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ABSTRACT

The study is an investigation and demonstration of the degree to which military experience in certain specialties is continuous with the career development patterns of workers in the entire United States society. Selected characteristics of 24 military occupations (six from each branch of the services) were compared with similar characteristics of civilian sector occupations or portions of those occupations in the areas of: formal education, vocational/technical training, previous experience, licensing or certification, and union apprenticeship/journeymanship. The study found that with the exception of combat occupations, military and civilian occupations can be coherently compared. In all, 71 tables, covering 144 pages are included. One lists the 24 military occupations studied. Three other tables list the adequacy of military training and work experience for meeting vocational/technical training requirements, previous experience requirements, and licensing/certification requirements of selected civilian occupations. The remaining 67 tables compare in detail the civilian employment standards of comparable occupations with the respective military occupations in the categories listed above. There are four appendixes: two on sources of military and civilian occupational information; and one each on an examination of army crawler tractor operator MOS 62E, and a suggested approach to combat arms occupations. (JR)

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Coordination and Integration of Military Education with National Career Education

Phase II: Final Report

19 February 1975

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Continuity of career development following military employment is a very significant attribute of military service. The All Volunteer Force and the increasing emphasis on career education in the public schools magnify the importance of this attribute. This report describes a frame of reference for viewing the military and civilian career development experiences as continuous. That frame of reference is then tested by detailed comparisons of the work, training and education experiences of persons in selected (cont on back)

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military occupations with the requirements for employment in similar civilian positions.

ACKNOWLEDGMENTS

This study was conducted with the valuable assistance of numerous key individuals in the armed forces, in the Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs, in the military departments, in other agencies of government and in industry. The organizations these persons represent are listed in Appendix A and Appendix B to this report. The ORI staff wishes to recognize the assistance of Dr. Marshall Farr, Director of Personnel and Training Research Programs for the Office of Naval Research, who served as the Scientific Officer for the study, Dr. M. Richard Rose, formerly Deputy Assistant Secretary of Defense (Education) and Dr. Ralph Canter, formerly Director of Manpower Research, OASD (M&RA).

Technical advice for the study was coordinated in the Department of Defense by Captain R. H. Loyd USN and Lieutenant Colonel R. T. Boyette USAF. Advisors to the study were Dr. W. Scanland, Commander J. H. Brame and Lieutenant Colonel J. M. Keenan USMC, representing the Department of the Navy; Mr. L. B. Kidder, representing the Department of the Army; Major J. F. Glaza, Major L. Tilley, Mr. R. Quick and Mr. W. R. Perry, representing the Department of the Air Force.

ORI wishes to express its appreciation to all involved this effort.

SUMMARY

BACKGROUND

The completion of the changeover to the All Volunteer Force places the military branches within the mainstream of the flow of persons in the national labor market. All employers who operate in that market must compete for the labor of qualified persons. The nature of the competition requires that all employers understand the attributes of their organizations and explain these characteristics to potential employees. An attribute that is highly valued by young workers is the potential continuity between their work with one employer and their work with other employers in the economy. This focus on continuity will undoubtedly grow, because a major innovation in the education of young Americans is increased emphasis on career education.

If the armed services are to be fully integrated with the national labor market, the continuity of military employment with civilian sector employment must be evaluated, understood and described to the national population, especially to young people who may be potential recruits.

PURPOSE

The purpose of this study has been to provide a frame of reference for viewing military work, training and education as a part of an individual's overall career development. In addition, this study was to prepare examples which demonstrate the continuity of selected military occupations with significant, comparable civilian opportunities.

STUDY APPROACH

The study approach consisted of the following procedures:

- In-depth examination of military career ladders for four selected military occupations (in avionics), one from each military branch, similar in task content to each other (reported in Phase I).
- Comparison of those four military career ladders with four civilian career ladders in similar avionics occupations. Comparisons were made concerning technical job content, managerial job content and entry requirements in the categories of formal education, work experience, vocational/technical training and licensing or certification prerequisites (reported in Phase I).
- Identification of the military occupations which deserved priority attention based on the fact that some occupations employ large numbers of persons but require very little, if any, formal training. This procedure required that all military occupations be ranked by their personnel density and by the length of formal training provided.
- Selection of 24 military occupations for further study (six from each branch).
- Collection, classification and collation of information on the first enlistment term work and training experience of persons in these military occupations and identification of the educational opportunities of these persons while serving.
- Collection, classification and collation of information on three civilian sector occupations that are similar to each of the 24 military occupations or portions of those occupations.
- Comparison of the military and civilian sector occupations based on the following categories of requirements: formal education, vocational/technical training, previous experience, licensing or certification and union apprenticeship/journeymanship.

FINDINGS AND RECOMMENDATIONS

- Military and civilian occupations can be compared in a coherent manner. Combat occupations, however, require special treatment that has not been fully developed. A rudimentary approach was developed, however, and is enclosed as Appendix D to the study.
- Comparison of military experience with the employment requirements of civilian sector occupations demonstrates the degree of career continuity between the sectors. Gaps in experience which may reduce continuity can be used by servicepersons as guidance concerning their use of military supported education and concerning their further development either with their military employer or with other employers.
- The comparisons produced may prove useful to policy-makers, planners, education/career counselors, teachers, personnel recruiters, and students/workers/recruits.
- The Department of Defense should consider expanding the number of military occupations that are compared, in depth, with civilian career development requirements.
- If the expansion of the information base occurs, as recommended above, priorities for expansion should be established entirely on the basis of personnel density per occupation. Reference to low level of formal training is not as essential as previously believed. A method for studying the career development implications of combat occupations should be developed in detail. These occupations employ large numbers of personnel. Furthermore, combat arms occupations may require significant learning, but the identification of such learning in relation to civilian sector needs may be impeded by the lack of a common language describing military and civilian work.

- The Department of Defense should submit this report for criticism to appropriate civilian sector education agencies and professional organizations.
- The Department of Defense should consider the application of career education concepts to its recruiting, career counseling, education and reenlistment programs for both enlisted and officer personnel.

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I. STUDY APPROACH AND RESULTS

INTRODUCTION

This report describes a study of Department of Defense (DOD) alternatives for coordinating and integrating military career education with other national career education programs. This study was supported by the Office of Naval Research (ONR) Program in Manpower Research and Development, by the Deputy Assistant Secretary of Defense (Education), and by the Director, Manpower Research and Utilization, Office of the Assistant Secretary of Defense, Manpower and Reserve Affairs.

Background of the Study

As was indicated in the Phase I Report,[1/] this study grew out of the more general movement toward career education in the public schools, and the increasing focus of guidance professionals on the complex process of career development. These national trends, coupled with the impact of the All Volunteer Force on military personnel policies, indicated that career education and career development concepts should be brought to bear on the military personnel situation. The study sponsors foresaw that not only the armed forces, but also individual servicepersons would benefit from this career-oriented approach. In addition, it was hoped that the total national education and guidance communities might benefit from this examination of career education within the military portion of the total society. This hope was based on the fact that the armed services are and have been employers, trainers and educators of a significant number of the people of the United States.

1/ M. W. Brown, W. T. Callahan and J. B. Smith, Coordination and Integration of Military Education With National Career Education. Phase I: Career Development in Selected Occupations, ORI Technical Report 795, 22 October 1973.

The final goal, in no sense less important than the others, was the improvement of the overall societal efficiency of Department of Defense expenditures for military training and education. In 1973, the Deputy Assistant Secretary of Defense (Education) recognized clearly that the persons who are trained to work in military uniform are, in varying degrees, also trained to work as civilians. If this training and education ceases to be used because servicepersons do not know how to apply their military training to the civilian sector, society is wasting developed talents. The likelihood of this waste is doubled if civilian employers do not recognize the true value of military training and education. Such potential disuse of developed human resources contradicts the increasing effort that the education and labor professions are devoting to improving the cost-effectiveness of their programs.

The growth of the popularity of career education, with its emphasis on better career information, on competency-based standards for students and workers, and on recognition of non-traditional methods and forums for education, suggests that this contradictory waste of talent and other resources might be avoided.

With these goals, the ORI study team has attempted to provide a frame of reference for viewing military training, education and work experience as a part of the career development and career education of persons who serve in the armed forces.

The Theme of the Study—Continuity of Career Development

The substance of this study can be summarized as an investigation and demonstration of the degree to which military experience in certain specialties is continuous with the career development pattern of workers in the entire United States society. In this study we have concentrated only on the potential for the smooth progression of a person from the initial military enlistment experience to the post-service experience. We have attempted to judge how smooth this transition is likely to be, and we have determined how this continuity might be improved. Suggestions for improvement are limited to actions that the Department of Defense and each of the services may take within currently existing programs. No suggestions are made for the initiation of new programs.

For the reasons described above, the transition from the service to civilian employment is very important from the viewpoint of the total society. It is however, only one of six potential movements of individuals that affect both the individual's career development and the perceptions that society holds of the career development value of military service. These movements are depicted as arrows in Figure 1. By elaborating on the meaning of this figure, we can describe the significance of military service for the career education and career development of individuals, and the impact of career development considerations on military manpower development considerations.

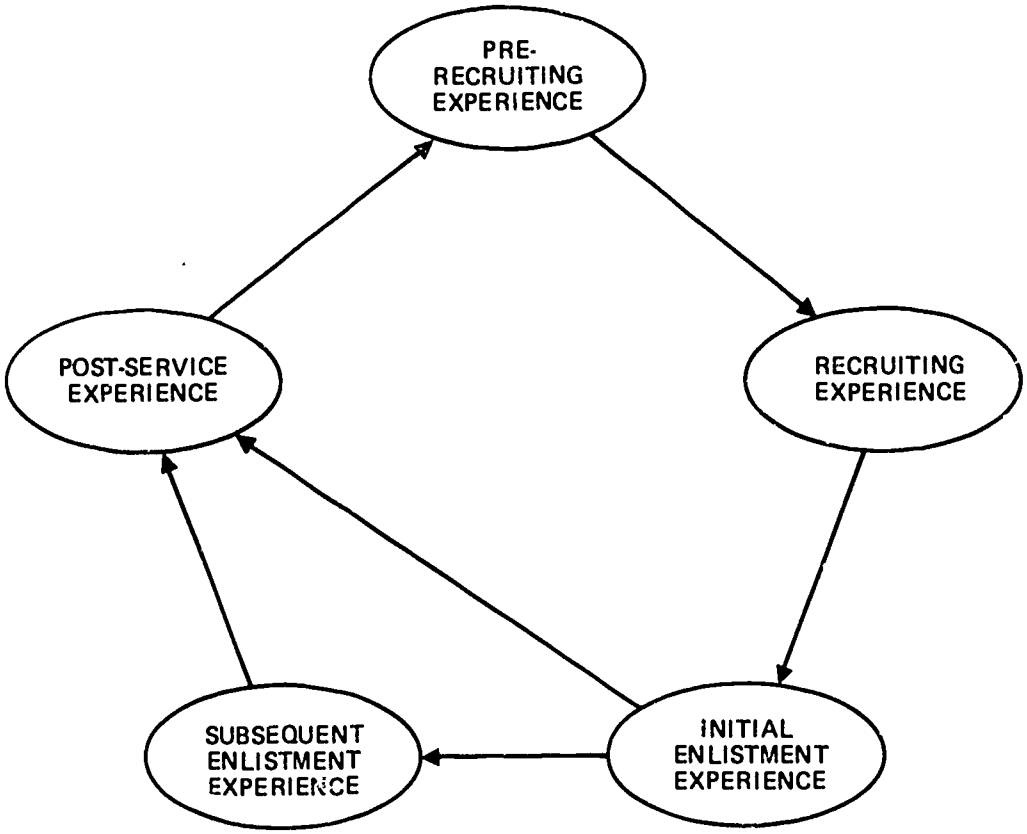

FIGURE 1. CONTINUITY OF INDIVIDUAL EXPERIENCE AS FRAMEWORK FOR VIEWING MILITARY CAREER DEVELOPMENT

Pre-Recruiting Experience

In 1972, Kenneth B. Hoyt, who is now Director of Career Education, United States Office of Education, defined career education as:

> "... the total effort of public education and the community aimed at helping all individuals to become familiar with the values of a work-oriented society, to integrate these values into their personal value systems, and to implement these values into their lives in such a way that work becomes possible, meaningful and satisfying to each individual."[2/]

From the perspective of this study, that definition has an important implication for the education of Americans before they may ever visit a military recruiter. We choose to call this period the "Pre-Recruiting Experience."

The value of working in the military portion of society must be understood both by those who do and those who do not choose to work for the armed services. Since this value is a matter of opinion, the career education approach would seem to indicate that military work become the subject of examination and discussion amongst educators and students. If this focus on military work is to have the greatest educational value, the information which is the substance of the discussion should be as accurate as possible.

Accuracy of information will also enhance the ability of each individual to predict whether military work will be "possible, meaningful and satisfying" for him. This accurate information would be best provided to students before the recruiting experience begins; if this were so, an individual could make a valid judgment of the armed services' and his own attributes. Such validity of judgment is very desirable even among those who decide against military service for themselves. More obviously, the individual and the armed services benefit by decreasing the probability that a qualified individual will mistakenly overlook the availability of a satisfactory military carcer development experience.

Finally, if the pre-recruiting experience were characterized by rich and accurate information, the individual who chooses to see a recruiter could make much more rational choices concerning his military experience. This would, in turn, give him a much greater sense of satisfaction in the service and increase the likelihood of continuity between his pre-military and military career development.

2/ Kenneth B. Hoyt, Rupert N. Evans, Edward F. Mackin and Garth L. Mangum, Career Education: What It Is and How To Do It (Salt Lake City, Utah: Olympus Publishing, 1972), p. 1.

Each of the armed services and the Office of the Assistant Secretary of Defense (M&RA) have undertaken various efforts to provide accurate information that will improve the quality of this Pre-Recruiting Experience. Additional efforts may be anticipated as the values and characteristics of career education are further internalized in the defense structure.

Recruiting Experience

If accurate military career information is widespread in the community, through career education programs or through other means, the first duty of the recruiter becomes the reinforcement of accurate perceptions that potential recruits bring with them. The recruiter can then go on to provide additional accurate information about the specific details of various employment (enlistment) options that the individual can select. Because of the accurate pre-recruiting perceptions that the candidate brings to the recruiting process, he should be better able to understand and evaluate these options in terms of his career development plans. If he goes to see the recruiter considerably before he plans to begin full-time work, the visit may help the candidate to clarify his career plans. As a result, he may be motivated to enter civilian school courses that will enhance his career development in either the military or the civilian work environments, or both.

First Term Military Experience

Beginning with recruit training and continuing as long as he serves, the individual in uniform should sense that his work confirms his expectations, is valuable in itself, and is preparing him for future work either in the armed forces or in civilian enterprises. In order to achieve this understanding, the individual must be informed of the value of his military training and education for his future career development, whether or not he continues military service. The armed services should provide this information for the following reasons:

- To maximize and facilitate the post-service employment success of veterans.
- To provide the serviceperson with an information base that will support valid comparisons between military and civilian opportunities following the first term of service, and thus support a satisfactory reenlistment/non-reenlistment decision.
- To enable the military employee to develop a coherent combination of military training, work experience and military education that will best advance his career development.

If, through this process, the military employee achieves a sense of the relationship of military work to the total economy, the continuity of his career development may be increased.

Subsequent Terms of Military Service

Although some emphasis on first term personnel is reasonable, the military services should inform personnel at all levels of seniority of the career development value of their military experience. Those service personnel who serve for fewer than approximately ten years need this information for the same reasons as those who serve only one enlistment term. Personnel who serve more than ten years, including those who retire, need this information for an additional reason. They may have advanced to positions of significant authority in their military organizations. When these personnel enter the civilian portion of the labor force they may have to accept positions of lesser responsibility. For this reason, personnel with extended service need career information and counseling before they separate from active duty to assist them in taking advantage of their military education opportunities, and to encourage them to conduct effective civilian job searches. These activities can help these individuals to achieve the best available post-service employment situation.

Post-Service Experience

The existence of the Veterans Administration demonstrates sensitivity to the needs of military veterans and repeated decisions by a majority of citizens to meet some of these needs. It is also possible that the post-service experiences of veterans will affect the quantity and quality of future military employees. If the post-service employment experiences of veterans indicate to others (veterans' friends, relatives and children) that the work of the military is not a prelude to a career but part of a career, positive effects on the "pre-recruiting experience" of other citizens may be predicted. Thus, the continuity of military service experience with the rest of a person's career can be seen to be an inter-generational consideration.

A MODEL FOR DEPARTMENT OF DEFENSE ACTION

These considerations of continuity and the information developed in this study suggest a model for DOD and military service integration with career education. This model would provide for intervention of the military employers during selected periods in the career development of individuals. Such intervention would increase the degree of continuity between the military and civilian portions of the overall societal career development pattern.

The model consists of four functions: education, training, work experience and counseling. These elements are linked within the military model by flows of accurate information among them. An equally important linkage requires

flows of accurate information from the military to the civilian portions of society and in the opposite direction.[3]

As is seen in Figure 2, counseling is the function that enables the individual to integrate work experience, training and education coherently and thus to recognize the career development value of the military experience. This recognition is useful for those considering enlistment, for those serving in uniform, and for those who have separated from the armed services.

Importance of Accurate Information to the Model

As can also be seen in Figure 2, accurate information concerning career development provides the basis for the integration of the military and civilian portions of the overall career education system. Such information also maximizes the continuity of career development of individuals who move from the civilian sector, into the military sector and, eventually, reenter the civilian sector. This "civilian to military to civilian" pattern seems to be predictable for most persons who enter the armed services. The only exceptions appear to be persons who die or are disabled while working in the military environment and a very few military retirees who do not work after military retirement. Since career education implies "continuing education," the experiences and career patterns of all military personnel, regardless of the duration of their military service, are included in the model.

The information that flows between the civilian and military portions of the national career education system must be complete, accurate and intelligible. This current project is not in any way complete, nor was it intended to be. Sections II through V of this report consider only 24 military occupations; depending on the level of detail desired, a complete review would require examination of one-thousand military occupations, or more. Furthermore, each of these 24 occupations is discussed in relation to only three civilian occupations. These civilian occupations were carefully chosen, as will be explained below, but they do not approach an exhaustive list of civilian occupations that are similar to military specialties. Rather than attempt completeness, this study seeks to test and demonstrate whether accurate and intelligible information can be developed to integrate the military and civilian portions of society's career education activities.

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[3] A previous ORI study discusses how the barriers to these flows may be penetrated. See M. W. Brown and W. T. Callahan, The All Volunteer Navy and the Schools: Recommendations for Integration of Navy Careers Into Career Education, ORI Technical Report 764, 12 February 1973, publisted also as AD 755 487.

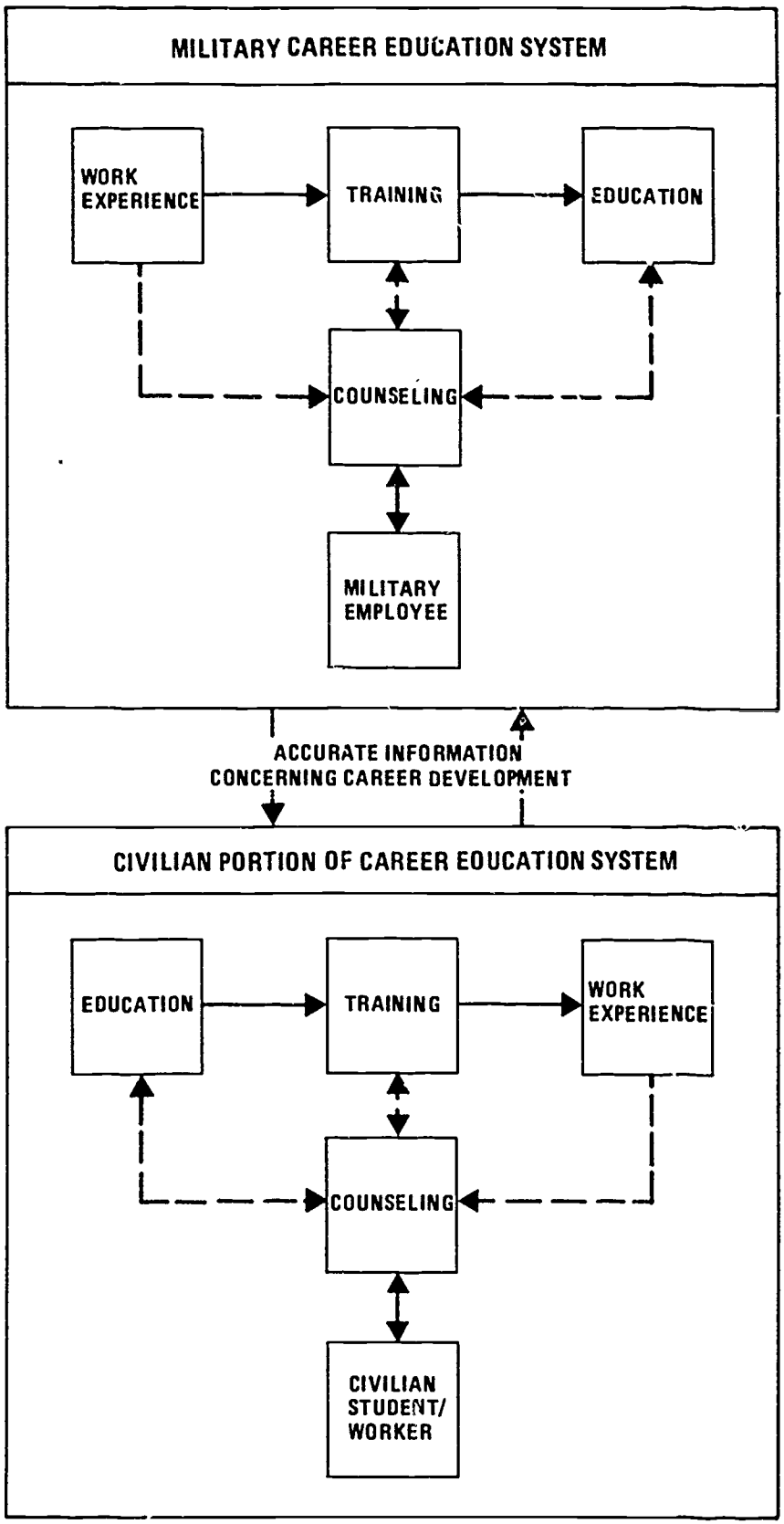

FIGURE 2. MILITARY CAREER EDUCATION AS A PART OF THE OVERALL CAREER EDUCATION SYSTEM

The accuracy and intelligibility of the information must be measured by the standards of the users of the information. The users who are foreseen for the information provided in Sections II through V are:

- DOD officials and those within the military departments who are directly responsible for education, training, counseling, recruiting and other personnel support for military personnel or prospective recruits.
- Public and private education professionals outside the Department of Defense who as counselors, teachers or administrators are concerned with the career education of individuals.
- DOD officials and non-DOD officials who are responsible for career education, labor affairs and economic policy-making, planning and programming at federal, regional, state or local levels.
- Personnel officers of civilian public or private sector employers, apprenticeship committees or other persons who need to evaluate military experience in terms of overall career development.

To expand the group of direct users to include all military personnel, recruit prospects, or students in career education programs, some re-writing may be required.

In addition, it should be acknowledged that the level of accuracy of the information in Sections II through V cannot exceed the accuracy of the sources of the information. These sources include the most authoritative publications available from military and civilian employers and various associations. These were reinforced by personal conversations, telephone conversations and written correspondence to clarify ORI's reading of the published materials. The military organizations who participated in this process are listed in Appendix A. Civilian organizations are included in Appendix B.

A higher standard of accuracy may have been achieved by ORI's undertaking an independent task analysis based on actual observation of military and civilian workers. This survey technique would have been too costly to justify given the scope of the study and the resources available.

DEVELOPMENT OF THE INFORMATION

This study consisted of two phases. A complete report of Phase I (mentioned earlier) was published in October of 1973.[4/] This first phase is briefly summarized here.

Phase I

Phase I produced an in-depth examination of military career ladders for four selected military occupational specialties—one from each service branch. This examination illuminated the technical and managerial training and experience, gained over twenty years, by persons in the field of avionics. The specific occupations examined were:

Navy - Aviation Electronics Technician (AT)

Marine Corps - Aircraft Navigation Systems Technician, IMA

Army - Avionic Navigation Equipment Repairman

Air Force - Avionic Navigation Systems Specialist.

Also developed were career ladders for four civilian occupations—three in aviation electronics and one in general electronics. Comparisons between each of the military career ladders and each of the civilian career ladders were made to illustrate the extent to which career progression and job functions are similar, and the extent to which military career education for these military specialties also satisfies the career education requirements for the civilian specialties at all levels on their career ladders. Military career education, for purposes of the study, was comprised of technical training, managerial training, work experience, and formal education obtained in the military working environment.

Phase I showed that for the occupations examined, military and civilian career ladders are, in general, highly comparable. Phase I demonstrated that military career education generally meets the requirements for employment in comparable civilian occupations. Phase I also showed that the armed services' education programs are potentially very advantageous for avionics personnel for the following reasons:

- Some civilian employers are involved in work that is more theoretical than the work for which avionics technicians are trained in the military services and that military education programs help bridge this gap.

4/ M. W. Brown, W. T. Callahan and J. B. Smith, Coordination and Integration of Military Education With National Career Education. Phase I: Career Development in Selected Occupations, ORI Technical Report 795, 22 October 1973.

- Civilian employers often require extensive experience within their organization for advancement to the highest technical positions in their structure. Military personnel, regardless of their actual experience, cannot achieve this requirement initially, but they can, through their education program, increase the likelihood of rapid promotion after they have left the service.
- Civilian employers sometimes require credentials and licenses that armed forces personnel do not necessarily have. If counseled, military personnel can use their education privileges to prepare for and obtain these credentials.

Phase II

Phase II of the study ends with the publication of this report. This phase consisted of two major tasks, each of which focused narrowly on the likely career education experiences of military personnel in approximately the first enlistment term. At the time that Phase II commenced, it was decided that clarification of this period of military service, because it affects the greatest number of personnel, required priority consideration.

Priority was also given to investigation of occupations that employ large numbers of military personnel. Within those, foremost attention was to be devoted to those occupations which require (and for which the armed services provide), relatively brief formal training. Based upon ORI's discussions with the DOD and military advisors to the study, it was decided that persons in these "high density, low training" specialties represented those military personnel who might benefit the most from an explication of the career development value of their military experience.

Identifying the Priority Military Occupations

No source was available that identified the military occupations that were characterized by high density of personnel and low formal training. For this reason, ORI had to conduct a methodical selection process that consisted of the following steps:

- Identification of occupational specialties normally available to enlisted personnel during a first enlistment term.
- Identification of formal schools and training courses which may be obtained in each occupational specialty available during a first enlistment term and a determination of the length of formal training provided.

- Ranking of occupational specialties from low to high on the basis of cumulative length of formal training programs which may be obtained during a first enlistment term. Length of basic or recruit training was not included in the computation of length of occupational training in any of the service branches.
- Identification of training other than formal school training (structured OJT, Career Development Courses (CDC)) associated with each occupational specialty available during a first enlistment term, and an estimate of the length of such training.
- Identification of authorized and operational enlisted strength for each occupational specialty available during a first enlistment term and the ranking of occupational specialties from high to low on the basis of operational enlisted strength.
- Comparison of occupational specialties ranked lowest on formal training with occupational specialties ranked highest on enlisted strength and identification of occupational specialties present in both rankings.

The evaluation of the length of formal schools introduces two significant limitations. The first is that certain combat occupations, such as Army Light Weapons Infantryman, MOS 11B, do not appear as a low training occupation because formal schools of considerable duration have been established for them. Thus, such occupations which may deserve priority attention were filtered out. This limitation was recognized, but it was decided that the combat arms occupations would require a separate analysis outside the scope of the current study.

A second deficiency is that the formal training ranking does not include an evaluation of the intensity of on-the-job training. If persons in certain specialties receive intensive on-the-job training, these experiences may, in fact, be more valuable than formal school training. To that extent, the ranking scheme may fail.

The listings of all military occupations, ranked by numbers of incumbents and ranked from low to high levels of formal training, were submitted in a working paper in February of 1974. A second, shorter working paper was submitted in March 1974. This paper identified candidates for selection for further study. From this list of candidates, and based upon consultations with OASD (M&RA) staff, ORI selected the 24 occupations that are listed in Table 1. The table indicates the specialty code, density rank and the training rank. It should be noted that the training rank is inverted, i.e., a ranking

TABLE 1

MILITARY OCCUPATIONS STUDIED DURING PHASE II

Branch	Title	Code	Density Rank	Training Rank
Navy	Aviation Machinist's Mate	ADJ	9	25 1/
Navy	Boatswain's Mate	BM	12	0 2/
Navy	Boiler Technician	BT	11	16.5
Navy	Electrician's Mate	EM	6	39
Navy	Machinist's Mate	MM	1	25 1/
Navy	Yeoman	YN	7	8.5
Marine Corps	Automotive Mechanic	3516	11	60.5
Marine Corps	Bulk Fuel Man	1391	22	0 2/
Marine Corps	Combat Engineer	1371	7	26.5
Marine Corps	Field Radio Operator	2531	3	34.5 1/
Marine Corps	Military Policeman	5811	13	34.5 1/
Marine Corps	Wireman	2511	10	0 2/
Army	Armor Crewman	11E	7	33 1/
Army	Carpenter	51B	42	33 1/
Army	Computer Systems Operator	74E	53	2.5
Army	Correctional Specialist	95C	30	33 1/
Army	Crawler Tractor Operator	62E	47	33 1/
Army	Motor Transport Operator	64C	3	33 1/
Air Force	Cook	622X0	17	30.5 1/
Air Force	Fire Protection Specialist	571X0	12	30.5 1/
Air Force	Inventory Management Specialist	645X0	4	18.5 1/
Air Force	Medical Service Specialist	902X0	11	46
Air Force	Pavements Maintenance Specialist	551X0	36	18.5 1/
Air Force	Weapons Mechanic	462X0	5	30.5 1/

1/ Occupations with the same training lengths were given an average rank.
2/ All occupations with no formal training were given a rank of zero.

was assigned to the occupations beginning with that with the shortest period of formal training. For example, Table 1 indicates that Aviation Machinist's Mate is the occupation for which the Navy provides the 25th shortest period of training.

Each of these military occupations was then examined in detail by review of official documents and discussions with personnel who are charged with overseeing these occupations. Where possible, these occupations were then compared with three apparently related occupations that are found in civilian organizations. For two military occupations, only two civilian comparisons were found to be reasonable. This reduced the number of comparisons from the maximum of 72 to 70.

The number of comparisons was further reduced to 67 because investigation of occupations related to Army Crawler Tractor Operator, MOS 62E, was excluded from the basic comparison process. This occupation was found to be under intensive study by the Army. A special report on this occupation is enclosed in this report in Appendix C.

Identifying the Related Civilian Occupations

The initial source used in the selection of civilian occupations was the Military-Civilian Job Comparability Manual, prepared by the Office of the Assistant Secretary of Defense (M&RA). At least three "highly related" occupations were chosen for each military occupation and, in some cases, "substantially related" occupations were referenced in the absence of highly related listings. For a number of military occupations, civilian counterparts were listed in the military occupational description manuals of the respective service branches. When more than three highly related civilian occupations could be identified, additional information on current civilian employment levels and projected employment outlook (from the Bureau of Labor Statistics, U. S. Department of Labor) was used in making the final choice. As a rule, only civilian occupations of high current and projected employment levels were chosen. However, some occupations with only moderate or poor employment outlook had to be used out of necessity.

For military occupations with no readily identifiable civilian counterparts, e.g., Army Armor Crewman and Marine Corps Combat Engineer, job functions were grouped into clusters representing particular skill categories. For example, Army Armor Crewmen perform certain tasks which center around weapons handling, another group of tasks which revolve around ground communications, and a third group of tasks which focus on demolition operations. Once these task clusters were identified, related occupations in the civilian sector could be identified.

For most of the military occupations, at least one highly comparable civilian occupation could be identified. However, many of the civilian occupations are only of moderate or low comparability. In a few instances, no

highly comparable civilian occupation could be identified. Another, more important, reason for the inclusion of civilian occupations of moderate or low comparability was that one of the goals of this project was to provide information that would support the "career exploration" process for military personnel. Career exploration includes the comparison of the tasks and benefits of a position with one employer with the tasks and benefits of the same position with another employer. It also is known, however, that career exploration can involve compromises and "trade-offs" and that an individual may wish to explore positions that are related but somewhat different from his current position. Thus, for example, the study includes a comparison of Army Correctional Specialist (MOS 95C20) with the civilian Private Security Guard and the Federal Government Protective Officer.

These comparisons will allow an Army Correctional Specialist to see that his general training and experience with the Army may enable him to secure employment that is not exactly like his Army occupation. This kind of exploration is important because it will help military personnel to broaden their occupational horizons. Such broadening seems to be a continuing need, especially of younger workers. In addition, it appears that descriptions of related occupations will be helpful to military personnel who decide to reside in a locality where their specific skills are not in demand. In the example under discussion, an Army Correctional Specialist may decide to locate in an area that has no positions available for correctional specialists per se. The material provided in this study should help an individual to understand, while he is still in the military organization, that he is generally prepared for a related occupation, such as guard, for which their may be openings.

The examination of both the military and the civilian specialties required a categorization of the civilian sector occupational entry requirements. For this purpose, ORI selected the following categories of requirements:

- Formal Education
- Vocational/Technical Training
- Previous Experience
- License/Certification
- Apprenticeship/Journeyman; this included both the requirements for entry into an apprenticeship program and the requirements for achieving journeyman's status (this category is most often related to craft or trade union membership)
- Other; e.g., physical or personality traits.

Sections II through V of this report contain tables showing the comparisons of the military occupations with related civilian occupations along the employment qualifications categories listed above. A comparison of job functions performed by military and civilian personnel is shown at the bottom of each table. Navy, Marine Corps, Army and Air Force comparison tables are shown in Sections II, III, IV and V, respectively.

ANALYSIS OF INFORMATION DEVELOPED

The tables that comprise Sections II through V provide the results of the basic analyses of the military/civilian occupational comparisons. Each table includes a statement of the relationship of a military occupation to the requirements of an occupation in the civilian environment. The tables depict this relationship for all of the categories described previously. Some summarization of the tables is provided here, but this in no sense indicates that this study represents an evaluation of either the military or the civilian employment structures.

Formal Education

Of the 67 occupations in the civilian environment, 36 required a high school diploma. One occupation, Computer Programmer, was reported to commonly require a bachelor's degree. For an additional 29 occupations, a high school diploma was found to be desirable; for five occupations that required a high school diploma, a bachelor's degree was desirable.

The manifest preference of employers for persons with a high school education confirms once again that the Department of Defense emphasis on encouraging service personnel to achieve the General Education Development (GED) certificate is consonant with employment trends in the non-military sector of the economy. The tables in Sections II through V note that a high school diploma can usually be achieved in the service. For purposes of non-DOD users, those military occupations that require a high school diploma for entry are also noted.

Recommendations concerning the amount of credit that civilian educational institutions might accept for formal technical training given in specific military specialties are included in the tables on the military side of the comparison. These credit recommendations, prepared by the Office on Educational Credit, American Council of Education (ACE), are not exhaustive, since ACE is in the process of updating its recommendations listing. ORI obtained information on all military specialties which have been evaluated up to this point for inclusion into the new ACE listing. Credit recommendations may be made at a future time by ACE for military specialties included in this report which do not presently show such recommendations.

Vocational/Technical Training

Fourteen of the civilian occupations studied required vocational/technical training. For an additional 48 occupations vocational/technical training was stated as desired by employers. The 14 occupations that required vocational/technical training and the adequacy of military training in satisfying these requirements are shown in Table 2.

Several reasons explain the inadequacy of military training relative to nine occupations. The most important reason is that the civilian sector occupations that ORI selected are not sufficiently similar to the military occupations with which they are compared. Accordingly, the training for these occupations is also dissimilar. This is apparent in the following instances:

- Navy Yeoman is a much more general occupation than civilian Shorthand Reporter. As a result, the training of the Navy Yeoman does not include the development of facility with shorthand that is central to the civilian occupation.
- The Marine Corps Combat Engineer specialty, although it includes blasting, is much less specialized than the civilian Blaster occupation. Certain Marines in this occupation may develop expertise in blasting that would enable them to qualify for the civilian occupation. The MOS training outlines and supporting documentation do not, however, support an estimate of the probability that such specialization in blasting would occur.
- Marine Corps Field Radio Operator is less specialized than the civilian sector Ground Radio Operator occupation.
- The Army Armor Crewman specialty is much less specialized than both the civilian Ground Radio Operator and the civilian Blaster occupations.
- Army Computer Systems Operator, although it provides useful background for computer programming, differs functionally from the civilian Computer Programmer occupation. A comparison between an Army Computer Programmer MOS and the similar civilian occupation would yield different results.

TABLE 2

ADEQUACY OF MILITARY TRAINING FOR MEETING VOCATIONAL/TECHNICAL TRAINING REQUIREMENTS OF SELECTED CIVILIAN OCCUPATIONS

Civilian Title	Military Title	Military Training	
		Adequate	Inadequate
Clerk Typist/Secretary	Yeoman (Navy)		X
Office Manager	Yeoman (Navy)		X
Shorthand Reporter	Yeoman (Navy)		X
Blaster	Combat Engineer (Marine Corps)		X
Ground Radio Operator	Field Radio Operator (Marine Corps)		X
Ground Radio Operator	Armor Crewman (Army)		X
Blaster	Armor Crewman (Army)		X
Computer Systems Operator "C"	Computer Systems Operator (Army)	X	
Computer Systems Operator "B" and "A"	Computer Systems Operator (Army)	X	
Computer Programmer	Computer Systems Operator (Army)		X
Federal Government Protective Officer	Correctional Specialist (Army)	X	
Tractor-Trailer Truck Driver	Motor Transport Operator (Army)	X	
Licensed Practical Nurse/ Licensed Vocational Nurse	Medical Service Specialist (Air Force)		X
Emergency Medical Technician	Medical Service Specialist (Air Force)	X*	

* The adequacy of Air Force Medical Service Specialist training is affirmed for the Emergency Medical Technician occupation when it is supplemented by an 81-hour course prepared by the U. S. Department of Transportation. Within the next year this course is to be incorporated into the formal training program for all Medical Service Specialists.

Information concerning these differences between the military and civilian occupations is, in itself, potentially useful to persons in the military occupations mentioned. Knowledge of these differences may enable military personnel to see what training they can obtain to overcome the differences should they decide to prepare for employment in these dissimilar civilian sector occupations. Decisions of this type may be advantageous to the individual, because his military training does provide useful background for specialization in the directions that the civilian occupations demand. Identification of this pattern of development was foreseen as one of the benefits of this study and affected the selection of civilian occupations, as described earlier.

A related explanation for the inadequacy of military training is that the structure of some military occupations requires less proficiency than that required by similar civilian occupations. Instances of this situation are noted in the comparison of Navy Yeoman with the civilian Clerk Typist/Secretary and Office Manager occupations. Available information on these civilian occupations indicates a strong similarity with a Yeoman's duties. The civilian occupations, however, require higher standards of typing skill than is required in Navy Yeoman training. The civilian occupational descriptions also mention basic shorthand as a requirement.

During the first term of enlistment, a Yeoman may develop pronounced skills in typing and may learn shorthand. The rating descriptions, qualifications for advancement and training outlines for Yeoman do not, however, support an estimate of the probability that such development would take place.

A final reason for the inadequacy of military training is the existence of legal requirements that exceed military training levels. This circumstance pertains to the comparison of Air Force Medical Service Specialist with the Licensed Practical Nurse (LPN)/Licensed Vocational Nurse (LVN) occupation. In most states this occupation requires 1,200 to 1,400 hours of formal training. The Air Force training program includes only 384 hours of which 332 involve technical training. It may be that the intensity of Air Force training compensates for some of the difference in length of training, but no evaluations were available to support such a judgment.

Previous Experience

Information on 19 of the civilian sector occupations specified previous experience as a requirement for employment. The adequacy of military work experience in meeting these requirements is shown in Table 3. As the table demonstrates, the first term military experience was adequate for 17 of the 19 civilian sector occupations. The two occupations for which military experience is not adequate, Shorthand Reporter (when compared with Navy Yeoman) and Blaster (when compared with Army Armor Crewman) require very specific skills that are not exercised to a sufficient extent in the military sector occupations.

TABLE 3

ADEQUACY OF MILITARY WORK EXPERIENCE FOR MEETING PREVIOUS EXPERIENCE REQUIREMENTS OF SELECTED CIVILIAN OCCUPATIONS

Civilian Title	Military Title	Military Experience	
		Adequate	Inadequate
Aircraft Engine Mechanic	Aviation Machinist's Mate (Navy)	X*	
Aircraft Assembler	Aviation Machinist's Mate (Navy)	X	
Merchant Marine Able Seaman	Boatswain's Mate (Navy)	X	
Electric Appliance Serviceman	Electrician's Mate (Navy)	X	
Shorthand Reporter	Yeoman (Navy)		X
Blaster	Combat Engineer (Marine Corps)	X	
Telephone Cable Splicer	Wireman (Marine Corps)	X	
Munitions Handler	Armor Crewman (Army)	X	
Blaster	Armor Crewman (Army)		X
Computer Systems Operator "C"	Computer Systems Specialist (Army)	X	
Computer Systems Operator "B" and "A"	Computer Systems Specialist (Army)	X	
Correctional Specialist	Correctional Specialist (Army)	X	
Federal Government Protective Specialist	Correctional Specialist (Army)	X	
Tractor-Trailer Truck Driver	Motor Transport Operator (Army)	X	
Public Transportation Operator	Motor Transport Operator (Army)	X	
Fire Fighting Instructor	Fire Protection Specialist (Air Force)	X	
Emergency Medical Technician	Medical Service Specialist (Air Force)	X**	
Aircraft Armament Assembler	Weapons Mechanic (Air Force)	X	
Munitions Handler	Weapons Mechanic (Air Force)	X	

* Navy Aviation Machinist's Mate experience is adequate for the Junior Mechanic Level of the civilian Aircraft Engine Mechanic occupation.

** The Air Force Medical Service Specialist experience is adequate for the civilian Emergency Medical Technician occupation only if the Air Force specialist performs emergency medical duties.

As described above, individual Navy Yeomen and Army Armor Crewmen may have sufficient experience for these civilian sector occupations, but no basis for estimating this occurrence is available.

License/Certification

Seventeen of the civilian sector occupations require licenses or certificates in some jurisdictions. The study did not allow for a complete survey of all requirements in all states, counties and cities. Information provided by the Department of Labor and national trade organizations was sufficient, however, to direct ORI to jurisdictions that provide examples of high standards for licensing and certification requirements. It is not possible to measure the generalizability of these examples, and they should be considered as merely indicative that for certain occupations, licensing is required. Persons who are interested in working in these occupations should determine whether licenses or certificates are required in the localities where they intend to seek employment.

Table 4 presents the adequacy of military training and experience in preparing an individual for those civilian sector occupations for which a license or certification is required. The tables in Sections II through V explain the bases for the judgments of adequacy and inadequacy for all of the employment requirement categories mentioned above.

Apprenticeship/Journeyman Status

Military training and/or experience met the requirements for entrance into all apprenticeship programs (which are most often sponsored by labor unions). In general, only age, physical condition, and aptitude are required. Journeyman status, as a rule, requires two to four years of prescribed work experiences supplemented by some classroom training. Credit for previous military training and/or experience may be awarded toward journeyman status by the local apprenticeship committees. The award of credit will vary considerably depending upon the craft or trade, upon the individual apprentice, upon the locality, and upon the local apprenticeship committee. It can be expected, however, that first enlistment term training and experience will not be adequate to meet the requirements for journeyman status in most crafts and trades. In order to ensure that the military veteran is given full credit for his military training and work experience, a written record of the types and duration of his experience should be maintained.

PRODUCTS OF THIS STUDY

The outputs of this study to date can be assessed from several perspectives. The reasons that motivated the study and observations made during its conduct prompt the ORI staff to review the products of this study in order to suggest to the Department of Defense some opportunities for future development.

TABLE 4

ADEQUACY OF MILITARY TRAINING AND EXPERIENCE FOR MEETING LICENSING/CERTIFICATION REQUIREMENTS OF SELECTED CIVILIAN OCCUPATIONS

Civilian Title	Military Title	Military Training/Experience	
		Adequate	Inadequate
Aircraft Engine Mechanic	Aviation Machinist's Mate (Navy)		X
Merchant Marine Able Seaman	Boatswain's Mate (Navy)	X	
Fireman (Boiler)	Boiler Technician (Navy	X*	
Stationary Engineer	Boiler Technician (Navy)		X*
Maintenance Electrician	Electrician's Mate (Navy)		X*
Stationary Engineer	Machinist's Mate (Navy)		X*
Air Conditioning and Refrigeration Mechanic	Machinist's Mate (Navy)		X*
Shorthand Reporter	Yeoman (Navy)		X*
Blaster	Combat Engineer (Marine Corps)		X*
Ground Radio Operator	Field Radio Operator (Marine Corps)		X
Broadcast Field Engineer	Field Radio Operator (Marine Corps)		X
Broadcast Technician	Field Radio Operator (Marine Corps)		X
Ground Radio Operator	Armor Crewman (Army)		X
Blaster	Armor Crewman (Army)		X*
Tractor-Trailer Truck Driver	Motor Transport Operator (Army)		X**
Licensed Practical Nurse/ Licensed Vocational Nurse	Medical Service Specialist (Air Force)	X*	

* The judgment of adequacy or inadequacy appears to be valid as stated based upon the information available, but variations are known to exist. Some jurisdictions have no licensing standards at all for persons in the occupations listed.

** Licensing/Certification requirements exist for drivers whose employers are involved in interstate commerce activities.

- An in-depth illustration that the armed services, in the field of avionics at least, are a coherent and important part of the career education process of the nation (Phase I).
- An illustration that the career development of armed forces personnel, within the armed services or without, is related to and can be enhanced by participation in DOD education programs.
- A complete rank ordering of all military occupations by both number of incumbents and length of formal training. This listing, as presented in the working papers cited previously, can be used to identify occupations that may deserve priority attention from military counseling and education managers.[5/]
- Information that can be used directly in the education counseling and career counseling of persons in the 24 military occupations that were studied. This same information can be used to demonstrate to the national education and labor professionals that the armed services are involved in up-to-date attempts to improve the career development of their personnel. The same information may be useful to recruiters in helping to elucidate the possible future career patterns that potential recruits may realize.
- A career development frame of reference within which to view military work, training and education.

RECOMMENDATIONS

The potential utility of these products will be explored in the following paragraphs. The application of the study will be discussed in relation to six groups of users: policy-makers, planners, education/career counselors, teachers, personnel recruiters, and students/workers/recruits.

Use by Policy-Makers

The information developed during this study confirms the need for accurate information flows between the military and civilian portions of the employment market. Both the similarities and differences that this study has shown

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5/ These working papers are available from ORI upon request.

concerning military and civilian occupations should be more widely known. The study supports a decision to integrate and coordinate the employment, education and training concerns of the Department of Defense with programs of other Federal agencies. These include the Department of Health, Education, and Welfare, the Department of Labor and the Department of Commerce. Without such coordination of the type which is exemplified in Appendix C to this report, the potentially wasteful separation of the military and civilian education and training sectors will persist. This separation is costly because it prevents students from securing valuable experience in the armed services, because it may disrupt the transition of individuals from military to civilian work environments, and because it may inhibit the application of military training, experience and education to civilian sector work tasks.

This study also supports a decision by the Department of Defense to encourage the type of activity that is currently proceeding concerning the Army Crawler Tractor Operator as described in Appendix C to this report. Variations of this procedure may be implemented to increase the clarity of career development of many other military sector occupations.

Policy-makers in the non-Defense agencies of the Federal government may use this report in essentially the same way. By exploring and clarifying the value of the military organizations as a part of the societal effort in career education, they may devise methods of improving the continuity and efficiency of the total career development process. Efforts of this sort conform precisely with the recent attention given by the President of the United States to improving the linkages between "work and education."

Use by Planners

Planners of education and training and recruiting programs in the Department of Defense and the military departments can use this study to support their various programs. The information provided in Sections II through V may be provided to educational specialists at military installations. These specialists may use the comparison tables to motivate service personnel to participate in the education program and to plan curricula and assistance for the participants.

The military side of the tables will help personnel (in the military specialties studied) to recognize what their military experience is worth. The civilian sector side of the tables will show them how to build on their military experience to qualify, if they so decide, for civilian employment. Education specialists can then assist with this skill development process by identifying and providing the training and education that these civilian qualifications indicate.

Planners of training programs may use the information on the civilian side of the tables as motivators for learning. The fact that military training also satisfies many civilian requirements can be explained to students in

military courses. This confirmation that their training is perceived by society as valuable to the individual as well as to the military organization may stimulate learning.

This latter point relates to a major limitation of the study, i.e., that combat arms occupations are not adequately handled. The existing study methodology, based on general occupational comparisons may not penetrate sufficiently into the military occupations to elucidate the true career development value of combat occupations. Because of the large number of people employed in these occupations, this is an important weakness. A suggestion for a special technique for investigating the combat arms occupations is provided in Appendix D to this report.

Planners of recruiting programs may use the tables as the basis for materials that may help prospective recruits to select the military occupation they wish to enter. The tables may also be used to support career education approaches to the schools, or in the development of advertising themes. It is also suggested that the tables be submitted for review to the American Personnel and Guidance Association (APGA). The APGA has taken a strong interest in establishing high professional standards for military recruiting in the All Volunteer Force era. Submission of the tables for review to the National Advisory Council on Vocational Education (MACVE) and the American Vocational Association (AVA) is also advisable. These submission may be accomplished through the Joint Education Liaison Directors of Recruiting (JELDOR).

Use by Counselors, Teachers

Counselors and teachers involved in career education programs can use the tables in Sections II through V. The tables show that virtually every occupation requires interrelated efforts in formal education, training and work experience. The tables explain the school subjects that workers need to perform successfully. They verify that career education can take place in a setting outside the traditional school systems, i.e., in the various military organizations. Finally, the tables provide information for direct use by persons who may be evaluating the "civilian to military to civilian" career development pattern.

Career counselors in the armed services may use the tables for reenlistment counseling of personnel in the military occupations that were studied. Depending on the orientation of the individual, the information on the tables concerning the value of military experience and the requirements of civilian occupations may help the individual to clarify his future career goals. This clarity of understanding may stimulate these military personnel to undertake a more intensive investigation of the military opportunities that are open to them if they reenlist.

