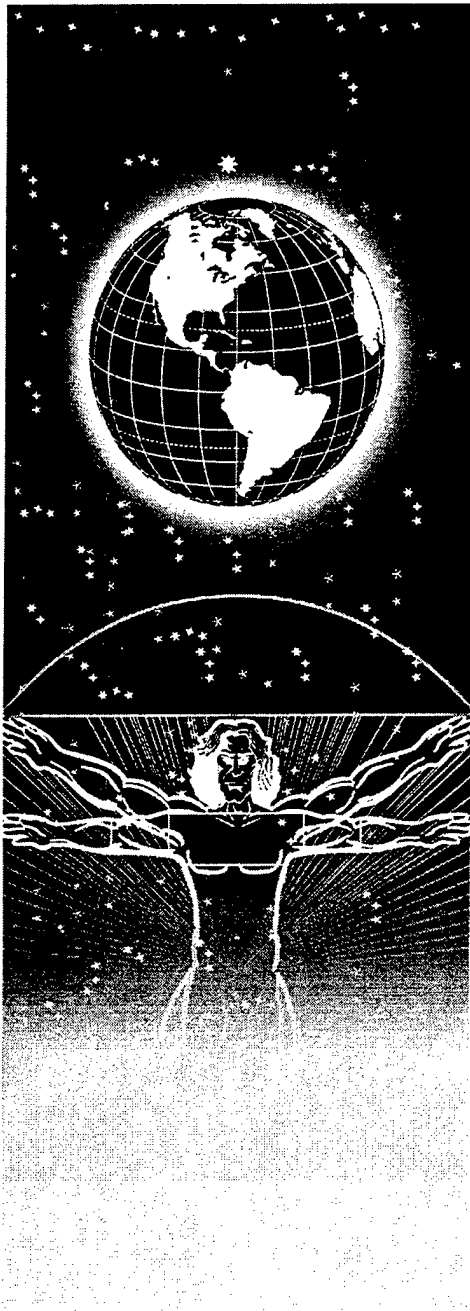


AL/HR-TP-1997-0055



UNITED STATES AIR FORCE ARMSTRONG LABORATORY

DETERMINANTS OF ENLISTED WEAPONS DIRECTOR SUCCESS

Ronald D. Dunlap
Thomas R. Carretta
John E. Kenny, Captain, USAF

HUMAN RESOURCES DIRECTORATE
AIRCREW TRAINING RESEARCH DIVISION
Aircrew Performance Branch
7909 Lindbergh Drive
Brooks AFB TX 78235-5352

December 1997

DTIC QUALITY INSPECTED 2

19980325 069

Approved for public release; distribution is unlimited.

AIR FORCE MATERIEL COMMAND
ARMSTRONG LABORATORY
HUMAN RESOURCES DIRECTORATE
AIRCREW TRAINING RESEARCH DIVISION
6001 South Power Road, Building 558
Mesa AZ 85206-0904

NOTICES

Publication of this paper does not constitute approval or disapproval of the ideas or findings. It is published in the interest of scientific and technical information (STINFO) exchange.

When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely Government-related procurement, the United States Government incurs no responsibility or any obligation whatsoever. The fact that the Government may have formulated or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication, or otherwise in any manner construed, as licensing the holder, or any other person or corporation; or as conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

The Office of Public Affairs has reviewed this paper, and it is releasable to the National Technical Information Service, where it will be available to the general public, including foreign nationals.

This paper has been reviewed and is approved for publication.

RONALD D. DUNLAP
Project Scientist

DEE H. ANDREWS
Technical Director

LYNN A. CARROLL, Colonel, USAF
Chief, Aircrew Training Research Division

Please notify AL/HRPP, 7909 Lindbergh Drive, Brooks AFB, TX 78235-5352, if your address changes, or if you no longer want to receive our technical reports. You may write or call the STINFO Office at DSN 240-3877 or commercial (210) 536-3877.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE December 1997	3. REPORT TYPE AND DATES COVERED Final - July 1996 to October 1997
----------------------------------	---------------------------------	---

4. TITLE AND SUBTITLE Determinants of Enlisted Weapons Director Success	5. FUNDING NUMBERS PE - 62205F PR - 1123 TA - B1 WU - 01, 10
--	--

6. AUTHOR(S) Ronald D. Dunlap Thomas R. Carretta John E. Kenny	8. PERFORMING ORGANIZATION REPORT NUMBER AL/HR-TP-1997-0055
---	--

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Armstrong Laboratory Human Resources Directorate Aircrew Training Research Division, Aircrew Performance Branch 7909 Lindbergh Drive Brooks Air Force Base TX 78235-5352	10. SPONSORING/MONITORING AGENCY REPORT NUMBER
--	--

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	11. SUPPLEMENTARY NOTES
---	-------------------------

Armstrong Laboratory Technical Monitor: Dr Thomas R. Carretta, (210) 536-3956

12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.	12b. DISTRIBUTION CODE
---	------------------------

13. ABSTRACT (*Maximum 200 words*)
The Weapons Director (WD) has played an integral part in the ability of the US Air Force to meet mission requirements. A great deal of interest has developed concerning the process by which prospective WDs are selected and trained. Until recently, the WD career field was limited to officers. A policy change in 1991 opened the field to enlisted personnel as well. Several problems were observed during this conversion, including higher than expected attrition and low job satisfaction for enlisted WDs. A research effort was undertaken to identify the personnel characteristics and organizational factors that influence training and job performance for the WD specialties of Aerospace Control and Warning System Surveillance Technician (1C5XX) and Airborne Warning Command and Control Systems Surveillance Technicians (1A4XX). Results varied by job specialties. Implications for enlisted weapons director selection and training are discussed.

