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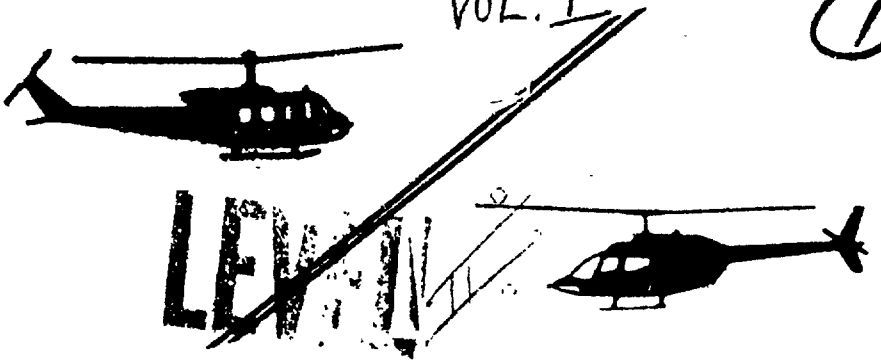

EVALUATION OF THE 175/40 INITIAL ENTRY ROTARY WING FLIGHT TRAINING PROGRAM

EXECUTIVE SUMMARY

DIRECTORATE OF EVALUATION AND STANDARDIZATION

FORT RUCKER, ALABAMA

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

This report presents results of an evaluation of the Army's 175/40 Initial Entry Rotary Wing (IERW) training program. The program consists of 175 flight and 40 simulator hours. In the last training phase of the program, students are divided into two training tracks, i.e., Utility Helicopter and Aeroscout. Data were gathered from IERW training files and through questionnaires administered to instructors at the Army Aviation Center and to unit instructors, supervisors, and program graduates at

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20 aviation field units world-wide. Data were gathered on graduates of both the 175/40 program and the 180/20 program that preceded it, and comparisons between the two programs are made. Results and conclusions are presented with reference to nine specific evaluation objectives. Major conclusions are: (1) the 175/40 IERW course is accomplishing its objectives; (2) the 175/40 course is an improvement over the 180/20 course; and (3) proficiency progression and individualized training can play an effective role in IERW training.

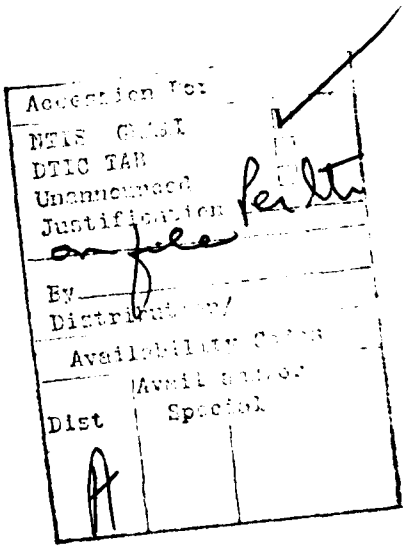
PREFACE

This report presents results of an evaluation of the U.S. Army's 175/40 Dual-Track Initial Entry Rotary Wing (IERW) course of instruction. The 175/40 course embodies major changes from the IERW course that preceded it, changes that warranted systematic examination of their effects on the capabilities of IERW graduates to perform effectively in Army aviation field units.

The evaluation took place during the period January 1978-March 1979. Data were gathered both from field unit settings and the institutional setting at the U.S. Army Aviation Center, Fort Rucker, Alabama. The actual data collection period was May-October 1978.

The evaluation effort involved the cooperative efforts of military, civil service, and contractor personnel. The contracted portion of the evaluation was conducted by Seville Research Corporation under contract MDA903-78-C-2008 to the U.S. Army Research Institute for the Behavorial and Social Sciences. Mr. Charles A. Gainer was the Contracting Officer's Technical Representative. The members of the USAAVNC 175/40 Evaluation Team and other individuals who contributed significantly to the effort are listed in the Acknowledgements section that follows this Preface.

The evaluation report consists of two volumes, the Executive Summary and the Final Report.



