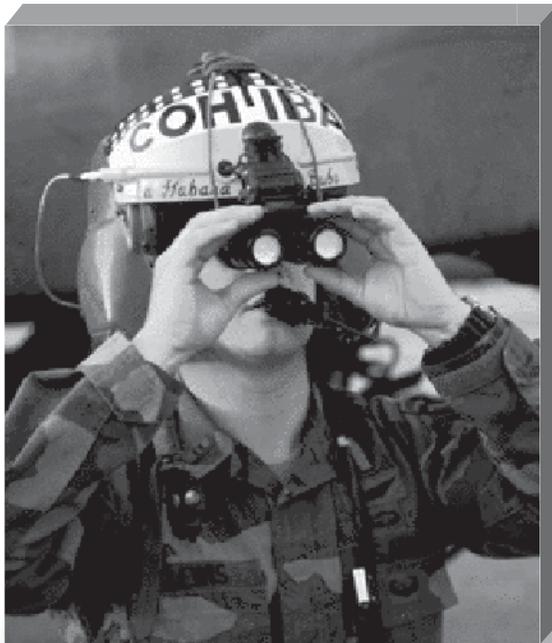
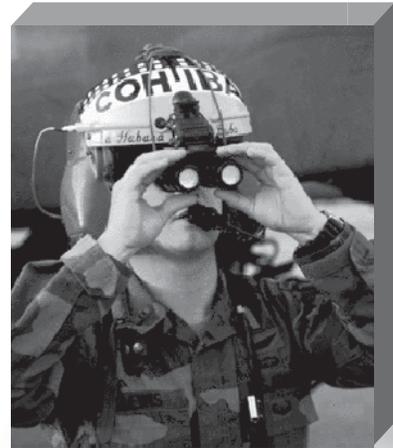


A
CBO
P A P E R

FEBRUARY 2002

**The Warrant
Officer Ranks:
Adding Flexibility
to Military
Personnel
Management**



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Personnel Management

The Congress of the United States
Congressional Budget Office

NOTES

Numbers in the text and tables may not add up to totals because of rounding.

All years referred to in this paper are fiscal years unless otherwise indicated.

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PREFACE

Recently, some policymakers and analysts have suggested that the Department of Defense might consider making greater use of the warrant officer ranks as a tool for attracting and retaining high-quality, skilled individuals, particularly in occupations with attractive civilian alternatives. Warrant officers, who account for only about 1.1 percent of active-duty military personnel, currently serve as senior technical experts and managers in a wide variety of occupational specialties and, in the Army, as pilots of helicopters and fixed-wing aircraft. In rank, they fall between enlisted personnel and commissioned officers (second lieutenant or ensign through general or admiral). Because the number of warrant officers is small, few people outside the individual services' communities of warrant officers know very much about their roles and management. That lack of knowledge hampers any discussion of possible new roles for warrant officers.

This Congressional Budget Office (CBO) paper describes current management practices for warrant officers and for a related group, called limited duty officers, in the Navy and the Marine Corps. It also examines the potential for increasing the number of warrant officers as a way to attract well-qualified individuals to serve in technical occupations, retain personnel in whom the services have invested substantial training resources, and retain exceptional performers regardless of occupation. The paper was prepared at the request of the Subcommittee on Personnel of the Senate Committee on Armed Services. In keeping with CBO's mandate to provide objective and nonpartisan analysis, the paper contains no recommendations.

Richard L. Fernandez of CBO's National Security Division prepared this paper under the general supervision of Deborah Clay-Mendez and Christopher Jehn. The author wishes to thank CBO colleagues Dawn Regan, Mark Musell, David Moore, and Barbara Edwards for their thoughtful comments on an earlier draft of the paper. Christine Bogusz edited the manuscript, Leah Mazade proofread it, and Cindy Cleveland prepared it for publication. Kathryn Winstead produced the cover, Lenny Skutnik produced the printed copies, and Annette Kalicki prepared the electronic versions for CBO's Web site (www.cbo.gov).



Dan L. Crippen
Director

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CHAPTER I

INTRODUCTION AND SUMMARY

Warrant officers are undoubtedly the least studied and least understood of the three main groups of military personnel. That status reflects their small numbers; at the end of 1999, only about 15,100 warrant officers were serving on active duty in the Army, Navy, and Marine Corps (none serve in the Air Force). In contrast, more than 1.1 million enlisted personnel—the group from which warrant officers are drawn—and 200,000 commissioned officers were serving.¹ Although probably best known for their role as helicopter pilots in the Army, warrant officers serve in virtually every military occupational area; most warrant officers, even in the Army, are not pilots.

Recently, some policymakers and analysts have suggested that the Department of Defense (DoD) might consider making greater use of the warrant officer ranks as a tool for attracting and retaining high-quality, skilled individuals, particularly in occupations with attractive civilian alternatives. Offering both higher pay and greater status than enlisted service, the warrant ranks might provide a more competitive career path for potential recruits who aspire to more than just a high school education, for experienced service members with skills that are valuable to the military, and for very capable people whose superior abilities may not be adequately recognized in the enlisted ranks. Like enlistment and reenlistment bonuses, expanded opportunities for warrant officers could be focused on specific occupational areas, an important advantage over a general pay raise whose effects, and costs, are across the board. Expanded use of warrant officers might also be considered as an alternative to raising the pay of midcareer and senior enlisted personnel, which some analysts argue is needed to bring the pay of those personnel into line with the pay of similarly educated workers in the private sector. For the cost of a 5 percent raise for personnel in the top four enlisted pay grades, roughly one in five of their positions could be converted into positions for warrant officers.² On average, warrant officers

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1. Throughout this paper, the term "commissioned" is reserved for officers in the grade of O-1 (second lieutenant or Navy ensign) and above. In fact, however, all warrant officers except those in the lowest grade also receive commissions; only appointments in the grade of W-1 are made by "warrant" by the secretary of the service concerned. See section 571, title 10 of the U.S. Code.
 2. Assuming the 5 percent pay raise for grades E-6 and above was effective on January 1, 2002, it would add about \$590 million to defense costs in 2002 and \$820 million in 2003, the first full fiscal year under the higher pay rates. Those figures reflect the personnel strength numbers reported in Department of Defense, *Selected Military Compensation Tables, 1 January 2001*.

The estimate for the number of enlisted positions that could be converted to positions for warrant officers was derived by comparing average rates of compensation for personnel in grades E-6 through E-9 with rates for personnel in grades W-1 through W-5, excluding Army aviators. Thus, the estimate

(excluding the Army's aviators) receive 30 percent more in basic pay than personnel in the top four enlisted pay grades receive.³

This paper provides information that policymakers need in considering alternative personnel structures that would make greater use of the warrant officer ranks. It describes the current policies and procedures governing warrant officers—how they fit into the personnel structure, where they come from, how they are managed, and who becomes one—as well as management practices for a closely related group in the Navy and the Marine Corps called limited duty officers (LDOs). Although some of that information is available in various published sources, most of the data presented here derive from the Congressional Budget Office's (CBO's) analysis of the career paths of individual service members and are not readily available elsewhere.