14. SUBJECT TERMS Armed Services Vocational Aptitude Battery; ASVAB; Attrition; Enlisted personnel; Job performance; Personnel selection; Training; WD; weapons director	15. NUMBER OF PAGES 28
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION ABSTRACT Unlimited
---	--	---	--------------------------------------

CONTENTS

	PAGE
SUMMARY	1
INTRODUCTION	1
METHOD	2
RESULTS	4
DISCUSSION	8
REFERENCES	10
APPENDIX A: 1A4X1 and 1C5X1 Weapons Director Job Requirements Survey ..	11
APPENDIX B: Mean Response for Each Question by 1A4X1D and 1C5X1D	20

TABLES

Table
No.

1	Means and Standard Deviations for the Five Key Components of Job Satisfaction by WD Type	4
2	Means and Standard Deviations for the Motivational Questions by WD Type	5
3	Means and Standard Deviations for the Situational Questions by WD Type	6
4	Means and Standard Deviations for the Attributes Associated with Successful Weapons Directors by WD Type	7
5	Means, Standard Deviations, and Ranks for the Four Most Important Abilities Identified by WD Type	8
6	Means and Standard Deviations for the Abilities that Received Significantly Different Ratings of Importance by WD Type.....	8

Preceding Page Blank

PREFACE

This project was initiated in response to a request from the Air Education and Training Command (AETC/XO) in July 96 to conduct research regarding human systems needs for weapons directors and air traffic controllers. The weapons director selection portion was performed under Work Unit 1123-A1-13, Correlates of Success of Enlisted Weapons Directors. This technical paper is a distillation of a much more detailed contractor report prepared by Metrica, Inc. personnel (Contract F41624-95-D-5030, Delivery Order 0009).

We would like to thank Lt Col David McAfee (AETC/XO) for coordinating the survey effort. We also thank the 147 Air Force personnel in the Airborne Warning Command and Control Systems (1A4XX) and Aerospace Control and Warning Systems (1C5XX) specialties who took the time to complete and return the survey. Their time and inputs are greatly appreciated and form the basis for this report.

DETERMINANTS OF ENLISTED WEAPONS DIRECTOR SUCCESS

SUMMARY

Until recently, the Weapons Director (WD) career field in the US Air Force was limited to officers. In 1991, it was opened up to enlisted personnel. Several problems were observed during the conversion, including higher than expected attrition and low job satisfaction for enlisted WDs. In response to these problems, a coordinated effort was undertaken to identify the personnel characteristics and organizational factors that influence training and job performance for the WD specialties of Aerospace Control and Warning System Surveillance Technician (1C5XX) and Airborne Warning Command and Control Systems Surveillance Technician (1A4XX). Results varied by job specialty, indicating greater job dissatisfaction for airborne WDs. This may have been due to differing job requirements for the airborne and ground-based WDs. In contrast, job incumbents in both specialties were in agreement as to the most critical abilities required for on-the-job performance. These included memorization, spatial orientation, self-evaluation of performance, and stress tolerance. Implications for enlisted WD selection and training are discussed.

INTRODUCTION

Weapons Directors (WD) play an integral part in the ability of the US Air Force (USAF) to meet mission requirements ranging from combat situations (e.g., directing fighter aircraft to enemy aircraft) to operations support (e.g., directing fighters to tankers for air refueling). Given the importance of these missions, a great deal of interest has developed concerning the process by which prospective WDs are selected and trained. Further, in previous years, the weapons director career field in the USAF was limited only to officers, while a policy change in 1991 opened the field to enlisted personnel as well.

The 1991 officer-to-enlisted conversion identified 904 officer WD positions to transfer to enlisted personnel. The goal was to achieve a ratio of about one officer to every five enlisted WDs (Lt Col D. McAfee, personal communication, September 1996). The transfer focused on two job specialties: Aerospace Control and Warning System Surveillance Technician (job specialty code 1C5XX) and Airborne Warning Command and Control Systems Surveillance Technician (job specialty code 1A4XX). Within each specialty are multiple subspecialties (i.e., shredouts). For instance, the 1A4XX includes Air Surveillance Technicians (i.e., 1A4XX) and Weapons Directors (1A4X1D). The same distinction is found for the 1C5XX career field.

At the time of the conversion, only a limited screening process was used for enlisted WDs. Enlisted personnel who were recruited for these positions were required to have completed one term of enlistment and have a favorable commander's recommendation. Several problems were encountered during the conversion. First, there was a shortage of volunteers, resulting in the use of nonvolunteers. Second, no incentives were offered to the enlisted personnel (e.g., additional pay, accelerated promotion rate) that may have increased the rate of volunteerism. Third, the rate of training attrition was much higher than expected. In most

enlisted specialties, training attrition runs about 5%. In WD training, it was between 9 and 20%. Finally, some job requirements may have acted as demotivating factors. These include extensive travel (up to 220 days per year) and lower salary for enlisted personnel than for the officers doing the same job. In the context of these problems, program managers for enlisted WD training requested research regarding the selection process. The goal was to minimize training attrition.

Armed Services Vocational Aptitude Battery and WD Performance

The first step in the research strategy was to examine the utility of currently available selection tests. If available tests could be used for WD selection, selection system costs would be nominal.

Ree and Carretta (in press) examined the validity of scores from the enlistment selection and classification battery (Armed Services Vocational Aptitude Battery or ASVAB; Ree & Carretta, 1994) for predicting success in WD training. Participants were 353 enlisted USAF personnel who attended WD training. All were in their second duty tour, having completed training and duty in a previous job. Analyses indicated that all four ASVAB aptitude composites were valid predictors of WD training performance. Only three academic failures were observed among 32 failed participants. The remaining 29 eliminees failed to progress in training, even though their ASVAB scores suggested that they should have been able to successfully complete WD training. It was speculated that low motivation and job design features were contributing factors for most eliminees.