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Important contributions to the Evaluation Team's literature and document search were ably made by Mr. Charles A. Gainer, Chief, Army Research Institute Field Unit, Fort Rucker, Alabama, and his staff. Appreciation is extended to Mr. William Apple and the staff of the Management Information System Office, Fort, Rucker, for their support with the data processing effort.

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Special thanks are given to the following individuals and their staffs who so ably assisted with collection of the field data:

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CW3 Kimmet	Fort Shafter, Hawaii
MAJ Oosterhuis	HQ, USAREUR
CPT Stanton	HQ, Eighth Army

175/40 IERW EVALUATION TEAM PERSONNEL

Numerous individuals from many organizations participated in the 175/40 IERW evaluation. Some personnel were involved in all phases of the evaluation including development of the evaluation plan and questionnaires, conduct of field survey, analysis of data, and development

of the final report. The following list identifies the personnel who comprised the Evaluation Team:

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EXECUTIVE SUMMARY

BACKGROUND

This report presents an evaluation of the U.S. Army 175/40 Initial Entry Rotary Wing (IERW) training program presently in use at the U.S. Army Aviation Center (USAAVNC), Fort Rucker, Alabama. The 175/40 program was instituted in 1977 as replacement for the 180/20 IERW program.[1] The nature and magnitude of change represented by the new 175/40 program, its criticality to Army operational capabilities, and the cost of IERW training prompted the U.S. Army Training and Doctrine Command (TRADOC) to direct USAAVNC to evaluate the new program.

In January 1978, the Directorate of Evaluation and Standardization (DES) was tasked to develop and implement an evaluation plan. A Center-level evaluation team was formed to manage the effort. Membership included the Directorate of Resource Management (DRM), Directorate of Training Development (DTD), Directorate of Training (DT), and the local Army Research Institute Field Unit (ARI). In May 1978, the efforts of the evaluation team were aided by personnel from the Seville Research Corporation, Pensacola, Florida.

The 175/40 IERW Program

The new program was developed by USAAVNC in 1976-1977 as a result of a year-long aviation training study[2] conducted in 1975-1976. That study examined the USAAVNC training procedures and aviator mission-task requirements to provide a sound basis for changes to the IERW program. Major changes, from the then existing 180/20 program, incorporated in the 175/40 program included:

- An increase in flight simulator time to 40 hours and a decrease of 5 hours actual flight time.
- The introduction of dual-track training during the final Combat Skills training phase, with some students trained in the OH-58 aircraft for Aeroscout missions and the remainder trained in the UH-1, Utility aircraft.

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[1] The two programs derive their descriptive titles from the numbers of flight (175 or 180) and simulator (40 or 20) hours each contains.

[2] U.S. Army Training and Doctrine Command. The United States Army Aviation Training Study. United States Army Aviation Center, Fort Rucker, Ala. July 1976.

- A greater emphasis in combat skills training.
- The incorporation of proficiency progression and individualized pacing within training phases.

The Evaluation Problem

The principal problem for the evaluation was to determine how effectively the 175/40 dual-track IERW training program was meeting the needs of commissioned and warrant officer aviators in their initial field unit aviator assignment following graduation. Secondly, the evaluation was to provide comparisons between the newer 175/40 IERW program and the baseline provided by the preceding 180/20 IERW program.

The Evaluation Plan

The evaluation plan called for the collection of data describing the field performance of critical tasks by graduates of the two programs during their first one and one-half to eight months after initial unit assignment. Data were gathered via questionnaire survey at selected Army Aviation units world-wide, and at USAAVNC via questionnaires and from IERW training files. The evaluation plan included nine specific evaluation objectives and a number of essential elements of analysis. The nine objectives are shown in Table 1. The plan also provided a method for data collection and data analysis.