The paper finds that current law permits considerable flexibility in the management of warrant officers, flexibility that has allowed the services to use the warrant officer system in markedly different ways. It concludes both that warrant officer programs designed to alleviate problems with personnel quality or experience in the enlisted ranks are feasible within current law and that those programs could be based on management practices already in use by one or more of the services.

Although the paper does not attempt to compare the costs and benefits of an expanded warrant officer system with those of alternative approaches to improving recruiting and retention, it does identify some of the questions that such an analysis would have to address. Among those questions are what value people place on current compensation in comparison with deferred compensation and what value potential warrant officers place on the status of warrant service in comparison with enlisted service. Because those questions are difficult to answer with existing data, the services might decide to test the concept of an expanded warrant officer system in some small occupational area.

reflects a steady state rather than the transition period in which the new warrant officers would be in the lower pay grades. The elements of compensation were basic pay, the allowances for food and housing, the employer's share of Social Security taxes, and the amount that the Department of Defense sets aside to fund the future retirement benefits of current military personnel. The pay rates were those in effect on July 1, 2001.

3. The actual raise in basic pay that enlisted personnel receive when they become warrant officers is less than 30 percent because that figure reflects an average for all enlisted personnel in grades E-6 and above, including many who do not advance beyond pay grade E-6 and so would be unlikely to qualify for warrant service under current policies.

The paper's discussion assumes the reader has a general understanding of management practices for enlisted personnel and commissioned officers. For readers with little knowledge of those management practices, Appendix A provides an overview.

WHY IS THERE INTEREST IN WARRANT OFFICERS?

Reports of problems in recruiting and retention during the late 1990s spurred a search for new approaches to meeting the services' personnel needs, but the specific idea of expanding opportunities for warrant officers can be traced more to concerns about the long-term needs of the military. (Indeed, in 2000, all of the services met their recruiting goals, and although both the Air Force and the Navy fell short of their goals for retention, the latter service reported sharp improvement.) For example, a 1999 study by RAND, a California-based think tank, documented the growing tendency for high school graduates to proceed directly to college and discussed a rising gap between the earnings of workers with only a high school education and those with some college training or a college degree.⁴ The study suggested the possibility of attracting graduates of two- or four-year college programs into the military but questioned whether enlisted rates of pay would be adequate inducement.

Among the more prominent advocates of an expanded role for warrant officers is Bernard Rostker, who served as Undersecretary of the Army and Undersecretary of Defense for Personnel and Readiness. In late 2000, for example, Rostker cited a growing need for computer-network administrators to support the "digitized" forces of the future in calling for opening the warrant ranks to more high-tech specialists. "Today, we train them and they leave us at \$30,000 [a year in pay]," he said to reporters. "Then they show up the next day working for the contractor at \$60,000."⁵

In addition to providing a possible solution to specific recruitment or retention problems, expanded use of the warrant ranks could simply be a better way to manage the personnel of a modern military. Under the enlisted personnel structure, the services have only limited flexibility to pay people according to their occupations and even less flexibility to manage careers in ways that are consistent with the training and experience requirements of different jobs. Many studies, including one completed as part of the review of DoD programs ordered by Secretary

4. Beth J. Asch, M. Rebecca Kilburn, and Jacob A. Klerman, *Attracting College-Bound Youth into the Military: Toward the Development of New Recruiting Policy Options*, MR-984-OSD (Santa Monica, Calif.: RAND, 1999).

5. Quoted in Vince Crawley, "Big Changes on the Way for Career Enlisted Pay?" *Navy Times* (January 8, 2001), p. 9.

of Defense Donald Rumsfeld, have criticized that one-size-fits-all approach to military personnel management.⁶ Redefining the roles of warrant officers, and increasing their numbers, could be one of the less radical ways to introduce greater flexibility into the personnel management system.

Although this paper focuses on the relationship between the careers of enlisted personnel and warrant officers, DoD might also consider whether the warrant officer career path, and the closely related career path of limited duty officers, would be a cost-effective alternative for positions that are now being filled by conventional commissioned officers. Both warrant officers and LDOs tend to have long careers—in some cases exceeding 30 years of total service—in which they gain expertise in particular fields. In contrast, typical career paths for commissioned officers move them quickly through a variety of assignments to prepare some fraction of them for senior leadership positions.

AN OVERVIEW OF WARRANT OFFICER AND LDO PROGRAMS

The services view warrant officers, apart from the Army's warrant officer aviators, as senior technical experts and managers. Warrant officers serve repeatedly in similar positions, without the succession of broadening assignments typical of the careers of commissioned officers. In comparison with commissioned officers, they are heavily concentrated in engineering and maintenance occupations and, in some of the services, in intelligence and administrative positions.

The system for managing warrant officers is so flexible that several different management models coexist within the services (see Table 1). The Army manages its warrant officer aviators under an early-select model, choosing most aviators from among enlisted personnel in their first or second enlistment terms and the rest directly from civilian life. Although promotions are slow for that group, their early selection places their pay squarely between that of enlisted personnel and commissioned officers of the same age, and the program attracts some of the best people in the junior enlisted ranks.

Both the Army and the Marine Corps manage their technician warrant officers under a midcareer model.⁷ They select enlisted personnel with moderate experience

6. Admiral David Jeremiah, U.S. Navy (Retired), "Special DoD News Briefing on Morale and Quality of Life" (Department of Defense, June 13, 2001). For an example of a study recommending different career lengths in different occupational areas, see Robert L. Goldich, *Military Retirement and Personnel Management: Should Active Duty Military Careers Be Lengthened?* CRS Report for Congress 95-1118 F (Congressional Research Service, November 14, 1995).

7. Following the services' practice, this paper uses the term "technician" to refer to all warrant officers other than aviators and a small group in the Marine Corps called infantry weapons officers.

in an enlisted occupation that is relevant to their future duties as warrant officers, give them additional technical training, and then promote them more rapidly than under the early-select model. Midcareer selection offers more modest financial rewards than early selection does, however, particularly for people who would have advanced rapidly through the enlisted ranks.