Although ASVAB composites were found to be valid, program managers for the enlisted WD career field were concerned that the ASVAB could not identify candidates likely to fail for nonacademic reasons. They wanted to determine whether there were additional ability factors not covered by ASVAB that could help improve prediction of training performance.

In response to program managers' concerns, a coordinated effort was undertaken to survey enlisted WDs to identify the personnel characteristics and organizational factors that may influence training and job performance in the 1A4XX and 1C5XX job specialties. It was intended that results of this effort be used to help design a preliminary selection system.

METHOD

Participants

The participants were 147 WD job incumbents, students, and instructors. They were mostly male (118 men, 28 women, and one failure to respond). Fifty were in the 1A4XX specialty (31 assistants and 19 WDs), 93 were in the 1C5XX specialty (56 assistants and 37 WDs), and four failed to specify their Air Force specialty code. The four participants who did not report their specialty were discarded from all analyses. All participants were currently assigned to bases in Air Combat Command or Pacific Air Forces.

Measures

The survey (see Appendix A) was designed to assess the importance of several factors thought to underlie WD performance and to define key issues related to success in the WD career field. These factors included basic abilities, organizational aspects, and the perceived working environment. The survey was divided into four sections: Personal Information, Motivation, Situational, and WD Abilities.

Personal Information. The questions in this section focused on basic demographic information as well as general information concerning job satisfaction. They concerned military grade, qualifications, and base of assignment. Also included were five general questions used by the Occupational Measurement Squadron to measure job satisfaction (Gould, 1976, 1978; Tuttle, Gould, & Hazel, 1975). These questions assessed job interest, training, the use of talents, sense of accomplishment, and the likelihood of reenlistment. The questions in this section used mainly fill-in-the-blank or predetermined alternative response formats.

Motivation. This section assessed the desire to become a weapons director. These questions dealt mainly with the attitude of the participants towards their technical training (i.e., before and after) and the reasons for wanting to become a WD. Responses to these questions were on a 7-point Likert scale ranging from Strongly Agree (7) to Strongly Disagree (1).

Situational. This section measured the quality of life, acceptance of responsibility, attitudes toward temporary duty assignments, and the relevance of various basic abilities for successful WD performance. Responses to questions in the Situational section used the same Likert scale as used in the Motivation section.

WD Abilities. The final section assessed the importance of several abilities for successful WD performance relative to their importance for performance in other Air Force specialties. These items were based on the 28 task/job requirements defined by Dittmar, Weissmuller, Driskill, Hand, and Earles (1994). A scale from very high (7) to not required (0) was used to indicate the ability level required to complete the task discussed in each question. A score of 4 or greater, on a given question, indicated that the ability level required to perform the task should be higher than that typically found in other Air Force specialties.

Procedures

Surveys were mailed to each duty location and supplied to participants via their supervisor. Two forms (i.e., paper-and-pencil or diskette) of the survey were distributed. About half (49%) of the respondents chose the paper-and-pencil format. Once completed, the surveys were placed in a sealed envelope and returned to Brooks Air Force Base for analysis. Participants provided informed consent per USAF Institutional Review Board procedures prior to completing the survey.

Analyses

Results were tabulated separately for the two job specialties (i.e., 1A4XXs and 1C5XXs). Within each specialty, data were analyzed for possible trends. Between-group analyses (i.e., t-tests) were conducted to compare the WDs from the two career fields. A $p < .05$ error rate and a 2-tailed t-test were used for all between-group analyses.

RESULTS

Analyses showed similar results for the total sample, the 1A4XXs ($n = 50$) versus the 1C5XXs ($n = 93$), and the 1A4X1Ds (WDs, $n = 19$) versus the 1C5X1Ds (WDs, $n = 37$). Given the similar results for the different samples, only the differences between the WD samples (1A4X1Ds versus 1C5X1Ds) will be discussed. Appendix B provides the mean responses for each survey question for the 1A4 WDs and 1C5 WDs. A more detailed summary of the study results for each sample is provided by Grimes, Weissmuller, and Driskill (1997).

Airborne (1A4X1D) versus Ground-Based (1C5X1D) WDs

Personal Information. Group comparisons on the five questions concerning job satisfaction indicated that 1C5X1Ds were more satisfied with their jobs than were 1A4X1Ds. As shown in Table 1, 1C5s had higher mean responses for all five questions as compared to 1A4s. We also found that 1A4s report a significantly greater likelihood to crosstrain than 1C5s, $p < .05$.

Table 1. Means and Standard Deviations for the Five Key Components of Job Satisfaction by WD Type

Component	Airborne (1A4X1D)		Ground-Based (1C5X1D)		
	Mean	SD	Mean	SD	t
1. Job Interest	4.72	1.8	6.16	0.9	-4.01*
2. Use of Talents	3.42	1.4	4.70	1.2	-3.57*
3. Training	3.37	1.3	4.54	1.4	-3.03*
4. Sense of Accomplishment	3.90	2.0	5.49	1.1	-3.85*
5. Likelihood of Reenlistment	3.26	1.0	4.11	1.2	-2.65

Notes. 1. The number of airborne WDs = 19 and the number of ground-based WDs = 37.

2. Scale values range from 7 (high) to 1 (low).

* $p < .05$ (2-tailed t-test)

Motivation. Table 2 summarizes the results from the Motivation section of the survey. Results were mixed. Prior to training, there were no significant differences between the groups in self-reported motivation. However, following training, 1C5s were more likely to report greater motivation than 1A4s. One possible explanation for this finding may be the differences

in job requirements for these two specialties. The 1C5s are ground-based WDs, while 1A4s are airborne. The 1A4s are required to spend more time on temporary duty assignments (up to 220 days) during the year, which requires more time away from the home/family. This may lead to a decrease in motivation towards the job for 1A4s.

