGE TOTAL/TRAINING
Benning	GA	182,296/140,000
Campbell	KY	105,415/65,091
**Chaffee	ARK	71,979/70,760
**Jackson	SC	52,598/45,000
**Lewis	WA	86,000/58,000
**Polk	LA	199,032/190,000
**Riley	KS	101,000/76,000
**Knox	KY	110,351/59,101
**Wood	MO	70,963/34,850
Dix	NJ	31,992/26,185
McClellan	AL	45,513/26,785
Ord	CA	28,500/28,500
Rucker	AL	58,939/50,000
Huachucha	ARI	73,344/68,825
Gordon	GA	55,502/43,607

**ECS

VI. Summary.

A. In the foregoing sections the background, objectives, scope, and approach of the study were reviewed; the definition and development of thirty-six candidate ARTEP evaluation implementation options were presented; the cost and effectiveness data base was identified; the development of option costs and option indexes of effectiveness was described; the selection of twelve prime candidate options was discussed; the design of two alternate programs of ARTEP evaluations of RC units during AT 76 to test the prime candidate options was detailed, and one was recommended; recommended potential substitutions of qualified NCO for officer personnel in selected evaluator positions were presented; and an analysis to identify Active Army and ARNG training sites suitable for ARTEP evaluations was summarized. The work accomplished to date - including the preparations and submissions of the First Interim Report, the Informal Report of Preliminary Results, and this, the Second Interim Report - completed phases 1 and 2, and commenced the first of four parts in phase 3 in the study.

B. In the following annexes to the report the details of data collection and methodology for the development of candidate ARTEP evaluation implementation option costs were described; the definition of evaluation effectiveness, the collection of effectiveness information, and the development of option effectiveness indexes were explained; analyses to identify Active Army and ARNG training sites suitable for ARTEP evaluations and to identify and recommend potential substitutions of qualified NCO for officer personnel suggested for evaluator positions were presented.

C. The remaining work in phase 3 involves the adaption of AT 75 data collection materials and methodology to AT 76 requirements and the development of additional materials as needed, the collection of data in coordination with and the assistance of FORSCOM and other cognizant agencies, the analysis of data to verify phase 1 and phase 2 results or to revise them as necessary, the final selection of cost-effective ARTEP evaluation implementation options, the design of a program of ARTEP evaluations of RC units with D+60 NATO contingency deployment as the deployment objective discriminator, the preparation and submission of a first draft final report, and the preparation and submission of the final report.

ANNEX A

COST AND EFFECTIVENESS

This annex presents detail in support of the discussions in Sections III and IV of the main report. The annex is divided into two appendixes. Appendix 1 identifies cost elements, discusses data collection, explains a methodology for estimating implementation option evaluation cost, and analyzes cost differences. Appendix 2 defines effectiveness, discusses data collection, and develops effectiveness indexes for each implementation option.

Appendix 1 to Annex A

ARTEP EVALUATION COST

I. Introduction.

A. General. This appendix presents a detailed discussion of the cost data collection and analysis effort and an explication of the methodology used to develop cost estimates for Reserve Component unit evaluations using ARTEP. Congressional interest in the Army's combat readiness and the Army's concern for the cost of training exercises to produce readiness appeared to make the assembly of cost data for ARTEP evaluations a routine matter. However, despite the generation of significant amounts of cost information and many on-going costing efforts by the U.S. Army, not all the cost data required for the Reserve Component Unit Evaluation Analysis (Cost-Effectiveness) study were available in fact, or in usable form.

B. Cost Data Requirements. The cost data to be collected were identified with the assistance of cognizant headquarters and agencies. Both investment and operational costs for ARTEP evaluations were sought. No data for investment cost were identified for annual training (AT) 75; however, the expanded AT 76 program may include investment type cost. The operational cost considered included Operation and Maintenance and Military Personnel for Army, National Guard and Army Reserve as well as Procurement of Ammunition, Army funds.

C. Excluded Cost. Initial planning included a concept of incremental cost for conducting ARTEP evaluations. When, however, it soon became apparent that base cost (for Army Training Tests, ATT, now replaced by ARTEP)

was not available the concept was modified to an ARTEP evaluation cost. As defined (see section V paragraph B) ARTEP evaluation cost does not include cost judged common to all type evaluations (such as ATT, Operational Readiness Training Tests, ARTEP). Accordingly, the following type costs (as listed in the First Interim Report) were excluded from the C-E analysis.

1. Personnel cost for the unit being evaluated, because personnel are paid for AT whether they are evaluated or not.

2. Travel and Per Diem for the unit being evaluated, because travel is necessary for attendance at AT.

3. Meal cost incurred throughout AT regardless of personnel activity.

4. Evaluator training cost, because such training is conducted prior to the exercise regardless of the type evaluation.

5. Self service supply center cost, because supplies will be consumed in the preparation for any type evaluation.

6. Medical support cost, because such support is required for any evaluation.

7. Personnel cost for the aggressor force because of the training value in this type duty.

D. Collateral Impact. Degradation of Active Army (AA) readiness because of support to Reserve Components (RC) has not thus far been quantified. The present data base contains data for only nine battalion

evaluations which were a part of the FORSCOM/TRADOC validation program requiring additional emphasis and support requirements. It appears appropriate to analyze degradation with the larger data base to be provided during AT 76, including options with other types of evaluator personnel. The Analysis of ARTEP Evaluator Tasks and Position Assignments found in Appendix 1 to Annex B recommends substitution of qualified noncommissioned officers for officers. If adopted by the Army these substitutions would reduce the requirement for officers to perform evaluator duties and offer a reduction in evaluator costs for the conduct of ARTEP evaluations.

II. Guidance and Assumptions.

A. Guidance. The approach to the study and the C-E analysis methodology were outlined in the First Interim Report dated 15 May 1975. At the Study Advisory Group (SAG) meeting on 10 June to review the report it was agreed that additive cost rather than total cost was probably more determinable, a sensitivity analysis be conducted to identify additional cost incurred by units having to travel to sites more distant than their normal AT sites, and that D+60 NATO contingency deployment would be used as a discriminator for programming Reserve Component unit evaluations. Consultations with DA DCSOPS and DCSLOG led to obtaining the acquisition cost of ammunition items from the Deputy Chief of Staff for Research, Development, and Acquisition (DCSRDA) and the Fiscal Year (FY) 77 budget figures for petroleum (POL) cost.

B. Assumptions. The costing of personnel support ARTEP evaluations for the evaluation planning group, evaluators, and support personnel was accomplished using standard military labor rates. Personnel cost was not

added for the evaluated unit or aggressor personnel. That some efficiencies are realized for biennial evaluations is acknowledged; conversely, quadrennial evaluations result in higher start-up cost. Because these proficiency gains and losses are dependent on the source and qualification of personnel as well as the personnel turnover rate, a linear cost discrimination was assumed between 2, 3, and 4 year evaluations.

III. Cost Elements.

A. Elements. The elements of cost for which data were collected were developed in cooperation with cognizant headquarters and agencies and are identified in Table A-1-1. (Tables begin on page A-1-24.) The cost data elements are operational in nature; no investment costs were identified for the AT 75 evaluations.

B. Operational Cost. The elements of operational cost are Personnel, Travel, Per diem, POL, Maintenance and Ammunition to support the evaluation. Cost data collection is necessary for the planning evaluation headquarters responsible for the conduct of the evaluation and writing the scenario; the evaluator group; support personnel such as drivers, radio operators, range personnel; the aggressor or threat force personnel; the evaluated unit; attached and supporting units. Personnel data is reportable by the number of personnel by category (O, WO & EM) and man-days by rank. Travel and per diem costs are necessary for personnel who must travel to the evaluation. POL consumed is accumulated in gallons by type - MOGAS, DIESEL and jet fuel (JP4). The maintenance cost is identified as the cost of the repair parts used during the evaluation. Ammunition is reportable by type and quantity utilized during the evaluation.

IV. Data.

A. Sources. As planned at the outset of the study the C-E analysis was dependent on the availability and use of existing data to determine the base (ATT) costs. A list of visits made to arrange for and collect such cost data is at Table A-1-2. During these visits the necessity to collect data was reviewed, the need for accurate data was explained, and definitions of data elements were clarified. The visits indicated that a detailed cost feedback system to identify the specific cost elements by unit and specific evaluation was nonexistent. The assistance of the tactical units was sought to collect the data elements necessary for the study. This assistance was as an additional task for the tactical units and the effort suffered in quality, stratification and comparability.

B. Quantity. Cost-effective analyses in general require large amounts of information; this study, in particular, required data which the existing cost feedback system does not accumulate. The study plan identified 81 elements of data, 54 from the Active Army (6 elements for 9 evaluations during AT 75) and 27 from the National Guard (3 elements for the 9 evaluations) to be collected. The National Guard obtained all the data and the Active Army collected 46 elements of data (see section V paragraph D). Headquarters FORSCOM and the National Guard Bureau assisted in the collection effort.

C. Quality. The quality and accuracy of the data were important because of the data projection to average type battalion costs and the need to extrapolate to all RC units in the Army. The quality of data varied with the zeal of the data collectors; some obtaining all the data in adequate detail. Some data were estimates, but were said to be the best data available

while others appeared to be incorrect. Comparability was difficult because of different collection methods and some data were not stratified to permit comparisons within and between data elements. Visits to Fort Hood, Fort Carson and Fort Lewis established that reportable maintenance cost would be incomplete. The cost system for direct support (DS) and general support (GS) maintenance shops charged the shop and not the unit receiving the support so this data was not available. A register was to be kept on spare parts provided RC units and data could be made available. The maintenance data reported were only for spare parts used during the evaluation period; since the tactical portion of the exercise is the period during which the primary effort is on keeping vehicles rolling, the maintenance costs collected may not be realistic.

D. Data Utilization. FY 77 budget prices for POL were obtained from DA DCSLOG to filter out the rapid change in actual cost during AT 75 and to project future cost. Likewise acquisition cost of items of ammunition were obtained from DCSRDA to project more realistically the cost for future ARTEP evaluations rather than use the actual cost of ammunition consumed. Telephone communication was maintained with the data collectors to clarify and explain the data received. The data received were priced and extended where necessary. The data were tabulated for each evaluation, segregating National Guard (POL, maintenance and ammunition) and Active Army (personnel, travel, per diem, POL, maintenance, and ammunition) cost. Analysis of the comparability of the data was undertaken. The extreme values were eliminated from further consideration, and in unusual cases a more indicative estimate was substituted for the data element. Inasmuch as the evaluations were not uniform, the different approaches (see Table 2) affected the data reported. The costs

were normalized to improve comparability. This treatment of the data elements will be identified and explained in the discussion of evaluation cost, paragraph V.

V. Evaluation Cost.

A. General. Visits to Headquarters, FORSCOM and to the posts and divisions where evaluations were to take place failed to identify satisfactory cost data for RC battalions being evaluated against the ATT. The use of available incomplete base case data would reduce the creditability of any incremental costs established. Even though AT 75 evaluation cost was to be collected, a soft base cost data would make the additive cost suspect. The data collection effort designed to capture the cost of AT 75 evaluations was to provide current actual data for the personnel support, POL, ammunition, maintenance, travel and per diem.

B. Definition. The evaluation cost is designed to identify the cost to support an ARTEP evaluation, not considering the excluded costs. Evaluation cost (EC) for type battalion was calculated as the sum of all cost elements as applicable and provided:

EC = AM (AA + RC) + MT (AA + RC) + PD (AA) + PER (AA) + POL (AA + RC) + TVL (AA)

Following are definitions of each data element and the rules for how the data were used to derive evaluation cost.

1. Ammunition. Ammunition (AM) items required for the evaluation were costed with acquisition cost as received from DCSRDA.

2. Maintenance. Maintenance (MT) cost was limited to the cost of repair parts utilized during the evaluation.

3. Personnel. The cost of personnel (PER) support by the Active Army, except the aggressor, was used because of the effect on readiness and personnel nonavailability for normal duties. Personnel support cost was not considered for the evaluated unit nor support rendered by RC units because attendance at AT accrues cost whether or not an evaluation takes place. The cost of the aggressor unit was not considered regardless of source because of the excellent training received while playing the role of aggressor. Maneuver Training Commands (MTC) personnel support was for the evaluators only because the task of scenario preparation will probably be handled during inactive duty training (IDT). The MTC normally does not provide support personnel for evaluations.

4. POL. The quantity of petroleum products (MOGAS, DIESEL, and JP4) consumed for the evaluation was multiplied by the FY 77 budget costs as provided by DA DCSLOG.

5. Travel. The cost of travel (TVL) for personnel required to support the evaluation was dollar value or POL consumption as reported.

6. Per Diem. Per diem (PD) necessary for personnel to support the evaluation was accumulated by number of officer and enlisted personnel times the number of days in a travel status.

C. Evaluation Cost Models. Using the EC formula and rules cited above three evaluation costs were developed: Actual AT 75 Evaluation Cost, the Evaluation Cost Based on the ARTEP Document (ECD), and the Evaluation Cost Based on the Actual Cost (ECA).

1. Actual AT 75 Evaluation Cost was accumulated from the AT 75 evaluations. POL and ammunition consumption were projected on acquisition cost; and type battalion, Mechanized Infantry (IN (M)), Tank (TK), and Field Artillery (FA), averages for level 3 with AA evaluators derived.

2. ECD was developed for all evaluator sources (AA, RC, MTC and mixes) for level 3 (level 2 for FA) and level 2 (level 1 for FA). The ECD used POL and maintenance averages from the actual AT 75 evaluations and costed personnel and ammunition as recommended by the ARTEP document. Travel and per diem were computed for personnel traveling to the actual AT 75 sites.

3. ECA started with the actual AT 75 cost by type battalion evaluated at level 3 cost with AA evaluators. It was necessary to estimate the cost of the other evaluator sources, travel and per diem; the ammunition maintenance and POL remained constant. Projecting the level 2 (level 1 for FA) was accomplished by applying ratios established in the ECD.

D. Actual AT 75 Evaluation Cost. During AT 75 nine RC battalion evaluations were conducted with AA evaluators as a part of the FORSCOM/TRADOC validation program. Based on data from these evaluations, actual AT 75 cost was developed for battalion level 3 evaluations. Tables A-1-3 to A-1-5 respectively reflect the data collected for three type battalions: Infantry (M), Tank, and 155 (SP) Field Artillery. Averages for both AA and RC were obtained by adding available data and dividing by the number of units reporting; see Tables A-1-6 to A-1-8.

1. Ammunition. The quantities of ammunition items actually used during evaluations as reported were costed using the DCSRDA cost.

The 1/303 AR Bn could not use pyrotechnics or blanks because of the potential for fire which existed at Yakima Firing Center; on the other hand, the 1/303 was the only Tank battalion which fired tank weapons in the AT 75 program. The 1/195 AR Bn cost does not include 4.2 in. mortar ammunition, but does include aggressor support by Troop E, 67 Cavalry. The ammunition data for the AA evaluators was not available for 1/123 AR, 3/117 IN (M), 1/134 IN (M) and 1/168 FA evaluations.

2. Maintenance. Cost provided was for a battalion level 3 evaluation in the context of a battalion Field Training Exercise (FTX) including the battalion slice support to each company. The actual spare parts cost was based on the actual number of vehicles utilized by the RC units. Recognizing that the maintenance cost reported does not consider the cost of DS and GS maintenance shop support, the estimated figures supplied by the State of Washington for the 81st Brigade provided average costs nearer actual maintenance costs for the battalions. AA cost for maintenance was unavailable for the 3/117 IN (M) and 1/123 AR evaluations.

3. Personnel. The personnel support provided the RC units during AT 75 evaluation was more than required for two reasons: the RC units were affiliated, two battalions were roundout, all had AA support and seven of the nine evaluations took place at AA installations; AT 75 evaluations were the first for RC units and the effort was designed to validate the documents. Thus, it may be that the personnel support provided future evaluations will be less, more in line with the ARTEP. The stratification of personnel data was not uniform, so no comparisons could be drawn concerning the various types of personnel support. Actual personnel cost for the AT 75 evaluations was for AA evaluators only. The personnel

support for the 1/134 IN (M) included home station support of the affiliation program.

4. POL. Petroleum products used during the AT 75 evaluation were costed using the DA DCSLOG FY 77 cost rates. The cost for 1/195 AR includes aggressor support by Troop E, 67 Cavalry. AA cost was unavailable for 3/117 IN (M) and 1/123 AR.

5. Travel and Per Diem.

a. Travel costs were reported as actual total dollars or as actual POL consumed to move personnel required to support the evaluation. Cost for 1/11 IN includes $26,636 for USAF C-141 support.

b. Per diem was the amount actually paid for personnel who had to travel to support an ARTEP evaluation.

6. The concept of evaluation cost for type battalions was developed for costing ARTEP evaluations, identifying cost associated for Active Army evaluators at level 3, and projecting the cost for each option. The concept provides the ability to extrapolate the additive cost for type battalions for the entire Reserve Component system.

E. Evaluation Cost Based on the ARTEP Document. The evaluation cost based on the ARTEP document (ECD) was under development concurrently with the collection of ECA cost data. The ECD was developed by type battalion for level 3 (ECD3) and level 2 (ECD2), see Tables A-1-9 to A-1-11 for all evaluator sources. Each ECD was accumulated as follows:

1. Ammunition. The ammunition items prescribed in the ARTEP documents for levels 3 and 2 were costed (see Tables A-1-12 to A-1-14) using the DCSRDA rates.

2. Maintenance. The maintenance cost developed for the actual AT 75 evaluations was used as being the best available estimate.

3. Personnel. The number of evaluators and support personnel by rank to support the evaluations was costed by standard military labor rates for levels 3 and 2 (see Tables A-1-15 to A-1-17).

a. AA - costed the evaluators and support personnel.

b. RC - personnel were not costed because the personnel would perform the duties during AT. RC headquarters contacted advised that they would handle an evaluation within their own resources with personnel at AT at the time of the evaluation.

c. MTC - will not normally provide support personnel.

d. Mix AA+ - utilized 75% of the AA cost, 12.5% of the RC cost (0), plus 12.5% of the MTC cost.

e. Mix RC+ - utilized 25% of the AA cost and 75% of the RC cost.

f. Mix Equal - utilized 50% of the AA cost, 25% of the RC cost, and 25% of the MTC cost.

4. POL. POL consumption for the actual AT 75 evaluations was utilized as the best estimate available. For these evaluations the actual number of vehicles utilized by the RC units was considered.

5. Travel and Per Diem.

a. Travel. The travel was projected by personnel required

to support the AT 75 evaluations at the actual sites using the 15 June 1975 Official Airline Guide rates with the method used for personnel in paragraph D3 above. (See Tables A-1-18 to A-1-20.)

b. Per Diem. Per diem rates were costed similarly for officers and enlisted men necessary to travel to support evaluations. See Tables A-1-21 to A-1-23.

F. Evaluation Cost Based on Actual Cost Data. The evaluation cost based on actual cost data started with the Actual AT 75 Evaluation Cost. The actual AT 75 cost is for battalion level 3 evaluations using AA evaluators. Other evaluator sources, travel and per diem costs had to be estimated. The actual AT 75 cost (averages by type battalion) were used for ammunition, maintenance and POL cost. It was necessary to project the cost by type battalion for level 3 (ECA3) and level 2 (ECA2) across the evaluator sources (see Tables A-1-24 to A-1-26). The Field Artillery battalion ARTEP includes only levels 2 and 1. For comparison with other type battalions these levels correspond to 3 and 2 respectively.

1. Ammunition. The quantity of ammunition items actually used during evaluations as reported was costed using the DCSRDA rates.

a. Level 3 Cost.

(1) Infantry Battalions. The ammunition cost for the 1/161 IN (M) Bn of $90,450.28 was eliminated as an extreme value. The remaining RC cost ranged from $25,065.70 to $28,910.16 and averaged $26,667. The AA data was not available for 3/117 IN (M) or the 1/134 IN (M) evaluations; the remaining AA cost averaged $4,327.

(2) Tank Battalions. The 1/303 AR BN could not use pyrotechnics or blanks because of the potential for fire which existed at Yakima Firing Center. The 1/303 was the only Tank battalion which fired tank weapons; the cost of the tank ammunition was not used and the ECD cost was substituted. The 1/195 Tank battalion ammunition does not include 4.2 in. mortar ammunition so the ECD cost was added. RC cost ranged from $13,995.35 to $19,447.57 and averaged $16,744. The ammunition used by the AA was not available for 1/123 AR evaluation; the remaining AA cost averaged $2,910.

(3) Field Artillery Battalions (Level 2). One RC unit, 1/168 FA, was evaluated at level 3 per the test edition ARTEP; the cost was $49,333.53. The AA reported no ammunition.

b. Level 2 Cost. Level 2 was estimated by applying the percentage increase between levels 3 and 2 in the ECD for average Infantry (2.63%) and Tank (41.96%) battalions. One RC FA BN, 2/146 FA, was evaluated at level 1; the cost was $88,142.64. Example: the ECA3 for a Tank battalion, $19,654 x 1.4196 = $27,900.82.

2. Maintenance. Cost provided was for a battalion level 3 evaluation in the context of a battalion FTX including the battalion slice support to each company. For the actual spare parts cost the actual number of vehicles utilized by the RC units was considered.

a. Level 3 Cost.

(1) Infantry Battalions. RC cost ranged from $653.80 to an estimate of $5000 with an average of $1,850.00. AA cost ranged from $0 to $2,166.97 and averaged $1,334.

(2) Tank Battalions. RC cost ranged from $535.17 to an estimate of $3,000 with an average of $2,232. One AA unit cost was $526.31; so the average of $526.

(3) Field Artillery Battalions (Level 2). RC costs were $263.85 and an estimate of $8,000 with an average of $4,132. AA costs were $31.62 and $0 with an average of $16.

b. Level 2 Cost. The actual AT 75 cost was utilized as the best available estimate of maintenance cost for level 2 evaluations. The AT 75 evaluations were conducted during a battalion FTX.