The Navy selects its warrant officers from among enlisted personnel late in their careers and generally does not give them additional training before they assume their new duties. Most of those selected are in grade E-7 (chief petty officer); the rest have advanced even farther. Although the Navy bypasses the lowest warrant officer pay grade, appointing most selectees in grade W-2, a late-career transfer to the warrant ranks yields only a small initial pay advantage over enlisted service for

TABLE 1. EXISTING MODELS OF WARRANT OFFICER MANAGEMENT

	Army Aviator	Army Technician	Marine Corps Technician	Navy Technician
Selection Point	Early career (0-8 years of service)	Midcareer (9-12 years of service) ^a	Midcareer (10-15 years of service)	Late career (14-20 years of service)
Enlisted Specialty	Any	Limited, based on warrant specialty (many excluded)	Limited, based on warrant specialty	Limited, based on warrant specialty
"Quality" of Selectees Compared with Enlisted Peers	Well above average	Above average	Above average	Average
Pay Advantage over Enlisted Peers	Large	Modest	Modest	Small
Speed of Promotion	Slow	Moderate	Moderate to rapid	Rapid

SOURCE: Congressional Budget Office.

a. The years shown were typical in 1998 and 1999. Current Army policy calls for selecting as technician warrant officers personnel with four to six years of experience in their enlisted occupation.

someone with good prospects for promotion. The Navy's LDO program, which selects enlisted personnel somewhat earlier and places them in the ranks of commissioned officers—most begin as an ensign (O-1)—offers much faster pay growth and appears to attract more-capable people.

A person's chances of becoming a warrant officer or limited duty officer depend on his or her service and occupational specialty. Overall chances are greatest in the Marine Corps and smallest in the Army (excluding aviators). The Army also limits opportunities most severely by occupational specialty; nearly half of Army personnel in grade E-6 (the most common grade among people selected for warrant service) work in specialties that do not directly feed into any warrant officer specialty. By contrast, only about 7 percent of Navy personnel have no direct route to warrant officer or LDO service.

The legislation governing the warrant officer system gives the services considerable flexibility in how they manage personnel. That flexibility and the diversity of management models in use suggest that if the services chose to expand their warrant officer ranks to help meet goals in enlisted recruiting and retention, they would not have to explore uncharted territory. The early-select model that the Army uses in managing its aviators, for example, could be adapted to aid recruiting in highly technical occupations. A service could offer immediate warrant status to some recruits who had obtained valuable technical training in civilian institutions and select others after they had demonstrated their competence in service schooling and completed an initial enlisted apprenticeship. The midcareer model could be used in a program designed to improve retention, either in selected occupations requiring lengthy training and offering high pay in the private sector or among top performers in various occupations.

If the services were to expand their warrant officer systems to help meet recruiting and retention goals, they would probably find that some adjustments were desirable. Management adaptations would naturally depend on which goal was being addressed but might include allowing top performers to advance much more rapidly than people with average skills or providing for more rapid advancement in some occupations than in others. If a greater role for warrant officers was found to be cost-effective, legislative changes might be pursued to create a new warrant officer pay grade above the existing grades, ease the rules governing mandatory separation of warrant officers, and possibly increase pay for warrant officers generally.

CHAPTER II

THE ROLES AND OCCUPATIONS OF WARRANT OFFICERS

AND LIMITED DUTY OFFICERS

Warrant officers and limited duty officers make up only about 1.4 percent of active-duty personnel (see Table 2). Even in the Army, the service with the heaviest concentration of warrant officers, technician warrant officers account for only about 1.3 percent of personnel; another 1.1 percent are aviators. The Navy has the longest tradition of warrant officer service, yet barely 0.5 percent of Navy personnel are warrant officers. Limited duty officers, however, account for another 1.0 percent of Navy personnel.¹

This chapter looks at what the small number of warrant officers and limited duty officers do in the services that employ them. In general, the services view personnel in both groups as senior technical experts, although Army warrant officer aviators do not appear to fit that definition well. Excluding those aviators, warrant officers tend to be concentrated in engineering and maintenance specialties, particularly in the Navy.

ROLES

The three services that employ warrant officers define their roles in essentially identical terms (see Box 1). Warrant officers are technical specialists serving in positions that require the authority of an officer. Their assignments are repetitive in nature rather than offering the broadening experiences required as preparation for higher command. Except for Army aviators and a few others, warrant officers' jobs are closely related to the occupational specialties they held as enlisted personnel; each warrant specialty is "fed" by a limited number of enlisted specialties. Compared with the occupational specialties of commissioned officers, those of warrant officers are more narrowly defined (and more numerous).

Limited duty officers in the Navy and the Marine Corps fill roles that, to an outsider, can seem strikingly similar to those of warrant officers. The differences in the formal definitions of warrant officers and LDOs are subtle, focusing on the degree of authority and responsibility as well as the breadth of expertise required (see Box 1). The occupational specialties of warrant officers and LDOs show considerable overlap; almost every Navy warrant officer specialty has a corresponding LDO

1. This paper does not examine the Coast Guard, which is under the jurisdiction of the Department of Transportation. About 4.1 percent of Coast Guard personnel are warrant officers.

specialty and vice versa, and most Marine Corps LDO specialties can also be held by warrant officers. Marine Corps LDOs must first serve as warrant officers, but the Navy—although it accepts warrant officer applicants—draws most of its limited duty officers directly from the enlisted ranks.

When the Navy reexamined its senior noncommissioned officer (NCO), warrant officer, and LDO programs in 1990, it produced what is probably the clearest statement of the differences among the groups (see Box 2). (Depending on the service, the term “noncommissioned officer” can refer to personnel in grades E-4 and above or E-5 and above.) The Navy's statement emphasizes the supervisory, leadership, and training roles of senior NCOs within an enlisted rating (occupational specialty). At the highest grade, the NCO's role may extend to matters stretching across “the full Navy rating spectrum.” The warrant officer is a technical leader and

TABLE 2. DISTRIBUTION OF ACTIVE-DUTY PERSONNEL BY GROUP AND SERVICE, FISCAL YEAR 1999

Service	Enlisted	Commissioned Officer	Warrant Officer	Total	Limited Duty Officer ^a
Number					
Army	396,155	66,104	11,491	473,750	*
Navy	314,286	52,136	1,757	368,179	3,687
Marine Corps	154,830	16,055	1,839	172,724	438
Air Force	<u>286,170</u>	<u>70,321</u>	<u>0</u>	<u>356,491</u>	<u>*</u>
All Services	1,151,441	204,616	15,087	1,371,144	4,125
Percentage of Total					
Army	83.6	14.0	2.4	100.0	*
Navy	85.4	14.2	0.5	100.0	1.0
Marine Corps	89.6	9.3	1.1	100.0	0.3
Air Force	80.3	19.7	0	100.0	*
All Services	84.0	14.9	1.1	100.0	0.3

SOURCE: Congressional Budget Office from data supplied by the Defense Manpower Data Center.

NOTE: * = not applicable.

a. Limited duty officers are included under commissioned officers. Numbers of LDOs reflect commissioned officers with a primary designator (Navy) or military occupational specialty (Marine Corps) that is assigned to LDOs.