Use by Personnel Recruiters

Personnel officers in civilian firms and labor organizations may find the tables valuable for clarifying the meaning of military experience of applicants. In that sense, these tables are in line with other DOD efforts to "translate" military experience into terms that are widely understood in the civilian employment market.

Use by Students/Workers/Recruits

If the tables were rewritten slightly, they could be used by virtually all students for purposes of broadening career awareness, for stimulating career exploration and for planning career skill preparation. Experienced workers who may be unemployed or considering a new direction in career development can use the tables for the same purposes. Since prospective military recruits comprise a subset of these two latter categories, they may also find the information useful for career awareness, exploration and skill preparation.

BROADENING THE INFORMATION BASE

The most significant method of increasing the value of the information in this report is to increase the number of military sector occupations that are examined. Eventually, all military specialties must be included. Because this process, if done in a single project, would be very costly, the Department of Defense may wish to establish a priority list of occupations to be studied. To date, priority has been assigned to the occupations that are characterized by high density of personnel and short duration of formal training. ORI recommends that DOD reconsider this selection criterion. It is suggested that personnel density alone is a more satisfactory criterion for several reasons.

- Some specialties are extremely more populous than others. For example, among Army personnel in their first enlistment, as many are employed in the 16 most populous MOSs as are employed in the next 110 most populous. Of these 16 most dense specialties, only two are very low training MOSs.
- Highly trained people may need career information just as much as do less trained workers. Civilian employers sometimes require qualifications that are not normally accumulated by servicepersons, regardless of length of training. This was identified during Phase I when it was shown that a veteran Aviation Electronics Technician, despite relatively extensive training,

would be unqualified for certain positions if he did not have a certain license. Thus, low amount of training is clearly not the only variable that deserves consideration. In terms of cost to society, unemployment of highly trained people may be more costly than the unemployment of less trained personnel.

- Military personnel, regardless of the duration of their training, may be unable to perceive and take advantage of their military training and experience by applying it to the work of the civilian sector.
- Military personnel, regardless of training, rank and age, display job search behaviors that are much less orderly than those of civilians. 6/

Because of these concerns, it seems that the proper method of selecting occupations to achieve the purposes of the study would be to pinpoint the most populous occupations as a priority for attention.

6/ See Robert B. Richardson, An Examination of the Transferability of Certain Military Skills and Experience to Civilian Occupations, U. S. Department of Labor, Office of Manpower Policy, Evaluation and Research, Washington, D. C., September, 1967. Also, see Laure M. Sharp, et al., The Employment of Retired Military Personnel, Bureau of Social Science Research, Inc., Washington, D. C., July, 1966.

II. COMPARISONS OF THE TRAINING/EXPERIENCE OF NAVY RATINGS WITH THE EMPLOYMENT STANDARDS FOR RELATED CIVILIAN OCCUPATIONS

TABLE 5

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR AIRCRAFT ENGINE MECHANIC WITH THE TRAINING EXPERIENCE OF NAVY AVIATION MACHINIST'S MATE J - ADJ

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Some Employers: A high school diploma or equivalent certificate. Desirable: A high school diploma or equivalent certificate; courses in mathematics, physics, chemistry, machine shop. Comments: Commercial air carriers, i.e., civilian companies operating large aircraft in interstate or intrastate air transportation (the large, well-known airline companies), are more likely to require high school diplomas than are general aviation companies (i.e., operators and service personnel for small aircraft such as those used for air taxis, executive or private business transportation, instructional flying, aerial work applications, or personal flying.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends credit for four semester hours in theory of turbine (jet) engines at the vocational certification level and two semester hours in theory of turbine (jet) engines at the technical associate degree level for formal training in this rating.
Vocational Technical Training	Desirable: Completion of a vocational training program in aircraft maintenance work or supervised, on-the-job training in general maintenance work, powerplant theory and maintenance, and power systems and components. Comments: Training can be gained by working as a mechanic's helper or by graduating from technical schools approved by the Federal Aviation Administration (FAA). However, it is difficult to be hired as a helper without some experience, especially for commercial air carriers. Once hired, however, many mechanics receive formal and on-the-job training monitored by tests for promotion purposes. General aviation companies usually have less formalized training programs in which the employee often learns by observing experienced mechanics.	Formal Training: (1) A total of 278 hours of technical training covering turbojet fundamentals, turbojet powerplants, turbojet powerplant and aircraft maintenance, line familiarization, and turbojet powerplant operations and (2) a self-paced aviation fundamentals course covering aircraft familiarization, aircraft support functions, naval aviation maintenance program, aviation publications, corrosion, handtools, hardware, mathematics, physics, and shop. All formal training is directly related to the training desired by civilian employers of Aircraft Engine Mechanics and is excellent preparation for such a position.
Previous Experience	Mandatory for Most Employers: Two to three year's experience to be hired as a junior mechanic; three to four years experience to be hired as a full mechanic. Experience should be related directly to powerplant systems and components. Desirable: Four year's experience working on aircraft powerplant systems including reciprocating and turbine engines, performing engine inspections, and working with engine components such as engine instruments, fire protection, electrical, lubricating, ignition, fuel, induction, cabling, and exhaust systems. Comments: Often formal training in aircraft maintenance at a technical school is credited toward experience requirements. Examples of experience which may be fully or partially credited are airline or FAA-approved repair station work, aircraft mechanic experience in the U.S. Armed Forces, work in an aircraft factory, teaching of aircraft maintenance courses, or flight engineer work. Also, obtaining an FAA Powerplant License (see License/Certification below) will be credited as work experience under almost all circumstances.	The experience gained as a Navy Aviation Machinist's Mate J is substantial preparation for the civilian position of junior mechanic. In individual cases, enough experience may have been accumulated to enter as a full mechanic. However, such cases would be rare and probably would require the obtainment of an FAA Powerplant License (see License/Certification below). Navy Aviation Machinist's Mate J would be better qualified for civilian line maintenance work than for overhaul work. The latter operation is geared toward the actual disassembling of engines and other aircraft parts while the line work calls for the replacing of malfunctioning units with properly functioning parts. The malfunctioning equipment is then sent to the overhaul area to be taken apart, repaired and reassembled.

TABLE 5 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License or Certification	Mandatory for Some Employers: FAA Powerplant License. Desirable: FAA Powerplant License and FAA Airframe License. Comments: Each FAA license can be obtained if the applicant (1) is 18 years of age, (2) is able to read, write, speak and understand the English language, or in the case of an applicant who does not meet this requirement and who is employed outside the U.S., have his certificate stamped "Valid Only Outside the United States," (3) can pass written, oral and practical tests within a period of 24 months, and (4) has at least 18 months of practical experience with the procedures, practices, materials, machine tools, and equipment generally used in constructing, maintaining, or altering powerplants. The FAA Powerplant written test consists of multiple-choice questions covering areas of (1) general mechanic knowledge (2) Powerplant Theory and Maintenance, and (3) Powerplant Systems and Components. The Airframe written test questions cover (1) general mechanic knowledge, (2) Airframe Structures, and (3) Airframe Systems and Components. A practical/oral test is also given for each license to demonstrate mechanical skills. Commercial air carriers are more likely than general aviation employers to require the above licenses. At very small general aviation stations, only one or two lead mechanics may have the FAA license which enables them to inspect and approve the work of the other mechanics. However, if one wants to move up to lead mechanic in any organization, both Airframe and Powerplant licenses are usually required.	The training and experience received by the Navy Aviation Machinist's Mate I covers most of the topics on the written and practical oral FAA Powerplant License Test. Areas not covered include weight and balance, maintenance publications, mechanic privileges and limitations, (civilian) maintenance forms and records, and reciprocating engines. FAA Airframe License Test material is not covered in the training or experience received by Navy Aviation Machinist's Mate I. FAA inspectors who administer the practical oral part of the Powerplant test may accept at their option documented military skills in lieu of administering a complete practical/oral test. However, they may not skip the topics of weight and balance materials and processes, cleaning and corrosion control, maintenance forms and records, maintenance publications, mechanic privileges and limitations, and propellers. The Airframe and Powerplant Mechanics Certification Guide—No. AC 65-2B, prepared by FAA, outlines in detail the topics covered by the written and practical/oral tests. This document is for sale from the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C., 20402.
Union Apprenticeship Journeyman	The principal unions associated with this occupation are the International Association of Machinists and Aerospace Workers, the Transport Workers Union of America, and, to a lesser extent, the International Brotherhood of Teamsters, Chauffeurs, Warehousemen, and Helpers of America. In general, apprenticeship or training programs are formulated and implemented by the airlines with the approval of the union. The larger commercial air carriers conduct formal training classes or send mechanics to manufacturer's training courses. (Often a series of training sessions will be directly related to a particular aircraft or piece of equipment.) General aviation organizations primarily use manufacturer's courses and do not administer any formal training.	No basis for comparison and evaluation.
Other	Desirable: The ability to do detailed work; superior mechanical aptitudes; physical agility.	No basis for comparison and evaluation.
Military-Civilian Job Function Comparability:	Comparability in job functions between the Navy Aviation Machinist's Mate I and the civilian Aircraft Engine Mechanic is very high. Both maintain aircraft jet engines and their related systems, conduct periodic inspections, and field-test and adjust engine components. The Navy personnel perform functions most closely related to the civilian line maintenance mechanics who remove and replace equipment, as opposed to overhaul mechanics who disassemble and repair the engine parts.	

TABLE 6

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR AIRCRAFT ASSEMBLER WITH THE TRAINING/EXPERIENCE OF NAVY AVIATION MACHINIST'S MATE I - AD1

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Some Employers: A high school diploma or equivalent certificate. Desirable: A high school diploma or equivalent certificate; courses in shop mathematics, blueprints, schematic diagrams and production illustrations. Comments: Employees with high school diplomas are more apt to qualify for trainee programs designed to develop higher skills.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends credit for four semester hours in theory of turbine (jet) engines at the vocational certificate level and two semester hours in theory of turbine (jet) engines at the technical associate degree level for formal training in this rating.
Vocational/Technical Training	Desirable: Vocational courses covering blueprints, schematic diagrams and production illustrations; familiarity with basic hand and power tools. Comments: Many skill levels are required in assembly operations but most are attained by on-the-job training and experience gained from repetitive work. Because of the innovative nature of the aircraft industry, products change rapidly and require a large force of trained workers who can adapt readily to new assembly techniques. Aerospace plants sometimes supplement day-to-day experience with formal training programs but these are usually short-term programs designed to meet immediate needs.	Formal Training: (1) A total of 278 hours of technical training covering turbojet fundamentals, turbojet powerplants, turbojet powerplant and aircraft maintenance, line familiarization, and turbojet powerplant operations, and (2) a self-paced aviation fundamentals course covering aircraft familiarization, aircraft support functions, naval aviation maintenance programs, aviation publications, corrosion control, basic hand tools, mathematics, physics and shop practices. All formal training should provide excellent mechanical and theoretical background for work as a civilian Aircraft Assembler.
Previous Experience	Mandatory for Some Employers: Two years of experience in assembly or related occupations. Desirable: Two to four years in general and specialized assembly techniques. Comments: On-the-job experience is generally the most important requirement for hiring and advancement. While some formal training programs do exist in some companies, experience gained from repetitive work and from learning under more highly skilled assemblers provides the best hiring and advancement opportunity. The initial grade level (of which there may be as many as 18) at which an employee is hired is determined mainly by the number of years of experience.	The experience gained as a Navy Aviation Machinist's Mate I will serve as excellent background for general and specific mechanical skills needed by a civilian Aircraft Assembler. Specific mechanical skills are highly transferable.
License/Certification	Desirable: A certificate from the Institute for the Certification of Engineering Technicians.	The training and experience of a Navy Aviation Machinist's Mate I can fully or partially satisfy the work experience requirements for certification by the Institute for the Certification of Engineering Technicians.

Table 6 (Cont.)

Requirements Category	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License, Certification (cont)	Comments: Two years of work experience are required prior to application for certification. Exam consists of two parts which test general knowledge as well as specialized knowledge in the mechanical field.	One year is subtracted from total military service as "not applicable" time. One-half of the remainder of military service (up to four years) may be counted as work experience. In addition, military training and experience provides excellent preparation for the certification exams.
Union Apprenticeship Journeyman	Some Aircraft Assemblers are members of such unions as the International Association of Machinists and Aerospace Workers and the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America. The work force at some aerospace companies is not unionized. There are few formal apprenticeship programs in existence. Such programs that do exist vary in length from three to five years and include instruction in such subjects as blueprint reading, mechanical drawing, shop mathematics, trade theory and physics. Application for journeyman status, in companies with no formal apprenticeship program, can be made after about eight years of work experience.	The training and experience of a Navy Aviation Machinist's Mate I would provide excellent background for general mechanical skills and an excellent understanding of powerplant fundamentals and equipment. Specific skills would be easily transferable. In some cases, military training and experience may be counted toward satisfaction of work experience requirements for journeyman status. Military training and experience will affect the factors in the level at which employment will start.
Other	[illegible] coordination, finger dexterity, and good manipulative skills; full use of both arms and hands although, in many cases, workers without full use of their legs are able to do bench assembly work.	No basis for comparison and evaluation, although persons with recent experience as a Navy Aviation Machinist's Mate I can be presumed to be in good physical condition and to have good manual dexterity and mechanical ability.
Military-Civilian Job Comparability	Comparability in job functions is very high among Navy Aviation Machinist's Mates I and Aircraft Assemblers who specialize in powerplants. Military and civilian personnel in this occupation service, maintain, troubleshoot, repair and test aircraft powerplants and associated systems. They use similar tools and publications and adhere to stringent inspection criteria. Comparability is moderately high among Aviation Machinist's Mates I and Aircraft Assemblers who specialize in other types of aircraft equipment.	

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TABLE 7

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR AUTOMOBILE MECHANIC WITH THE TRAINING EXPERIENCE OF NAVY AVIATION MACHINIST'S MATE J - ADJ

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Some Employers or for Entrance Into Some Apprenticeship Programs: A high school diploma or equivalent certificate. Desirable: A high school diploma or equivalent certificate; courses in science, mathematics, business arithmetic. Comments: A high school diploma is more important for those applicants who have no experience.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends credit for four semester hours in theory of turbine (jet) engines at the vocational certificate level and two semester hours in theory of turbine (jet) engines at the technical associate degree level for formal training in this rating.
Vocational Technical Training	Desirable: Vocational courses in automobile repair, construction or operation. Comments: Many high schools, vocational schools, and technical institutes offer courses in automobile repair work. The typical vocational school curriculum in automotive technology includes engines, fuel systems, electrical systems, power trains and brakes, steering, alignment, suspension, automatic transmission, and air conditioning. Graduates of technical schools are usually in great demand because of the need for skilled mechanics at the entry level. Even the mechanic who learns the trade strictly by on-the-job training usually must attend night vocational school or courses conducted by the manufacturer to acquire the needed technical skills. Once hired, mechanics are often sent to factory training centers to receive training on specific equipment. Manufacturers also send representatives to local shops to conduct short training sessions.	Formal training: (1) A total of 278 hours of technical training covering turbojet fundamentals, turbojet powerplants, turbojet powerplant and aircraft maintenance, line familiarization, and turbojet powerplant operations, and (2) a self-paced aviation fundamentals course covering aircraft familiarization, aircraft support functions, naval aviation maintenance programs, aviation publications, corrosion, handtools, hardware, mathematics, physics, and shop. All formal training should provide good mechanical background for work as a civilian Automobile Mechanic, although equipment worked with is very different in each sector.
Previous Experience	Desirable: Experience in automobile repair gained from working as a gasoline service station attendant, from a mechanic's shop, from the Armed Forces, or from working on automobiles as a hobby. Comments: On-the-job experience in this field can be obtained by working as a mechanic's helper. Although beginners can make simple repairs after a few months, 3 to 4 years are required to become proficient in all types of repairs. An additional year or two is required to learn a difficult specialty such as automatic transmission repair. Training authorities recommend a 3- or 4-year formal apprenticeship program as the best way to become a skilled Automobile Mechanic (see Union Apprenticeship/Journeyman below). However, formal apprenticeship programs are not abundant.	The experience gained as a Navy Aviation Machinist's Mate J will serve as background for general mechanical skills needed by a civilian Automobile Mechanic. However, specific mechanical skills are not transferable.
License Certification	Mandatory for Most Employers: A valid motor vehicle operator's license, chauffeur's license, or classified license (designating the operation of specific categories of motor vehicles), depending upon the state issuing the license. Desirable: A certificate from the National Institute for Automotive Service Excellence showing professional competence in Automobile Mechanic work.	The training and experience of a Navy Aviation Machinist's Mate J will have no bearing on the application for a motor vehicle operator's license nor will it qualify one to take the National Institute for Automotive Service Excellence certification examination.

TABLE 7 (Cont)

Requirement Category	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License Certification (cont)	Comments: Two or more years of full-time experience as an automobile or truck mechanic are a prerequisite to taking the National Institute examinations. Substitution of formal training in automobile or truck mechanics may be made for up to one year of work experience. Tests are given in eight different specialties: (1) engine repair, (2) automatic transmission, (3) manual transmission, (4) front end, (5) brakes, (6) electrical systems, (7) heating and air conditioning, and (8) engine tune-up. A person can become certified in any one of the eight areas, but to be certified as a General Automobile Mechanic, one must pass all eight tests.	
Union Apprenticeship Journeyman	Some Automobile Mechanics belong to such labor unions as the International Association of Machinists and Aerospace Workers, the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America, the Sheet Metal Workers' International Association, or the International Union, United Automobile, Aerospace, and Agricultural Implement Workers of America. Guidelines for apprenticeship programs have been formulated by joint labor-management apprenticeship committees. The typical program consists of 8,000 hours of work experience over a 4-year period supplemented by 144 hours of classroom training for each of the 4 years of apprenticeship. Apprenticeship Entrance Standards: The applicant must be 18 to 30 years of age and physically fit for the work of the trade as evidenced by a doctor's certificate. Individual local apprenticeship committees may require an oral interview, the taking of an aptitude test, school transcripts, or previous work records. Journeyman Status: A total of 8,000 hours of work experience typically covering the following areas: shop routine, brakes, chassis, clutch and unit transmission, rear axle assembly, power plant, electrical system, motor analysis, and miscellaneous areas such as fuel systems, distributors, auxiliary devices, shop operations, etc. Supplemental classroom instruction often includes shop arithmetic, bench work and hand tool operations, lubrication, safety, inspection, welding, motor analysis and tool room machines.	Apprenticeship Entrance Requirements: There is little basis for comparison or evaluation but it should be noted that maximum age requirements are often extended for veterans. Journeyman Status: The training and experience of a Navy Aviation Machinist's Mate I would provide good background for general mechanical skills and an understanding of power plants equipment. The transfer of specific skills would be difficult. However, credit for previous training or experience as an Aviation Machinist's Mate I may be granted on an individual basis by the local apprenticeship committee.
Other	Desirable: Good physical condition; manual dexterity; good mechanical ability.	No basis for comparison and evaluation, although persons with recent experience as a Navy Aviation Machinist's Mate I can be presumed to be in good physical condition and to have good manual dexterity and mechanical ability.
Military-Civilian Occupation Comparability:	Comparability in job functions is low. The civilian Automobile Mechanic maintains, repairs, diagnoses, and corrects malfunctions in automobile engines as well as other automotive parts such as brakes, clutches, rear axle assemblies, chassis, electrical system. The Navy Aviation Machinist' Mate I works on aircraft power plants which are much more powerful and complex pieces of equipment. In addition, the Aviation Machinist's work is subject to much more stringent inspection standards than civilian automobile mechanical work.	

Table [illegible]

[illegible] MERCHANT MARINE [illegible]
WITH [illegible] BOATSWAIN'S MATE - BM

Requirement Categories	[illegible] Requirements[1]	[illegible] Military Occupation
Formal Education	Desirable: At least eighth grade education.	Equivalent of more than high school diploma can normally be obtained through participation in voluntary education programs.
Vocational Technical Training	Desirable: Training in any and all functions related to the handling and maintenance of [illegible] vessels in any waters, such as those listed under Previous Experience category below. Mandatory: To obtain a U.S. Coast Guard certificate (see License Certification category below), formal technical training may be substituted for experience requirements (see Previous Experience category below) at the following rates: (1) 18 months training in a seagoing training ship approved by the Coast Guard satisfies the service requirement for unlimited certification, any waters, (2) able seaman training in a Coast Guard-approved school may be applied to satisfy up to one year of the service requirement for unlimited certification, any waters, and (3) completion of a training course of at least nine months, including six months aboard a seagoing vessel, satisfies the service requirement for 12-month certification, any waters.	On-the-Job Training: All training is on-the-job (OJT) under the supervision of a qualified Boatswain's Mate, and through individual study of Navy correspondence courses and training manuals. Over a period of approximately two years, OJT is generally given in all activities relating to deck and boat seamanship.
Previous Experience	Mandatory for U.S. Coast Guard Certification: Experience is needed in such skills as lifeboat and liferaft launching and handling; uses and operation of common davits; nautical terms; use of the compass; requirements for running lights, passing signals, fog and distress signals; handling the wheel; use of engine room telegraph or bell-pull signals; knots, bends, splices, and hitches in common use. The required experience durations are as follows: (1) Any waters, unlimited certification—three years' deck experience on vessels of 100 gross tons or more operating on ocean or coastwise routes or on the Great Lakes, (2) Any waters, 12-month certification—12 months' deck experience on vessels of 100 gross tons or more operating on ocean or coastwise routes or on the Great Lakes, (3) Great Lakes, 18-month certification—18 months' deck experience on vessels of 100 gross tons or more operating on ocean or coastwise routes or on the Great Lakes, smaller lakes, bays, or sounds, (4) Tugs and towboats, any waters—18 months' deck experience on vessels operating on ocean or coastwise routes, on the Great Lakes, or on bays and sounds connecting directly with the seas, (5) Bays and sounds, 12-month certification—vessels 500 gross tons or less, not carrying passengers—12 months' deck experience in vessels operating on ocean or coastwise routes, on the Great Lakes, or on bays and sounds connected directly with the seas, (6) Seagoing barges, 12-month certification—12 months' deck experience on vessels operating on ocean or coastwise routes, on the Great Lakes, or on bays and sounds connected directly with the seas. See Vocational Technical Training category above for training substitutions for experience.	Generally Boatswain's Mates' experience meets the years-of-experience requirement, although length of service and types of assignment would have some bearing on qualifications.

TABLE 8 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License Certification	Mandatory: U.S. Coast Guard certification is required, except for Able Seamen employed on (a) unrigged vessels other than seagoing barges, (b) tugs or towboats on bays and sounds connected directly with the sea, and (c) sail vessels of less than 500 net tons not carrying passengers for hire and not operating on high seas. The certification prerequisites are: (1) Age--at least 19 years (19-21 years of age preferred, but veterans are accepted up to 24 years of age), (2) Physical condition--must pass physical exam given by U.S. Public Health Service officer. Exam covers visual acuity, color perception, hearing, general physical condition (in exceptional cases, physical exam requirement may be waived at discretion of Officer in Charge, U.S. Coast Guard Marine Inspection if applicant has unexpired deck license), (3) Service/training requirements--see Previous Experience category for service/training requirements and Vocational/Technical Training category for educational substitutes for service/training requirements, (4) Language requirements--ability to speak and understand English, to pass oral or written exam and to communicate effectively during normal work and during emergencies aboard ship, (5) Examination and demonstration of ability--must pass oral or written examination, and skills demonstration examination, conducted by Coast Guard Marine Inspection. Exam covers knowledge stated under Previous Experience category above. Comments: Only one-fourth of Able Seamen required by law to be employed on a given vessel may hold a 12-month limited certificate; all others must hold an unlimited certificate.	Navy Boatswain's Mates would meet minimum age requirement during the first enlistment term. Entry into naval service requires good physical condition, and advancement to the Boatswain's Mate series requires physical strength and "good" vision and hearing. Service/training requirements can be met through on-the-job training and experience in the Boatswain's Mate Third Class Rating with perhaps some training/experience in skills and knowledge specified for the Boatswain's Mate Second Class rating. Opportunities for improvement of skills are available through voluntary education programs. Experience in the Boatswain's Mate Third Class rating generally should enable applicants to pass the exam for Able Seaman certification.
Union Apprenticeship Journeyman	There are two unions for Merchant Marine Able Seamen: The National Maritime Union, and the Seafarers International Union. Vocational/technical training available for upgrading and changing specialties is provided by these unions. Registration with the union is required for eligibility to attend courses. Also, most hiring is done through union halls run by these two unions (although some shipping companies deal with unions formed by their own employees). Typical topics covered in upgrade training include use of ground tackle and cargo gear, deck machinery, ship safety and first-aid procedures, search and rescue, firefighting and damage control, basic rules of the road, elementary navigation, oceanography, use of navigation instruments, and lookout duties.	No basis for comparison and evaluation.
Other	There are not standards besides the ones outlined above.	No basis for comparison and evaluation.
Military/Civilian Job Function Comparability:	The work of Navy Boatswain's Mates is highly comparable to that of Merchant Marine Able Seamen. Navy personnel receive additional training related to military procedures and functions; most other skills and knowledge are the same.	

1/ The civilian entrance standards outlined here are for Able Seaman which is one level above the entry-level of Ordinary Seaman. The Able Seaman position was deemed more comparable to the Navy Boatswain's Mate Third or Second Class rating than was the lower, entry-level position of Ordinary Seaman.

TABLE 9

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR RIGGER AND MACHINE MOVER WITH THE TRAINING EXPERIENCE OF NAVY BOATSWAIN'S MATE - BM

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma or equivalent certificate or at least some high school education; courses in mathematics.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational Technical Training	Desirable for Entrance into an Apprenticeship Program: Courses in drafting, blueprint reading, layout work; training in work details involved in the dismantling, erection, and movement of heavy equipment and structures where a knowledge of mechanical principles is required. Comments: While one can learn this trade by working as a helper, most training authorities recommend the completion of a 3-year apprenticeship program as the best way to learn the trade (see Union Apprenticeship/Journeyman category below).	On-the-Job Training: All training is on-the-job (OJT) under supervision of a qualified Boatswain's Mate, and through individual study of Navy correspondence courses and training manuals. Over a period of approximately 2 years, OJT is given in all activities relating to deck and boat seamanship. Such activities include painting, maintenance, upkeep of ship's external structure and deck equipment, rigging, taking charge of working parties, and operating and maintaining equipment used in loading and unloading. The training received in rigging would be very desirable background for entrance into a civilian apprenticeship program involving rigging and machine moving tasks.
Previous Experience	Desirable for Entrance into an Apprenticeship Program: Experience on jobs requiring considerable judgment in selecting and positioning tools and equipment, in structural work, and in maintenance, construction or dismantling work.	The experience gained by Navy Boatswain's Mates in rigging associated with cargo handling or fueling would be excellent background for entrance into a civilian apprenticeship program involving rigging and moving tasks.
License Certification	No license or certificate is needed to perform the duties of this occupation.	No basis for comparison and evaluation.
Union Apprenticeship Journeyman	Riggers and Machine Movers commonly are employed by general contractors on large building projects, by iron and steel companies, or by large industrial establishments which do their own construction work. Unions usually associated with this occupation are the International Association of Bridge, Structural and Ornamental Iron Workers, and the United Steelworkers of America. Apprenticeship programs ordinarily are implemented by joint labor-management apprenticeship committees. The Association of General Contractors of America is another organization which has been active in formulating apprenticeship programs for workers in the iron industry. The typical program for Riggers and Movers in the iron industry or other heavy industry settings involves 6,000 hours of work experience over a 3-year period.	Apprenticeship Entrance Requirements: There is little basis for comparison and evaluation but it should be noted that age ranges for apprenticeship entrance are often waived or extended for veterans and that local apprenticeship committees often given preference to veterans in general. Journeyman Status: The training and experience gained by Navy Boatswain's Mates in rigging associated with cargo handling or fueling is similar in many ways to the training and work experience required to achieve journeyman status in the civilian apprenticeship program associated with the occupation of Rigger and Machine Mover. Training and experience received as a Navy Boatswain's Mate may be credited toward journeyman status by the local apprenticeship committee on an individual basis.

TABLE 9 (Cont)

Requirements for Occupation	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship Program (Cont)	Apprenticeship Entrance Requirements: Typical entrance requirements include (1) an acceptable age from (approximately) 18 to 30, (2) good physical condition including above-average strength, agility, and a sense of balance, (3) evidence of appropriate education, ability, and aptitude as required by the local apprenticeship committee. Journeyman Status: A typical apprenticeship program requires the completion of 6,000 hours of work experience over a 4-year period covering such areas as care and use of tools, rigging and hoisting equipment, heavy construction machinery, weights and supports, cables and slings, arrangement of guys, types of knots, riveting, welding, and splicing rope and steel cable.	
Other	Desirable: Above-average strength; agility; a good sense of balance.	No basis for comparison and evaluation.
Military - Civilian Job Function Comparability:	Comparability in job functions is low. Navy Boatswain's Mates perform some of the functions associated with rigging and machine moving, especially in cargo handling or fueling tasks, but are not concerned totally with such activities. General seamanship duties and maintenance of the ship, which involve functions unrelated to rigging and machine moving, constitute a large part of the Boatswain's Mate's work day. Civilian Riggers and Machine Movers, however, spend the majority of their time performing rigging and moving functions.	

TABLE 19

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR FIREMAN (BOILER) WITH THE TRAINING, EXPERIENCE OF NAVY BOILER TECHNICIAN - 81

Subject Matter Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: some high school education; advancement to Stationary Engineer may be helped by courses in chemistry, physics, blueprint reading, electricity, air conditioning, and refrigeration.	Participation in voluntary education programs can enable a Navy Boiler Technician to obtain any education courses that he or she may lack to enter into the civilian occupation of Fireman (Boiler).
Vocational Technical Training	Many Firemen (Boiler) learn their trade by working as helpers in boiler rooms. Some vocational school programs have courses in steam engineering which may prepare students to become Firemen (Boiler) without first working as helpers. Comments: Preparation requirements vary because some cities and states require Firemen (Boiler) to be licensed. (See License Certification category below.)	Formal Training: Approximately 300 hours of training covering such topics as engineering terminology, boiler types, control values, flow and liquid level measuring devices, pneumatic tools, fuel oil systems, fundamentals of combustion, pumps, plant maintenance, precision measuring instruments, insulation, air compressors, damage control, blueprint reading, and environmental control. This training should be fully adequate for work as a civilian Fireman (Boiler). Comments: Formal training curriculum is under revision. Changes are primarily in organization of material rather than in actual program substance.
Previous Experience	Desirable: Experience in operating low pressure and high pressure boilers. This includes (1) inspecting and lighting boilers, (2) maintaining steam pressure, (3) operating mechanical devices that regulate air, gas, oil or coal flow, (4) reading meters and safety gauges, (5) making minor repairs, and (6) testing and treating boiler water with chemicals.	The experience gained by a Navy Boiler Technician is excellent preparation for performance of the civilian Fireman (Boiler) occupation.
License Certification	Some large cities and a few states have licensing requirements for Firemen (Boiler). A First Class Fireman must be able to show on an examination that he or she can assume full responsibility for a boiler or boilers. This includes high and low pressure systems, controls, water testing and treatment procedures, pump and valve maintenance, small engine maintenance and lubrication, diagnosis and evaluation of malfunctions, emergency procedures and other subjects. The First Class examination also includes requirements for the Second Class examination. A Second Class Fireman must be able to show on an examination that he or she can operate a boiler or boilers under the direction of a First Class Fireman or Stationary Engineer. The examination requires the applicant to know the differences between various types of boilers, the procedures for correcting the most common and most important boiler malfunctions, the use of various valves and pumps, safety precautions, dangerous conditions, diagnosis of leaks, and lighting and cleaning of oil burners.	The training and experience of a Navy Boiler Technician includes many of the skills and much of the knowledge required for licensing as a Second Class Fireman. Some of the Navy Boiler Technician's experience may also be valuable for taking the First Class examination. Comments: Because the qualifications for licenses are different in various locations, the specific application of Navy Boiler Technician's experience to the Fireman licensing should be determined by examining the licensing requirements of specific locations.

TABLE 10 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License/Certification (Cont)	Comments: The licensing qualifications stated above summarize those of a single state (Massachusetts). They probably include the basic skills of the occupation, but licensing requirements of other municipal or state jurisdictions may be slightly different.	
Union Apprenticeship/ Journeyman	Some members of this occupation are members of the International Brotherhood of Firemen and Oilers or the International Union of Operating Engineers. No apprenticeship standards have been formulated for this occupation.	No basis for comparison and evaluation.
Other	Desirable: Firemen (Boiler) should have a basic understanding of machinery normal vision, and good hearing.	No firm basis for comparison and evaluation, but persons with recent experience as a Navy Boiler Technician can be presumed to understand machinery and have normal vision and good hearing.
Military-Civilian Job Function Comparability:	Comparability in job functions is generally high if the Navy Boiler Technician is compared with the Second Class Fireman. Persons in each of these occupations operate, maintain, repair, and test boilers under the direction of supervisors. Navy Boiler Technicians who become responsible for supervising the overall maintenance of a boiler or boilers may gain some experience that is comparable to the work of First Class Firemen.	

TABLE II

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR STATIONARY ENGINEER WITH THE TRAINING, EXPERIENCE OF NAVY BOILER TECHNICIAN - BT

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory For Entrance Into Most Apprenticeship Programs: A high school diploma or equivalent certificate. (See Union Apprenticeship Journeyman category below.) Desirable: A high school diploma or equivalent certificate; courses in physics, chemistry, and mathematics.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational Technical Training	Desirable For Entrance Into an Apprenticeship Program: Vocational training in machine-shop practice, mechanical drawing, applied electricity, blueprint reading, use of hand and power tools. Comments: It is possible to start as a helper to licensed Stationary Engineers and gradually accumulate the knowledge and skills needed to perform the full range of required duties, but most training authorities recommend formal apprenticeship programs because of the increasing complexity of the machines and systems. Also, many states and cities have licensing requirements which include the passing of a written and/or oral examination which requires knowledge and training in specific areas of boiler room operations. (See License/Certification category below.)	Formal Training: Approximately 300 hours of training covering such topics as engineering terminology, boiler types, control valves, flow and liquid level measuring devices, pneumatic tools, fuel oil systems, fundamentals of combustion, pumps, plant maintenance, precision measuring instruments, insulation, air compressors, damage control, blueprint reading, and environmental control. The training received by the Navy Boiler Technician is excellent preparation for entrance into a civilian apprenticeship program for the Stationary Engineer occupation. Comments: Formal training curriculum is under revision. Changes are primarily in organization of material rather than in actual program substance.
Previous Experience	Desirable For Entrance Into an Apprenticeship Program: Experience on jobs which involve blueprint reading, use of hand and power tools, knowledge of pumps and piping, work with refrigeration, heating, ventilating, air-conditioning systems, or knowledge of boilers and steam systems. Comments: Stationary Engineers often enter this occupation initially as Firemen (Boiler) who operate, maintain, and tend the boilers, and then advance to the engineer level with the accumulation of knowledge about a variety of equipment and systems.	The experience gained as a Navy Boiler Technician is excellent preparation for entrance into a civilian apprenticeship program for the Stationary Engineer occupation.
License/Certification	A number of states and many cities have licensing requirements for Stationary Engineers. Requirements differ among localities but, in general, applicants often must be over a minimum age, must reside for a specified period in the state or locality in which the examination is given, and must meet experience requirements to take the appropriate written and/or oral examination. The National Insutute for the Uniform Licensing of Power Engineers, Inc. has established a national voluntary program through which one can establish a level of competence and professionalism in the power engineering field. For a Third Class Engineer license (the lowest of three categories of licenses), the requirements are (1) minimum age of 20 years, (2) a high school diploma or GED, (3) three years of an approved apprenticeship or on-the-job training program, (4) three years of experience, and (5) the passing of written, oral, and practical examinations.	The training and experience received by Navy Boiler Technicians will be helpful in meeting some of the licensing requirements for Stationary Engineers in states or cities where such requirements exist. However, additional residency or experience requirements or knowledge of local safety codes may have to be met before the licensing examination(s) can be taken. State and/or city laws governing the occupation of Stationary Engineer must be consulted to ascertain the amount of military training and experience which is applicable.

TABLE 11 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship, Journeyman	Among the unions to which Stationary Engineers belong are the International Union of Operating Engineers (IUOE) and the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America. A National Joint Apprenticeship and Training Committee for Stationary Engineers, made up of representatives of IUOE and management, has formulated guidelines for an apprenticeship program of approximately 8,000 hours over a four-year period. Apprenticeship Entrance Requirements: The National Joint Apprenticeship Committee specifies that the apprentice must (1) be at least 18 and not over 25 years of age, (2) have sufficient education (high school diploma or certificate of equivalency) to satisfactorily complete the necessary related theoretical instruction, (3) be physically able to perform the work of the trade, and (4) meet other entrance requirements that may be established by the local joint committee. Journeyman Status: Completion of approximately 8,000 hours of work experience over a four-year period covering the following areas: hand, portable, and power tools; boilers and steam systems; pumps, piping, and compressed gas systems; refrigeration, heating, ventilating, and air-conditioning systems; electricity; industrial relations and supervision. In addition, approximately 144 hours of related classroom instruction per year for each of the four years must be completed.	Apprenticeship Entrance Requirements: There is little basis for comparison and evaluation of the training and experience of Navy Boiler Technicians with the entrance requirements for civilian Stationary Engineer apprenticeship programs. However, it should be noted that local apprenticeship committees have the authority to waive the maximum age limit for veterans. Journeyman Status: Local apprenticeship committees have the option of granting credit toward journeyman status once an applicant has been accepted into the apprenticeship program. Training and experience gained as Navy Boiler Technicians in such areas as hand and power tools, boilers and steam systems, and pumps and piping will possibly be acceptable to the local apprenticeship committee. Navy Boiler Technicians may be less familiar with the topics of refrigeration, heating, ventilation and air-conditioning systems, electricity, and industrial relations and supervision.
Other	Desirable: Manual dexterity; good physical condition; mechanical aptitude.	No basis for comparison and evaluation.
Military-Civilian Job Function Comparability:	Comparability in job functions is moderate. The civilian Stationary Engineer, in addition to performing most of the functions of a Navy Boiler Technician, usually has responsibility for a number of different types of turbines, generators, engines, pumps, and compressors. In large plants, a Stationary Engineer may have charge of an entire boiler room and, therefore, must be familiar with a variety of equipment ranging from boilers and turbines to air-conditioning and refrigeration systems. The Navy Boiler Technician performs functions related directly to boiler operation and maintenance but does not often deal with a variety of equipment. He also performs fewer equipment analysis and test functions than would the civilian Stationary Engineer.	

TABLE 12

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR BOILERMAKER WITH THE TRAINING/EXPERIENCE OF NAVY BOILER TECHNICIAN - BT

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma or at least an eighth grade education; courses in mathematics.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocation Technical Training	Desirable For Entrance Into an Apprenticeship Program: Training in blueprint reading, welding, shop mathematics, and the operation of various industrial machines used for shaping and cutting metal parts.	Formal Training: Approximately 300 hours of training covering such topics as engineering terminology, boiler types, control valves, flow and liquid level measuring devices, pneumatic tools, fuel oil systems, fundamentals of combustion, pumps, plant maintenance, precision measuring instruments, insulation, air compressors, damage control, blueprint reading, and environmental control. While the above topics are geared toward boiler operation and maintenance activities, they provide a good background for instruction in boilermaking skills. Comments: Formal training curriculum is under revision. Changes are primarily in organization of material rather than in actual program substance.
Previous Experience	Desirable For Entrance Into an Apprenticeship Program: Experience in blueprint reading, welding, and machine operations used to aline, file, grind, cut, rivet, or bolt heavy metal.	The experience gained as a Navy Boiler Technician in the operation, repair, and maintenance of boilers and auxiliary equipment provides familiarization with such equipment and knowledge of the principles of operation which is helpful background information for entrance into an apprenticeship program for boilermaking.
License/Certification	No license or certificate is required for the occupation of Boilermaker. Comments: For some work on boilers where the strength of the weld is highly critical, the person who is performing the welding job may be required to pass an examination given by the employer or to have a certificate showing proficiency in welding operations. Often installation and repair work must meet state and local safety standards.	No basis for comparison and evaluation.
Union Apprenticeship/ Journeyman	The principal union associated with this occupation is the International Brotherhood of Boilermakers, Iron Shipbuilders, Blacksmiths, Forgers, and Helpers. Some boilermaking workers are members of industrial unions such as the Industrial Union of Marine and Shipbuilding Workers of America, the Oil, Chemical and Atomic Workers International Union, and the United Steelworkers of America.	Apprenticeship Entrance Requirements: There is little basis for comparison and evaluation of the training and experience of Navy Boiler Technicians with the entrance requirements for civilian Boilermaker apprenticeship programs. It should be noted, however, that maximum age limits are often extended for ex-military personnel.

Table 1 (cont)

Civilian Job Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship Journeyman (cont)	A typical apprenticeship program is comprised of 8,000 hours of on-the-job training experience over a four-year period plus approximately 150 hours per year of classroom instruction. Apprenticeship Entrance Requirements (variation may occur among unions or locals of unions): An applicant must (1) be an American citizen or be in the process of being naturalized, (2) be between 18 and 26 years of age, (3) apply for indenture, (4) successfully pass a physical examination, (5) successfully pass an aptitude test, and (6) be interviewed and approved by the local apprenticeship committee. Journeyman Status: Completion of 8,000 hours of on-the-job training and experience over a four-year period covering such areas as familiarization with tools, machine operations, hot forming, burning, welding, fitting, layout, and general boiler work. Approximately 150 hours of classroom instruction per year for four years covering such subjects as blueprint reading, shop mathematics, welding, rigging, riveting, bolting, caulking, pressure problems, fitting, laying out, boiler structure, use of tools, and nomenclature.	Journeyman Status: While much of the training and experience gained as a Navy Boiler Technician may not be directly related to the training experience required of civilian Boilermakers, the general information about boilers, steam systems, pumps, piping, etc., will be helpful background information for application to the boilermaking field. Local apprenticeship committees have the option of granting credit toward journeyman status once an applicant has been accepted into the apprenticeship program. Each case is evaluated individually on its own merits.
Other	Desirable: Good physical health; the ability to do heavy physical work; mechanical aptitude; manual dexterity.	No basis for comparison and evaluation.

Military-Civilian Job Function Comparability: Comparability in job functions is low. Civilian Boilermakers commonly assemble and erect large boilers in shops or at construction sites where such equipment is used. They hft heavy metal parts into place with rigging equipment, weld or rivet the parts together, and then test for leaks or defects. They also perform repair functions such as patching weak spots, replacing defective sections, or strengthening joints. The Navy Boiler Technician is concerned mainly with (1) organizational and intermediate maintenance on (marine) boilers, pumps, valves, blowers, auxiliary turbines, and associated machinery, (2) operating fireroom machinery, (3) transferring, testing, treating, and taking inventories of fuel and water, and (4) maintaining records and reports. Some similarity between the two positions may occur in such functions as testing of the equipment for leaks or malfunctions or in the repairs of parts or equipment which do not require structural changes.

TABLE 13

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR MAINTENANCE ELECTRICIAN WITH THE TRAINING EXPERIENCE OF NAVY ELECTRICIAN'S MATE - EM

Requirement Category	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Entrance Into Most Apprenticeship Programs: A high school diploma or equivalent certificate. Desirable: A high school diploma; courses in algebra, trigonometry.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education (ACE), Office on Educational Credit recommends the following credits for the Electrician's Mate Class A School: (1) Six semester hours in electricity and electrical laboratory at the vocational certificate level or at the technical associate degree level, and (2) three semester hours in industrial education at the baccalaureate degree level. For the Basic Electricity and Electronics School, ACE recommends granting credit as follows: (1) Three semester hours in basic electricity at the vocational certificate level or at the technical associate degree level, and (2) two semester hours in basic electricity at the baccalaureate degree level.
Vocational Technical Training	Desirable: Post-secondary technical courses in such topics as mechanical and electrical drawing, blueprint reading, estimating materials and supplies, technical report writing, basic and advanced electrical theory, circuits and circuit design, conductors, shop practices, methods of installation, trouble-shooting, meters, lighting, generators, motors, transformers, solid state devices, motor controllers and maintenance techniques. Comments: Technical courses are usually used to supplement actual on-the-job training. In the electrical industry, a great many journeymen have acquired their knowledge and skills through an apprenticeship program (see Union Apprenticeship Journeyman category below).	Formal Training: Electrician's Mate Class A School provides twelve weeks of training covering the topics of safety precautions and first-aid, test equipment, introduction to rotating machinery, AC/DC generators, blueprints, transformers, maintenance and material management, synchros, amplifiers, degaussing equipment, regulatory devices, cables, lighting, motors, AC/DC controllers, electrohydraulics and pneumatics, basic electron/atomic/semiconductor theory, circuits, rectifiers, transistors, multivibrators and electronic pulse counters. Basic Electricity and Electronics school provides a self-paced curriculum (of approximately 21 days) covering electrical current, voltage, resistance, parallel and series-paralleled circuits, induction, transformers, capacitance and resistant-reactive circuits. Training gained as a Navy Electrician's Mate covers many of the topics presented in a typical civilian post-secondary school curriculum in electricity and electronics. Civilian courses may ordinarily be of longer duration, but Navy instruction serves as excellent preparation for further courses in the electrical trades.
Previous Experience	Desirable: Some experience working with electrical equipment, fixture installation, wiring, electric motors, electronic controls, light or power systems, or communications and signal systems. Comments: This occupation can be learned informally by working as an electrician's helper for a number of years. However, many people enter this trade through a formal apprenticeship program (see Union Apprenticeship Journeyman category below).	Experience gained as a Navy Electrician's Mate will be excellent preparation for work in the civilian sector as a Maintenance Electrician. However, actual journeyman status may not be achieved until more experience has been acquired.
License Certification	Mandatory for Some States, Counties or Cities: A license showing proficiency in the electrical trade and/or in regulations and codes governing electrical installations and building construction.	Training and experience gained as a Navy Electrician's Mate will prepare a person for licensing requirements in general. Local laws must be investigated to determine what specific requirements exist and if Navy training and/or experience may be applied toward meeting those requirements.

TABLE 13 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License Certification (Cont)	Comments: The licensing requirements vary widely among different localities. Most states and a substantial number of cities require electrical contractors to be licensed. A smaller number of states, counties and cities require journeyman electricians to be licensed. Prerequisites for most licenses include minimum experience standards (usually journeyman status) and the completion of a written examination covering craft knowledge and national or local electrical codes and regulations.	
Union Apprenticeship Journeyman	The union commonly associated with this trade is the International Brotherhood of Electrical Workers (IBEW). An extensive apprenticeship program has been developed by a joint committee representing the IBEW and the National Electrical Contractors Association, Inc. Similar programs have been formulated by contracting associations such as the Associated Builders and Contractors, Inc. Most programs require about 8,000 hours of work experience over a four-year period, supplemented by approximately 570 hours of job-related education over the same period. Apprenticeship Entrance Requirements: Standard requirements for all programs include: (1) An age range of 18 to approximately 35; (2) a high school diploma or equivalent certificate; (3) evidence of good health; (4) satisfactory completion of some type of aptitude test. Journeyman Status: Attained after completion of standard programs which generally include on-the-job training covering (1) general safety instructions and equipment; (2) installation of conduits, wires, generators, lighting and power circuits, and power and control equipment; (3) blueprints and wiring diagrams; (4) servicing, troubleshooting, repairing and testing power circuits and electrical equipment; (5) installation and maintenance of powerhouse and substation circuits, fuses, switchboards, relays, motors, generators and other associated equipment. Related classroom instruction includes basic electrical math, safety and first-aid, blueprints, electrical symbols, National Electrical Code, theory and fundamentals of basic electricity, AC/DC circuits, measuring devices, power distribution, wiring methods, motors, generators, transformers, circuit diagrams, welding and cutting techniques, and test equipment.	Apprenticeship Entrance Requirements: There is little basis for comparison and evaluation but it should be noted that most apprenticeship programs extend the maximum age limit for veterans (as a rule up to a maximum of four years). Journeyman Status: The training and experience of a Navy Electrician's Mate is similar to the training/experience required to become a Maintenance Electrician in the civilian sector. Additional training would probably be required due to differences in particular equipment and it would be necessary to become familiar with the National Electrical Code stipulations. Credit for Navy training and experience may be granted on an individual basis by local apprenticeship committees.
Other	Mandatory: Good color vision. Desirable: Agility, manual dexterity, mechanical ability.	Normal color perception is required of personnel in this Navy rating.

Military-Civilian Job Function Comparability: Comparability of job functions is very high. Navy and civilian personnel work with essentially the same types of equipment according to the same principles and theories. Both groups are heavily involved in servicing, repairing and testing equipment. Navy personnel are not usually involved with national, state or local codes, however they do abide by military codes, specifications and regulations.