Table 2. Means and Standard Deviations for the Motivational Questions by WD Type

Question	Airborne (1A4X1D)		Ground-Based (1C5X1D)		t
	Mean	SD	Mean	SD	
16. Positive attitude toward WD training prior to attending.	5.58	1.8	6.19	1.0	-1.64
17. Positive attitude toward WD training after attending.	3.16	2.0	5.08	1.9	-3.52*
18. Positive attitude toward WD equipment prior to training.	5.21	1.7	5.41	1.5	-0.45
19. Positive attitude toward WD equipment after attending.	3.53	1.9	5.22	1.7	-3.39*
20. Was a WD volunteer.	5.00	2.4	6.65	1.0	-3.64*
21. Wanted to become a WD for professional reasons.	4.79	2.1	6.16	1.3	-3.01*
22. Wanted to become a WD for personal reasons.	4.63	2.3	5.81	1.8	-2.11*
23. Becoming a WD has had an adverse impact on home/family life.	5.47	1.4	4.19	2.3	2.22*
24. Should have opportunity to move between 1A4 and 1C5 specialties	4.63	2.7	4.70	2.3	-0.10

Notes. 1. The number of airborne WDs = 19 and the number of ground-based WDs = 37.

2. Scale values range from 7 (strongly agree) to 1 (strongly disagree).

* $p < .05$ (2-tailed t-test)

Situational. The questions pertaining to intrinsic motivation (i.e., Do you like the job environment?) indicate that 1C5s enjoy their work environment more so than 1A4s. In general, 1C5s report a more challenging and rewarding job experience (as shown in Table 3). One possible explanation for the lower 1A4 Situational scores may be due to the motivational factors previously discussed. Further, enlisted WDs in both career fields report some dissonance that officers are performing the same duties as enlisted ($M = 5.16$ for 1A4s and $M = 4.46$ for 1C5s).

Table 3. Means and Standard Deviations for the Situational Questions by WD Type

Question	<u>Airborne (1A4X1D)</u>		<u>Ground-Based (1C5X1D)</u>		t
	Mean	SD	Mean	SD	
26. I like controlling the aircraft and being part of the Air Force.	5.16	1.8	6.32	1.0	-3.11*
27. I like the level of responsibility.	4.79	1.8	6.19	1.3	-3.34*
28. I enjoy the challenge of directing aircraft.	4.89	2.0	6.57	0.8	-4.49*
29. Being a WD is exciting.	4.16	2.3	6.30	1.0	-4.86*
30. Being a WD is rewarding.	3.26	2.1	5.59	1.6	-4.63*
34. Equipment at school was similar to equipment on the job at the gaining unit.	2.37	2.0	5.05	1.8	-5.08*
37. Receiving feedback/criticism is helpful to my job performance.	5.16	1.8	6.27	1.1	-2.86*
39. Length of base assignment is too short	2.37	1.5	4.30	2.0	-3.70*

Notes. 1. The number of airborne WDs = 19 and the number of ground-based WDs = 37.

2. Scale values range from 7 (strongly agree) to 1 (strongly disagree).

* $p < .05$ (2-tailed t-test)

Questions 45-66 were designed to obtain statements requiring an agree/disagree type response. Information from these questions provided some insight into the perceived requirements of the attributes associated with successful weapons directors. As shown in Table 4, the 1A4s differed significantly from the 1C5s on only three questions. For all three questions where group differences occurred, the 1C5s exhibited a more positive attitude than did the 1A4s.

Table 4. Means and Standard Deviations for the Attributes Associated with Successful Weapons Directors by WD Type

Question	Airborne (1A4X1D)		Ground-Based (1C5X1D)		
	Mean	SD	Mean	SD	t
60. A successful WD must see the job through.	6.05	1.0	6.51	0.6	-2.15*
63. A WD has ample opportunity to develop supervisory/leadership skills.	2.79	1.7	4.22	1.5	-3.23*
64. A WD has ample opportunity to develop management/admin skills.	2.95	1.9	4.08	1.5	-2.44*

Notes. 1. The number of airborne WDs = 19 and the number of ground-based WDs = 37.
 2. Numbers in parentheses represent the rank of that score within that group.
 3. Scale values range from 7 (strongly agree) to 1 (strongly disagree).

*p < .05 (2-tailed t-test)

WD Abilities. The final section of the questionnaire determined the perceived importance of 28 abilities for successful job performance. It is noteworthy that none of the abilities were rated lower than 3.2 on a 7-point scale. As shown in Table 5, although the two groups agreed on the four most important abilities, rankings were slightly different. Table 6 provides questions that were significantly different from one another for WD specialties in terms of relative importance.

Table 5. Means, Standard Deviations, and Ranks for the Four Most Important Abilities Identified by WD Type

Question	Airborne (1A4X1D)		Ground-Based (1C5X1D)		
	Mean	SD	Mean	SD	t
73. Ability to memorize job-related information.	6.21 (4)	0.7	5.70 (4)	1.0	1.98
79. Spatial orientation to self and other objects.	6.37 (2)	0.7	5.89 (1)	1.0	1.87
92. Ability to work in stressful situations.	6.26 (3)	0.9	5.81 (3)	1.0	1.65
94. Ability to evaluate self-performance.	6.53 (1)	0.8	5.84 (2)	1.3	2.11*

Notes. 1. The number of airborne WDs = 19 and the number of ground-based WDs = 37.
 2. Numbers in parentheses represent the rank of that score within that group.
 3. Scale values range from 7 (very high) to 1 (very low).