3. Personnel. The AT 75 evaluation cost for AA personnel support was high due to the affiliation program and validation of the ARTEP documents.

a. Level 3. AA averages by type battalions were developed:

(1) Infantry Battalions. The cost for the 1/161 IN (M) of $121,390 was rejected as an extreme value. The cost for the 1/134 IN (M) included $36,041, a total of 747 man-days, for preparation for the evaluation. This cost was normalized by reducing the preparation expense to $22,904 to eliminate normal support to the affiliation program. The remaining cost ranged from $33,335 to $35,258 and averaged $34,015.

(2) Tank Battalions. The cost ranged from $10,486 to $33,099 and averaged $23,654.

(3) Field Artillery Battalions (Level 2). Both RC evaluations were considered because the ARTEP has no difference in personnel support between levels. The costs were $25,584.50 and $26,330 and averaged $25,927.

b. Level 2. The level 3 costs approximated the level 2 ECD cost for Tank and Mechanized Infantry; the ECD level 2 costs were rounded up to the next thousand dollars for the level 2 ECA. For Field Artillery the level 3 ECA was higher than ECD level 1 so it was also rounded up. The personnel cost by type battalion is $34,000 for Mechanized Infantry, $25,000 for Tank and $21,000 for Field Artillery (level 1).

c. The cost by evaluator source was developed by multiplying the percent of ECD evaluator source cost to ECD AA cost by the ECA for AA evaluator cost for type battalion; see Tables A-1-24 to A-1-26.

4. POL. Petroleum used during the AT 75 evaluations were costed using the DA DCSLOG FY 77 rates.

a. Level 3.

(1) Infantry Battalions. Data was not available for AA support of 3/117 IN (M) evaluation. The remaining AA cost ranged from $1,576.86 to $3,517.79 and averaged $2,377. RC cost ranged from $1,480.04 to $4,597.94 and averaged $2,655.

(2) Tank Battalions. Data was not available for AA support of 1/123 AR evaluation. The AA costs were $900.56 and $2,997 and averaged $1,949. RC cost ranged from $2,717.03 to $5,306.42 and averaged $4,102.

(3) Field Artillery Battalions (Level 2). AA costs were $839.77 and $131.36 and averaged $486. RC costs were $1,091.80 and $1,814.05 and averaged $1,453.

b. Level 2. The ECA3 cost was utilized as the best available level 2 estimate. The AT 75 evaluations for battalion level 3 approximated

level 2 POL consumption because they were conducted in the battalion FTX mode.

5. Travel and Per Diem. The battalion averages reflect the cost of travel and per diem for AA support of AT 75 evaluations.

a. Level 3. AA averages were developed by type battalion.

(1) Travel.

(a) Infantry Battalions. The cost to support the 1/134 IN (M) was reduced to the commercial air rates rather than the USAF C-141 charge. The cost ranged from $0 to $10,388 and averaged $2,937.

(b) Tank Battalions. The cost ranged from $0 to $1,357.86 and averaged $453.

(c) Field Artillery Battalions (Level 2). The costs were $0 and $2,320 and averaged $1,160.

(2) Per Diem.

(a) Infantry Battalions. The cost ranged from $0 to $10,200 and averaged $2,688.

(b) Tank Battalions. The cost ranged from $0 to $1,091.50 and averaged $364.

(c) Field Artillery Battalions (Level 2). The costs were $0 to $3,302 and averaged $1,651.

(3) Travel and per diem were estimated for evaluator sources by multiplying the percentage of ECD3 type evaluator cost to AA ECD3 cost times

the AA ECA cost. Example: an equal mix of evaluators ECD3 travel cost for an Infantry battalion was $4,979 which was 1.06% of the AA ECD3 (4690). Multiply 1.06 by the AA ECA3 travel cost for an Infantry battalion - $2,937 for an equal evaluator mix ECA3 of $3,113.22.

b. Level 2. The total of travel and per diem cost by type battalion was estimated using the ratio of ECA3 (TVL + PD) to ECD (TVL + PD) multiplied by the ECD2 (TVL + PD). Example: a Tank battalion ECA3 is $453 + $364 or $817 and the ECD3 was $326 + $822 or 1,148. The ratio (817 ÷ 1,148) x ECD2 (557 + 1,347) = $1,355.02.

(1) Tank Battalions. The per diem ($592) was developed in the same manner and subtracted from the total (TVL + PD) of $1,355 to yield the travel of $759.

(2) Infantry Battalions. Travel ($3,193) was developed as above and subtracted from the total (TVL + PD) of $6,184 to yield the per diem of $2,991.

(3) Field Artillery Battalions (Level 1). Additional support is not required to evaluate at level 1.

6. Opposing Forces. The opposing forces concept of an evaluation where one element of a unit acts as the aggressor has potential for cost reduction especially in ammunition and POL. The 1/134 IN (M) evaluation was conducted on a RC post where it was impractical to provide Active Army aggressors. Co A 1/134 IN (M) was evaluated and also served as the aggressor for the battalion; the reserve company was simulated. In

this case the data were not complete nor stratified to permit analysis. This technique appears feasible for future evaluations and the effect on cost will be examined if used during AT 76.

G. Option Cost. The ECA and ECD estimated the cost by evaluator source and level for battalion evaluations. It was necessary to determine EC for 2, 3 and 4 year evaluations to complete the cost estimation for all 36 options. A linear relationship was assumed for the frequency variable. ECA and ECD by option are in Tables A-1-27 to A-1-29.

H. AT 76 EC. AT 76 evaluations are to be primarily company evaluations while AT 75 evaluations were accomplished at battalion level. Evaluation cost will be developed by type company. It appears that RC units will probably be evaluated at company level in the future and a data base has not been developed. In some instances, battalion aggregates are to be evaluated and an attempt to accumulate battalion cost will be made to permit comparability with the AT 75 EC data bank. A data collection package has been developed to assist in the collection of stratified data for cost estimation and analysis.

VI. ARTEP Document Analyses.

A. The ARTEPs.

1. ECD3 and ECD2. The three ARTEP documents for which data were collected, 7-45 Mechanized Infantry Battalion, 17-35 Tank Battalion, and 6-365 Field Artillery 155 (SP) Direct Support Units were analyzed. The analyses considered only AA evaluators. The ECD for a Mechanized Infantry battalion ARTEP for level 2 is 6.4% above the ECD3, while for a

Tank battalion the ECD2 is an additional 39.5% and for a Field Artillery battalion it is increased by 19.4%; see Table A-1-30.

2. ECA3 and ECD3. The evaluation costs with AA evaluators, ECA3 and ECD3 were compared. The Mechanized Infantry ECA3 was 15.8% below the ECD3 while Tank battalion was 18% above and Field Artillery was 42.8% above the ECD3. The comparisons are shown in Table A-1-31.

B. Data Element Analyses. The cost of ammunition and personnel support represented 84% of the Infantry, 78% of the Tank ECD3 and 85% of the Field Artillery ECD2.

1. Ammunition.

a. The cost of additional ammunition recommended by the ARTEP to support different evaluation levels varied between 2.7 and 54 percent. Table A-1-32 shows the cost of ammunition for a Mechanized Infantry battalion is $49,347 for level 3 and $50,664 for level 2 or an increase of only 2.7%; the cost for level 1 is $70,456 or an additional 39%.

b. Ammunition used for AT 75 evaluations was compared with that recommended by the ARTEP document. Table A-1-33 reflects the ammunition cost for the four Infantry battalions averaged 37% less than the cost of the ammunition recommended in the ARTEP while the two Field Artillery battalions cost exceeded the cost of the ammunition recommended by the ARTEP by 69.6% and 117%.

2. Personnel.

a. The affiliation and ARTEP validation programs raised

the average battalion personnel cost for the AT 75 evaluations. Comparisons were made between the ARTEP suggested personnel support between levels. The Field Artillery ARTEP recommends the same personnel support for levels 2 and 1. Table A-1-34 shows the ECD3 for a Tank battalion is $22,330 for evaluators and $6,785 for support personnel for a total of $29,115. The ECD2 total of $33,095 is 13.7% more costly than the ECD3.

b. The average cost of personnel support utilized for AT 75 evaluations is compared with that recommended by the ARTEP document. As shown in Table A-1-35, the personnel support for a Field Artillery battalion ECA3 was $25,927 or 26.4% above the ECD2 cost of $20,510.

c. Recommendations made in The Analysis of ARTEP Evaluator Tasks and Position Assignments (Appendix 1 to Annex B) introduce potential reductions in the cost of personnel support and per diem required by the ARTEP evaluations.

VII. RC System Cost.

A. Contingency Deployment. The SAG directed D+60 days be used as unit discriminator for this study. Under direction of the contract officer's representative (COR) units used in the evaluation were extracted from the Program Objective Memorandum (POM) FY 77-81.

B. Approaches.

1. Minimum Cost. If fiscal concern is paramount, a minimum ECD based on quadrennial evaluations with RC evaluators for all the D+60 units is:

IN (M)		$489,294
TK		211,920
FA 155		194,370
Minimum Cost	=	$895,584

2. Maximum Effectiveness. If primary concern is the evaluation effectiveness, the ECD based on biennial evaluations with AA evaluators is:

IN (M)		$1,694,288
TK		672,690
FA 155		650,320
Maximum Effectiveness Cost	=	$3,017,298

3. Requirement. The initial analysis suggests a recommended program which will be stratified considering the requirements for roundout, affiliation, D+60 and D+60 plus units. The need for evaluation does not appear to be uniform in frequency, configuration or level.

VIII. Sensitivity Analysis. SAG guidance included a requirement for a sensitivity analysis to identify additional cost incurred by units required to travel to ARTEP evaluation sites more distant than normal AT sites. The survey of major training sites (Appendix 2 to Annex B) identified 54 sites with the requisites for ARTEP evaluation. With this flexibility, there appears to be no further requirement to consider the need to travel to an ARTEP evaluation site more distant than the normal AT site. The data collection effort for AT 76 will provide MTC and RC in addition to AA evaluator data in a wider range of evaluations for further sensitivity analyses.

IX. Summary. The methodology has been reviewed to include definitions of cost, the data elements and the data collected. Evaluation costs for AT 75 evaluations, based on the ARTEP document, and based on actual cost data have been explained. Information developed as a result of sensitivity and ARTEP document analyses have been reviewed. A cost collection package has been developed to assist in AT 76 data collection and the AT 76 program for data collection is being coordinated with HQ, FORSCOM. The AT 76 program should result in the development of type company cost and enlarge the battalion cost data base. If the opposing forces concept of evaluation is utilized, the effects on cost will be examined. Extrapolations will be made to estimate the EC for an RC evaluation program.

Table A-1-1.

Cost Elements

Operational Cost

- Personnel Required for Evaluations
  - Evaluation Headquarters
  - Evaluators
  - Aggressors
  - Support Personnel
  - Attached and Supporting Units
- Travel
- Per Diem
- POL
  - Evaluated Unit
  - Evaluation Headquarters
  - Evaluators
  - Aggressors
  - Support Personnel
  - Attached and Supporting Units
- Maintenance (repair parts) Cost
- Ammunition

Table A-1-2.

Coordination and Data Collection Visits

Pentagon	DA DCSOPS & PLANS DA DCSLOG DA DCSCOM DA DCSRDA NGB OCAR
Fort McPherson, GA	FORSCOM DCSOPS DCSCOM
Fort Monroe, VA	TRADOC DCSOPS
Arlington, VA	Army Research Institute
Fort Benning, GA	USACATB USAIS
Nashville, TN	TN AG USPFO
Cookeville, TN	3/117 IN BN(M)
Fort Knox, KY	Army Readiness Region VI
Frankfort, KY	KY AG USPFO
Fort Hood, TX	III Corps - G3, G4 & DRC 1st CAV DIV 2nd AR DIV MASSTER 1/123 AR BN 3/117 IN BN (M)
Fort Meade, MD	First Army - DCSOI, Office of TNG EVAL Army Readiness Region III 97th ARCOM
Richmond, VA	80th TNG DIV 80th MTC
Fort Dix, NJ	RCTC(E) Army Readiness Region II
Fort Carson, CO	G3, G4, COMPT, DRA 4th IN DIV (M) 1/195 AR BN 2/134 IN BN (M)

Table A-1-2. (continued)

Yakima, WA	1/161 IN BN (M) 1/303 AR BN
Fort Lewis, WA	G3, G4, COMPT, DRCS 9th IN DIV 2/146 FA BN
Camp Murray, WA	WA AG USPFO
Seattle, WA	81st Brigade (M)
Lincoln, NE	NE AG 67th Brigade (M)
Fort Belvoir, VA	USA Engineer School
Camp Ripley, MN	1/134 IN BN (M) 867 EN CO

Table A-1-3.

Cost Data for AT 75 ARTEP Evaluations
Mechanized Infantry Battalions

NG Cost	3/117 IN	1/161 IN	2/134 IN	1/134 IN
POL	$ 4,597.94	$ 2,504.99	$ 1,480.04	$ 2,037.07
Maint	1,022.60	5,000.00[a]	724.63	653.80
Ammo	26,026.50	90,450.28	28,910.16	25,065.70
NG TOTAL	$31,647.04	$97,955.27	$31,114.83	$27,756.57

AA Cost	2/50 IN	2/2 IN	1/12 IN	1/11 IN
Personnel	$33,452.00	$121,390.00	$35,258.00	$46,472.00[b]
Travel	0.00	1,363.25	0.00	27,266.00[c]
Per Diem	0.00	553.50	0.00	10,200.00
POL	NA[d]	3,517.79	1,576.86	2,037.07
Maint	NA	0.00	2,166.97	501.63
Ammo	NA	3,264.55	5,389.64	NA
AA TOTAL	$33,452.00	$130,089.09	$44,391.47	$86,476.70

TOTAL	$65,099.04	$228,044.36	$75,506.30	$114,233.27

[a] Estimate.

[b] Includes preparation costs of $36,041.

[c] Includes $26,636 for USAF C-141.

[d] NA - not available.

Table A-1-4.

Cost Data for AT 75 ARTEP Evaluations
Tank Battalions

NG Cost	1/123 AR	1/303 AR	1/195 AR
POL	$ 5,306.42	$ 2,717.03	$ 4,283.69[b]
Maint	535.17	3,000.00[d]	3,159.83
Ammo	16,789.34	79,820.82[ef]	7,855.69[c]
NG TOTAL	$22,630.93	$85,537.85	$15,299.21[a]

AA Cost	2/67 AR	2/77 AR	1/70 AR
Personnel	$27,376.00	$10,486.00	$33,099.00
Travel	0.00	1,357.86	0.00
Per Diem	0.00	1,091.50	0.00
POL	NA[g]	900.56	2,997.00
Maint	NA	NA	526.31
Ammo	NA	0.00[f]	2,910.30
AA TOTAL	$27,376.00	$13,835.92	$39,532.61

TOTAL	$50,006.93	$99,373.77	$54,831.82

[a] Includes aggressor Troop E, 167 Cavalry.

[b] Includes $599.34 for aggressor.

[c] Includes $2,655.02 for aggressor;
4.2 in. mortar ammunition not included.

[d] Estimate.

[e] Tank weapon ammunition only.

[f] Range conditions prohibited blanks and
pyrotechnics.

[g] NA - not available.

Table A-1-5.

Cost Data for AT 75 ARTEP Evaluations
155 (SP) Field Artillery Battalions

NG Cost	1/168 FA L3	2/146 FA L1
POL	$ 1,814.05	$ 1,091.80
Maint	263.85	8,000.00[a]
Ammo	49,333.53	88,142.64
NG TOTAL	$51,411.43	$97,234.44

AA Cost	1/19 FA	1/11 FA
Personnel	$26,330.00	$25,584.50
Travel	2,320.00	0.00
Per Diem	3,302.00	0.00
POL	839.77	131.36
Maint	31.62	0.00
Ammo	0.00	531.25
AA TOTAL	$32,823.39	$26,247.11
TOTAL	$84,234.82	$123,481.55

[a] Estimate.

Table A-1-6.
Average AT 75 ARTEP Evaluation Cost - Level 3
Mechanized Infantry Battalions

NG Cost	3/117 IN	1/161 IN	2/134 IN	1/134 IN	Bn Avg. L3
POL	$ 4,597.94	$ 2,504.99	$ 1,480.04	$ 2,037.07	$ 2,655.00
Maint	1,022.60	5,000.00	724.63	653.80	1,850.00
Ammo	26,026.50	90,450.28[a]	28,910.16	25,065.70	26,667.00
NG TOTAL	$31,647.04	$97,955.27	$31,114.83	$27,756.57	$31,172.00

AA Cost	2/50 IN	2/2 IN	1/12 IN	1/11 IN	Bn Avg. L3
Personnel	$33,452.00	$121,390.00[a]	$35,258.00	$33,335.00[b]	$34,015.00
Travel	0.00	1,363.25	0.00	10,388.00[c]	2,937.00
Per Diem	0.00	553.50	0.00	10,200.00	2,688.00
POL	NA[d]	3,517.79	1,576.86	2,037.07	2,377.00
Maint	NA	0.00	2,166.97	501.63	1,334.00
Ammo	NA	3,264.55	5,389.64	NA	4,327.00
AA TOTAL	$33,452.00	$130,089.09	$44,391.47	$56,461.70	$47,678.00
TOTAL	$65,099.04	$228,044.36	$75,506.30	$84,218.27	$78,850.00[e]

[a] Rejected as extreme.

[b] Reduced preparation cost to $22,904.

[c] Commercial air rates.

[d] NA - not available.

[e] Based on actual data.

Table A-1-7.

Average AT 75 ARTEP Evaluation Cost - Level 3

Tank Battalions

NG Cost	1/123 AR	1/303 AR	1/195 AR	Bn Avg. L3
POL	$ 5,306.42	$ 2,717.03	$ 4,283.69	$ 4,102.00
Maint	535.17	3,000.00	3,159.83	2,232.00
Ammo	16,789.34	19,447.57[a]	13,995.35[b]	16,744.00
NG TOTAL	$22,630.93	$25,164.60	$21,438.87	$23,078.00

AA Cost	2/67 AR	2/77 AR	1/70 AR	Bn Avg. L3
Personnel	$27,376.00	$10,486.00	$33,099.00	$23,654.00
Travel	0.00	1,357.86	0.00	453.00
Per Diem	0.00	1,091.50	0.00	364.00
POL	NA[c]	900.56	2,997.00	1,949.00
Maint	NA	NA	526.31	526.00
Ammo	NA	0.00	2,910.30	2,910.00
AA TOTAL	$27,376.00	$13,835.92	$39,532.61	$29,856.00
TOTAL	$50,006.93	$39,000.52	$60,971.48	$52,934.00[d]

[a] ARTEP document cost.

[b] Includes 4.2 in. mortar ammunition.

[c] NA - not available.

[d] Based on actual data.

Table A-1-8.

Average AT 75 ARTEP Evaluation Cost - Level 2

155 (SP) Field Artillery Battalions

NG Cost	1/168 FA L3[a]	2/146 FA L1[a]	Bn Avg. L3[b]
POL	$ 1,814.05	$ 1,091.80	$ 1,453.00
Maint	263.85	8,000.00	4,132.00
Ammo	49,333,53	88,142.64	49,334.00
NG TOTAL	$51,411.43	$97,234.44	$54,919.00

AA Cost	1/19 FA L3[a]	1/11 FA L1[a]	Bn Avg. L3[b]
Personnel	$26,330.00	$25,584.50	$25,927.00
Travel	2,320.00	0.00	1,160.00
Per Diem	3,302.00	0.00	1,651.00
POL	839.77	131.36	486.00
Maint	31.62	0.00	16.00
Ammo	0.00	531.25	266.00
AA TOTAL	$32,823.39	$26,247.11	$29,506.00

TOTAL	$84,234.82	$123,481.55	$84,425.00[c]

[a] Per Test Edition ARTEP.

[b] Per DA Edition ARTEP.

[c] Based on actual data.

Table A-1-9.