TABLE II

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR CONSTRUCTION ELECTRICIAN WITH THE TRAINING EXPERIENCE OF NAVY ELECTRICIAN'S MATE - EM

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Entrance Into Most Apprenticeship Programs: A high school diploma or equivalent certificate. Desirable: A high school diploma; courses in algebra, trigonometry, geometry, and physics.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education (ACE) Office on Educational Credit recommends for the Electrician's Mate Class A School: (1) Six semester hours in electricity and electrical laboratory at the vocational certificate level or at the technical associate degree level, and (2) three semester hours in industrial education at the baccalaureate degree level. For the Basic Electricity and Electronics School ACE recommends: (1) Three semester hours in basic electricity at the vocational certificate level or at the technical associate degree level, and (2) two semester hours in basic electricity at the baccalaureate degree level.
Vocational Technical Training	Desirable: Post-secondary technical courses in such topics as mechanical and electrical drawing, blueprint reading, estimating materials and supplies, technical report writing, basic and advanced electrical theory, circuits and circuit design, conductors, shop practices, methods of installation, trouble-shooting, meters, generators, motors, lighting, transformers, solid state devices, motor controllers, and maintenance techniques. Comments: Technical courses are usually used to supplement actual on-the-job training. In the electrical industry, a great many journeymen have acquired their knowledge and skills through an apprenticeship program (see Union Apprenticeship/Journeyman category below).	Formal Training: Electrician's Mate Class A School provides 12 weeks of training covering the topics of safety precaution and first-aid, test equipment, introduction to rotating machinery, AC/DC generators, blueprints, transformers, maintenance and material management, synchros, amplifiers, degaussing equipment, regulating devices, cables, lighting, motors, basic electron/atomic/semiconductor theories, circuits, rectifiers, transistors, multivibrators, and electronic pulse counters. Basic Electricity and Electronics School provides a self-paced curriculum (of approximately 21 days) covering electrical current, voltage, resistance, voltage and current in series circuits, relationships of current, voltage and resistance, parallel and series-parallel circuits, induction, transformers, capacitance, and resistant-reactive circuits. Training gained as a Navy Electrician's Mate covers many of the topics presented in a typical civilian post-secondary school curriculum in electricity and electronics. Civilian courses may ordinarily be of longer duration, but Navy instruction serves as excellent preparation for further courses in the electrical trades.
Previous Experience	Desirable: Experience working with electrical equipment, fixture installation, wiring, electric motors, electronic controls, light or power systems, or communications and signal systems. Comments: This occupation can be learned informally by working as an electrician's helper for a number of years. However, many people enter this trade through a formal apprenticeship program (see Union Apprenticeship/Journeyman category below).	Experience gained as a Navy Electrician's Mate will be excellent preparation for work in the civilian sector as a Construction Electrician. However, journeyman status may not be able to be achieved until more experience has been acquired.
License Certification	Mandatory for Some States, Counties or Cities: A license showing proficiency in the electrical trade and/or in regulations and codes governing electrical installations and building construction.	Training and experience gained as a Navy Electrician's Mate will prepare a person for licensing requirements in general. Local laws must be investigated to determine what specific requirements exists and if

TABLE 14 (Cont)

Requirement (Cont)	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License, Certification (Cont)	Comments: The licensing requirements vary widely among different localities. Most states, and a substantial number of cities, require electrical contractors to be licensed. A lesser number of states, counties and cities require journeymen electricians to be licensed. Prerequisites for most licenses include minimum experience standards (usually journeyman status) and the completion of a written examination covering craft knowledge and national or local electrical codes and regulations.	training and/or experience may be applied toward meeting those requirements.
Union Apprenticeship Journeyman	The union commonly associated with this trade is the International Brotherhood of Electrical Workers (IBEW). An extensive apprenticeship program has been developed by a joint committee representing the IBEW and the National Electrical Contractors Association, Inc. Similar programs have been formulated by contracting associations such as the Associated Independent Electrical Contractors of America, Inc. and the Associated Builders and Contractors, Inc. All programs require 8,000 hours of work experience over a four-year period, supplemented by 576 hours of job related education over the same period. Apprenticeship Entrance Requirements: Standard requirements for all programs include (1) age ranges from a minimum of 18 to a maximum of between 24 or 35, depending upon the program, (2) a high school diploma or equivalent certificate, and, for one program, one year of algebra, (3) evidence of physical fitness to perform the work of the trade, (4) for some programs, the completion of an aptitude test. Journeyman Status: Standard construction electrician programs for commercial, residential or industrial (inside) work generally include preliminary orientation (use of tools, types of equipment, etc.), residential and commercial rough wiring, residential and commercial finish work, industrial lighting and service installation, trouble-shooting, motor installation and control. Related classroom instruction includes basic electrical math, safety and first-aid, blueprints, electrical symbols, National Electrical Code, theory and fundamentals of basic electricity, AC DC circuits, measuring devices, wiring methods, appliances, interior distribution, industrial and commercial calculations, motors, generators, transformers, circuit drawing, illumination and design, substations, primary distribution, electronic fundamentals, and welding and cutting.	Apprenticeship Entrance Requirements: There is little basis for comparison and evaluation but it should be noted that most apprenticeship programs extend the maximum age limit for veterans (as a rule up to a maximum of four years). Journeyman Status: The training and experience of the Navy Electrician's Mate is similar to the training/experience required to become a Construction Electrician in the civilian sector. Additional training would probably be needed in commercial, residential and industrial calculations and procedures, and familiarization with the National Electrical Code stipulations. Credit for Navy training or experience may be granted on an individual basis by local apprenticeship committees.
Other	Mandatory: Good color vision. Desirable: Manual dexterity; agility; mechanical ability.	Normal color perception is required of personnel in this Navy rating.

Military-Civilian Job Function Comparability: Comparability in job functions is high. Both civilian and military personnel work with common electrical equipment such as motors, generators, wiring, transformer, voltage and frequency regulators, controllers, appliances, and electrical measuring and testing devices. However, Navy personnel tend to perform maintenance functions to a greater degree than do civilian Construction Electricians. Also, Navy personnel do not have to be as concerned with national, state or local electrical codes as do civilian Construction Electricians; however, they do abide by service codes and regulations.

TABLE 1

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR ELECTRICIAN'S MATE WITH THE TRAINING EXPERIENCE OF NAVY ELECTRICIAN'S MATE - EM

Requirement Categories	Civilian Employment Standards [1]	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma or equivalent certificate; courses in mathematics and physics. Comments: A high school diploma is often needed to enroll in courses related to electricity and electronics at public or private technical schools, institutes or community colleges.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education (ACE), Office on Educational Credit recommends for the Electrician's Mate Class A School: (1) Six semester hours in electricity and electrical laboratory at the vocational certificate level or at the technical associate degree level, and (2) three semester hours in industrial education at the baccalaureate degree level. For the Basic Electricity and Electronics School ACE recommends: (1) Three semester hours in basic electricity at the vocational certificate level or at the technical associate degree level, and (2) two semester hours in basic electricity at the baccalaureate degree level.
Vocational Technical Training	Desirable: Post-secondary technical courses at public or private technical schools, institutes or community colleges. The typical curriculum in electric appliance servicing may last from six months to two years and usually includes such topics as fundamentals of electricity, electric wiring, test equipment, trouble-shooting, tools, electric motors, small engines, the servicing of small applicances (irons, toasters, mixers, blenders, vacuum cleaners, etc.), or the servicing of larger appliances (ranges, clothes washers, dishwashers, waste disposals, refrigerators, freezers, air-conditioners, etc.). Comments: Appliance manufacturers or major distributors often run technical training programs for their service people. However, training or experience prerequisites may exist for initial hire. Courses by manufacturers often provide in-depth training and specialization in a specific product line. The initial training period, generally six to 12 months, includes both practical "hands on" experience and classroom instruction.	Formal Training: Electrician's Mate Class A School provides 12 weeks of training covering the topics of safety precaution and first-aid, test equipment, introduction to rotating machinery, AC/DC generators, blueprints, transformers, maintenance and material management, synchros, amplifiers, degaussing equipment, regulating devices, cables, lighting, motors, basic electron/atomic semiconductor theories, circuits, rectifiers, transistors, multivibrators, and electronic pulse counters. Basic Electricity and Electronics School provides a self-paced curriculum (of approximately 21 days) covering electrical current, voltage, resistance, voltage and current in series circuits, relationships of current, voltage, and resistance, parallel and series-parallel circuits, induction, transformers, capacitance, and resistant-reactive circuits. Training gained as a Navy Electrician's Mate covers much of the electrical theory included in a typical post-secondary curriculum in electric appliance servicing. Familiarity with specific types of electrical equipment would probably be obtained from related Navy work experience. In general, the formal training received by Electrician's Mates would be excellent preparation for more advanced courses in electricity and electronics or provide adequate prerequisite knowledge for further training given by an appliance manufacturer or distributor in the civilian sector.
Previous Experience	Mandatory for Many Employers: Some experience in installing, disassembling, rebuilding or repairing small or large electrical appliances. Comments: Many servicemen start as helpers and acquire skills through on-the-job training. Progression is gradually made from performing simple repair jobs, like replacing switches, to more complex tasks, like adjusting washer controls. Approximately three	The experience gained as a Navy Electrician's Mate would provide some portion of the three years' experience usually needed to become a fully qualified Appliance serviceman in the civilian sector. Navy experience would have to be evaluated on an individual basis to determine the specific applicability of Navy occupational tasks and the similarity of equipment involved.

TABLE 15 (cont)

Requirement Categories	Civilian Employment Standards	Comparison or Evaluation of Military Occupation
Previous Experience (cont)	years' on-the-job experience is needed to become fully qualified. Formal courses in appliance servicing can shorten this period.	
License Certification	Mandatory: If the position involves making service calls in company motor vehicles the employee must possess or obtain a valid motor vehicle operator's license, chauffeur's license, or classified license (designating specific categories of vehicles), depending on the state issuing the license.	No basis for comparison and evaluation.
Union Apprenticeship Journeyman	No union is commonly associated with this occupation. Apprenticeship programs which are in existence have been established by appliance manufacturers or service agencies and usually combine on-the-job training with demonstrations or correspondence courses geared to a specific type of equipment. Such programs usually include instruction and supervised work experience in one or more of the following areas: delivery and pickup of appliances, installation of appliances, laundry equipment, refrigeration equipment, ranges, dishwashers, water heaters, disposals, freezers, water coolers, dehumidifiers and air-conditioners (central or window).	Navy training and experience in this rating should provide good background for entrance into an apprenticeship program in the civilian sector which will build upon fundamental knowledge of basic electricity and electronics and the repair of common electric appliances.
Other	Mandatory: Good color vision. Desirable: Manual dexterity; mechanical ability.	Normal color perception is required of personnel in this Navy rating.
Military-Civilian Job Function Comparability:	Comparability in job functions is high. Both the Navy Electrician's Mate and the civilian Electric Appliance Serviceman diagnose, check, disassemble, reassemble, repair, clean, and/or install electric appliances. Navy Electrician's Mates may perform additional duties such as watchstanding, general inspections, or operation of equipment such as film projectors. Differences occur in the proportion of maintenance vs. installation performed (Electrician's Mates may perform less installation tasks), in customer service functions (which only civilian personnel perform), and in the types of models of equipment worked with.	

1/ These Standards exclude information on Radio or Television Servicemen which often involves slightly different training curricula and may require a state or local license.

TABLE 16

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR INDUSTRIAL MACHINE REPAIRMAN WITH THE TRAINING/EXPERIENCE OF NAVY MACHINIST'S MATE - MM

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Entrance into Some Apprenticeship Programs: A high school diploma or equivalent certificate (see Union Apprenticeship/ Journeyman category below). Desirable: Some high school education; courses in mathematics.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational/Technical Training	Desirable: Technical training in mechanical drawing, blueprint reading, or shop work.	Formal Training: A total of 400 hours of training, approximately 300 of which are job-skill related. Training is related to the areas of maintenance and repair of ship distilling plants, refrigeration and air-conditioning equipment, valves, pumps, condensers, main propulsion equipment, and remote auxiliary equipment. This training is excellent background for further training in the civilian occupation of Industrial Machine Repairman.
Previous Experience	Desirable: Experience involving the maintenance or repair of machinery or industrial equipment; experience in following blueprints, lubrication charts or engineering specifications.	The experience gained as Navy Machinist's Mate is excellent background for the work performed by civilian Industrial Machine Repairmen.
License/Certification	No license or certificate is needed to carry out the functions this occupation.	No basis for comparison and evaluation.
Union Apprenticeship/ Journeyman	Labor unions commonly associated with this occupation are the Allied Industrial Workers of America International Union, the International Association of Machinists and Aerospace Workers, the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America, the United Steelworkers of America, and the International Union of Electrical, Radio and Machine Workers. While Industrial Machine Repairmen can start as helpers and accumulate skills of the trade informally through several years of experience, there are formal apprenticeship programs in existence. The typical program is formulated by a joint labor-mangement apprenticeship committee and, for this trade, consists of approximately 8,000 hours of work experience over a 4-year period supplemented by approximately 144 hours of classroom instruction per year for each of the four years.	The training and experience of the Navy Machinist's Mate would be very adequate preparation for work in the civilian sector as Industrial Machine Repairman apprentice or helper. Journeyman status would probably require more training and experience. Apprenticeship Entrance Requirements: There is little basis for comparison and evaluation, but it should be noted that special exceptions can be given to applicants who have unusual qualifications but who meet only minimum requirements. Journeyman Status: The training and experience of Navy Machinist's Mates covers topics related to tools, hydraulics, blueprint reading, and safety but does not cover such areas as milling machine, grinding, bench and floor work, welding, physics, mathematics, or shop drawing. Credit for previous training and experience is given on an individual basis by local union apprenticeship committees.

TABLE 16 (Cont)

Occupational Category	Civilian Employment Standards	Comparison and Evaluation of Military Occupations
Industrial Machinery Repairman (Cont)	Apprenticeship Entrance Requirements: Typical qualifications for apprenticeship include (1) having a high school diploma or equivalent certificate, (2) being between the ages of 18 and 26, unless state requirements are otherwise, and (3) being physically able to perform the duties of the trade as determined by a physical examination. In addition, some local apprenticeship committees evaluate applicants on the basis of education, work experience, tests (aptitude, mechanical, or interest), and a personal interview. Journeyman Status: A total of 8,000 hours of work experience must be completed over a four-year period in the following areas: tool crib, shaper, planer or slotter, engine lathe, milling machine, grinding, bench and floor work, and hydraulics. Related classroom instruction includes shop mathematics, blueprint reading, safety instructions, machine tool operation theory, shop drawing, elementary physics, welding, and machine design.	
Other	Desirable: Good physical condition; manual dexterity; mechanical aptitude.	No basis for comparison and evaluation.

Military-Civilian Job Function Comparability: Comparability in job functions is high. Both the Navy Machinist's Mate and the civilian Industrial Machine Repairman maintain and repair machinery and other mechanical equipment and regularly inspect, clean, oil or grease machinery to prevent breakdown. However, in the civilian sector, Industrial Machine Repairmen may work on many different types of machines depending upon the industry for which they work. Therefore, the civilian repairman may be able to perform more diverse functions, especially if he or she has been exposed to different equipment in a number of industrial settings. In addition, civilian repairmen at the journeyman level may have more experience than Navy Machinist's Mates in machine shop functions requiring welding, grinding, milling machine or lathes.

TABLE I-1

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR STATIONARY ENGINEER WITH THE TRAINING EXPERIENCE OF NAVY MACHINIST'S MATE - MM

Occupational Requirements	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Entrance Into Most Apprenticeship Programs: A high school diploma or equivalent certificate. (See Pattern Apprenticeship Journeyman category below). Desirable: A high school diploma or equivalent certificate; courses in physics, chemistry and mathematics.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational Technical Training	Desirable for Entrance Into an Apprenticeship Program: Vocational training in machine-shop practice, mechanical drawing, applied electricity, blueprint reading, use of hand and power tools. Comments: It is possible to start as a helper to licensed Stationary Engineers and gradually accumulate the knowledge and skills needed to perform the full range of required duties, but most training authorities recommend formal apprenticeship programs because of the increasing complexity of the machines and systems. Also, many states and cities have licensing requirements which include the passing of a written and/or oral examination which requires knowledge and training in specific areas of boiler room operations. (See License/Certification category below.)	Formal Training: A total of 400 hours of training, approximately 300 of which are job-skill related. Training is related to the areas of maintenance and repair of ship distilling plants, refrigeration and air-conditioning equipment, valves, pumps, condensers, main propulsion equipment, and remote auxiliary equipment. The training received by Navy Machinist's Mates includes all of the topics that are desirable background for the Stationary Engineer occupation. Formal training in any one of the topics is not extensive; when combined with on-the-job training, however, the formal training of Machinist's Mates is more than adequate for entrance into apprenticeship programs.
Previous Experience	Desirable for Entrance Into an Apprenticeship Program: Experience on jobs involving blueprint reading, use of hand and power tools, knowledge of pumps and piping, work with refrigeration heating ventilating air-conditioning systems, or knowledge of boilers and steam systems. Comments: Stationary Engineers often enter this occupation initially as Firemen (Boiler) who operate, maintain, and tend boilers. They then advance to the engineer level with the accumulation of knowledge about a variety of equipment and systems.	The experience gained as a Navy Machinist's Mate provides preparation for entrance into the civilian Stationary Engineer occupation. Experience includes most, if not all, topics seen as desirable for entrance into an apprenticeship program for Stationary Engineers.
License/Certification	A number of states and many cities have licensing requirements for Stationary Engineers. Requirements differ among localities, but in general applicants must be a minimum age, must reside for a specified time in the state or locality, and must meet experience requirements to take the appropriate written and/or oral examination. The National Institute for the Uniform Licensing of Power Engineers, Inc. has established a national voluntary program through which one can establish a level of competence and professionalism in the power engineering field. For a Third Class Engineer license (the lowest of three categories of licenses) the requirements are	The training and experience received by Navy Machinist's Mates will be helpful in meeting some of the licensing requirements for Stationary Engineers. However, residency requirements, or requirements for knowledge of local safety codes may have to be met before the licensing examination(s) can be taken. State and/or city laws governing the occupation of Stationary Engineer must be consulted to ascertain the amount of military training and experience that is applicable.

Table 17 (Cont)

Civilian Occupation	Civilian Employment Factors	Comparison and Evaluation of Military Occupations
[illegible]	(1) a minimum age of 20 years, (2) a high school diploma or GED, (3) three years in an approved apprenticeship or on-the-job training program, (4) three years of experience and (5) the passing of written, oral and practical examinations.	
[illegible]	Among the unions to which Stationary Engineers belong are the International Union of Operating Engineers (IUOE) and the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America. A National Joint Apprenticeship and Training Committee for Stationary Engineers, made up of representatives of IUOE and management, has formulated guidelines for an apprenticeship program of approximately 8,000 hours over a four-year period. Apprenticeship Entrance Requirements: The National Joint Apprenticeship Committee specifies that the apprentice must (1) be at least 18 and not over 21 years of age, (2) have sufficient education (high school diploma or certificate of equivalency) to satisfactorily complete the necessary related theoretical instruction, (3) be physically able to perform the work of the trade, (4) meet other entrance requirements that may be established by the local joint committee. Journeyman Status: Completion of approximately 8,000 hours of work experience over a four-year period covering hand, portable and power tools; boilers and steam systems; pump, piping and compressed gas systems; refrigeration, heating, ventilation and air-conditioning; electricity; industrial relations and supervision. In addition, approximately 144 hours of related classroom instruction per year for each of the four years must be completed.	Apprenticeship Entrance Requirements: There is little basis for comparison and evaluation of the training and experience of Navy Machinist's Mates with the requirements for entry into an apprenticeship program for Stationary Engineers. Local apprenticeship committees do have the right, however, to waive the maximum age limit to admit veterans. Navy Machinist's Mates should also be physically able to perform the work of the trade. Journeyman Status: Local apprenticeship committees have the option of granting credit toward journeyman status once an applicant has been accepted into the apprenticeship program. Training and experience gained as a Navy Machinist's Mate in such areas as distilling plants, refrigeration and air-conditioning, valve, pump and condenser maintenance and repair, propulsion operations, shop practices, and use of hand tools may be acceptable to the local apprenticeship committee.
Other	Desirable: Manual dexterity; good physical condition; mechanical aptitude.	No basis for certain comparison or evaluation, but persons with recent experience as a Navy Machinist's Mate probably have manual dexterity, good physical condition and mechanical aptitude.

Military-Civilian Job Function Comparability: Comparability of job functions is high. Both the civilian Stationary Engineer and the Navy Machinist's Mate probably test, maintain and repair a variety of equipment including propulsion equipment, pumps, elevators, piping, heating, ventilation and air-conditioning equipment. These occupations probably differ most in the fact that the Navy environment for the work of a Machinist's Mate is unique and in the fact that the specific equipment worked on is not entirely the same as that used in the civilian sector.

TABLE 18

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR AIR CONDITIONING AND REFRIGERATION MECHANIC WITH THE TRAINING EXPERIENCE OF NAVY MACHINIST'S MATE - MM

[illegible]	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma or equivalent certificate; courses in mathematics, physics and blueprint reading.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational Technical Training	Desirable for Entrance into Some Apprenticeship Programs: (1) Vocational training in mechanical drawing, applied electricity, electronic testing devices, blueprint reading and the use of hand and power tools, and or (2) completion of a formal technical training course. Comments: A variety of technical training courses exist and generally include approximately 1,000 hours of classroom and laboratory training. Subjects covered include basic electricity, applied physics, basic refrigeration, commercial refrigeration, comfort cooling, heating, industrial refrigeration and air conditioning systems.	Formal Training: A total of 400 hours of training, approximately 300 of which are skill-related. Training covers service, maintenance, repair and test of ship distilling plants, refrigeration and air conditioning equipment, valves, pumps, condensers, main propulsion equipment, and remote auxiliary equipment. Specific training in refrigeration and air conditioning equipment provides excellent background for civilian training in this field. Other training provides generally helpful mechanical knowledge.
[illegible] Experience	Desirable: Experience involving the use of hand and power tools, testing devices, blueprints, schematic diagrams, engineering specifications and electrical troubleshooting techniques.	The experience gained as a Navy Machinist's Mate is excellent background for general mechanical work. Only portions of this experience will be directly transferable to the work of an Air Conditioning and Refrigeration Mechanic, but all of this experience will be generally helpful.
License or Certification	Some states and municipalities have licensing and/or certification requirements. A typical example is the state of Connecticut where a journeyman license is required in order to perform independent work for a licensed air conditioning and refrigeration equipment contractor. An applicant for a journeyman license must: (1) be 18 years of age; (2) have worked as an apprentice for two years; (3) submit notorized statements of competency from employers. Credit can be granted for military experience. Comments: The term journeyman usually refers to union status. The state of Connecticut uses the term to denote a licensed status which permits a mechanic to perform independent work for a licensed contractor.	The training and experience received by a Navy Machinist's Mate will be helpful in meeting some of the licensing requirements for civilian Air Conditioning and Refrigeration Mechanics. However, residency requirements or knowledge of local safety codes may have to be met before licenses can be awarded. State and/or city laws governing the occupation of Air Conditioning and Refrigeration Mechanic must be consulted to ascertain the amount of military training and experience that is applicable.

TABLE I (Cont)

[illegible]	Civilian Employment Standards	Comparison or Evaluation of Military Occupation
[illegible]	...ers of the unions to which Air Conditioning and Refrigeration Mechanics belong are the Sheet Metal Workers' International Association, the United Association of Journeyman and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada, and the International Brotherhood of Electrical Workers. There are no national apprenticeship guidelines but locals may have their own apprenticeship programs. The Associated Builders and Contractors, Inc., a professional organization, has recommended a four-year classroom instruction program which includes 576 hours of instruction covering such subjects as: basic refrigeration cycle, physical properties of gases, temperature measurement, copper tubing and fittings, heat transfer, refrigeration valves, refrigerants and driers, operating cycles, basic electricity, heating systems, refrigeration oils, electric and pneumatic control circuits, power wiring, advanced electricity, starters, motors, accessories, refrigerant piping, absorption, welding, load calculations, and energy conservation. This program may be considered to be typical of apprenticeship classroom instruction. Journeyman status can generally be attained after four to five years of training as an apprentice. The actual requirements for journeyman status are determined locally.	There is little basis for certain comparison and evaluation of the training and experience of Navy Machinist's Mates with requirements for entry into a local apprenticeship program. However, maximum age limits for admittance can usually be waived for veterans and Navy Machinist's Mates should be physically able to perform the work of the trade. Journeyman Status: Some credit toward journeyman status can be granted for military training and experience. Local requirements dictate the amount of credit that can be awarded. The Navy Machinist's Mate's training and experience in the service, maintenance, repair and test of air conditioning and refrigeration equipment, valves, pumps, and condensers may be acceptable to local apprenticeship committees.
[illegible]ther	Desirable: Good physical condition, manual dexterity and mechanical aptitude.	No basis for certain comparison and evaluation, but persons with recent experience as a Navy Machinist's Mate probably have mechanical aptitude, manual dexterity and good physical condition.

Military-Civilian Job Function Comparability: Comparability of job functions is high although the civilian Air Conditioning and Refrigeration Mechanic spends all of his time on air conditioning and refrigeration equipment, while the Navy Machinist's Mate spends only a portion of his time on such equipment. These occupations probably differ most in the fact that the Navy environment for the work of a Machinist's Mate is unique and in the fact that the specific equipment worked on is not entirely the same.

TABLE 19

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR CLERK TYPIST SECRETARY WITH THE TRAINING/EXPERIENCE OF NAVY YEOMAN - YN

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Most Employers: High school diploma or equivalent certificate. Desirable: Business school, junior college, or college study, preferably in a combination business liberal arts curriculum; high school diploma or college degree preferred.	A high school diploma can be obtained by attending voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends credit for three semester hours of typing on the basis of a proficiency examination at the vocational certificate level or technical associate degree level for formal training in this rating.
Vocational/Technical Training	Mandatory for Most Employers: Clerk Typist-training in typing to attain minimum speed of 40-45 words per minute (wpm). Secretary-training in typing to attain minimum speed of 50-60 wpm; training in taking dictation to attain minimum speed of 100-140 wpm (shorthand or stenotype machine may be used). Either position-training in English grammar, punctuation, capitalization, spelling, word usage, and business writing formats and conventions; basic arithmetic skills; use of common office machines. Desirable: Basic arithmetic skills, bookkeeping, accounting, business law, office procedures, business administration, data processing procedures and applications, and dictaphone transcription. Comments: Training does not have to be obtained in school, except, in general, training in typing and shorthand. Demonstration of the necessary skills is of major importance. People may start in a lower-level office clerk position and learn clerk typist or secretarial skills on the job and through independent study. The more training a person has, however, the better (more responsibility, higher salary) the entry-level position he or she can obtain.	Formal Training: Yeoman Class "A" school is a self-paced course completed over a period of 4 to 7 weeks. Topics include typing, naval correspondence, officer service records, legal information, special Navy systems such as the Enlisted Performance Evaluation System and the Manpower and Personnel Management Information System. Good background preparation for the occupation of Clerk Typist or Secretary is provided in training for Navy Yeomen, particularly in the areas of English language usage for correspondence and in typing. However, Class A training alone may not give Yeomen the degree of expertise in some skill areas generally required for civilian clerk typist or, especially, for civilian secretarial positions. For example, the minimum typing speed required of entry-level Yeomen is 20 wpm. Yeomen have the opportunity to improve their typing and other skills on the job and through independent study. Yeomen would need training in shorthand or stenotyping to qualify for many secretarial positions.
Previous Experience	Desirable: Experience in typing, shorthand, filing, bookkeeping, accounting, office procedures, business administration, data processing procedures or dictaphone transcription. Comments: Experience is not essential to enter the field for people who have at least the basic skills listed above. Many organizations will hire Clerk Typists who have the adequate typing skills and train them in office procedures, etc., on the job. Many organizations also have "junior secretary"	Experience as a Navy Yeoman can provide excellent preparation for civilian employment, particularly as a Clerk Typist, and also as a Secretary in positions that do not require shorthand. Specifically, Yeomen gain experience in office systems and procedures, English usage for correspondence and other business writing, typing, organization and maintenance of files and reference materials such as official publications, operation of office machines, and routine minor maintenance of typewriters and duplicating equipment. Yeomen also learn legal terminology, which, with other skills, may equip them to specialize in legal work as a Typist or Secretary.

TABLE 19 (cont)

Job Element Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Previous Experience (cont)	positions that provide people who have the basic secretarial skills with an opportunity to gain experience on the job. Performance is usually more important than the number of years of experience in obtaining promotions.	
License/Certification	No license or certification is needed to carry out the functions of these occupations. Comments: The National Secretaries Association administers an examination to become a Certified Professional Secretary. The examination covers personal adjustment and human relations, business law, business administration, secretarial accounting, secretarial skills, and secretarial procedures. Although certification is not a requirement for employment, it may increase an applicant's chances of getting a high-level job.	The training and experience of Navy Yeomen may provide some help in passing some parts of the National Secretaries Association examination such as secretarial skills, secretarial procedures and business administration, but additional skills or experience would probably be necessary to successfully pass all parts of the examination. A study outline and bibliography of books to be used in preparation for the examination is distributed by local chapters of the National Secretaries Association.
Union Apprenticeship/ Journeyman	Union membership is not associated with entry into the occupation of Clerk Typist or Secretary. Comments: There are unions, but relatively few office clerical workers are members (estimated 8% in 1973). Some employees in this occupation are members of the Office and Professional Employees International Union. Some government employees may belong to state, local, and municipal employee unions.	No basis for comparison and evaluation.
Other	Desirable: Ability to get along well with others; willingness and ability to accept responsibility; initiative; good judgment in decision-making; ability to listen, take orders, and follow through without supervision; ability and willingness to do detailed work; good memory; patience; promptness; good grooming.	The same attributes are important for success in the occupation of Yeoman.
Military-Civilian Job Function Comparability:	Comparability in job functions is high, except that Yeomen generally do not learn to take dictation, at least in the first term of enlistment. Depending upon the individual and the specific assignment, a Yeoman's work could vary from clerk typist to secretarial duties. Clerk Typists and Secretaries both must type faster than the minimum speed of Yeomen, but Yeomen have the opportunity to increase their typing speed. Yeomen have ample opportunity to perfect skills in office procedures, English usage, record keeping, filing, and office machine operation.	

TABLE 20

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR OFFICE MANAGER WITH THE TRAINING/EXPERIENCE OF NAVY YEOMAN - YN

Requirement Categories	Civilian Employment Standards [1/]	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Most Employers: High school diploma or equivalent certificate; some business school, junior college, or college training in business subjects. Desirable: Bachelor's degree in Business Administration. Comments: It is recommended that a college preparatory curriculum be followed in high school, with electives from business-related courses such as typing, shorthand, bookkeeping, accounting, and data processing. Education requirements vary with the size and kind of organization in which the individual wants to work. Large corporations require more education. Small businesses and family-operated businesses usually do not require as much education; in these cases, a two-year degree from a business college, junior college, or other program is usually considered sufficient.	A high school diploma may be obtained by attending voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends credit for three semester hours of typing on the basis of a proficiency examination at the vocational certificate level or technical associate degree level for formal training in this rating.
Vocational/Technical Training	Mandatory for Most Employers: Training in office management and procedures, personnel management, bookkeeping, accounting, English, business letter and report writing, business law, and use of office machines. Desirable (often mandatory for employment with larger firms): In addition to mandatory requirements, above, training in personnel management, psychology, individual and corporate tax, insurance, data processing applications for business, principles of economics, and marketing. Comments: Training in typing, shorthand, individual and corporate tax, and insurance may be required or desirable, particularly for people working in smaller firms or managing their own small businesses because Office Managers in small organizations usually have a wider range of responsibility.	Formal Training: Yeoman Class "A" school is a self-paced course completed over a period of 4 to 7 weeks. Topics include typing, naval correspondence, officer service records, legal information, special Navy systems such as the Enlisted Performance Evaluation System and the Manpower and Personnel Management Information System. The training received by Navy Yeomen is good background preparation for the civilian Office Manager profession, particularly in the areas of English language usage needed for correspondence and report writing, general office procedures, use of office machines, record keeping, and typing.
Previous Experience	Desirable: Wide-ranging business experience. Comments: There are no fixed experience requirements. However, beginners usually start in less authoritative office positions and work up to Office Manager. Promotions to Office Manager usually are based more on performance than time-in-service. The more diversified a person's experience, the more valuable it will be because of exposure to different kinds of office procedures and systems, problems, and problem-solving approaches.	Experience as a Navy Yeoman enhances a person's background for the profession of Office Manager. Yeoman experience offers an opportunity to develop skills and learn office systems and procedures. In terms of "learning the business from the group up", Yeoman experience is a good beginning experience for the occupation of Office Manager.

TABLE 20 (Cont)

Requirement Categories	Civilian Employment Standards[1]	Comparison and Evaluation of Military Occupation
License/Certification	No license or certification is needed to carry out the functions of this occupation.	No basis for comparison and evaluation.
Union Apprenticeship/ Journeyman	Union membership is not associated with entry into this occupation.	No basis for comparison and evaluation.
Other	Desirable: Willingness and ability to accept heavy responsibility and to work long hours when necessary; good organizational skills; aptitude for detailed work; ability to concentrate for long periods of time; good memory; good speaking and writing skills; capacity to form good working relationships with all kinds of people; tact; leadership potential.	The job of Yeoman calls for a number of similar attributes—in particular, good organizational skills, aptitude for detailed work, ability to concentrate, good memory, and capacity to get along well with others. These attributes may need to be developed, along with confidence and leadership skills, for the more demanding functions of the position of Office Manager.

Military-Civilian Job Function Comparability: Comparability in job functions is moderate. Navy Yeomen and civilian Office Managers work in similar environments and therefore have basic office skills and knowledge in common. For example, both jobs require knowledge of office procedures, materials, and equipment; both require recordkeeping skills and knowledge of standard English usage, etc. However, the Office Manager exercises more supervisory functions, while the Navy Yeoman must be proficient in clerical skills, especially during the first term of enlistment. The work of the Yeoman would be more comparable to the work of an employee who is supervised by an Office Manager.

[1] The Civilian Employment Standards cover the position commonly known as Office Manager, which is a general title. Other titles may be given to personnel in this occupation, including "Office Administrator" and "Director of Administration". Sometimes an "Administrative Assistant" performs the functions of Office Manager.

TABLE 21

COMPARISON OF CIVILIAN EMPLOYMENT STANDARD FOR SHORTHAND REPORTER WITH THE TRAINING/EXPERIENCE OF NAVY YEOMAN - YN

Requirement Categories	Civilian Employment Standards 1/	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Most Employers: High school diploma or equivalent certificate. Desirable: Junior college or university study to gain a broad knowledge of a variety of subjects.	A high school diploma can be obtained by attending voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends credit for three semester hours of typing on the basis of a proficiency examination at the vocational certificate level or technical associate degree level for formal training in this rating.
Vocational/Technical Training	Mandatory for Most Employers: Technical training in stenography, English language word usage, grammar, spelling, punctuation, and legal and medical terminology. Comments: There is no formal requirement to complete a training program. However, training is necessary to develop job skills, especially stenotyping. The following training standards have been established by the National Shorthand Reporters Association (NSRA): (1) sufficient training in stenotyping (use of a shorthand machine) to attain minimum speed of 225 words per minute (wpm); (2) sufficient training in typing to attain minimum speed of 60 wpm; (3) training in standard English usage including word study, grammar, punctuation, spelling, and capitalization; (4) training in principles of civil and criminal law, legal terminology including common Latin phrases, rules of evidence, court procedures, the duties of the court reporter, and professional ethics; (5) elementary anatomy and physiology, and medical word study including prefixes, suffixes, roots. People can enter the field with lower stenotyping speeds (minimum generally agreed to be 180 wpm). Usually this is done by joining freelance agencies, which give beginners less taxing assignments such as preparing transcripts from notes of another shorthand reporter, taking statements of accident witnesses in insurance investigations, taking depositions (sworn statements given by witnesses before a trial). However, experience of this kind is not considered an adequate substitute for training.	Formal Training: Yeoman Class "A" school is a self-paced course completed over a period of 4 to 7 weeks. Topics include typing, naval correspondence, officer service records, legal information, special Navy systems such as the Enlisted Performance Evaluation System and the Manpower and Personnel Management Information System. The training received by Navy Yeomen is good background preparation for the civilian Shorthand Reporter profession, particularly in the areas of English language usage needed for correspondence and in legal terminology. Additional training would be needed in stenography and/or in the use of stenotyping machines.
Previous Experience	Mandatory for Official Reporters in U.S. District Courts: Applicants for these appointments (full-time, permanent jobs) must have at least four years' court reporting experience as a freelancer, or four years as an official court reporter in a lower court, or four years' experience by a combination of the two. Comments: Although there is no formal experience requirement other than that noted above, people in the field estimate that it takes at least a year of experience on the job, after training, to become a truly proficient Shorthand Reporter.	While experience as a Navy Yeoman provides a good background for stenographer work in the areas of English grammar, spelling, word usage, punctuation, etc., specific experience in stenography must be obtained to qualify for shorthand reporting work in the civilian sector.

TABLE 21 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License/Certification	Mandatory for Official Reporters in U.S. District Courts: A Certificate of Proficiency issued by NSRA. Mandatory for Some States: Approximately 12 states by law require a person to take an examination to become a Certified Shorthand Reporter (CSR); approximately 12 other states have examining boards or committees which ordinarily administer some type of examination. Desirable: A Certificate of Proficiency or a Certificate of Merit issued by NSRA. Comments: The CSR examinations differ among various states but most measure dictation speed and accuracy of transcription. The requirements in states governed by boards or committees are extremely varied, with each board or committee defining its own regulations. The NSRA Certificate of Proficiency examination requires the taking of dictation at speeds of 180 to 225 wpm depending on the type of material dictated. The NSRA Certificate of Merit examination requires dictation speeds of 200 to 260 wpm. Final scores are based on recorded speed adjusted by (1) closeness of transcript to what was said (errors include wrong words, omissions, use of contraction in place of two words, and the reverse); (2) accuracy in punctuation in context of meaning of material; and (3) accuracy in spelling.	Training and experience as a Yeoman is useful only if a person has stenographic skills adequate to consider applying for certification.
Union Apprenticeship/ Journeyman	Union membership is not associated with entry into this occupation.	No basis for comparison and evaluation.
Other	Ability to sit and to concentrate for long periods of time; patience; good hearing; good vision; generally good health; punctuality; attention to detail; broad background of general knowledge.	The job of Yeoman calls for many of these personal attributes. However, they are generally of more critical importance for Shorthand Reporters because of the sustained intensity of effort that often is required in reporting work.

Military-Civilian Job Function Comparability: Comparability in job functions is low. While Navy Yeomen and civilian Shorthand Reporters both need skills in English usage, grammar and legal terminology, the Shorthand Reporter must be proficient in stenographic skills and be familiar with various types of stenotyping equipment.

1/ The Civilian Employment Standards cover the general position of "Shorthand Reporter" which is a broad title for the entire stenographic field. There are several specialties: court reporter, hearing reporter, legislative reporter, and general or freelance reporter. However, professional requirements for these specialties generally are the same.

III. COMPARISONS OF THE TRAINING/EXPERIENCE OF MARINE CORPS OCCUPATIONAL SPECIALTIES WITH THE EMPLOYMENT STANDARDS FOR RELATED CIVILIAN OCCUPATIONS

TABLE 22

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR AUTOMOBILE MECHANIC WITH THE TRAINING EXPERIENCE OF MARINE CORPS AUTOMOTIVE MECHANIC - MOS 3516

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Some Employers or for Entrance into Some Apprenticeship Programs: A high school diploma or equivalent certificate. Desirable: A high school diploma or equivalent certificate; courses in science, mathematics, business arithmetic. Comments: A high school diploma is more important for those applicants who have no experience.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational/Technical Training	Desirable: Vocational courses in automobile repair, construction or operation. Comments: Many high schools, vocational schools and technical institutes offer courses in automobile repair work. The typical vocational school curriculum in automotive technology includes engines, fuel systems, electrical systems, power trains and brakes, steering, alignment suspension, automatic transmission, and air conditioning. Graduates of technical schools are usually in great demand because of the need for skilled mechanics at the entrance level. Even the mechanic who learns the trade strictly by on-the-job training usually must attend night vocational school or courses conducted by the manufacturer to acquire the needed technical skills. Once hired, mechanics are often sent to factory training centers to receive training on specific equipment. Manufacturers also send representatives to local shops to conduct short training sessions.	Formal Training: Approximately 500 hours of formal training, 400 hours of which are MOS skill-related. Topics include: introduction to mechanical training, tools, power plants, ignition systems, automotive fuel systems, electrical systems, compression, transmission systems, chassis, brakes, suspension systems, maintenance equipment training and management operations. All formal training should provide excellent mechanical background for work as a civilian Automobile Mechanic. The equipment worked with is very similar and, in some cases, identical.
Previous Experience	Desirable: Experience in automobile repair gained from working as a gasoline service station attendant; from working in a mechanic's shop or in the Armed Forces; or from working on automobiles as a hobby. Comments On-the-job experience in this field can be obtained by working as a mechanic's helper. Although beginners can make simple repairs after a few months, 3 to 4 years are required to become proficient in all types of repairs. An additional year or two is required to learn a particular specialty such as automatic transmission repair. Training authorities recommend a 3- or 4-year formal apprenticeship program as the best way to become a skilled automobile mechanic (see Union Apprenticeship/Journeyman section below). However, formal apprenticeship programs are not abundant.	The experience gained as a Marine Corps Automotive Mechanic will provide excellent background for general and specific skills needed by a civilian Automobile Mechanic.

TABLE 22 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License Certification	Mandatory for Most Employers: A valid motor vehicle operator's license or classified license (designating the operation of specific categories of motor vehicles), depending upon the state issuing the license. Desirable: A certificate from the National Institute for Automotove Service Excellence showing professional competence in automobile mechanic work. Comments: Two or more years of full-time experience as an automobile or truck mechanic are a prerequisite to taking the National Institute examinations. Substitution of formal training in automobile or truck mechanics may take the place of one year of work experience. Tests are given in eight different specialties: (1) engine repair; (2) automatic transmission; (3) manual transmission; (4) front end; (5) brakes; (6) electrical systems; (7) heating and air conditioning; and (8) engine tune-up. A person can be certified in any one of the eight areas, but, to be certified as a General Automobile Mechanic, one must pass all eight tests.	A prerequisite for training as a Marine Corps Automotive Mechanic is the possession of the psychological and physiological qualifications for licensing as a government motor vehicle operator. The training and experience of a Marine Corps Automotive Mechanic will satisfy the experience prerequisites for taking the National Institute examinations. The number of specialties in which he may choose to be examined will be determined by the degree of his military experience in each specialty. In some cases, he may have sufficent documented experience to seek certification in all eight specialties.
Union Apprenticeship Journeyman	Some Automobile Mechanics belong to such unions as the International Association of Machinists and Aerospace Workers, the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America, the Sheet Metal Workers' International Association, or the International Union, United Automobile, Aerospace, and Agricultural Implement Workers of America. Guidelines for apprenticeship programs have been formulated by joint labor-management apprenticeship committees. The typical program consists of 8,000 hours of work experience over a 4-year period supplemented by 144 hours of classroom training for each of the four years of apprenticeship. Apprenticeship Entrance Requirements: The applicant must be 18-30 years of age and physically fit for the work of the trade as evidenced by a doctor's certificate. Individual local apprenticeship committees may require an oral interview, the taking of an aptitude test, school transcripts or records of previous work. Journeyman Status: A total of 8,000 hours of work experience typically covering the following areas: shop routine, brakes, chassis, clutch and transmission, rear axle assembly, power plant, electrical system, motor analysis and miscellaneous areas such as fuel systems, distributors, auxiliary devices, shop operations, etc. Supplemental classroom instruction often includes shop arithmetic, benchwork and hand tool operations, lubrication, safety, inspection, welding, motor analysis and tool room machines.	Apprenticeship Entrance Requirements: There is little basis for comparison or evaluation but it should be noted that maximum age requirements are often extended for veterans. Journeyman Status: The training and experience of a Marine Corps Automotive Mechanic would provide excellent background in general automotive mechanical skills and an excellent understanding of automotive power plants and systems. The transfer of specific skills should be accomplished with ease. The similarities of the work of military and civilian automotive mechanics may make it possible for local apprenticeship committees to allow full credit for military experience.
Other	Desirable: Good physical condition; manual dexterity; good mechanical ability.	No basis for comparison and evaluation although persons with recent experience as Marine Corps Automotive Mechanics can be presumed to be in good physical condition and have good manual dexterity and mechanical ability.

Military-Civilian Job Function Comparability: Comparability in job function is very high. Civilian Automotive Mechanics and Marine Corps Automotive Mechanics both perform work on automobile engines, systems and accessories. The tools and support equipment used by both groups are similar, if not identical. Work and inspection standards are essentially the same for both groups. The only apparent differences in job functions result from differences in the specific types of vehicles that are maintained.

TABLE 23

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR TRUCK MECHANIC WITH THE TRAINING/EXPERIENCE OF MARINE CORPS AUTOMOTIVE MECHANIC - MOS 3516

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma or equivalent certificate or at least two years of high school; courses in science and mathematics. Comments: A high school diploma is more important for applicants who have no experience. Aptitude tests are often given to applicants, especially by employers who run formal apprenticeship programs (see Union Apprenticeship Journeyman category below).	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational Technical Training	Desirable: Courses in automobile repair or machine shop work. Comments: Many technical and trade schools, area vocational technical institutes and high schools offer programs in automotive mechanics. Such courses are fully or partially applicable to truck mechanics positions. Courses may last from one semester to two full years. Courses cover gasoline engines, fuel systems, electrical systems, chassis and brakes, transmissions, air conditioning, shop procedures, diesel engines, diesel fuel and tune-up, truck electrical and carburetion systems, and truck drive trains. Graduates usually need additional on-the-job training before they become skilled mechanics.	Formal Training: Approximately 500 hours of formal training, 400 hours of which are MOS skill-related. Topics include: introduction to mechanical training, tools, power plants, ignition systems, automotive fuel systems, electrical systems, compression, transmission systems, chassis, brakes, suspension systems, maintenance equipment training and management operations. All of the above topics are good general preparation for the work of civilian Truck Mechanics. Additional training is needed to learn the specifications of trucks used in the civilian sector.
Previous Experience	Desirable for Entrance into an Apprenticeship Program: Experience in automobile, truck or bus maintenance or repair. Comments: Inexperienced and/or untrained personnel may learn this trade by working as helpers to experienced gasoline or diesel engine mechanics for a period of three to four years. Formal training will shorten this period so that only a brief period of on-the-job experience is needed to become a skilled mechanic.	The experience gained as a Marine Corps Automotive Mechanic provides good background for entry into an apprenticeship program for truck mechanics.
License Certification	Mandatory: If the mechanic's duties include driving the equipment on public roads, he or she must have a valid motor vehicle operator's license, chauffeur's license, or classified license (designating the operation of specific categories of motor vehicles) depending on the state issuing the license. Desirable: A certificate from the National Institute for Automotive Service Excellence showing professional competence as a Heavy-Duty Truck Mechanic. Comments: Two or more years of full-time experience as an automobile or truck mechanic are a prerequisite for the National Institute certification examinations. Substitution of formal training in automobile or truck mechanics may take the place of one year of work experience. Tests are given in six different specialties: (1) gasoline engine mechanic; (2) diesel engine mechanic; (3) drive train mechanic; (4) brakes mechanic; (5) suspension and steering mechanic; (6) electrical systems mechanic. It is possible to be certified in any one of the six areas, but to be certified as a General	A prerequisite for training as a Marine Corps Automotive Mechanic is the possession of the psychological and physiological qualifications for licensing as a government motor vehicle operator. The Marine Corps Automotive Mechanic receives training in the areas of maintenance and repair of gasoline engines, brakes, suspension and steering systems, and electrical systems. If the Marine Corps Automotive Mechanic can document two years of full-time work experience, it is possible that he could successfully pass one or more of the national certification examinations.

TABLE 24 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License Certification (Cont)	Heavy-Duty Truck Mechanic, one must pass the gasoline or diesel engine test plus all of the other four tests.	
Union Apprenticeship Journeyman	Truck mechanics commonly belong to labor unions such as the International Association of Machinists and Aerospace Workers, the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America, the Amalgamated Transit Union, the Sheet Metal Worker's International Association, the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America or the International Brotherhood of Electrical Workers. Guidelines for apprenticeship programs have been formulated by joint labor management apprenticeship committees. The typical program consists of 8,000 of work experience over a four-year period, plus 144 hours of related classroom instruction for each of the four years. The program outlined below, which was formulated by the American Trucking Association in conjunction with the first two unions mentioned above, is typical of apprenticeship programs designed for Truck Mechanics. Apprenticeship Entrance Requirements: The applicant must be 18 to 30 years of age; individual local apprenticeship committees may require an oral interview, the taking of an aptitude test, school grades transcript, or previous work records. Journeyman Status: A total of 8,000 apprentice work hours covering the following areas: electrical systems (1,000 hours), fuel (750 hours), cooling (500 hours), lubrication (500 hours), engine (1,500 hours), clutch (400 hours) transmission (500 hours), drive shaft and universals (250 hours), differential (250 hours), rear axle (250 hours), steering (250 hours), brakes (400 hours), wheels and rims (400 hours), accessories (500 hours), miscellaneous, including service calls, towing, miscellaneous small parts (300 hours). Supplemental classroom instruction includes wiring and ignition diagrams, hydraulics, blueprint reading, mathematics, precision instruments, power transmission, and business management.	Apprenticeship Entrance Requirements: There is little basis for comparison and evaluation but it should be noted that age ranges for apprenticeship entrance may be waived or extended for veterans by local apprenticeship committees. Journeyman Status: The training and experience gained by Marine Corps Automotive Mechanics provides background training and experience required to achieve journeyman status in the Truck Mechanic occupation. Credit for Marine Corps or other experience may be granted by local apprenticeship committees on an individual basis, but for some apprenticeship programs no more than two year's credit can be given.
Other	Desirable: Good physical condition, manual dexterity, good mechanical ability.	No basis for comparison or evaluation, although persons with recent experience as a Marine Corps Automotive Mechanic can be presumed to be in good physical condition, and to have manual dexterity and good mechanical ability.
Military-Civilian Job Function Comparability:	Comparability in job functions is generally high. Both civilian and military mechanics perform preventive maintenance and repairs on trucks. Marine Corps Automotive Mechanics may not, however, gain experience with some specific types of equipment that are used in the civilian sector.	