To insure comparative data, graduates were to be selected from a window of one and one-half to eight months after initial unit assignment. Units surveyed were selected on the basis of density of target graduates. Three final survey questionnaires were developed, based on an approved training task list provided by DTD, to be completed by the graduate, his unit instructor pilot, and his unit supervisor. Concurrently with the field data collection, two questionnaires were constructed to gather data in the school. One was to be completed by instructor pilots and supervisors on the flight line; the other by academic instructors. In addition, historical data were collected from the flight records of the graduates, and current data were gathered from daily grade slips for each phase of training.

Table 1

Specific Evaluation Objectives

I. Evaluate differences in the performance of critical tasks between 180/20 and 175/40 IERW graduates at selected field locations.

II. Evaluate the IERW training performance and graduate field performance of Aeroscout and Utility track aviators.

III. Evaluate differences in the checkride performance of 180/20 and 175/40 students on comparable maneuvers within stages of IERW training.

IV. Determine if 175/40 graduates are capable of performing at the ARTEP III/ARL II level within three to six months after assignment to operational units

V. Determine if graduates of the 175/40 Aeroscout and Utility tracks are being properly assigned to and utilized in the field.

VI. Determine if a 175/40 POI with a proficiency based checkride policy is adequate for successful completion of the IERW training objectives.

VII. Identify elements within the current 175/40 program which are and are not compatible with the concept of a self-paced IERW program, and why.

VIII. Develop a model for monitoring and evaluating progress and changes in the IERW program in the future.

IX. Provide student performance data and resource data required for a cost effectiveness analysis of the 175/40 IERW program.

SPECIFIC OBJECTIVES, FINDINGS, AND CONCLUSIONS

Principal findings and conclusions are presented in terms of the nine specific evaluation objectives. Findings and conclusions are elaborated at length in the basic report and the appendices.

Objective I

The concern of Objective I was the evaluation of differences between 180/20 and 175/40 graduates in their performance of critical tasks in the field. Data for this evaluation were derived from field questionnaires administered to unit IPs and supervisors familiar with the graduate's field performance. The supervisors rated the adequacy of the graduate's training on 30 mission-oriented tasks. Ratings were on a five-point scale covering adequacy of training. The unit IP rated the competency of the graduate on his initial performance and his current performance (i.e., 1½ to 8 months after graduation) for 95 aviator tasks included in IERW training. Ratings were on a five-point scale ranging from inadequate to highly competent.

Results.

- Results showed that the 175/40 graduates were rated as adequate or more on 27 of the 30 mission-oriented tasks by half or more of the supervisors, while for the 180/20 graduates, a similar rating was shown for only 13 of the 30 mission-oriented tasks. Data are shown in Table 2.

- Results of IP ratings indicated that the 175/40 graduate was more competent than the 180/20 graduate upon initially reporting to the unit on Instrument, Night, and Aeroscout tasks. On current (1½ to 8 months later) performance, the 175/40 graduates equalled or exceeded the 180/20 graduates in all but one task area, i.e., Aeroscout tasks. These data are shown in Table 3.

Conclusion.

- It is concluded that the 175/40 program produces a graduate who is better able to perform critical tasks in the field unit setting than is the graduate of the 180/20 program.

Table 2

Field Supervisor Ratings of Adequacy of Graduate Training by Program (Adequate, Slightly & Substantially Overtrained)

Task Area	Supervisor Responses Frequency and Percentage 180/20 f	%	175/40 f	%
1. Conduct Coordination with Combat Troops	32	36	32	45
2. Conduct the Movement	44	49	37	55
3. Transport External Load	41	53	31	52
4. Transport Internal Load	59	63	44	66
5. Submit Reports	38	44	36	58
6. Plan Day Mission	72	68	63	80
7. Plan Night Mission	51	50	45	61
8. Perform Low Level Flight (Day)	82	75	64	81
9. Perform Low Level Flight (Night)	42	44	37	54
10. Perform Contour Flight (Day)	76	71	59	75
11. Perform Contour Flight (Night)	40	45	37	55
12. Perform NOE Flight (Day)	70	71	56	79
13. Perform NOE Flight (Night)	29	40	25	52
14. Prepare for Mission and Takeoff	53	59	44	71
15. Enroute Flight/Approach and Landing	57	66	45	67
16. Demonstrate Movement Techniques	30	50	29	67
17. Select/Provide Vectors to Holding Area	19	36	26	64
18. Select Attack Positions	19	38	24	62
19. Acquire and Identify Targets	18	35	22	57
20. Target Handoff/Security	16	34	19	53
21. Engage Targets	19	32	21	56
22. Use Indirect Fire, Artillery, Mortar, Illumination	12	25	21	56
23. Employ Tactical Air	7	16	12	37
24. Provide Target Effectiveness Data	14	28	17	46
25. Reports	24	43	21	53
26. Perform Zone Reconnaissance	37	59	33	71
27. Detect Enemy Camouflage and Concealment	26	43	24	53
28. Select/Recommend Landing Zone	47	63	39	67
29. Select Assembly Area	35	58	29	61
30. Perform Screening Mission	22	45	23	57