Evaluation Cost Based on the ARTEP Document (ECD)

Mechanized Infantry Battalions

Level 3

	AA	RC	MTC	AA+	RC+	Equal
Ammo	$49,347	$49,347	$49,347	$49,347	$49,347	$49,347
Maint	3,184	3,184	3,184	3,184	3,184	3,184
Personnel	29,115	0	22,330	24,627	7,279	20,141
POL	5,032	5,032	5,032	5,032	5,032	5,032
Travel	4,690	0	6,394	4,878	1,175	4,979
Per Diem	2,303	0	3,317	2,142	576	1,981
ECD3	$93,671	$57,563	$89,604	$89,210	$66,593	$84,664

Level 2

	AA	RC	MTC	AA+	RC+	Equal
Ammo	$50,664	$50,664	$50,664	$50,664	$50,664	$50,664
Maint	3,184	3,184	3,184	3,184	3,184	3,184
Personnel	33,095	0	25,710	28,035	8,274	22,976
POL	5,032	5,032	5,032	5,032	5,032	5,032
Travel	5,098	0	6,950	5,298	1,275	5,411
Per Diem	2,591	0	3,781	2,416	648	2,241
ECD2	$99,664	$58,880	$95,321	$94,629	$69,077	$89,508

AD-A066 261 LITTON MELLONICS SYSTEMS DEVELOPMENT DIV SPRINGFIELD VA F/G 5/9
RESERVE COMPONENT UNIT EVALUATION ANALYSIS (COST-EFFECTIVENESS)--ETC(U)
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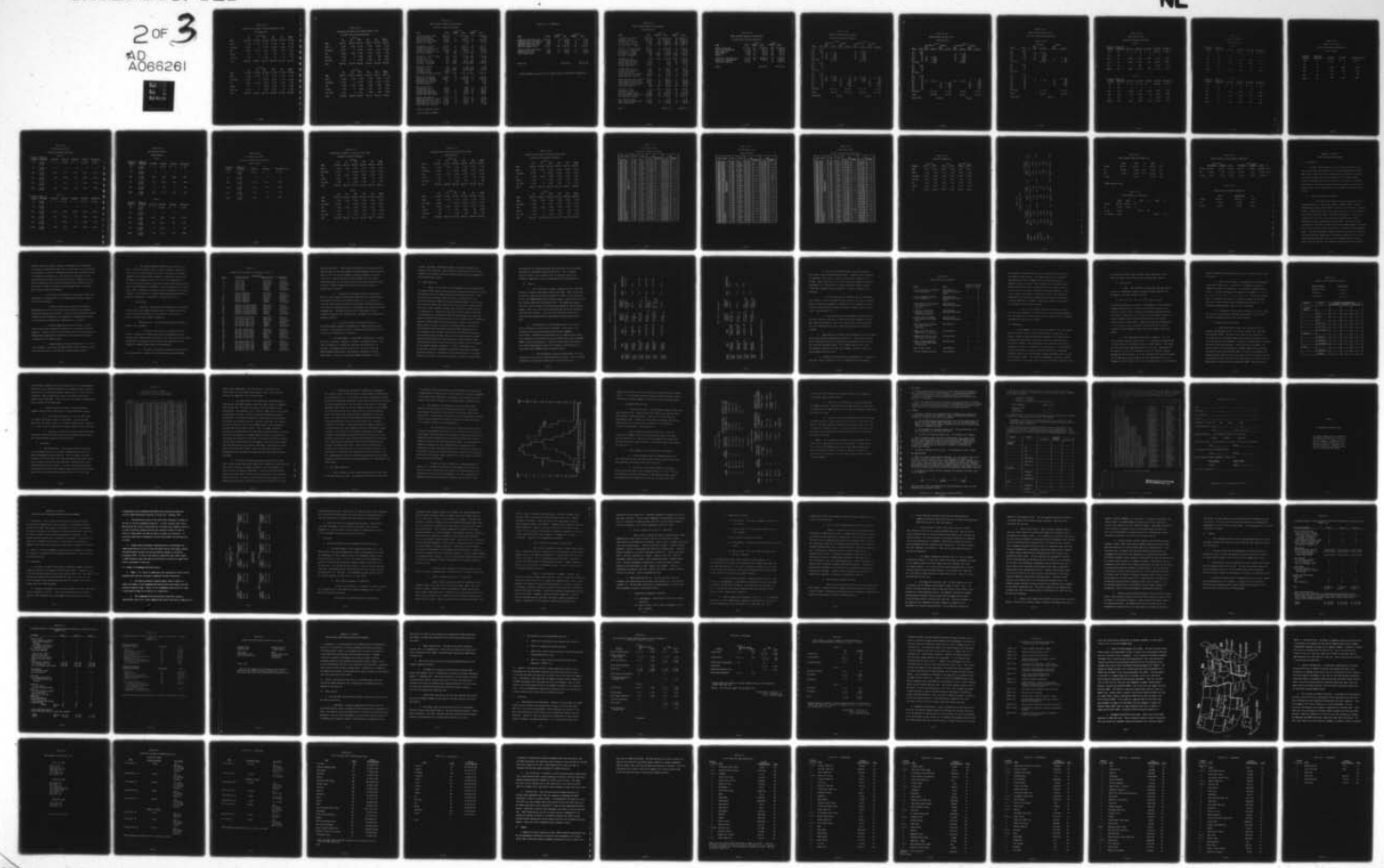


Table A-1-10.

Evaluation Cost Based on the ARTEP Document (ECD)

Tank Battalions

Level 3

	AA	RC	MTC	AA+	RC+	Equal
Ammo	$19,448	$19,448	$19,448	$19,448	$19,448	$19,448
Maint	2,758	2,758	2,758	2,758	2,758	2,758
Personnel	15,440	0	12,800	13,180	3,860	10,920
POL	6,051	6,051	6,051	6,051	6,051	6,051
Travel	326	0	3,113	957	82	1,483
Per Diem	822	0	1,963	862	206	902
ECD3	$44,845	$28,257	$46,133	$43,256	$32,405	$41,562

Level 2

	AA	RC	MTC	AA+	RC+	Equal
Ammo	$27,608	$27,608	$27,608	$27,608	$27,608	$27,608
Maint	2,758	2,758	2,758	2,758	2,758	2,758
Personnel	24,255	0	18,130	20,457	6,064	16,661
POL	6,051	6,051	6,051	6,051	6,051	6,051
Travel	557	0	4,080	1,608	141	2,555
Per Diem	1,347	0	2,892	1,372	337	1,396
ECD2	$62,576	$36,417	$61,519	$59,854	$42,959	$57,029

Table A-1-11.

Evaluation Cost Based on the ARTEP Document (ECD)

155 (SP) Field Artillery Battalions

Level 2

	AA	RC	MTC	AA+	RC+	Equal
Ammo	$29,252	$29,252	$29,252	$29,252	$29,252	$29,252
Maint	4,148	4,148	4,148	4,148	4,148	4,148
Personnel	20,510	0	15,700	17,346	5,126	14,180
POL	1,939	1,939	1,939	1,939	1,939	1,939
Travel	1,120	0	2,884	1,561	280	2,002
Per Diem	2,151	0	3,165	2,009	538	1,867
ECD2	$59,120	$35,339	$57,088	$56,255	$41,283	$53,388

Level 1

	AA	RC	MTC	AA+	RC+	Equal
Ammo	$40,731	$40,731	$40,731	$40,731	$40,731	$40,731
Maint	4,148	4,148	4,148	4,148	4,148	4,148
Personnel	20,510	0	15,700	17,346	5,126	14,180
POL	1,939	1,939	1,939	1,939	1,939	1,939
Travel	1,120	0	2,884	1,561	280	2,002
Per Diem	2,151	0	3,165	2,009	538	1,867
ECD1	$70,599	$46,818	$68,567	$67,734	$52,762	$64,867

Table A-1-12.

ARTEP Document Ammunition Requirements

Mechanized Infantry Battalions

Item	Price	Level 3 Number	Level 3 Cost	Level 2 Number	Level 2 Cost
Ctg HE 81 mm Mort w/PDF	$58.384	70	$ 4,086.88	70	$ 4,086.88
Ctg Ill 81 mm Mort	55.323	-	0.00	-	0.00
Ctg Smk WP 81 mm Mort	37.169	30	1,115.07	30	1,115.07
Ctg HE 4.2 in Mort w/PDF	72.965	65	4,742.73	65	4,742.73
Ctg Ill 4.2 in Mort	67.025	-	0.00	-	0.00
Ctg Smk WP 4.2 in Mort	78.239	30	2,347.17	30	2,347.17
Ctg HEAT 106 mm RR > or[a]	126.771	12	1,521.25	12	1,521.25
Ctg HEP-T 106 mm RR > or[a]	133.269	12	1,599.23	12	1,599.23
Ctg Spotter-Tracer cal .50	1.650	12	19.80	12	19.80
Ctg Tr cal .50 MLB	.805	2200	1,771.00	2200	1,771.00
Ctg Ball cal .50 Tr 4-1 MLB	1.130	1000	1,130.00	1000	1,130.00
Ctg Ball cal .30	.182	14	2.55	14	2.55
Ctg Tracer cal .30	.182	15	2.73	15	2.73
Ctg Ball 7.62 mm MLB	.172	1800	309.60	1800	309.60
Ctg Blank 7.62 mm MLB	.145	25000	3,625.00	25000	3,625.00
Ctg Tracer 7.62 mm	.154	3	.46	3	.46
Ctg Ball 5.56 mm	.0779	7200	560.88	7200	560.88
Ctg Blank 5.56 mm	.05703	30000	1,710.90	30000	1,710.90
Ctg Blank 105 mm	14.582				
Ctg 20 mm TP-T MLB F/Gun M139	7.947	1000	7,947.00	1000	7,947.00
Rocket Prac 35 mm LAW	6.608	45	297.36	45	297.36
Guided Missile TOW Prac	3435.00	3	10,305.00	3	10,305.00
Diaphragm Blast Sim TOW	1.00	15	15.00	15	15.00
Mine Apers Prac NM M17	[b]	-	0.00	-	0.00
Fuze Mine AT Prac	[b]	-	0.00	-	0.00
Mine Antitank Prac	[b]	-	0.00	-	0.00
Grenade hand riot CS	28.250	-	0.00	30	847.50
Grenade hand smoke red	6.954	10	69.54	20	139.08
Grenade hand smoke green	7.474	2	14.95	40	298.96
Grenade hand smoke yellow	9.222	15	138.33	25	230.55
Grenade hand smoke HC	8.319	10	83.19	10	83.19
Signal gnd green star cluster	10.697	9	96.27	40	427.88
Signal gnd red star cluster	14.959	20	299.18	20	299.18
Signal gnd white star cluster	10.216	9	91.94	15	153.24
Signal gnd red star prcht	10.817	4	43.27	-	0.00

[a] HEP-T or HEAT may be used.

[b] Not available at DCSRDA.

Table A-1-12. (continued)

Item	Price	Level 3 Number	Level 3 Cost	Level 2 Number	Level 2 Cost
Signal gnd white star prcht	$10.326	2	$ 20.65	-	$ 0.00
Simulator projectile gnd burst	2.355	45	105.98	40	94.20
Simulator booby trap flash	1.836	5	9.18	5	9.18
Simulator booby trap illum	2.502	5	12.51	5	12.51
Mine M18 claymore inert	36.791	180	6,622.38	180	6,622.38
Simulator booby trap whistle	2.229	5	11.15	5	11.15
Simulator flash arty	3.500	40	140.00	40	140.00
Flare surface trip	6.738	-	0.00	-	0.00
Worst Cost			$49,346.88		$50,957.36[c]

[c] Final adjustment increased total by $293.03 which was considered insignificant.

Table A-1-13.

ARTEP Document Ammunition Requirements

Tank Battalions

Item	Price	Level 3 Number	Level 3 Cost	Level 2 Number	Level 2 Cost
Ctg HEAT-TP-T, 105 mm	$157.434	150	$23,615.10	150	$23,615.10
Ctg HEP-T, 105 mm	114.324	90	10,289.16	90	10,289.16
Ctg APDS-TP-T, 105 mm	137.069	90	12,336.21	90	12,336.21
Ctg 4-1 Tracer cal .50	1.130	3190	3,604.70	3190	3,604.70
Ctg smoke WP 4.2 in Mort	78.239	30	2,347.17	30	2,347.17
Ctg HE, 4.2 in w/prox fuze	100.221	16	1,603.54	16	1,603.54
Ctg HE, 4.2 in Mort w/PDF	72.965	30	2,188.95	30	2,188.95
Ctg Illum 4.2 in Mort	67.025	-	0.00	-	0.00
Ctg Blank 7.62 mm MLB	.145	15000	2,175.00	41200	5,974.00
Ctg Ball 7.62 mm MLB	.172	5250	903.00	5250	903.00
Ctg Blank 5.56 mm	.05703	20240	1,154.29	44020	2,510.46
Grenade hand smk green	7.474	5	37.37	60	448.44
Grenade hand smk red	6.954	-	0.00	35	243.39
Grenade hand smk yellow	9.222	5	46.11	35	322.77
Grenade hand smk HC	8.319	-	0.00	-	0.00
Grenade hand riot CS	28.250	10	282.50	30	847.50
Sim projectile gnd burst	2.355	75	176.63	135	317.93
Sim arty gnd burst	2.355	-	0.00	-	0.00
Signal gnd white star prcht	10.326	6	61.96	6	61.96
Signal gnd red star prcht	10.817	20	216.34	60	649.02
Signal gnd green star cluster	10.697	27	288.82	67	716.70
Signal gnd red star cluster	14.959	27	403.89	37	553.48
Signal gnd white star cluster	10.216	20	204.32	55	561.88
Fuze grenade hand practice	.882	75	66.15	75	66.15
Ctg Tracer .50 cal	.805	180	144.90	180	144.90
Ctg Ball 5.56 mm	.0779	2376	185.09	2376	185.09
Ctg Tracer 7.62 mm	.154	9	1.39	9	1.39
Ctg HE 81 mm Mort w/PDF	58.384	62	3,619.81	62	3,619.81
Ctg HE 81 mm Mort w/prox fuze	100.980	12	1,211.76	12	1,211.76
Ctg smoke WP 81 mm Mort	37.169	30	1,115.07	30	1,115.07
Ctg Illum 81 mm Mort	55.323	-	0.00	-	0.00
Mines claymore M18A1 (Inert)	36.791	60	2,207.46	60	2,207.46
Flare surface trip	6.738	6	40.43	6	40.43
TOTAL			$70,527.12		$78,687.42

Table A-1-14.

ARTEP Document Ammunition Requirements

155 (SP) Field Artillery Battalions

Item	Price	Level 2 Number	Level 2 Cost	Level 1 Number	Level 1 Cost
Charge, Propelling	$ 24.217	224	$ 5,424.61	308	$ 7,458.84
Fuze, Point Detonating	6.287	192	1,207.10	258	1,622.05
Fuze, Proximity	57.640	8	461.12	8	461.12
Fuze, MTSQ	17.733	24	425.59	42	744.79
Primer	1.054	224	236.10	308	324.63
Projectile, High Explosive	93.753	208	19,500.62	274	25,688.32
Projectile, Illumination	124.794	16	1,996.70	16	1,996.70
Projectile, Smoke HC	135.236			18	2,434.25
TOTAL			$29,251.84		$40,730.70

Table A-1-15.

ARTEP Document Personnel Support

Mechanized Infantry Battalions

		Level 3				Level 2			
		Evaluators		Support		Evaluators		Support	
Rank	Rate	Man-Days	Dollars	Man-Days	Dollars	Man-Days	Dollars	Man-Days	Dollars
O-6	$125								
O-5	101					10	$ 1,010		
O-4	83	10	$ 830			30	2,490		
O-3	71	70	4,970			80	5,680		
O-2	56	60	3,360			60	3,360		
O-1	40	90	3,600			90	3,600		
Sub-Total			$12,760				$16,140		
W-4	$ 80								
W-3	68								
W-2	57								
W-1	47								
Sub-Total									
E-9	$ 70								
E-8	59								
E-7	51	30	$ 1,530	5	$ 255	30	$ 1,530	5	$ 255
E-6	43	120	5,160	5	215	120	5,160	5	215
E-5	36	80	2,880	25	900	80	2,880	25	900
E-4	30			85	2,550			105	3,150
E-3	27			75	2,025			75	2,025
E-2	24			35	840			35	840
E-1	22								
Sub-Total			$ 9,570		$ 6,785		$ 9,570		$ 7,385
TOTAL			$22,330		$ 6,785		$25,710		$ 7,385
GRAND TOTAL			$29,115				$33,095		

Table A-1-16.

ARTEP Document Personnel Cost

Tank Battalions

		Level 3				Level 2			
		Evaluators		Support		Evaluators		Support	
Rank	Rate	Man-Days	Dollars	Man-Days	Dollars	Man-Days	Dollars	Man-Days	Dollars
O-6	$125								
O-5	101					10	$ 1,010		
O-4	83					10	830		
O-3	71	40	$ 2,840			70	4,970		
O-2	56	50	2,800			60	3,360		
O-1	40	50	2,000			70	2,800		
Sub-Total			$ 7,640				$12,970		
W-4	$ 80								
W-3	68								
W-2	57								
W-1	47								
Sub-Total									
E-9	$ 70								
E-8	59								
E-7	51							5	$ 255
E-6	43	120	$ 5,160			120	$ 5,160	5	215
E-5	36			15	$ 540			20	720
E-4	30			35	1,050			90	2,700
E-3	27			30	810			65	1,755
E-2	24			10	240			20	480
E-1	22								
Sub-Total			$ 5,160		$ 2,640		$ 5,160		$ 6,125
TOTAL			$12,800		$ 2,640		$18,130		$ 6,125
GRAND TOTAL				$15,440				$24,255	

Table A-1-17.

ARTEP Document Personnel Cost

155 (SP) Field Artillery Battalions

Levels 2 and 1

		Evaluator		Support	
Rank	Rate	Man-Days	Dollars	Man-Days	Dollars
0-6	$125				
0-5	101	10	$ 1,010		
0-4	83	10	830		
0-3	71	70	4,970		
0-2	56	80	4,480	5	$ 280
0-1	40	100	4,000	15	600
Sub-Total			$15,290		$ 880
W-4	$ 80				
W-3	68				
W-2	57				
W-1	47				
Sub-Total					
E-9	$ 70				
E-8	59				
E-7	51			5	$ 255
E-6	43	10	$ 430	10	430
E-5	36			25	900
E-4	30			55	1,650
E-3	27			25	675
E-2	24				
E-1	22				
Sub-Total			$ 430		$ 3,910
TOTAL			$15,720		$ 4,790
GRAND TOTAL				$20,510	

Table A-1-18.

Travel Cost for ECD

Mechanized Infantry Battalions

Level 3

Evaluator Source	Number of Travellers	3/117 IN	1/161 IN	2/134 IN	1/134 IN	Bn Avg. L3
AA	92	$ 0	$ 729	$ 0	$18,032	$ 4,690
RC	92	0	0	0	0	0
MTC	46	8,004	6,624	1,932	9,016	6,394
AA+	92	2,088	2,267	504	14,651	4,878
RC+	92	0	190	0	4,508	1,175
Equal	92	4,002	3,676	966	11,270	4,979

Level 2

Evaluator Source	Number of Travellers	3/117 IN	1/161 IN	2/134 IN	1/134 IN	Bn Avg. L2
AA	100	$ 0	$ 792	$ 0	$19,600	$ 5,098
RC	100	0	0	0	0	0
MTC	50	8,700	7,200	2,100	9,800	6,950
AA+	100	2,262	2,458	546	15,925	5,298
RC+	100	0	198	0	4,900	1,275
Equal	100	4,350	3,996	1,050	12,250	5,411

Table A-1-19.

Travel Cost for ECD

Tank Battalions

Level 3

Evaluator Source	Number of Travellers	1/123 AR	1/303 AR	1/195 AR	Bn Avg. L3
AA	44	$ 0	$ 979	$ 0	$ 326
RC	44	0	0	0	0
MTC	26	4,524	3,724	1,092	3,113
AA+	44	1,044	1,576	504	957
RC+	44	0	245	0	82
Equal	44	1,914	2,074	966	1,483

Level 2

Evaluator Source	Number of Travellers	1/123 AR	1/303 AR	1/195 AR	Bn Avg. L2
AA	75	$ 0	$ 1,670	$ 0	$ 557
RC	75	0	0	0	0
MTC	34	5,916	4,896	1,428	4,080
AA+	75	1,740	2,664	420	1,608
RC+	75	0	423	0	141
Equal	75	3,306	3,560	798	2,555

Table A-1-20.

Travel Cost for ECD

155 (SP) Field Artillery Battalions

Levels 2 and 1

Evaluator Source	Number of Travellers	1/168 FA	2/146 FA	Bn Avg. L2 & L1
AA	56	$ 2,240	$ 0	$ 1,120
RC	56	0	0	0
MTC	28	1,904	3,864	2,884
AA+	56	2,156	966	1,561
RC+	56	560	0	280
Equal	56	2,072	1,932	2,002

Table A-1-21.

Per Diem Cost for ECD

Mechanized Infantry Battalions

Level 3

Evaluator Source	Number of Personnel	3/117 IN	1/161 IN	2/134 IN	1/134 IN	Bn Avg. L3
AA	23 OFF 69 EM	$ 0	$ 4,605	$ 0	$ 4,605	$ 2,303
RC	23 OFF 69 EM	0	0	0	0	0
MTC	23 OFF 23 EM	3,317	3,317	3,317	3,317	3,317
AA+	23 OFF 69 EM	415	3,868	415	3,868	2,142
RC+	23 OFF 69 EM	0	1,151	0	1,151	576
Equal	23 OFF 69 EM	829	3,132	829	3,132	1,981

Level 2

Evaluator Source	Number of Personnel	3/117 IN	1/161 IN	2/134 IN	1/134 IN	Bn Avg. L2
AA	27 OFF 73 EM	$ 0	$ 5,181	$ 0	$ 5,181	$ 2,591
RC	27 OFF 73 EM	0	0	0	0	0
MTC	27 OFF 23 EM	3,781	3,781	3,781	3,781	3,781
AA+	27 OFF 73 EM	473	4,358	473	4,358	2,416
RC+	27 OFF 73 EM	0	1,295	0	1,295	648
Equal	27 OFF 73 EM	945	3,536	945	3,536	2,241

Table A-1-22.

Per Diem Cost for ECD

Tank Battalions

Level 3

Evaluator Source	Number of Personnel	1/123 AR	1/303 AR	1/195 AR	Bn Avg. L3
AA	14 OFF 30 EM	$ 0	$ 2,467	$ 0	$ 822
RC	14 OFF 30 EM	0	0	0	0
MTC	14 OFF 12 EM	1,963	1,963	1,963	1,963
AA+	14 OFF 30 EM	245	2,095	245	862
RC+	14 OFF 30 EM	0	617	0	206
Equal	14 OFF 30 EM	491	1,724	491	902

Level 2

Evaluator Source	Number of Personnel	1/123 AR	1/303 AR	1/195 AR	Bn Avg. L2
AA	22 OFF 53 EM	$ 0	$ 4,040	$ 0	$ 1,347
RC	22 OFF 53 EM	0	0	0	0
MTC	22 OFF 12 EM	2,892	2,892	2,892	2,892
AA+	22 OFF 53 EM	362	3,392	362	1,372
RC+	22 OFF 53 EM	0	1,010	0	337
Equal	22 OFF 53 EM	723	2,743	723	1,396

Table A-1-23.

Per Diem Cost for ECD

155 (SP) Field Artillery Battalions

Levels 2 and 1

Evaluator Source	Number of Personnel	1/168 FA	2/146 FA	Bn Avg. L2 & L1
AA	31 OFF 25 EM	$ 4,302	$ 0	$ 2,151
RC	31 OFF 25 EM	0	0	0
MTC	27 OFF 1 EM	3,165	3,165	3,165
AA+	31 OFF 25 EM	3,622	396	2,009
RC+	31 OFF 25 EM	1,076	0	538
Equal	31 OFF 25 EM	2,942	791	1,867

Table A-1-24.