BOX 1.
THE SERVICES' DEFINITIONS OF WARRANT
OFFICERS AND LIMITED DUTY OFFICERS

Warrant Officer

Army. "An officer appointed by warrant by the Secretary of the Army, based on a sound level of technical and tactical competence. The Warrant Officer is a highly specialized expert and trainer who, by gaining progressive levels of expertise and leadership, operates, maintains, administers, and manages the Army's equipment, support activities, or technical systems for an entire career." (Department of the Army, *Warrant Officer Professional Development*, Pamphlet 600-11, December 30, 1996, p. 3)

Navy. "The CWO [chief warrant officer¹] Program provides technically oriented commissioned officers to perform duties requiring technical competence in specific enlisted occupational fields and the authority and responsibility greater than that required of chief petty officers." (Department of the Navy, Secretary of the Navy Instruction 1130.3C, July 30, 1992)

Marine Corps. "[A] technical specialist who performs duties that require extensive knowledge, training, and experience with systems or equipment which are beyond the duties of staff non-commissioned and unrestricted officers." (United States Marine Corps, "USMC Restricted Officer Program," briefing for the Congressional Budget Office by Major Michael R. Pfister, September 25, 2000)

Limited Duty Officer

Navy. "The LDO Program provides technically oriented commissioned officers to perform duties requiring the authority, responsibility and managerial skills of commissioned officers, but limited to broad enlisted occupational fields outside the normal development pattern of the unrestricted line, the restricted line or staff corps competitive categories." (Department of the Navy, Secretary of the Navy Instruction 1130.3C, July 30, 1992)

Marine Corps. "Technical specialist who performs duties that require extensive knowledge, training, and experience with systems or equipment which are beyond the duties of a warrant officer and senior unrestricted officer." (United States Marine Corps, "USMC Restricted Officer Program," briefing for the Congressional Budget Office by Major Michael R. Pfister, September 25, 2000)

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1. All three services refer to warrant officers in pay grade W-2 and above as chief warrant officers. The Navy does not use pay grade W-1 and so refers to its chief warrant officer (CWO) program.

BOX 2.
THE NAVY'S DESCRIPTION OF DIFFERENCES AMONG
ITS SENIOR NONCOMMISSIONED OFFICERS, WARRANT
OFFICERS, AND LIMITED DUTY OFFICERS

Senior Noncommissioned Officer

“E-7: Technical authority and expert within a rating. Directly leads, supervises, instructs and trains lower rated personnel.

“E-8: Senior technical supervisor within a rating or career field. Primarily responsible for leadership, supervision and training oriented to system and subsystem maintenance, repair and operation. If warranted by manning, could act in the role of MCPO [master chief petty officer—E-9] in terms of leadership, administrative and managerial responsibilities.

“E-9: Senior enlisted leader responsible for matters pertaining to leadership, administrative and managerial functions involving enlisted ratings. The MCPO is expected to contribute in matters of policy formulation as well as implementation within his/her occupational field or across the full Navy rating spectrum.”

Warrant Officer

“A technical leader and specialist who directs technical operations in a given occupational specialty and serves successive tours in that specialty. Remains the technical expert.”

Limited Duty Officer

“Technical leader filling leadership and management positions in a broad technical field requiring a background outside the normal pattern for unrestricted and restricted line officers. With seniority becomes more the ‘officer’ and less the ‘technician.’”

SOURCE: Navy Occupational Development and Analysis Center, *A Review of Navy E-7, E-8, E-9, Warrant, and Limited Duty Officer Occupational Classification Structures* (October 1990), p. 2.

specialist who “directs technical operations.” LDOs fill “leadership and management” positions and, as they reach the higher ranks, become “more the ‘officer’ and less the ‘technician.’” Army descriptions of occupational duties tend to convey distinctions similar to the Navy's, with senior NCOs as supervisors and warrant officers as technical managers.

Notwithstanding the Navy's seemingly clear distinctions, a telling indication of how subtle the difference is between a warrant officer and a senior noncommissioned officer comes from the services' differing responses to the introduction of the two most senior enlisted pay grades—E-8 and E-9—in 1958. The Air Force elected to discontinue its warrant officer program, recently noting that the decision

“cut out an additional management layer and a separate personnel management system, and created increased promotion opportunity for the senior enlisted.”² The Navy initially decided to eliminate warrant officers as well, and to expand its LDO program. Four years later, however, the Navy reinstated the warrant officer program, a decision that may have reflected, in part, the Navy's long tradition of warrant officer service, which dates from that service's earliest years. The Army had completed a review of its warrant officer program in 1957 and apparently did not consider eliminating that program in response to the introduction of the new pay grades.

The most obvious difference among senior enlisted personnel, warrant officers, LDOs, and commissioned officers other than LDOs lies in their pay. Although the pay scales overlap considerably, warrant officers' pay generally falls between that of senior noncommissioned officers and commissioned officers—usually closer to the former. Limited duty officers receive the same benefits as other commissioned officers, but because they previously served at least four years in the enlisted ranks, their basic pay through grade O-3 is somewhat higher than that of other officers in those grades. (The pay grades O-1E through O-3E apply to such personnel.) New warrant officers typically earn about 17 percent to 20 percent more in basic pay than they did as enlisted personnel, and new LDOs in the Navy—serving in the lowest officer grade (ensign)—earn another 2 to 7 percentage points more. Those raises, however, leave the pay of both groups about 40 percent below that of commissioned officers with the same amount of military service who entered directly from civilian life. (Chapter IV discusses warrant officer and LDO selection practices and pay profiles more fully.)

OCCUPATIONS

Warrant officers and limited duty officers are drawn most heavily from equipment repair specialties in the enlisted ranks; thus, in comparison with commissioned officers, they tend to be heavily concentrated in engineering and maintenance occupations (see Table 3). More than half of all warrant officers and LDOs, excluding the Army's aviators, are found in such occupations, whereas less than 20 percent of commissioned officers serve in engineering and maintenance specialties in any of the three services. The Marine Corps also relies heavily on warrant officers in administrative positions; its largest single warrant officer occupation is personnel officer. In the Army, intelligence is another area in which warrant officers are heavily represented. Notably underrepresented in the warrant officer ranks are tactical operations officers—ground, air, and naval arms—except, of course, for the

2. Air Force response to a Congressional Budget Office request for information provided by the Office of Budget & Appropriations Liaison on November 9, 2000.

TABLE 3. DISTRIBUTION OF WARRANT OFFICERS AND LIMITED DUTY OFFICERS AND OF COMMISSIONED OFFICERS IN PAY GRADE O-4, BY OFFICER OCCUPATIONAL CATEGORY, FISCAL YEAR 1999 (In percent)

	Army		Navy		Marine Corps		Three Services Combined	
	Warrant	Commissioned	Warrant and Limited Duty	Commissioned	Warrant and Limited Duty	Commissioned	Warrant and Limited Duty	Commissioned
Engineering and Maintenance Officers	45	11	69	17	42	10	54	13
Administrators	12	11	13	14	23	8	14	12
Supply, Procurement, and Allied Officers	18	15	4	7	16	16	12	12
Intelligence Officers	17	8	5	6	5	5	10	7
Tactical Operations Officers	7	39	8	40	11	53	8	41
Scientists and Professionals	1	17	1	11	2	7	1	13
General Officers and Executives, N.E.C.	0	0	0	4	0	0	0	2

SOURCE: Congressional Budget Office from data supplied by the Defense Manpower Data Center.