TABLE 24

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR DIESEL EQUIPMENT MECHANIC WITH THE TRAINING/EXPERIENCE OF MARINE CORPS AUTOMOTIVE MECHANIC - MOS 3516

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable. A high school diploma or equivalent certificate or at least two years of high school; courses in science and mathematics. Comments: A high school diploma is more important for those applicants with no experience. Aptitude tests are often given applicants, especially by employers who run formal apprenticeship programs.	A high school diploma can formally be obtained through participation in voluntary education programs.
Vocational, Technical Training	Desirable: Courses in automobile repair or machine shop work. Comments: Many technical and trade schools offer programs in diesel engine maintenance and repair lasting anywhere from six months to two years in length. Courses usually cover the disassembly, inspection and reassembly of all engine components, the diagnosis and repair of mechanical malfunctions, coverage of diesel engine accessories, along with some training in such areas as blueprint reading, hydraulics, and welding. Graduates, however, usually need additional on-the-job training before they become skilled mechanics. (See Previous Experience category below.)	Formal Training: Approximately 500 hours of formal training, 400 hours of which are MOS skill-related. Topics include: introduction to mechanical training, tools, power plants, ignition systems, automotive fuel systems, electrical systems, compression, transmission systems, chassis, brakes, suspension systems, maintenance equipment training and management operations. All of the above topics would be good general background preparation for the training needed by civilian Diesel Equipment Mechanics. However, additional training would be needed relating specifically to diesel engines and other diesel-powered equipment.
Previous Experience	Desirable for Entrance into an Apprenticeship Program: Experience in automobile, truck or bus maintenance repair; experience with the use or repair of diesel equipment. Comments: Inexperienced and/or untrained personnel may learn this trade by working as helpers or formal apprentices to experienced gasoline or diesel engine mechanics for a period of 3 to 4 years. If only gasoline engines are worked with, an additional 6 to 18 months of experience is needed on diesel equipment specifically. Formal vocational training will shorten this period so that only a brief period of on-the-job experience is needed to become a skilled mechanic.	The experience gained as a Marine Corps Automotive Mechanic would be good background for entrance into an apprenticeship program for Diesel Equipment Mechanics. However, experience would be lacking in knowledge of diesel engines and other diesel-powered equipment.
License Certification	Mandatory: If the mechanic's duties include driving the equipment on public roads, he or she must have a valid motor vehicle operator's license, chauffeur's license, or classified license (designating the operation of specific categories of motor vehicles), depending upon the state issuing the license. Desirable. If one works primarily on heavy-duty truck engines, a certificate from the National Institute for Automotive Service Excellence showing professional competence as a Heavy-Duty Truck Mechanic.	A prerequisite for training as a Marine Corps Automotive Mechanic is the possession of the psychological and physiological qualifications for licensing as a government motor vehicle operator.

TABLE 21 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License/Certification (Cont)	Comments: Two or more years of full-time experience as an automobile or truck mechanic are a prerequisite to taking the certification examinations. Substitution of formal training in automobile or truck mechanics may be made for up to one year of work experience. Tests are given in six different specialties: (1) gasoline engine mechanic, (2) diesel engine mechanic, (3) drive train mechanic, (4) brakes mechanic, (5) suspension and steering mechanic, and (6) electrical systems mechanic. A person can become certified in any one of the six areas, but to be certified as a General Heavy-Duty Truck Mechanic, one must pass the gasoline or diesel engines tests plus all of the other four tests.	The Marine Corps Automotive Mechanic receives training in the areas of maintenance and repair to gasoline engines, brakes, suspension and steering systems, and electrical systems. The areas of drive train mechanical work or diesel engine work are not covered fully in formal training. If the Marine Corps Automotive Mechanic can document two years of full-time work experience, it is possible that he could successfully pass one or more of the national certification examinations.
Union Apprenticeship/ Journeyman	Diesel mechanics commonly belong to labor unions such as the International Association of Machinists and Aerospace Workers, the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America, the Amalgamated Transit Union, the Sheet Metal Workers' International Association, the International Union, United Automobile, Aerospace, and Agricultural Implement Workers of America, or the International Brotherhood of Electrical Workers. Guidelines for apprenticeship programs have been formulated by joint labor-management apprenticeship committees. The typical program consists of 8,000 hours of work experience over a four-year period supplemented by 144 hours of classroom training for each of the four years of apprenticeship. The program outlined below is geared toward diesel truck mechanics and was formulated by the American Trucking Association in conjunction with the first two unions mentioned above. Apprenticeship Entrance Requirements: The applicant must be 18 to 30 years of age; individual local apprenticeship committees may require an oral interview, the taking of an aptitude test, school grades, or previous work records. Journeyman Status: A total of 8,000 hours of work experience covering the following areas: Orientation-parts and accessories, parts requisitions, etc. (500 hours), motor overhaul (2,500 hours), fuel system (2,500 hours), electrical system repair (1,250 hours), power transmission system repair (500 hours), cooling system repair (750 hours). Supplemental classroom instruction includes wiring and ignition diagrams, hydraulics, blueprint reading, mathematics, precision instruments, power transmission, and business management.	Apprenticeship Entrance Requirements: There is little basis for comparison and evaluation, but it should be noted that age ranges for apprenticeship entrance may be waived or extended for veterans by local apprenticeship committees. Journeyman Status: The training and experience gained by Marine Corps Automotive Mechanics is good background for training and experience required to achieve journeyman status in the civilian apprenticeship program associated with the occupation of Diesel Equipment Mechanic. While training/experience on diesel engines per se is lacking, some credit towards journeyman status may be given by local apprenticeship committees on an individual basis.
Other	Desirable: Good physical condition; manual dexterity; good mechanical ability.	No basis for comparison or evaluation, although persons with recent experience as a Marine Corps Automotive Mechanic can be presumed to be in good physical condition and have good manual dexterity and mechanical ability.

Military-Civilian Job Function Comparability: Comparability in job functions is moderate. Both civilian and military personnel perform inspection, test, repair and maintenance functions on transportation equipment. However, Marine Corps Automotive Mechanics are generally limited to working with gasoline engines and do not work on the variety of equipment that civilian Diesel Equipment Mechanics would work with. The civilian Diesel Mechanic works mainly on diesel engines that power such equipment as heavy trucks, buses, boats, locomotives, or construction equipment.

TABLE 25

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR PETROLEUM TERMINAL OPERATOR WITH THE TRAINING/EXPERIENCE OF MARINE CORPS BULK FUEL MAN - MOS 1391

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma or equivalent certificate. Comments: Employers often give aptitude tests to estimate the applicant's ability to learn job functions.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational/Technical Training	Desirable: Knowledge of various types of tools and equipment as they are used in petroleum terminal or refinery work such as pumps, motors, air compressors, motor operated valves, winches, pick-up trucks or forklifts. Comments: New employees usually receive on-the-job training in such areas as fuel handling, safety procedures, use of tools, spill prevention and control, federal regulations governing petroleum storage, transportation, etc., taking samples, non-technical tests, warehouse or canning operations (as required), proper storage of products and supplies, directing tugs, barges, tankers, etc., to proper locations, and the operation and maintenance of pumps, motors, valves, compressors, oil separators or other related equipment. Although the American Petroleum Institute has published some self-paced books purchased by oil companies, no standard training guidelines exist; generally each company has devised its own special company policies and procedures.	Field Skill Training: Five weeks of structured on-the-job training including such areas as (1) the characteristics and functions of beach unloading stations, booster stations, dispensing stations and tank farms, (2) the identification and repair of various kinds of pumps, (3) the installation and regulation of equipment such as filter separators, service nozzles, manifolds, meters, pressure regulators, and fuel monitors, (4) identification and proper use of various hand tools, (5) preinstallation checks on various types of fuel stations, (6) procedures during line breakages, (7) types of vehicles required for mobile loading, (8) procedures for handling various types of drums, (9) the characteristics of military fuels, (10) instrument and gauge readings, and (11) use of fire fighting equipment. The training received by Marine Corps Bulk Fuel Men is excellent preparation for the civilian occupation of Petroleum Terminal Operator. Differences may occur in the equipment used, but training in this MOS will provide good background for further instruction on specific civilian equipment and company procedures.
Previous Experience	Desirable: Work experience involving the handling of fuels, the use of hand tools, maintenance and repair functions. Comments: Most new employees receive close supervision upon initial hire and gradually accumulate the knowledge and experience to receive, store, maintain and issue materials and supplies, take samples, check guages, perform non-technical tests on the product, hook up hoses and lines, open and close valves, draw off tank bottoms, operate oil separators, perform equipment maintenance and repair functions, and perform duties associated with warehouse or canning operations. It takes approximately three years to reach full-performance level.	The experience of a Marine Corps Bulk Fuel Man is excellent preparation for the civilian position of Petroleum Terminal Operator. Such experience may enable the achievement of full-performance level work before the typical three-year time span.

TABLE 25 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License/Certification	Mandatory: If motor transport equipment is operated, possession of a valid motor vehicle operator's license is required.	If motor transport equipment is used in carrying out the function of this MOS, a Military Operator's License is required. Comments: Approximately 10 percent of personnel in this rating would ordinarily operate motor transport equipment.
Union Apprenticeship Journeyman	The union commonly associated with this occupation is the Oil, Chemical and Atomic Workers International Union. No apprenticeship guidelines exist at the national level. Each petroleum company tends to have its own specialized training practices and procedures, and variation is great among programs.	No basis for comparison and evaluation, but it could be expected that the training and experience gained in this MOS would be helpful background preparation for any further training in specific company equipment or procedures.
Other	Desirable: Ability to follow directions; reasonably good eyesight to read instruments and guages; good manual dexterity and mechanical abilities.	There is little basis for comparison and evaluation but it could be expected that Marine Corps Bulk Fuel Men would have reasonably good eyesight, manual dexterity and mechanical abilities.
Military-Civilian Job Function Comparability:	Comparability in job functions is high. Both the Marine Corps Bulk Fuel Man and the civilian Petroleum Terminal Operator operate and maintain fuel handling and storage equipment and are concerned with the storage, safety and control of large quantities of fuel. However, civilian personnel would not be concerned with the installation of equipment or with the clearing of sites or camouflaging techniques associated with installation. Also, civilian storage equipment, at least at large, commercial terminals, tends to be of greater dimensions and, at times, more complex than the equipment maintained by the Marine Corps Bulk Fuel Man.	

TABLE 26

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR PETROLEUM REFINERY MECHANIC WITH THE TRAINING/EXPERIENCE OF MARINE CORPS BULK FUEL MAN - MOS 1391

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma or equivalent certificate. Comments: Employers often give aptitude tests to estimate the applicant's ability to learn job functions.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational Technical Training	Desirable: A working knowledge or training in various types of tools used in mechanical repair work which are likely to be used in a petroleum refinery such as pipe cutting equipment, drill press, lathes, tapping and threading equipment, oxyacetylene burning and electric welding equipment, soldering irons, conduit bending tools, grease guns, scaffolds, meter proving equipment, hand power tools, ohmmeters, voltmeters, ammeters, oscilloscopes, circuit breakers, block and tackle, and safety equipment.	Field Skill Training: Five weeks of structured on-the-job training including such areas as (1) the characteristics and functions of beach unloading stations, booster stations, dispensing stations and tank farms, (2) the identification and repair of various kinds of pumps, (3) the installation and regulation of equipment such as filter separators, service nozzles, manifolds, meters, pressure regulators, and fuel monitors, (4) identification and proper use of various hand tools, (5) preinstallation checks on various types of fuel stations, (6) procedures during line breakages, (7) types of vehicles required for mobile loading, (8) procedures for handling various types of drums, (9) the characteristics of military fuels, (10) instrument and guage readings, and (11) use of fire fighting equipment. The training received by Marine Corps Bulk Fuel Men provides knowledge about fuel handling operations and equipment which is helpful background for positions in the petroleum refinery industry. However, additional mechanical skills and familiarity with tools and maintenance equipment would be needed to fully qualify for the civilian position of Petroleum Refinery Mechanic.
Previous Experience	Desirable: Work experience involving the diagnosing of malfunctions, dismantling, maintaining, repairing, reassembling, or checking of plant equipment and machinery. Comments: New employees usually receive close supervision upon initial hire and gradually accumulate knowledge about common refinery maintenance problems. Initial tasks may include the use of common hand tools, the operation of lift trucks, slop trucks or other vehicles, assisting in the installation of equipment, obtaining layout and diagram information, or maintaining work areas in an orderly, clean condition. Eventually the mechanic learns to perform such tasks as installing rigging and scaffolding, maintaining/repairing petroleum product pipe lines, valves and associated equipment, performing electrical work on machinery, transformers, generators, gears, etc.,	Experience gained as a Marine Corps Bulk Fuel Man is good preparation for the work experience desired of civilian Petroleum Refinery Mechanics. Basic mechanical skills achieved in this MOS provide a good basis for the accumulation of additional skills needed to perform all-around mechanical work in a civilian petroleum refinery.

TABLE 2b (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Previous Experience (Cont.)	working with outside contractors, and performing various repair jobs which may include skills in plumbing, carpentry, insulating, rigging, etc. An experienced Refinery Mechanic must be able to do a variety of tasks and very often must develop skills in more than one craft.	
License/Certification	Mandatory: If motor transport equipment is operated, possession of a valid motor vehicle operator's license is required.	If motor transport equipment is used in carrying out the functions of this MOS, a Military Operator's Permit is required. Comments: Approximately 10 percent of personnel in this rating would ordinarily operate motor transport equipment.
Union Apprenticeship/ Journeyman	The union commonly associated with this occupation is the Oil, Chemical and Atomic Workers International Union. No apprenticeship guidelines exist at the national level. Each petroleum company tends to have its own specialized training practices and procedures, and variation is great among programs.	No basis for comparison and evaluation, but it could be expected that the training and experience gained in this MOS would be helpful background preparation for any further training in specific company equipment or procedures.
Other	Desirable: Good physical stamina; good eye-hand coordination; manual dexterity; mechanical ability.	There is little basis for comparison and evaluation but it could be expected that Marine Corps Bulk Fuel Men would have reasonably good eyesight, manual dexterity and mechanical abilities.
Military-Civilian Job Function Comparability:	Comparability in job functions is moderate. Both Marine Corps Bulk Fuel Men and civilian Petroleum Refinery Mechanics operate, maintain and repair fuel handling units and accessory equipment. However, Marine Corps personnel are primarily concerned with the storage and handling of large quantities of fuel which may involve the setting up of storage locations, camouflaging and some quality testing. Refinery Mechanics perform maintenance and repair work on equipment that often is more complex than the military storage equipment, since the refining process involves various production steps for which precision equipment is necessary. The Refinery Mechanics, therefore, must acquire expert mechanical skills and be able to maintain and repair a variety of fuel processing, storage and handling equipment.	

TABLE 27

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR PETROLEUM LABORATORY TESTER WITH THE TRAINING/EXPERIENCE OF MARINE CORPS BULK FUEL MAN - MOS 1391

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Some Employers: A high school diploma or equivalent certificate; courses in chemistry, mathematics and physics. Desirable: An associate degree, baccalaureate degree or some college courses in chemistry, mathematics, physics, logic, or data analysis.	A high school diploma and college-level courses can normally be obtained through participation in voluntary education programs.
Vocational/Technical Training	Desirable: Formal training in fuel technology, civil engineering, electrical engineering, or chemistry. Comments: Most employers run their own formal or informal on-the-job training programs for laboratory testers which include such topics as refinery chemistry, petroleum and chemicals fundamentals, fire protection and safety considerations, properties of petroleum products, fluid pressure and flow, hydrocarbon nomenclature and structure, temperature and heat, mathematics, sketching, statistics, physics, chemistry, product sampling procedures, laboratory testing procedures, laboratory analytical instruments. Often a training program will commence with full-time classroom instruction for one or two months and then combine on-the-job experiential training with intermittent instruction.	Field Skill Training: Five weeks of structured on-the-job training including such areas as (1) the characteristics and functions of beach unloading stations, booster stations, dispensing stations and tank farms, (2) the identification or repair of various kinds of pumps, (3) the installation and regulation of equipment such as filter separators, service nozzles, manifolds, meters, pressure regulators, and fuel monitors, (4) identification and proper use of various hand tools, (5) preinstallation checks on various types of fuel stations, (6) procedures during line breakages, (7) types of vehicles required for mobile loading, (8) procedures for handling various types of drums, (9) the characteristics of military fuels, (10) instrument and guage readings, and (11) use of fire fighting equipment. The training received by Marine Corps Bulk Fuel Men provides good background information on the physical characteristics and properties of petroleum and petroleum products that would be helpful for further instruction in petroleum laboratory testing procedures and for courses in the physical sciences pertaining to petroleum refining and laboratory procedures.
Previous Experience	Desirable: Experience working in a laboratory or with information requiring the use of analytical skills, logic or interpretive skills; familiarity with computer input/output data and data forms; experience in some phase of petroleum production, refining, storage or transportation procedures. Comments: Petroleum Laboratory Testers initially perform routine tests on different petroleum products to determine certain chemical and/or physical properties of the product and submit test results to laboratory supervisory personnel. Eventually, more complex tests are able to be performed on fluid viscosity, specific gravity, flash and firepoints, color, pour, water and sediment, melting point, penetration, doctor solution, distillation and corrosion.	The experience of a Marine Corps Bulk Fuel Man provides knowledge of the physical characteristics and properties of petroleum and petroleum products and familiarity with the storage and handling of petroleum which would be helpful general background for further specialized training in petroleum laboratory procedures.

TABLE 27 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License Certification	No license or certificate is needed to perform the duties of this occupation.	No basis for comparison and evaluation.
Union Apprenticeship Journeyman	The union commonly associated with this occupation is the Oil, Chemical and Atomic Workers International Union. No apprenticeship guidelines exist at the national level. Each petroleum company tends to have its own specialized training practices and procedures, and variation is great among programs.	No basis for comparison and evaluation, but it could be expected that the training and experience gained in this MOS would be helpful background preparation for any further training in specific company equipment or procedures
Other	Desirable: Analytical ability; ability to express oneself well orally and in writing; good finger and hand dexterity.	There is little basis for comparison and evaluation but it could be expected that Marine Corps Bulk Fuel Men would have reasonably good finger and hand dexterity.

Military-Civilian Job Function Comparability: Comparability in job functions is low. While both Marine Corps Bulk Fuel Men and civilian Petroleum Laboratory Testers are involved in segments of the petroleum production-refining-distribution chain, Marine Corps personnel work heavily with storage/handling functions, involving heavy mechanical and physical duties, while civilian Laboratory Testers perform testing/analytical functions, involving laboratory procedures and practices.

TABLE 28

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR RIGGER AND MACHINE MOVER WITH THE TRAINING/EXPERIENCE OF MARINE CORPS COMBAT ENGINEER - MOS 1371

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma or equivalent certificate or at least some high school education; courses in mathematics.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends one semester hour in hands-on construction at the vocational certificate level for formal training in this MOS.
Vocational/Technical Training	Desirable for Entrance into an Apprenticeship Program: Courses in drafting, blueprint reading, layout work; training in work details involved in the dismantling, erection and movement of heavy equipment and structures where a knowledge of mechanical principles is required. Comments: While one can learn this trade by working as a helper, most training authorities recommend the completion of a 3-year apprenticeship program as the best way to learn the trade. (See Union Apprenticeship/Journeyman category below.)	Formal Training: Marine Corps Combat Engineers receive 211 hours of training, 196 hours of which is MOS skill-related. A total of 17 hours is directly applicable to the work of the Rigger and Machine Mover occupation. This involves the use of fiber ropes, wire ropes, block and tackle. An additional 24 hours relating to portable bridge construction and dismantling is indirectly related. This training is desirable background for entrance into a civilian apprenticeship program for the Rigger and Machine Mover occupation.
Previous Experience	Desirable for Entrance Into an Apprenticeship Program: Experience on jobs requiring considerable judgment in selecting and positioning tools and equipment, in structural work, and in maintenance, construction or dismantling work.	Marine Corps Combat Engineers construct, assemble and operate rigging devices to lift and move heavy objects. They plan their work by examining drawings and blueprints to determine the materials, tools and sequence of operations required to perform a task. They construct, alter, repair and maintain buildings and structures, including bridges, and coordinate with plumbers, electricians and other specialists in installing utilities. These tasks should provide a good record of previous experience that is desirable for entry into an apprenticeship program for the Rigger and Machine Mover occupation.
License/Certification	No license or certificate is needed to perform the duties of this occupation.	No basis for comparison and evaluation.
Union Apprenticeship/ Journeyman	Riggers and Machine Movers commonly are employed by general contractors on large building projects, by iron and steel companies or by large industrial establishments which do their own construction work. Unions usually associated with this occupation are the International Association of Bridge, Structural and Ornamental Iron Workers and the United Steelworkers of America. Apprenticeship programs ordinarily are implemented by joint labor management apprenticeship committees. The Association of General Contractors of America is another organization that has been	Apprenticeship Entrance Requirements: There is little basis for comparison or evaluation, although it can be assumed that a person with recent experience as a Marine Corps Combat Engineer would meet the physical and educational qualifications required. Journeyman Status: Some of the training and experience gained by a Marine Corps Combat Engineer is similar to the experience of apprentices in the Rigger and Machine Mover occupation. Local

TABLE 28 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship Journeyman (Cont)	active in formulating apprenticeship programs for workers in this occupation. The typical program for Riggers and Machine Movers in the iron industry or other heavy industrial settings involves 6,000 hours of work experience over a 3-year period. Apprenticeship Entrance Requirements: Typical entrance requirements include (1) an acceptable age (from approximately 18 to 30), (2) good physical condition, (3) evidence of appropriate education, ability and aptitude as required by the local apprenticeship committee. Journeyman Status: A typical apprenticeship program requires the completion of 6,000 hours of work experience over a 3-year period covering such areas as care and use of tools, rigging and hoisting equipment, heavy construction machinery, weights and supports, cables and slings, arrangements of guys, types of knots, welding, riveting, and splicing rope and steel cable.	apprenticeship committees may, therefore, grant some credit toward journeyman status on the basis of this experience. Such credit, however, is not guaranteed and is awarded only on an individual basis.
Other	Desirable: Above average strength; agility; good sense of balance.	No basis for comparison and evaluation.

Military-Civilian Job Function Comparability: Comparability in job functions is moderate. Although the Marine Corps Combat Engineer is involved in some of the same functions as the Rigger and Machine Mover, the Marine's total experience during any period may also be oriented toward construction and demolition operations. In that sense, the Rigger and Machine Mover occupation is more specialized than the Marine's experience is likely to be.

TABLE 9

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR BLASTER WITH THE TRAINING EXPERIENCE OF MARINE CORPS COMBAT ENGINEER - MOS 1371

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Most Employers: Ability to read and write in order to understand and give oral and written orders. Desirable: High school diploma or equivalent certificate.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends one semester hour in hands-on construction at the vocational certificate level for formal training in this MOS.
Vocational Technical Training	Mandatory for Most Employers: Formal or on-the-job training in (1) use, transportation, storing and handling of explosive materials and (2) the content of federal, state and local laws and regulations that pertain to explosives. Desirable: Formal training in the use of explosives covering such topics as product categories, ingredients and properties of explosives, detonation mechanisms, misfires, magazine and truck security, destruction of explosives, recommended use methods, instrumentation, hazard identification and prevention, "fly rocket," shot guarding, blast signals, federal, state and local regulations. Comments: E. I. DuPont deNemours and Company, Inc. offers a 3-day course approximately every two weeks at various locations around the United States which covers all of the above topics. This course is open to personnel of recognized industrial firms, universities, training organizations, government agencies and insurance companies.	Formal Training: A total of 211 hours of instruction, 194 of which are MOS skill-related: the section of Demolitions (34 hours) is directly related to the Blaster occupation. The section on Landmine Warfare (40 hours) is indirectly related because of the use and care of explosives and firing mechanisms. The other sections are not related.
Previous Experience	Mandatory for Most Employers: If no training has been received, experience is required in the use, handling, storing, and transportation of sensitive explosives under controlled conditions.	The training (described above) received by the Marine Corps Combat Engineer is directly applicable to the work of the civilian Blaster. However, it is not possible to estimate how much experience in blasting a Marine Corps Combat Engineer will have during the first enlistment term. On the basis of training and general experience, a Marine Corps Combat Engineer may be able to meet the previous experience requirements of the Blaster occupation.
License Certification	A license or permit to handle, use, store and or transport explosives is needed in approximately 15 states. Requirements to obtain a license, certificate or permit differ among these states; some require a written and or oral examination while others require only a statement of previous training or experience.	Training and or experience gained as a Marine Corps Combat Engineer provide some preparation for the licenses required for the Blaster occupation. Additional study of federal, state and local laws and regulations, and health and safety regulations will be necessary.

TABLE 29 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License Certification (Cont)	Comments: Examination material usually consists of (1) federal, state and/or local laws or regulations governing the use, storage, handling, and transportation of explosives; (2) instructions and warnings concerning the use, storage, handling, and transportation of explosives published by the Institute of Makers of Explosives. Health and safety regulations concerning the use of explosives are published by the Occupational Safety and Health Administration of the U.S. Department of Labor and the Bureau of Mines of the U.S. Department of the Interior.	
Union Apprenticeship Journeyman	Union membership is not common among members of this occupation.	No basis for comparison and evaluation.
Other	Mandatory for Most Employers: No addiction to alcohol, narcotics or other dangerous drugs. Desirable: Good physical condition; physical agility; ability to communicate well; maturity; at least 21 years of age.	No basis for comparison and evaluation, although good physical condition, some physical agility and the ability to communicate well are essential characteristics of the Marine Corps Combat Engineer.
Military-Civilian Job Function Comparability:	Comparability in job functions is moderate. Blasting is a specialization of a narrow part of the training and probable work experience of the Marine Corps Combat Engineer. Marines in this MOS may be quite capable of specializing in this field, if they desired, but this would involve a shift in the emphasis of their overall occupation.	

TABLE 39

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR IRON WORKER (ERECTOR) WITH THE TRAINING EXPERIENCE OF MARINE CORPS COMBAT ENGINEER - MOS 1371

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma or equivalent certificate.	A high school diploma can be obtained through a voluntary education program. Comments: The American Council on Education, Office on Educational Credit recommends one semester hour in hands-on construction at the vocational certificate level for formal training in this MOS.
Vocational Technical Training	Desirable for Entrance into an Apprenticeship Program: Vocational training in welding, shop practice, or construction. Comments: Many of the skills of this occupation, such as working high above the ground or water can be gained only by on-the-job experience. Most training authorities recommend that this experience be gained in the context of an apprenticeship program.	Formal Training: Marine Corps Combat Engineers receive 211 hours of training, 196 hours of which are MOS skill-related. Approximately 60 hours of the construction portion are related to tools, rigging and procedures that are used in the Iron Worker (Erector) occupation.
Previous Experience	Desirable: Experience in construction work may increase the likelihood that an individual will be accepted by a local apprenticeship committee.	Marine Corps Combat Engineer experience in construction may be helpful background for entry into the Iron Worker (Erector) occupation. It is unlikely, however, that a Marine Combat Engineer will have the extensive experience in welding and working with steel girders and beams high above ground or water that is common in this occupation.
License/Certification	No license or certification is required for performance of this occupation.	No basis for comparison and evaluation.
Union Apprenticeship Journeyman	Many workers in this occupation are members of the International Association of Bridge, Structural and Ornamental Iron Workers. Apprenticeship Entrance Requirements: According to the Associated General Contractors of America the general qualifications required of apprentice Iron Workers (Erector) are (1) 18 to 30 years of age, (2) physical ability to perform the work of the trade, requiring above average strength, agility and sense of balance. Education, ability and aptitude entrance requirements may be establisned by local apprenticeship committees.	No firm basis for comparison or evaluation, but the Marine Corps Combat Engineer's training and experience with hand and power tools, and with rigging and fitting of structural parts may be considered applicable experience. Credit for this experience, however, cannot be guaranteed and must be given on an individual basis by local apprenticeship committees.

TABLE 30 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship Journeyman (Cont)	Journeyman Status: Completion of 6,000 hours (three years) of on-the-job training as well as a minimum of 432 hours classroom instruction over the same three-year period are required. During this period, apprentices learn the care and use of tools (275 hours), erection of various parts of structures (2,800 hours), riveting (400 hours), erection of sheeting (850 hours), and welding (1,675 hours).	
Other	No other requirements have been established for this occupation.	No basis for comparison and evaluation.
Military-Civilian Job Function Comparability:	Comparability in job functions is generally low. The Iron Worker (Erector) occupation is more specialized than the Marine Corps Combat Engineer occupation because (1) it focuses almost exclusively on steel fitting, welding and riveting; (2) it involves much heavier and larger scale work; (3) it may include working at great heights, which in itself may be the most difficult characteristic of the occupation.	

TABLE 31

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR GROUND RADIO OPERATOR WITH THE TRAINING/EXPERIENCE OF MARINE CORPS FIELD RADIO OPERATOR - MOS 2531

Requirement Categories	Civilian Employment Standards[1]	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory For Most Employers: High school diploma or equivalent certificate. Desirable: The ability to write and to maintain accurate logs of work activity.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit, recommends credit in typing on the basis of an institutional examination at the baccalaureate level for formal training in this MOS.
Vocational/Technical Training	Mandatory: The ability to touch-type or teletype at 40 words per minute. Desirable: Training in the use of radio equipment and systems used for communications with air/ground traffic; training in the identification of weather code symbols, air traffic control procedures and abbreviations, and familiarity with technical and operational terms encountered in aviation communications. Comments: A probationary period is usually served. The new employee receives on-the-job training in the use of equipment and proper procedures and operations.	Formal Training: A total of 280 hours of which 210 hours are MOS skill-related. The section on Communications Procedures (49 hours) covers all basic practices involved in operating a radio transmitter/receiver and the rules which govern such operation. The Field Radio Equipment section (161 hours) covers general principles of radio communication and the set-up, operation, and preventive maintenance of specific radio equipment Marine Corps Field Radio Operator training does not include touch-typing or the aviation terminology used by Ground Radio Operators.
Previous Experience	Desirable: Experience in the use of radio equipment, control position equipment, or point-to-point systems used for the delivery of air/ground traffic; experience with the dispatching of vehicles or the distribution of messages over radiotelephone equipment.	Experience gained as a Marine Corps Field Radio Operator will provide general background in the use of radio equipment and experience with message precedence and other aspects of message distribution. Experience with air/ground control communications is probably not obtained.
License/Certification	Mandatory: Possession of a Federal Communications Commission (FCC) Radiotelephone Third Class Operator Permit or Radiotelegraph Third Class Operator Permit; a Restricted Radiotelephone Operator Permit may be acceptable initially for new employees. Desirable: Possession of an FCC Radiotelephone Second Class Operator License or Radiotelegraph Second Class Operator License. Comments: To obtain any of the above permits or licenses, one must be a citizen or national of the United States (waivers may be made for citizens of U.S. Trust Territories or alien aircraft pilots). There are no prerequisite training or education requirements. All of the permits or licenses except the Restricted Radiotelephone Operator Permit require the passing of an examination covering:	Training received by the Marine Corps Field Radio Operator will not provide adequate preparation for the completion of the FCC permit or licensing examinations. A major specific deficiency is that the Marine does not receive training or experience related to the regulations, laws and practices governing civilian radiotelephone and radiotelegraph operations in the civilian sector. The FCC has prepared a Study Guide and Reference Material for Commercial Radio Operator Examinations (Revised May 15, 1955) which is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

TABLE 31 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License/Certification (Cont)	(1) the provisions of laws, treaties and regulations with which an operator must be familiar, (2) the operating procedures and practices generally followed or required by radiotelephone or radiotelegraph stations, and (3) for Second Class licenses, technical and legal matters applicable to operating various classes of stations. In addition, applicants for Radiotelegraph Third Class Operator Permit and Radiotelegraph Second Class Operator License must pass a code test for transmitting and receiving the International Morse Code for a period of one minute without error at a prescribed rate of speed. Permits and licenses other than the Restricted Radiotelephone Operator Permit are issued for a period of five years. The Restricted Radiotelephone Operator Permit is issued for the lifetime of the holder. This permit restricts the operator to certain types of stations and prohibits him or her from making any adjustments that may result in improper transmitter operation.	
Union Apprenticeship/ Journeyman	Unions common to this occupation are the Communications Workers of America, the Transport Workers Union, and the Brotherhood of Teamsters, Chauffeurs, Warehousemen, and Helpers of America. No formal apprenticeship program exists for this occupation.	No basis for comparison and evaluation.
Other	Desirable: Good speaking voice; the ability to speak clearly and intelligibly without a conspicuous accent; willingness to work shift assignments.	No basis for comparison and evaluation.

Military-Civilian Job Function Comparability: Comparability in job functions is moderate. Both the Marine Corps Field Radio Operator and the Civilian Ground Radio Operator are specialists in radio communications within restricted, highly disciplined networks. The subject matter and terminology used by the Marine, however, does not reflect the aviation orientation of the civilian occupation; the Marine operator is probably oriented toward adaptability to various field conditions. The civilian operator appears to work toward maintaining very high quality communications within less varied, more restricted conditions as reflected in the license requirements.

1/ The civilian employment standards represent requirements for Ground Radio Operators working in an aviation environment which involves the transmission of communications between air and ground traffic and facilities. Employment standards for Ground Radio Operators in other environments, e.g. marine radio operators, public safety radio services, land transportation radio services, may differ from these standards. However, the aviation-oriented ground radio operators were chosen because they represent a well-defined group with more uniform employment standards than radio operators in other environments.

The employment standards outlined in this table are for Ground Radio Operators in an aviation environment in non-government positions. The closest government counterpart is the Air Traffic Controller at Federal Aviation Administration (FAA) flight service stations. Entrance standards for these positions tend to be very stringent because the career progression could lead ultimately to the performance of functions at a high-density air traffic control center which requires special mental, physical, and emotional qualifications for adequate job performance. Information on FAA Air Traffic Controllers appears in U.S. Civil Service Commission Announcement No. 418.

TABLE 32

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR BROADCAST FIELD ENGINEER WITH THE TRAINING/EXPERIENCE OF MARINE CORPS FIELD RADIO OPERATOR - MOS 2531

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma or equivalent certificate; courses in algebra, trigonometry, physics, science, electronics.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends credit in typing on the basis of an institutional examination at the baccalaureate level for formal training in this MOS.
Vocational/Technical Training	Desirable: Technical courses or an associate degree in broadcast technology with emphasis on field engineer courses. Comments: Most associate degree curricula in broadcast technology last approximately two years and include courses such as fundamentals of AC/DC circuits, tubes and transistors, circuit analysis, electronics, amplifiers, operation, theory and maintenance of broadcast equipment, pulse and switching circuits, communications, broadcast instruments and measurements, preparation and installation of broadcast field transmission equipment, and Federal broadcast regulations.	Formal Training: A total of 280 hours of which 210 hours are MOS skill-related. The section on Communications Procedures (49 hours) covers all basic practices involved in operating a radio transmitter/receiver and rules which govern such operation. The Field Radio Equipment section (161 hours) covers general principles of radio communication and the set-up, operation, and preventive maintenance of specific radio equipment. Marine Corps Field Radio Operator training does not include coverage of electronic theory and general workings of electronic devices, knowledge of a variety of broadcast equipment (cameras, videotape units, projection equipment, etc.), or Federal regulations. However, they are concerned with the preparation and installation of certain types of field radio equipment which would be helpful background for the functions of civilian Broadcast Field Engineer.
Previous Experience	Desirable: Building or operating an amateur radio station; work experience with the preparation and installation of electronic equipment.	Experience in the preparation and installation of field radio equipment would be helpful background experience for the civilian occupation of Broadcast Field Engineer.
License/Certification	Mandatory for Most Employers: Possession of a Federal Communications Commission (FCC) Radiotelephone First Class Operator License. Comments: To obtain the FCC license, one must be a citizen or national of the United States (waivers may be made for citizens of United States Trust Territories or alien aircraft pilots). There are no prerequisite training or education requirements. Applicants must pass an examination covering (1) provisions of laws, treaties and regulations with which every operator should be familiar, (2) basic operating procedures and practices generally followed or required in communicating by radiotelephone stations, (3) technical, legal and other matters applicable to operating radiotelephone stations other than	Training received by the Marine Corps Field Radio Operator will not provide adequate preparation for completion of the FCC licensing examination. The Marine does not receive training or experience related to laws, treaties or regulations governing civilian radiotelephone operators or to technical and legal matters applicable to broadcast stations. The FCC has prepared a Study Guide and Reference Material for Commercial Radio Operator Examinations (Revised May 15, 1955) which is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402.

TABLE 32 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License Certification (Cont)	broadcast, and (4) advanced technical, legal and other matters particularly applicable to operating various classes of broadcast stations.	
Union Apprenticeship Journeyman	The unions commonly associated with this occupation are the Communications Workers of America, the International Brotherhood of Electrical Workers, and the National Association of Broadcast Employees and Technicians. Few, if any, formal apprenticeship programs exist for the occupation of Broadcast Field Engineer. However, the type of experience and training considered necessary to develop a skilled worker in the broadcasting trade in general equals approximately 8,000 hours over a four-year period. The standard topics include (1) radio laws, (2) basic radio practices, (3) basic and advanced radiotelephony, (4) operation and repair of radio broadcast equipment, (5) basic and advanced television, and (6) operation and repair of television broadcast equipment.	Training and experience of the Marine Corps Field Radio Operator would not cover training in civilian radio laws or in any phases of television operation or repair work. However, if one were able to pass the FCC Radiotelephone First Class Operator License (see Civilian License/Certification Standards) or to demonstrate good knowledge/skill in the use of radiotelephone equipment, acceptance into an apprenticeship program or (more likely) for informal on-the-job training may be possible.
Other	Desirable: Adequate physical strength to carry broadcast equipment; physical agility; good vision and depth perception.	No basis for comparison and evaluation.

Military-Civilian Job Function Comparability: Comparability in job functions is moderate. Both the Marine Corps Field Radio Operator and the civilian Broadcast Field Engineer are specialists in the preparation and installation of communications equipment, often in an outdoor or rough setting. However, the Broadcast Field Engineer works with heavier, more sophisticated, varied kinds of equipment needed to transmit both audio and video transmissions (although the actual broadcast is often handled by the studio engineer). The Marine Corps Field Radio Operator, on the other hand, works with less complex radiotelephone equipment but completes the preparation, installation, operation and transmission of information himself.

TABLE 33

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR BROADCAST TECHNICIAN WITH THE TRAINING/EXPERIENCE OF MARINE CORPS FIELD RADIO OPERATOR - MOS 2531

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma or equivalent certificate; courses in algebra, trigonometry, physics, science, electronics.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends credit in typing on the basis of an institutional examination at the baccalaureate level for formal training in this MOS.
Vocational/Technical Training	Desirable: Technical courses or an associate degree in broadcast technology. Comments: Most associate degree curricula in broadcast technology last approximately two years and include courses such as fundamentals of AC/DC circuits, tubes and transistors, circuit analysis, electronics, amplifiers, operation, theory and maintenance of broadcast equipment, pulse and switching circuits, communications, broadcast instruments and measurements, and Federal broadcast regulations.	Formal Training: A total of 280 hours of which 210 hours are MOS skill-related. The section on Communications Procedures (49 hours) covers all basic practices involved in operating a radio transmitter/receiver and rules which govern such operation. The Field Radio Equipment section (161 hours) covers general principles of radio communication and the set-up, operation, and preventive maintenance of specific radio equipment. Marine Corps Field Radio Operator training does not include coverage of electronic theory and general workings of electronic devices, knowledge of a variety of broadcast equipment (cameras, video-tape units, projection equipment, etc.), or Federal regulations which are included in a typical broadcast technology curriculum.
Previous Experience	Desirable: Building or operating an amateur radio station; work experience in one of the following environments: (1) in a radio, television broadcast station or cable television company, (2) in educational institutions or private industries which use television cameras or video-tape equipment, (3) in a manufacturing company or sales firm which sells radio and television equipment, or (4) in a sound reproduction or recording studio.	Experience gained as a Marine Corps Field Radio Operator will provide general background in the use of radio equipment and some experience with message procedure and other aspects of message distribution. Experience with a variety of broadcast equipment, broadcasting techniques, instruments and measurements (such as signal generators, picture monitors, digital counters), or Federal regulations is not obtained.
License/Certification	Mandatory for Most Employers: Possession of a Federal Communication Commission (FCC) Radiotelephone First Class Operator License. Comments: To obtain the FCC license, one must be a citizen or national of the United States (waivers may be made for citizens of U.S. Trust Territories or alien aircraft pilots). There are no prerequisite training or education requirements. Applicants must pass an examination covering (1) provisions of laws, treaties and regulations with which every operator should be familiar, (2) basic operating procedures and practices generally followed or required in communicating by radiotelephone stations, (3) technical, legal and other matters applicable to operating radiotelephone stations other than broadcast, and (4) advanced technical, legal and other matters particularly applicable to operating various classes of broadcast stations.	Training received by the Marine Corps Field Radio Operator will not provide adequate preparation for completion of the FCC licensing examination. The Marine does not receive training or experience related to laws, treaties or regulations governing civilian radiotelephone operators or to technical and legal matters applicable to broadcast stations. The FCC has prepared a Study Guide and Reference Material for Commercial Radio Operator Examinations (Revised May 15, 1955) which is for sale by the Superintendent of Documents, U.S Government Printing Office, Washington, D. C. 20402.

TABLE 33 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship Journeyman	The unions commonly associated with this occupation are the Communications Workers of America, the International Brotherhood of Electrical Workers, and the National Association of Broadcast Employees and Technicians. Few, if any, formal apprenticeship programs exist for the occupation of Broadcast Technician. However, the type of experience and training considered necessary to develop a skilled worker in the broadcasting trade equals approximately 8,000 hours over a four-year period. The standard topics include (1) radio laws, (2) basic radio practices, (3) basic and advanced radiotelephony, (4) operation and repair of radio broadcast equipment, (5) basic and advanced television, and (6) operation and repair of television broadcast equipment.	Training and experience of the Marine Corps Field Radio Operator would not cover training in civilian radio laws or in any phases of television operation or repair work. However, if one were able to pass the FCC Radiotelephone First Class Operator License (see Civilian License/Certification Standards) or to demonstrate good knowledge/skill in the use of radiotelephone equipment, acceptance into an apprenticeship program or (more likely) for informal on-the-job training may be possible.
Other	Desirable: Good vision and depth perception.	No basis for comparison and evaluation.

Military-Civilian Job Function Comparability: Comparability in job functions is low. The Marine Corps Field Radio Operator works with radio equipment in an outdoor, rugged setting and is concerned primarily with message transmission and distribution. The civilian Broadcast Technician works with a variety of audio and video broadcast equipment in a studio setting, and is concerned with the transmission of high quality communications within more restricted conditions.

TABLE 34

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR MUNICIPAL POLICE OFFICER WITH THE TRAINING/EXPERIENCE OF MARINE CORPS MILITARY POLICEMAN - MOS 5811

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory in Most Cities, Counties, and Towns: High school diploma or equivalent certificate. Mandatory in Some Cities: Some college training. Desirable: High school or college courses in psychology, sociology, English, history, government, business law, physics, and physical education; participation in sports.	A high school diploma can normally be obtained in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends three semester hours in criminal justice at the technical associate degree level or at the baccalaureate degree level for formal training in this MOS.
Vocational/Technical Training	Municipal police officers usually go through a period of training before they are assigned to work on their own. Training in some small towns consists of on-the-job experience working with experienced officers. In larger departments, formal training is given, sometimes in highly developed police academies. Such formal training covers constitutional law and civil rights, state laws and ordinances, accident investigation, patrol, traffic control, self-defense, use of firearms, first aid and emergency procedures. Formal training and education is also available in more than 500 community and junior colleges, colleges, and universities. These programs provide background in a wide variety of law enforcement, justice, social and psychological subjects. These programs will help persons who wish to be accepted as recruits in municipal police departments.	Formal Training: 296 hours, 222 of which are MOS skill-related. About 170 hours of this training are directly related to the training of Municipal Police Officers. Marine Corps Military Policeman training covers all of the subjects studied by Municipal Police Officers with the exception of certain state and local laws and ordinances and local police practices. In addition, the Marine Corps Military Policeman studies about 50 hours that are indirectly applicable to municipal police training. These hours cover military restraints on the use of force, military police station organization, military police forms and records, and a military police operations exercise. All of these hours reflect in varying degrees, the procedures of Municipal Police Officers. Because they are oriented to military operations, they are only indirectly related. All of this training is excellent background for entry into the municipal police, but Marine Corps Military Policemen must still complete the full municipal training program.
Previous Experience	Desirable: Previous experience as a military policeman. Comments: Military experience often is an advantage on the competitive entrance examinations given by most police departments.	Marine Corps Military Policeman experience is excellent background for entry into the municipal police.
License/Certification	Mandatory for Some Jurisdictions: Possession of a valid motor vehicle operator's license. Comments: Some jurisdictions issue a police training certificate upon completion of training.	The training for Marine Corps Military Policemen includes operation of motor vehicles and qualifies one for award of a Military Operator's Permit.

TABLE 34 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship / Journeyman	Most Municipal Police Officers are not members of unions, although some department members have their own organizations that consider pay and benefits issues.	No basis for comparison and evaluation.
Other	Mandatory for Most Jurisdictions: Municipal Police Officers must: (1) be a minimum of 21 years of age; (2) be a U.S. citizen; (3) meet height and weight standards; (4) pass tests of strength and agility; and (5) pass a background investigation. Mandatory for Some Jurisdictions: Demonstration of honesty, good judgment, self-discipline, and responsibility in interviews with senior police officers and psychiatrists or psychologists.	No firm basis for comparison and evaluation, but a Marine Corps Military Policeman must also meet physical, mental, and character standards that are similar to those established for Municipal Police Officers.

Military-Civilian Job Function Comparability: Comparability of job functions is very high. Both the Municipal Police Officer and the Marine Corps Military Policeman are responsible for law enforcement in their respective local communities. The Marine Corps Military Policeman differs from the Municipal Police Officer in that the former (1) is involved with military as well as civilian law enforcement functions and (2) does not need to be as familiar with state and local laws as does the police officer in specific municipalities.

TABLE 35

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR STATE POLICE (HIGHWAY PATROL) OFFICER WITH THE TRAINING/EXPERIENCE OF MARINE CORPS MILITARY POLICEMAN - MOS 5811

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory in Most States: High school education or an equivalent combination of education and experience. Desirable: High school and college courses in English, reading, government, psychology, sociology, physics, and physical education; participation in sports.	A high school diploma can normally be obtained in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends three semester hours in criminal justice at the technical associate degree level or at the baccalaureate degree level for formal training in this MOS.
Vocational/Technical Training	State Police Officers are trained by the departments to which they belong. Training includes classroom instruction in state laws and in procedures for accident investigation, patrol and traffic control. Use of guns, self-defense, high-speed driving, and first aid are also covered. Some states also have state police cadet programs. In these programs, high school graduates who have not reached the minimum age for state police (21 years) are hired for civilian, non-enforcement duties in the state police departments. Cadets who qualify can become State Police Officers when they reach 21 years of age.	Formal Training: 2[illegible] hours, 222 of which are MOS skill-related. About 170 hours of this training are directly related to the training of State Police Officers, and they cover the entire range of state police work except the laws of specific states. The remaining 50 hours are indirectly related to the training of State Police Officers. These hours of training include military restraints on the use of force, military police station organization, military police forms and records and a military police operations exercise. All of these hours reflect in varying degrees the procedures of state police departments, but because they are military oriented, they are considered to be indirectly related. All of this training is excellent background for entry into the state police, but Marine Corps police veterans who enter this occupation must undergo the complete state police recruit training program.
Previous Experience	Desirable: Previous experience as a military policeman. Comments: Previous experience may enhance chances of promotion after the initial probation period.	The Marine Corps Military Policeman experience is excellent background for entry into the state police. Some states give hiring preference to persons with military police experience.
License/Certification	Mandatory: Possession of a valid motor vehicle operator's license. Comments: Some states issue a police training certificate upon completion of training.	The training for Marine Corps Military Policemen includes the operation of motor vehicles and qualifies one for award of a Military Operator's Permit.

TABLE 35 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship/ Journeyman	State Police Officers are generally not members of any union.	No basis for comparison and evaluation.
Other	Mandatory in Most States: State Police Officers must: (1) be 21 years of age; (2) pass a competitive examination; (3) meet physical requirements including height, weight, and eyesight standards; (4) undergo a background investigation which is intended to measure their honesty and responsibility. Desirable: Demonstration of self-discipline; willingness to work with the public; willingness to work indoors and outdoors.	No firm basis for comparison and evaluation, but a Marine Corps Military Policeman must also meet physical, mental, and character standards that are similar to those established for State Police Officers.
Military-Civilian Job Function Comparability:	Comparability of these occupations is high. The primary differences between these occupations are that Marine Corps Policemen function under military law which may differ procedurally from the law of some states, and they learn practical techniques that are designed exclusively for war situations. In addition, the Marine Corps Military Policeman will perform fewer high-speed highway patrol functions than will the State Police Officer.	

TABLE 36

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR PRIVATE SECURITY GUARD WITH THE TRAINING/EXPERIENCE OF MARINE CORPS MILITARY POLICEMAN - MOS 5811

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Some Employers: A high school diploma or equivalent certificate, or at least a tenth grade education; for all employers, the ability to read and write and to follow written and oral instructions. Comments: A test may be given to applicants without a high school diploma of for whom reading and/or writing abilities are questioned.	A high school diploma can normally be obtained in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends three semester hours in criminal justice at the technical associate degree level or at the baccalaureate degree level for formal training in this MOS.
Vocational Technical Training	Desirable: Previous training as a civilian or military guard or as a member of a police or security force; skills such as: (1) understanding and enforcing company or office rules and regulations; (2) giving clear, intelligent and fair orders to subordinates or to the general public when necessary; and (3) understanding reports, report forms, and the details necessary for the preparation of good reports. Comments: Some form of training is often given to new employees in this occupation in such areas as theft and fire prevention, company rules and regulations, vehicular or pedestrian traffic control, safety and first aid, public relations, arrest and apprehension procedures, and report writing techniques.	Formal Training: 296 hours, 222 hours of which are MOS skill-related; certain topics covered in the 86-hour section on "Common Law Enforcement Activities and Skill Development," such as unarmed defense, search and seizure, evidence handling, warnings and waivers, are directly related to Private Security Guard training; several topics covered in the 114-hour section on "Military Police Enforcement Activities and Tactical Operations," such as patrol operations, traffic control and accident investigation are generally related; very few topics in the 31-hour section on "Correctional Administration and Operations" are related to the work of Private Security Guards. In general, training in this MOS should adequately qualify a person for entry into the civilian Private Security Guard occupation.
Previous Experience	Desirable: Previous experience as a civilian or military guard or as a member of a police or security force; job experience requiring discipline or security clearance, or involving the protection of company/plant/office personnel or property, the enforcement of rules and regulations, the monitoring or control of traffic or individuals within a work area, the prevention of espionage or sabotage, the maintenance of control during emergencies, the prevention of fire and theft, the conduct of inspections, handling of classified documents or participation in crash, fire and rescue operations.	Experience gained as a Marine Corps Military Policeman will satisfy most of the experience qualifications desired by civilian employers of Private Security Guards. Comments: Former military personnel are often given preference for civilian Private Security Guard jobs. In some cases, such personnel are assigned more demanding duties, especially if security guard or correctional tasks have been performed routinely as a part of the veteran's primary military duties.
License/Certification	Mandatory for Some Employers: Possession of a valid motor vehicle operator's license. For employers authorizing the issuance of firearms, the proper permit in accordance with applicable federal, state, or local firearms control laws and company regulations is required.	The training for Marine Corps Military Policeman includes the operation of motor vehicles and qualifies a person for award of a Military Operator's Permit.