Evaluation Cost Based on Actual Cost Data (ECA)

Mechanized Infantry Battalions

Level 3

	AA	RC	MTC	AA+	RC+	Equal
Ammo	$30,994	$30,994	$30,994	$30,994	$30,994	$30,994
Maint	3,184	3,184	3,184	3,184	3,184	3,184
Personnel	34,015	0	26,090	28,777	8,504	23,538
POL	5,032	5,032	5,032	5,032	5,032	5,032
Travel	2,937	0	3,994	3,055	734	3,113
Per Diem	2,688	0	3,871	2,500	672	2,312
ECA3	$78,850	$39,210	$73,165	$73,542	$49,120	$68,173

Level 2

	AA	RC	MTC	AA+	RC+	Equal
Ammo	$31,809	$31,809	$31,809	$31,809	$31,809	$31,809
Maint	3,184	3,184	3,184	3,184	3,184	3,184
Personnel	34,000	0	26,418	28,798	8,500	23,596
POL	5,032	5,032	5,032	5,032	5,032	5,032
Travel	3,193	0	4,343	3,321	798	3,385
Per Diem	2,991	0	4,367	2,782	748	2,602
ECA2	$80,209	$40,025	$75,153	$74,926	$50,071	$69,608

Table A-1-25.

Evaluation Cost Based on Actual Cost Data (ECA)

Tank Battalions

Level 3

	AA	RC	MTC	AA+	RC+	Equal
Ammo	$19,654	$19,654	$19,654	$19,654	$19,654	$19,654
Maint	2,758	2,758	2,758	2,758	2,758	2,758
Personnel	23,654	0	19,609	20,201	5,914	16,723
POL	6,051	6,051	6,051	6,051	6,051	6,051
Travel	453	0	4,326	1,332	113	2,061
Per Diem	364	0	870	382	91	400
ECA3	$52,934	$28,463	$53,268	$50,378	$34,581	$47,647

Level 2

	AA	RC	MTC	AA+	RC+	Equal
Ammo	$27,901	$27,901	$27,901	$27,901	$27,901	$27,901
Maint	2,758	2,758	2,758	2,758	2,758	2,758
Personnel	25,000	0	18,700	21,075	6,250	17,175
POL	6,051	6,051	6,051	6,051	6,051	6,051
Travel	759	0	5,564	2,194	190	3,484
Per Diem	596	0	1,281	608	149	620
ECA2	$63,065	$36,710	$62,255	$60,587	$43,299	$57,989

Table A-1-26.

Evaluation Cost Based on Actual Cost Data (ECA)

155 (SP) Field Artillery Battalions

Level 3

	AA	RC	MTC	AA+	RC+	Equal
Ammo	$49,600	$49,600	$49,600	$49,600	$49,600	$49,600
Maint	4,148	4,148	4,148	4,148	4,148	4,148
Personnel	25,927	0	19,860	21,934	6,482	17,916
POL	1,939	1,939	1,939	1,939	1,939	1,939
Travel	1,160	0	2,993	1,624	290	2,076
Per Diem	1,651	0	4,260	2,311	413	2,955
ECA3	$84,425	$55,687	$82,800	$81,556	$62,872	$78,634

Level 1

	AA	RC	MTC	AA+	RC+	Equal
Ammo	$88,409	$88,409	$88,409	$88,409	$88,409	$88,409
Maint	4,148	4,148	4,148	4,148	4,148	4,148
Personnel	21,000	0	16,112	17,766	5,250	14,511
POL	1,939	1,939	1,939	1,939	1,939	1,939
Travel	1,160	0	2,993	1,624	290	2,076
Per Diem	1,651	0	4,260	2,311	413	2,955
ECA2	$118,307	$94,496	$117,861	$116,197	$100,449	$114,038

Table A-1-27.

ECD-ECA Option Cost

Mechanized Infantry Battalions

EVAL SOURCE	LEVEL	FREQ	ECD		ECA	
			$	RANK	$	RANK
Act Army	BN	Bi	49,832		40,105	
Act Army	BN	Tri	37,374		30,078	
Act Army	BN	Quad	24,916		20,053	
Act Army	CO	Bi	46,836		39,425	
Act Army	CO	Tri	35,127		29,569	
Act Army	CO	Quad	23,418		19,713	
Res Comp	BN	Bi	29,440		20,013	
Res Comp	BN	Tri	22,080	7	15,009	6
Res Comp	BN	Quad	14,720	2	10,006	2
Res Comp	CO	Bi	28,782		19,605	
Res Comp	CO	Tri	21,586	6	14,704	5
Res Comp	CO	Quad	14,391	1	9,803	1
Man Tng Cmd	BN	Bi	47,661		37,577	
Man Tng Cmd	BN	Tri	35,745		28,182	
Man Tng Cmd	BN	Quad	23,830		18,788	
Man Tng Cmd	CO	Bi	44,802		36,583	
Man Tng Cmd	CO	Tri	33,602		27,437	
Man Tng Cmd	CO	Quad	22,401	10	18,291	9
Mix AA+	BN	Bi	47,315		37,463	
Mix AA+	BN	Tri	35,486		28,097	
Mix AA+	BN	Quad	23,657		18,732	
Mix AA+	CO	Bi	44,605		36,771	
Mix AA+	CO	Tri	33,454		27,578	
Mix AA+	CO	Quad	22,303	8	18,386	10
Mix RC+	BN	Bi	34,539		25,036	
Mix RC+	BN	Tri	25,904		18,777	
Mix RC+	BN	Quad	17,269	4	12,518	4
Mix RC+	CO	Bi	33,297		24,560	
Mix RC+	CO	Tri	24,972		18,420	
Mix RC+	CO	Quad	16,648	3	12,280	3
Mix Equal	BN	Bi	44,754		34,804	
Mix Equal	BN	Tri	33,566		26,103	
Mix Equal	BN	Quad	22,377	9	17,402	8
Mix Equal	CO	Bi	42,332		34,087	
Mix Equal	CO	Tri	31,749		25,565	
Mix Equal	CO	Quad	21,116	5	17,043	7

Table A-1-28.

ECD-ECA Option Cost

Tank Battalions

EVAL SOURCE	LEVEL	FREQ	ECD		ECA	
			$	RANK	$	RANK
Act Army	BN	Bi	31,288		31,533	
Act Army	BN	Tri	23,466		23,649	
Act Army	BN	Quad	15,644		15,766	
Act Army	CO	Bi	22,423		26,467	
Act Army	CO	Tri	16,817		19,850	
Act Army	CO	Quad	11,211	8	13,234	7
Res Comp	BN	Bi	18,209		18,355	
Res Comp	BN	Tri	13,656		13,766	9
Res Comp	BN	Quad	9,104	3	9,178	3
Res Comp	CO	Bi	14,129		14,232	10
Res Comp	CO	Tri	10,596	5	10,674	4
Res Comp	CO	Quad	7,064	1	7,116	1
Man Tng Cmd	BN	Bi	30,760		31,128	
Man Tng Cmd	BN	Tri	23,070		23,346	
Man Tng Cmd	BN	Quad	15,380		15,564	
Man Tng Cmd	CO	Bi	23,067		26,634	
Man Tng Cmd	CO	Tri	17,300		19,976	
Man Tng Cmd	CO	Quad	11,533	9	13,317	8
Mix AA+	BN	Bi	29,927		30,294	
Mix AA+	BN	Tri	22,445		22,720	
Mix AA+	BN	Quad	14,964		15,147	
Mix AA+	CO	Bi	21,628		25,189	
Mix AA+	CO	Tri	16,221		18,892	
Mix AA+	CO	Quad	10,814	7	12,595	6
Mix RC+	BN	Bi	21,480		21,650	
Mix RC+	BN	Tri	16,110		16,237	
Mix RC+	BN	Quad	10,740	6	10,825	5
Mix RC+	CO	Bi	16,203		17,291	
Mix RC+	CO	Tri	12,152	10	12,968	7
Mix RC+	CO	Quad	8,101	2	8,645	2
Mix Equal	BN	Bi	28,515		28,995	
Mix Equal	BN	Tri	21,386		21,746	
Mix Equal	BN	Quad	14,257		14,497	
Mix Equal	CO	Bi	20,781		23,824	
Mix Equal	CO	Tri	15,586		17,868	
Mix Equal	CO	Quad	10,391	4	11,912	6

Table A-1-29.

ECD-ECA Option Cost

155 (SP) Field Artillery Battalions

EVAL SOURCE	LEVEL	FREQ	ECD		ECA	
			$	RANK	$	RANK
Act Army	BN	Bi	35,300		59,154	
Act Army	BN	Tri	26,475		44,365	
Act Army	BN	Quad	17,650		29,577	
Act Army	CO	Bi	29,560		42,213	
Act Army	CO	Tri	22,170		31,660	
Act Army	CO	Quad	14,780	9	21,107	7
Res Comp	BN	Bi	23,409		47,248	
Res Comp	BN	Tri	17,557		35,436	
Res Comp	BN	Quad	11,705	3	23,624	9
Res Comp	CO	Bi	17,670		27,844	
Res Comp	CO	Tri	13,252	5	20,883	6
Res Comp	CO	Quad	8,835	1	13,922	1
Man Tng Cmd	BN	Bi	34,284		58,931	
Man Tng Cmd	BN	Tri	25,713		44,198	
Man Tng Cmd	BN	Quad	17,142		29,463	
Man Tng Cmd	CO	Bi	28,544		41,400	
Man Tng Cmd	CO	Tri	21,408		31,050	
Man Tng Cmd	CO	Quad	14,272	8	20,700	5
Mix AA+	BN	Bi	33,867		58,099	
Mix AA+	BN	Tri	25,400		43,574	
Mix AA+	BN	Quad	16,934		29,049	
Mix AA+	CO	Bi	28,128		40,778	
Mix AA+	CO	Tri	21,096		30,584	
Mix AA+	CO	Quad	14,064	7	20,389	4
Mix RC+	BN	Bi	26,381		50,225	
Mix RC+	BN	Tri	19,786		37,668	
Mix RC+	BN	Quad	13,191	4	25,113	10
Mix RC+	CO	Bi	20,642		31,436	
Mix RC+	CO	Tri	15,481	10	23,557	8
Mix RC+	CO	Quad	10,321	2	15,718	2
Mix Equal	BN	Bi	32,434		57,019	
Mix Equal	BN	Tri	24,325		42,764	
Mix Equal	BN	Quad	16,217		28,510	
Mix Equal	CO	Bi	26,694		39,317	
Mix Equal	CO	Tri	20,021		29,488	
Mix Equal	CO	Quad	13,347	6	19,659	3

Table A-1-30.

ECD3-ECD2 Comparisons

Element	IN (M) Bn		TK Bn		155 (SP) FA Bn	
	ECD3	ECD2	ECD3	ECD2	ECD2	ECD1
Ammo	49,347	50,664	19,448	27,608	29,252	40,731
Maint	3,184	3,184	2,758	2,758	4,148	4,148
Personnel	29,115	33,095	15,440	24,255	20,510	20,510
Per Diem	2,303	2,591	822	1,347	2,151	2,151
POL	5,032	5,032	6,051	6,051	1,939	1,939
Travel	4,690	5,098	326	557	1,120	1,120
EC	93,691	99,664	44,845	62,576	59,120	70,599

Table A-1-31.

ECD3-ECA3 Comparisons

Element	IN (M) Bn ECD3	IN (M) Bn ECA3	%	TK Bn ECD3	TK Bn ECA3	%	155 (SP) FA Bn ECD2	155 (SP) FA Bn ECA3	%
Ammo	$49,347	$30,994	-37.2	$19,448	$19,654	+ 1.1	$29,252	$49,600	+69.6
Maint	3,184	3,184		2,758	2,758		4,148	4,148	
Personnel	29,115	34,015	+16.8	15,440	23,654	+53.2	20,510	25,927	+26.4
Per Diem	2,303	2,688		822	364		2,151	1,651	
POL	5,032	5,032		6,051	6,051		1,939	1,939	
Travel	4,690	2,937		326	453		1,120	1,160	
EC	$93,671	$78,850	-15.4	$44,845	$52,934	+18.0	$59,120	$84,425	+42.8

Table A-1-32.

ARTEP Document Ammunition Comparisons

	ECD3	ECD2	%	ECD1	%
IN (M)	$49,347	$50,664	2.7	$70,456	39.1
TK	19,448	27,608	42.0	39,229	42.1
TK*	51,080	78,678	54.0	93,165	18.4
FA 155		29,252		40,731	39.2

* With tank gun firing.

Table A-1-33.

ECA-ECD Ammunition Comparisons

	ECA3	ECD3	%	ECD2	%	ECD1	%
IN (M)	$30,994	$49,347	-37.2				
TK	19,654	19,448	+ 1.1				
FA 155	49,600			$29,252	+69.6		
FA 155-ECA1	88,409					$40,731	+117.1

Table A-1-34.

ARTEP Document Personnel Support Comparisons

	ECD3 (FA L2)			ECD2 (FA L1)			
	Evaluators	Support	Total	Evaluators	Support	Total	%
IN (M)	$22,330	$6,785	$29,115	$25,710	$7,385	$33,095	+13.7
TK	12,800	2,640	15,440	18,130	6,125	24,255	+57.1
FA 155	15,720	4,790	20,510	15,720	4,790	20,510	+ 0

Table A-1-35.

ECA-ECD Personnel Support Comparisons

	ECA3	ECD3 (FA L2)	%
IN (M)	$34,015	$29,115	+16.8
TK	23,654	15,440	+53.2
FA 155	25,927	20,510	+26.4

Appendix 2 to Annex A

ARTEP EVALUATION EFFECTIVENESS

I. Introduction.

A. General. This appendix presents a detailed discussion of the data collected and the methodology used to develop implementation option effectiveness indexes for Reserve Component unit evaluations using ARTEP. The discussion begins with the identification of the candidate ARTEP evaluation implementation options, proceeds to a definition of evaluation effectiveness, continues with a description of the data collection effort, and culminates with an explication of the development of the effectiveness indexes.

B. Candidate Implementation Options.

1. In the First Interim Report seventy-two basic and a to-be-determined multiple of twenty-four composite candidate ARTEP evaluation implementation options were described in terms of five variables - evaluation schedule, organizational level tested, aggressor source, test configuration, and controller/evaluator source. The first four variables, respectively, included three, two, two, and two alternative elements (twenty-four combinations using one element from each variable). The fifth variable included three alternative elements and a to-be-determined number of selected mixes (ratios of Active Army to RC personnel in a mixed controller/evaluator group). The three alternative elements of the fifth variable in conjunction with the twenty-four combinations of alternative elements of the first four variables established the seventy-two basic candidate options; each mix added twenty-four options. The alternative frequencies in the evaluation

schedule variable were annual, biennial, and triennial; the alternatives in the source of aggressor variable were all Active Army or all RC personnel; the alternatives in the test configuration variable were evaluated unit pure or evaluated unit combined (e.g., task force); the alternatives in the organizational level tested variable were battalion or company size units; and the alternatives in the controller/evaluator source variable were all Active Army, all ARNG, all Maneuver Training Command (MTC), or selected mixes of Active Army and RC personnel.

2. At the 10 June 1975 SAG meeting it was agreed to apply the following as a screening process to the implementation options proposed in the First Interim Report.

a. Eliminate combined arms testing as an alternative. FORSCOM emphasis will be on testing pure units without cross attachments required for combined arms operation. (Since the test configuration variable included only two alternatives, the elimination of combined arms testing as one effectively eliminated test configuration as a variable.)

b. Eliminate aggressor source as a variable. RC units tested at Active Army installations normally will be provided Active Army aggressors. However, RC units tested at other sites will have RC aggressors. FORSCOM cannot support the costs involved in providing Active Army units as aggressors for all ARTEP testing.

c. Expand frequency of testing alternatives to 2, 3, and 4 year intervals. Delete from consideration the one year alternative since even Active Army units are not required to undergo annual testing.

3. The foregoing guidance reduced the option variables to three - controller/evaluator source, evaluation schedule (frequency of evaluation), and organizational level tested. The number of alternative elements for the second and third remained, respectively, three and two. The number of alternative elements for the first was established at six by defining three general mixed groups of Active Army and RC personnel: Active Army predominate, RC predominate, and Active Army and RC essentially equal. Thus, by forming all combinations of the alternatives of the three variables a set of thirty-six candidate ARTEP evaluation implementation options was identified. The options are listed in Table A-2-1.

C. Effectiveness.

1. Definition. Effectiveness was considered to be a function of the extent to which ARTEP evaluation meets its stated objectives and fulfills the implicit functions of any evaluative system, namely, to provide valid and useful feedback information.

2. ARTEP Objectives. The objectives presented following are common to all type ARTEP:

a. "To evaluate the ability of a [type] battalion to serve as a nucleus of a combined arms task force performing specified missions under simulated combat conditions." For this objective effectiveness determination was concerned with the accuracy and completeness of the information rendered through conduct of the evaluation.

b. "To evaluate the efficiency and the effectiveness of past training of all echelons of the battalion from crew/squad through

Table A-2-1.

Candidate ARTEP Evaluation Implementation Options

Number	Description		
	Evaluator Source	Level Tested	Frequency
1	Active Army	Battalion	Biennial
2	Active Army	Battalion	Triennial
3	Active Army	Battalion	Quadrennial
4	Active Army	Company	Biennial
5	Active Army	Company	Triennial
6	Active Army	Company	Quadrennial
7	Reserve Component	Battalion	Biennial
8	Reserve Component	Battalion	Triennial
9	Reserve Component	Battalion	Quadrennial
10	Reserve Component	Company	Biennial
11	Reserve Component	Company	Triennial
12	Reserve Component	Company	Quadrennial
13	Maneuver Training Command	Battalion	Biennial
14	Maneuver Training Command	Battalion	Triennial
15	Maneuver Training Command	Battalion	Quadrennial
16	Maneuver Training Command	Company	Biennial
17	Maneuver Training Command	Company	Triennial
18	Maneuver Training Command	Company	Quadrennial
19	Mix (Active Army > RC)	Battalion	Biennial
20	Mix (Active Army > RC)	Battalion	Triennial
21	Mix (Active Army > RC)	Battalion	Quadrennial
22	Mix (Active Army > RC)	Company	Biennial
23	Mix (Active Army > RC)	Company	Triennial
24	Mix (Active Army > RC)	Company	Quadrennial
25	Mix (RC > Active Army)	Battalion	Biennial
26	Mix (RC > Active Army)	Battalion	Triennial
27	Mix (RC > Active Army)	Battalion	Quadrennial
28	Mix (RC > Active Army)	Company	Biennial
29	Mix (RC > Active Army)	Company	Triennial
30	Mix (RC > Active Army)	Company	Quadrennial
31	Mix (Active Army ≥ RC)	Battalion	Biennial
32	Mix (Active Army ≥ RC)	Battalion	Triennial
33	Mix (Active Army ≥ RC)	Battalion	Quadrennial
34	Mix (Active Army ≥ RC)	Company	Biennial
35	Mix (Active Army ≥ RC)	Company	Triennial
36	Mix (Active Army ≥ RC)	Company	Quadrennial

battalion/task force." Effectiveness with regard to this objective rested upon the extent to which the evaluation yielded information which reflected changes in unit (or sub-unit/element) performance through a test-train-retest cycle. (Because the units evaluated during AT 75 will not be evaluated during AT 76, and because records of previous evaluations cannot be matched to ARTEP information the aim of this objective cannot be quantitatively assessed.)

c. "To provide an assessment of future training needs." Relative to this objective effectiveness determination was concerned with the diagnostic ability of the evaluation process, i.e., its ability to convey the causes of mission failure or unit/element training deficiencies to the end that evaluation results are translatable into corrective training recommendations. (The ARTEP used during AT 75 and guidance for the validation program did not include specific requirements for formal written diagnostic reports.)

d. "To provide a guide for training objectives by specifying minimum standards of performance for combat-critical missions and tasks." This objective relates to training only and therefore was not a concern for effectiveness of evaluation.

3. Data Requirements. In the ARTEP training cycle - training objectives → training → evaluation → feedback → training objectives - the role of evaluation is to improve the efficiency and effectiveness of training. The feedback portion of the cycle is the key to assessing ARTEP evaluation effectiveness, and therefore, implementation option effectiveness. The extent to which the feedback information is timely,

accurate, and useful (including acceptable to the user) determines the efficacy of the evaluation. These essential characteristics of evaluation feedback were selected as the bases of data necessary for the development of option effectiveness indexes.

II. Data Collection.

A. General. At the outset it was determined that all data needed for the conduct of effectiveness analysis would be obtained from on-going activities, to include observation of ARTEP evaluation and validation exercises, surveys and interviews of personnel involved, mailings of questionnaires, and reviews and analyses of ARTEP results and evaluator comments. Not all these data collection efforts were planned for AT 75, nor were all feasible during that period. Most interview and some survey activity was obviated because all evaluations were conducted by Active Army evaluator groups (no RC, MTC, or mixed personnel), and because neither the ARTEP document nor associated guidance required formal feedback reports to the evaluated RC unit. Comparative analyses of ARTEP evaluation results (deficiencies noted by the evaluator group) and the critique (1-R report) of training readiness rendered by a three-man Active Army team present during the ARTEP evaluation exercise (and throughout AT) but normally not involved in the ARTEP evaluation per se was precluded because (to reduce impact on Active Army personnel resources required for evaluations) the three-man team was selected from the ARTEP evaluator group with the result that principal evaluators served the purposes of two otherwise separate evaluations. In these circumstances it was unlikely that 1-R report information would differ significantly from ARTEP evaluation information. With the use of RC and MTC personnel as evaluators during AT 76, as well as Active Army evaluators, and with the larger number

of evaluations to be conducted during that period there will be increased opportunity for meaningful surveys and interviews. Also, if formal evaluation reports to the evaluated units are required, analyses for timeliness, completeness, and user acceptability can be more objective.

B. Sources.

1. It was infeasible to design a program of RC unit evaluations especially to provide effectiveness data for the study. Thus, all the data used for this report were collected during AT 75 relative to the RC portion of the joint FORSCOM/TRADOC ARTEP validation program. The RC portion involved four different ARTEP and ten affiliated units - four Mechanized Infantry, three Tank, and two 155 mm (SP) Field Artillery battalions, and one Engineer company. Table A-2-2 lists the ten evaluations and outlines the context in which they were conducted. Clearly the data collection scene was not a controlled setting permitting the experimentation ideally needed for the study.