NOTES: N.E.C. = not elsewhere classified.

Figures for commissioned officers reflect duty occupations for officers in pay grade O-4 (major or lieutenant commander) excluding limited duty officers; figures for warrant officers reflect primary occupations for all warrant pay grades. Totals exclude nonoccupational personnel (principally students), personnel whose occupation is unknown, health care officers, and Army warrant officer aviators.

Army's aviators. That underrepresentation is consistent with the role of technical expert that all three services define for warrant officers.

The enlisted occupational specialties that contribute disproportionate numbers of personnel to the technician warrant officer ranks are generally in the areas of electrical/mechanical equipment repair, electronic equipment repair, and, except in the Marine Corps, communications and intelligence (see Table 4).³ Personnel in the basic war-fighting specialties—infantry, gun crews, and seamanship—generally do not qualify directly for warrant officer or LDO service. The Army draws a few warrant officers from among personnel in health care specialties, but the eligible specialties are medical equipment repairer and veterinary food inspection specialist.

3. Direct comparisons of enlisted and officer (including warrant officer) occupations are not possible because the Department of Defense groups those occupations differently. The comparisons here group the occupations of warrant officers and limited duty officers according to the occupational categories of the enlisted specialties that feed into them.

TABLE 4. DISTRIBUTION OF WARRANT OFFICERS AND LIMITED DUTY OFFICERS AND OF ENLISTED PERSONNEL IN GRADES E-6 AND ABOVE, BY ENLISTED OCCUPATIONAL CATEGORY, FISCAL YEAR 1999 (In percent)

	Army ^a		Navy	
	Warrant Officers	Enlisted	Warrant Officers and Limited Duty Officers	Enlisted
Electrical/Mechanical Equipment Repairers	27	12	36	26
Functional Support and Administration	20	20	12	16
Electronic Equipment Repairers	8	6	24	17
Communications and Intelligence Specialists	16	11	17	11
Infantry, Gun Crews, and Seamanship Specialists	13	28	4	9
Service and Supply Handlers	10	10	4	5
Other Technical and Allied Specialists	2	5	1	4
Craftsworkers	1	1	2	7
Health Care Specialists	3	8	0	6

(Continued)

TABLE 4. CONTINUED

	Marine Corps		Three Services Combined	
	Warrant Officers and Limited Duty Officers	Enlisted	Warrant Officers and Limited Duty Officers	Enlisted
Electrical/Mechanical Equipment Repairers	23	19	30	18
Functional Support and Administration	32	27	19	19
Electronic Equipment Repairers	16	9	16	10
Communications and Intelligence Specialists	6	11	15	11
Infantry, Gun Crews, and Seamanship Specialists	5	17	8	19
Service and Supply Handlers	10	12	7	8
Other Technical and Allied Specialists	6	4	2	4
Craftworkers	3	2	2	4
Health Care Specialists	0	0	1	6

SOURCE: Congressional Budget Office from data supplied by the Defense Manpower Data Center.

NOTE: Warrant officers and LDOs are distributed on the basis of the occupational groups of the enlisted specialties that feed into each warrant officer specialty.

a. Army figures exclude aviators.

CHAPTER III

MANAGEMENT OF WARRANT OFFICERS

AND LIMITED DUTY OFFICERS

The services face few restrictions on how they manage their warrant officers, a fact reflected in management practices that differ substantially. The Warrant Officer Management Act, which was passed as part of the National Defense Authorization Act for Fiscal Years 1992 and 1993, established only two main constraints. First, in creating the new pay grade of W-5, the act required each service to place no more than 5 percent of its warrant officers in that grade. At present, that constraint is not binding; the Navy does not use the grade at all, and only the Marine Corps comes close to the limit (see Table 5). Second, the act established uniform procedures for the operation of warrant officer promotion boards and required the separation of warrant officers who were twice passed over for promotion to the next grade. Both of those constraints mirror procedures that apply to commissioned officers.¹

Limited duty officers are distinguished in law from other commissioned officers in three significant respects. First, LDOs are authorized only in the Navy and the Marine Corps. Second, initial appointments as LDOs can only be made from among warrant officers or (in the Navy) enlisted personnel in grades E-6 through E-8.² Third, personnel must have completed at least 10 years of active service in the Navy or the Marine Corps before being appointed as LDOs. The services establish two further distinctions: LDOs occupy separate sets of occupational specialties, and they need not have a college degree.

MANAGEMENT MODELS

Although five distinct groups of warrant officers exist—aviators and technicians in the Army, technicians and infantry weapons officers in the Marine Corps, and technicians in the Navy—under current practices the five groups fall into one of three general management models: early select, midcareer select, and late-career select. Those models are distinguished primarily by the point in their careers at which enlisted personnel are selected for warrant service; other aspects of management flow from the selection timings.

-
1. The services may convene boards to selectively "continue"—that is, allow to remain on active duty—commissioned and warrant officers who have been twice passed over for promotion.
 2. The Marine Corps may appoint enlisted personnel as LDOs, but it does not do so.

- o *Early select.* The Army selects most of its warrant officer aviators—primarily helicopter pilots but some fixed-wing pilots as well—from among enlisted personnel in their first or second term of enlistment. The remainder enter directly from civilian life; in recent years, those direct accessions have accounted for about one-quarter of new pilots. As noted earlier, aviator selectees can come from any enlisted occupation, although the Army prefers individuals with civilian flying experience. The Army promotes aviators more slowly than its technician warrant officers, and fewer of them complete the 20 or more years of service needed to qualify for military retirement benefits.
- o *Midcareer select.* The Army and the Marine Corps choose their technician warrant officers primarily from among personnel in grade E-6 (staff sergeant). Most have completed 10 to 15 years of service when they are selected, and they must have served in one of a limited number of enlisted feeder specialties established for each warrant

TABLE 5. DISTRIBUTION OF WARRANT OFFICERS AND LIMITED DUTY OFFICERS BY PAY GRADE WITHIN EACH SERVICE, FISCAL YEAR 1999 (In percent)

Pay Grade	Army	Navy	Marine Corps
Warrant Officers			
W-1	16.7	0	13.1
W-2	42.1	43.8	42.9
W-3	25.5	29.5	26.0
W-4	12.7	26.7	13.3
W-5	3.0	0	4.7
Limited Duty Officers			
O-1E	*	18.2	0
O-2E	*	13.1	0
O-3E	*	44.6	49.5
O-4	*	18.3	38.6
O-5	*	5.2	11.9
O-6	*	0.7	0

SOURCE: Congressional Budget Office from data supplied by the Defense Manpower Data Center.