Table 3

Mean Competency Index Ratings for 180/20 and 175/40 Graduates

		180/20	175/40	Difference Significance[a]
INITIAL PERFORMANCE AS RATED BY IP:				
	Basic	32	36	NS
	Instrument	31	47	*
TASK	Tactics	24	31	NS
AREA	Night	26	34	*
	Utility	19	19	NS
	Aeroscout	12	32	*
CURRENT PERFORMANCE AS RATED BY IP:				
	Basic	68	66	NS
	Instrument	61	67	*
TASK	Tactics	54	56	NS
AREA	Night	58	65	*
	Utility	50	67	*
	Aeroscout	63	49	*

[a] Differences between the two groups significant at the .01 level are indicated with an asterisk (*). NS indicates the difference is not statistically significant at the .01 level.

Objective II

The focus of Objective II was the IERW training performance and graduate field performance of Utility and Aeroscout track aviators. Data for the comparisons were from the field questionnaires given to graduates and unit IPs. Graduates rated the adequacy of their training, on the same five-point scale given the supervisors, for 140 aviator tasks included in IERW training. This listing included both tasks that were common to the two tracks as well as those that were unique. Data pertinent to the field performance, as rated by the IPs, were the same as for Objective I.

Results.

- Results for the IP ratings of initial unit performance of graduates showed the 175/40 Aeroscout graduate to be significantly better than the 180/20 unit-transitioned OH-58 Aviator on Aeroscout tasks, while IP ratings showed no difference between the two IERW programs on Utility tasks. Instructor pilot ratings (see Table 3) of "current" performance favor the 175/40 Utility track graduate on Utility tasks, but the 180/20 unit-transitioned OH-58 aviator is favored on Aeroscout tasks.

- Results from the graduate ratings of the adequacy of dual-track training indicated that the 175/40 program graduate considered his Aeroscout training significantly more adequate than did the 180/20 graduate who received unit OH-58 transition, but the ratings for the Utility track tasks are similar for the two IERW programs. The 175/40 graduate also rated his training as more adequate on Tactics, Night, and Night Vision Goggles tasks than did the 180/20 graduate. Data are shown in Table 4.

Table 4

Graduate Ratings of IERW Training Adequacy by Task Area
(Adequate; Slightly; and Substantially Overtrained)

	Aviator Task Area	No. of Tasks	Percentage of Responses: 180/20	175/40 Utility	175/40 Aeroscout
I.	Basic	33	86	86	86
II.	Instrument	13	86	89	83
III.	Tactics	34	51	59	62
IV.	A. Night	19	46	84	79
	B. NVG	15	3	55	72
V.	Utility	10	52	58	Not applicable
VI.	Aeroscout	16	19	Not applicable	64

Conclusion.

- The conclusion is that both tracks of the 175/40 program are producing the desired output skills. Graduates from each of the 175/40 tracks view their IERW training as generally more adequate than did 180/20 program graduates, and IPs judged both 175/40 groups as adequate to meet initial unit needs. The Aeroscout track of the 175/40 program represents one of the major IERW changes. It is producing a graduate who performs well and who has specific skills his predecessor lacked.