TABLE 36 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship Journeyman	Union membership is not common in this profession.	No basis for comparison and evaluation.
Other	Mandatory for Most Employers: No police, court or criminal record; good vision and hearing; good physical fitness and stamina; emotional stability; self-control, tactfulness and good judgment. Some employers require U.S. citizenship; minimum of 21 years of age; possession of or access to an automobile; specific height and/or weight ranges. Desirable: High personal standards of conduct; alertness and watchfulness; loyalty to work; sense of responsibility; ability to work within an organization or as a member of a team; courtesy and helpfulness; regularity in job attendance; ability to take orders from superiors without questions and to give clear, intelligent orders to subordinates.	No basis for comparison and evaluation. Comments: It can be expected that civilian employers may assume that ex-military personnel possess the qualities that are desirable for this occupation.

Military-Civilian Job Function Comparability: Comparability in overall job functions is generally low. The Marine Corps Military Policeman performs more complex functions than does the civilian Private Security Guard. Marine police personnel perform investigations, preserve evidence and crime scenes, may guard prisoners, take fingerprints, perform motorized patrol involving radio communication, testify in criminal cases, and other legal proceedings. Such activities are not common of Private Security Guards, although they sometimes may be required.

TABLE 37

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR TELEPHONE LINEMAN WITH THE TRAINING/EXPERIENCE OF MARINE CORPS WIREMAN - MOS 2511

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Some Employers: A high school diploma or equivalent certificate, or a vocational school certificate. Desirable: A high school diploma or equivalent certificate, or a vocational school certificate; knowledge of basic mathematics and basic principles of electricity and electronics. Comments: Employers often administer an aptitude test, an examination measuring basic skills in mathematics, electricity or electronics, or a mechanical comprehension test to applicants.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational/Technical Training	Desirable: Familiarity with telephone equipment; training in skills requiring manual dexterity and mechanical comprehension. Comments: Most employers conduct formal or on-the-job training for new employees which includes instruction in basic mathematics, basic electricity and electronics, safety rules, use and care of tools, pole climbing, pole setting, guying facilities, ropes and rigging, material handling, stringing or burying of wires or cables, and record keeping.	Field Skill Training: Five weeks of structured training covering exercises leading to the installation of field telephone switchboards, stringing and burying of telephone lines, adjustments to field telephone equipment, location of faults in and making repairs to field telephone lines, preparation and interpretation of line route maps, circuit diagrams, traffic diagrams, and the coordination of telephone installation and operation with other communication activities. Training in this MOS should adequately qualify one for entrance into the civilian Telephone Lineman occupation.
Previous Experience	Desirable: Experience working with telephone equipment or electrical transmission lines; experience on jobs requiring manual dexterity, mechanical comprehension, and physical stamina. Comments: The introduction of powered aerial equipment has reduced the pole climbing tasks of Linemen to some extent; however, the majority may still climb poles under some circumstances.	The experience gained as a Marine Corps Wireman should satisfy the experience standards outlined by civilian employers of Telephone Linemen. Comments: Civilian employers may give preference to ex-military personnel who have had experience with communications equipment such as Marine Corps Wiremen, particularly for entry-level telephone crafts jobs such as Lineman.
License/Certification	No license or certification is needed to carry out the functions of this position.	No basis for comparison and evaluation.

TABLE 37 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship/ Journeyman	Telephone Linemen commonly belong to the Communications Workers of America, the International Brotherhood of Electrical Workers or unions representing the (approximately) 2,000 independent telephone companies throughout the United States. The latter unions have formed the Alliance of Independent Telephone Unions. Training for this occupation is most often conducted by the employing companies rather than by the unions themselves.	No basis for comparison and evaluation. Comments: In most union shops, promotions are based upon both qualifications and seniority. Therefore, even though ex-Marine Corps personnel may have higher qualifications and more experience than other employees performing the same functions, the ex-Marines may not have the seniority required for advancement.
Other	Desirable: Good physical condition; good color perception; manual dexterity; ability to work under severe weather conditions; ability to work cooperatively with others.	No basis for comparison and evaluation. Comments: Marine Corps Wiremen who have maintained Marine Corps physical standards and who have performed their occupational duties satisfactorily would fulfill the "Other" Civilian Employment Standards for Telephone Lineman.

Military-Civilian Job Function Comparability: Comparability in job functions is very high. Both Marine Corps Wiremen and civilian Linemen perform tasks involving the stringing or burying of telephone lines, the setting of telephone poles, the repairing of wire or cable breaks, and the retrieving of wire for reuse. Marine Corps Wiremen work primarily with field telephone equipment and often install and operate field telephone switchboards which may involve the preparation and interpretation of route maps or circuit diagrams, preliminary reconnaissance activities, and the coordination of the telephone installation or operation with other communications activities. Civilian Linemen, on the other hand, may perform only wire stringing or burying activities, erection of telephone poles or wire/cable maintenance tasks but usually work with more complex telephone systems and may operate sophisticated aerial and digging equipment.

TABLE 38

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR TELEPHONE CABLE SPLICER WITH THE TRAINING/EXPERIENCE OF MARINE CORPS WIREMAN - MOS 2511

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Some Employers: A high school diploma, equivalent certificate, or a vocational school certificate. Desirable: A high school diploma, equivalent certificate, or a vocational school certificate; knowledge of basic mathematics and basic principles of electricity and electronics. Comments: Employers often administer an aptitude test, an examination measuring basic skills in mathematics, electricity, or electronics, or a mechanical comprehension test.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational Technical Training	Desirable: Familiarization with telephone equipment; training in skills requiring manual dexterity and mechanical comprehension. Comments: Most employers conduct formal or on-the-job training for new employees. Training includes instruction in the identification of various types of cables, cable sealing and splicing procedures, use of cable test sets, testing of cables for malfunctions, recognition of print symbols, use of splicing machines, setting up for aerial cable work, and completion of job information sheets. Some employers will not conduct training in cable splicing tasks until the employee has gained some familiarity with cable construction, line construction or other semi-skilled or skilled telephone crafts activities.	Field Skill Training: Five weeks of structured training covering exercises leading to the installation of field telephone switchboards, stringing and burying of telephone lines, adjustments to field telephone equipment, location of faults in and making repairs to field telephone equipment, preparation and interpretation of line route maps, circuit diagrams, and the coordination of telephone installation and operation with other communications activities. Although training in this MOS does not cover cable splicing tasks, instruction in the above-stated job functions provides background training for such tasks.
Previous Experience	Mandatory for Some Employers: At least two to six months experience performing telephone cable construction, line construction or semi-skilled or skilled telephone crafts activities. Desirable: Familiarity with semi-skilled or skilled telephone crafts activities; general experience on jobs requiring manual dexterity, mechanical comprehension, and physical stamina. Comments: New employees who have had no previous telephone crafts experience may initially perform the duties of Telephone Lineman or such lesser skilled, routine duties as providing tools and supplies to experienced splicers, assisting in hanging platforms for overhead cable work, helping to hang cables from poles or to lay underground cables, or operating heaters or	The experience gained as a Marine Corps Wireman provides preparation for the occupation of Cable Splicer and should fulfill many of the experience qualifications required or desired by civilian employers of such personnel. Comments: Marine Corps Wiremen possess general background experience in telephone crafts work, but because of the highly specialized nature of cable splicing tasks, Marine Corps veterans who carried MOS 2511 (along with other new employees) may be required initially to perform lesser skilled, routine tasks for a designated period of time before being taught the more highly-skilled cable splicing tasks.

TABLE 38 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Previous Experience (Cont)	pumps used in underground tunnel work. Approximately two to three years of experience is needed to become a highly skilled, fully qualified Cable Splicer.	
License/Certification	No license or certificate is needed to carry out the functions of this position.	
Union Apprenticeship/ Journeyman	Telephone Cable Splicers commonly belong to the Communications Workers of America, the International Brotherhood of Electrical Workers or unions representing the (approximately) 2,000 independent telephone companies throughout the United States. The latter unions have formed the Alliance of Independent Telephone Unions. Training for this occupation is most often conducted by the employing companies rather than by the unions themselves.	No basis for comparison and evaluation.
Other	Desirable: Good physical condition; good color perception; manual dexterity; ability to work under severe weather conditions; ability to work cooperatively with others.	No basis for comparison and evaluation. Comments: It could be assumed that Marine Corps Wiremen who have maintained the physical qualifications of Marines and who have performed their occupational duties satisfactorily would fulfill the "Other" Civilian Employment Standards for Telephone Cable Splicer.
Military-Civilian Job Function Comparability:	Comparability in job functions is moderate. This Marine Corps MOS corresponds most closely to the civilian occupation of Telephone Lineman. However, both Marine Corps Wiremen and civilian Cable Splicers perform telephone crafts functions involving telephone line and cable interconnections and maintenance work. The military personnel perform a wide variety of skilled and semi-skilled functions involving the laying and maintaining of field wire, the installation and operation of field telephones, switchboards, and other field telephone equipment. The civilian Cable Splicers, conversely, perform more specialized, often highly skilled, functions involving the completion of line connections or the inspection and repair of damaged connections. The Cable Splicers also work on the larger, more complex telephone systems which are often needed to service densely populated areas.	

TABLE 39

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR TELEPHONE CENTRAL OFFICE INSTALLER WITH THE TRAINING/EXPERIENCE OF MARINE CORPS WIREMAN - MOS 2511

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Most Employers: A high school diploma or equivalent certificate, or a vocational school certificate. Desirable: A high school diploma, equivalent certificate, or a vocational school certificate; knowledge of basic electricity and electronics, high school physics, or electricity shop courses. Comments: Employers often administer an aptitude test, an examination measuring basic skills in mathematics, electricity or electronics, or a mechanical comprehension test to applicants.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational/Technical Training	Desirable: Familiarity with telephone equipment or electrical shop equipment; training in skills requiring manual dexterity and mechanical comprehension; the ability to handle small metal and woodworking tools of various kinds; the ability to read circuit diagrams and blueprints. Comments: Most employers conduct formal or on-the-job training for new employees. Training includes instruction in layout and erection of frames and equipment, use of tools, equipment adjustment and testing, central office methods and procedures, operation of circuits, blueprint and job specification reading, relay adjustments, clearing central office trouble, basic electricity, testboards, testing local and toll lines, safety instruction and accident prevention. Increasingly complex central office and toll equipment is requiring more highly skilled personnel who have had training in or who are able to be trained in the electronics field.	Field Skill Training: Five weeks of structured training covering exercises leading to the installation of field telephone switchboards, stringing and burying of telephone lines, adjustments to field telephone equipment, location of faults in and making repairs to field telephone equipment, preparation and interpretation of line route maps, circuit diagrams, and coordination of telephone installation and operation with other communications activities. Although training in this MOS does not cover most central office installation tasks, instruction in the above-stated job functions provides background training for central office installation tasks.
Previous Experience	Desirable: Familiarity with electronic equipment, telephone equipment or electrical shop equipment; experience in reading circuit diagrams and blueprints; experience on jobs requiring manual dexterity, mechanical comprehension, or the use of small metal or woodworking tools. Comments: New employees who have had no previous telephone crafts experience may initially perform less complex, repair duties and gradually work into more highly skilled installation tasks.	The experience gained as a Marine Corps Wireman provides general background preparation for the occupation of Central Office Installer and should fulfill some of the experience qualifications desired by civilian employers of such personnel. Comments: Marine Corps Wiremen possess general background experience in telephone crafts work, but because of the skilled, specialized nature of central office installation tasks, these personnel (along with

TABLE 39 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Previous Experience (Cont)	Central Office Installers often work for manufacturers of telephone equipment as opposed to telephone companies, and, therefore, may specialize in the installation of (and the repair of) a certain type or types of equipment.	other new employees) may be required initially to perform lesser skilled, repair-oriented tasks for a designated period of time before being taught more highly-skilled central office installation tasks.
License Certification	No license or certification is needed to carry out the functions of this position.	No basis for comparison and evaluation.
Union Apprenticeship	Central Office Installers commonly belong to the Communications Workers of America, the International Brotherhood of Electrical Workers or unions representing independent telephone companies or individual manufacturers. Training for this occupation is most often conducted by the employing companies rather than by the unions themselves.	No basis for comparison and evaluation.
Other	Desirable: Good physical condition including the ability to work in cramped spaces and to spend large amounts of time standing, reaching, stooping, bending, twisting, grasping, and using considerable hand movement; good color vision; ability to work cooperatively with others.	No basis for comparison and evaluation. Comments: It could be assumed that Marine Corps Wiremen who have maintained Marine Corps physical qualifications and who have performed their occupational duties satisfactorily for a reasonable period of time would fulfill many of the "Other" Civilian Employment Standards for Central Office Installers.
Military-Civilian Job Functional Comparability:	Comparability in job functions is moderate. Both Marine Corps Wiremen and Civilian Central Office Installers perform telephone crafts functions in general. However, the military personnel perform a wide variety of skilled and semi-skilled functions involving the laying and maintaining of field wire, the installation and operation of field telephones, switchboards, and other field telephone equipment in an outdoor setting. The civilian Central Office Installer installs, modifies, tests, or replaces electrical office telephone equipment, such as circuit selecting and switching apparatus, automatic message accounting systems, voice amplifiers, transmitting equipment, etc. in an indoor setting. The civilian position, at times, requires communication with or service to a customer which makes the employee's attitude and overall impression an important aspect of the job.	

IV. COMPARISONS OF THE TRAINING/EXPERIENCE OF ARMY OCCUPATIONAL SPECIALTIES WITH THE EMPLOYMENT STANDARDS FOR RELATED CIVILIAN OCCUPATIONS

TABLE 40

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR MUNITIONS HANDLER WITH THE TRAINING/EXPERIENCE OF ARMY ARMOR CREWMAN - 11110/20

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Some Employers: High school diploma or equivalent certificate. Desirable: High school diploma or equivalent certificate; ability to do mathematical computation; ability to read written instructions and write clearly.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational/Technical Training	Desirable: Training in the handling, loading, firing, and testing of guns, propellants, explosives or ordnance devices. Comments: The actual testing of the equipment, as opposed only to the handling of the equipment, requires skills such as setting up test instruments properly, making appropriate mathematical test computations, and recording results accurately. Training in handling and testing of equipment is usually given on the job.	Formal Training: A total of 280 hours of instruction, 205 of which are MOS skill-related; the sections on weapons (23 hours) and tank gunnery (57 hours) are directly related to training in the handling, loading, and firing of guns; the other sections are not directly related to such training but may contribute to an understanding of the conditions under which various types of weapons are used. While training for this MOS should fulfill most of the employment standards desired by civilian employers of Munitions Handlers, deficiencies occur in the testing of weaponry and may also result from differences between military and civilian equipment.
Previous Experience	Mandatory for Some Employers: Experience in handling, loading, and firing of guns or the use of propellants, explosives, or other ordnance devices. Desirable: Experience in the handling and testing of guns or other ordnance devices including the setting up of test equipment and the computations and documentation needed to measure the accuracy and tolerance ranges of such equipment. Comments: A new employee initially may only handle, load or fire the equipment. After a few months on the job, the employee then will become involved in the testing of such equipment.	Experience gained as an Army Armor Crewman in the handling, loading, and firing of weapons will fulfill most of employment standards required or desired by civilian employers of Munitions Handlers. Additional experience may be required in the testing of weaponry or on specific pieces of equipment not used in the military environment.
License/Certification	No license or certificate is needed to carry out the duties of this occupation.	No basis for comparison and evaluation.

TABLE 40 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship / Journeyman	No unions are associated with this occupation specifically. Employees may join a union representing various groups of employees at the establishment where they work.	No basis for comparison and evaluation.
Other	Desirable: Good physical condition; ability to use mechanical hand tools.	No basis for comparison and evaluation, although good physical condition and the ability to use hand tools can be assumed of persons with recent experience as an Army Armor Crewman.

Military-Civilian Job Function Comparability: Comparability in job functions is moderate. As part of a broader range of duties, the Army Armor Crewman operates firing controls and fire control instruments, fires individual and vehicular mounted weapons, loads tank weapons and prepares ammunition for firing, receives and distributes all types of tank ammunition, and assists in the organizational maintenance of tank weapons. The civilian Munitions Handler's chief duties are the handling, loading, and firing of guns, propellants, explosives or other ordnance devices. In addition, he or she often performs internal or external ballistics tests which involve the setting up of proper equipment, the calculation of mathematical computations, and the recording of test results and/or the maintenance of test laboratory notebooks.

TABLE 41

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR GROUND RADIO OPERATOR WITH THE TRAINING EXPERIENCE OF ARMY ARMOR CREWMAN - 11F10/20

Requirement Categories	Civilian Employment Standards [1]	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Most Employers: High school diploma or equivalent certificate. Desirable: The ability to write and maintain accurate logs of work activity.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational Technical Training	Mandatory: The ability to touch type or teletype at 40 words per minute. Desirable: Training in the use of radio equipment and systems used for communications with air/ground traffic; training in the identification of weather code symbols, traffic control procedures and abbreviations, and familiarity with technical and operational terms encountered in aviation communication. Comments: A probationary period is usually served during which the new employee is given on-the-job training in the use of the equipment and proper procedures and operations.	Formal Training: A total of 280 hours of instruction, 205 of which are MOS skill-related; the section on communications (13 hours) gives some general background in radiotelephone communications procedures. Other sections of the 205-hour instruction are not related to the desired training for civilian Ground Radio Operators. Deficiencies occur in teletypist training and in lack of terminology specific to the aviation air/ground communication system.
Previous Experience	Desirable: Experience with the use of radio equipment, control position equipment, or point-to-point systems used for the delivery of air/ground traffic; experience with the dispatching of vehicles or the distribution of messages over radiotelephone equipment.	Experience gained as an Army Armor Crewman in the ground communications area will provide general background knowledge of the use of radiotelephone equipment. Additional experience is desired for operations specific to air/ground traffic control.
License Certification	Mandatory: Possession of a Federal Communications Commission (FCC) Radiotelephone Third Class Operator Permit or Radiotelegraph Third Class Operator Permit; a Restricted Radiotelephone Operator Permit may be acceptable initially for new employees. Desirable: Possession of a Federal Communications Commission Radiotelephone Second Class Operator License or a Radiotelegraph Second Class Operator License. Comments: To obtain any of the above permits or licenses, one must be a citizen or national of the United States (waivers may be made for citizens of U.S. Trust Territories or alien aircraft pilots). There are no prerequisite training or education requirements. All of the permits or licenses except the Restricted Radiotelephone Operator Permit require the passing of an examination covering (1) the provisions of laws, treaties and regulations with which an operator must be familiar, (2) the operating procedures and practices generally followed or required by radiotelephone or radiotelegraph stations, and (3) for Second Class licenses, technical and legal matters applicable to operating various classes of stations. In addition, applicants for Radiotelegraph Third Class Operator Permit and Radiotelegraph Second Class Operator License must pass a code test for	Training received by Army Armor Crewman will not provide adequate preparation for satisfactory completion of the FCC permit or licensing examinations. Experience gained by Armor Crewman will provide general familiarity with the use of radiotelephone equipment but will not provide experience related to regulations, laws, procedures and practices required of radiotelephone or radiotelegraph operators and stations covered in the FCC examinations. The FCC has prepared a Study Guide and Reference Material for Commercial Radio Operator Examinations (Revised May 15, 1955) which is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402.

TABLE 11 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License Certification (Cont)	transmitting and receiving the International Morse Code for a period of one minute without error at a prescribed rate of speed. Permits and licenses other than the Restricted Radiotelephone Operator Permit are issued for a period of five years. The Restricted Radiotelephone Operator Permit is issued for the lifetime of the holder. This permit restricts the operator to certain types of stations and prohibits him or her from making any adjustments that may result in improper transmitter operation.	
Union Apprenticeship Journeyman	Unions common to this occupation are the Communications Workers of America, the Transport Workers Union, and the Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America. No formal apprenticeship program for this occupation exists at the present time.	No basis for comparison and evaluation.
Other	Desirable: Good speaking voice; the ability to speak clearly and intelligibly without a conspicuous accent; willingness to work shift assignments.	No basis for comparison and evaluation.
Military-Civilian Job Function Comparability:	Comparability in job functions is low. The Army Armor Crewman employs radiotelephone procedures, terminology, security, and maintenance of radiotelephone equipment as part of a broader range of duties. The civilian Ground Radio Operator's sole function is to transmit messages and provide a communication link between traffic and station personnel. This also calls for the reading and reviewing of rules and regulations governing the operation of such equipment and the keeping of accurate logs of communications.	

[1] The civilian employment standards represent requirements for Ground Radio Operators working in an aviation environment which involves the transmission of communications between air and ground traffic and facilities. Employment standards for Ground Radio Operators in other environments, e.g., marine radio operators, public safety radio services, land transportation radio services, may differ from these standards. However, the aviation-oriented Ground Radio Operators were chosen because they represent a well-defined group with more uniform employment standards than radio operators in other environments.

The employment standards outlined in this table are for Ground Radio Operators in an aviation environment in non-government positions. The closest government counterpart is the Air Traffic Controller at Federal Aviation Administration (FAA) flight service stations. Entrance standards for these positions tend to be very stringent because the career progression could lead ultimately to the performance of functions at a high-density air traffic control center which requires special mental, physical and emotional qualifications for adequate job performance. Information on FAA Air Traffic Controllers appears in U.S. Civil Service Commission Announcement No. 418.

TABLE 42

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR BLASTER WITH THE TRAINING/EXPERIENCE OF ARMY ARMOR CREWMAN - 11E10/20

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Most Employers: The ability to understand and give written and oral orders. Desirable: High school diploma or equivalent certificate.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational/Technical Training	Mandatory for Most Employers: Formal or on-the-job training in (1) the use, transportation, storing and handling of explosive materials and (2) the content of federal, state and local laws and regulations which pertain to explosives. Desirable: Formal training in the use of explosives covering such topics as product categories, ingredients and properties of explosives, detonation mechanisms, misfires, magazine and truck security, destruction of explosives, recommended use methods, instrumentation, hazard identification and prevention, "fly rocket," shot guarding, blast signals, federal, state or local regulations. Comments: E. I. DuPont deNemours and Company, Inc., offers a 3-day course approximately every two weeks at various locations around the United States which covers all of the above topics. This course is open to personnel of recognized industrial firms, universities, training organizations, government agencies and insurance companies.	Formal Training: A total of 280 hours of instruction, 205 of which are MOS skill-related; the sections on weapons (23 hours) and tank gunnery (57 hours) are distantly related because of the use of ammunition and weapons firing; the other sections of the training are not related.
Previous Experience	Mandatory for Most Employers: If no training has been received, experience is required in the use, handling, storing, and transportation of sensitive explosives under controlled conditions.	Experience with the use and handling of ammunition may be helpful as general background but additional experience is needed in the handling of sensitive explosives or their use under extremely controlled conditions.
License/Certification	A license or permit to use, handle, store, and/or transport explosives is needed in approximately 15 states. Requirements to obtain a license, certificate or permit differ among these states; some require a written and/or oral examination while others require only a statement of previous training and experience. Comments: Examination material usually consists of (1) federal, state and/or local laws or regulations governing the use, storage, handling, and transportation of explosives, (2) instructions and warnings concerning the	Training and/or experience gained as an Army Armor Crewman will not prepare one for state licensing examinations for the civilian occupation of Blaster.

TABLE 42 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License Certification (Cont)	use, storage, handling, and transportation of explosives published by the Institute of Makers of Explosives. Health and safety regulations concerning the use of explosives also are published by the Occupational Safety and Health Administration of the U.S. Department of Labor and the Bureau of Mines of the U.S. Department of the Interior.	
Union Apprenticeship/ Journeyman	Union membership is not common of members of this occupation.	No basis for comparison and evaluation.
Other	Mandatory for Most Employers: Not be addicted to alcohol, narcotics or other dangerous drugs. Desirable: Good physical condition; physical agility; the ability to communicate well; maturity; at least 21 years of age.	No basis for comparison and evaluation, although good physical condition and the ability to communicate well are essential characteristics of an Army Armor Crewman.

Military-Civilian Job Function Comparability: Comparability in job functions is low. Army Armor Crewmen do employ demolitions, and lay and remove mines but their exposure to explosives generally is limited to ammunition and weaponry. The civilian Blaster generally prepares and places explosive charges, prepares blast equipment, at times drills shot holes, sets off charges, and examines areas in which charges have been set off. The Blaster must follow strict rules and regulations when handling, storing, transporting, or using these sensitive charges or devices and, therefore works in an extremely controlled environment. The Armor Crewman does not have to be as concerned about the sensitivity of ammunition or weaponry or prescribed safety laws or regulations.

TABLE 43

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR CONSTRUCTION CARPENTER WITH THE TRAINING/EXPERIENCE OF ARMY CARPENTER - 51B20

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: High school diploma or equivalent certificate; courses in mathematics, mechanical drawing, and industrial arts. Comments: Tests measuring an understanding of mathematics, vocabulary and word meanings, reasoning powers and an aptitude for carpentry are often given apprenticeship applicants.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational Technical Training	Desirable for Entrance into an Apprenticeship Program: Skills in drafting, mathematics applicable to layout work, blueprint reading and familiarity with woodworking machines (see Union Apprenticeship/Journeyman category below). Comments: While some members of this trade acquire skills informally or through correspondence courses, most training authorities recommend the completion of a formal apprenticeship program.	Formal Training: A total of 280 hours of instruction, 204 of which are MOS skill-related topics including mathematics, construction print reading and bill of materials, carpenter hand tools, carpenter power tools, construction materials and hardware, scaffolds and ladders, building layout, concrete form work, building construction, timber trestles, bridges and timber pile wharves, vertical construction training, reinforcement training. All the above topics provide excellent background for entrance into a civilian carpentry apprenticeship training program.
Previous Experience	Desirable for Entrance into an Apprenticeship Program: Work experience involving the use of hand tools, power equipment, blueprints, the laying, matching or leveling of surfaces, the cutting, fitting or molding of wood or metal materials, the erection or assembly of structures, frames or furniture (see Union Apprenticeship/Journeyman category below).	Experience gained as an Army Carpenter is excellent preparation for entrance into a civilian carpentry apprencticeship training program.
License/Certification	No license or certificate is needed to carry out the functions of this position.	No basis for comparison and evaluation.
Union Apprenticeship/ Journeyman	One set of apprenticeship and training standards has been formulated by a National Joint Carpentry Apprenticeship and Training Committee representing the United Brotherhood of Carpenters and Joiners of America, the Associated General Contractors of America, Inc., and the National Association of Home Builders of the United States. Another set has been formulated by the Associated Builders and Contractors, Inc. Both sets are in conformance with basic standards recommended by the Bureau of Apprenticeship and Training U.S. Department of Labor. Apprenticeship Entrance Requirements — Mandatory for the National Joint Committee Program: Minimum 17 years of age; at least 2 years of high school; United States citizenship; satisfactory passing of a physical examination. Mandatory for Some Local Committees: Completion of an aptitude test battery; submission of letters of recommendation or character references; birth certificate; high school diploma (if attained) and proof of military discharge for veterans; a personal interview. Mandatory for the Associated Builders and Contractors, Inc. Program: Minimum legal age to handle tools of the trade; 9th grade education or higher; doctor's certificate stating the applican's physical ability to perform construction work; ability to provide own transportation; evidence of high school diploma (if attained) and transcripts of last grade completed; proof of military discharge for veterans; at least 3 personal	Apprenticeship Entrance Requirements: No basis for comparison and evaluation. Journeyman Status: Army Carpenters perform many of the same functions performed by prospective civilian carpentry journeymen. Areas not covered by Army Carpenters which are covered in the 8,000 civilian work program include welding, plastics and resilience, acoustics and drywall. Civilian classroom training not covered by military training in this MOS includes State and Federal safety codes and regulations, welding, cabinetmaking, plastics and resilience, acoustics and drywall, safety course (per Occupational Safety and Health Administration). Civilian carpenters also receive more hours of instruction than Army Carpenters receive. Previous training and experience is evaluated for each individual by the civilian trainer with whom the apprentice signs an apprenticeship agreement. For the Associated Builders and Contractors, Inc. program, no more than 500 hours of training and/or experience will be credited toward journeyman status.

TABLE 43 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship Journeyman (Cont)	references; and completion of a general aptitude test battery (administered by most State Departments of Labor). Journeyman Status — Mandatory for the National Joint Committee: Completion of 8,000 hours of work experience distributed over the following areas: layout (500 hours), form building (1,200 hours), rough framing (1,200 hours), outside finishing (800 hours), inside finishing (1,500 hours), care and use of tools and woodworking machinery (500 hours), welding (500 hours), plastics and resilience (300 hours), acoustics and drywall (1,000 hours), miscellaneous such as safety, scaffolding, walkways, protection, etc. (500 hours). In addition, 144 hours classroom instruction per year of related courses are required for each of the 4 years of apprenticeship. Mandatory for the Associated Builders and Contractors, Inc.: Completion of 8,000 hours of work experience distributed over the following areas: foundations, walls and floors (1,500 hours), framing (800 hours), roofs (700 hours), exterior mill work (1,000 hours), interior wall coverings (500 hours), floors (500 hours), stairs (500 hours), interior finish (1,000 hours), miscellaneous such as walkways, scaffolding, sheds, repairs, concrete forms, etc. (1,500 hours). Related classroom instruction of 144 hours per year for each of the 4 years of apprenticeship covering the following topics: accident prevention, first-aid, safety hazards, State and Federal safety codes and regulations, ethics and history of the trade, tools and materials, review and application of basic mathematics, elementary blueprint reading, foundations, rough framing, exterior finishes, roof framing, stair building and finishing, cabinetmaking, reinforced concrete form construction, heavy timber construction, welding, acoustics and drywall, plastics and resilience. Comments: An apprenticeship agreement is drawn up between the accepted trainee and the trainer, who may be either an employer or the local committee. The trainer initially evaluates previous training and experience for credit leading to advanced standing and monitors the progress of the trainee throughout the apprenticeship period. In many major cities, training leaders work closely with public school officials and, at times, are permitted to use public educational facilities for classroom instruction. Although training or experience gained as a carpenter's "helper" may add to one's carpentry skills, such work does not replace formal apprenticeship training.	
Other	Desirable: Good manual dexterity; good sense of balance; no fear of high places; ability to work closely with others.	No basis for comparison and evaluation.

Military-Civilian Job Function Comparability: Comparability in job functions is high. Both civilian and military carpenters examine blueprints, sketches and drawings, build forms or scaffolding for erection or repair of structures, erect building framework or parts of frames, install doors, windows, stairs, and interior finishes, and employ standard carpentry tools for general carpentry work and special power tools for heavy carpentry work. However, military carpenters often are involved in more maintenance carpentry work than are civilian construction carpenters, and have more experience with rough structures which do not require the finishing skills often used by civilian construction carpenters.

TABLE 44

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR CABINETMAKER WITH THE TRAINING EXPERIENCE OF ARMY CARPENTER - 51B20

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: High school diploma or equivalent certificate; courses in mathematics, mechanical drawing, industrial arts or vocational carpentry. Comments: Tests measuring an understanding of mathematics, vocabulary and word meanings, reasoning powers and an aptitude for carpentry are often given to apprenticeship candidates.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational Technical Training	Desirable for Entrance into an Apprenticeship Program: Skills in drafting, mathematics applicable to layout work, blueprint reading and familiarity with woodworking machines (see Union Apprenticeship/Journeyman category below). Comments: Some Cabinetmakers acquire skills informally or through correspondence courses, but most training authorities recommend the completion of a formal apprenticeship program.	Formal Training: A total of 280 hours of instruction, 204 of which are MOS skill-related topics including mathematics, construction, print reading and bill of materials, carpenter hand tools, power tools, construction materials and hardware, scaffolds and ladders, building layout, concrete formwork, building construction, timber trestles, bridges and timber pile wharves, vertical construction, reinforcement. All of these topics provide background for entry into a civilian cabinetmaker apprenticeship program.
Previous Experience	Desirable for Entrance into an Apprenticeship Program: Work experience involving the use of hand tools, power equipment, blueprints, laying, matching, or leveling of surfaces, cutting, fitting or molding of wood or metal materials, the erection or assembly of structures, frames or furniture. (See Union Apprenticeship Journeyman category below.)	Experience gained as an Army Carpenter is excellent preparation for entrance into a civilian cabinetmaker apprenticeship training program.
License Certification	No license or certificate is needed to carry out the functions of this position.	No basis for comparison and evaluation.
Union Apprenticeship Journeyman	A set of apprenticeship and training standards has been formulated by a National Joint Carpentry Apprenticeship and Training Committee representing the United Brotherhood of Carpenters and Joiners of America, the Associated General Contractors of America, Inc., and the National Association of Home Builders of the United States. Mandatory Apprenticeship Entrance Requirements of the National Joint Carpentry Apprenticeship Committee: Minimum 17 years of age; at least two years of high school; United States citizenship; satisfactory physical examination. Minimum for State/Local Committees: Completion of an aptitude test [illegible]; [illegible] letters of recommendation or character references; birth certificate; high school diploma (if attained); and proof of military [illegible]; a personal interview. Minimum for Advancement Journeyman Status: Completion of 8,000 hours [illegible] experience distributed over the following areas: Sharpening and [illegible] hand tools (500 hours); working from stock bills and drawings [illegible] hours); use of power equipment including cutoff saws, table saws, jointers, [illegible] planers, shapers, sanders, etc. (1,500 hours); grinding [illegible] saws (500 hours); laying, matching and cutting veneers [illegible]; [illegible] and preparing material for assembly (500 hours); gluing	Apprenticeship Entrance Requirements: No basis for comparison and evaluation. Journeyman Status: Army Carpenters learn many of the general skills required of cabinetmakers such as the use and care of power and hand tools, working from stock bills and drawings, hanging of doors, basic mathematics, blueprint reading and estimating, and stairbuilding. However, the Army Carpenter occupation is not oriented specifically to cabinetmaking, but to construction. Among cabinetmaking skills that Army Carpenters do not normally practice are: layout, matching and cutting veneers; dressing and preparing material for assembly; gluing stock; gluing of flat work; assembling of cabinets and built-ins. Army Carpenters are also not required to learn Federal and State safety codes, regulations and standards.

TABLE 44 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship Journeyman (Cont)	stock (200 hours); layout work for milling and general trim-saw work from stock bills and details (1,000 hours); sanding of moldings, gluing of flat work and cleaning for finish (200 hours); assembling of doors, drawers, skeleton frames, fitting and hanging doors and drawers, fitting and applying moldings and matching veneers (800 hours); assembling and installing cabinets, built-ins, paneling, etc. (1,500 hours); independent layout, machining and assembling of cabinets and built-ins (500 hours). Related instruction that accompanies apprenticeship includes safety, first-aid, safety codes and regulations; ethics and history of cabinetmaking; care and use of hand and power tools; types and uses of materials; basic mathematics; exterior finish; interior finish; acceptable standards for cabinets, casework and built-ins; set-up, operation and maintenance of power mill equipment; blueprint reading and estimating; shop drawings and cutting lists; stairbuilding and employer-employee relations. Comments: An apprenticeship agreement is drawn up between the accepted trainee and the trainer who may be either an employer or the local apprenticeship committee. The trainer initially evaluates previous training and experience for credit leading to advanced standing and monitors the progress of the trainee through the apprenticeship period. In many major cities, training leaders work closely with public school officials, and at times are permitted to use public educational facilities for classroom instruction. Although training or experience gained as a carpenter's "helper" may add to one's carpentry skills, such work does not replace formal apprenticeship training.	
Other	Desirable: Good manual dexterity; ability to work with others.	No basis for comparison and evaluation.
Military-Civilian Job Function Comparability:	Comparability in job functions is moderate. While both the military and civilian carpenters perform general carpentry functions such as blueprint reading, use of carpentry hand tools and power tools, hanging of doors, working from stock bills or drawings, the Army Carpenter does not perform the cabinetmaking functions commonly performed by the civilian Cabinetmaker. The Army Carpenter is oriented to construction and maintenance of frames, scaffolding, walls and siding and the installation of doors, floors, window sashes or stairs, while the civilian Cabinetmaker concentrates on the assembling and installation of cabinets, built-in units, paneling, etc.	

TABLE 45

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR FURNITURE MAKER WITH THE TRAINING EXPERIENCE OF ARMY CARPENTER - 51B20

Employment Standards	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
General Education	Mandatory for Some Employers: A high school diploma or equivalent certificate. Other employers recruit persons who have not graduated from high school.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational Technical Training	Desirable: Courses in industrial arts or vocational courses related to manufacturing. Some schools and community colleges have specific furniture manufacturing curricula. Comments: Manufacturers provide training for new employees. On-the-job training for inexperienced workers usually lasts from one and one-half to two years. Training includes safety, use and care of hand and power tools, blueprint reading, uses of glue, fasteners and holding devices, sanding, finishing, upholstering and cabinet construction.	Formal Training: A total of 280 hours of instruction, 204 of which are MOS skill-related topics including mathematics, construction print reading, carpenter hand and power tools, construction materials and hardware, scaffolds and ladders, building layout, concrete formwork, building construction, timber trestle bridges and timber pile wharves, vertical construction training and reinforcement training. Comments: All of these topics develop general carpentry abilities such as thinking in geometric terms, reading prints and plans and using tools to build within tolerances which are skills that are valuable in furniture making. Because furniture making is a manufacturing activity, however, the furniture maker occupation is generally unrelated to the construction skills learned by Army Carpenters.
Previous Experience	No previous experience is required for entry into this occupation.	Army Carpentry experience would provide excellent background for persons applying at the entry level of this occupation, but would not by itself enable an individual to obtain a position higher than the entry level.
License Certification	No license or certificate is needed to carry out the functions of this position.	No basis for comparison and evaluation.
Has Apprenticeship Journeyman	Journeyman Status: Many persons in this occupation are not members of any union that requires an apprenticeship. However, the Bureau of Apprenticeship and Training, Manpower Administration, U.S. Department of Labor indicates that an apprenticeship for Furniture Makers has been approved. It includes: use of hand tools (1,600 hours); blueprint reading, including sketches and drawings (400 hours); matching of materials for color grain and texture (400 hours);	Journeyman Status: Army Carpenters are not involved, generally, in the production of furniture. The training is similar to that of Furniture Makers only in the use of hand tools and blueprint reading. Army Carpenters do not, however, gain experience, necessarily, in matching of materials for color, grain and texture, set-up and operation of woodworking machines, gluing, fitting, clamping and assembly, repair and fashioning of furniture and coating assembled furniture.

TABLE 45 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship/ Journeyman (Cont)	set-up and operation of woodworking machines (1,600 hours); gluing, fitting, clamping and assembly (2,400 hours); repair and fashioning of custom furniture (800 hours); coating assembled furniture with stain, varnish, paint, etc. (800 hours).	
Other	No other requirements have been established for this occupation.	No basis for comparison and evaluation.
Military-Civilian Job Function Comparability:	Comparability in job functions is generally low. While civilian Furniture Makers and Army Carpenters perform such common functions as blueprint reading, and the employment of standard tools for general carpentry work, civilian Furniture Makers focus on a specific aspect of carpentry which requires skills in woodworking, matching of materials, gluing, assembly operations, cabinet making, upholstery, and wood finishing. Army Carpenters are oriented toward construction and maintenance work involving the building of scaffolding, frames, walls, siding and the installation of doors, floors, window sashes, stairs, etc.	

TABLE 46

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR COMPUTER SYSTEMS OPERATOR "C" WITH THE TRAINING/EXPERIENCE OF ARMY COMPUTER SYSTEMS OPERATOR - 74L10/20

Requirement Categories	Civilian Employment Standards [1]	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Most Employers: High school diploma or equivalent certificate; ability to understand technical language used in operating instructions and equipment manuals; ability to perform operating records and timing computer runs. Desirable: High school diploma or equivalent certificate; courses in mathematics or accounting; some background in science or physics (helpful for analog equipment). Comments: A high school diploma or some college training is often required of applicants who have had no specialized training or experience. Tests are often administered to applicants to determine their aptitude for computer work, particularly in logical reasoning abilities, and their adaptability for performance of job functions.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends: (1) four semester hours credit in computer operations at the vocational certificate level or the technical associate degree level, (2) two semester hours credit in computer operations at the baccalaureate degree level for formal training in this MOS.
Vocational/Technical Training	Mandatory for Most Employers: At least one year of technical training after high school including courses such as the operation of computers and peripheral equipment, mathematics for data processing, elementary computer programming, or accounting; closely supervised on-the-job training covering the above topics is also adequate. Comments: Large establishments may have openings for trainee positions and conduct their own formal training program. If in-plant classes are not held, new operators are sent to a school conducted by the equipment manufacturer. Both types of classes usually last from one to three weeks. On-the-job training ranges from a few months to a year, depending upon the complexity of the computer equipment and the amount of operator intervention required. Smaller computer establishments often do not have training facilities and are apt to require applicants to have previous computer operator training or experience.	Formal Training: A total of 184 hours, 152 of which are MOS skill-related subjects are offered. All subjects are directly related to the training desired of civilian Computer Systems Operator "C" applicants. While no training is given in mathematics for data processing or accounting, the 152 hours of training that is received should satisfy the employment standards for entrance into this civilian occupation. Difficulty in transferability may occur only in instances in which training has been obtained on computer systems configurations which are dissimilar.
Previous Experience	Mandatory for Many Employers: Approximately one year's experience in the data processing field. Comments: Smaller establishments with no training facilities usually require previous experience in the data processing field. Applicants without a high school diploma or, in some cases, college courses almost always are required to have previous experience or training.	The experience gained as Army Computer Systems Operator qualifies one for entrance into the civilian position of Computer Systems Operator "C".

TABLE 46 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License Certification	No license or certificate is needed to carry out the functions of this occupation.	No basis for comparison and evaluation.
Union Apprenticeship Journeyman	No union exists solely for data processing personnel across professional areas. Computer Operators may join a union representing other groups of employees at the establishment for which they work. At some scattered locations, small, specialized bargaining units have been formed within narrow job areas, e.g., railroad data processing personnel.	No basis for comparison and evaluation.
Other	Desirable: Ability to express oneself well enough to explain operating problems to supervising personnel or manufacturer representatives; ability to adhere to a fixed schedule; above-average spatial and form perception (to wire control panels and identify errors in input/output material); an interest in working with machines and performing duties according to a set, organized procedure; ability to perform a variety of tasks involving frequent change within the framework of specific delineations; ability to concentrate on several aspects of the job at once; ability to remain alert and act quickly in the event of processing problems or stoppages.	No basis for comparison and evaluation. Comments: Satisfactory performance for a reasonable length of time of the duties of Army Computer Systems Operator provides evidence for fulfillment of most of the "Other" Civilian Employment Standards for Computer Systems Operator.
Military-Civilian Job Function Comparability:	Comparability in job functions is very high, with Army Computer Systems Operators performing additional tasks not usually performed by civilian personnel in this entry-level occupation. Both military and civilian personnel perform the basic operations of operating the computer console, determining equipment setup and "run" operations, switching necessary auxiliary equipment into circuit, observing console panel and display devices for evidence of deviation from the norm, recording operating time and "down" time, and clearing the computer at the end of the run. However, the civilian Computer Systems Operator "C" usually works only on routine programs and is closely supervised. The employee at this point is developing a working knowledge of the computer equipment and sharpening his or her ability to detect problems involved in running routine programs. The Army Computer Systems Operator, at least at the 74E20 level, is already correcting errors observed from the console, adjusting input data to purify the defective data, conferring with the programmer when more complex errors occur, and determining whether the seriousness of machine errors justifies computer maintenance or whether continuation of the run should be attempted.	

1 Civilian employment standards for Computer Systems Operator "C" represent requirements for the entry-level position of the computer operator profession. Standards for the intermediate and advanced positions, represented by Computer Systems Operators "B" and "A", respectively, are shown on the following table (Table 47). The categorization of Computer Systems Operators "A," "B," and "C" is used commonly by the Federal government and often by private establishments which deal with government contracts.

TABLE 17

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR COMPUTER SYSTEMS OPERATORS "B" AND "A" WITH THE TRAINING EXPERIENCE OF ARMY COMPUTER SYSTEMS OPERATOR - 74E10/20

Requirement Categories	Civilian Employment Standards [1]	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Most Employers: High school diploma or equivalent certificate; ability to understand technical language used in operating instructions and equipment manuals; ability to perform arithmetic functions for preparing operating records and timing computer runs. Desirable: An associate degree or 4-year degree in electronic data processing or closely related fields.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends: (1) four semester hours credit in computer operations at the vocational certificate level or the technical associate degree level, (2) two semester hours credit in computer operations at the baccalaureate degree level for formal training in this MOS.
Vocational Technical Training	Mandatory for Most Employers: Formal or on-the-job supervised training in the basic techniques and job functions of the Computer Systems Operator "C" entry-level position (see preceding Table 4.7). Desirable: A vocational certificate, associate or 4-year electronic degree in data processing including instruction on the specific type of equipment worked with on the job. Comments: Computer Systems Operators "B" and "A" are intermediate and advanced positions, respectively. While it is possible to work up to these positions through experience only, formal classroom or on-the-job supervised instruction is usually required to become proficient in these job skills.	Formal Training: A total of 184 hours, 152 of which are MOS skill-related subjects are offered. All 152 hours are directly related to the training desired by civilian employers of Computer Systems Operators "B" and "A". Difficulty in transferability may occur in instances in which training has been obtained on equipment or hardware configurations which are dissimilar.
Previous Experience	Mandatory for Most Employers: Two years (for Computer Operator "B") to four years (for Computer Operator "A") in the operation of computer systems. Desirable: Experience operating a system in a multiprogramming environment using various hardware configurations including remote communications terminals; some supervisory experience; experience in communicating with nontechnical users of data processing equipment.	All experience gained as an Army Computer Systems Operator is applicable to the qualifications and work experience desired by civilian employers of Computer Systems Operators "B" and "A". Some deficiencies may occur in supervisory experience or with exposure to different computer systems or hardware configurations. Army experience should satisfy the civilian employment standards for the Computer Systems Operator "B" position and, in some cases, for the "A" position also. The latter position requires an Army Computer Systems Operator who has been able to accumulate the required experience and has shown the potential for supervisory functions.
Union Apprenticeship/ Journeyman	No union exists for data processing personnel across professional areas. Computer Operators may have the opportunity to join a union representing other groups of employees at the establishment for which they work. In some scattered locations, small, specialized bargaining agents have been formed within narrow job areas, e.g., railroad data processing personnel.	No basis for comparison and evaluation.

TABLE 47 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Other	Desirable: Ability to express oneself well enough to explain operating problems to supervisory personnel or manufacturer representatives; ability to adhere to a fixed schedule; above-average spatial and form perception (to wire control panels and identify errors in input/output material); an interest in working with machines and performing duties according to a set, organized procedure; ability to perform a variety of tasks involving frequent change within the framework of specific delineations; ability to concentrate on several aspects of the job at once; ability to remain alert and act quickly in the event of processing problems or stoppages; ability to supervise, guide or direct lower level operators.	No basis for comparison and evaluation. Comments: Satisfactory performance for a reasonable length of time of the duties of Army Computer Systems Operator provides evidence for fulfillment of most of the "Other" Civilian Employment Standards for this occupation.
Military-Civilian Job Function Comparability:	Comparability in job functions is very high. Both military and civilian personnel determine equipment setup and "run" operations, load equipment and control various auxiliary equipment, observe console and display devices for deviation from the norm, and record "run" information. Civilian Computer Systems Operators "B" commonly run established production programs for which alternate programs are provided in the event of program errors. In error situations, standard correction techniques can usually be employed. Computer Systems Operator "A" is a more senior position commonly involving the running and testing of new programs. Such programs are often of complex design so that the identification of error source may require a working knowledge of the total program and no alternate may be available. This position also requires the ability to give direction and guidance to lower level operators. Army Computer Systems Operators commonly perform the functions of Civilian Computer Systems Operators "B". Quantity and quality of experience received and aptitude for job functions determine what portion of Computer Systems Operator "A" functions can be performed by Army personnel.	

1/ Civilian employment standards for Computer Systems Operators "B" and "A" represent requirements for the intermediate and advanced positions, respectively, of the computer operator profession. Standards for the entry-level position, represented by Computer Systems Operator "C" are shown on the preceding table (Table 46). The categorization of Computer Systems Operators "A", "B", and "C" is used commonly by the Federal government and often by private establishments which deal with government contracts.