NOTE: * = not applicable.

officer specialty. The selectees generally receive formal training in their warrant officer specialty. Most complete 20 years of service, after which they leave the military at rates similar to those of commissioned officers.

- o *Late-career select.* The Navy selects personnel for warrant service late in their enlisted careers, requiring them to reach the grade of E-7 (chief petty officer) before they become warrant officers. The Marine Corps does the same for its 40 or so marine gunners (formally, infantry weapons officers), the smallest group of warrant officers. New marine gunners attend a training course; most Navy warrant officers do not. Both groups begin their warrant service in grade W-2 and generally receive the fastest promotions. The groups selected late tend to have longer careers—including their enlisted service—than the other groups of warrant officers.

The Army recently announced plans to select its technician warrant officers earlier, when they have completed five to eight years of service. If implemented, that plan would create a fourth model of warrant officer management—an *early-career select* model. It would differ from the early-select model used for Army aviators in that it would not allow direct accessions from civilian life and would require that applicants first achieve basic qualification in their enlisted specialty. Presumably, the model might be expected to yield longer average careers for warrant officers, particularly in light of the Army's policy of imposing six-year service commitments on its new warrant officers. Apparently, however, some of the organizations within the Army that are responsible for setting personnel requirements in career fields and individual specialties consider second-term personnel to be unprepared for service as warrant officers.

Two models describe the management of limited duty officers in the Navy and the Marine Corps. As noted earlier, the Marine Corps requires prospective LDOs to first serve as warrant officers, whereas the Navy draws most of its LDOs directly from the enlisted ranks. Those LDOs who move up from the enlisted ranks begin their LDO service in grade O-1E (ensign). Marine Corps LDOs, most of whom are in grade W-3 when they move up, start in grade O-3E (captain); Navy regulations call for appointing LDOs who advance from the warrant ranks to grade O-2E (lieutenant junior grade).

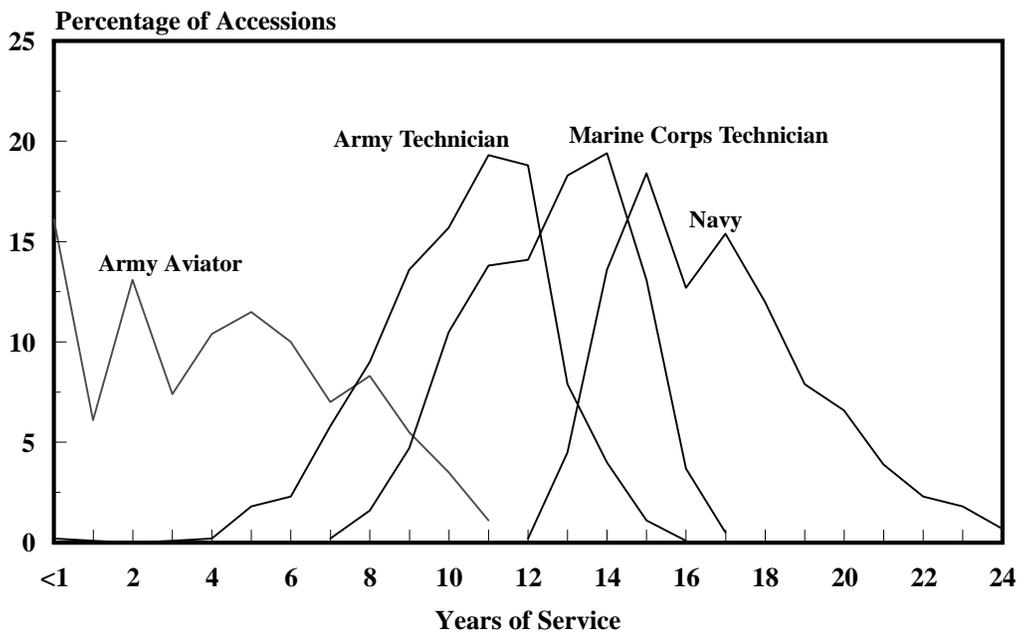
ACCESSION

The three basic models of warrant officer management are evident in the distribution of accessions by the year of service that individuals had completed when they became warrant officers (see Figure 1). More than half of new Army aviators in 1998 and

1999 had completed fewer than four years of service when they achieved the rank of warrant officer; only about 10 percent had completed more than eight years of service. In sharp contrast, almost all new Navy warrant officers had completed at least 14 years of service, and 15 percent had completed at least 20 years of service and were eligible to retire. The Army's and the Marine Corps' technician warrant officers fell between those two groups, with most having completed roughly 10 to 14 years of service at accession.

The services' formal rules governing warrant officer appointments underlie most of the differences among groups that appear in Figure 1. Potential Army aviators must be under 29 years of age to be selected, and, as noted earlier, some apply before they enter the Army. In the Marine Corps, technician applicants must have completed at least eight years of service; the Army requires a minimum of four to six years' experience in the occupational field for which the person is applying.

FIGURE 1. DISTRIBUTION OF WARRANT OFFICER ACCESSIONS BY YEARS OF SERVICE AT ACCESSION, FISCAL YEARS 1998-1999



SOURCE: Congressional Budget Office from data supplied by the Defense Manpower Data Center.

NOTES: Army data exclude approximately 13 percent of accessions for which an occupational specialty could not be identified. Most probably represent personnel in training as aviators.

Data for the marine gunner group are not shown because there were too few accessions to provide a meaningful distribution.

The Navy requires warrant officer applicants to have completed between 12 and 24 years of service.

The three management models are also apparent in the enlisted pay grades that new warrant officers last held (see Table 6). Roughly 20 percent of Army

TABLE 6. DISTRIBUTION OF WARRANT OFFICER AND LIMITED DUTY OFFICER ACCESSIONS BY LAST PAY GRADE, FISCAL YEARS 1998-1999 (In percent)

Last Pay Grade	Warrant Officers				Limited Duty Officers	
	Army Aviator	Army Technician ^b	Marine Corps Technician ^b	Navy ^c	Navy ^d	Marine Corps ^e
None ^a	20.0	*	*	*	*	*
E-1	0.6	*	*	*	*	*
E-2	0.4	*	*	*	*	*
E-3	4.3	*	*	*	*	*
E-4	22.0	*	*	*	*	*
E-5	37.2	13.3	3.7	*	*	*
E-6	15.5	68.6	75.6	0.2	13.4	*
E-7	0.2	18.1	20.6	70.1	65.7	*
E-8	0	0	0	24.3	7.7	*
E-9	0	0	0	5.4	0	*
W-2	*	*	*	*	2.2	6.7
W-3	*	*	*	*	9.8	92.0
W-4	*	*	*	*	1.2	1.3

SOURCE: Congressional Budget Office from data supplied by the Defense Manpower Data Center.

NOTES: * = not applicable.