Objective III

Objective III is directed to differences in checkride performance of 180/20 and 175/40 students on comparable maneuvers within stages of IERW training. Data were flight checkride grades from USAAVNC training records for samples of six classes from the two IERW programs. Mean checkride grades for the six classes were examined at five comparable stages. The Night and Aeroscout Combat Skills portions of the 175/40 program had no counterpart in the 180/20 program and were excluded from this comparison.

Results.

- Results comparing mean checkride grades for primary, UH-1 Contact Transition, Basic Instrument, Advanced Instrument, and the Combat Skills Utility track showed a significant difference in the UH-1 Contact Transition grades only. This difference appears to reflect the difference in the Primary phase flight time which favors the 180/20 program (i.e., 85 hours for the 180/20 and 50 hours for the 175/40). Results are shown in Table 5.

Conclusion.

- The conclusion is that there were no differences in IERW checkride performance of students in the two programs with the exception of the contact phase.

Table 5

IERW Mean Checkride Grades by Phase and Program
(A = 180/20; B = 175/40)

Phase	Program	Mean	S.D.	N	Difference Significance
Primary	A	83.7	3.09	95	NS
	B	84.7	3.15	120	
Contact	A	88.4	2.48	95	*
	B	85.8	2.90	120	
Basic Instrument	A	85.8	3.00	91	NS
	B	86.7	5.12	110	
Advanced Instrument	A	82.5	4.97	91	NS
	B	84.4	9.86	104	
Tactics	A	87.7	2.74	91	NS
Combat Skills (Utility)	B	88.1	3.07	70	

* significant at .01 level.

Objective IV

Objective IV addressed the capability of 175/40 IERW graduates to perform at the ARTEP 3/ARL 2 level within one and one-half to eight months after assignment to operational units. Data were from the field questionnaire item which asked for the graduate's aviator readiness level

(ARL) as defined in the Aircrew Training Manual and as assigned by the unit commander. Post-IERW flight time was also examined.

Results.

- Results indicated the percentage of graduates from the two programs who reported category ARL 1 and ARL 2 combined were nearly identical, 86% from the 180/20 program and 85% from the 175/40. This result is of interest in view of the fact that post-IERW flight time showed that the 180/20 graduate group reported somewhat more flying hours since graduation than did the 175/40 group.

Conclusion.

- The conclusion is that the 175/40 graduate is well able to function at the ARL 2 level within one and one-half to eight months after unit assignment. Graduates of the new program were able to reach ARL 2 level in the same proportionate numbers as the 180/20 program graduates who preceded them in the field.

Objective V

Objective V dealt with the assignment and utilization of the 175/40 Aeroscout and Utility track graduates in the field. Data were from a field questionnaire item which asked the graduate the type of aircraft he was now flying in his primary assignment. The frequency with which the aviator tasks included in IERW training were performed in unit mission training was examined to provide an index of utilization.

Results.

- Results indicated that most of the graduates from the 175/40 Aeroscout track (91%) were assigned to the OH-58 aircraft, and that a substantial portion (80%) of the Utility track graduates were assigned to the UH-1 aircraft. Assignment patterns are shown in Table 6. The relative frequency of the IERW aviator tasks performed by the dual-track groups during mission training suggested that in mission training at the units graduates of the 175/40 program were being properly utilized.

Conclusion.

- It is concluded that the 175/40 track graduates are generally being properly assigned and utilized in the field, thus maintaining the integrity of the dual-track training concept.

Table 6

Primary Aircraft Assignment

Type Rotary Wing Aircraft Now Flying	Program Group 180/20 f	%	175/40 Utility f	%	175/40 Aeroscout f	%
UH-1	65	65	78	80	3	5
OH-58	22	22	7	7	53	91
AH-1	12	12	10	10	1	2
CH-47	1	1	3	3	1	2
Totals	100	100	98	100	58	100

Objective VI

Objective VI was concerned with a determination of whether the 175/40 program of instruction with a proficiency based checkride policy was adequate for completion of the IERW training objectives. Data utilized were daily training grades drawn from records of 175/40 IERW classes at USAAVNC. Checkride performance data were tabulated by training day for students progressing through the various phases of training, and normative performance data for each maneuver in a training phase of the 175/40 IERW program were developed based on time to proficiency. These data were compared to checkride performance data for sets of six classes sampled at each of the five training phases involving a total of 30 classes.