TABLE 48

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR COMPUTER PROGRAMMER WITH THE TRAINING/EXPERIENCE OF ARMY COMPUTER SYSTEMS OPERATOR - 74L10 29

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Most Employers: High school diploma or equivalent certificate. Mandatory for Some Employers: A 2-year associate or 4-year baccalaureate degree. Vocational training (see below) can usually be substituted for formal education. Desirable: A 2-year associate or 4-year baccalaureate degree in data processing, accounting, mathematics, business administration or other closely related areas. Comments: Some organizations require a college degree because of the promotional potential it provides or because the programmer will be dealing with problems involving more than basic computer knowledge such as market research or statistical forecasting. The level of mathematical proficiency required varies from job to job. Programmers working on simple data processing problems need only arithmetic and algebra, while those involved in forecasting, optimization or other complex problems may need knowledge of differential equations and mathematical statistics.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends: (1) four semester hours credit in computer operations at the vocational certificate level or the technical associate degree level, (2) two semester hours credit in computer operations at the baccalaureate degree level for formal training in this MOS.
Vocational/Technical Training	Mandatory for Most Employers: Technical course(s) in computer operations and programming methods. Desirable: Technical course(s) in computer operations and progamming methods coupled with 6 months to 2 years of on-the-job supervised training in computer operations and programming methods including knowledge of machine hardware capabilities, flow charting, computer language and operating instructions, data worksheet forms, program testing and "debugging," and program documentation. Comments: A large number of technical schools, junior colleges, and universities offer technical courses in computer programming ranging from introductory home study courses to advanced computer technology. Some business establishments with large data processing facilities conduct formal classes for untrained but educationally-qualified applicants. Such in-plant classes are supplemented by on-the-job training lasting approximately 6 months.	Formal Training: A total of 184 hours, 152 of which are MOS skill-related subjects are offered. All 152 hours provide good information on computer hardware systems helpful to Computer Programmers as background knowledge in computer operations. The topics "Introduction to Automatic Data Processing Systems" and "Concepts of Computer Programming" are directly applicable to training desired of civilian computer programming personnel. This MOS-related training plus a technical course or courses specifically in the writing of computer programs would qualify the Army Computer Systems Operator for entry into the civilian computer programming profession. Comments: Many self-paced programmed texts exist for those who want instruction in the writing of computer programs.
Previous Experience	Desirable: Six months to one year of experience in computer operations and programming methods including the preparation of routine phases of production programs, the preparation of flow charts into computer	All experience gained as an Army Computer Systems Operator is helpful background experience for the civilian Computer Programmer. Any experience in the writing of computer programs or with

TABLE 48 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Previous Experience (Cont)	instructions, the compilation of test data, the testing and "debugging" of programs, and program documentation. Comments: Approximately one year of experience is needed before a programmer can handle all aspects of the job without close supervision. Often a programmer will remain a trainee for 3 to 12 months before attaining full programmer status. Some employees who have had experience in machine tabulation or payroll are promoted to programming jobs. However, these personnel usually need additional courses in data processing to become fully qualified programmers.	the preparation of Job Control Language needed to execute programs which the Army personnel may pick up in the performance of job functions is directly applicable to the experience desired by civilian employers of Computer Programmers.
License/Certification	No license or certificate is needed to carry out the functions of this occupation.	No basis for comparison and evaluation.
Union Apprenticeship Journeyman	No union exists solely for data processing personnel across professional areas. Computer programmers may join a union representing other groups of employees at the establishment for which they work. At some scattered locations, small, specialized bargaining units have been formed within a narrow job area, e.g., railroad data processing personnel.	No basis for comparison and evaluation.
Other	Desirable: An aptitude for logical, analytical thinking; patience, persistence and the ability to work with extreme accuracy; ingenuity and imagination to solve problems in new ways; numerical ability; spatial aptitude and form perception to interpret diagrams, visualize flow charts, and recognize pertinent detail.	No basis for comparison and evaluation.
Military-Civilian Job Function Comparability:	Comparability in job functions is relatively low. Army Computer Systems Operators are concerned with the running of computer equipment (hardware). This work involves determining equipment setup, loading equipment, controlling various auxiliary devices and attending to console operations and machine settings. Occasionally the operator is concerned with computer program (software) logic in the case of machine stoppages, but he or she must confer with the programmer to understand the program instructions and program logic. The civilian Computer Programmer is concerned with writing the programs which will be run on the computer. This involves planning (flow charting) the logic of the program, writing the computer-language instructions, and correcting (debugging) errors in the program when it is tested. At times the programmer must confer with the operator on problems concerning machine capabilities or machine stoppage when the program is being tested or it is in the production run (after it is fully tested).	

TABLE 49

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR CORRECTIONAL SPECIALIST WITH THE TRAINING/EXPERIENCE OF ARMY CORRECTIONAL SPECIALIST - 95C20

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Most Employers (other than the Federal government): A high school diploma or an equivalent certificate. Comments: Many employers, other than the Federal government, often give an aptitude test or an examination of general mental abilities.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends: (1) Three semester hours in criminal justice at the technical associate degree or baccalaureate degree level for 95B10 training (prerequisite for 95C20 training); (2) two semester hours in criminal justice at the technical associate degree level for 95C20 training.
Vocational Technical Training	Desirable: Introductory knowledge of modern methods and objectives of discipline required of persons under restraint; training in such areas as effectiveness with persons displaying anti-social behavior, and writing intelligible, complete and concise reports; the use of tact, diplomacy, fairness, and firmness in dealing with people; accurate interpretation of institutional rules and regulations; effectiveness in instructing, counseling, and persuading others; full participation as a member of a team and in the promotion of teamwork. Comments: Most employers conduct a formal or informal training program lasting approximately 1-6 weeks covering such topics as transportation and movement of inmates, security procedures, disturbance control, escort duty, searches, supervision of inmates, available treatment programs, first-aid and safety procedures, firearms safety, legal ethics, interpersonal relations, group dynamics, drug identification and control, and report writing.	Formal Training: A total of 296 hours, 222 hours of which are MOS skilled-related instruction; topics covered under sections on "Common Law Enforcement Activities and Skill Development" and "Army Correctional Administration and Operations" such as riot control, armed, unarmed defense, search and seizure, interviews and interrogations, authority and jurisdiction, warnings and waivers, race relations, report writing, group dynamics, prisoner interviews and counseling, disciplinary measures, control of contraband, legal aspects of corrections, and internal and external control measures are closely related to civilian Correctional Specialist training; topics covered under the section on "Military Police Enforcement Activities and Tactical Operations" are less related to such training.
Previous Experience	Mandatory for the Federal Prison System: Three and one-half years of paid or volunteer experience in one or more of the following (or similar) types of work: (1) supervisory or leadership experience, (2) teaching or instructing, especially with adults or disadvantaged groups, (3) enforcement of rules and regulations relating to safety, health or protection, (4) rehabilitation or corrections, (5) counseling in a welfare or other social service agency, (6) interviewing and counseling, or (7) sales work which involves extensive person-to-person relationships. For the Federal prison system, two years of study completed successfully in a resident school above high school level may be substituted for two years of general experience. Successful completion of a full four-year course of college study may be substituted for three years of general experience. One full semester of graduate study in correctional administration, criminology, psychology, sociology, or social work	Three and one-half years of experience gained as an Army Correctional Specialist will satisfy all of the experience qualifications required or desired by civilian employers of Correctional Specialists. Comments: Ex-military personnel, particularly those who have dealt with corrections, security, or guard duties, may be given preference for Correctional Specialist jobs in the civilian sector. While entrance above job entry level may prove difficult initially, promotions may come more rapidly for those who have had comparable previous experience and who perform satisfactorily during an initial probationary period.

TABLE 49 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Previous Experience (Cont)	completed successfully in an accredited college or university may be substituted for six months of general experience. Desirable: Experience involving counseling, teaching, rehabilitation, supervisory or leadership skills; experience in positions requiring the need for maturity, understanding, tact, diplomacy, respect for authority and the ability to function effectively under trying circumstances.	
License Certification	No license or certificate is needed for the performance of the duties of Correctional Specialist. Comments: Many employers, particularly state institutional training centers, award certificates upon the satisfactory completion of their Correctional Specialist training program.	No basis for comparison and evaluation.
Union Apprenticeship Journeyman	Federal Correctional Specialists often join the American Federation of Government Employees. State Correctional Specialists are often members of the American Federation of State, County, and Municipal Employees. No apprenticeship program is sponsored by a union at this time.	No basis for comparison and evaluation.
Other	Mandatory for Some Employers: No police, court, or criminal record; good physical condition with sufficient physical strength and agility with no disabling defects which would preclude the controlling of inmates; good vision with or without corrective lens; minimum of 18 or 21 years of age; minimum height or height/weight ranges; emotional stability and maturity; ability to stand guard for long periods of time under varying work conditions; attendance at a personal interview.	No basis for comparison and evaluation. Comments: Army Correctional Specialists who have performed their occupational duties satisfactorily for a reasonable period of time would fulfill many of the "Other" Civilian Employment Standards for Correctional Specialists.

Military-Civilian Job Function Comparability: Comparability in job functions is very high. Both military and civilian personnel are concerned with the custody, safekeeping and well-being of persons in confinement, the prevention of escapes, the maintenance of order, the enforcement of rules of conduct, security and/or labor standards. Military personnel, in addition, perform the added functions of evaluating the prisoner's character and adjustment to confinement, providing counseling as needed, providing some assistance with emotionally disturbed prisoners, and helping to identify and solve problems of prisoners. These more psychologically oriented functions provide an added dimension to the military Correctional Specialist occupation. In the civilian sector, these functions are usually performed by other categories of personnel such as counselors, probation officers or parole officers.

TABLE 50

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR PRIVATE SECURITY GUARD WITH THE TRAINING/EXPERIENCE OF ARMY CORRICTIONAL SPECIALIST - 95C20

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Some Employers: A high school diploma or equivalent certificate, or at least a 10th grade education. For all employers, the ability to read and write, and to follow written or oral instructions. Comments: A test may be given to applicants without a high school diploma or for whom reading and/or writing abilities are questioned.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends: (1) Three semester hours in criminal justice at the technical associate degree or baccalaureate degree level for 95B10 training (prerequisite for 95C20 training); (2) two semester hours in criminal justice at the technical associate degree level for 95C20 training.
Vocational/Technical Training	Desirable: Previous training as a civilian or military guard or as a member of a police or security force; skills such as (1) understanding and enforcing company or office rules and regulations, (2) giving clear, intelligent and fair orders to subordinates or to the general public when necessary, and (3) understanding reports, report forms and the details necessary for the preparation of good reports. Comments: Some form of training is often given new employees in such areas as theft and fire protection, company rules and regulations, vehicular or individual traffic control, safety and first-aid, public relations, arrest and apprehension procedures, and report writing techniques.	Formal Training: A total of 296 hours, 222 hours of which are MOS skill-related instruction; certain topics covered in the 86-hour section on "Common Law Enforcement Activities and Skill Development" such as unarmed defense, search and seizure, evidence handling, warnings and waivers are related to Private Security Guard training; a few topics covered in the 114-hour section on "Military Police Enforcement Activities and Tactical Operations" such as patrol operations, traffic control and accident investigation are generally related; very few topics in the 31-hour section on "Army Correctional Administration and Operations" are related to such training. In general, training in this MOS should adequately qualify one for entrance into the civilian Private Security Guard occupation.
Previous Experience	Desirable: Previous experience as a civilian or military guard or as a member of a police or security force; job experience requiring discipline or security clearance, the safety or the protection of company/plant/office personnel or property, the enforcement of rules and regulations, the monitoring or control of traffic or individuals within a work area, the prevention of espionage or sabotage, the maintenance of control during emergencies, the prevention of fire and theft, the conducting of inspections, the handling of classified documents, or the participation in crash/fire/rescue operations.	The experience gained as an Army Correctional Specialist will satisfy most of the experience qualifications desired by civilian employers of Private Security Guards. Comments: Ex-military personnel are often given preference for civilian private security jobs. In some cases, such personnel are assigned more demanding duties, especially if security, guard or correctional tasks have been performed routinely as part of one's primary duties.
License/Certification	Mandatory for Some Employers: The possession of a valid motor vehicle operator's license. For employers authorizing the issuance of firearms, the proper permit in accordance with federal, state or local firearms control laws and company regulations.	The training for Army Correctional Specialist includes the operation of motor vehicles and qualifies one for award of a Military Operator's Permit.

TABLE 50 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship/ Journeyman	Union membership is not common of members in this profession.	No basis for comparison and evaluation.
Other	Mandatory for Most Employers: No police, court or criminal record; good vision and hearing; good physical fitness and stamina; emotional stability; self-control; tactfulness; good judgment. For some employers, U.S. citizenship; minimum of 21 years of age; possession of or access to an automobile; specific height and/or weight ranges. Desirable: High personal standard of conduct; alertness and watchfulness; loyalty to work; a sense of responsibility; ability to work within an organization or as a member of a team; courteousness and helpfulness; regularity in job attendance; ability to take orders from superiors without questions and to give clear, intelligent orders to subordinates.	No basis for comparison and evaluation. Comments: It could be expected that civilian employers may be inclined to assume that ex-military personnel possess such desired qualities as the ability to work within an organization or as a member of a team, the ability to take orders, loyalty, and a sense of responsibility.

Military-Civilian Job Function Comparability: Comparability in overall job functions is generally low. The Army Correctional Specialist performs more complex functions than does the civilian Private Security Guard. The Army personnel are most often concerned with the guarding of prisoners and the performance of confinement facility activities, e.g., inspecting prisoner work areas, noting and recording sanitation conditions, etc. These functions are most similar to those performed by the civilian Correctional Specialist, which is covered in a preceding chart. The civilian Private Security Guard is commonly involved with the protection of property, the prevention of damage, fire, or theft, or the patrolling and inspection of work premises. Less frequently, the guard is involved with the arrest or apprehension of suspects, participation in emergency situations, investigation of accidents or robberies, or controlling disorderly crowds.

TABLE 51

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR FEDERAL GOVERNMENT PROTECTIVE OFFICER WITH THE TRAINING/EXPERIENCE OF ARMY CORRECTIONAL SPECIALIST - 95C20

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory: Two years of education at a resident school (as opposed to correspondence school) above the high school level; previous experience of the same duration (see below) may be substituted partially or fully for the education requirement.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends: (1) Three semester hours in criminal justice at the technical associate degree or baccalaureate degree level for 95B10 training (prerequisite for 95C20 training); (2) two semester hours of criminal justice at the technical associate degree level for 95C20 training.
Vocational/Technical Training	Mandatory: Persons selected for the position must successfully pass a 4-week training program covering basic law and criminal justice, investigative and reporting procedures for various crimes and incidents, protective systems and techniques, bomb searches and related skills. Comments: Persons selected for this civilian position must successfully complete a one-year probationary period. Once that period is completed, specific justification is needed to suspend or fire one from that position.	Formal Training: A total of 296 hours, 222 of which are MOS skill-related; topics covered in the 86-hour section on "Common Law Enforcement Activities and Skill Development" are generally related to the civilian Protective Officer training; sections on "Military Police Enforcement Activities and Tactical Operations" and "Army Correctional Administration and Operations" are not similar to such training.
Previous Experience	Mandatory: Two years of experience demonstrating: (1) the ability to meet and deal with the general public; (2) the ability to understand and apply various rules and regulations, and (3) the ability to maintain poise and self-control under stress; formal education of the same duration (see above) may be substituted partially or fully for the experience requirement.	Any type of military service may be credited toward meeting the 2-year experience requirement. This MOS, therefore, more than adequately qualifies one for civilian experience entrance standards.
License/Certification	Mandatory: Possession of a valid motor vehicle operator's license or the ability to obtain one within 30 days after being hired.	The training for Army Correctional Specialist includes the operation of motor vehicles and qualifies one for award of a Military Operator's Permit.
Union Apprenticeship/ Journeyman	Approximately 90% of the Federal Protective Officers belong to either the International Federation of Federal Police, the American Federation of Government Employees or the National Federation of Federal Employees. At the present time, membership in the latter two organizations is not opened to any federal protective/police personnel.	No basis for comparison and evaluation.

TABLE 51 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship/ Journeyman (Cont)	Comments: After 1970, all federal protective/police personnel were allowed to join only those unions or bargaining groups composed of people performing protective/policing/guard functions solely. Unions or bargaining units representing diverse groups of occupations are no longer open to Federal Protective Officers or other categories of federal guards or police.	
Other	Mandatory: U.S. citizenship; good moral character as determined by a background investigation; good physical health as determined by passing a physical examination; a personal interview; a written test of verbal abilities and abstract reasoning. Comments: The written examination lasts approximately two hours; application in advance is not required. It is usually given at designated times by the U.S. Civil Service Commission in Washington, D. C., or in its district offices around the country.	No basis for comparison and evaluation.
Military-Civilian Job Function Comparability:	Comparability in overall job functions is generally low. The military personnel are most often concerned with the guarding of prisoners and the performance of confinement facility activities, e.g., inspecting prisoner work areas, noting and recording sanitation conditions, etc. The civilian Protective Officer usually is involved with activities which often include directing incoming visitors to federal buildings, checking passes of such visitors, and regulating alarm systems. Less frequently the officer may be involved with detecting suspicious behavior among visitors, investigating accidents or robberies, participating in emergency evacuations, or keeping demonstrations from becoming disorderly.	

TABLE 52

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR LIGHT/HEAVY TRUCK DRIVER WITH THE TRAINING/EXPERIENCE OF ARMY MOTOR TRANSPORT OPERATOR - 64C20/30

Requirement Categories	Civilian Employment Standards[1]	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Some Employers: A high school diploma, equivalent certificate, or a vocational school certificate. Desirable: A high school diploma or at least 2-4 years of high school.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational/Technical Training	Desirable: Some supervised training in operation of the equipment to be assigned to the driver; knowledge of traffic laws and driving safety measures; knowledge of minor maintenance functions. Comments: Employers often conduct an informal training or orientation program during which the new driver is tested on the road and/or by written examination, given instruction in specific driving skills or operation of the vehicle, and supervised directly during initial assignments.	Formal Training: A total of 280 hours of training are conducted at the 64C20 level; 133 of these hours cover MOS-related training specifically (light vehicle driving). Eighty hours of training are conducted at the 64C30 level; 67 of these hours cover MOS-related training specifically (heavy vehicle driving). All MOS-related training contributes directly to light/heavy truck driving skills except training involving tractor-trailer equipment which usually would not be assigned to local delivery truck drivers.
Previous Experience	Desirable: Approximately six months of truck driving experience, preferably on the same type of equipment that is assigned on the job; experience in dealing with people or serving the public. Comments: New personnel, particularly inexperienced personnel, may start as extra drivers and receive regular assignments when openings occur.	All experience related to the driving of light or heavy equipment at the 64C20 and 30 skill levels is applicable to civilian truck-driving experience, especially if military and civilian equipment are similar. Deficiencies may exist because of dissimilarity in military and civilian equipment or lack of experience in accident analysis and prevention, log/record keeping, or highway traffic and safety regulations peculiar to a locale. Comments: It is most important to fully document the quality and quantity of driving experience obtained and the types of equipment used during the military career for comparison with work sought in the civilian sector. An effort to provide complete documentation of military experience in terms understandable to civilian employers is currently underway at the U.S. Army Transportation School at Fort Eustis, Virginia.
License/Certification	Mandatory: A valid motor vehicle operator's license, chauffeur's license, or classified license (designating operation of specific categories of motor vehicles), depending upon the state issuing the license.	The training for Army Motor Transport Operator qualifies one for award of a Military Operator's Permit.

TABLE 52 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship/ Journeyman	Membership in the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America is common of employees in this occupation. Some drivers belong to unions representing the employees of the company for which they work. No formal apprenticeship training program is sponsored by a union at the present time.	No basis for comparison and evaluation.
Other	Mandatory for Most Employers: Good vision with or without corrective lens; good hearing, good motor and eye-hand-foot coordination; manual dexterity; ability to lift heavy objects; evidence of good driving record. Desirable: Minimum 21 years of age; ability to judge distances and have quick reflexes to avoid accidents; ability to be tactful and courteous when dealing with the public.	Army Motor Transport Operators would fulfill the physical qualifications required for the civilian position of Light/ Heavy Truck Driver.

Military-Civilian Job Function Comparability: Comparability in overall job functions is generally high, especially at the 64C20 skill level. Similarity in functions is enhanced greatly when the military and civilian equipment is comparable. A major dissimilarity may occur if the functions of the civilian truck driver include dealing with the public to a great extent. If this is the case, then additional skills exist in the civilian sector which are not necessarily required of the Army Motor Transport Operator.

1/ The standards outlined in this table do not cover truck driving positions for personnel involved in interstate commerce. For detailed information on Department of Transportation regulations governing interstate transportation positions see Table 53, Comparison of Civilian Employment Standards for Tractor-Trailer Truck Driver With the Training/ Experience of Army Motor Transport Operator - 64C20/30.

TABLE 38

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR TRACTOR-TRAILER TRUCK DRIVER WITH THE TRAINING/EXPERIENCE OF ARMY MOTOR TRANSPORT OPERATOR - 64C20/30

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Employers in Interstate Commerce: The abilities to read and speak the English language sufficiently to converse with the general public, to understand highway traffic signs and signals in the English language, to respond to official inquires, and to make entries on reports and records. Desirable: At least two years of a high school education.	No basis for comparison and evaluation.
Vocational/Technical Training	Mandatory for Employers in Interstate Commerce: The abilities (by reason of training, experience or both) to safely operate the type of motor vehicle driven, to be familiar with methods and procedures for securing cargo, and to determine whether the cargo has been properly located, distributed and secured. Desirable for All Employers: Some training on the specific tractor-trailor equipment to be operated including turning, braking, operating in traffic, coupling, use of controls and emergency equipment, backing, parking, light maintenance, freight handling, accident prevention, and safety regulations.	Formal Training: A total of 280 hours of training are conducted at the 64C20 level; 133 of these hours cover MOS-related training specifically (light vehicle driving). Eighty hours of training are conducted at the 64C30 level; 67 of these hours cover MOS-related training specifically (heavy vehicle driving). The 67 hours of heavy vehicle driving which includes vehicle operation, driving skills and vehicle maintenance contribute directly to tractor-trailer driving skills (particularly if military and civilian equipment are very similar). The 133 hours of light vehicle driving is less directly applicable but will contribute to such skills as freight handling, basic driving practices, vehicle maintenance, accident reporting and safety regulations.
Previous Experience	Mandatory for Employers in Interstate Commerce: The abilities (by reason of training, experience or both) to safely operate the type of motor vehicle driven, to be familiar with methods and procedures for securing cargo, and to determine whether the cargo has been properly located, distributed and secured. Desirable for All Employers: One-two year's experience on tractor-trailer equipment including turning, braking, operating in traffic, coupling, use of controls and emergency equipment, backing, parking, light maintenance, freight handling, accident prevention, and safety regulations. Comments: Most employers conduct a 2-6 week orientation/training for both experienced and non-experienced new personnel.	All experience related to the driving of tractor-trailer type equipment (usually at the 64C30 level) is applicable, especially if similarity exists between military and civilian equipment. In general, driving skills obtained at both the 64C20 and 30 levels offer good background experience. Deficiencies may exist because of dissimilarity in military and civilian equipment, or lack of experience in accident analysis and prevention, log/record keeping, or highway traffic and safety regulations peculiar to a locale. Comments: It is most important to fully document the quantity and quality of driving experience obtained and the types of equipment used during the military career for comparison with work sought in the civilian sector. An effort to provide complete documentation of military experience in terms understandable to civilian employers is currently underway at the U.S. Army Transportation School at Fort Eustis, Virginia.
License/Certification	Mandatory for Employers in Interstate Commerce: Certificates for satisfactory completion within the preceding three years of a road test and a written examination of motor-carrier safety regulations. For all employers, a valid motor vehicle operator's license, chauffeur's license, or classified license (designating operation of specific categories of motor vehicles), depending upon the state issuing the license.	The training for Army Motor Transport Operator qualifies one for award of a Military Operator's Permit. Comments: For ex-military (or any other) applicants for civilian interstate driving positions, copies of lists of possible questions on the written examination

TABLE 55 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License Certification (Cont)	Comments: The road test is conducted by the motor carrier or a person designated by the carrier. At a minimum, the test must include the performance of a pretrip inspection, coupling and uncoupling combination units, placing the vehicle in operation, use of the vehicle's controls and emergency equipment, operating in traffic and while passing other vehicles, turning, braking, slowing by means other than braking, backing, and parking the vehicle. The written test covers rules and regulations established by the Federal Highway Administration pertaining to commercial vehicle safety.	may be obtained from the Director, Bureau of Motor Carrier Safety, Department of Transportation, Washington, D. C., or any Regional Federal Highway Administrator.
Union Apprenticeship Journeyman	Membership in the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America is common of employees in this occupation. Some drivers of private carriers belong to unions representing the employees of the company for which they work. No formal apprenticeship training program is sponsored by a union at the present time.	No basis for comparison and evaluation.
Other	Mandatory for Employers in Interstate Commerce: An applicant must supply the following information for the 3-year period preceding the date of application: (1) all addresses at which the applicant has resided, (2) a list of all motor vehicle accidents, and (3) the names and addresses of all employers. The applicant must also supply a list of all violations of motor vehicle laws or ordnances and the facts about any denial, revocation, or suspension of a license, permit or privilege to operate a motor vehicle. A medical examination is required every two years. An applicant must be at least 21 years of age. For all employers, evidence of good driving record, good health (including 20/40 vision with corrective lens, good hearing, normal use of limbs), and maturity is required. For some employers, weight and height ranges are specified. Comments: In an effort to hire mature individuals some employers prefer employees no younger than 25 years of age.	No basis for comparison and evaluation. Comments: Driving records during a military career should be documented fully to include both commendations and violations or accidents.
Military-Civilian Job Function Comparability:	Comparability in overall job functions is generally high, especially at the 64C30 skill level. Similarity in functions is enhanced greatly when the military and civilian equipment is comparable.	

TABLE 51

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR PUBLIC TRANSPORTATION OPERATOR WITH THE TRAINING EXPERIENCE OF ARMY MOTOR TRANSPORT OPERATOR - 64C20/30

Requirement Categories	Civilian Employment Standards[1]	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Most Employers: The ability to read, write and communicate effectively. Desirable: High school diploma or at least 2-4 years of high school.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational/Technical Training	Desirable: Some training in the operation of large vehicles; knowledge of traffic laws and vehicle safety measures. Comments: Employers often conduct a formal training program lasting several weeks which includes instruction in vehicle operation, safe driving practices, safety regulations, traffic laws, record keeping, and dealing courteously with the public. A road test and/or written examination usually is conducted during or following training. Close supervision is given the new employee during initial assignments.	Formal Training: A total of 280 hours of training are conducted at the 64C20 level; 133 of these hours cover MOS-related training specifically (light vehicle driving). Eighty hours of training are conducted at the 64C30 level; 67 of these hours cover MOS-related training specifically (heavy vehicle driving). All MOS-related training contributes to general driving skills and familiarization with traffic and safety regulations. However, dissimilarity between military equipment and public transportation equipment may reduce the immediate transferability of specific driving skills.
Previous Experience	Mandatory for Most Employers: One-two years of driving experience on some type of motor vehicle. Desirable: One-two years of driving experience on a large vehicle under all weather conditions; some experience in serving or dealing with the public. Comments: New personnel, particularly inexperienced personnel, may start as extra drivers and receive regular assignments when openings occur.	All experience related to the driving of light or heavy equipment at the 64C20 and 30 skill levels is applicable to general driving experience mandatory for entry into the public transporation field. The desired driving experience on a large vehicle under all weather conditions is likely to be satisfied also. Deficiencies may exist because of dissimilarities between military and civilian equipment or lack of experience in dealing with the public on the part of military personnel. Comments: It is most important to fully document the quality and quantity of driving experience obtained and the types of equipment used during the military career for comparison with work sought in the civilian sector. An effort to provide complete documentation of military experience in terms understandable to civilian employers is currently underway at the U.S. Army Transportation School at Fort Eustis, Virginia.
License Certification	Mandatory for All Employers: A valid motor vehicle operator's license, chauffeur's license, or classified license (designating operation of specific categories of motor vehicles), depending upon the state issuing the license.	The training for Army Motor Transport Operator qualifies one for award of a Military Operator's Permit.

TABLE 54 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Union Apprenticeship Journeyman	Membership in the Amalgamated Transit Union, the Transport Workers Union of America, or the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America, is common for employees in this occupation. No formal apprenticeship training program is sponsored by a union at the present time.	No basis for comparison and evaluation.
Other	Mandatory for Most Employers: Good vision with or without corrective lens; good hearing; good motor, eye-hand-foot coordination and manual dexterity; emotional stability; evidence of good driving record. Desirable: Minimum 21 years of age; ability to judge distances and have quick reflexes to avoid accidents; ability to be tactful and courteous with passengers.	Army Motor Transport Operators would fulfill most of the physical qualifications required for the civilian position of Public Transportation Operator.
Military-Civilian Job Function Comparability:	Comparability in overall job functions is moderate. General driving skills are needed in both the military and civilian occupations. However, the greatest potential difference occurs in functions related to serving the public in the civilian sector. Public transportation operators may routinely perform such tasks as collecting fare, issuing transfers, selling tickets, answering questions concerning routes and schedules, or making requests of passengers to insure their safety and comfort. Such tasks are rarely or never performed by Army Transport Operators.	

1/ The standards outlined in this table do not cover public transportation positions for personnel involved in interstate commerce. For detailed information on Department of Transportation regulations governing interstate transportation positions see Table 4.14, Comparison of Civilian Employment Standards for Tractor-Trailer Truck Driver With the Training/Experience of Army Motor Transport Operator - 64C20/30.

V. COMPARISONS OF THE TRAINING/EXPERIENCE OF AIR FORCE SPECIALTIES WITH THE EMPLOYMENT STANDARDS FOR RELATED CIVILIAN OCCUPATIONS

TABLE 55

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR COOK WITH THE TRAINING EXPERIENCE OF AIR FORCE COOK - AFS 66230 66250

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma or equivalent certificate; courses in cooking, biology, chemistry, and nutrition. Comments: A high school diploma may be particularly helpful, or even required, for entering a vocational program given under the guidance of restaurant associations, hotel management groups, trade unions, or technical schools and colleges.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational Technical Training	Desirable: Vocational training at a post-high school trade school, technical school, junior college, university, or in food service program run by a restaurant association, hotel management group trade association or union; a typical two-year program includes courses in baking, meatcutting, nutrition, food operations, storeroom and stewarding procedures, food and beverage controls, international and classical cuisine, food purchasing, breakfast cookery, sanitation, table service, buffet catering and decorating, cost control, first-aid, vending and convenience foods, pantry operations, menu preparation and basic arithmetic and mathematics. Comments: Many cooks acquire their skills on the job while employed as kitchen helpers. However, those who have had courses in restaurant cooking or food service management have a distinct advantage in obtaining jobs in large restaurants or hotels where standards often are high. In addition, prior training (or experience) in a vocational or trade school is frequently a prerequisite to acceptance into the few apprenticeship programs which do exist. Many states operate post-high school trade or technical schools which offer cook training. Most management programs are restricted to junior colleges, community colleges, or four-year program colleges or universities. The Culinary Institute of America is the primary, private, nonprofit, post-high school educational institution in the United States in which a student can train to become an expert cook or chef.	Formal Training: A total of 320 hours of formal training, 280 hours of which cover technical skills in areas of food service functions, sanitation, equipment, nutrition, menus, storeroom, meat identification, principles of food preparation, in-flight missile-site and field-site feeding, obtaining supplies, dinner preparation and service, short order preparation, breakfast preparation and service. Correspondence Courses: Common to the entire Food Service Career Field are topics covering sanitation, nutrition, menus, rations, food inspection and storage, and food service accounting. At the 3 skill level for this AFS, topics cover sanitation, operation and maintenance of food service equipment, principles of cookery, special feeding situations, and food service accounting. At the 5 skill level, topics include dining hall equipment, special categories of food service equipment, principles of cookery, cooking methods, serving food, meatcutting and baking fundamentals, the flight feeding system, field kitchen operations, supervision of personnel, planning and scheduling activities, inspection of food service activities, and technical food service functions. Much of the classroom instruction and correspondence courses for this AFS cover (in shorter form) the same material that would be covered in a typical vocational training program for the civilian Cook. Topics that would not be covered relate to entertainment, decoration or catering functions or the preparation of gourmet dishes. In general, Air Force training is excellent preparation for further specialized training in the civilian food preparation field and probably could be credited toward civilian vocational training program.
Work as Experience	Desirable: Experience in positions relating to food preparation, cleaning and sanitation, service of food, food control (reception and storage, checker, cashier, accountant, etc.), or food management or administration. Comments: Inexperienced workers may be able to enter the profession as kitchen helper and after a few months of on-the-job training qualify as an assistant cook (fry cook, broiler cook, soup cook, etc.). However, acquiring the	The experience gained as an Air Force Cook is excellent preparation for the position of Cook in the civilian sector. It is likely that ex-Air Force personnel could be hired directly into the position of Cook (as opposed to assistant cook) or attain the position very quickly after a short probationary period, especially in an institutional setting. Positions in fine restaurants or exclusive clubs would require more experience, probably of a specialized nature.

TABLE 33 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Previous Experience (Cont)	variety of skills necessary for advancement to head cook or chef in a fine restaurant often takes several years.	
License Certification	Mandatory in Most States: A health certificate indicating the cooks and chefs are free from contagious diseases.	Air Force personnel who have served recently could be expected to be free from contagious diseases.
Union Apprenticeship Journeyman	The major labor union associated with this occupation is the Hotel and Restaurant Employees and Bartenders International Union. A large number of trade and professional associations and organizations are associated with this field. The few apprenticeship programs which do exist are sponsored primarily by large hotels, often in cooperation with a union, chefs' associations or trade associations. Most hotels which cooperate in such programs are often restricted economically in the number of apprentices they can effectively train and, therefore, prerequisites to acceptance often include prior training and/or experience. When accepted, apprentices are usually guaranteed a prescribed training program for approximately two to three years. The format and quality of the programs are extremely variable and frequently depend upon the specific organization, the chef or other individuals in charge of the program. However, topics commonly included are meatcutting, pastry cook, cold meat station, vegetable station, fried foods, roasting and broiling, second cook and assistant, menu making, and storeroom duties.	Air Force training and experience related to the AFS would be excellent preparation for entrance into an apprenticeship program. Documented training and experience may be able to be credited toward journeyman status in an apprenticeship program on an individual basis.
Other	Desirable: ability to work with people in a team relationship; ability to work under pressure; cleanliness; keen sense of taste and smell.	There is little basis for comparison and evaluation but it would be excepted that Air Force personnel who perform the functions of this AFS satisfactorily would possess the ability to work with people in a team relationship.

Military-civilian job functional comparability: Comparability in job functions is very high, particularly between Air Force Cooks and civilian Cooks who work in institutional settings. Both military and civilian personnel prepare, cook and/or serve food and are concerned with nutrition, diet and sanitation conditions. Differences between Air Force personnel and non-institutional civilian Cooks may occur on the type of cooking performed (gourmet vs. plain), the quantity of food cooked (small parties vs. large institutional dining rooms), or the emphasis on atmosphere and decoration (decorative vs. functional).

TABLE 36

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR FOOD STEWARD WITH THE TRAINING EXPERIENCE OF AIR FORCE CODE - AFS 66230 66250

Requirement Categories	Civilian Employment Standards[1]	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma or equivalent certificate; courses in nutrition, biology, cost accounting, budgeting, merchandise control. Comments: A high school diploma may be particularly helpful, or even required, for entering a vocational program given under the guidance of restaurant associations, hotel management groups, trade unions, or technical schools and colleges.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational Technical Training	Desirable: Vocational training at a post-high school trade school, junior college, university or in a food service program run by a restaurant association, hotel management group, trade association or union; a typical two-year program includes courses in menu planning, food purchasing, food storage, equipment purchasing, equipment layout, personnel management, food standards and sanitation, catering, beverage control, food cost accounting, and record keeping. Comments: Inexperienced workers can enter the food service field directly and work their way up the career ladder. However, those who have had courses in an area of food service management have a distinct advantage in obtaining jobs in large restaurants or hotels where standards often are high. In addition, prior training (or experience) in a vocational or trade school is frequently a prerequisite to acceptance into the few apprenticeship programs which do exist.	Formal Training: A total of 320 hours of formal training, 280 hours of which cover technical skills in areas of food service functions, sanitation, equipment, nutrition, menus, storeroom, meat identification, principles of food preparation, in-flight missile-site and field-site feeding, obtaining supplies, dinner preparation and service, short order preparation, breakfast preparation and service. Correspondence Courses: Common to the entire Food Service Career Field are topics covering sanitation, nutrition, menus, rations, food inspection and storage, and food service accounting. At the 3 skill level for this AFS topics cover sanitation, operation and maintenance of food service equipment, principles of cookery, special feeding situations, and food service accounting. At the 5 skill level topics include dining hall equipment, special categories of food service equipment, principles of cookery, cooking methods, serving food, meatcutting and baking fundamentals, the flight feeding system, field kitchen operations, supervision of personnel, planning and scheduling activities, inspection of food service activities, and technical food service functions. Topics covered in Air Force training for this AFS such as food inspection and storage, food service accounting, storeroom, sanitation, food service equipment, and inspection of food service activities would be excellent preparation for further specialized training for the civilian position of Food Steward and may possibly be able to be credited toward civilian vocational training programs.
Previous Experience	Desirable: Experience in the operation of food storerooms, filling orders, receiving merchandise, checking daily inventories, keeping daily food merchandise records, and coordinating the work of non-cooking kitchen help and storeroom workers. Comments: Inexperienced workers may be able to enter the occupation of Food Steward by working initially as a porter, dining room host, kitchen equipment operator, or food checker and gradually work up to intermediate positions such as this one.	The work of the Air Force Cook would be good preparation for the civilian position of Food Steward. The experience gained in drawing supplies, operating equipment, maintaining production and accounting records, sanitation standards, and, at the 5 skill level, personnel supervision is particularly applicable. Further experience would probably be needed in the organization of storerooms, food purchasing, food cost accounting, beverage control, equipment purchasing and layout, and catering. Also, the unique procedures involved in the purchasing and control of food and other merchandise for any specific restaurant, institution, club, etc., must be fully understood before a person can adequately perform the duties related to those procedures.

TABLE 56 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License Certification	No license is required to perform the functions of this occupation.	No basis for comparison and evaluation.
Union Apprenticeship Journeyman	The major labor union associated with this occupation is The Hotel and Restaurant Employees and Bartenders International Union. A large number of trade and professional association and organizations are associated with this field. The few apprenticeship programs which do exist are sponsored primarily by large hotels, often in cooperation with a union or trade associations and focus primarily on food preparation and serving with Steward duties woven into the program. Most hotels which cooperate in such programs are often restricted economically in the number of apprentices they can effectively train, and, therefore, prerequisites to apprenticeship often include prior training and/or experience. When accepted, apprentices are usually guaranteed a prescribed training program for approximately two to three years. The format and quality of the programs are extremely varied and frequently, depend upon the specific organization or manager.	Air Force training and experience related to this AFS would be excellent preparation for entrance into an apprenticeship program. Documented training and experience may be able to be credited toward journeyman status in an apprenticeship program on an individual basis.
Other	Desirable: Ability to work with people in a team relationship; ability to keep accurate records; ability to be well-organized.	There is little basis for comparison and evaluation but it would be expected that Air Force personnel who perform the functions of this AFS satisfactorily would possess the ability to work with people in a team relationship.

Military-Civilian Job Function Comparability: Comparability in job functions is moderate. While Air Force Cooks perform some of the functions that would be performed in the civilian sector by a Food Steward they are concerned primarily with the preparation and serving of food and only secondarily with drawing supplies or maintaining accounting records (and only at the 5 skill level). Civilian Food Stewards, conversely, are most concerned with accounting procedures, food purchasing and storage, record keeping, and general storeroom operations, and may or may not be concerned with aspects of food preparation and service.

1 The employment standards represent those for the position of Food Steward in a large establishment or institution. In small- or medium-size establishments the position is often called Chef Steward and combines the duties of food preparation and storeroom organization.

TABLE 57

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR FOOD PROCESSING TECHNICIAN WITH THE TRAINING/EXPERIENCE OF AIR FORCE COOK - AFS 66230/66250

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma; courses in biology, chemistry, algebra, geometry, and statistics. Comments: Although there are a number of ways to qualify for the position of Food Processing Technician, post-secondary vocational training is increasingly becoming a prerequisite for employment. Most schools offering post-secondary training require a high school diploma for admittance.	A high school diploma can normally be obtained through participation in voluntary education programs
Vocational-Technical Training	Desirable: Technical courses at a technical institute, junior college, community college, or the technical division of a four-year university such as chemistry, biology, mathematics, and specialized study of food processing, quality control, packaging, plant and environmental sanitation, and technical report writing. Comments: The majority of specialized programs are two years in length leading to an associate of applied science degree. Curricula vary considerably, with some geared toward a specific food processing industry such as dairy, meat, baking, etc. Admission requirements commonly include a high school diploma plus one year each of science and mathematics; biology and chemistry are recommended. Some post-secondary schools admit students with no diploma but with successful work experience in the food industry and recommendations from their employers.	Formal Training: A total of 320 hours of formal training, 280 hours of which cover technical skills in areas of food service functions, sanitation, equipment, nutrition, menus, storeroom, meat identification, principles of food preparation, in-flight missile-site and field-site feeding, obtaining supplies, dinner preparation and service, short order preparation, breakfast preparation and service. Correspondence Courses: Common to the entire Food Service Career Field are topics covering sanitation, nutrition, menus, rations, food inspection and storage, and food service accounting. At the 3 skill level for this AFS, topics cover sanitation, operation and maintenance of food service equipment, principles of cookery, special feeding situations, and food service accounting. At the 5 skill level, topics include dining hall equipment, special categories of food service equipment, principles of cookery, cooking methods, serving food, meatcutting and baking fundamentals, the flight feeding system, field kitchen operations, supervision of personnel, planning and scheduling activities, inspection of food service activities, and technical food service functions. Training in this AFS will not give the specific knowledge needed to perform the functions of a civilian Food Processing Technician. However, training in food preparation, cooking ingredients, and sanitation will provide a good background for further preparatory training for this occupation.
Previous Experience	Desirable: Experience in some phase of the food processing industry such as chemical laboratory technician, laboratory tester, quality control tester, physical-science aide, plant facilities technician, biological aide, laboratory analyst, or research and development technician. Comments: Technicians can qualify for jobs by completing on-the-job training programs. However, post-secondary training is becoming an	Experience as an Air Force Cook will provide a general understanding of food ingredients and food quality but will not provide experience specifically related to the functions performed by a civilian Food Processing Technician.

TABLE 57 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Previous Experience	increasingly important qualification for employment. A combination of training supplemented by experience is recommended and often required by many post-secondary institutions.	
License/Certification	No License is required to perform the duties of this position. Comments: In one particular industry, the dairy industry, Food Processing Technicians who work in a laboratory setting must meet licensing requirements in most states. The requirements vary greatly but a written examination usually is given.	No basis for comparison and evaluation.
Union Apprenticeship/ Journeyman	No union is commonly associated with this occupational field. Any on-the-job training programs are usually handled by the employers and are tailored specifically to the environment, which may be a research and development lab, quality control lab, a food processing plant, food broker, government food inspection agency, supermarket chain, food warehousing and/or transportation company, or manufacturer of food processing equipment.	No basis for comparison and evaluation.
Other	Desirable: The ability to work to exacting standards; the ability to express oneself well orally and in writing.	No basis for comparison and evaluation.
Military-Civilian Job Function Comparability:	Comparability in job functions is low. The Air Force Cook is concerned with the preparation of food to be served in the immediate future and works with and maintains kitchen utensils and equipment. The Food Processing Technician works in laboratory or industrial plant settings and performs evaluations, inspections or research tests on both raw ingredients and processed food. However, both the Air Force Cook and the civilian Food Processing Technician are often concerned with sanitation conditions, proper storage conditions, and overall quality of food.	

TABLE 58

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR CRASH FIRE FIGHTER WITH THE TRAINING/EXPERIENCE OF AIR FORCE FIRE PROTECTION SPECIALIST - AFS 57130/57150

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Most Employers: "A high school diploma or equivalent certificate. Comments: In most municipalities, local civil service regulations require the passing of a written examination. The test items consist of questions to determine the applicant's knowledge of subjects important to daily fire fighting operations and his or her ability to learn duties and assignments.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational/Technical Training	Desirable: Although most new employees receive formal and/or on-the-job training at a state, county, municipal or local fire house training school, it is helpful to have previous training in the areas of fire prevention, crash fire fighting techniques, types of aircraft, armament and explosive cargo, aircraft fire and rescue operations, and types of aircraft incidents, as well as general fire fighting principles related to structural fire fighting. Comments: Crash fire fighting is often taught within the framework of a general fire fighting course which includes instruction in structural fire fighting also. The fire fighters most likely to receive crash training are those civilians working on a military base or with a fire fighting force in a large city which has one or more airports where specialization of work functions is needed.	Formal Training: At the 3 skill level, 320 hours of instruction are given, 274 hours of which are AFS skill-related. Topics cover principles of combustion, heat and smoke ventilation, hand tools and supplies, extinguishers and extinguishing agents, missile and weapons fire protection, natural cover fire fighting, breathing apparatus, structural rescue operations and accessories, pumps and hoses, aerospace vehicle fire fighting, aerospace rescue operations, equipment maintenance, and inspection and conditioning of aerospace vehicles. At the 5 skill-level most personnel receive some training in either fire vehicle operations, rescue work, or missile fire protection. Correspondence Courses: At the 3 skill level, courses cover fire protection administration, fire department communications, fire protection hydraulics, chemistry of fires, extinguishers and hand tools, weapons and munitions, basics of structural fire protection, and basics of aerospace vehicle fire protection. At the 5 skill level, courses cover fire protection organization and administration, theory of combustion, extinguishers and tools, regulations and inspections, flammable materials, principles of structured fire fighting, structural fire fighting vehicles, principles of aerospace vehicle fire fighting, and aerospace vehicle fire trucks. Air Force Fire Protection Specialist training is excellent preparation for the civilian position of Crash Fire Fighter. It is highly probable that this training would be credited toward a civilian training program in crash fire fighting since there are few civilian positions in which a person can gain crash fire fighting training.
Previous Experience	Desirable: Experience in some area of crash fire fighting or at least in general fire fighting functions including fire protection, fire inspection, or fire fighting instruction. Comments: Normally the trainee status period for Crash Fire Fighters lasts from six months to one year. It takes approximately three to five years to gain the experience to move up to first level supervisory positions.	The experience gained as Air Force Fire Protection Specialist is excellent preparation for the civilian occupation of Crash Fire Fighter. This experience is almost certain to be accepted in the civilian sector and will probably shorten or eliminate the period during which the new employee is in trainee status.

TABLE 38 (cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License Certification	Mandatory: For operation of fire fighting vehicles, possession of a valid motor vehicle operator's permit or the ability to obtain one within 30 days after being hired is required. Some employers administer a road test before appointment. Comments: No license or certificate is recognized nationally for the civilian position of Crash Fire Fighter. However, the International Association of Fire Fighters has published guidelines for a 991-hour training course to become a certified Fire Fighter which includes crash fire fighting techniques.	Personnel entering the Air Force Fire Protection Career Field must possess a valid state motor vehicle operator's license. A Government Motor Vehicle Permit is also issued to personnel who successfully complete all training at the 3 skill level.
Union Apprenticeship Journeyman	Most apprenticeship programs include instruction in both structural and crash fire fighting techniques. The International Association of Fire Fighters (AFL-CIO) has formulated national apprenticeship standards which member fire departments use as guidelines in developing their own programs with the help of local joint (labor and management) apprenticeship committees. Apprenticeship Entrance Requirements: Apprenticeship applicants are selected on the basis of local civil service rules and regulations, local statutes, and local fire department rules. Requirements usually include: (1) age range of 21 to 28 years, (2) height range of 5 ft 8in. to 6 ft 4 in., (3) good manual dexterity and reasonable strength and ability (including no aversion to heights), (4) successfully passing a physical examination, (5) high school education or equivalent certificate, (6) local residency requirements, (7) good moral standards as evidenced by work or character references, and (8) successfully passing a written examination and oral interview(s). Journeyman Status: The following on-the-job work experiences are recommended for crash fire fighting training: types of aircraft, aircraft engines and other systems, crash rescue apparatus, extinguishing agents, armament and explosive cargo, nuclear weapons, aircraft fire and rescue communications, pre-incident planning, familiarization of aircraft and surrounding areas, ground activities, fire station activities, types of aircraft incidents, crash fire fighting techniques, and post-incident operations. These topics are part of a larger program for training structural and crash fire fighting personnel. The entire on-the-job training program is to be supplemented by 144 hours per year of formal instruction (no definite time frame is recommended).	Apprenticeship Entrance Requirements: No basis for comparison and evaluation except that minimum height, weight and physical standards are required for personnel in this AFS. Journeyman Status: Training and experience of the Air Force Fire Protection Specialist covers many of the areas recommended for civilian Crash Fire Fighter training programs. Length of formal instruction ordinarily will be longer in the civilian apprenticeship program but credit for Air Force training/experience may shorten the apprentice time period considerably.
Other	Mandatory for Most Employers: Physical strength, stamina, and agility as determined by a test; between (approximately) 21 to 28 years of age; within (approximately) a height range of 5 ft 8 in. to 6 ft 4 in.	Air Force Fire Protection Specialists must meet prescribed height, weight, and physical standards which are consistent with civilian standards.
Military-Civilian Job Function Comparability:	Comparability in job functions is very high. Both Air Force Fire Protection Specialists and civilian Crash Fire Fighters locate fires in aircraft, operate fire extinguishing equipment, rescue people from burning aircraft, perform salvage operations drive and operate motor-driven crash fire fighting equipment, give emergency first-aid, initiate aircraft fire and rescue communications, and perform maintenance on crash fire fighting equipment. Both civilian and military also tend to perform some structural fire fighting functions. Major differences occur only in the type of aircraft serviced; military personnel are often exposed to weapons or armament systems aboard aircraft which are potentially more dangerous during crash operations than are civilian aircraft without such equipment.	

TABLE 59

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR STRUCTURAL FIRE FIGHTER WITH THE TRAINING/EXPERIENCE OF AIR FORCE FIRE PROTECTION SPECIALIST - AFS 57130/57150

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Most Employers: A high school diploma or equivalent certificate. Comments: In most municipalities, local civil service regulations require the passing of a written examination. The test often consists of questions to determine the applicant's knowledge of subjects important to daily fire fighting operations and his or her ability to learn duties and assignments.	A high schoo diploma can normally be obtained through participation in voluntary education programs.
Vocational/Technical Training	Desirable: Although most new employees receive formal and/or on-the-job training at a state, county, municipal or local fire house training school, it is helpful to have previous training in the areas of fire prevention, fire-fighting techniques, first-aid, and to be familiar with fire fighting equipment. Comments: Technical courses often are offered at technical schools or community colleges in Fire Service Training. A typical program over an 18-month period may include courses in appartus and equipment, water distribution systems, fire prevention, fire fighting tactics, fire protection equipment and systems, fire hydraulics, fire alarm systems and communications, fire investigation and detection, and radiological hazards. Practical demonstrations or exercises are often included in the curriculum.	Formal Training: At the 3 skill level 320 hours of instruction are given, 274 hours of which are AFS skill-related. Topics cover principles of combustion, heat and smoke ventilation, hand tools and supplies, extinguishers and extinguishing agents, missile and weapons fire protection, natural cover fire fighting, breathing apparatus, structural rescue operations and accessories, pumps and hoses, aerospace vehicle fire fighting, aerospace rescue operations, equipment maintenance, and inspection and conditioning of aerospace vehicles. At the 5 skill level most personnel receive some training in either fire vehicle operations, rescue work, or missile fire protection. Correspondence Courses: At the 3 skill level, courses cover fire protection administration, fire department communications, fire protection hydraulics, chemistry of fires, extinguishers and hand tools, weapons and munitions, basics of structural fire protection, and basics of aerospace vehicle fire protection. At the 5 skill level, courses cover fire protection organization and administration, theory of combustion, extinguishers and tools, regulations and inspections, flammable materials, principles of structured fire fighting, structural fire fighting vehicles, principles of aerospace vehicle fire fighting, and aerospace vehicle fire trucks. Air Force Fire Protection Specialist training covers all the topics commonly taught in a technical school (although of shorter duration) and would provide excellent background for further training in specific procedures and equipment used by individual employers.
Previous Experience	Desirable: Experience in some phase of fire fighting, fire protection, fire inspection, or fire fighting instruction. Comments: Credit is often given for experience gained as a volunteer Fire Fighter or for related training in the Armed Forces. This additional credit often improves the applicant's chances for appointment.	The experience gained as Air Force Fire Protection Specialist is excellent preparation for the civilian occupation of Structural Fire Fighter. Such experience will improve an applicant's chances for appointment and, once hired, may allow for faster progression through the training or apprenticeship period or even appointment at full performance level.