2. Litton-Mellonics study team members were on site at all but one evaluation (a Field Artillery battalion). During these visits interviews with the chief evaluators and the RC unit commanders were possible. Effectiveness questionnaires (to be completed and returned to Litton-Mellonics by direct mail) were distributed along with the FORSCOM/TRADOC validation questionnaires. Additional effectiveness questionnaires were mailed through channels (also to be returned to Litton-Mellonics by direct mail) under FORSCOM and NGB transmittal letters.

a. The questionnaire consisted of three pages: the first, instructions; the second, a rating data matrix; the third, a list of 36 ARTEP implementation options and a ranking table. (See Enclosure A-2-1.)

Table A-2-2.

Reserve Component Evaluations, AT 75, FORSCOM/TRADOC ARTEP Validation Program

Dates	Unit	Site	Evaluator Source	Aggressor Source	Level	Configuration
23-26 March 1975	1/123 AR (KY-ARNG)	Ft Hood, TX	2/67 AR Ft Hood, TX	2nd Sqdrn 1st Cav 2 Co's	L-3	Task Force
9-12 June 1975	1/168 FA (NE-ARNG)	Cp Guernsey, WY	1/19 FA Ft Carson, CO	1/19 FA	L-3	Pure
16-18 June 1975	3/117 IN (M) (TN-ARNG)	Ft Hood, TX	2/50 IN (M) Ft Hood, TX	C Co, 2/67 IN (M)	L-3	Task Force
28-31 July 1975	1/195 AR (NE-ARNG)	Ft Carson, CO	1/70 AR Ft Carson, CO	Trp E, 167 Cav 67 Bde (NE-ARNG)	L-3	Task Force
11-14 July 1975	2/134 IN (M) (NE-ARNG)	Ft Carson, CO	1/12 IN (M) Ft Carson, CO	2 Co's, Co - 170 AR Co - 112 AR	L-3	Task Force
23-26 June 1975	2/146 FA (WA-ARNG)	Ft Lewis, WA	1/11 FA Ft Lewis, WA	1/11 FA	L-1	Pure

Table A-2-2. (continued)

Dates	Unit	Site	Evaluator Source	Aggressor Source	Level	Configuration
3, 7-9 July 1975	1/303 AR (WA-ARNG)	Yakima Firing Center, WA	2/77 AR Ft Lewis, WA	2/77 AR	L-3	Pure
23-25 June 1975	1/161 IN (M) (WA ARNG)	Yakima Firing Center, WA	2/2 IN Ft Lewis, WA	2/2 IN	L-3	Pure
18-20 Aug 1975	1/134 IN (M) (NE-ARNG)	Cp Ripley, MN	1/11 IN (M) Ft Carson, CO	A Co, 1/134 IN (M) (NE-ARNG)	L-3	Pure
18-20 Aug 1975	867 EN Co (NE-ARNG)	Cp Ripley, MN	4th EN Co Ft Carson, CO	A Co, 1/134 IN (M) (NE-ARNG)	L-3	*

*Platoons attached to companys of 1/134 IN (M).

b. On the top half of the matrix page the respondents were asked to rate the three option variables - evaluator source, frequency of evaluation, level tested - using a 1-5 point scale, respectively low to high. Each variable was to be rated in terms of the degree to which the respondent felt it contributed to an ideal evaluation system as defined by the three standards related to feedback: timeliness, accuracy, and usefulness.

c. On the bottom half of the matrix page the respondents were required to rate the elements of each variable (e.g., MTC for evaluator source, triennial for frequency, or company for level) separately in terms of their perceived ability to meet the standards, using the same 1-5 point scale. (See Enclosure A-2-1.)

d. On the third page the respondents were asked to review the list of thirty-six options, to choose the ten that appeared to be the most feasible and effective, and to list their choices in rank order from 1 to 10 (1 understood to be best) in the table provided at the bottom of the page.

3. Approximately two hundred (200) questionnaires were distributed to the seven personnel groups shown in Table A-2-3. (The table also shows the AT 76 planned collection of effectiveness data from the same seven and four additional personnel groups.) Of one hundred and sixty-two (162) questionnaires returned fifty (50) were incomplete, leaving a useable set of one hundred and twelve (112).

4. Attached to each distributed questionnaire was a biographical data sheet (copy at Enclosure A-2-2) to be completed by each respondent -

Table A-2-3.

Effectiveness Data Collection

Source	Data	Collection Period AT 75	AT 76
Active Army Officer Evaluation (each evaluation)	Questionnaires	X	X
	Structured Interviews		X
	Survey		X
Reserve Component Evaluators (each evaluation)	Questionnaires	X	X
	Structured Interviews		X
	Survey		X
Army Readiness Region Officers with ARTEP duties or experience	Questionnaires		X
	Structured Interviews		X
RC Officer and Enlisted Personnel in each unit undergoing evaluation	Questionnaires	X	X
	Structured Interviews		X
Maneuver Training Command Staff Officers with ARTEP duties	Questionnaires		X
	Structured Interviews		X
Branch School Staff Officers with ARTEP duties or experience	Questionnaires	X	X
CONUSA Staff Officers with ARTEP duties or experience	Questionnaires		X
FORSCOM Staff Officers with ARTEP duties or experience	Questionnaires	X	X
TRADOC (including USACATB) Officers with ARTEP duties or experience	Questionnaires	X	X
Study Advisory Group	Questionnaires	X	X
Selected Pentagon Personnel	Questionnaires	X	

with assurance of personal anonymity in all materials furnished to the Army under the study contract. One hundred and fifty-five completed biographical data sheets accompanied the returned questionnaires. A comparative analysis of Active Army respondent and RC respondent group profiles developed from the biographical data showed combat experience, in favor of the Active Army, as the most significant difference. Otherwise, in general, the analysis showed both the Active Army and the RC respondents to be experienced, branch qualified officers and NCO, well suited for ARTEP duty assignments. The complete analysis is presented in a subsequent section of this appendix.

5. Since all AT 75 ARTEP evaluations of RC units involved only Active Army evaluators (so that interviews with RC and MTC evaluators were precluded) only the questionnaire data were applicable to all candidate implementation options for this report.

III. Methodology.

A. Overall Approach. The C-E analysis proposed in the First Interim Report was based on ratios of option effectiveness to option cost. To provide a measure of option effectiveness adaptable to the required ratio arithmetic the questionnaire rating data were used to construct option effectiveness indexes. The questionnaire choice data were used to check respondents consistency in completing the questionnaires. The construction of option effectiveness indexes involved the calculation of individual respondent option scores and the simple averaging (arithmetic mean) of these scores grouped by ARTEP. The checking of respondents consistency involved the calculation of unit option scores, the use of individual respondent choices

to determine unit option ranks by ARTEP, and the comparison of like ARTEP unit option ranks (choice) with unit option ranks (score).

B. Option Scores.

1. Model. The calculation of individual respondent option scores was accomplished by means of a model developed especially for the purpose. The model includes each item

$$E = V(V_t + V_a + V_u) + F(F_t + F_a + F_u) + L(L_t + L_a + L_u)$$

of rating data relative to an option. In the model, E is the individual respondent option score; V, F, and L are the ratings assigned to the variables evaluator source, frequency of evaluation, and organizational level tested, respectively; V_t, V_a, and V_u, are the ratings assigned to a given evaluator source element relative to each of the essential characteristics of effectiveness - timeliness, accuracy, and usefulness; F_t, F_a, F_u and L_t, L_a, L_u respectively and similarly are the ratings assigned to a given frequency element and a given organizational level element.

2. The right member of the model is symmetric - i.e., the three principal terms are similar forms. It is apparent by inspection that E is most sensitive to variations in the V, F, and L factors. For example, with all terms on the right taken equal to 5, E is 225. Changing any of the factors V, F, or L to 1 decreases E to 165, or 27 percent, whereas changing any of the terms V_t, V_a, V_u to 1 decreases E to 205, only 9 percent. On the other hand, with all terms on the right taken equal to 1, E is 9. Changing any of the factors V, F, or L to 5 increases E to 21, or 133 percent,

whereas changing any of the terms F_t, F_a, F_u to 5 increases E to 13, only 44 percent.

3. The use of the model is illustrated with the questionnaire rating data in Table A-2-4. For option 10 - quadrennial evaluation at company level with all RC evaluators - the individual respondent option score, E = 126, was calculated by substituting in the model V = 5, V_t = 4, V_a = 3, V_u = 3, F = 4, F_t = 4, F_a = 4, F_u = 5, L = 2, and L_t, L_a, L_u each equal 4. Similarly, for option 26 - triennial evaluation at battalion level with a mixed evaluator group (predominately RC personnel) - the individual respondent option score E = 99 was calculated.

4. Proceeding as in the above illustrations, using the rating data in all the satisfactorily completed questionnaires, 112 sets of 36 individual respondent options scores were calculated.

C. Option Effectiveness Indexes.

1. Three effectiveness indexes were calculated for each candidate implementation option - one each for Infantry (M), Tank, and Field Artillery ARTEP. The effectiveness index for any given option was calculated as the arithmetic mean of the individual respondent option scores for the group of respondents - evaluators, evaluated RC unit personnel, and branch school staff personnel - associated with a given ARTEP. For example, the set of 112 questionnaires included eighteen from respondents associated with the Field Artillery ARTEP - six Active Army personnel who evaluated two RC Field Artillery units during AT 75, five personnel from the two evaluated RC units, and seven Active Army officers at the Field Artillery School who were involved in the development of ARTEP. Option by option

Table A-2-4.

Example of Questionnaire Rating Data

Option Variable	Rating (1-5)
Evaluator Source	5
Frequency	4
Level Tested	2

VARIABLE	ELEMENT	STANDARD (CHARACTERISTIC)		
		TIMELINESS	ACCURACY	USEFULNESS
EVALUATOR SOURCE				
	AA	5	4	5
	MTC	2	2	2
	RC	4	3	3
	MIX (AA>)	4	3	3
	MIX (RC>)	3	2	2
	MIX (AA≅RC)	4	3	3
FREQUENCY				
	BIENNIAL	4	4	5
	TRIENNIAL	4	3	3
	QUADRENNIAL	4	2	2
LEVEL				
	BATTALION	4	4	4
	COMPANY	4	4	4

the individual respondent option scores based on data in the questionnaires completed by these eighteen respondents were averaged (arithmetic mean) to derive thirty-six option effectiveness indexes relative to Field Artillery evaluations. Option effectiveness indexes were derived similarly for Infantry (M) and Tank ARTEP. Table A-2-5 lists the indexes of effectiveness for all options for the three ARTEP.

2. A careful inspection of Table A-2-5 revealed strong agreement among the three ARTEP relative to high effectiveness options.

a. For Infantry (M) options 1, 4, 19, 22, and 34 have the largest effectiveness indexes, in that order. For Tank the same options have the largest indexes, in a slightly different order. Options 1, 4, 22 and 34 (not in order) have the largest indexes for Field Artillery.

b. The group of options with the ten largest effectiveness indexes for Infantry (M) includes eight with the largest indexes for Tank and a different eight similarly for Field Artillery.

D. Consistency.

1. Unit Option Scores. Unit option scores were calculated as the arithmetic mean of the individual respondent option scores for a group of respondents from the same unit. Thus, for example, for three evaluators all from the same Active Army Tank battalion unit option scores were calculated as the sum of their individual respondent option scores, option by option, divided by three. In this way unit option scores were calculated for nine Active Army evaluator groups and nine RC unit personnel groups (for the nine battalion evaluations during AT 75) and for three

Table A-2-5.

Option Effectiveness Indexes
for Mechanized Infantry, Tank, and
155 (SP) Field Artillery Battalion ARTEP

Option Number	Eval. Source	Level	Freq.	Indexes		
				IN (M)	TK	FA
1	Act Army	BN	Bi	138.6	151.9	135.5
2	Act Army	BN	Tri	121.8	133.9	125.4
3	Act Army	BN	Quad	109.7	125.3	117.7
4	Act Army	CO	Bi	137.4	157.7	141
5	Act Army	CO	Tri	120.6	140.6	130.8
6	Act Army	CO	Quad	108.5	131	121.7
7	Res Comp	BN	Bi	119	126	114.5
8	Res Comp	BN	Tri	102.2	110.1	104.3
9	Res Comp	BN	Quad	90.2	83.7	95.3
10	Res Comp	CO	Bi	117.9	131.7	119.9
11	Res Comp	CO	Tri	101.3	114.6	109.8
12	Res Comp	CO	Quad	89.0	105.1	100.7
13	Man Tng Cmd	BN	Bi	123.8	128.6	123.2
14	Man Tng Cmd	BN	Tri	106.6	112.7	113.1
15	Man Tng Cmd	BN	Quad	94.6	102	103.9
16	Man Tng Cmd	CO	Bi	122.3	134.4	128.6
17	Man Tng Cmd	CO	Tri	105.4	117.3	118.5
18	Man Tng Cmd	CO	Quad	93.3	107.7	109.4
19	Mix AA+	BN	Bi	133.0	145	127.6
20	Mix AA+	BN	Tri	116.2	128.8	117.5
21	Mix AA+	BN	Quad	104.2	118.4	108.3
22	Mix AA+	CO	Bi	131.8	150.8	133.1
23	Mix AA+	CO	Tri	115	133.7	122.9
24	Mix AA+	CO	Quad	103	124.1	113.8
25	Mix RC+	BN	Bi	122.5	132.1	120.3
26	Mix RC+	BN	Tri	105.6	115.7	110.2
27	Mix RC+	BN	Quad	93.6	105.5	101.1
28	Mix RC+	CO	Bi	118.3	137.9	125.1
29	Mix RC+	CO	Tri	104.5	120.5	114.9
30	Mix RC+	CO	Quad	92.4	111.3	105.8
31	Mix Equal	BN	Bi	126.8	142.1	126.5
32	Mix Equal	BN	Tri	110	122.8	116.4
33	Mix Equal	BN	Quad	98.0	112.4	107.3
34	Mix Equal	CO	Bi	127	144.8	131.9
35	Mix Equal	CO	Tri	110.2	127.5	121.8
36	Mix Equal	CO	Quad	98.1	118.1	112.7

branch school staff groups. The twenty-one sets of thirty-six unit option scores were rank ordered from largest to least. These rank data were used for comparisons to be discussed below.

2. Unit Option Ranks. Unit option ranks were determined by combining the individual respondent choice data from a group of respondents from the same unit. The choice data appear on the third page of each questionnaire. (See Enclosure A-2-1.) They are simply a list of ten options in rank order (1 is best) - options the respondent deemed most feasible and effective. To facilitate combination, each option was assigned points on the basis of its rank in the list - the option with rank 1 was assigned 10 points, the one with rank 2 was assigned 9 points, and continuing the one with rank 10 was assigned 1 point. Then, for example, for three evaluators all from the same Active Army Tank battalion the points associated with their option choices were summed, option by option. The option with the largest sum was placed in rank order 1; the option with the next largest sum was placed in rank order 2; the assignment of rank in this way continued until all option choices were placed in rank order. These position assignments were the unit option ranks. In this way unit option ranks were determined for the same twenty-one groups for which unit option scores were calculated.

3. For each of the twenty-one groups respective unit option ranks (score) and unit option ranks (choice) were compared by visual inspection. There were no instances of perfect agreement of two rank orderings, and there were none of complete disagreement. In general, more than half the options in one rank order list (say, choice) were present in the other rank order list (score). On the basis of this relatively high agreement it was judged that the data were sufficiently consistent for purposes of the study.

4. Additionally, the matter of consistency and agreement was a concern relative to the derivation of option indexes of effectiveness by an averaging process. To investigate, the sums of individual respondent option scores from which effectiveness indexes were calculated were separated into three component parts: the first part was the sum of the individual respondent option scores for all the evaluators relative to a given ARTEP; the second and third parts were similar sums for all the RC personnel and all the branch school staff personnel, respectively, for the same ARTEP. The component sums were appropriately divided by the number of associated personnel in each case to derive three sets of 36 option averages for each ARTEP. Twelve options with the highest averages were selected from each set, and arranged in rank order from highest average to lowest. For the three sets of Infantry (M) averages, for example, a method of rank-difference correlation analysis was used to assess the agreement between Active Army evaluators and evaluated RC unit personnel, Active Army evaluators and branch school staff, and evaluated RC unit personnel and branch school staff. Similar analyses were made with the three sets of Tank and three sets of Field Artillery averages. All coefficients of correlation were significant at the five percent level. This strong agreement between the three groups associated with each ARTEP dispelled the concern about the averaging procedure used to determine option effectiveness.

IV. Data Support Analyses.

A. The two analyses in this section deal directly with the origin of the data used in the study. The purpose of the first was to show that

it is unlikely that the questionnaire rating data might have derived from a random process, so that they more likely represent the considered judgments of the experts who provided them. The purpose of the second was to gain insight to the extent of expertise in the questionnaire respondent group.

B. The importance of effectiveness in the cost-effectiveness analysis and the preclusion from obtaining more objective effectiveness data required some appraisal of the quality of the option effectiveness indexes used. In particular, the concern lay in the consideration of whether the set of data from which the indexes were derived was more than simply a set of chance responses to the questionnaires.

1. The consideration was cast in statistical terms by letting H stand for the hypotheses that the set of 112 scores for an option forms a random sample from a population with a probability distribution based on the assumption that the probabilities for choosing the ratings (the integers 1 through 5 as given in the questionnaires) were equal. An exact theoretical frequency distribution of scores (multinomial) was developed for the assumption in H, and a chi-square goodness-of-fit technique was used to test H for each of the thirty-six (36) sets of actual scores (one set per option). On the basis of chi-square values significant at the one percent (.01) level, H was rejected for all options.

2. A composite of these comparisons is shown graphically in Figure A-2-1. The dashed line depicts the distribution of the 4,032 (36 times 112) scores, and the solid line portrays the expected frequencies of occurrence of scores based on the assumption in H. Thus, graphically the combined results and analytically the individual sets of results do not

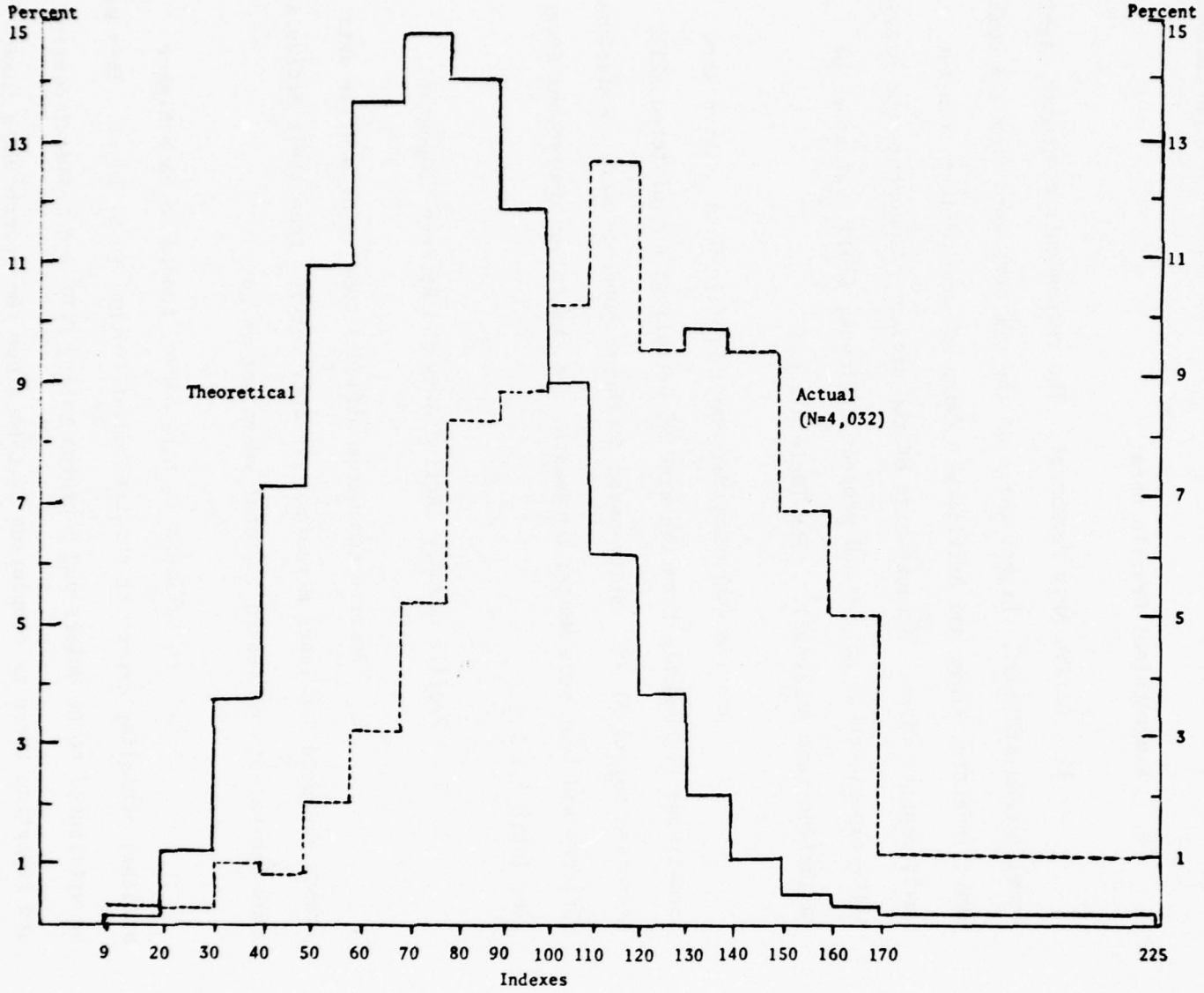


Figure A-2-1. Distribution of Effectiveness Indexes, Theoretical and Actual

support the assumption that the rating data were generated through a random process. It is, therefore, much more likely that the effectiveness indexes reflect the considered judgments of the military experts who participated.

C. Biographical Profile Data.

1. Active Army Personnel. The respondents comprised eighty-four commissioned officers. Eighty-three of the officers were from the combat arms; Infantry, Armor and Artillery. There was one officer from the quartermaster corps. Seventy-nine of the officer respondents had previous ARTEP experience as action and project officers, field evaluators or validation team personnel. (See Table A-2-6.)