Army data exclude approximately 13 percent of accessions for which an occupational specialty could not be identified. Most probably represent personnel in training as aviators. Last pay grade refers to the grade that individuals held at the beginning of the fiscal year in which they were appointed as warrant officers or LDOs.

Data for the marine gunner group are not shown because there were too few accessions to provide a meaningful distribution.

- a. Indicates personnel who were not on active duty at the beginning of the year.
- b. The minimum pay grade for selection is E-5.
- c. The minimum pay grade for selection is E-7, except that personnel in pay grade E-6 who have been selected for promotion to E-7 may apply.
- d. The minimum pay grade for selection is E-6.
- e. Only warrant officers are accepted as limited duty officers.

aviators were not on active duty at the beginning of the year in which they became warrant officers; almost all of the rest were in grades E-4 through E-6, the typical grades for Army enlisted personnel in their second enlistment term or at the end of their first. Technician warrant officers in the Army and the Marine Corps were all in grades E-5 through E-7 when they advanced, with the lowest of those grades more common for the Army. Finally, almost all Navy warrant officers last served in grades E-7 and E-8.

The Navy's and the Marine Corps' distinct approaches to management of limited duty officers are reflected in both the grade and year-of-service distribution of new LDOs. The Navy accepts enlisted personnel for LDO service beginning at grade E-6 (petty officer first class) and with as few as eight years of service completed.³ In 1998 and 1999, most successful applicants were in grade E-7, and only one in eight came from the warrant officer ranks. A typical LDO selectee had completed 14 years of enlisted service (see Figure 2). Marine Corps LDOs, who first serve as warrant officers, tended to be approaching retirement eligibility when they were selected. A typical Marine Corps LDO selectee in 1998 and 1999 was in grade W-3 and had completed 18 years of service.

The differing patterns of warrant officer management among the services appear to reflect differences in their views of what best prepares an individual to serve as a warrant officer. The Navy apparently feels that on-the-job training in the enlisted ranks is the only suitable preparation; it gives formal schoolhouse training to new warrant officers in only two of its roughly 30 warrant officer specialties. The Army and the Marine Corps, in contrast, combine earlier selection of technician warrant officers with extensive formal training of those officers in their occupations. In addition, they place new warrants in grade W-1 (warrant officer) rather than in W-2 (chief warrant officer) as the Navy does.⁴ As noted earlier, overall Army policy considers four to six years' work experience to be adequate preparation for technician warrant officers, although successful applicants tend to have considerably more. Finally, the early-select model of warrant officer management that the Army uses for its aviators is the most extreme example of the view that in-service experience is not important.

3. Personnel in grade E-6 must have met all of the requirements for promotion to E-7 except the minimum time in their rating (occupational specialty).

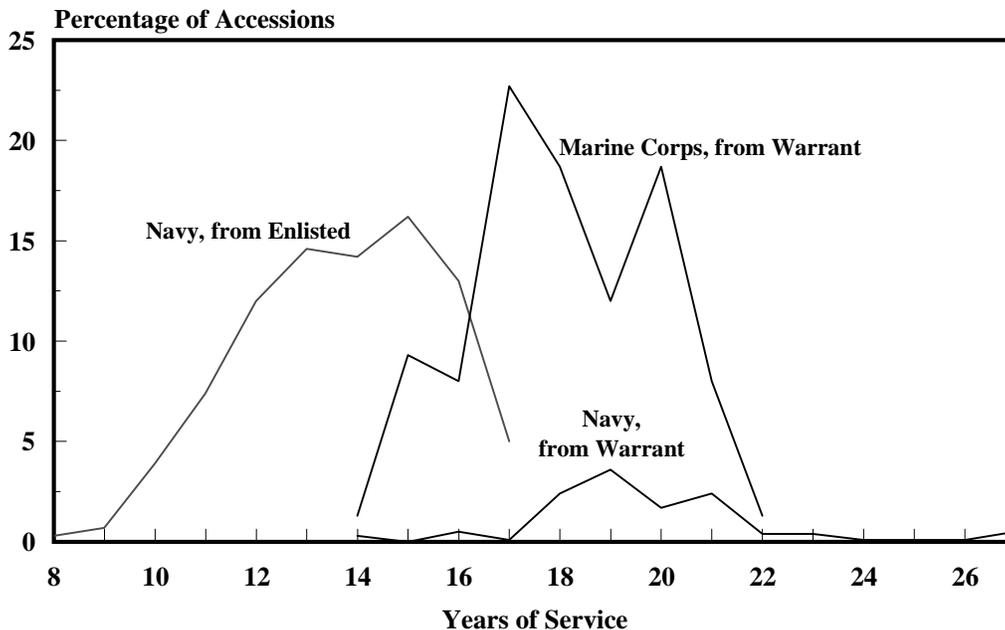
4. Navy personnel may be appointed in grade W-3 if they have served at least two years in grade E-9 (master chief petty officer).

PROMOTION

The services face few external constraints on how they manage warrant officer promotions. Perhaps as a result, the outcomes of the promotion process differ among the services in every major respect. Some of those differences appear to reflect the point in their careers at which enlisted personnel become warrant officers, but others do not.

Under the Warrant Officer Management Act, the services model their promotion practices for warrant officers on those for commissioned officers, as noted earlier. The services establish promotion zones defined by officers' time in their current pay grade to determine eligibility for promotion. Competitive categories—groups of occupational specialties—determine which officers compete together for available promotions. Promotion boards examine candidates' records and recommend promotions. Warrant officers who twice fail to be promoted to the next higher grade when considered by a promotion board must be separated unless they are selected for continuation by another board established for that purpose.

FIGURE 2. DISTRIBUTION OF LIMITED DUTY OFFICER ACCESSIONS BY YEARS OF SERVICE AT ACCESSION, FISCAL YEARS 1998-1999



SOURCE: Congressional Budget Office from data supplied by the Defense Manpower Data Center.

For purposes of promotion, the Navy and the Marine Corps treat limited duty officers like other commissioned officers, so this paper does not discuss the LDO promotion process in detail. One aspect of the process, however, is important for the comparison of pay levels that appears in Chapter IV. Navy LDOs who enter from the enlisted ranks, and thus begin at grade O-1E (ensign), can expect nearly automatic promotion to grades O-2E and O-3E at two-year intervals.

The flexibility in the promotion process for warrant officers allows the services to take different approaches to determining the timing of promotion and officers' chances for promotion. Although the Marine Corps attempts to give people in different occupational specialties an equal chance at promotion, it allows occupational vacancies to drive differences in the timing of promotions among occupations. The Navy, by contrast, promotes the best people without regard to occupational vacancies, and on a set schedule. The Army also promotes on set schedules—one schedule for aviators and another for technicians—and although it generally allows occupational vacancies to drive differences in promotion chances, it holds those differences within certain bounds.