TABLE 59 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License Certification	Mandatory: For operation of fire fighting vehicles, possession of a valid motor vehicle operator's permit or the ability to obtain one within 30 days after being hired is required. Some employers administer a road test before appointment. Comments: No license or certificate is recognized nationally for the civilian position of Structural Fire Fighter. However, some states, counties or municipalities have their own certification programs. The International Association of Fire Fighters recommends a minimum of 691 hours classroom training (a basic course of 550 hours and an advanced course of 141 hours) to become a certified Fire Fighter.	Personnel entering the Air Force Fire Protection Career Field must possess a valid state motor vehicle operator's license. A Government Motor Vehicle Permit is also issued to personnel who successfully complete all training at the 3 skill level.
Union Apprenticeship Journeyman	The International Association of Fire Fighters (AFL-CIO) has formulated national apprenticeship standards which member fire departments use as guidelines in developing their own programs with the help of local joint (labor and management) apprenticeship committees. Apprenticeship Entrance Requirements: Apprenticeship applicants are selected on the basis of local civil service rules and regulations, local statutes, and local fire department rules. Requirements usually include: (1) age range of 21 to 28 years, (2) height range of 5 ft 8 in. to 6 ft 4 in., (3) good manual dexterity and reasonable strength and ability (including no aversion to heights), (4) successfully passing a physical examination (5) high school education or equivalent certificate, (6) local residency requirements, (7) good moral standards as evidence by work or character references, and (8) successfully passing a written examination and oral interview(s). Journeyman Status: The following on-the-job work experiences are recommended for inclusion into a training program; individual time schedules for completion vary: forcible entry, ropes, portable extinguishers, ladders, hoses, salvage and overhaul, fire streams, fire apparatus, ventilation, rescue, first-aid, inspection, water supplies, automatic sprinklers, and aircraft fire protection and rescue. A minimum of 144 hours of related technical instruction for each year of the apprenticeship program also is recommended.	Apprenticeship Entrance Requirements: No basis for comparison and evaluation except that minimum height, weight and physical standards are required for personnel in this AFS. Journeyman Status: Training and experience of the Air Force Fire Protection Specialist covers many of the areas recommended for civilian Structural Fire Fighter training programs. Length of formal instruction ordinarily will be longer in the civilian apprenticeship program but credit for Air Force training/experience may shorten the apprentice time period considerably.
Other	Mandatory for Most Employers: Physical strength, stamina, and agility as determined by a test; between (approximately) 21 to 28 years of age; within (approximately) a height range of 5 ft 8 in. to 6 ft 4 in.	Air Force Fire Protection Specialists must meet prescribed minimum height, weight, and physical standards which are consistent with civilian standards.

Military-Civilian Job Function Comparability: Comparability in job functions is very high. Both Air Force Fire Protection Specialists and civilian Structural Fire Fighters respond to fire alarms, operate fire fighting equipment, rescue persons from burning structures, perform salvage operations, drive or operate motor-driven fire fighting equipment, give emergency first-aid, operate fire alarm communications systems, and perform maintenance on apparatus and equipment. Air Force personnel perform additional duties related to crash fire fighting and attend to damaged aerospace vehicles. Civilian Structural Fire Fighters ordinarily fight natural cover fires or fires in buildings or other housing, office or storage structures and are less involved with crash fire fighting operations.

TABLE 60

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR FIRE FIGHTING INSTRUCTOR WITH THE TRAINING EXPERIENCE OF AIR FORCE FIRE PROTECTION SPECIALIST - AFS 57130/57150

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Some Employers: A high school diploma or equivalent certificate; completion of at least one course in teaching methods and techniques. Desirable: An Associate of Arts or Science Degree in Fire Technology, Fire Administration, or a related discipline; courses in teaching methods and techniques. Comments: Requirements vary within each state and local municipality. Few localities have definitive standards governing the qualifications for Fire Fighting Instructor.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational/Technical Training	Desirable: Training in such areas as fire fighting operations, fire technology, fire administration, fire protection or fire safety technology; knowledge of the (1) principles and practices of modern fire fighting, (2) use of fire fighting tools and equipment, (3) rescue and first-aid principles, and (4) teaching aids and training methods; abilities to (1) demonstrate equipment and fire fighting techniques, (2) organize and supervise fire drill sessions, (3) prepare and present instructional material, (4) evaluate student progress, and (5) determine the need for new training materials. Comments: Few localities have mandatory vocational/technical requirements for Fire Fighting Instructors. Often the instructor for fire house training is chosen from among fire fighter personnel on the basis of performance, experience and personality characteristics. Instructors at city-wide or state-wide academies usually must comply with state education requirements.	Formal Training: At the 3 skill level, 320 hours of instruction are given, 274 hours of which are AFS skill-related. Topics cover principles of combustion, heat and smoke ventilation, hand tools and supplies, extinguishers and extinguishing agents, missile and weapons fire protection, natural cover fire fighting, breathing apparatus, structural rescue operations and accessories, pumps and hoses, aerospace vehicle fire fighting, aerospace rescue operations, equipment maintenance, and inspection and conditioning of aerospace vehicles. At the 5 skill level, most personnel receive some training in either fire vehicle operations, rescue work, or missile fire protection. Correspondence Courses: At the 3 skill level, courses cover fire protection administration, fire department communications, fire protection hydraulics, chemistry of fires, extinguishers and hand tools, weapons and munitions, basics of structural fire protection, and basics of aerospace vehicle fire protection. At the 5 skill level, courses cover fire protection organization and administration, theory of combustion, extinguishers and tools, regulations and inspections, flammable materials, principles of structured fire fighting, structural fire fighting vehicles, principles of aerospace vehicle fire fighting, and aerospace vehicle fire trucks. The formal training received by Air Force Fire Protection Specialists is excellent background for knowledge of course content appropriate for training fire fighting personnel. Training in teaching methods and techniques is included to some extent in correspondence courses at the 5 skill level.
Previous Experience	Mandatory for Most Employers: Experience as a regular member of an organized fire department, preferably in a supervisory capacity.	Experience gained as an Air Force Fire Protection Specialist is excellent background for the civilian position of Fire Fighting Instructor. Supervisory or on-the-job trainer functions (usually at the 5 skill

TABLE 69 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Previous Experience (Cont)	Desirable: Experience as a regular member of an organized fire department for a number of years, at least one year of which involved training or related activities. Comments: Instructors at a state-wide or city-wide academy may be required to meet specific experience standards set forth by state or local laws or regulations.	level) are especially helpful as preparation for the civilian position of Fire Fighting Instructor.
License/Certification	Instructors at local fire houses do not ordinarily need a license or certificate to perform the functions of their occupation. A few states (approximately 11) have established commissions to formulate standards for fire fighters, instructors, inspectors and/or fire officers but the majority of states have not progressed to this level of organization at this time. The International Fire Service Training Association has published general guidelines stating personal qualifications desired in an instructor but does not outline license certification standards. The National Fire Protection Association plans to publish standards for Fire Fighting Instructors some time in 1975. Instructors at state or local training academies may have to meet state education certification requirements.	State or local regulations governing teacher certification should be investigated in the locality in which the veteran decides to seek work.
Union Apprenticeship/ Journeyman	The International Association of Fire Fighters (AFL-CIO) is commonly associated with this profession. Although apprenticeship guidelines for Fire Fighters have been formulated by this group no apprenticeship guidelines exist for Fire Fighting Instructors.	No basis for comparison and evaluation.
Other	Desirable: Leadership ability; the ability to understand and get along with people; a desire to teach; ingenuity and creativity; the ability to express oneself well orally and in writing.	No basis for comparison and evaluation.
Military-Civilian Job Function Comparability:	Comparability in job functions is moderate. Air Force Fire Protection Specialists commonly perform fire fighting functions and only occasionally are involved with the training or supervision of fire fighting personnel (and only at the 5 skill level). Conversely, civilian Fire Fighting Instructors spend practically all of their time in a training capacity, demonstrating and teaching fire fighting techniques and equipment usage.	

TABLE 61

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR INVENTORY CONTROL CLERK WITH THE TRAINING/EXPERIENCE OF AIR FORCE INVENTORY MANAGEMENT SPECIALIST - AFS 64530/64550

Requirement Categories	Civilian Employment Standards [1]	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: High school diploma or equivalent certificate; good reading and writing skills; a basic knowledge of mathematics.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational/Technical Training	Desirable: Courses in business math, accounting, manual and automated inventory control systems, report writing, typing and filing. Comments: Inventory Control Clerks usually receive on-the-job training lasting from a few days to months. New employees may be assigned simple tasks such as counting or marking stock. As the worker progresses, he or she learns to maintain manual or automated records of incoming and outgoing material, take inventory, and order supplies. Familiarity with automated inventory control systems is helpful since many large employers must use non-manual systems to account for large quantities of goods. In some instances, Inventory Control Clerks may need instruction in data processing systems or procedures in order to understand the input-output data from computerized inventory control systems.	Formal Training: A total of 280 hours is given, 232 of which are AFS skill-related. Topics include automatic data processing system of inventory control, supply publications, item accounting and stock control, materiel control, supplies and equipment management, maintenance support, inventory, document control, and demand processing. Correspondence Courses: At the 5 skill level, topics cover organization of standard base supply, item research, file maintenance inputs, suspense files and listings, document control, demand processing, supply points, repair cycle, bench stock, requisitioning, due-outs, base excesses, shipments and transfers, the USAF Equipment Management System, operational support, equipment reports and listings, equipment transactions, equipment allowance documents, Air Force engine management, Air Force stock fund, standardization and surveillance, materiel control and civil engineer support, and communication security. The training received by the Air Force Inventory Management Specialist is adequate preparation for the civilian position of Inventory Control Clerk. Some specialized training will always be necessary to acclimate the new employee to the specific procedures and equipment used by the civilian employer. Knowledge of Air Force data processing procedures used for inventory control is particularly helpful since many large civilian employers commonly use automated or computerized systems to maintain control over large quantities of goods.
Previous Experience	Desirable: Experience in jobs involving itemization of merchandise, maintenance of records, purchasing, inventory or distribution control, accounting procedures, sales functions, or storage and organization of goods. Comments: The inventory control field is a good entrance point for promotions into management-oriented positions in such areas as purchasing, buying, sales, or personnel procurement.	The work experience of Air Force Inventory Management Specialists is more than adequate preparation for the civilian occupation of Inventory Control Clerk. The heavy emphasis on data collection in support of supply/equipment authorizations and for financial planning would provide excellent background for sophisticated accounting or control procedures used by civilian employers. Advancement to managerial positions could be enhanced by experience in this AFS.

TABLE 61 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
License Certification	No license or certificate is needed to carry out the functions of this position. Comments: Generally, employees who handle jewelry, liquor or drugs must be bonded.	No basis for comparison and evaluation
Union Apprenticeship Journeyman	The union commonly associated with this occupation is the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America. No national apprenticeship program in this occupation exists at this time. All training is usually carried out on-the-job and involves procedures specific to the individual employer.	No basis for comparison and evaluation.
Other	Desirable: Ability to work systematically; ability to write legibly; ability to properly complete forms and reports.	No basis for comparison and evaluation, but it would be expected that Air Force Inventory Management Specialists would have extensive experience in the completion of forms, reports, and other paperwork.
Military-Civilian Job Function Comparability:	Comparability in job functions is high. Both Air Force Inventory Management Specialists and civilian Inventory Control Clerks perform itemization, accounting, inventory or monitoring procedures on quantities of goods, supplies, merchandise or equipment. Functions may differ somewhat when civilian personnel are not as involved in documentation procedures, because these procedures comprise much of the work of the Air Force personnel. Also, civilian personnel at times may be concerned with the handling or shipping of merchandise as secondary functions or duties.	

1 The Civilian Employment Standards cover inventory control positions in relatively large organizations where specialization of labor occurs. In small- or medium-size companies inventory control duties may be combined with shipping receiving or stock clerk functions.

TABLE 42

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR SHIPPING AND RECEIVING CLERK WITH THE TRAINING EXPERIENCE OF AIR FORCE INVENTORY MANAGEMENT SPECIALIST - AFS 64530 64550

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma or equivalent certificate; courses in business arithmetic, typing, other business subjects helpful for completing paperwork. Comments: In addition to formal education, a person should be able to use independent judgment, because part of an experienced clerk's functions may involve making decisions as to the handling of damaged merchandise, the application of standard rules to unique situations, or the supervision of personnel who are packing or distributing merchandise or goods.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational Technical Training	Desirable: Courses in business math, report writing or inventory control systems. Comments: New employees usually are trained on-the-job. As part of training they become familiar with merchandise to be handled, company forms, and standard procedures used in transferring the merchandise. Familiarity with accounting or inventory systems is often necessary since information about receipt or shipment of goods usually must be reported into some form of control system.	Formal Training: A total of 280 hours is given, 232 of which are AFS skill-related. Topics include automatic data processing system of inventory control, supply publications, item accounting and stock control, materiel control, supplies and equipment management, maintenance support, inventory, document control, and demand processing. Correspondence Courses: At the 5 skill level, topics cover organization of standard base supply, item research, file maintenance inputs, suspense files and listings, document control, demand processing, supply points, repair cycle, bench stock, requisitioning, due-outs, base excesses, shipments and transfers, the USAF Equipment Management System, operational support, equipment reports and listings, equipment transactions, equipment allowance documents, Air Force engine management, Air Force stock fund, standardization and surveillance, materiel control and civil engineer support, and communication security. The training received by Air Force Inventory Management Specialists is adequate preparation for the civilian position of Shipping and Receiving Clerk. Some on-the-job training will always be necessary, however, since each employer has its own special categories of merchandise as well as specific procedures which must be followed in handling the merchandise. The background knowledge in data processing procedures used in inventory control is particularly helpful for civilian employment with large employers who often use automated or computerized systems in conjunction with inventory control or shipping and receiving functions.
Previous Experience	Desirable: Experience in jobs involving the transferral of goods, packaging of merchandise, inventory control, the preparation of invoices, sales slips and receipts, merchandise inspection, merchandise storage, or recordkeeping and accountability procedures.	The work experience of Air Force Inventory Management Specialists is excellent preparation for the civilian occupation of Shipping and Receiving Clerk. Such experience should help considerably in rapid promotion to more responsible positions or even allow for entrance at a level higher than the usual entry-level position.

TABLE 62 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Previous Experience (Cont)	Comments: Experience as a Shipping and Receiving Clerk offers a good opportunity for a person to learn about the company's products and business practices. Promotions can be made to such areas as warehouse management, sales, customer services, purchasing or procurement.	
License Certification	No license or certificate is needed to carry out the functions of this occupation. Comments: Generally, employees who handle jewelry, liquor or drugs must be bonded.	No basis for comparison and evaluation.
Union Apprenticeship Journeyman	The union commonly associated with this occupation is the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America. No national apprenticeship program in this occupation exists at this time. All training is usually carried out on-the-job and involves procedures specific to the individual employer.	No basis for comparison and evaluation.
Other	Desirable: Ability to write legibly; ability to properly complete forms and reports; good physical condition, especially if lifting or moving of heavy objects is required.	No basis for comparison and evaluation, but it would be expected that Air Force Inventory Management Specialists would have extensive experience in the completion of forms, reports, and other paperwork.
Military-Civilian Job Function Comparability:	Comparability of job functions is moderate. Air Force Inventory Management Specialists are more concerned with supplies and equipment accountability than with the actual mechanics of shipping and receiving goods. In the civilian sector, the Shipping and Receiving Clerk would most likely make arrangements for the shipment/receipt of goods or actually package or unpackage goods. Depending on the size and organizational structure of the company or organization, the Shipping and Receiving Clerk may or may not be involved in inventory control functions.	

TABLE 63

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR PARTS-ORDER CLERK WITH THE TRAINING EXPERIENCE OF AIR FORCE INVENTORY MANAGEMENT SPECIALIST - AFS 64530/64550

Requirement Categories	Civilian Employment Standards [1]	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma or equivalent certificate; courses in basic mathematics, bookkeeping or accounting procedures. Comments: Some employers may give applicants tests measuring reading, basic mathematical, clerical, and/or typing skills.	A high school diploma can normally be obtained through participation in voluntary education programs.
Vocational Technical Training	Desirable: Training in blueprint or diagram reading, or in the assembling of equipment (preferably motor transportation equipment); familiarity with computer input-output information or data sheets; familiarity with the operation of calculators, adding machines, typewriters. Comments: Parts-Order Clerks usually receive on-the-job training lasting approximately three to six months. New employees may post data to various records such as ledgers, shop orders, master tool records, etc., sort and file records, correspondence, etc., write up orders, or supply information from files and records. More experienced employees learn to prepare reports and correspondence, prepare and maintain parts-control records, reconcile records to provide a constant balance between parts availability and parts requirements, assign, issue or release parts to using shops or customers, prepare shipping documents, process receiving notices, prepare purchase orders, or coordinate parts-order activities with other related departments.	Formal Training: A total of 280 hours is given, 232 of which are AFS skill-related. Topics include automatic data processing system of inventory control, supply publications, item accounting and stock control, materiel control, supplies and equipment management, maintenance support, inventory, document control, and demand processing. Correspondence Courses: At the 5 skill level, topics cover organization of standard base supply, item research, file maintenance inputs, suspense files and listings, document control, demand processing, supply points, repair cycle, bench stock, requisitioning, due-outs, base excesses, shipments and transfers, the USAF Equipment Management System, operational support, equipment reports and listings, equipment transactions, equipment allowance documents, Air Force engine management, Air Force stock fund, standardization and surveillance, materiel control and civil engineer support, and communication security. The training received by Air Force Inventory Management Specialist is adequate preparation for the civilian position of Parts-Order Clerk. Familiarization with specific parts and equipment will be necessary but the general inventory and clerical duties associated with this Air Force Specialty will be helpful background for parts-order work in the civilian sector. Knowledge of Air Force data processing procedures used for inventory control will also familiarize the employee with computer input/output information which is used in the civilian sector by many employers.
Previous Experience	Desirable: Experience in positions involving the inventory or cataloging of items, clerical or bookkeeping procedures related to the itemization of goods, the use of data processing or computerized input/output information, or customer or public service contact. Comments: Previous experience as a mechanic who has used the parts now being cataloged or ordered is helpful. If no direct mechanical experience with the specific	The work experience of Air Force Inventory Management Specialists is adequate preparation for the civilian occupation of Parts-Order Clerk. While experience with the specific parts or equipment that is used in the civilian sector might be lacking, the experience gained with inventory control procedures, itemization of supplies, and familiarity with data processing input/output information would provide excellent background preparation for parts-order work.

TABLE 63 (Cont)

Recruitment Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Previous Experience (Cont)	or similar parts has been obtained, it is helpful at least to be able to visualize interrelationships among parts.	
License/Certification	No license or certificate is needed to carry out the duties of this occupation.	No basis for comparison and evaluation.
Union Apprenticeship/ Journeyman	Unions commonly associated with this occupation are the International Brotherhood of Teamsters, Chauffeurs, Warehousemen, and Helpers of America and the International Association of Machinists and Aerospace Workers.. No national apprenticeship program in this occupation exists at this time All training is usually carried out on-the-job and involves procedures specific to individual employers.	No basis for comparison and evaluation.
Other	Desirable: Ability to copy information correctly; good memory; ability to visualize interrelationships between parts of equipment; ability to write legibly.	No basis for comparison and evaluation.
Military-Civilian Job Function Comparability:	Comparability in job functions is moderate. Both the Air Force Inventory Management Specialists and the civilian Parts-Order Clerks are concerned with the itemization, inventory or monitoring of supplies and equipment. However, civilian personnel are often also concerned with the distribution of parts and not as fully involved in the documentation or analysis of data used in support of financial planning or in the evaluation of equipment utilization with which the Air Force personnel are involved. Civilian personnel also must deal with the public (as customers) at various times (depending upon the division of labor in the organization) and, therefore, may have to be concerned with customer relations or public relations skills.	

1/ The Civilian Employment Standards cover Parts-Order Clerks in the motor transportation industry where the majority of these personnel are employed.

[illegible]	[illegible]	Comparison and Evaluation of Military Occupation
[illegible] Education	Mandatory: [illegible]th–12th grade [illegible] minimum in most states, 10th [illegible]. [illegible] Minimum high school diploma.	A high school diploma can be obtained by attendance at voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends (1) a certificate in nursing or credit in nursing on the basis of an institutional examination at the vocational certificate level, (2) 30 semester hours in nursing plus any additional credit on the basis of an institutional examination at the technical associate degree level, (3) credit in nursing on the basis of an institutional examination (if Air Force training were taken after 6/69) or 2 semester hours in physiology and hygiene (if Air Force training were taken before 6/69) at the baccalaureate degree level.
[illegible] technical training	Mandatory: As a prerequisite to the LPN LVN examination, in most states, 12[illegible] hours (one academic or calendar year) of formal [illegible] courses covering such topics as body structure and function, nutrition, personal and vocational relationships, human growth and development, drugs and chemical solutions, basic principles of [illegible], laboratory and hospital procedures, pharmacology, medical-surgical nursing, maternal and child health, psychiatric nursing; [illegible] usually are not given.	Formal Training: Air Force training for the Medical Service Specialist consists of 384 hours formal training, 332 of which involve technical training in such topics as medical terminology, anatomy and physiology, hospital safety practices, vital signs measurements, toxic agents, emergency medical treatment, various types of injuries, aspects of disaster medicine, field casualty care, acute medical problems, admission and disposition of patients, comfort and hygiene, common disease-causing organisms, medical and surgical aseptic techniques, and disorders relating to all major body systems. Correspondence Courses: Correspondence courses taken at the 3 skill level cover such topics as basic nursing techniques, diagnostic and therapeutic measures, nursing care related to specific physiological conditions and age categories, preoperative and postoperative care, outpatient emergencies and aeromedical evacuation. At the 5 skill level, correspondence courses cover general nursing care, management functions, special nursing care related to illnesses of all major body systems, care related to particular categories of patients such as pediatric, geriatric, or psychiatric patients, aeromedical evacuation and field medical care in disasters. Medical Service Specialist formal and correspondence school training covers most of the topics covered by civilian nursing vocational courses. Some deficiencies may occur in the areas of pharmacology, basic science, maternal and child care, and human growth and development. Also, civilian courses are of longer duration and, therefore, may cover all of the topics mentioned above in greater depth.

TABLE 64 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Vocational Technical Training (Cont)		Comments: The American Medical Association Council on Medical Education has approved a number of military educational programs in the medical field; however, the Air Force Medical Service Specialist course has not been approved for civilian LPN/LVN work.
Previous Experience	Experience is useful only insofar as it helps an individual pass the test for the LPN/LVN license in the state in which he or she intends to work. In some, but not most, states, experience may be substituted for the training that must be completed in order to qualify to take the LPN/LVN license test.	With the possible exception of ambulance driving and aeromedical evacuation, all Air Force experience, particularly that obtained at the 5 skill level, contributes to an individual's ability to pass LPN/LVN license test. Direct applicability of experience varies from state to state (see below).
License Certification	Mandatory: LPN/LVN license issued at the state level by all 50 states and D. C. Applicants must pass written exam of 60-120 multiple choice items which include questions about natural and social sciences, nutrition and diet therapy, and pharmacology, as they relate to clinical nursing. Comments: All states renew licenses either annually or biennially and have provisions for licensing foreign-educated applicants. Licenses are transferable among employers within a state while interstate transferability varies, depending on comparability of training programs. All state boards of nursing give the LPN/LVN examination at least once a year.	Thirty-four states currently allow military personnel training in the health field to take the licensing examination on the basis of their training in the military alone. Examination applicants should contact the board of nursing in the state in which they are seeking licensure in order to determine applicability of their military experience in that state.
Union Apprenticeship Membership	Union membership usually not associated with entry into this occupation.	No basis for comparison and evaluation.
Other	Mandatory: good moral character; in most states U.S. citizenship; 18 state will accept declaration of intent for U.S. citizenship; in most states a minimum of 18-20 years of age; in some states evidence of good physical or mental health.	No basis for comparison and evaluation.

Military-Civilian Job Function Comparability: Comparability in job functions is high, with practically all of the military tasks applicable to civilian sector nursing tasks. Only the military functions of ambulance driving and aeromedical evacuation are not usually performed by the ordinary LPN/LVN; emergency teams which receive special training are used in the civilian sector in these functions.

1 Standards reflect those required to qualify to take the examination for a license to become a Licensed Practical Nurse (LPN) or Licensed Vocational Nurse (LVN). This license is the key to entry into this occupation throughout the civilian health sector.

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR EMERGENCY MEDICAL TECHNICIAN WITH THE EDUCATION AND EXPERIENCE OF AIR FORCE MEDICAL SERVICE SPECIALIST - AFS 90230 90250

Educational Requirements	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
General Education	Desirable: Minimum of a high school diploma or equivalent certificate; courses in the physical sciences, anatomy, physiology, psychology, or sociology.	A high school diploma can be obtained by attendance at voluntary education programs. Comments: The American Council on Education, Office on Educational Credit recommends (1) a certificate in nursing or credit in nursing on the basis of an institutional examination at the vocational certificate level, (2) 30 semester hours in nursing plus any additional credit on the basis of an institutional examination at the technical associate degree level, (3) credit in nursing on the basis of an institutional examination (if Air Force training was taken after 6/69) or 2 semester hours in physiology and hygiene (if Air Force training was taken before 6/69) at the baccalaureate degree level.
Vocational Technical Training	Mandatory to become a Registered Emergency Medical Technician (EMT) (see licensure certification below): Successful completion of an approved EMT training program. The minimum approved training program must follow or be equivalent to the Department of Transportation (DOT) 81-hour EMT course which consists of 23 lessons involving 71 hours of classroom training and 10 hours of in-hospital observation. Most state governing bodies have implemented a version of this course which includes an overview of the EMT's job, a review of anatomy and physiology, life threatening emergencies, injuries, common medical emergencies, childbirth and problems of child patients, lifting and moving patients, environmental emergencies, extrication from automobiles, and operational aspects of the EMT's job. Desirable: The topics outlined above are considered to give minimum adequate preparation for the performance of an EMT's duties by the American Medical Association (AMA) and DOT. Comments: The National Highway Safety Administration within DOT initiated guidelines in 1966 for developing state emergency medical systems and formulated the EMT program outlined above which is now used in at least 44 states.	Formal Training: Air Force training for the Medical Service Specialist consists of 384 hours of formal training, 332 of which involve technical training in such topics as medical terminology, anatomy and physiology, hospital safety practices, vital signs measurement, toxic agents, emergency medical treatment, aspects of disaster medicine, field casualty care, acute medical problems, admission and disposition of patients, comfort and hygiene, common disease-causing organisms, medical and surgical aseptic techniques, and disorders relating to all major body systems. Correspondence Courses: Correspondence courses taken at the 3 skill level cover such topics as basic nursing techniques, diagnostic and therapeutic measures, nursing care related to specific physiological conditions and age categories, preoperative and postoperative care, outpatient emergencies and aeromedical evacuation. At the 5 skill level, correspondence courses cover general nursing care, management functions, special nursing care related to illness of all major body systems, care related to particular categories of patients such as pediatric, geriatric, or psychiatric patients, aeromedical evacuation and field medical care in disasters. Medical Service Specialist formal and correspondence school training covers most of the topics covered by the DOT course outline. Deficiencies may occur in the areas of childbirth and child patients, environmental emergencies, extrication from automobiles, and operational aspects of the EMT's job. Completion of the prescribed 81-hour civilian course would greatly enhance the probability of passing the National Registry examination. Comments: Within the next year, the DOT 81-hour EMT course will be incorporated into the formal training program for all Medical Service Specialists. At the present time those Specialists assigned to emergency room duties usually receive this course automatically. In addition, many Air Force medical installations are offering this course on a regular basis for those who want to increase their skills in emergency medicine.

TABLE 65 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Previous Experience	Mandatory to Become a Registered EMT: For EMT non-ambulance personnel, 6 months patient health care service in such occupations as registered nurse, licensed practical nurse, lab technician, orderly, military corpsman with actual field duty, etc.; for EMT ambulance personnel, 6 months emergency ambulance, rescue or military field service duty (provisional registration will be given EMT ambulance personnel who have completed training but who have not accrued six months experience). Desirable: The experience outlined above is considered minimum for adequate performance of an EMT's duties by the AMA and DOT.	Experience gained as an Air Force Medical Service Specialist will qualify one to take the National Registry examination if such experience has been in the area of emergency care and rescue service in which independent judgment has been used and direct patient care has been provided. The Registry gives the example of the "medical service specialist whose duties require him to serve as an ambulance attendant in response to accidents." Such experience must have been for a minimum of 6 months within the past 6 years. Individual state Departments of Health may require more stringent standards. The Department of Health in the state in which one plans to reside should be contacted for specific information.
License Certification	Desirable: Registration through the National Registry of Emergency Medical Technicians as an EMT (non-ambulance) or EMT (ambulance). Applicants must pass (1) a written examination of 150 multiple choice questions covering all phases of emergency medical service and (2) a practical examination demonstrating one's ability to physically apply the necessary skills of the EMT and to answer questions related to the prescribed practical skills. The training and experience outlined above are prerequisites for examination application. • Comments: Examinations are scheduled on an area or regional basis depending upon the number of applications received and the availability of physicians to monitor the exam. Re-registration is required every two years which involves the completion of a questionnaire, updating one's training and experience; the examination need not be retaken. As of August 1974, approximately 75,000 EMTs (out of a total of 220,000) had completed certification training. Approximately 32,000 of the trained group had completed the Registry's other requirements.	Provisions are underway for the administration of the National Registry examination at Air Force medical installations. Some installations have already conducted the examination. The training and experience of the Air Force Medical Specialist, especially if it involves assignment to emergency, rescue or ambulance duty, and completion of the DOT 81-hour EMT course, will provide a good basis for the ability to pass the National Registry examination.
Union Apprenticeship Journeyman	Union membership is usually not associated with entry into this occupation.	No basis for comparison and evaluation.
Other	Mandatory to Become a Registered EMT: A minimum of 18 years of age. Desirable: Good motor coordination; good manual dexterity; ability to give and receive verbal and written directions and instructions; ability to use good judgment under stress; leadership ability; emotional stability and psychological adaptability; good health; ability to lift and carry up to 100 pounds; good visual acuity and color discrimination.	No basis for comparison and evaluation.

Military-Civilian Job Function Comparability: Comparability in job functions is high. Comparability is the highest when the Air Force Medical Service Specialist has been given a relatively long assignment in emergency, rescue, or ambulance duties. The civilian Emergency Medical Technician works with each component of a community's emergency care system (1) to give appropriate initial medical care at the site of an emergency, (2) to use the emergency communication system effectively and efficiently, (3) to manage patient transportation with all support functions, and (4) to function within the emergency medical department. Some specialization takes place between ambulance and non-ambulance personnel. The Medical Service Specialist, in addition to performing emergency medical duties, performs general nursing duties, assists with examinations and treatments, operates or sets up therapeutic equipment, performs general ward services, cares for incapacitated patients, and performs duties in the clinic. The similiarity in job functions is heightened if the Air Force Specialist performs emergency medical duties more extensively than other general nursing duties.

Sec. 96

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR MEDICAL ASSISTANT WITH THE TRAINING/EXPERIENCE OF AIR FORCE MEDICAL SERVICE SPECIALIST - AFS 90230/90250

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
General Education	Desirable. Graduates of two-year educational programs have best opportunities. High school graduates are next preferred. Non-graduates who have taken courses in general science, biology and chemistry may qualify for some positions.	High school diploma can be obtained by attendance at voluntary education programs. Additional participation in Air Force education programs can lead to partial or full completion of two-year medical assistant education program. Comments: The American Council on Education, Office on Educational Credit recommends: (1) a certificate in nursing or credit in nursing on the basis of an institutional examination at the vocational certificate level, (2) 30 semester hours in nursing plus any additional credit on the basis of institutional examination at the technical associate degree level, (3) credit in nursing on the basis of an institutional examination (if Air Force training were taken after 6/69) or 2 semester hours in physiology and hygiene (if Air Force training were taken before 6/69) at the baccalaureate degree level.
Vocational Technical Training	Desirable. A two-year program consisting of courses in anatomy and physiology, medical terminology, medical law and ethics, psychology, administrative and clinical procedures, lab orientation, humanities and social science, practical experience in physician's office or accredited hospital.	Formal Training: Air Force training for the Medical Service Specialist consists of 384 hours of formal training, 332 of which involve technical training in such topics as medical terminology, anatomy and physiology, hospital safety practices, vital signs measurements, toxic agents, emergency medical treatment, various types of injuries, aspects of disaster medicine, field casualty care, acute medical problems, admission and disposition of patients, comfort and hygiene, common disease-causing organisms, medical and surgical aseptic techniques, and disorders relating to all major body systems. Correspondence Courses: Correspondence courses taken at the 3 skill level cover such topics as basic nursing techniques, diagnostic and therapeutic measures, nursing care related to specific physiological conditions and age categories, preoperative and postoperative care, outpatient emergencies and aeromedical evacuation. At the 5 skill level, correspondence courses cover general nursing care, management functions, special nursing care related to illnesses of all major body systems, care related to particular categories of patients such as pediatric, geriatric, or psychiatric patients, aeromedical evacuation and field medical care in disasters. Medical Service Specialist formal and correspondence courses are all applicable to the work of civilian Medical Assistant except aeromedical evacuation and field medical care.

TABLE 66 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Previous Experience	Desirable: Some experience in a physician's office or hospital in such functions as preparing patients for examination or treatment, assisting with some examinations, measuring vital signs, assisting in emergencies, obtaining medical histories, sterilizing instruments, performing routine lab tests, maintaining medical records, purchasing supplies and equipment, scheduling and receiving patients, handling insurance and office accounts. Comments: Many Medical Assistants gain experience by working for a private physician who is willing to train them. The proportion of medical to administrative duties performed in these situations is too varied to estimate. Medical/administrative proportions will vary depending on whether the work is done in a hospital or private office, individual or group physician's office and also will vary with the changing needs of the employer.	All experience of the Air Force Medical Service Specialist is applicable to Medical Assistant's work except for that portion devoted to ambulance driving or aeromedical evacuation. Air Force experience in performing medical administrative functions appears to fall short of that required of civilian Medical Assistants.
License Certification	Desirable: Certification by the American Association of Medical Assistants or the American Medical Technologists Association. Comments: Less than ten percent of the practicing medical assistants in the civilian sector are certified at this time.	Military training and experience totalling a minimum of three years qualifies a person to take the certification examination offered by the American Association of Medical Assistants.
Union Apprenticeship/ Journeyman	Workers in this occupation have not organized as a group with any union. Some Medical Assistants join a more general union that may have organized in a hospital where they work, while Medical Assistants who work in government facilities often are members of the American Federation of State, County and Municipal Employees.	No basis for comparison and evaluation.
Other	Desirable: Physical stamina, adaptability, positive attitude, discretion, good judgment, neatness, accuracy, friendly and cheerful manner.	No basis for comparison and evaluation.

Military-Civilian Job Function Comparability: Comparability in job functions is high. The Air Force Medical Service Specialist and the civilian Medical Assistant perform many similar duties. The Air Force specialist may be involved in ambulance driving or aeromedical evacuation that does not appear in the normal pattern of Medical Assistant's work. Medical Assistants may perform more administrative duties than are required of the Air Force Medical Service Specialist.

[illegible] STANDARDS FOR ASPECTS OF PLANT OPERATION WITH THE TRAINING EXPERIENCE [illegible] MAINTENANCE SPECIALIST - AFS 55130 55150

[illegible]	[illegible]	Comparison and Evaluation of Military Training
[illegible] Education	[illegible] Vocational certificate, courses [illegible]	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit suggests the following credit recommendations For formal training at the 3 skill level (received between 10/65 and 11/71), (1) 7 semester hours in construction technology at the vocational certificate level, (2) 5 semester hours in construction technology at the technical associate degree level. For training received after 11 [illegible] 1, (1) 4 semester hours in construction technology at the vocational certificate level, (2) 3 semester hours in construction technology at the technical associate degree level. For formal training at the 5 skill level, (1) 4 semester hours in construction of pavements at the vocational certificate level, (2) 2 semester hours in construction of pavements at the technical associate degree level or the baccalaureate level.
Vocational Technical Training	[illegible] training in quality control aspects of a plant operation, especially as related to the construction industry. [illegible] junior colleges, community colleges, or universities have 2-year construction [illegible] curricula which cover such topics as [illegible] management, plant safety, quality improvement, cost reduction, supervisory skills, project scheduling, personnel training, public relations, and federal safety codes. However, specific knowledge about the operation of asphalt plant operation would be needed. The Asphalt Institute has published an educational series on asphalt technology and construction which users and producers of asphaltic materials can use for training purposes. Topics covered include petroleum asphalt, mineral aggregates, asphalt concrete mix design, manufacture of hot-asphalt plant mixes, hot-mix asphalt paving, cold-laid asphalt pavements, surface treatment and seal coats, soils and drainage, structural design of asphalt pavements, and asphalt in pavement maintenance.	Formal Training: At the 3 skill level, 280 hours of instruction are given, 224 hours of which are AFS skill-related. Topics include calculation of areas and volumes, engineering drawings, soil mechanics and testing, basic course and subgrade, erosion control, construction stakes, tools and equipment, concrete mixtures, rigid and flexible pavement construction and maintenance, bituminous mixtures, vegetation control, snow and ice removal, and handling of explosives. At the 5 skill level, 120 hours of instruction are given, 116 of which are AFS skill-related. Topics include blueprints and drawings, publications, herbicides, drainage systems, soil mechanics, subgrade and base courses, concrete mixtures, bituminous mixtures, and rigid and flexible pavement construction and repair. Correspondence Courses: At the 3 skill level, topics include testing soils, paving materials, subgrade and base courses, construction and maintenance of paved surfaces, drainage, soil erosion, vegetation control, prefabricated surface mats, aircraft revetments, and railroad track maintenance. At the 5 skill level, topics include communication security, publications, drawings, supervision and training of subordinates, resources and work force management, construction and maintenance of concrete and bituminous pavements, drainage, railroad track maintenance, revetments and prefabricated surface mats, explosives, mobile pavement equipment, soil characteristics, and vegetation.

TABLE 67 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Vocational Technical Training (Cont)	... federally-funded road construction projects, contractors are required to provide training to those employees working on the project. The Road Builders' Training Association has formulated guidelines for on-the-job training administered through its state associations. The training for Asphalt Plant Operator calls for 1,040 hours covering orientation and observation of job functions (90 hours), care and maintenance of equipment (370 hours), and actual operation of equipment (580 hours).	The training of Air Force Pavements Maintenance Specialists would provide excellent background for further training in asphalt plant operations required by specific employers. Knowledge about flexible pavement construction and maintenance, bituminous mixtures, and mixture preparation and testing would be directly applicable to asphalt plant operations.
Previous Experience	Desirable: Experience in an industry involved in the use of asphalt where familiarity with storing, mixing, testing, processing, or lay-down techniques are obtained. Comments: Most Asphalt Plant Operators learn their work on the job and gradually accumulate skills in sampling asphalt and aggregate mixtures, designing job mix formulas, lay-down techniques (for evaluation, not paving purposes), and record keeping (temperature charts, test results, quality control, etc.).	The experience of Air Force Pavements Maintenance Specialists is excellent preparation for the civilian position of Asphalt Plant Operator. This experience would probably allow entry at a level higher than trainee (dependent upon company policy and seniority requirements).
License/Certification	No license or certificate is needed to perform the duties of this occupation.	No basis for comparison and evaluation.
Union Apprenticeship/ Journeyman	Unions to which Asphalt Plant Operators often belong include the International Union of Operating Engineers and the Operative Plasterers' and Cement Masons' International Association of the United States and Canada. Apprenticeship standards for a general Plant Equipment Operator have been formulated by the International Union of Operating Engineers, in conjunction with the National Constructors Association and the Associated General Contractors of America. A portion of the programs specifically deals with the operation of asphalt plants. Apprenticeship Entrance Requirements: An applicant must (1) be at least 18 and not over 25 years of age, (2) have sufficient education (12th grade or equivalent) to satisfactorily complete the required hours of related theoretical instruction, (3) be an American citizen or in the process of naturalization, (4) be physically able to perform the work of the trade, and (5) meet other entrance requirements as may be established by local committees. Journeyman Status: A total of 6,000 hours of work experience over a 3-year period must be obtained covering the operation of asphalt plants, batch plants, concrete mixers and pugmills, crushing plants, screening plants, washing plants, material loaders, drills, maintenance (cutting, burning, grease, oil), erecting and dismantling, welding, cutting, burning, and general equipment. Related theoretical instruction is also given over a 3-year period.	Apprenticeship Entrance Requirements. There is little basis for comparison and evaluation, but it should be noted that local apprenticeship committees have the authority to waive the maximum age limit and to give special consideration to eligible veterans (or other special cases). Journeyman Status: Air Force Pavements Maintenance Specialists have some training and experience in plant equipment operation but spend additional time actually constructing and/or repairing pavements which would not be required in the training of civilian Asphalt Plant Operators. However, credit for training and/or experience may be given apprentices by local apprenticeship committees on an individual basis.
Other	Desirable: Good organizational skills; good supervisory skills.	Air Force Pavements Maintenance Specialists would probably perform supervisory functions at the 5 skill level.

Military-Civilian Job Function Comparability: Comparability in job functions is high. However, Air Force personnel perform a broader range of tasks than do civilian Asphalt Plant Operators. In addition to operating asphalt and concrete batch plants, the military personnel perform some construction and maintenance tasks, inspect railroad beds and tracks, sample and test soils, and assist in the use of explosives. Civilian Asphalt Plant Operators work with the job mix formulas which primarily involves quality control work. While they must be familiar with proper paving techniques, they do not perform paving or lay-down functions per se.

TABLE 4.5

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR PAVING MACHINE OPERATOR WITH THE TRAINING/EXPERIENCE OF AIR FORCE PAVEMENTS MAINTENANCE SPECIALIST — AFS 55130/55150

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Some Apprenticeship Programs: A 12th grade education or its equivalent. Desirable: A high school diploma or equivalent certificate or at least some high school courses.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit suggests the following credit recommendations: For formal training at the 3 skill level (received between 10/65 and 11/71), (1) 7 semester hours in construction technology at the vocational certificate level, (2) 5 semester hours in construction technology at the technical associate degree level. For training received after 11/71, (1) 4 semester hours in construction technology at the vocational certificate level, (2) 3 semester hours in construction technology at the technical associate degree level. For formal training at the 5 skill level, (1) 4 semester hours in construction of pavements at the vocational certificate level, (2) 2 semester hours in construction of pavements at the technical associate degree level or the baccalaureate level.
Vocational/Technical Training	Desirable: Training in the operation of paving and grading equipment. Comments: Few (if any) institutional programs exist to train personnel in the operation of paving and grading equipment (or for other heavy construction equipment). Most training is done on-the-job through informal or formal supervision and/or demonstration, or in an apprenticeship program which combines work experience with formal instruction (see Union Apprenticeship/Journeyman category below). On federally-funded road construction projects, contractors are required to provide training to those employees working on the project. The Road Builders' Training Association has formulated guidelines for on-the-job training administered through its state associations. The training for Paving Machine Operator calls for 1,040 hours covering orientation to and observation of job functions (70 hours), care and maintenance of equipment (155 hours), and actual operation of equipment (815 hours).	Formal Training: At the 3 skill level, 280 hours of instruction are given, 224 hours of which are AFS skill-related. Topics include calculation of areas and volumes, engineering drawings, soil mechanics and testing, basic course and subgrade, erosion control, construction stakes, tools and equipment, concrete mixtures, rigid and flexible pavement construction and maintenance, bituminous mixtures, vegetation control, snow and ice removal, and handling of explosives. At the 5 skill level, 120 hours of instruction are given, 116 of which are AFS skill-related. Topics include blueprints and drawings, publications, herbicides, drainage systems, soil mechanics, subgrade and base courses, concrete mixtures, bituminous mixtures, and rigid and flexible pavement construction and repair. Correspondence Courses: At the 3 skill level, topics include testing soils, paving materials, subgrade and base courses, construction and maintenance of paved surfaces, drainage, soil erosion, vegetation control, prefabricated surface mats, aircraft revetments, and railroad track maintenance. At the 5 skill level, topics include communication security, publications, drawings, supervision and training of subordinates, resources and work force management, construction and maintenance of concrete and bituminous pavements, drainage, railroad track maintenance, revetments and prefabricated surface mats, explosives, mobile pavement equipment, soil characteristics, and vegetation. The training received by Air Force Pavements Maintenance Specialists is excellent preparation for work in the civilian sector as a Paving Machine Operator. Not only are personnel in this AFS instructed in paving techniques, but they also receive

TABLE 68 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Vocational Technical Training (Cont)		instruction in sampling and testing, mixing batches, soil and vegetation, and snow and ice control, which would give them a broad perspective of the entire construction or maintenance job to be performed.
Previous Experience	Desirable: Experience on jobs requiring the operation of construction machinery. Comments: Most employees advance from unskilled laborers who may assist in mixing, pouring, raking, or spreading paving mixtures to machine operators who gradually accumulate skills in the operation of many types of paving equipment. Eventually (approximately 3-4 years) they may be able to supervise a construction/maintenance crew of laborers and machine operators.	Air Force Pavements Maintenance Specialists have excellent experience in various phases of the construction, maintenance, inspection, and repair of rigid and flexible pavements. Air Force personnel not only use paving equipment but also operate fixed and mobile plants, perform samples and tests on soil and various paving mixtures, and may supervise lower level personnel (usually at the 5 skill level). Veterans would most certainly enter this civilian occupation above the unskilled laborer position and, depending upon the variety of machines operated and the supervisory experience accumulated, may be performing work comparable or close to the supervisory level.
License/Certification	No license or certificate is needed to perform the duties of this occupation. Comments: Individual states usually require that a license be issued to personnel who drive heavy equipment on the open road, but the operation of such equipment at a construction site does not require a license.	No basis for comparison and evaluation.
Union Apprenticeship/ Journeyman	Unions to which Paving Machine Operators often belong include the International Union of Operating Engineers, the Laborers' International Union of North America, or the Operative Plasterers' and Cement Masons' International Association of the United States and Canada. The International Union of Operating Engineers, in conjunction with the National Constructors Association and the Associated General Contractors of America, has formulated apprenticeship standards for training in the operation of grade and paving equipment which is as follows. Apprenticeship Entrance Requirements: An applicant must (1) be at least 18 and not over 25 years of age, (2) have sufficient education (12th grade or equivalent) to satisfactorily complete the required hours of related theoretical instruction, (3) be an American citizen or in the process of naturalization, (4) be physically able to perform the work of the trade, and (5) meet other entrance requirements as may be established by local committees. Journeyman Status: A total of 6,000 hours of work experience over a 3-year period must be obtained covering the operation of graders, scrapers, rollers and other compacting machines, tractor-type skip loaders and hi-lifts, wheel-type tractors, trenching machines, bulldozers, concrete and asphalt spreaders, screed and finishing machines, concrete mixer-pavers, specialty paving equipment and other general equipment. Related theoretical instruction is also given over a 3-year period.	Apprenticeship Entrance Requirements: There is little basis for comparison and evaluation, but it should be noted that local apprenticeship committees have the authority to waive the maximum age limit and to give special consideration to eligible veterans (or other special cases). Journeyman Status: Air Force Pavements Maintenance Specialists operate certain types of grade and paving equipment but would need additional experience on a variety of equipment to satisfy the requirements for journeyman status in this type of broad-based program. However, credit for previous training or experience may be given by local apprenticeship committees on an individual basis.
Other	Desirable: Good manual dexterity and mechanical ability.	No basis for comparison and evaluation.

Military-Civilian Job Function Comparability: Comparability in job functions is moderate. Air Force Pavements Maintenance Specialists perform much broader job functions than do civilian Paving Machine Operators including mixing, sampling and site preparation functions. Civilian personnel generally only operate, make minor repairs to, and adjust (to job specifications) various types of paving machinery.

TABLE C-4

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR CEMENT MASON WITH THE TRAINING/EXPERIENCE OF AIR FORCE PAVEMENTS MAINTENANCE SPECIALIST - AFS 55130, 55150

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Desirable: A high school diploma or equivalent certificate or at least some high school education courses in applied mathematics and related sciences. Comments: While a high school education is not required for most apprenticeship or training programs, high school mathematics is needed to understand classroom instruction often included as part of a training program.	A high school diploma can normally be obtained through participation in voluntary education programs. Comments: The American Council on Education, Office on Educational Credit suggests the following credit recommendations: For formal training at the 3 skill level received between 10/65 and 11/71, (1) 7 semester hours in construction technology at the vocational certificate level, (2) 5 semester hours in construction technology at the technical associate degree level. For training received after 11/71, (1) 4 semester hours in construction technology at the vocational certificate level, (2) 3 semester hours in construction technology at the technical associate degree level. For formal training at the 5 skill level, (1) 4 semester hours in construction of pavements at the vocational certificate level, (2) 2 semester hours in construction of pavements at the technical associate degree level or the baccalaureate level.
Vocational/Technical Training	Desirable: Training in blueprint reading, architectural drawing, estimating materials and costs. Comments: While cement masonry skills can be taught informally by working on construction jobs as laborers assisting cement masons, most training authorities recommend a 2- to 3-year apprenticeship program as the best way to learn this trade (see Union Apprenticeship/Journeyman category below).	Formal Training: At the 3 skill level, 280 hours of instruction are given, 224 hours of which are AFS skill-related. Topics include calculation of areas and volumes, engineering drawings, soil mechanics and testing, basic course and subgrade, erosion control, construction stakes, tools and equipment, concrete mixtures, rigid and flexible pavement construction and maintenance, bituminous mixtures, vegetation control, snow and ice removal, and handling of explosives. At the 5 skill level, 120 hours of instruction are given, 116 of which are AFS skill-related. Topics include blueprints and drawings, publications, herbicides, drainage systems, soil mechanics, subgrade and base courses, concrete mixtures, bituminous mixtures, and rigid and flexible pavement construction and repair. Correspondence Courses: At the 3 skill level topics include testing soils, paving materials, subgrade and base courses, construction and maintenance of paved surfaces, drainage, soil erosion, vegetation control, prefabricated surface mats, aircraft revetments, and railroad track maintenance. At the 5 skill level, topics include communication security, publications, drawings, supervision and training of subordinates, resources and work force management construction and maintenance of concrete and bituminous pavements, drainage, railroad track maintenance, revetments and prefabricated surface mats, explosives, mobile pavement equipment, soil characteristics, and vegetation. Training received by Air Force Pavements Maintenance Specialists is excellent preparation for further informal or apprenticeship training for the civilian occupation of Cement Mason. Some employers are likely to grant credit or advanced standing for Air Force training if the work of the civilian employer involves pavement construction, maintenance or repair.