2. Reserve Component Personnel Profile Data. There were seventy-one respondents from the nine RC battalions administered ARTEP exercises during AT 75. Sixty-seven of the respondents were commissioned officers and four were Master Sergeants, E-8, battalion operations Sergeants. (See Table A-2-7.)

3. Profile Summary (Active Army and Reserve Component).

a. Reserve Component officers completing profile data sheets averaged 4-6 years more inactive duty service than their Active Army rank equivalents possessed in total years active duty.

b. RC officers in this survey tended to have higher military schooling except at the Lieutenant Colonel (O-5) level. This may be attributed to RC Majors and Captains taking C&GS non-resident courses and reporting these as completion of C&GS since the profile data sheet

Table A-2-6.

Active Army Profiles

Number	Rank	Combat Experience	Average Years Active Duty	Command Experience (P) Plt (C) Company (B) Bn/Bde	Highest Mil. Sch. (B) Basic, C&GS (C) Career, AWC
4	COL 0-6	4	23.3 (27-21)	4-Bn/Bde	1-C&GS, 3-AWC
26	LTC 0-5	24	18.3 (22-12)	21-B, 5-C	25-C&GS, 1-C
31	MAJ 0-4	29	13.6 (19-10)	1-B, 31-C	16-C&GS, 15-C
21	CPT 0-3	19	8.5 (13-6)	21-C, 1-P	16-C, 5-B
2	1LT 0-2	--	2.3 same	2-P	2-B

Table A-2-7.

Reserve Component Profiles

Number	Rank	Combat Experience	Average Years Active Duty	Average Years RC Inactive Duty	Command Experience (P) Plt (C) Company (B) Bn/Bde	Highest Mil. Sch. (B) Basic (C) Career (C&GS) C&GS or higher
6	LTC 0-5	1	Less than 1 (2-0)	25 (28-20)	6-Bn/Bde	5-C&GS, 1-Career
13	MAJ 0-4	2	2 (12-0)	19 (28-9)	12-C, 1-Bn	10-C&GS, 3-Career
45	CPT 0-3	12	1.5 (9-0)	12 (20-1)	40-C, 5-P	17-Basic, 18-Career 10-C&GS
3	1LT 0-2	--	--	6 (9-4)	3-CoCmd	1-B, 2-C
4	MSG E-8	2	2	21 (27-18)	2-First Sqt. 1-Plt Sqt.	----

failed to provide a category for personnel enrolled in (not completed) non-resident courses at Army schools.

c. There was little difference between the two groups in command experience. Approximately ninety-three percent of both groups had commanded units commensurate with their ranks (LTC-Bn, Major, Captain-Co, LT-Platoon) or higher.

d. The most significant difference between the two groups is combat experience. Ninety-three percent (78 of 84) of the Active Army officers had combat experience compared to twenty-four percent (15 of 63) of the Reserve Component officers. The survey indicates that the RC and AA officers were experienced, branch qualified officers, well suited for ARTEP duty assignments.

V. Summary. This appendix was prepared to be self-contained and to permit its use independent of the rest of the report. Its main concern was to present the methodology used to construct ARTEP implementation option effectiveness indexes. The options identified in Table A-2-5 (page A-2-17) are essential to the cost-effectiveness analyses presented in the Main Report.

A. BACKGROUND

1. The Department of Army is sponsoring a study entitled Reserve Component Unit Evaluation Analysis (Cost-Effectiveness). The purpose of the study is to define alternative options for implementing Reserve Component unit evaluations using ARTEP, and through appropriate analysis to select options that are cost-effective.

2. Much of the effectiveness data necessary to the analysis must be collected by means of questionnaires completed by persons who have had active participation in ARTEP development, testing or validation. This questionnaire serves as the final effort in the collection of the necessary effectiveness data.

B. GENERAL

1. Alternative options for implementing Reserve Component unit evaluations are defined in terms of three variables: Source of evaluators/controllers, frequency of evaluation, and level of evaluation.

a. The Evaluator/Controller group elements are: (1) all Active Army; (2) Maneuver Training Command (MTC), USAR units, one for each Army Readiness Region; (3) other Reserve Component personnel; or (4) a mix of Active Army and Reserve Component personnel.

b. The frequency of evaluation elements are: (1) every two years; (2) every three years; or (3) every four years.

c. The level of evaluation elements are: (1) battalion; (2) company.

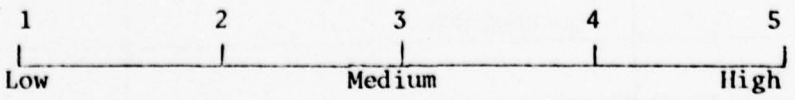
2. These alternative option variables for evaluation, when viewed in the context of the educational cycle of training-assessment-feedback-training, shall be judged according to their perceived effectiveness. Effectiveness in turn must be judged on the basis of (1) timeliness of feedback; (2) accuracy of feedback; and (3) usefulness of feedback in directing (or redirecting) training.

3. For further information call collect: Litton-Mellonics (703) 573-8001.

C. THE QUESTIONNAIRE

1. This is a two part questionnaire involving: (1) the rating of the option variables and their elements, and (2) the ranking of the options. The first step involves rating the three option variables and their elements (B.1.a., B.1.b., B.1.c.) on a 1-5 point scale. The second step requires the ranking of the 36 options developed from different combinations of the variable elements. The intended result is a composite of qualified judgments that indicates the most effective evaluation options to be used in the final cost-effectiveness analysis.

2. In rating the variables and their elements the following five point scale will be employed:



When using this scale, any number may be used more than once, but it is not required that each number be used.

Enclosure A-2-1. Effectiveness Data Questionnaire

3. Rate each of the three option variables, using the above scale, in terms of the degree to which it contributes to an ideal evaluation system as defined by the three standards:

1. Timeliness of feedback
2. Accuracy of feedback
3. Usefulness of feedback in directing training

OPTION VARIABLE	RATING (1-5)
Evaluator Source	_____
Frequency	_____
Level Tested	_____

4. Using the same 1-5 scale rate each element separately against each standard in terms of its perceived ability to meet the standard.

For example, in the process of rating each element, ask yourself: "How timely (accurate) (useful) will the evaluation feedback be from Active Army (MTC) (RC) (MIX) evaluators?"

Three different mixes of evaluators have been chosen consisting of a mix of Active Army and Reserve Component personnel in varying proportions - either predominantly Active Army (AA>), predominantly Reserve Component (RC>), or an essentially equal mix of Active Army and Reserve Component personnel as evaluators (=).

VARIABLE	ELEMENT	STANDARD		
		TIMELINESS	ACCURACY	USEFULNESS
EVALUATOR SOURCE				
	AA			
	MTC			
	RC			
	MIX (AA>)			
	MIX (RC>)			
	MIX (=)			
FREQUENCY				
	BIENNIAL			
	TRIENNIAL			
	QUADRENNIAL			
LEVEL				
	BATTALION			
	COMPANY			

Enclosure A-2-1. (continued)

5. The second part of the questionnaire is the ranking of the options. Reading across, there are thirty-six options listed below. Select ten options that appear to be the most feasible and effective and then Rank them 1-10, most desirable to least desirable. Use the work space provided at the bottom of this page to display your choices.

EVALUATOR SOURCE	FREQUENCY	LEVEL TESTED
Active Army	Biennial	Battalion
Active Army	Triennial	Battalion
Active Army	Quadrennial	Battalion
Active Army	Biennial	Company
Active Army	Triennial	Company
Active Army	Quadrennial	Company
Reserve Component	Biennial	Battalion
Reserve Component	Triennial	Battalion
Reserve Component	Quadrennial	Battalion
Reserve Component	Biennial	Company
Reserve Component	Triennial	Company
Reserve Component	Quadrennial	Company
Maneuver Training Command	Biennial	Battalion
Maneuver Training Command	Triennial	Battalion
Maneuver Training Command	Quadrennial	Battalion
Maneuver Training Command	Biennial	Company
Maneuver Training Command	Triennial	Company
Maneuver Training Command	Quadrennial	Company
Mix (predominantly Active Army)	Biennial	Battalion
Mix (predominantly Active Army)	Triennial	Battalion
Mix (predominantly Active Army)	Quadrennial	Battalion
Mix (predominantly Active Army)	Biennial	Company
Mix (predominantly Active Army)	Triennial	Company
Mix (predominantly Active Army)	Quadrennial	Company
Mix (predominantly Reserve Component)	Biennial	Battalion
Mix (predominantly Reserve Component)	Triennial	Battalion
Mix (predominantly Reserve Component)	Quadrennial	Battalion
Mix (predominantly Reserve Component)	Biennial	Company
Mix (predominantly Reserve Component)	Triennial	Company
Mix (predominantly Reserve Component)	Quadrennial	Company
Mix (essentially equal, AA and RC)	Biennial	Battalion
Mix (essentially equal, AA and RC)	Triennial	Battalion
Mix (essentially equal, AA and RC)	Quadrennial	Battalion
Mix (essentially equal, AA and RC)	Biennial	Company
Mix (essentially equal, AA and RC)	Triennial	Company
Mix (essentially equal, AA and RC)	Quadrennial	Company

Rank	List 10 Most Effective Options

Enclosure A-2-1. (continued)

BIOGRAPHICAL DATA SHEET

Name: _____

Rank/Grade: _____

Organization: _____

Branch: _____

Component: (Circle one) AA USAR ARNG

Combat Experience: Korea _____ S.E. Asia _____

None _____ Other (Specify) _____

Command Experience: (Circle highest command position held)

PLATOON COMPANY BATTALION

Total Active Duty: (RC personnel do not include AT or Service Schooling)

YEARS _____ MONTHS _____

Total Inactive Reserve Component Service:

YEARS _____ MONTHS _____

Highest Military School Attended: (Circle one)

BASIC COURSE CAREER COURSE

C & GS OTHER: _____

ARTEP Duty Assignment: _____

Enclosure A-2-2. Biographical Data Sheet

ANNEX B

EVALUATORS AND TRAINING SITES

This annex presents detail in support of the summary information in Section V of the main report. The annex is divided into two appendixes. Appendix 1 is an analysis of ARTEP evaluator tasks and position assignments. Appendix 2 is a survey of major training sites suitable for unit evaluations using ARTEP.

Appendix 1 to Annex B

ANALYSIS OF ARTEP EVALUATOR TASKS AND POSITION ASSIGNMENTS

I. Introduction. At the 10 June 1975 Study Advisory Group (SAG) meeting for the Reserve Component Unit Evaluation Analysis (C-E) additional guidance provided to the study team included a requirement to consider, in determining the source of evaluators, the importance of differentiating between requirements for officer evaluators versus enlisted evaluators/data collectors. This appendix presents the work done in response to this guidance. The presentation begins with a statement of the purpose, a description of the methodology, a summary of the results, and a discussion of the analysis leading to the results.

II. Purpose. To review recommended evaluator officer assignments to determine the feasibility of using qualified noncommissioned officers in lieu of officers in selected positions.

III. Methodology.

A. An analysis was made of the nature of individual judgments required to accomplish assessment of performance of ARTEP mission tasks. Standards listed in the training and evaluation outlines for Infantry (ARTEP 7-45), Tank (ARTEP 17-35) and Artillery (ARTEP 6-365) battalion ARTEP were used in this analysis. The senior and deputy senior evaluator positions were not included in the analyses because there are no NCO equivalents.

B. Evaluator requirements for assessing performance of various tasks during tactical operations at levels 1, 2 and 3 were identified for each evaluator position. The requirements were then compared with the major duties and tasks

of appropriate senior noncommissioned (NCO) officer military occupational specialty (MOS) descriptions contained in AR 611-201, 3 February 1975.

C. Consideration was given to the rank of the individual in charge of the unit or sub-unit undergoing evaluation. In those instances where senior NCO possessed the requisite qualifications to evaluate units headed by officers, at least one officer evaluator position was retained in order to allow an officer in charge (OIC) with NCO assistants to conduct the evaluation. If necessary, under these circumstances, the OIC could conduct the briefings and critiques.

D. Another officer personnel consideration was the requirement for commissioned officers to serve as OIC and safety officers (SO) during infantry and tank battalion sub-unit live firing exercises (Chapter 2, AR 385-63, 28 February 1973). In view of the wealth of experienced senior NCO assigned to ARTEP evaluator teams there may be justification to waiver the commissioned officer requirement in some cases.

IV. Summary of Recommended NCO Substitutions.

A. Number. As a result of comparisons and considerations certain officer evaluator positions were selected as candidates for NCO substitution.

1. The officer evaluator strength figures shown in Table B-1-1 reflect the impact of the recommended NCO substitutions upon Infantry and Tank battalion evaluator teams. Details of the recommended substitutions are shown in the tables on pages B-1-14 and B-1-15, respectively.

2. The recommended Artillery battalion 155 mm (SP) evaluator substitutions consist of a senior communications NCO for the battery communications

Table B-1-1.

Infantry Battalion (Mech)
(ARTEP 7-45)

Level 1		Level 2		Level 3	
ARTEP Suggested	Recommended Change	ARTEP Suggested	Recommended Change	ARTEP Suggested	Recommended Change
OFF 23	OFF 14 (-9)	OFF 27	OFF 15 (-12)	OFF 23	OFF 11 (-12)
NCO 16	NCO 25 (+9)	NCO 23	NCO 35 (+12)	NCO 23	NCO 35 (+12)

Tank Battalion
(ARTEP 17-35)

Level 1		Level 2		Level 3	
ARTEP Suggested	Recommended Change	ARTEP Suggested	Recommended Change	ARTEP Suggested	Recommended Change
OFF 21	OFF 15 (-6)	OFF 21	OFF 15 (-6)	OFF 13	OFF 7 (-6)
NCO 13	NCO 19 (+6)	NCO 13	NCO 19 (+6)	NCO 13	NCO 19 (+6)

CPT/LT evaluator (see table, page B-1-16). No other artillery officer evaluators were selected for NCO substitution since they either are evaluating positions with peer counterparts or positions for which there are no NCO equivalent.

B. Duties and skills of recommended NCO substitutes. MOS duties of senior NCO recommended as officer evaluator substitutes may be found in paragraph V-A. Unlike officers, NCO are required to undergo annual testing of their knowledge of these requisite duties and skills.

V. Discussion.

A. Officer Evaluator Positions Recommended for NCO Substitution.

1. Assistant Infantry or Tank company/team evaluator, LT. This officer assists the MAJ/CPT company/team evaluator in observing and assessing unit performance of tasks assigned as part of the fundamental ARTEP tactical missions for units at Level 1, 2 and 3. He extends the senior company/team evaluator's data collecting capability through coverage of additional areas and activities. This officer must have served in a unit of the type undergoing evaluation. Recommended infantry NCO substitutions are for a Senior Sergeant, E-8, MOS 11G50 or E-7, MOS 11B40. The recommended tank NCO substitutions are for a Senior Sergeant, E-8, MOS 11E50, or E-7, MOS 11E40.

a. Duties, Master Sergeant, E-8, MOS 11G50.

Serves as First Sergeant in a company or as Chief Instructor in a training facility, Chief Advisor to a Reserve Component unit, or Chief Advisor to foreign military unit.

Must be able to perform the duties of Light Weapons

Infantryman (11B), Infantry Indirect Fire Crewman (11C), Infantry Operations and Intelligence Specialist (11E), or Infantry Direct Fire Crewman (11H) at the "4" skill level. Serves as First Sergeant of a company. Interprets and supervises execution of company policy and standard operating procedures (SOP). Assists in planning, coordinating, and supervising all activities that support the company mission. Advises company commander on all matters concerning enlisted personnel, to include assignments, reassignments, transfers, promotions, granting of passes and leave, punishments, welfare, privileges, and awards. Directs and coordinates company administration. Forms unit for drill, ceremonies, and other military formations. Receives report of personnel present and absent, and reports number of unauthorized absences. Holds NCO call to disseminate instructions and information to subordinate enlisted supervisors. Coordinates operation of company food service and supply activities. Assists company commander in accomplishing unit training. Assists in inspection of organizational activities as prescribed by commander, observes discrepancies, and initiates appropriate corrective action.

Serves as Chief Instructor in a training facility, Chief Advisor to a Reserve Component unit, or Chief Advisor to a foreign military unit.

b. Duties, Sergeant First Class, E-7, MOS 11B40.

Must be able to perform the duties of Infantryman (11B20). Commands infantry fire team, rifle or crew-served weapons squad, section, or platoon in combat. Supervises tactical deployment of weapons and personnel. Selects weapons emplacement sites. Evaluates terrain and assigns fields of fire, target types, and target areas. Controls and selects ammunition types for use against specific targets. Measures angles with military relation formula, field

glasses, or map. Establishes observation post. Observes, estimates range, requests, shifts, and adjusts unit and supporting indirect fire. Computes and reports firing data. Orders and directs fire and movement to destroy enemy personnel, weapons, and equipment. Commands patrols engaged in obtaining combat information. Supervises construction of hasty field fortifications, security of unit, preventive maintenance of weapons and equipment, and receipt, storage, and distribution of food, supplies, and ammunition. Instructs replacements. Enforces correct communication procedures.

c. Duties, Master/First Sergeant, E-8, MOS 11E50.

Must be able to perform the duties of Armor Crewman (11E40). Serves as Operations Sergeant in operations section of battalion, group, combat command, division, and comparable headquarters. Prepares operations directives, reports, and records. Assists in planning tactical operations. Interprets tactical and technical data in combined arms operations. Computes combat data. Conducts oversea training of replacement personnel. Assists in supervising of staff armor operations activities.

Serves as First Sergeant of a company. Interprets and supervises execution of company policy and SOP. Assists in planning, coordinating, and supervising all activities that support the company mission. Advises company commander on all matters concerning enlisted personnel, to include assignments, reassignments, transfers, promotions, granting of passes and leave, punishments, welfare, privileges, and awards. Directs and coordinates company administration. Forms unit for drill, ceremonies, and other military formations. Receives report of personnel present and absent, and reports number of unauthorized absences. Holds NCO call to disseminate instructions and information to

subordinate enlisted supervisors. Coordinates operation of company food service and supply activities. Assists company commander in accomplishing unit training. Assists in inspection of organizational activities as prescribed by commander, observes discrepancies, and initiates appropriate corrective action.

d. Duties, Sergeant First Class, E-7, MOS 11E40.

Must be able to perform the duties of Armor Crewman (11E20). Commands tank or tank section, security section, or tank platoon in armor, tank/infantry, and reconnaissance operations. Selects routes, assembly and bivouac areas, and firing positions. Identifies and selects targets. Operates ranging equipment. Advises on displacement and location of firing position. Identifies, directs avoidance of, or destroys tank traps and barriers. Requests and adjusts mortar, artillery, and naval fire support. Supervises tank fire, tank fire adjustment, indirect fire support, and air-ground operations. Conducts battle drill. Supervises employment of demolitions, laying, and removal of mines. Supervises crew maintenance of tanks, weapons, and equipment. Assists in preparation of operations directives, reports, and records. Conducts technical and tactical training. Trains replacement personnel.

2. Redeye Team evaluator, LT. At least two redeye teams are evaluated, each consisting of two personnel, one sergeant, E-5, team chief and a gunner, E-4. The two teams are selected at random and must successfully meet these standards to achieve a satisfactory rating:

a. Selection and occupation of position

(1) Leader/gunner: satisfactory selection and occupation of position

(2) Redeye section: 90% of leaders and gunners meet the above standards

b. Engage hostile aircraft

(1) Leader/gunner: satisfactory engagement completed for 2 of 3 targets

(2) Redeye section: 90% of leaders and gunners meet the above standards

c. Visually recognize forward area aircraft

(1) Leader/gunner: successfully recognize 90% of the aircraft slides

(2) Redeye section: 90% of the leaders and gunners meet the above standards.

It is recommended that Redeye section Sergeants, Staff Sergeant, E-6, be substituted for the LT, Redeye team evaluator for the infantry (MOS 11B40) and tank (MOS 11E40) battalions. The section sergeants are charged with assisting in the training and supervision of their five assigned redeye teams and should be well qualified to accomplish these ARTEP evaluations.

3. Assistant platoon evaluator, infantry and tank platoons. These positions are recommended for substitution by sergeants first class, MOS 11B40 for infantry and MOS 11E40 for Armored. As outlined above in paragraph 1-b and 1-d, infantry and tank platoon sergeants possess the necessary tactical skills to readily conduct these evaluations.

4. Battery communications evaluator, CPT/LT, SC. It is recommended that senior artillery communications sergeants be substituted for this position: tactical communications chief, MOS 31G40, E-7, or MOS 31G50, E-8. These

communications chiefs are qualified to supervise tactical communications of field artillery battalions.

a. Duties, Tactical Communications Chief, SFC, MOS 31G40.

Supervises installation, operation, and organizational maintenance of communications systems in infantry, armor, artillery, or other units employing similar methods of communication. Must be able to perform the duties of field communications operations or maintenance MOS. Supervises the installation, operation, and organizational maintenance of wire systems, frequency modulated radio nets, air-ground radio sets, and radio teletypewriter sets. Participates in reconnaissance for selection of locations for communications facilities. Determines requirements, assigns duties, and coordinates activities of communications personnel in employment of wire, radio, messenger, visual, and sound communications. Insures compliance with directives and instructions regarding communications matters. Inspects unit communications equipment for serviceability and coordinates organizational maintenance of equipment. Conducts training programs for unit personnel in communications operations, procedures, and maintenance practices.

b. Duties, Master Sergeant, MOS 31G50.

Must be able to perform the duties of Tactical Communications Chief (31G40). Supervises tactical communications operating activities of unit to which assigned. Coordinates operating activities of subordinate communications element in establishment of effective communications net.

B. Officer Evaluator Positions Not Selected for NCO Substitution.

(Summaries describing officer duties are derived largely from appropriate ARTEP editions and U.S. Army Field Manuals)

1. Senior evaluator, COL/LT; deputy senior evaluator, LTC/MAJ. These officers are critical to a successful ARTEP evaluation. They develop the overall evaluation plan to include the training and supervision of evaluator and support personnel. The senior evaluator is personally responsible for preparing the test and reporting unit performance. Both officers should have extensive branch background and duty experience with a similar unit. The senior evaluator must have commanded a like battalion. There are no senior NCO with requisite training and experience.