*p < .05 (2-tailed t-test)

Table 6. Means and Standard Deviations for the Abilities that Received Significantly Different Ratings of Importance by WD Type

Question	<u>Airborne (1A4X1D)</u>		<u>Ground-Based (1C5X1D)</u>		t
	Mean	SD	Mean	SD	
81. Ability to produce unique responses or improvise.	6.21	0.8	5.47	1.1	2.60*
89. Ability to cooperate and work well in teams.	6.21	0.8	5.16	1.0	3.97*
94. Ability to evaluate self-performance.	6.53	0.8	5.84	1.3	2.11*

Notes. 1. The number of airborne WDs = 19 and the number of ground-based WDs = 37.

2. Scale values ranged from 7 = very high to 1 = very low

* $p < .05$ (2-tailed t-test)

DISCUSSION

Several personnel characteristics and organizational factors were identified that may influence WD performance in training and on the job. Researchers and program managers may use this information to develop procedures to select prospective WD candidates and to improve the training and operational environment in the career field.

Results of the survey indicated that level of job satisfaction was related to job specialty, with airborne WDs being less satisfied. Compared with ground-based WDs, airborne WDs were less interested in their job, were less likely to feel their talents or training were being used, were less likely to feel a sense of accomplishment, and reported a lower likelihood of reenlistment at the end of their current enlistment. These results may be due to differences in job characteristics and the work environment. Weapon directors assigned to the 1A4X1D Air Force specialty are air-based in the AWACS aircraft, while those in the 1C5X1D specialty are ground-based. The duty day for 1A4X1Ds typically is longer than that for 1C5X1Ds due to mission requirements. The addition of mission briefs and debriefs, as well as extended temporary duty travel, decreases off-duty time, therefore making the 1A4X1D career less desirable.

A distinction should be made between attrition and retention issues. Attrition during technical training may be due either to a lack of ability or lack of motivation (Ree & Carretta, in press), while the retention problems are probably more closely related to job satisfaction (i.e. motivation). Anecdotal evidence for this distinction was provided by WD instructors at Tyndall AFB, FL (personal communication, July 23, 1997). Although they offered no empirical evidence, they felt that lack of ability, rather than lack of motivation, was the primary cause of training failures.

Based on the results of this survey and our discussions with WD instructors, two distinct issues are apparent in regard to WD training and on-the-job performance. Despite some evidence to the contrary (Ree & Carretta, in press), WD instructors reported that lack of motivation is not a problem *during training*. They contend that most training failures occur due to a lack of ability. It is possible that although current enlistment selection tests (i.e., ASVAB) are valid predictors of enlisted WD training performance, improvements in selection could be made. For instance, the ASVAB does not include tests of memorization, spatial orientation, or stress tolerance--factors identified by WDs as important for on-the-job performance. If this is correct, a screening device that measures these abilities may help decrease training attrition at the technical school. Based on the recommendations of WD instructors and results of the survey, research has been initiated to develop a WD work sample test and evaluate its utility for selection.

Once a WD reaches the job, motivation appears to play the major role in retention. This is evident with the survey results, especially for the 1A4X1D career field. The solution for retention problems may involve job redesign (e.g., shorter duty days, less temporary duty travel), increased opportunities for promotion, and increased pay incentives.

REFERENCES

Dittmar, M. J., Weissmuller, J. J., Driskill, W. E., Hand, D. K., & Earles, J. A. (1992). *Methodology for identifying abilities for job specialties (MIDAS)* (AL/HR-TP-1994-0008, AD A). Brooks AFB, TX: Manpower and Personnel Division, Armstrong Laboratory Human Resources Directorate.

Gould, R. B. (1976). *Review of an Air Force job satisfaction research project: Status report through September 1996* (AFHRL-TR-76-75, AD A035 684). Brooks AFB, TX: Occupation and Manpower Research Division, Air Force Human Resources Laboratory.

Gould, R. B. (1978). *Air Force Occupational Attitude Inventory development* (AFHRL-TR-78-60, AD A062 987). Brooks AFB, TX: Occupation and Manpower Research Division, Air Force Human Resources Laboratory.

Grimes, G. R., Weissmuller, J. J., & Driskill, W. E. (1997). *Correlates of enlisted weapons director success*. Unpublished manuscript, Metrica, Inc., San Antonio, TX.

Ree, M. J., & Carretta, T. R. (1994). Factor analysis of ASVAB: Confirming a Vernon-like model. *Educational and Psychological Measurement*, 54, 459-463.

Ree, M. J., & Carretta, T. R. (in press). Lack of ability is not always the problem. *Journal of Business and Psychology*.

Tuttle, T. C., Gould, R. B., & Hazel, J. T. (1975). *Dimensions of job satisfaction: Initial development of the Air Force Occupational Attitude Inventory* (AFHRL-TR-75-1, AD A014 796). Lackland AFB, TX: Occupational and Manpower Research Division, Air Force Human Resources Laboratory.

APPENDIX A

**1A4X1 AND 1C5X1 WEAPONS DIRECTOR
JOB REQUIREMENTS SURVEY**

PERSONAL INFORMATION

Please fill in the following information. GRADE _____ AFSC _____

NAME _____ SSAN _____

ORGANIZATION _____ BASE OF ASSIGNMENT _____

TIME IN PRESENT JOB ____ yrs ____ mos TAFMS ____ yrs ____ mos

TIME IN CAREER FIELD ____ yrs ____ mos SEX M ____ F ____ (Check One)

I have attended the Weapons Director (WD) course at Tyndall AFB, Florida.

Yes
No

If you attended, did you successfully complete the course?

Yes
No

If you are a WD, please estimate the number of times in your CAREER you have controlled each of the following scenarios. If you're not a WD, leave it blank.

2 v 2 _____

2 v 4 _____

4 v 4 _____

LFE (4 v Many) _____

INSTRUCTIONS

Please answer each one of the questions on this portion of the questionnaire by marking the area which corresponds to your *most appropriate* response.