Results.

- Results indicated that in all phases of training there were variations among individuals in both calendar and flight times required to complete each phase. This indicates that individual proficiency was utilized by instructors in the management of student training progress. However, results also show that some students did not reach the criterion level of proficiency on each and all maneuvers within the various phases. Nevertheless, time to proficiency was quite stable as indicated by a high degree of relationship of the mean training day to proficiency for the various maneuvers across classes. In terms of programmed flight hours, the various training phases were completed typically in less than programmed time.

Conclusion.

- It is concluded that the proficiency based checkride policy is feasible for IERW training.

Objective VII

In Objective VII, the compatibility of various elements of the 175/40 IERW program with the concept of individualized training was considered. Elements of the program setting critically examined were: (1) instructional delivery system; (2) instructional objectives; (3) performance measurement; and (4) management. The analysis involved examination of various IERW training, practices, and procedures.

Results.

- Findings from the analysis identified certain factors that contributed a positive or negative influence to the implementation of individualized training.

  Instructional delivery. On the positive side, the student-to-instructor ratio in flight and simulator instruction approaches the desired one-to-one ratio, and academic instruction for Primary and Instrument phases makes use of a programmed instruction individualized approach. On the negative side, formation flying and multi-ship tactical operations, the use of platform instruction for Transition, Night, and Combat Skills phases, and the omission of reference to individualization and proficiency progression works against implementation of the concept.

  Instructional objectives. On the positive side for most phases, well-developed objectives for instruction and detailed performance standards are stated. On the negative side, Combat Skills areas are not as rigorously treated.

  Performance measurement. On the negative side is the emphasis on use of subjective measures. A greater degree of objectivity would be more supportive of individualization.

  Management. On the negative side, the concept is limited by the scheduling and flow of instructional events; course management that is geared toward maintaining class integrity; the lack of specific incentive mechanisms to encourage accelerated training progress; and the requirement that classes move between phases on a fixed-schedule group basis tend to work against implementation of individualized training.

Conclusion.

- It is concluded that there is no basic incompatibility between the current 175/40 IERW program and the concept of individualization. However, there are areas in which compatibility could be increased, e.g., management.

Objective VIII

Objective VIII was directed to the development of a model to monitor and evaluate progress and change in the IERW program in the future.

Results and Conclusion.

- A model for monitoring and evaluating IERW training and for validation of the training content was developed. Two versions were presented, one oriented to the current and near future time frame, and one toward the longer time frame. The near-time model was based upon current data input for fulfilling the monitoring and evaluation functions. The longer term model was based on desired data inputs that may become available in the future.

Objective IX

Objective IX was to provide student performance data and resource data for cost-effectiveness analysis of the 175/40 IERW program. Data were derived from a daily status report on aviation training for each IERW student class in residence during the evaluation. Two facets of IERW training were evaluated: Student:IP ratio and aircraft utilization, i.e., students:aircraft ratio.

Results.

- Results from two sample subsets of student classes produced similar results for the student:IP ratio. The ratio ranged from 2.0:1 to 2.6:1 across the five training phases for one subset, and for the other subset the range was 2.0:1 to 2.4:1. Aircraft utilization during the period examined was lower than that programmed (4:1), due primarily to weather. The student:aircraft ratio was 4.2:1.

Conclusions.

- Conclusions indicate that the Student:IP ratios and student:aircraft ratios of 2:1 and 4:1 are valid goals and are being met as nearly as austere staffing will permit.

SUMMARY CONCLUSIONS

Based on the foregoing considerations, the following conclusions are drawn:

- The 175/40 IERW program is accomplishing its objectives.
- The 175/40 IERW is an improvement over the 180/20 program.
- Proficiency progression and individualized training can play an effective role in IERW training.

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