2. Fire support coordination evaluator, CPT, FA. The fire support coordination evaluator is an artillery officer who advises the commander and staff on fire support, prepares the fires support plan and coordinates with other fire support agencies. He is also a nuclear weapons employment officer and when required, prepares a detailed target analyses. He coordinates all supporting fires delivered on surface targets to include naval and air. There is no senior NCO equivalent for this duty.

3. Chief aggressor controller, MAJ. The chief aggressor position is used only with the Infantry (Mech) battalion ARTEP at Levels 1 and 2. The Artillery and Tank battalions usually assign these duties to their deputy senior evaluator or a senior aggressor officer. The aggressor controller is charged with developing a detailed tactical scenario for the aggressor force which includes desired actions, locations and a time table. He provides guidance to the aggressor force commander on uniform, equipment and aggressor force requirements for specific required actions. He also monitors training and

rehearsals of the aggressor force. The chief aggressor controller should be a field grade officer with extensive branch experience. There are no NCO equivalents for this duty.

4. Special staff officers: HQ Co evaluator, MAJ/CPT; comm Plt evaluator, CPT/LT; Maint Plt evaluator, CPT; Medical Plt evaluator, CPT/LT; and Support Plt evaluator, CPT/LT. It was decided not to consider substitutions for those officer assignments to Battalion/Task force headquarters which include special staff functions and responsibilities. The decision not to consider these assignments was made on the basis that it is understood some senior NCO serving as communications, maintenance, medical and support platoon sergeants do acquire special staff experience through serving in the absence of the appropriate platoon leader. Yet the experience and knowledge of staff and special staff functions at the professional level necessary in an evaluator is not included in the NCO MOS duty requirements and the capability may not be found in many of the senior NCO requisitioned to fill special staff ARTEP battalion/task force headquarters positions. Officers requisitioned by MOS to fill the position will be either serving in the position or should have requisite experience from previous training and duty. The special staff evaluators are assigned only to the tank battalion evaluation team. The infantry assigns evaluation of these positions as an additional duty to members of the infantry evaluation team. The Artillery ARTEP utilizes communications evaluators and covers the remaining special staff functions as additional duty for Artillery evaluators.

5. Infantry, tank company/team, MAJ/CPT; artillery battery evaluator, MAJ/CPT. Positions are filled by a Major or Captain with command experience as a

company or battery commander of a similar unit. In general, senior NCO do not usually acquire the needed company or battery level tactical experience to evaluate these organizations in an ARTEP environment. Some company and battery first sergeants are assigned tactical training and supervisory duties but most are utilized primarily in administrative roles and thus permit officer personnel to concentrate on the tactical training of the unit.

6. Infantry platoon evaluator, MAJ/CPT; tank and mortar platoon evaluator, CPT/LT. Most of the officer evaluator positions not selected for NCO substitution are of a type for which there are no NCO equivalent. A few positions, such as infantry, tank and mortar platoon evaluators were not recommended for substitution even though there are qualified NCO available. The platoon sergeants of these platoons certainly have the training and experience to evaluate similar platoons in an ARTEP environment. Substitutions were not recommended at the platoon level although substitutions were made for the officer, assistant platoon evaluator (Infantry and Tank platoon). One reason for not substituting at platoon leader evaluator level is the requirement (AR 385-63, 28 February 1973) for officers in charge of firing or safety officers for live firing exercises (see table, page B-1-17). Another reason is the matter of traditionally having personnel evaluated by their peers or superiors. It is not considered good policy in any profession to have leaders evaluated by subordinates, junior in rank and presumably, knowledge and experience.

7. Infantry chief crew/platoon evaluator, MAJ; tank crew evaluator, CPT/LT. These positions evaluate live fire exercises and may be readily filled by infantry or tank platoon sergeants or senior infantry and armored sergeants with platoon experience. The infantry major chief crew evaluator was not recommended for substitution for the same reasons as outlined in paragraph 6.

The Captain, assistant infantry chief crew evaluator, was recommended for NCO substitution. One of the two CPT/LT tank crew evaluators was recommended for replacement by a senior NCO for similar reasons. The remaining officer could serve as OIC for live firing.

VI. Summary.

1. The recommended addition of senior noncommissioned officers to assume some ARTEP evaluator team officer positions should not cause change in effectiveness of evaluation.

2. Positions selected for NCO substitution are those for which the needed skills fall well within the bounds of required expertise of an Infantry or Armored Senior Sergeant or the Artillery Tactical Communications Chief.

3. Some difficulty could be experienced in those situations where senior NCO are evaluating officer led sub-units. This may occur during Infantry and Tank crew/platoon evaluations. The OIC should be made aware of possible difficulties and be charged with briefings and critiques of any officer led units.

4. Consideration might be given to expanding the role of senior infantry and tank NCO during live fire exercises. It appears to be an unnecessary officer personnel strength burden to require commissioned evaluators as OIC and SO for each of the sub-unit live firing ranges.

Table B-1-2.

Recommended Changes in Infantry Battalion Evaluator Team Officer Personnel Positions (ARTEP 7-45)

EVALUATOR PERSONNEL	LEVEL 1	LEVEL 2	LEVEL 3
Battalion/Task Force HQ			
Senior Evaluator, COL/LTC	1	1	0
Deputy Senior Eval, LTC/MAJ	1	1	0
Fire Support Coordination Evaluator, CPT (Arty)	1	1	0
Chief Aggressor Controller, MAJ	1	1	0
Chief Crew/Plt Evaluator, MAJ	1	1	1
*Asst Crew/Plt Evaluator, CPT	1	1	1
NCO Crew/Plt Evaluator, E7	1	1	1
Company/Teams			
Co/Team Evaluator, MAJ/CPT	1 per(3 total)	1 per(3 total)	1 per(3 total)
*Asst Co/Team Evaluator, LT	1 per(3 total)	1 per(3 total)	1 per(3 total)
Asst Co/Team Evaluator, Senior NCO (E7/E6)	1 per(3 total)	1 per(3 total)	1 per(3 total)
Rifle Platoons			
Plt Evaluator, MAJ/CPT	1	2	2
*Asst Plt Evaluator, LT	1	2	2
Asst Plt Evaluator, 1 NCO	1	2	2
Rifle Squads			
*Squad Evaluator(s), LT	1	3	3
Asst Sqd Evaluators, Senior NCO (E7/E6)	3	9	9
Weapons and Surveillance Proficiency			
CPT	1	1	1
**LT	7	7	7
NCO (E7/E6/E5)	8	8	8
TOTAL	23 Officers 16 NCO	27 Officers 23 NCO	23 Officers 23 NCO

*Senior NCO Substitution

**Three of the seven lieutenants are recommended for substitution by senior Infantry NCO, SFC (E-7). The weapons and surveillance personnel evaluate the Scout Platoon, Ground Surveillance, Redeye Team, AT Squad, Heavy Mortar Platoon, and 81 mm Mortar Section.

Change	14 (-9) OFF	15 (-12) OFF	11 (-12) OFF
Totals	25 (+9) NCO	35 (+12) NCO	35 (+12) NCO

Table B-1-3.

Recommended Changes in Tank Battalion Evaluator Team Officer Personnel Positions (ARTEP 17-35)

EVALUATOR		LEVEL 1	LEVEL 2	LEVEL 3
Task Force HQ				
Senior Evaluator, COL/LTC		1	1	0
Deputy Senior Evaluator, LTC/MAJ		1	1	0
Fire Support Coordination Evaluator, CPT (Arty)		1	1	0
HQ & CBT SPT CO EVAL				
HQ Co Eval MAJ/CPT		1	1	0
comm Plt Eval CPT/LT		1	1	0
Maint Plt Eval CPT		1	1	0
Medical Plt Eval CPT/LT		1	1	0
Support Plt Eval CPT/LT		1	1	0
Teams				
Tm Evaluator, MAJ/CPT		1 per TM	1 per TM	1 per TM
*Asst Tm Evaluator, LT		1 per TM	1 per TM	1 per TM
Asst Tm Evaluator NCO (E7/E6)		1 per TM	1 per TM	1 per TM
Tank Platoons				
Plt Evaluator CPT/LT		1	1	1
*Asst Plt Eval LT		1	1	1
Tank Crew				
**Crew Evaluators CPT/LT		2	2	2
Asst Crew Evaluators NCO (E7/E6)		2	2	2
Scout Plt				
Plt Eval CPT/LT		1	1	1
Asst Plt Eval NCO (E7/E6)		2	2	2
Mort Plt				
Plt & FDC Evaluator CPT/LT		1	1	1
FO Eval NCO (E6)		3	3	3
Mort Posit Eval (E6)		1	1	1
Redeye Tms				
*Team Evaluator LT		1	1	1
Ground Surveillance				
Crew Evaluator NCO (E7/E6)		1	1	1
AVLB NCO (E7/E6)		1	1	1
TOTALS	Officer	21	21	13
	NCO	13	13	13

*Senior NCO Substitutions

**Senior NCO Substitution for one crew evaluator

Change	Officer	15 (-6)	15 (-6)	7 (-6)
Totals	NCO	19 (+6)	19 (+6)	19 (+6)

Table B-1-4.

Recommended Changes in Artillery Battalion Evaluator Team Officer Personnel Positions
(ARTEP 6-365)

Battery Evaluation Evaluator Personnel	Branch/MOS	Grade
Chief (1)	FA	LTC/MAJ
Firing Battery (1) ea (3)	FA	CPT/LT
HQ & HQ Battery (1)	FA	CPT/LT
Service Battery (1)	FA	CPT/LT
Tactical Nuclear Operations (1)	FA	MAJ/CPT
*Communications (2)	SC	CPT/LT
Observation (3) (Minimum of 3,	31G	NCO
including aerial observation	FA	CPT/LT
Fire Direction (1)	FA	CPT/LT

Battalion Evaluation Evaluation Personnel	Branch/MOS	Grade
Chief (1)	FA	BG/COL/LTC
Controller (1)	FA	LTC/MAJ
Battery (5) (1 per battery)	FA	MAJ/CPT
Tactical Nuclear Operations (1)	FA	LTC/MAJ/CPT
Communication (2)	SC	CPT/LT
	31G	NCO
Fire Direction (4)	FA	CPT/LT
Fire Support Coordination (1) (2 per brigade or battalion size Maneuver Force)	FA	MAJ/CPT
Observation (1 per brigade or battalion size Maneuver Force)	FA	CPT/LT

*Senior NCO Substitution for CPT/LT, SC as Battery Communications Evaluator

Table B-1-5.

Infantry and Tank Battalion Sub-Unit Live Firing

Tank Battalion (ARTEP 17-35)	Infantry Battalion (ARTEP 7-45)
Tank crew	Squad
Heavy mortar crew	Heavy mortar platoon
*Tank platoon/section	81 mm mortar
	AT/TOW crew

*Level 1 only

Sub-unit live firing for the infantry and tank battalion require the same number of ranges at ARTEP level 2 and 3. The tank battalion adds tank platoon/section firing at level 1.

Appendix 2 to Annex B

MAJOR TRAINING SITES SUITABLE FOR ARTEP EVALUATIONS

I. Introduction. In the development of the ARTEP evaluation implementation options to be considered in the Reserve Component Unit Evaluation Analysis (Cost-Effectiveness) study it was recognized that the choice of options for a given ARTEP could be affected by the facilities available. Although initially this potential contingency was viewed as an annual training scheduling problem for the Continental United States Armies (CONUSA), at the 10 June 1975 meeting of the SAG it was agreed that the study effort, nonetheless, would include a survey of major training sites. Following are a statement of the purpose of the survey, a delineation of the scope, an outline of the approach used, and a discussion of the results.

II. Purpose. The purpose of the survey is to determine which sites are suitable for ARTEP evaluations and to identify the type ARTEP which may be employed at each such site.

III. Scope and Data.

A. The type ARTEP considered and the major training sites covered define the scope of the survey.

1. Type ARTEP. The Reserve Component Unit Evaluation Analysis (Cost-Effectiveness) study is concerned with high priority Reserve Component (RC) units. For purposes of the study high priority is directly associated with early deployment. The use of early deployment as a criterion of selection results in a concentration of Armored, Infantry, Field Artillery, and Engineer RC units.

Such units are likely to receive priority in scheduling for ARTEP evaluations. Accordingly, the type ARTEP applicable to these units were given priority in the survey.

2. Major training sites. The need for the survey inherently dictates that it be comprehensive. To this end, the survey covers most Active Army, Army National Guard (ARNG), and United States Army Reserve (USAR) major training sites.

B. Data used in the survey were derived from published materials and through telephone interviews.

1. The ARNG sites surveyed are those listed in National Guard Bureau (NGB) pamphlet 210-21, " Installations, Training Site General Information Summary," 1 September 1974. Each listing includes a site description, location, training acreage, ranges, aviation facilities, utilities and restrictions. Telephone interviews with operations and training personnel at the sites, maps, and logistical information obtained from the Material Branch, Logistics Division, NGB provided other important data.

2. United States Army Reserve site data were obtained from various Army Reserve Commands (ARCOM) and the logistics division, Office of the Chief, Army Reserve.

3. The primary source of Active Army site data is the Engineer Strategic Studies Group (ESSG) Volume II, "Division Stationing Analysis", Office, Chief of Engineers, July 1968. Additional data were obtained through telephone interviews with operations and training staff personnel at the sites.

4. Test Editions of the following ARTEP were used:

a. ARTEP 17-35, Tank Battalion and Combined Arms Task Force

b. ARTEP 7-45, Mechanized Infantry Battalion

c. ARTEP 6-365, Field Artillery Battalion, 155 mm Self-Propelled, Armored/Mechanized Division

d. ARTEP 7-15, Light Infantry (Inf/Abn/Ambl/Light) Ranger Supplement to ARTEP 7-15

IV. Approach. The approach involved a simple comparison of maneuver area requirements for each type ARTEP evaluation with the training areas available at the individual major training sites to identify those sites that have adequate areas. Additionally, where applicable the approach included similar comparisons of ARTEP requirements for firing range facilities and equipment (such as track vehicles) with firing range facilities and equipment available at the individual sites. In this straightforward approach the comparisons led to an identification of major training sites suitable for given ARTEP evaluations.

V. Discussion.

A. ARTEP Maneuver Area Requirements. Maneuver area requirements for ARTEP evaluations were obtained and developed from a review of selected type ARTEP, Table B-2-1 lists the area requirements (linear dimensions and surface) for the major combat missions at each of three levels for Mechanized Infantry and Tank battalions. Table B-2-2 lists the same kind of information for Light Infantry, Airborne, Airmobile, and Ranger battalions. It is clear from the tables that

Table B-2-1.

Tank and Infantry (Mech) Battalion Maneuver Area Requirements**
by Mission at Levels 1, 2, and 3

Mission	Infantry (Mech) KM	Infantry (Mech) Acres*	Tank KM	Tank Acres*
Level 1				
Bn/TF Daylight Attack	10 x 1.5	3,700	10 x 5	12,500
Bn/TF Illuminated Night Attack	5 x 1.5	1,900	5 x 1.5	1,900
Bn/TF Area Defense	2 x 5	2,500	3 x 5	3,700
	-	-	6 x 6	8,900
Bn/TF Night Withdrawal	2 x 6	3,000	-	-
Bn/TF Delay	2 x 15	7,400	6 x 15	22,200
	2 x 25	12,300	6 x 25	37,000
Bn/TF Tactical Road March	24	-	24	-
Bn/TF Night Occupation Assembly Area	-	-	5 x 5	6,100
Level 2				
Bn/TF Attack	1.5 x 5	1,900	4 x 5	4,900
	-	-	5 x 5	6,100
Bn/TF Defense	2 x 5	2,500	2 x 5	2,500
Bn/TF Night Withdrawal	2 x 6	3,000	6 x 6	8,900
Tactical Road March	24	-	24	-
Bn/TF Delay	-	-	6 x 15	22,200
	-	-	6 x 25	37,000
Night Occupation Assembly Area	-	-	5 x 5	6,100

(continued)

Table B-2-1 (continued)

Mission	Level 3 Infantry (Mech) KM	Infantry (Mech) Acres*	Tank KM	Tank Acres*
Co/TM Attack	.5 x .5	600	2.5 x 4	2,500
	-	-	2.5 x 5	3,100
Co/TM Defense	.75 x 1.1	200	1.5 x 1.1	400
	-	-	3 x 1.1	800
Co/TM Tactical Road March	24	-	24	-
Co/TM Delay	-	-	1.5 x 15	5,600
Occupation Assembly Area	-	-	3 x 3	2,200
Co/TM Night Withdrawal	.5 x 6	750	-	-

* Acreage figures are rounded to nearest hundred when over one thousand and nearest fifty when less.

**Source: Test Editions, ARTEP 7-45 and ARTEP 17-35.

1 Square Meter = 10.764 Sq. Ft.
1 acre = 43,560 Sq. Ft.
1 acre = 4,047 Sq. Meters

Table B-2-2.

Light Infantry, Airborne, Airmobile, and Ranger Battalion
Maneuver Area Requirements by Mission at Levels 1, 2, and 3

Level 3

	KM	Acreage*
Co/TM Attack	.5 x 2	250
Co/TM Defense	.75 x 2	400
	1.5 x 2	750
Co/TM Withdrawal	.75 x 3	550

Level 2

Bn Daylight Attack	1.5 x 2	750
Bn Defense	2 x 5	2,500
	3 x 5	3,700
Withdrawal	2 x 3	1,500

Level 1

Bn Attack	1.5 x 2	750
Bn Defense	2 x 5	2,500
	3 x 5	3,700
Delay	2 x 15	7,400
	2 x 25	12,300

*Acreage figures are rounded to nearest hundred when over one thousand and nearest fifty when less. Movement to contact at levels 1, 2, and 3 consists of a linear move of 8-10 KM.

1 Square Meter = 10.764 Sq. Ft.
1 acre = 43,560 Sq. Ft.
1 acre = 4,047 Sq. Meters

Mechanized Infantry and Tank battalions require the largest maneuver areas, in general; and that the largest single maneuver area requirement is for the Tank battalion task force conducting a delay (levels 1 and 2), roughly from 22 to 37 thousand acres. For Mechanized Infantry the largest maneuver area requirement is for the battalion task force in the delay (level 1), roughly from 7 to 12 thousand acres. Light Infantry, Airborne, Airmobile, and Ranger battalions also have their largest maneuver area requirement, 7 to 12 thousand acres, associated with the delay (level 1). Maneuver area requirements for level 3 evaluations in all cases are lower than those for levels 1 and 2. Thus, within the above two ranges of area requirements, 35 thousand acres and 10 thousand acres have been selected as overall minimums for the respective type battalions (ARTEP). The 10 thousand acre minimum is also applicable to evaluations using the ARTEP listed in Table B-2-3. Since on the basis of FORSCOM guidance, most Reserve Component units using ARTEP will be evaluated at level 3 the two minimums readily provide adequate maneuver areas. One possible problem, however, must be mentioned. At sites with training areas very close to the minimums there might be some difficulty in meeting the 24KM road march requirement for Mechanized Infantry and Tank battalions. Here, the senior evaluator may permit a reduction in the overall march distance, or the march might be conducted over a more circuitous, but still tactically sound, route than normally desirable.

B. Equipment Considerations. A major consideration in selecting training facilities for Armored, Infantry (Mech) and Self-propelled Artillery battalions is the availability of tracked vehicles at the training sites since the equipment is not easily moved by road and the cost of shipping such equipment might preclude units from bringing their own to Annual Training. National Guard units and United

Table B-2-3.

Army Training and Evaluation Program Test Editions Available Autumn 1975

ARTEP 1-167	Assault Support Helicopter Company
ARTEP 5-35	Engineer Combat Battalion Corps
ARTEP 5-115	Engineer Construction Battalion
ARTEP 5-145	Engineer Battalion, and Company Infantry Mechanized Division
ARTEP 6-155	Field Artillery Battalion, 105 mm Towed Divisional, Non-Divisional, and Sep Inf Bde
ARTEP 6-365	Field Artillery Battalion, 155 mm Self-Propelled, Armored/Mechanized Division
ARTEP 7-15	Light Inf Bn (Inf/Abn/Ambl/Light) Ranger Supplement to ARTEP 7-15
ARTEP 7-45	Mechanized Infantry Battalion
ARTEP 11-35	Signal Battalion, Armored Division Signal Battalion, Infantry Division Signal Battalion, Infantry Division (Mechanized)
ARTEP 17-35	Tank Battalion and Combined Arms Task Force
ARTEP 17-55	Armored Cavalry Squadron
ARTEP 19-97	Military Police Physical Security Company
ARTEP 29-17	Forward Support Company, Maint Bn, Infantry, Mech Inf and Armored Div
ARTEP 31-101	Special Forces Training and Evaluation Program
ARTEP 33-500	Psychological Operations Training and Evaluation Program
ARTEP 44-325	Air Defense Artillery Battalion, Chaparral Vulcan, Self-Propelled

States Army Reserve units preposition and maintain equipment at several major training sites in the three CONUSA areas.

1. Annual Training Equipment Pool (ATEP). The Chief, National Guard Bureau directs the establishment of ATEP at various sites and designates the units that will contribute items of equipment. In this connection the NGB has prepared (September 1975) a draft National Guard Regulation No. 750-2 prescribing basic concepts and policies and assigning responsibilities for the handling of unit equipment now stored in ATEP and Weekend Training Equipment Pools (WETEP). The regulation changes the ATEP title to Mobilization and Training Equipment Site (MATES) and the WETEP to Unit Training Equipment Site (UTES). The main purpose of the ATEP is to support ARNG units in training, as well as to facilitate their potential rapid mobilization and early deployment. There are five ATEP sites in the First U.S. Army area with equipment to support Infantry (Mech), Engineer, and Artillery battalion ARTEP. Four of the sites can support the tank battalion ARTEP. The Fifth U.S. Army area contains three ATEP sites that can support Tank, Infantry (Mech), Engineer, and Artillery battalion ARTEP; one that can support Tank, Infantry, and Engineer ARTEP and one that can support only Field Artillery ARTEP. In the Sixth U.S. Army area four of seven ATEP sites have equipment to support the Tank ARTEP, four the equipment to support the Infantry (Mech) ARTEP, three to support Engineer units and six capable of supporting Artillery ARTEP. Locations of ATEP are shown in Figure B-2-1.