1. How do you find your job? Choose only one.

- Extremely Dull
- Very Dull
- Fairly Dull
- So-So
- Fairly Interesting
- Very Interesting
- Extremely Interesting

2. How does your job utilize your talents? Choose only one.

- Not At All
- Very Little
- Fairly Well
- Quite Well
- Very Well
- Excellently
- Perfectly

3. How does your job utilize your training? Choose only one.

- Not At All
- Very Little
- Fairly Well
- Quite Well
- Very Well
- Excellently
- Perfectly

4. How satisfied are you with the sense of accomplishment you gain from your work? Choose only one.

- Extremely Dissatisfied
- Very Dissatisfied
- Slightly Dissatisfied
- Neither Satisfied Nor Dissatisfied
- Slightly Satisfied
- Very Satisfied
- Extremely Satisfied

5. Do you plan to reenlist at the end of your current enlistment? Choose only one.

- Will Retire (I will have completed at least 20 years of service)
- Definitely Will Not Reenlist
- Probably Will Not Reenlist
- Probably Will Reenlist
- Definitely Will Reenlist

6. While in an Air Force environment, I am made to feel uncomfortable by other individuals whose behavior is objectionable. Objectionable behaviors include such things as making derogatory comments about people because of their educational level, beliefs, sex, race, color, or national origin; using vulgar language; telling obscene jokes or stories; threatening use of violence; repeating unwanted social invitations; or hinting of job-related retaliation for denial of unwanted social contacts.

- None of the time
- Almost never
- Some of the time
- Fair amount of the time
- Most of the time
- Almost always
- All of the time

7. I feel that I, as an individual, receive an appropriate level of respect and consideration from my organization (managers, supervisors, co-workers, or support personnel) whether on or off the job for the work that I do and the manner in which I discharge my job and other military duties.

- None of the time
- Almost never
- Some of the time
- Fair amount of the time
- Most of the time
- Almost always
- All of the time

For the following questions, use this rating scale to rate the extent that you agree with the written statements. Write the number of the response that you feel best describes your opinion in the box adjacent to the statement.

- 7. **STRONGLY AGREE**
- 6. **MODERATELY AGREE**
- 5. **SLIGHTLY AGREE**
- 4. **NEUTRAL / NO OPINION**
- 3. **SLIGHTLY DISAGREE**
- 2. **MODERATELY DISAGREE**
- 1. **STRONGLY DISAGREE**

Sample Question:5

I like looking at radar scopes.

8. If a program existed where I could pursue a college education and still work irregular hours and go TDY, I would enroll.

- 9. Given the opportunity to cross-train into another AFSC, I would.
- 10. I like working in fast-paced, busy environments.
- 11. I like to work in an environment where I'm a member of a team.
- 12. I enjoy making important decisions.
- 13. I am a good listener.
- 14. I am assertive.
- 15. I receive my job performance feedback in a positive, professional manner.

MOTIVATION SECTION - INSTRUCTIONS

Continue using the same rating scale to answer each one of the questions on this portion of the questionnaire by marking the area which corresponds to the most appropriate response. *If you are not a weapons director (WD), please answer based upon your opinion and perceptions of the position of WD.*

- 16. I had/have a positive attitude towards the WD training program prior to attending.
- 17. I had a positive attitude towards the WD training program after attending.
(If you have not attended, mark No Opinion).
- 18. I had/have a positive attitude towards the equipment used in the WD training prior to attending.
- 19. I had a positive attitude towards the equipment used in the WD training after attending the course. (If you have not attended, mark No Opinion).
- 20. I was/am a volunteer to attend the WD course. (Not if you were/are a volunteer on paper, but was it your idea?)
- 21. I want(ed) to become a WD for professional/career reasons.
- 22. I want(ed) to become a WD for personal reasons.

23. Becoming a WD has had (or would have if you became a WD) an adverse impact on my home/family life?

24. WDs should have the opportunity to move back and forth between AWACS (1A4X1D) and ground-based (1C5X1D) controlling.

SITUATIONAL ASSESSMENT

25. Incentive pay is/was a positive factor in my decision to be a Weapons Director.

26. I really like controlling aircraft and being part of what the Air Force is really about, flying and protecting our air space.

27. I appreciate the high level of responsibility I have as a WD.

28. I enjoy the challenge of being a WD.

29. Being a WD is exciting.

30. I find being a WD a rewarding career.

31. I am aware that the schoolhouse continues to upgrade equipment such as the recently installed MCET, and upcoming AWACS simulators.

32. Instructors at the WD school at Tyndall AFB showed concern for the students.

32a. (AWACS Only) Instructors at the IQT program at Tinker AFB showed concern for the students.

33. Instructors did what they could to improve a student's chances to graduate.

33a. (AWACS Only) Instructors at IQT did what they could to improve a student's chances to graduate.

34. Using the equipment at the WD school allowed me to perform WD duties at my gaining unit with minimal on-the-job equipment familiarization.

35. The working relationship between officer and enlisted WDs is positive.

36. Officers performing the same functions as enlisted creates tension within the organization.

- 37. Receiving feedback/criticism about my job performance makes me a better WD.
- 38. The locations where I can be assigned (PCS) are a positive aspect of the career field.
- 39. The length of time I spend assigned to a base is too short.
- 40. I go on too many Temporary Duty assignments (TDYs) a year.
- 41. The duration of TDYs is one of the **positive** aspects of the career field.
- 42. While on TDY, my skills are used effectively.
- 43. I enjoy my TDY trips to other places.
- 44. Being a WD will prepare me for good job opportunities in the civilian sector when I exit the Air Force.
- 45. Promotion rates for WDs are higher than the average AFSC.
- 46. The ability to think in three dimensions while working in two dimensions is critical to successful performance as a WD.
- 47. A successful WD needs to speak clearly and concisely.
- 48. A successful WD should be outgoing and not afraid to speak to those he/she does not know.
- 49. Understanding basic geometry is essential to performing the tasks of a WD.
- 50. To be successful, a WD needs to be a good listener.
- 51. To be a successful WD, you need to be assertive.
- 52. A good WD needs to be able to handle several tasks at one time.
- 53. Prioritizing and identifying what should be done first/next is a critical to being a WD.
- 54. A good WD can assimilate information and make correct decisions quickly.