TABLE 69 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Previous Experience	Desirable: Experience on jobs requiring the handling of tools and equipment, layout work, blueprint reading, architectural drawing, mixing and pouring of paving mixtures, finishing techniques, or the knowledge of local building codes. Comments: It takes approximately 2 to 3 years of on-the-job experience coupled with formal or informal instruction to become fully qualified as a journeyman Cement Mason. If no formal instruction is received, the training/apprenticeship period may be somewhat longer.	The experience gained as an Air Force Pavements Maintenance Specialist is excellent background preparation for the civilian position of Cement Mason. However, additional experience would be needed to become proficient at the journeyman level.
License/Certification	No license or certificate is needed to perform the functions of this occupation.	No basis for comparison and evaluation.
Union Apprenticeship/ Journeyman	Unions common to this occupation are the Operative Plasterers' and Cement Masons' International Association of the United States and Canada (OP& CMIA) and the Bricklayers, Masons and Plasterers' International Union of America. A National Cement Masonry, Asphalt, and Composition Apprenticeship and Training Committee made up of representatives from the OP& CMIA, the Associated General Contractors of America and the American Society of Concrete Construction has formulated national standards of apprenticeship. The Associated Builders and Contractors, Inc. (ABC) also have formulated apprenticeship guidelines for implementation by their local chapters. Both sets of standards have been registered with the Bureau of Apprenticeship and Training, U.S. Department of Labor. Apprenticeship Entrance Requirements: Generally the minimum age requirement is 17 years or, in the case of ABC, the applicant must be of legal age to handle the tools of the trade. For any apprenticeship program the applicant must be physically fit to perform the work of the trade. Local apprenticeship committees may administer aptitude tests or use other tools for personnel selection. Journeyman Status--Mandatory for the National Joint Committee: Completion of 4000 hours of work experience over a 2-year period covering such areas as use of tools and equipment, layout work, mixing and pouring concrete, establishing gradelines and heights, setting screeds, finishing of pavements, floors, walls, ceilings, etc., use of colors, waterproofing, renovation, and safety. An optional third year emphasizing foreman training may be taken in some local programs. Over the 2-year period, 288 hours of related instruction is given in such areas as mathematics, plan reading and freehand sketching, estimating, related science, trade theory, safety, architectural drawing, and building codes and legislation. Mandatory for the Associated Builders and Contractors, Inc.: Completion of 6000 hours of work experience over a 3-year period covering such areas as setting screeds and layout work, mix and consistency, pouring and tamping concrete, rough finishing (hand or machine), floating, hand troweling, using vibrating machine, patching, marking and edging, surface protection, and safety and good work habits. Approximately 432 hours of related instruction is given over a 3-year period.	Apprenticeship Entrance Requirements: There is little basis for comparison and evaluation but it should be noted that special consideration may be given to eligible veterans (or other special cases) at the option of the local apprenticeship committee. Journeyman Status: Air Force Pavements Maintenance Specialists perform many of the same functions performed by prospective civilian cement masonry journeymen in the areas relating to concrete mixing, pouring and finishing and pavement construction. Construction relating to structures, buildings, or ornamental masonry is not covered in Air Force training and experience. Credit for previous training and/or experience is granted by local apprenticeship committees on an individual basis.
Other	Desirable: Good manual dexterity.	No basis for comparison and evaluation.

Military-Civilian Job Function Comparability: Comparability in job functions is moderate. Air Force Pavements Maintenance Specialists and (most) civilian Cement Masons construct and repair concrete pavement surfaces. However, Cement Masons also commonly perform work on structures or buildings that require more sophisticated ornamental or finishing techniques. Conversely, Air Force personnel must be knowledgeable about soil and soil testing, erosion control, vegetation, flexible pavement construction (involving bituminous mixtures), snow and ice removal, and the use of explosives — areas in which civilian Cement Masons would not be involved.

TABLE 7-1

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR AIRCRAFT ARMAMENT ASSEMBLER WITH THE TRAINING EXPERIENCE OF AIR FORCE WEAPONS MECHANIC - AFS 46230 46250

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Some Employers: A high school diploma or equivalent certificate. Desirable: A high school diploma or equivalent certificate; courses in shop, mathematics, blueprints, schematic diagrams and production illustrations. Comments: Employees with high school diplomas are more apt to qualify for trainee programs designed to develop higher skills.	A high school diploma is required for assignment to this AFS. Comments: The American Council on Education, Office on Educational Credit, suggests awarding the following credit for military training: For Weapons Mechanic (TAC) - One semester hour (if training occurred during the period 3 66 to 12/68) or three semester hours (if training occurred after 11/68) in electronics laboratory at the vocational certificate level or the technical associate degree level. For Weapons Mechanic (ADC) - Four semester hours as an elective in weapons systems at the vocational certificate or technical associate degree levels, and credit in weapons systems on the basis of an institutional examination at the baccalaureate level. For Weapons Mechanic (SAC) - Four semester hours as an elective in all vocational and technical programs at the vocational certificate level or the technical associate degree level.
Vocational Technical Training	Desirable: Vocational courses covering blueprints, schematic diagrams, production illustrations, industrial electronics, and basic hand and power tools. Comments: Many skill levels are required in armament assembly operations but most are attained by on-the-job training and experience gained from repetitive work. Because of the innovative nature of the aircraft industry, products change rapidly and a large force of trained workers are required who can adapt readily to new assembly techniques. Aerospace plants sometimes supplement day-to-day experience with formal training programs but these are usually short-term programs designed to meet immediate needs.	Formal Training: A total of from 256 to 443 hours of technical training (depending on type of training, i.e., TAC, ADC or SAC) covering such topics as technical forms and publications, basic electricity, munitions (rockets, missiles, bombs, launchers, fuses), and special equipment including non-nuclear weapons systems, nuclear weapons systems, automatic weapons and specific gun systems (depending on type of training, i.e., TAC, ADC, or SAC). Correspondence Courses: At the 5 skill level, correspondence courses cover organization of munitions maintenance activities, maintenance procedures, publications, AC and DC circuits, corrosion control, trouble-shooting techniques, hydraulics and pneumatics, aircraft munitions and associated equipment, and specific aircraft weapons systems. All formal training and correspondence courses should provide excellent mechanical and theoretical background for work as a civilian Aircraft Armament Assembler.
Previous Experience	Mandatory for Some Employers: Two years of experience in assembly or related occupations. Desirable: Two to four years in general and specialized assembly techniques.	The experience gained as an Air Force Weapons Mechanic will serve as excellent background for general and specific mechanical skills needed by a civilian Aircraft Armament Assembler. Specific mechanical skills are highly transferable. Three to five years of experience as an Air Force Weapons Mechanic will satisfy the experience requirement for some employers.

TABLE 70 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Previous Experience (Cont)	Comments: On-the-job experience is generally the most important requirement for hiring and advancement. While some formal training programs do exist in some companies, experience gained from repetitive work and from learning under more highly skilled assemblers provides the best hiring and advancement opportunity. The initial grade level at which an employee is hired is determined mainly by the number of years of experience.	
License/Certification *	Desirable: A certificate from the Institute for the Certification of Engineering Technicians. Comments: Two years of work experience are required prior to application for certification. Exam consists of two parts which test general knowledge as well as specialized knowledge in the mechanical field.	The training and experience of an Air Force Weapons Mechanic can fully or partially satisfy the work experience requirements for certification by the Institute for the Certification of Engineering Technicians. One year is subtracted from total military service as "not applicable" time. One-half of the remainder of military service (up to four years) may be counted as work experience. In addition, military training and experience provides excellent preparation for the certification exam.
Union Apprenticeship Journeyman	Some aircraft armament assemblers are members of such unions as the International Association of Machinists and Aerospace Workers, the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America, and the International Union of Electrical, Radio and Machine Workers. The work force at some aerospace companies is not unionized. There are few formal apprenticeship programs in existence. Such programs that do exist vary in length from three to five years and include instruction in such subjects as mathematics, electricity, engineering drawing, industrial electronics and industrial physics. Application for journeyman status in companies with no formal apprenticeship program can be made after about five-eight years of work experience.	The training and experience of an Air Force Weapons Mechanic would provide excellent background for general mechanical skills and an excellent understanding of armament system fundamentals and equipment. Specific skills would be easily transferable. In some cases, military training and experience could be counted toward satisfaction of work requirements for journeyman status. Military training and experience will affect the factory grade level at which employment will start.
Other	Desirable: Good eye-hand coordination, finger dexterity, good manipulation skill, and good physical condition.	No basis for comparison and evaluation, although persons with recent experience as an Air Force Weapons Mechanic can be presumed to be in good physical condition and to have good manual dexterity and mechanical ability.

Military-Civilian Job Function Comparability: Comparability in job functions is very high between Air Force Weapons Mechanics and Aircraft Armament Assemblers. Military and civilian personnel in this field assemble, maintain, troubleshoot, repair and test aircraft armament systems, aircraft munitions and associated systems and equipment. They use similar tools and publications and adhere to stringent inspection criteria.

TABLE 1

COMPARISON OF CIVILIAN EMPLOYMENT STANDARDS FOR MUNITIONS HANDLER WITH FHL TRAINING EXPERIENCE OF AIR FORCE WEAPONS MECHANIC - AFS 46230/46250

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Formal Education	Mandatory for Some Employers: High school diploma or equivalent certificate. Desirable: High school diploma or equivalent certificate; ability to do mathematical computations; ability to read written instructions and to write clearly.	A high school diploma is required for assignment to this AFS. Comments: The American Council on Education, Office on Educational Credit, suggests awarding the following credit for military training: For Weapons Mechanic (TAC) - One semester hour (if training occurred during the period 3/66 to 12/68) or three semester hours (if training occurred after 11/68) in electronics laboratory at the vocational certificate level or the technical associate degree level. For Weapons Mechanic (ADC) - Four semester hours as an elective in weapons systems at the vocational certificate or technical associate degree levels, and credit in weapons systems on the basis of an institutional examination at the baccalaureate level. For Weapons Mechanic (SAC) - Four semester hours as an elective in all vocational and technical programs at the vocational certificate level or the technical associate degree level.
Vocational Technical Training	Desirable: Training in the handling, loading, firing and testing of guns, propellants, explosives or ordnance devices. Comments: The actual testing of the equipment, as opposed to the handling of the equipment, requires skills such as setting up test instruments properly, making appropriate mathematical test computations, and recording results accurately. Training in handling and testing of equipment is usually given on the job.	Formal Training: A total of from 256 to 443 hours of technical training (depending on type of training, i.e., TAC, ADC or SAC) covering such topics as technical forms and publications, basic electricity, munitions (rockets, missiles, bombs, launchers, fuses), and special equipment including non-nuclear weapons systems, nuclear weapons systems, automatic weapons and specific gun systems (depending on type of training, i.e., TAC, ADC or SAC). Correspondence Courses: At the 5 skill level, correspondence courses cover organization of munitions maintenance activities, maintenance procedures, publications, AC and DC circuits, corrosion control, trouble-shooting techniques, hydraulics and pneumatics, aircraft munitions and associated equipment, and specific aircraft weapons systems. Formal instruction and correspondence courses, particularly information on automatic weapons and gun systems, should provide good theoretical and mechanical background for work as a civilian Munitions Handler.
Previous Experience	Mandatory for Some Employers: Experience in handling, loading, and firing of guns or the use of propellants, explosives or other ordnance devices. Desirable: Experience in the handling and testing of guns or other ordnance devices including the setting up of test equipment and the	Experience gained as an Air Force Weapons Mechanic will fulfill the mandatory requirements established by some employers. Some of the desirable experience is also apparently acquired, although the Air Force Weapons Mechanic does not normally perform work under controlled, experimental conditions. Additional experience or on-the-job training in these testing activities appears to be required.

TABLE 71 (Cont)

Requirement Categories	Civilian Employment Standards	Comparison and Evaluation of Military Occupation
Previous Experience (Cont)	computation and documentation needed to measure the accuracy and tolerance ranges of such equipment. Comments: A new employee initially may only handle, load or fire the equipment. After a few months on the job, the employee will become involved in the testing of ordnance.	
License/Certification	No license or certificate is needed for the practice of this occupation.	No basis for comparison and evaluation.
Union Apprenticeship/ Journeyman	No unions are associated with this occupation specifically. Employees may join a union representing various groups of employees at the establishments where they work.	No basis for comparison and evaluation.
Other	Desirable: Good physical condition; ability to use mechanical hand tools.	No basis for comparison and evaluation, although good physical condition and the ability to use hand tools can be assumed of persons with recent experience as an Air Force Weapons Mechanic.
Military-Civilian Job Function Comparability:	Comparability in job functions is generally high. The Air Force Weapons Mechanic appears to perform similar functions to the civilian Munitions Handler with the exception of the conduct of testing of ordnance under controlled conditions. The highest comparability occurs where military personnel work with automatic weapons or gun systems as opposed to nuclear armaments.	

APPENDIX A

SOURCES OF MILITARY OCCUPATIONAL INFORMATION

The sources of information on the length of training and enlisted strength of all military occupations opened to enlisted personnel during a first enlistment period in all four military branches are stated in an ORI working paper entitled Identification of Occupational Specialties in the Military Characterized by High Enlisted Strength and Low Training in First Enlistment Term, 11 March 1974.

The sources of information on training curricula, military occupational job descriptions, and task analysis data for each of the 24 military occupations covered in this report are listed below by military branch.

UNITED STATES NAVY

Chief of Naval Education and Training
Navy Campus for Achievement
Pensacola, FL

Chief of Naval Technical Training
Naval Air Station Memphis
Millington, TN

UNITED STATES MARINE CORPS

Training Requirements Section
Director of Training and Education Division
Deputy Chief of Staff for Manpower
Headquarters, U. S. Marine Corps
Washington, DC

Motor Transport Section
Engineer/Motor Transport/General Supply Branch
Materiel Division
Department of Installations and Logistics
Headquarters, U. S. Marine Corps
Washington, DC

Education Services Branch
Director of Training and Education Division
Deputy Chief of Staff for Manpower
Headquarters, U. S. Marine Corps
Washington, DC

Director of Instruction
Marine Corps Combat Engineer School
Camp Lejeune, NC

Curriculum Branch
Military Police School
Fort Gordon, GA

Communications and Electronics School
Subunit 2, Company B
Marine Corps Recruit Depot
San Diego, CA

Office of Manpower and Utilization
Marine Corps Base
Quantico, VA

UNITED STATES ARMY

Doctrine Training Development Division
Office of Deputy Commandant for Combat and
Training Development
Fort Eustis, VA

Directorate of Plans and Training
Training Division, AIT Coordinator
Fort Dix, NJ

Directorate of Plans and Training
Training Division
Fort Leonard Wood, MO

Curriculum Branch
Military Police School
Fort Gordon, GA

Institute of Administration
Curriculum Branch
Directorate of Training and Education
Fort Benjamin Harrison, IN

Directorate of Plans and Training
Training Division
Fort Knox, KY

Military Occupation Specialty Division
Personnel Management Development Directorate
Military Personnel Center
Headquarters, U. S. Army
Washington, DC

Schools Branch
Deputy for Training and Accession Management
Enlisted Personnel Directorate
Military Personnel Center
Headquarters, U. S. Army
Washington, DC

Classification and Standards Branch
Enlisted Division
Directorate of Military Personnel Management
Deputy Chief of Staff for Personnel
Headquarters, U. S. Army
Washington, DC

Educational Development Section
Leadership and Behavior Division
Directorate of Human Resources Development
Deputy Chief of Staff for Personnel
Headquarters, U. S. Army
Washington, DC

UNITED STATES AIR FORCE

Systems Specialties Training Branch
Training Programs Division
Director of Personnel Programs
Deputy Chief of Staff, Personnel
Headquarters, U. S. Air Force
Washington, DC

Instructional Systems and Resources Branch
Training Programs Division
Director of Personnel Programs
Deputy Chief of Staff, Personnel
Headquarters, U. S. Air Force
Washington, DC

Classification and Evaluation Branch
Policy Division
Director of Personnel Plans
Deputy Chief of Staff, Personnel
Headquarters, U. S. Air Force
Washington, DC

Materiel and Operations Requirements Branch
Management Engineering and Requirements Division
Director of Manpower and Organization
Deputy Chief of Staff, Programs and Resources
Headquarters, U. S. Air Force
Washington, DC

3700 Occupational Measurement Squadron
Occupations Survey Branch
Headquarters Air Training Command
Lackland Air Force Base, TX

Extension Course Institute
Gunter Air Force Base, AL

Career Division
Community College of the Air Force
Randolph Air Force Base, TX

APPENDIX B

SOURCES OF CIVILIAN OCCUPATIONAL INFORMATION[1/]

CIVILIAN OCCUPATIONS RELATED TO SELECTED U. S. NAVY RATINGS

For Aviation Machinist's Mate - ADJ:

Aircraft Mechanic

Federal Aviation Administration
Department of Transportation
Washington, DC

International Brotherhood of Teamsters, Chauffeurs, Warehousemen, and Helpers of America
Washington, DC

Transport Workers Union
Washington, DC

1/ Private companies are not listed. Information received from private companies which have given permission for the release of such information can be obtained by contacting CRI.

Information for many civilian occupations was obtained from the Bureau of Policies and Standards of the U. S. Civil Service Commission, the Bureau of Labor Statistics and the Bureau of Apprenticeship and Training of the U. S. Department of Labor, and the Office on Educational Credit, American Council on Education, all located in Washington, DC.

The civilian occupations are listed in the same order as they appear in the text of this report.

Aircraft Mechanic (Cont)

International Association of Machinists and Aerospace Workers
Washington, DC

Aircraft Assembler

International Union of Electrical, Radio and Machine Workers
Washington, DC

National Aeronautics and Space Administration
Personnel Office
Washington, DC

National Aeronautics and Space Administration
Personnel Office
Wallops Island, VA

Aerospace Industries Association
Washington, DC

Institute for the Certification of Engineering Technicians
Washington, DC

International Association of Machinists and Aerospace Workers
Washington, DC

International Union, United Automobile, Aerospace and Agricultural Implement Workers of America
Detroit, MI

Automobile Mechanic

Automotive Service Industry Association
Chicago, IL

Motor Vehicle Manufacturing Association
Detroit, MI

National Institute for Automotive Service Excellence
Washington, DC

Automotive Service Councils of America
Hillside, IL

National Automobile Dealers Association
Washington, DC

Automobile Mechanic (Cont)

General Motors Training Center
Fairfax, VA

Sheet Metal Workers' International Association
Washington, DC

International Union, United Automobile, Aerospace, and Agricultural Implement Workers of America
Detroit, MI

International Association of Machinists and Aerospace Workers
Washington, DC

International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America
Washington, DC

For Boatswain's Mate - BM:

Merchant Marine Able Seaman

International Organization of Masters, Mates and Pilots
New York, NY

Seafarer's International Union of North America
Brooklyn, NY

National Maritime Union of America
New York, NY

Office of Maritime Manpower
Department of Commerce
Washington, DC

Merchant Vessel Personnel Branch
U. S. Coast Guard
Washington, DC

Rigger and Machine Mover

International Association of Bridge, Structural and Ornamental Iron Workers
Washington, DC

Association of General Contractors of America
Washington, DC

Iron Workers Local No. 5
Washington, DC

Rigger and Machine Mover (Cont)

National Iron Workers and Employers Training Program
Arlington, VA

Apprenticeship Task Force of the Steel Industry
Bethlehem, PA

United Steelworkers of America
Pittsburgh, PA

For Boiler Technician - BT:

Fireman (Boiler)

International Brotherhood of Firemen and Oilers
Washington, DC

Massachusetts Department of Public Safety
Boston, MA

Peterson School of Steam Engineering
Boston, MA

National Association of Power Engineers, Inc.
Chicago, IL

International Union of Operating Engineers
Washington, DC

National Institute for the Uniform Licensing of Power Engineers, Inc.
Chicago, IL

Stationary Engineer

Massachusetts Department of Public Safety
Boston, MA

National Association of Power Engineers
Chicago, IL

International Union of Operating Engineers
Washington, DC

Operating Engineers Local No. 68
West Caldwell, NJ

National Institute for the Uniform Licensing of Power Engineers, Inc.
Chicago, IL

International Union, United Automobile, Aerospace and Agriculture Implement Workers of America
Detroit, MI

Boilermaker

United Steelworkers of America
Pittsburgh, PA

Apprenticeship Task Force of the Steel Industry
Bethlehem, PA

Boilermaker's National Apprenticeship Program
Kansas City, KS

International Brotherhood of Boilermakers, Iron Shipbuilders, Blacksmiths, Forgers and Helpers
Washington, DC

International Union of Marine and Shipbuilding Workers of America
Washington, DC

Oil, Chemical and Atomic Workers International Union
Denver, CO

For Electrician's Mate - EM:

Maintenance Electrician

Associated Builders and Contractors, Inc.
Washington, DC

The Thaddeus Stevens Trade School
Lancaster, PA

International Brotherhood of Electrical Workers
Washington, DC

Long Beach Naval Shipyard
Long Beach, CA

National Electrical Contractors Association
Washington, DC

Construction Electrician

International Brotherhood of Electrical Workers
Washington, DC

National Electrical Contractors Association
Washington, DC

National Joint Apprenticeship and Training Committee for the Electrical Industry
Washington, DC

Construction Electrician (Cont)

Connecticut State Boards of Occupational Licensing
Hartford, CT

Associated Builders and Contractors
Washington, DC

Associated Independent Electrical Contractors of America, Inc.
Washington, DC

Electric Appliance Serviceman

National Radio Institute
Washington, DC

Association of Home Appliance Manufacturers
Chicago, IL

New England Appliance Service School
Boston, MA

National Appliance and Radio-TV Dealers Association
Chicago, IL

Technical Solid State Training, Inc.
Hyattsville, MD

Appliance Parts Distributors Association, Inc.
Detroit, MI

For Machinist's Mate - MM:

Industrial Machine Repairman

Allied Industrial Workers of America International Union
Madison, WI

International Association of Machinists and Aerospace Workers
Washington, DC

International Union, United Automobile, Aerospace and Agricultural Implement Workers of America
Detroit, MI

United Steelworkers of America
Pittsburgh, PA

International Union of Electrical, Radio and Machine Workers
Washington, DC

Stationary Engineer

Massachusetts Department of Public Safety
Boston, MA

National Association of Power Engineers
Chicago, IL

International Union of Operating Engineers
Washington, DC

Operating Engineers Local No. 68
West Caldwell, NJ

National Institute for the Uniform Licensing of Power Engineers, Inc.
Chicago, IL

International Union, United Automobile, Aerospace and Agriculture Implement Workers of America
Detroit, MI

Air Conditioning and Refrigeration Mechanic

Lincoln Technical Institute
New York, NY

Refrigeration Research Foundation
Washington, DC

Air Conditioning and Refrigeration Institute
Arlington, VA

ITT Technical Institute
Boston, MA

Connecticut State Boards of Occupational Licensing
Hartford, CT

United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada
Washington, DC

National Training Fund for Sheet Metal and Air Conditioning Industry
Washington, DC

Sheet Metal Workers' International Association
Washington, DC

International Brotherhood of Electrical Workers
Washington, DC

Air Conditioning and Refrigeration Mechanic (Cont)

Refrigeration Service Engineering Society
Des Plaines, IL

For Yeoman - YN:

Clerk Typist/Secretary

United Business Schools Association
Washington, DC

Association of Independent Colleges and Schools
Washington, DC

ITT Educational Services, Inc.
Indianapolis, IN

National Secretaries Association
Kansas City, MO

American Management Association, Inc.
New York, NY

Virginia Commonwealth University
Richmond, VA

Strayer College
Washington, DC

Office and Professional Employees International Union
Washington, DC

National Business Education Association
Reston, VA

Office Manager

Refer to the sources listed above under the civilian occupation of Clerk Typist/Secretary.

Shorthand Reporter

National Shorthand Reporters Association
Arlington, VA

United States Court Reporters Association
Norfolk, VA

Administrative Office of the United States Courts
Washington, DC

CIVILIAN OCCUPATIONS RELATED TO SELECTED U. S. MARINE CORPS SPECIALTIES

For Automotive Mechanic - MOS 3516:

Automobile Mechanic

Automotive Service Industry Association
Chicago, IL

Motor Vehicle Manufacturing Association
Detroit, MI

National Institute for Automotive Service Excellence
Washington, DC

Automotive Service Councils of America
Hillside, IL

National Automobile Dealers Association
Washington, DC

General Motors Training Center
Fairfax, VA

Sheet Metal Workers' International Association
Washington, DC

International Union, United Automobile, Aerospace, and Agricultural Implement Workers of America
Detroit, MI

International Association of Machinists and Aerospace Workers
Washington, DC

International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America
Washington, DC

Truck Mechanic

Sheet Metal Workers' International Association
Washington, DC

Amalgamated Transit Union
Washington, DC

International Association of Machinists and Aerospace Workers
Washington, DC

International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America
Washington, DC

Truck Mechanic (Cont)

American Trucking Association, Inc.
Washington, DC

Lincoln Technical Institute
Washington, DC

National Institute for Automotive Service Excellence
Washington, DC

United Automobile, Aerospace and Agricultural Implement Workers of America
Detroit, MI

International Brotherhood of Electrical Workers
Washington, DC

Diesel Equipment Mechanic

Refer to the sources listed above under the civilian occupation of Truck Mechanic.

For Bulk Fuel Man - MOS 1391:

Petroleum Terminal Operator

Oil, Chemical and Atomic Workers International Union
Denver, CO

National Petroleum Refiners Association
Washington, DC

American Petroleum Institute
Washington, DC

American Geological Institute
Falls Church, VA

American Association of Petroleum Geologists
Tulsa, OK

Petroleum Refinery Mechanic

Refer to the sources listed above under the civilian occupation of Petroleum Terminal Operator.

Petroleum Laboratory Tester

Refer to the sources listed above under the civilian occupation of Petroleum Terminal Operator.

For Combat Engineer - MOS 1371:

Rigger and Machine Mover

International Association of Bridge, Structural and Ornamental Iron Workers
Washington, DC

Association of General Contractors of America
Washington, DC

Iron Workers Local No. 5
Washington, DC

National Iron Workers and Employers Training Program
Arlington, VA

Apprenticeship Task Force of the Steel Industry
Bethlehem, PA

United Steelworkers of America
Pittsburgh, PA

Blaster

Institute of Makers of Explosives
New York, NY

Illinois State Department of Mines and Minerals
Springfield, IL

Mining Enforcement Safety Administration
Bureau of Mines
Department of the Interior
Washington, DC

Occupational Health and Safety Administration
Department of Labor
Washington, DC

National Association of Demolition Contractors
Oak Brook, IL

Iron Worker (Erector)

International Assocation of Bridge, Structural and Ornamental Iron Workers
Washington, DC

Associated General Contractors of America, Inc.
Washington, DC

For Field Radio Operator - MOS 2531:

Ground Radio Operator

Federal Communications Commission
Washington, DC

Chronicle Guidance Publications, Inc.
Moravia, NY

Federal Aviation Administration
Department of Transportation
Washington, DC

Air Transportation Association
Washington, DC

Communications Workers of America
Washington, DC

Transport Workers Union
Washington, DC

International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America
Washington, DC

Broadcast Field Engineer

Northern Virginia Community College
Annandale, VA

National Association of Broadcasters
Washington, DC

Federal Communications Commission
Washington, DC

Capital Radio Engineering Institute
Washington, DC

International Brotherhood of Electrical Workers
Washington, DC

Communications Workers of America
Washington, DC

National Association of Broadcast Employees and Technicians
Washington, DC

Broadcast Technician

Refer to the sources listed above under the civilian occupation of Broadcast Field Engineer.

For Military Policeman - MOS 5811:

Municipal Police Officer

Montgomery County Government Employment Office
Rockville, MD

Northern Virginia Police Academy
Fairfax, VA

County of Fairfax Police Headquarters
Fairfax, VA

Prince George's County Police Training and Education Division
Forestville, MD

Montgomery County Police Academy
Rockville, MD

International Brotherhood of Police Officer
Washington, DC

International Association of Chiefs of Police
Washington, DC

Washington, DC Metropolitan Police Department
Washington, DC

State Police (Highway Patrol) Officer

The Police Foundation
Washington, DC

Maryland State Police
Pikesville, MD

Commission on Police Officer Standards and Training
Police Standards Division
Sacramento, CA

Maryland State Training Commission
Rockville, MD

Private Security Guard

United Plant Guard Workers of America
Chicago, IL

Illinois State Department of Registration and Education
Springfield, IL

For Wireman - MOS 2511:

Telephone Lineman

Texas Engineering Extension Services
The Texas A&M University System
College Station, Texas

U. S. Independent Telephone Association
Washington, DC

International Brotherhood of Electrical Workers
Washington, DC

Communications Workers of America
Washington, DC

Alliance of Independent Telephone Unions
Hamden, CT

Telephone Cable Splicer

Refer to the sources listed above under the civilian occupation of Telephone Lineman.

Telephone Central Office Installer

Refer to the sources listed above under the civilian occupation of Telephone Lineman.

CIVILIAN OCCUPATIONS RELATED TO SELECTED U. S. ARMY SPECIALTIES

For Armor Crewman - MOS 11E10/20:

Munitions Handler

American Defense Preparedness Association
Washington, DC

Ground Radio Operator

Federal Communications Commission
Washington, DC

Chronicle Guidance Publications, Inc.
Moravia, NY

Federal Aviation Administration
Department of Transportation
Washington, DC

Air Transportation Association
Washington, DC

Ground Radio Operator (Cont)

Communications Workers of America
Washington, DC

Transport Workers Union
Washington, DC

International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America
Washington, DC

Blaster

Institute of Makers of Explosives
New York, NY

Illinois State Department of Mines and Minerals
Springfield, IL

Mining Enforcement Safety Administration
Bureau of Mines
Department of Interior
Washington, DC

Occupational Health and Safety Administration
Department of Labor
Washington, DC

National Association of Demolition Contractors
Oak Brook, IL

For Carpenter - MOS 51B20:

Construction Carpenter

United Brotherhood of Carpenters and Joiners of America
Washington, DC

National Joint Apprenticeship Committee for Carpenters
Upper Marlboro, MD

Associated General Contractors of America
Washington, DC

Associated Builders and Contractors, Inc.
Washington, DC

Building and Construction Trades Department
AFL-CIO
Washington, DC

National Association of Home Builders of the United States
Washington, DC

Cabinetmaker

Refer to the sources listed above under the civilian occupation of Construction Carpenter, plus the following:

Johnson School of Technology
Scranton, PA

The Thaddeus Stevens Trade School
Lancaster, PA

Oklahoma State Department of Vocational
Technical Education
Stillwater, OK

Furniture Maker

North Carolina State Department of Education
Raleigh, NC

Southern Furniture Manufacturing Association
South Highpoint, NC

North Carolina State Department of Labor
Raleigh, NC

National Association of Furniture Manufacturers
Washington, DC

National Wholesale Furniture Association
Chicago, IL

School of Furniture Making and Management
North Carolina State University
Raleigh, NC

For Computer Systems Operator - MOS 74E10/20:

Computer Systems Operator "C"

Computer Sciences Technicolor Associates
(NASA on-site Computing Facility Management)
Goddard Space Flight Center
Greenbelt, MD

Data Processing Management Association
District of Columbia Chapter (Representative)
Washington, DC

Association for Computing Machinery
Washington, DC

American Society for Information Science
Washington, DC

Computer Systems Operator "C" (Cont)

Business Equipment Manufacturers Association
New York, NY

National Education Association
Washington, DC

Association for Educational Data Systems
Washington, DC

International Institute of Computer Professions
Silver Spring, MD

American Federation of Information Processing Societies
Washington, DC

Computer Systems Operators "B" and "A"

Refer to the sources listed above under the civilian occupation of Computer Systems Operator "C".

Computer Programmer

Refer to the sources listed above under the civilian occupation of Computer Systems Operator "C".

For Correctional Specialist - MOS 95C20:

Correctional Specialist

American Correctional Association
Washington, DC

Institute of Criminal Justice and Criminology
University of Maryland
College Park, MD

Virginia Law Enforcement Training and Standards Commission
Richmond, VA

Maryland Department of Public Safety and Correctional Services
Division of Corrections
Baltimore, MD

D. C. Department of Corrections
Training Academy
Lorton, VA

Patuxent Training Institute
Jessup, MD

Correctional Specialist (Cont)

Bureau of Prisons
U. S. Department of Justice
Washington, DC

Maryland State Department of Corrections
Baltimore, MD

Arlington County Department of Personnel
Arlington, VA

Staff Training Center
U. S. Penitentiary
Atlanta, GA

American Federation of State, County, and Municipal Employees
Washington, DC

Private Security Guard

United Plant Guard Workers of America
Chicago, IL

Illinois State Department of Registration and Education
Springfield, IL

Federal Government Protective Officer

International Federation of Federal Police
Washington, DC

American Federation of Government Employees
Washington, DC

National Federation of Federal Employees
Washington, DC

General Services Administration
Washington, DC

Bureau of Prisons
United States Department of Justice
Washington, DC

For Motor Transport Operator - 64C20/30:

Light/Heavy Truck Driver

National Commission on Uniform Traffic Laws
Washington, DC

Association of Motor Vehicle Administrators
Washington, DC

Light/Heavy Truck Driver (Cont)

National Highway Traffic Safety Administration
Department of Transportation
Washington, DC

American Trucking Association
Washington, DC

International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America
Washington, DC

Tractor-Trailer Truck Driver

Bureau of Motor Carrier Safety
Federal Highway Administration
Department of Transportation
Washington, DC

National Highway Traffic Safety Administration
Department of Transportation
Washington, DC

Ryder Technical Institute
Atlanta, GA

American Trucking Association
Washington, DC

International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America
Washington, DC

Public Transporation Operator

American Transit Association
Washington, DC

Amalgamated Transit Union
Washington, DC

Transport Workers Union of America
Washington, DC

International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America
Washington, DC

Chicago Transit Authority
Chicago, IL

CIVILIAN OCCUPATIONS RELATED TO SELECTED U. S. AIR FORCE SPECIALTIES

For Cook - AFS 66230/66250:

Cook

League of International Food Education
Washington, DC

National Institute for the Food Service Industry
Chicago, IL

Culinery Institute of America
New York, NY

Hotel and Restaurant Employees and Bartenders International Union
Cincinnati, OH

Institutional Food Distributors of America
Washington, DC

National Association of College and University Food Services
Philadelphia, PA

American Association of Food Equipment Manufacturers
Chicago, IL

Food Steward

Refer to the sources listed above under the civilian occupation of Cook.

Food Processing Technician

Institute of Food Technologists
Chicago, IL

American Dietetic Association
Chicago, IL

International Soceity of Food Service Consultants
Gainesville, FL

National Food Distributors Association
Chicago, IL

For Fire Protection Specialist - AFS 57130/50:

Crash Fire Fighter

Society of Fire Protection Engineers
Boston, MA

Crash Fire Fighter (Cont)

International Fire Administration Institute
State University of New York
Albany, NY

International Association of Firefighters
Washington, DC

National Fire Protection Association
Washington, DC

Society of Fire Protection Engineers
Boston, MA

Olympia Fire Department
Olympia, WA

City of Seattle Fire Department
Seattle, WA

International Association of Fire Chiefs
Washington, DC

International Fire Service Training Association
Oklahoma State University
Stillwater, OK

Federal Aviation Administration
Department of Transportation
Washington, DC

Structural Fire Fighter

Refer to sources listed above under the civilian occupation of Crash Fire Fighter.

Fire Fighting Instructor

Refer to sources listed above under the civilian occupation of Crash Fire Fighter.

For Inventory Management Specialist - AFS 64530/50:

Inventory Control Clerk

National Association of Wholesalers-Distributors
Washington, DC

International Brotherhood of Teamsters, Chauffeurs,
Warehousemen and Helpers
Washington, DC

Shipping and Receiving Clerk

Refer to sources listed above under the civilian occupation of Inventory Control Clerk.

Parts-Order Clerk

American Trucking Association
Washington, DC

International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers
Washington, DC

International Association of Machinists and Aerospace Workers
Washington, DC

For Medical Service Specialist - AFS 90230/50:

Licensed Practical Nurse (LPN)/Licensed Vocational Nurse (LVN)

Practical Nurses' Examining Board
Department of Occupations and Professions
Government of the District of Columbia
Washington, DC

American Nurses' Association
Kansas City, MO

National League of Nursing
New York, NY

Department of Health Occupations
Sikeston Public Schools
Sikeston, MO

Johnston School of Practical Nursing
Union Memorial Hospital
Baltimore, MD

Hannah Harrison Career School
YWCA of the National Capital Area
Washington, DC

National MEDIHC Program
National Institutes of Health
Bethesda, MD

American Association of Community and Junior Colleges
Washington, DC

Emergency Medical Technician

National Registry of Emergency Medical Technicians
Columbus, OH

Emergency Medical Technician (Cont)

National Highway Safety Administration
Department of Transportation
Washington, DC

Division of Emergency Health Services
Health Services and Mental Health Administration
Department of Health, Education and Welfare
Washington, DC

American Medical Association
Washington, DC and Chicago, IL

Medical Assistant

American Medical Technologists Association
Park Ridge, IL

American Association of Medical Assistants
Chicago, IL

Department of Medical Professions and Services
American Medical Association
Chicago, IL

Accrediting Bureau of Medical Laboratory Schools
Elkhart, IN

American Registry of Medical Assistants
Thompsonville, CT

American Federation of State, County and Municipal Employees
Washington, DC

For Pavements Maintenance Specialist - AFS 55130/50:

Asphalt Plant Operator

International Union of Operating Engineers
Washington, DC

Operative Plasterers' and Cement Masons' International Association of the United States and Canada
Washington, DC

Associated General Contractors of America
Washington, DC

National Constructors Association
Washington, DC

Asphalt Plant Operator (Cont)

Road Builders' Training Association, Inc.
Washington, DC

National Asphalt Pavement Association
Riverdale, MD

The Asphalt Institute
College Park, MD

Laborers' International Union of North America
Washington, DC

Paving Machine Operator

Refer to sources listed above under the civilian occupation of Asphalt Plant Operator.

Cement Mason

Operative Plasterers' and Cement Masons' International Association of the United States and Canada
Washington, DC

Associated General Contractor of America
Washington, DC

American Society of Concrete Construction
Des Plaines, IL

Bricklayers, Masons and Plasterers' International Union of America
Washington, DC

Portland Cement Association
Skokie, IL

Associated Builders and Contractors, Inc.
Washington, DC

For Weapons Mechanic - AFS 46230/50:

Aircraft Armament Assembler

International Union of Electrical, Radio and Machine Workers
Washington, DC

National Aeronautics and Space Administration
Personnel Office
Washington, DC

Aircraft Armament Assembler (Cont)

National Aeronautics and Space Administration
Personnel Office
Wallops Island, VA

Aerospace Industries Association
Washington, DC

Institute for the Certification of Engineering Technicians
Washington, DC

International Association of Machinists and Aerospace Workers
Washington, DC

International Union, United Automobile, Aerospace and Agricultural Implement Workers of America
Detroit, MI

Munitions Handler

American Defense Preparedness Association
Washington, DC

APPENDIX C

EXAMINATION OF ARMY CRAWLER TRACTOR OPERATOR - MOS 62E

PURPOSE AND BACKGROUND

The purpose of identifying entry employment standards for civilian occupations, and assessing the extent to which the first enlistment term in similar military occupations meets those standards, is the development of information that can ultimately be used to maximize the value of the first enlistment term to the future career development of the military personnel in those occupations. The results of the comparisons of civilian standards with first term military experience which are contained in this report are intended to show both strengths and weaknesses of first term career development potential, and point to areas in which supplemental education appears to be needed to maximize this first term potential.

Based upon ORI's contacts with both civilian and military information sources concerning the Army Crawler Tractor Operator, MOS 62E, it was determined that efforts to maximize the value of Army training and experience for future civilian employment in the field of heavy equipment operation are already underway. It was determined, further, that recontacting civilian information sources for the purpose of identifying civilian employment standards would be redundant, and perhaps even disruptive, in light of the current Army efforts involving representatives of the civilian employment community. ORI's examination of the Army Crawler Tractor Operator, therefore, has been excepted from the format used to analyze the other occupational specialties selected for this study. It is based almost entirely upon information obtained from the Department of Training and Doctrine Development, U. S. Army Engineer School, Fort Belvoir, Virginia. This organization has been responsible for the development of programs to facilitate transfer of Army training and experience to civilian applications, and for the coordination of the effort to develop Interservice Apprenticeship Standards for operating engineers in all service branches.

MILITARY ENGINEER APPRENTICESHIP PROGRAM

In 1973, the U. S. Army Engineer School initiated a program whereby personnel in Career Field 62, Engineer Heavy Equipment Operation and Maintenance, can maintain a personal log book of training and experience, and also post progress in training and experience to a central registry maintained by the Engineer School. The personal log book, entitled Apprentice Master Record, coupled with the verification of progress available from the central registry, equips personnel, such as Crawler Tractor Operators, to present evidence of qualifications to civilian employers or unions they may wish to approach following separation from the Army. The International Union of Operating Engineers (IUOE) and the Associated General Contractors of America (AGCA) have cooperated with the Engineer School in the development of this program, and in the endorsement of it to Army personnel. Both organizations have indicated that the content of the Apprentice Master Record will be used by individual local unions and AGCA member organizations in determining the amount of apprenticeship credit to be allowed an individual applying to one of their Apprenticeship Programs.

INTERSERVICE APPRENTICESHIP PROGRAM

In 1974, the U. S. Army Engineer School completed development, in draft form, of Interservice Apprenticeship Standards for Military Equipment Operators and Mechanics. These standards parallel the National Apprenticeship Standards for the Trade of Operating Engineer, which have been developed by the National Joint Apprenticeship and Training Committee (NJATC) for Operating Engineers. This committee works in cooperation with the Bureau of Apprenticeship and Training (BAT) of the U. S. Department of Labor, and is comprised of the International Union of Operating Engineers, the Associated General Contractors of America, and the National Constructors Association. The Interservice Apprenticeship Standards have been developed by the Army in conjunction with BAT and NJATC, and with the cooperation of the Navy, Marine Corps, and Air Force. In May, 1974, the draft standards were submitted to the Commandant, U. S. Army Training and Doctrine Command, for endorsement and forwarding to the U. S. Department of Labor.

The Interservice Apprenticeship Standards outline four operating engineer areas for which journeyman status may be pursued by service personnel. These are (1) Engineer Equipment Mechanic, (2) Universal Equipment Operator, (3) Grading and Paving Equipment Operator, and (4) Plant Equipment Operator. For each area, key work processes in which journeymen must be experienced have been defined. For example, in the case of the Grading and Paving Equipment Operator (the area for which the Army Crawler Tractor Operator would likely prepare), the principal work processes in which experience must be accumulated are defined in terms of operation, maintenance, safety and other experience with the following equipment.

Equipment	Approximate Hours
Graders (Basic and Finish)	600
Scrapers (Self-Propelled)	600
Compaction Equipment (Self-Propelled and Towed)	200
Loaders	500
Forklift	300
Crawler/Wheeled Tractors	600
Trenching Machine	100
Asphalt Paving Equipment	600
Concrete Paving Equipment	600
Pumps, Air Compressors, Generators	200
Miscellaneous—Heaters, Welders	50
Specializations (in one or more types of equipment)	1,650

A total of 6,000 hours of experience must be accumulated across all of the equipment listed above. The standards direct that an individual must serve for a minimum four-year term in order to accumulate the hours of experience. (Personnel at the Engineer School estimate that engineer equipment operators will receive approximately 1,500 hours of operating experience in a year.) In addition to gaining experience in work processes, personnel in the apprenticeship program must complete a total of 432 hours (144 hours per year) of related instruction. Interservice Equipment Operator courses are scheduled for implementation by January, 1975. The Army will provide this training for all services, except Navy, at Fort Leonard Wood, Missouri. The Navy will train its operating engineers at another site, using a Program of Instruction similar to that to be used at Fort Leonard Wood.

The hours of interservice training completed by personnel will be credits toward the total instruction requirement of the apprenticeship program. For the Army Crawler Tractor Operator, for example, the training schedule is comprised of 40 hours of operating equipment fundamentals, and 80 hours of instruction in crawler tractor operation, maintenance, etc. Length of training varies from one occupational speciality to another and from one service branch to another.

The balance of the related instruction hours needed for completion of the apprenticeship program is attained through correspondence courses. These courses are available primarily through the Army at this time. Correspondence course hours are fully credited toward the apprentice training hour requirement.

The Interservice Apprenticeship Program utilizes the record-keeping system described earlier under the Military Engineer Apprenticeship Program. The Apprentice Master Record, maintained by the individual apprentice, is evaluated quarterly by the trainee's supervisor.

All apprentices are registered with the Bureau of Apprenticeship and Training, Department of Labor. All actions affecting an apprentice are reported by the Engineer School to this apprentice registry, which awards a certificate of completion of apprenticeship when all program requirements have been met.

CURRENT DEVELOPMENTS—IMPLICATIONS FOR CRAWLER TRACTOR OPERATOR

The Department of the Army, through its Enlisted Personnel Management System Study, is considering revision of Career Management Field (CMF) 51, which contains MOS 62E, Crawler Tractor Operator. Consideration is being given to consolidating all MOS 62 occupations, with few exceptions, in a General Construction Machine Operator occupation. The Engineer School, at the same time, is suggesting an alternative consolidation involving MOS 62E, K, and L (Crawler Tractor, Grader, Wheeled Tractor, and Scoop Loader, part of 62M). The form that the final revision of CMF 51 takes will affect the relative ease or difficulty with which an individual in the heavy construction equipment field will meet the Interservice Apprenticeship Standards. Because the standards call for experience with a variety of equipment, broadening the scope of the operating engineer occupations will enable individuals to routinely obtain more of the needed apprentice experience than would have been possible under the current MOS structure in which a single piece of equipment receives primary attention.

It is also true, however, than an individual in MOS 62E will obtain experience with other pieces of equipment in any event, because a mix of equipment is normally present on a construction site, and opportunities to receive on-the-job training and experience with other equipment are always present.

APPENDIX D

SUGGESTED APPROACH TO COMBAT ARMS OCCUPATIONS

During Phases I and II of this study, the examination of combat arms occupations in terms of career development was addressed only partially. This partial examination, although useful per se, does not penetrate to the center of the problem of helping combat arms personnel to improve the continuity of their career development. These combat occupations will require a special methodology because some of them have no apparent civilian counterparts. This does not mean that these occupations provide zero career development opportunity. It indicates only that the pattern of career development of persons in some combat arms occupations apparently does not match the totality of any single occupation in non-military economic activity.

The goal of the examination of combat specialties, then, should be to illustrate how each of the skills exercised in these occupations can be expanded by the individual serviceperson to increase his employability in one or more civilian sector occupations. This will also help servicepersons to clarify their views of their potential future if they reenlist for combat arms or if they pursue other military specialties.

The study of combat arms occupations might begin with a categorization of the skills embodied in each of the combat arms occupations under study. The categories would represent work functions. An example is provided below.

LIGHT WEAPONS INFANTRYMAN
MOS 11B

A professional infantryman works to develop and maintain high proficiency in each of the many skills that are or might be required in combat. Some of these skills, if developed further and practiced in a less varied atmosphere, comprise the major work of many persons in occupations other than infantryman.

Description of MOS (From AR 611-201)	Skill/Activity That May be Further Developed
Aims and fires rifle	
Assists machinegunner	
Changes target and adjusts fire	
Moves to and occupies new position	
Throws grenades	Ability to perform physical and mental tasks, including decision-making required for offensive and defensive fighting
Engages in hand-to-hand combat	
Employs bayonet and silent weapons	
Inflicts casualties on enemy, seizes ground, captures prisoners, and stops enemy advance	
Employs cover, concealment and camouflage for weapons and personnel	
Interprets hand or arm signals	Communication
Obtains tactical information as member of combat or reconnaissance patrol	Data Collection
Identifies enemy personnel and material	Data Collection
Escapes and evades enemy	Ability to perform physical and mental tasks required for self-protection and unit security in a combat situation
Assists in construction of field fortifications, road blocks, wire entanglements, minefields	Construction, security
Assembles, emplaces, detects, disarms and plots mines under supervision of specialist personnel	Demolition and anti-explosive security

Description of MOS (From AR 611-201)	Skill/Activity That May be Further Developed
Prepares simple demolitions	Construction and demolition
Breaches and sketches minefield	Security
Prepares rough maps, field sketches, and overlays	Communication
Reads compass	Land navigation
Locates position on maps and aerial photographs	Land navigation
Lays field wire	Communication
Operates radiotelephone and field telephone equipment	Communication
Employs radiotelephone security measures	Communication, security
Performs preventive maintenance and assists in organizational maintenance of weapons and equipment	Mechanical, automotive and electrical/electronic maintenance
Protects self, weapons and equipment from chemical or other contamination	Environmental and health security
Assists in operation of ammunition supply point	Distribution of goods
Carries and prepares ammunition for use	Munitions handling
Administers first-aid	Emergency medical care
Applies field sanitation methods	Public health

Each of the Skill/Activity categories can then be related to several military and civilian sector occupations that are specializations of that category. Construction and demolition, for example, could be related to the various Army Combat Engineer MOSs and to various civilian sector occupations embraced by the construction field. Once these linkages have been made, the methodology followed during Phase II can be employed to describe the relationships between civilian employment requirements and the training/work experience of military personnel. In this manner, the combat arms occupations can be brought within the scope of the career development view of military work. As with the other occupations, the combat occupation can be examined to show the opportunities that servicepersons can pursue by building on their military training and experience. This examination can also show any training deficiencies that servicepersons need to overcome to increase their employability in specific fields.

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