2. Equipment Concentration Sites (ECS). These sites are the USAR equivalent to ARNG ATEP sites. They are normally located at annual training (AT) sites and contain unit equipment required for multiple unit training assemblies

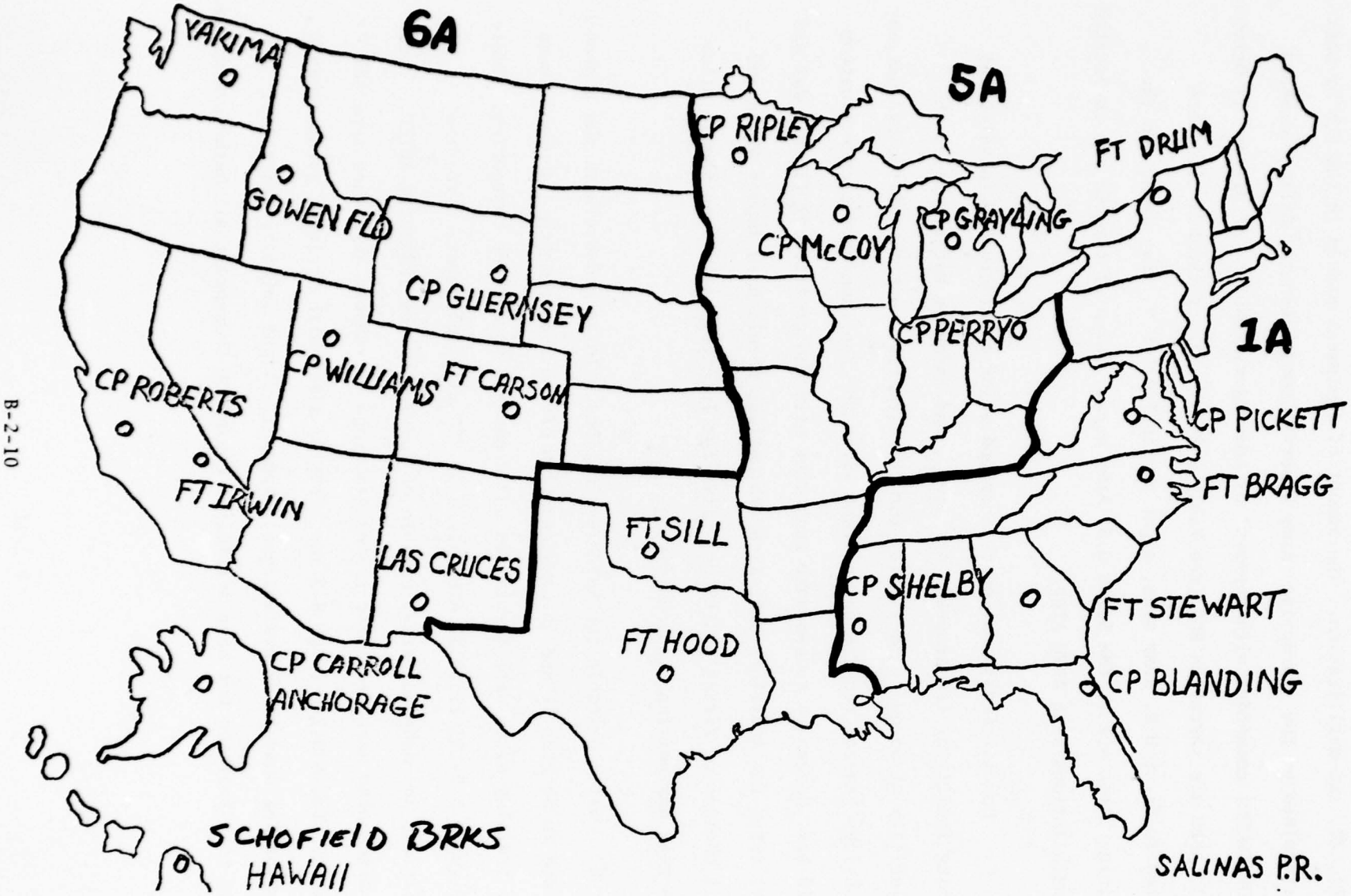


Figure B-2-1. U.S. ATEP Locations

(MUTA), AT, and mobilization. The amount of equipment placed in the ECS by units is determined by the appropriate Army Reserve Command/General Officer Command (ARCOM/GOCOM) commander with approval by commander, CONUSA. AT present (1 October 1975) there are seventeen ECS (see Table B-2-4). Six of the ECS sites are located in First U.S. Army area, eight are in Fifth U.S. Army area, and the remaining three are in the Sixth U.S. Army area. Seven of the ECS are co-located at installations with ARNG ATEP.

C. Special Considerations. A second major consideration in selecting training facilities for Armored, Artillery, and Infantry battalions is the availability of adequate facilities for the live fire portions of the evaluations. The obvious general requirement is that sites for the Tank battalion evaluation should have ranges to accommodate tank crew main gun proficiency firing, day and night; sites for Artillery battalion evaluations should have impact areas and permit choices of firing positions; sites for Infantry battalions should allow for mortar and antitank weapons firing.

D. Sites Suitable for ARTEP Evaluations. In accordance with the approach outlined in Section IV and in consideration of the requirements discussed above major training sites were identified and separated into three categories. Table B-2-5 (page B-2-13) lists 17 ATEP sites or ECS with equipment, live fire facilities, and maneuver areas capable of supporting the indicated ARTEP. These ATEP sites also have requisite training acreage to support any other type ARTEP exercise. Table B-2-6 (page B-2-15) lists 37 sites with training areas capable of supporting some ARTEP evaluations, especially light Infantry battalion. The ECS in this table do not have sufficient equipment to support all ARTEP evaluations.

Table B-2-4.

USAR Equipment Concentration Sites

First U.S. Army

*Fort Drum, NY
*Camp Pickett, VA
Indiantown Gap, PA
*Fort Bragg, NC
Fort Jackson, SC
*Camp Shelby, MS

Fifth U.S. Army

Fort Knox, KY
*Fort Hood, TX
*Fort McCoy, WI
Fort Sam Houston, TX
Fort Leonard Wood, MO
Fort Chaffee, AK
Fort Polk, LA
*Fort Sill, OK

Sixth U.S. Army

Fort Lewis, WA
Camp Parks, CA
Fort Riley, KS

*Site also has an ATEP.

Table B-2-5.

ATEP Sites Suitable for ARTEP Evaluations

First U. S. Army

ATEP	Training Acreage	Type ARTEP
*Fort Drum, NY	90,000	Tank INF (Mech) FA 8 IN (SP) FA 155 (SP) Engineer
*Camp Pickett, VA	35,000	Tank INF (Mech) FA 155 (SP) Engineer
*Fort Bragg, NC	125,000	INF (Mech) FA 155 (SP) FA 8 IN (SP) Engineer
*Camp Shelby, MS	100,000	Tank INF (Mech) FA 155 (SP) Engineer
Fort Stewart, GA	278,000	Tank INF (Mech) FA 8 IN (SP) FA 155 (SP) Engineer

Fifth U. S. Army

Camp Ripley, MN	54,000	Tank INF (Mech) Engineer
*Fort McCoy, WI	43,000	Tank INF (Mech) FA 155 (SP) Engineer
Camp Grayling, MI	123,000	Tank INF (Mech) FA 155 (SP) Engineer

*USAR Equipment Concentration Site co-located with ATEP.

Table B-2-5. (continued)

ATEP	Training Acreage	Type ARTEP
*Fort Hood, TX	140,000	Tank INF (Mech) FA 155 (SP) FA 8 IN (SP) Engineer
*Fort Sill, OK	86,000	FA 155 (SP) FA 8 IN (SP)
	Sixth U. S. Army	
Yakima Range, WA	263,000	Tank INF (Mech) FA 155 (SP) Engineer
Gowen Field, ID	173,000	Tank FA 155 (SP)
Camp Guernsey, WY	26,000	FA 155 (SP) FA 8 IN (SP)
Camp Williams, UT	21,000	FA 155 (SP)
*Fort Carson, CO	105,000	Tank INF (Mech) FA 155 (SP) FA 8 IN (SP) Engineer
Camp Roberts, CA	39,000	INF (Mech) Engineer
Fort Irwin, CA	470,000	Tank INF (Mech) FA 155 (SP) FA 8 IN (SP)

*USAR Equipment Concentration Site co-located with ATEP.

Table B-2-6.

Sites with More Than 10,000 Training Acres*

SITE	STATE	ACREAGE TOTAL/TRAINING
Atterbury	IND	33,500/33,500
Badlands Bombing Range	SD	42,240/42,240
Beauregard	LA	13,290/12,500
Blanding	FLA	72,397/51,500
Custer	SD	71,680/71,680
Gunpowder Rifle Range	MD	240,023/240,023
Natchez Trace	TN	24,000/18,000
Robinson	ARK	32,900/30,000
Roswell	NM	12,334/12,000
Shadehill	SD	25,600/25,600
Swift	TX	11,777/11,777
Gruber	OK	66,000/26,000
McCoy	WI	60,000/44,000
Dona Ana Range (Fort Bliss)	NM	1,054,156/65,290
Farmington	NM	10,240/10,240
Belle Fourche Reservoir	SD	17,920/17,920
Dugway	UT	841,000/50,000
Wind Cave National Park	SD	30,000/30,000
Yuma Proving Grounds	AR	903,000/901,000
Hunter Liggett Reservation	CA	168,000/168,000
Imperial Valley Unit Training	CA	38,000/38,000
**Indiantown Gap	PA	18,500/11,300

* Sites with more than 35 thousand training acres are suitable for Tank battalion ARTEP evaluation.

**ECS

Table B-2-6. (continued)

SITE	STATE	ACREAGE TOTAL/TRAINING
Benning	GA	182,296/140,000
Campbell	KY	105,415/65,091
**Chaffee	ARK	71,979/70,760
**Jackson	SC	52,598/45,000
**Lewis	WA	86,000/58,000
**Polk	LA	199,032/190,000
**Riley	KS	101,000/76,000
**Knox	KY	110,351/59,101
**Wood	MO	70,963/34,850
Dix	NJ	31,992/26,185
McClellan	AL	45,513/26,785
Ord	CA	28,500/28,500
Rucker	AL	58,939/50,000
Huachucha	ARI	73,344/68,825
Gordon	GA	55,502/43,607

**ECS

In addition to providing for necessary equipment before the sites may be used for ARTEP evaluations, the range facilities available at each site must be reviewed. Table B-2-7 (page B-2-19) lists a large number of sites with less than 10 thousand acres and thus judged unsuitable for ARTEP evaluations.

E. Site Utilization. According to a site utilization report compiled from First, Fifth and Sixth Army circulars published 15 February 1975 more than three hundred thousand personnel attended AT at ATEP sites last year. Fort Drum, New York, led all training sites in the country with a site total of 82,162. Table B-2-8 (page B-2-26) shows the RC troop attendance at ATEP sites for AT 1974.

F. Priority Units. There are more than one hundred battalion size priority early deployment units that will probably be scheduled for ARTEP evaluations as early as resources permit. The geographical distribution is such that Fifth U.S. Army contains nearly forty percent of the units and except for a few Hawaii based units, First and Sixth U.S. Army each have approximately thirty percent. Hawaii has a priority early deployment unit which is also an affiliated unit. ARTEP scheduling for the unit in Hawaii could be accommodated at the sponsor unit station in Hawaii or at Pohokuloa training area, Hawaii, which contains 55,000 training acres and has range facilities for all Infantry division weapons. There are no early deployment units assigned to Alaska.

VI. Summary.

A comparison of major training site data, ARTEP evaluation requirements data, and the geographical distribution of priority early deployment units by type reveals that a sufficient number of adequate training sites exist in each of the

Army areas for ARTEP evaluations. The ATEP and ECS sites listed at Table B-2-5 (page B-2-13) with their type ARTEP support capabilities should accommodate Infantry (Mech), Tank, Artillery and Engineer battalions as required. The Active Army and RC sites listed in Table B-2-6 (page B-2-15) (sites with more than 10,000 training acres) may be utilized when scheduling allows.

Table B-2-7.

Sites* With Less Than 10,000 Acres

CONTROL F, S or P	SITE	ACREAGE TOTAL/TRAINING	STATE
S	Pittsfield State Forest	40/40	MS
F & S	Townsend Station Forest	2713/1300	MS
F to S	Rehoboth	11/11	MS
S	Camp Curtis Guild	512/300	MS
S	Douglas State Forest	400/400	MS
S	Knightvill Dam	400/300	MS
S	Northampton	60/55	MS
S	Dever State School	1300/1300	MS
P	Adams	10/10	MS
F	Georgetown	1000/900	MS
F	Camp Edwards	12000/8000	MS
S	Camp Hartell	59/59	CN
S	Camp Meskill	88/30	CN
S	Nassahegan	1226/1226	CN
S	Nehantic	3655/3655	CN
S	Nepaug	1094/1094	CN
S	Stone's Ranch	2000/2000	CN
S	Thomaston Dam	794/794	CN
F to ANG	Bradlee Field	11.5/NMC	CN
S	Brainard Airport	88/NMC	CN
F	Bangor Int. Airport	2010/14	ME
F to S	Auburn TRNG Site	162/150	ME

*These sites are largely under Federal (F) or State (S) control. A few are privately (P) owned. All may be utilized for IDT and AT. Size is expressed in acres, Total/Training. Training acreage is unknown when blank. NMC means no maneuver capability.

Table B-2-7. (continued)

CONTROL F, S or P	SITE	ACREAGE TOTAL/TRAINING	STATE
F to S	Caswell TRNG Site	859/625	ME
S	Frye Mt. TRNG Site	5000/475	ME
S	Hollis TRNG Site	540/325	ME
F to S	Naval Air Station	52/30	ME
S	Plymouth TRNG Site	100/85	ME
S	Camp Keys	51/9.2	ME
P	Gardiner TRNG Site	114/100	ME
P	Island Falls TRNG Site	8/8	ME
F	Moosehorn Refuge	500/75	ME
P	Woodstock	75/65	ME
S	Camp Labonte	10/NMC	NH
P	Geneseco Target Range	25/25	NY
S	Gilderland Target Range	230/125	NY
S	Hudson TRNG Area	20/20	NY
F & S	Ticonderoga Target Range	7.7/3	NY
F to S	Malone Target Range	43/43	NY
S	Newark TRNG Site	130/90	NY
F to S	Ocean Target Range	127/127	NY
S	Rome	30/30	NY
S	Camp Smith	2000/1500	NY
S	South Dayton	485/485	NY
S	Camp Vannum	33.8/33.8	RI
F & S	Camp Johnson	729/729	VT
S	Sea Girt	167/100	NJ
S	Camp Dawson	1018/435	WVA

Table B-2-7. (continued)

CONTROL F, S or P	SITE	ACREAGE TOTAL/TRAINING	STATE
S	Bethany Beach	98/30	DEL
F to S	New Castle Rifle Range	224/75	DEL
S	NC National Guard TRNG Area	4234/4724	NC
S	State Military Reservation	751/500	VA
S	Byrd Field TRNG Area	100/	VA
S	Pickens Bend	75/75	SC
F to S	Clarkes Hill	200/200	SC
S	Lexington	20/20	SC
S	Winnsboro	20/20	SC
S	Camp Lincoln	268/268	IL
S	Marseilles NG TRNG Area	3000/3000	IL
S	Camp Logan Weapons Range	246/NMC	IL
S	Danvill Weapons Range	28/NMC	IL
F to S	Riverside	43/NMC	IL
F	US Army Training Area	4000/4000	IL
F to S	Jefferson City	112/NMC	MO
F	Weldon Springs	1655/1350	MO
F & S	Camp Clark	1282/900	MO
F to S	Camp Crowder	3200/3200	MO
S	Raytown	48.3/48.3	MO
S	Wappapello Lake	3240/5200	MO
S	Ashtabula Rifle Range	22/NMC	OH
S	Brown Rifle Range	32/NMC	OH
F to S	Camp Sherman Rifle Range	468/	OH
S	Zanesville Rifle Range	14/NMC	OH
Federally Leased & City of Akron	La Due Reservoir	5000/1000	OH

Table B-2-7. (continued)

CONTROL F, S or P	SITE	ACREAGE TOTAL/TRAINING	STATE
S	Camp Perry Military Reservation	630/400	OH
F to S	Ravenna Arsenal	920/920	OH
F to S	Catoosa Rifle Range	1726/1726	IN
S	Ashland Range	54/	KY
S	W. KY WETSITE	3060/3000	KY
S	Ravenna Range	88/NMC	KY
S	Cedars of Lebanon	1500/1500	TN
S	Loudon TRNG Area	670/670	TN
S	Laurel Hill TRNG Site	600/600	TN
F to S	Tullahoma J.W/Airstrip	2500/2500	TN
F to S	Milan Arsenal	2190/2190	TN
S	Bristol Rifle Range	NMC	TN
F to S	John Seiver	120/NMC	TN
F to S	Smyrna	NMC	TN
F	Oak Ridge Reservation	1576/1000	TN
F to S	Camp Villere	1710/1710	LA
S	Windy Hill TRNG Area	600/500	LA
P	Weaver Plantation	1000/600	LA
S	Nichell Barracks	2405/2400	KS
F to S	Hastings	3211/3200	NB
F to S	Mead	1185/1185	NB
S	Camp Dodge	2200/1200	IO
	Alamogordo	640/	NM
	Fort Wingate	727/	NM
S	Springer	80/	NM
S	Las Vegas	277/	NM

Table B-2-7. (continued)

CONTROL F, S or P	SITE	ACREAGE TOTAL/TRAINING	STATE
S	Taos	90/90	NM
F	Kirtland AFB	2100/NMC	NM
F	Santa Fe	6400/NMC	NM
F	Farmington	10240/10240	NM
F	Garrison WETSITE	707/707	ND
F	Williston WETSITE	300/300	ND
S	Camp Gilbert C. Grafton	2200/1500	ND
S	Angastora Reservoir	8960/8960	SD
S	Battle Mt. Sanitarium Reservation	3200/3200	SD
S	Bear Butte	1200/1200	SD
S	McNenney Fish Hatchery	2560/2560	SD
S	Swan Lake	1000/1000	SD
F	Deadman Mountain	2560/2560	SD
P	Kabiegman TRNG Area	600/600	SD
F	Missouri River	2000/2000	SD
F	Roubaiz	640/640	SD
S	Racine Small Drums Range	80/80	WI
S	Grassy Lake	320/260	WI
County	Marathan County Range	500/40	WI
S	Mud Lake Wild Life Area	460/200	WI
S	Camp Williams	2000/2000	WI
S	Custer Reserve Forces TRNG Site	7138/7138	MI
F to S	Camp McCain	3006/3006	MI
F	W. H. Harrison	2912/2200	MT
F	Camp Ashland	937/937	NE
F	Kearney Rifle Range	1143/NMC	NE

Table B-2-7. (continued)

CONTROL F, S or P	SITE	ACREAGE TOTAL/TRAINING	STATE
State Univ NE	Sidney	1920/	NE
F to S	Stead TRNG Facility	387/387	NE
S	Perry Rifle Range	240/NMC	OK
S	Lake Murray Station Park	300/300	OK
F to S	Addicks TRNG Area	809/809	TX
F to S	Anaville AFB	273/273	TX
S	Camp Barkley	1049/1049	TX
S	Camp Bowie	5410/5410	TX
S	Camp Mabry	374/374	TX
S	Eagle Mountain TRNG Area	1270/1270	TX
S	Camp Maxey	9989/9989	TX
S	Silvertown TRNG Area	3000/3000	TX
P	Redbird DZ	198/198	TX
F	Buckley Air NG	3535/3000	CO
S	Camp George West	640/640	CO
F	Florence Military Reservation	5692/5692	AR
F	Navajo Depot	28000/960	AR
F	Saguaro Lake TRNG Site	5760/5760	AR
S	Papago	480/320	AR
S	Camp Sanluis Obispo	4600/2500	CA
F to S	Camp Parks	1000/1000	CA
F to S	Chinese Camp	5000/5000	CA
S	Delaveaga Park	130/	CA
S	Healy Ranch	200/200	CA
S	Santa Fe Flood Control	730/730	CA
S	Fresno Air Terminal	5/NMC	CA

Table B-2-7. (continued)

CONTROL F, S or P	SITE	ACREAGE TOTAL/TRAINING	STATE
F	Headdsburg WETS	125/	CA
P	Rocky Hill WETS	500/	CA
S	Camp Adair		OR
S	Camp Rilea	1865/975	OR
S	Camp Withycombe	234/192	OR
S	Camp Murray	229/210	WA

AD-A066 261 LITTON MELLONICS SYSTEMS DEVELOPMENT DIV SPRINGFIELD VA F/6 5/9
RESERVE COMPONENT UNIT EVALUATION ANALYSIS (COST-EFFECTIVENESS)--ETC(U)
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Table B-2-8.

Reserve Component Personnel Attendance AT 1974

First U.S. Army

+FT Drum, NY	82,162
FT Stewart, GA	19,336
+Camp Pickett, VA	15,677
+FT Bragg, NC	22,672
+Camp Shelby, MS	33,832
Total	173,679

Fifth U.S. Army

+*FT Sill, OK	
+FT McCoy, WI	45,566
FT Hood, TX	3,842
Camp Ripley, MN	19,766
Camp Grayling, MI	25,549
Total	94,723

Sixth U.S. Army

Camp Roberts, CA	10,163
FT Irwin, CA	10,658
Gowen Fld, ID	7,189
Camp Guernsey, WY	4,748
Camp Williams, UT	3,524
+FT Carson, CO	5,572
Yakima, WA	3,722
Total	40,004

*Newly created ATEP (1975) located at Fort Carson, CO (Sixth Army) and Fort Sill, OK, Fifth Army. ATEP located at Camp Blanding, FLA, Dona Ana Range, NM (Fort Bliss) and Camp Perry, Ohio are not listed. These ATEP are equipped to support ADA AW units not included in ARTEP.

+USAR Equipment Concentration Sites co-located with ATEP.