- 55. A successful WD needs to be able to work well in a stressful environment.
- 56. To be a successful WD, you need to have a lot of self confidence.
- 57. Anticipating what hasn't yet happened is an key factor for a WD to be successful.
- 58. Looking at one thing while listening to another and pushing buttons or flipping switches with your hands (head and hand coordination) is key to the success of a WD.
- 59. WDs must be meticulous about how they do their job.
- 60. A successful WD must be dedicated to seeing the job all the way through.
- 61. A WD's responsibilities are more than an 8-5 job.
- 62. Ignoring some things while focusing on others is an important part of the job for a WD.
- 63. A WD is provided ample opportunity to develop their supervisory/leadership skills.
- 64. A WD is provided ample opportunity to develop management/admin skills.
- 65. Part of a WD's responsibility is to facilitate team performance.
- 66. Because of the nature of the work, a good WD waits for opinions from others before making decisions.

WD ABILITIES - INSTRUCTIONS

Use the rating scale below to rate this portion of the survey. Select the response that you feel best represents the importance of each ability to the position of Weapons Director and place the corresponding number in the appropriate box. If you are not a Weapons Director, please respond according to your impressions/perceptions of the job.

7. **VERY HIGH** - Individuals need a level of this ability that is much higher than the average enlisted person in the Air Force to successfully perform the tasks associated with this AFSC.

6. **HIGH** - Individuals need a level of this ability that is somewhat higher than the average enlisted person in the Air Force to successfully perform the tasks associated with this AFSC.

5. **SLIGHTLY ABOVE AVERAGE** - Individuals need a level of this ability that is slightly higher than the average enlisted person in the Air Force to successfully perform the tasks associated with this AFSC.

4. **AVERAGE** - Individuals need a level of this ability that is about the same as the average enlisted person in the Air Force to successfully perform the tasks associated with this AFSC.

3. SLIGHTLY BELOW AVERAGE - Individuals need a level of this ability that is slightly lower than the average enlisted person in the Air Force to successfully perform the tasks associated with this AFSC.

2. LOW - Individuals need a level of this ability that is lower than the average enlisted person in the Air Force to successfully perform the tasks associated with this AFSC.

1. VERY LOW - Individuals need a level of this ability that is much lower than the average enlisted person in the Air Force to successfully perform the tasks associated with this AFSC.

0. NOT REQUIRED - Individuals DO NOT need this ability to successfully perform the tasks associated with this AFSC.

- 67. The ability to understand language, both individual words as well as words as they appear in sentences and paragraphs.
- 68. The ability to use language (either oral or written) to communicate information or ideas to other people.
- 69. The ability to perform numerical operations quickly and accurately: for example, add, subtract, multiply, and divide.
- 70. The ability to reason abstractly using mathematical concepts and symbols in order to change a problem described in words into a solvable mathematical equation.
- 71. The ability to find the most appropriate general concepts or rules which fit sets of data or which explain how a given series of individual items are related to each other.
- 72. The ability to apply general concepts or rules to specific cases or to proceed from stated premises to their logical conclusions.
- 73. The ability to memorize and retain new information which occurs as a regular or routine part of the task.
- 74. The ability to apply rules in order to arrange information into the best or most appropriate sequence. The types of information considered under this ability include numbers, letters, words, pictures, procedures, sentences, and mathematical or logical operations.
- 75. The ability to shift between two or more sources of information. The information obtained from these sources is either combined and used as a whole, or is retained and used separately.
- 76. The ability to "hold in mind" a particular visual pattern and then find it embedded in distracting material.
- 77. The ability to quickly combine and organize a set of apparently different elements into a single, meaningful pattern or configuration.
- 78. The ability to quickly find figures, make comparisons, or carry out other tasks involving visual perception.
- 79. The ability to maintain orientation with respect to objects in space or to comprehend the position of objects in space with respect to your position.
- 80. The ability to manipulate or transform the visual images of spatial patterns or objects into other spatial arrangements.

- 81. The ability to produce unusual or clever responses related to a given topic or situation or to improvise solutions to problems or to develop procedures in situations where standard operating procedures do not apply.
- 82. The ability to exert muscular force against fairly immovable or heavy external objects in order to lift, push, or pull that object.
- 83. The ability to make skillful, coordinated movements of the fingers where manipulations of objects may or may not be involved.
- 84. The ability to make precise, steady arm-hand positioning movements where both strength and speed are minimized.
- 85. The ability to coordinate the movements of two or more limbs (e.g., two legs, two hands, one leg and one hand).
- 86. The ability to quickly pick the right action that goes with a given condition where several different actions can be selected.
- 87. The ability to make timed, anticipatory muscular movements to intercept or follow a continuously moving object whose speed and/or direction may vary in an unpredictable fashion.
- 88. The ability to get others to think or act as you would like them to, without force or coercion.
- 89. The ability to work with others in a cooperative manner to complete tasks or achieve goals within both small and large group settings requiring teamwork.
- 90. The ability to assume responsibility for the productivity, behavior, or well being of others.
- 91. The ability to work productively in limited personal contact situations.
- 92. The ability to work productively in situations where people are angry, distressed, or tense.
- 93. The ability to place yourself in the situation of others and understand how they are feeling.
- 94. The ability to evaluate one's own performance, capabilities, and accomplishments.

If you have any comments about the questionnaire or the career field in general, please place them here. If your comments relate to a specific question, please write the number of the question prior to your comment. If you need more space, please write your comments on an additional sheet and include them with the survey.

THANK YOU FOR YOUR ASSISTANCE !

APPENDIX B

Mean Response for Each Question by 1A4X1D and 1C5X1D*

Survey Question Number	1A4X1D (Airborne) Mean Response	1C5X1D (Ground) Mean Response
1	4.72 (1.8)	6.16 (0.9)
2	3.42 (1.4)	4.7 (1.2)
3	3.37 (1.3)	4.54 (1.4)
4	3.9 (2.0)	5.49 (1.1)
5	3.26 (1.0)	4.11 (1.2)
6	2.58 (1.8)	2.49 (1.2)
7	4.26 (1.6)	4.59 (1.2)
8	6.53 (1.1)	6.11 (1.4)
9	5.79 (1.9)	4.22 (1.9)
10	6.37 (0.7)	6 (1.1)
11	6.21 (1.1)	6.43 (0.8)
12	6.32 (0.7)	6.43 (0.8)
13	5.74 (1.0)	5.87 (0.8)
14	5.79 (1.2)	6.05 (1.0)
15	5.63 (1.6)	5.89 (1.2)
16	5.58 (1.8)	6.19 (1.0)
17	3.16 (2.0)	5.08 (1.9)
18	5.21 (1.7)	5.41 (1.5)
19	3.53 (1.9)	5.22 (1.7)
20	5 (2.4)	6.65 (1.0)
21	4.79 (2.1)	6.16 (1.3)
22	4.63 (2.3)	5.81 (1.8)
23	5.47 (1.4)	4.19 (2.3)
24	4.63 (2.7)	4.7 (2.3)
25	4.42 (2.7)	4.51 (2.2)
26	5.16 (1.8)	6.32 (1.0)
27	4.79 (1.8)	6.19 (1.3)
28	4.89 (2.0)	6.57 (0.8)
29	4.16 (2.3)	6.3 (1.0)
30	3.26 (2.1)	5.59 (1.6)
31	5.21 (2.0)	5.81 (1.4)

32	3.42 (2.0)	4.41 (1.8)
32a (AWACS only)	3.79 (2.1)	3.95 (0.3)
33	4 (2.1)	4.84 (1.7)
33a (AWACS only)	4.05 (2.0)	3.95 (0.3)
34	2.37 (2.0)	5.05 (1.8)
35	3.63 (2.0)	4.11 (1.7)
36	5.16 (1.9)	4.46 (2.0)
37	5.16 (1.8)	6.27 (1.1)
38	2.42 (1.6)	2.84 (1.7)
39	2.37 (1.5)	4.3 (2.0)
40	4.33 (2.2)	3.84 (2.2)
41	3.58 (1.8)	3.08 (1.7)
42	4.39 (1.8)	4.54 (1.7)
43	5.44 (1.4)	4.95 (1.7)
44	1.84 (1.7)	2.3 (1.6)
45	2.21 (1.7)	2.3 (1.4)
46	6.05 (1.0)	6.22 (1.2)
47	6.74 (0.4)	6.59 (0.6)
48	6.58 (0.7)	6.19 (1.1)
49	5.74 (1.4)	6.22 (1.4)
50	6.37 (0.7)	6.7 (0.6)
51	6.58 (0.8)	6.43 (1.0)
52	6.79 (0.5)	6.68 (0.6)
53	6.63 (0.6)	6.7 (0.5)
54	6.63 (0.6)	6.65 (0.6)
55	6.84 (0.4)	6.68 (0.6)
56	6.63 (0.7)	6.38 (0.9)
57	5.95 (1.0)	6.27 (0.9)
58	6.42 (0.8)	5.87 (1.3)
59	5.53 (1.3)	6.11 (1.0)
60	6.05 (1.0)	6.51 (0.6)
61	5.84 (1.7)	6.49 (0.8)
62	4.26 (1.9)	4.24 (1.9)
63	2.79 (1.7)	4.22 (1.5)
64	2.95 (1.9)	4.08 (1.5)
65	5.26 (1.8)	5.51 (1.1)
66	3.16 (1.8)	3.11 (1.8)
67	5.21 (0.9)	5.39 (1.3)

68	6.11 (0.9)	5.58 (1.1)
69	5.11 (1.4)	5.33 (1.1)
70	4.47 (1.5)	4.86 (1.3)
71	5.16 (1.1)	5.13 (0.9)
72	5.74 (0.8)	5.57 (0.9)
73	6.21 (0.7)	5.7 (1.0)
74	5.68 (1.1)	5.7 (1.0)
75	6.05 (0.8)	5.62 (1.0)
76	5.61 (0.8)	5.66 (0.9)
77	5.37 (1.1)	5.67 (0.9)
78	5.95 (1.0)	5.7 (1.1)
79	6.37 (0.7)	5.89 (1.0)
80	5.84 (1.4)	5.68 (1.0)
81	6.21 (0.8)	5.47 (1.1)
82	3.2 (1.6)	3.56 (1.3)
83	4.47 (1.7)	4.59 (1.1)
84	3.83 (1.4)	4.17 (1.3)
85	4.53 (1.5)	4.47 (1.4)
86	5.95 (0.9)	5.38 (1.2)
87	4.42 (1.4)	4.7 (1.4)
88	4.79 (1.5)	4.8 (1.3)
89	6.21 (0.8)	5.16 (1.0)
90	5.42 (1.3)	5.24 (1.1)
91	5.21 (1.3)	5.2 (1.1)
92	6.26 (0.9)	5.81 (1.0)
93	5.11 (1.3)	5.08 (1.2)
94	6.53 (0.8)	5.84 (1.3)

*Standard Deviations are shown in ().