The timing of warrant officer promotions in the three services generally reflects the timing of accessions. The Navy, selecting its warrant officers rather late in their military careers, promotes them fairly rapidly (see Table 7). Army aviators, some of whom begin their careers as warrant officers without first serving in the enlisted ranks, face the slowest rate of promotion. If the Army promoted its aviators as rapidly as the Navy did its warrant officers, most would reach their final pay grade before completing 20 years of total service (enlisted and warrant). Conversely, slower promotions for Navy warrant officers would give some of them only one promotion to look forward to before they completed 30 years.

The two groups selected under the midcareer model—Army and Marine Corps technicians—are not promoted at similar paces, as might be expected. Army policy recently changed from promoting technician warrant officers at six-year intervals after the first promotion to five-year intervals; the data for 1998 and 1999 show the effects of that transition. The Marine Corps, in contrast, promotes its technicians at closer to four-year intervals, with promotion to W-2 coming after only 18 months compared with 24 months for Army technicians. The Army's slower pace may reflect the longer careers that it apparently envisions for warrant officers. As noted above, it would like to select its technician warrant officers even earlier than it currently does. In addition, the Army takes advantage of a provision in federal law that allows Army personnel in grade W-5 to remain in the service until they complete 30 years of warrant service—other warrant officers must generally retire when they complete 30 years of total service.

Warrant officers' chances for promotion through at least grade W-3 are fairly high, particularly in the Navy and the Marine Corps. As mentioned earlier, promotion to W-2 in the Army and the Marine Corps is virtually automatic, with promotion

TABLE 7. MEDIAN MONTHS IN PAY GRADE AT PROMOTION AND IMPLIED YEARS OF WARRANT OFFICER SERVICE, FISCAL YEAR 1999

Service/Group	Pay Grade			
	W-2	W-3	W-4	W-5
Median Months in Pay Grade at Promotion				
Army				
Aviator	24	73	71	70
Technician ^a	24	68 ^b	70	66
Navy	*	48	48	*
Marine Corps				
Marine gunner ^c	*	46	36	38
Technician	18	40 ^b	50 ^b	45 ^b
Implied Years of Warrant Officer Service at Promotion				
Army				
Aviator	2.0	8.1	14.0	19.8
Technician	2.0	7.7	13.5	19.0
Navy	*	4.0	8.0	*
Marine Corps				
Marine gunner	*	3.8	6.8	10.0
Technician	1.5	4.8	9.0	12.8

SOURCE: Congressional Budget Office from data supplied by the Defense Manpower Data Center.

NOTE: * = not applicable.

- a. During 1999, the timing of promotions for Army technicians was in transition from the old pattern of six years in grade (after W-2) to the new pattern of five years in grade.
- b. Substantial variation among personnel promoted.
- c. Figures for marine gunners are based on very few observations.

rates—measured by a statistic called promotion opportunity—near 100 percent.⁵ Promotion rates to W-3 ranged in recent years from about 80 percent in the Army to 95 percent in the Navy (see Table 8). Beyond that point, promotion rates are generally lower, although the Navy announced a promotion opportunity to W-4 of 90 percent for 2002.

The lower opportunity for promotion to W-3 in the Army than in the Navy is consistent with those services' different management models. Selecting its warrant officers early, the Army cannot be sure that they will all succeed, so it erects a significant hurdle to promotion to the W-3 level. It also promotes slowly, providing continual performance incentives throughout a career despite the constraint of having only five pay grades for warrant officers. The Navy, by contrast, chooses people who have already proven their worth, and it makes warrant officer service attractive by promoting rapidly and with high probability. The rationale for the practices of the Marine Corps seems less clear; although it selects its technician warrant officers in a fashion similar to that of the Army, it promotes them in a manner more like the Navy. The Marine Corps' rapid pace of promotion may reflect its close ties with the Navy; alternatively, the Marine Corps may have more confidence in its selection process than the Army has in its process.

The services reward superior performers by promoting them ahead of their peers, but few warrant officers receive early promotions. (The same is true for commissioned officers.) The Warrant Officer Management Act caps those so-called below-the-zone promotions at 10 percent of the total for a particular pay grade—15 percent with the approval of the Secretary of Defense. Recent promotion results, however, showed below-the-zone promotions well under the limit. The Marine Corps promoted no warrant officers early in 2000, and early promotions among Army aviators and Navy warrant officers have generally accounted for less than 5 percent. Only among Army technicians was the below-the-zone promotion rate as high as about 7 percent, and that high rate was limited to grades W-3 and W-4. Moreover,

5. The promotion opportunity to a given grade is, roughly, the probability that a randomly chosen individual in the next lower grade will be promoted. The stated opportunity for a given year, however, does not directly measure individuals' chances of promotion. Before a promotion board meets, which typically occurs once a year, service officials establish a primary zone of consideration for promotion based on officers' dates of rank—that is, the date that they assumed their current grade. For example, in 2001, the primary zone for technician warrant officers in the Army for promotion to W-3 included officers with dates of rank in grade W-2 from October 1, 1996, to September 30, 1997. The earliest date of rank in the zone is the latest date excluded from the primary zone for the previous year's board. In addition to considering all the personnel in the primary zone, the board considers for promotion all personnel "above the zone"—that is, those still in the service who were passed over for promotion by the previous board—and may consider personnel below the zone. The promotion opportunity is defined as the number of people selected for promotion, whether above, below, or in the zone, divided by the number of personnel considered who were in the primary zone. Typically, each service establishes the opportunity by telling its promotion board how many officers the board may select for promotion.

all the services generally consider warrant officers for promotion no more than one year earlier than the normal time.

The timing of warrant officers' promotions is not closely tied to their total time in the military, in contrast with promotions for commissioned officers and, to a lesser extent, enlisted personnel (see Figure 3). The variation in timing occurs even within a single management model, a result of warrant officers beginning their warrant service with widely varying amounts of enlisted service behind them. Among Army aviators, for example, the most common time for promotion to grade W-4 in 1998 and 1999 was after they completed 15 years of total service, but for those who became aviators after first serving in the enlisted ranks, the promotion to W-4 could occur much later. Promotions of Marine Corps technicians to W-4 spanned the 20-year point at which those officers became eligible to retire, as did promotions of Navy warrant officers to W-3. Variation in the timing of promotions as a function of years of military service, both across the management models and within them, has implications for whether individual warrant officers decide to remain in the military and whether enlisted personnel decide to seek warrant officer status. The former is discussed below and the latter is addressed in Chapter IV.

TABLE 8. RECENT PROMOTION OPPORTUNITIES FOR WARRANT OFFICERS
(In percent)

Service/Group	Opportunity to Pay Grade		
	W-3	W-4	W-5
Army			
Aviator	83.5	84.0	59.0
Technician	78.2	80.3	53.4
Navy	95.0	75.0	*
Marine Corps ^a	90.4	81.3	65.4

SOURCE: Department of Defense.

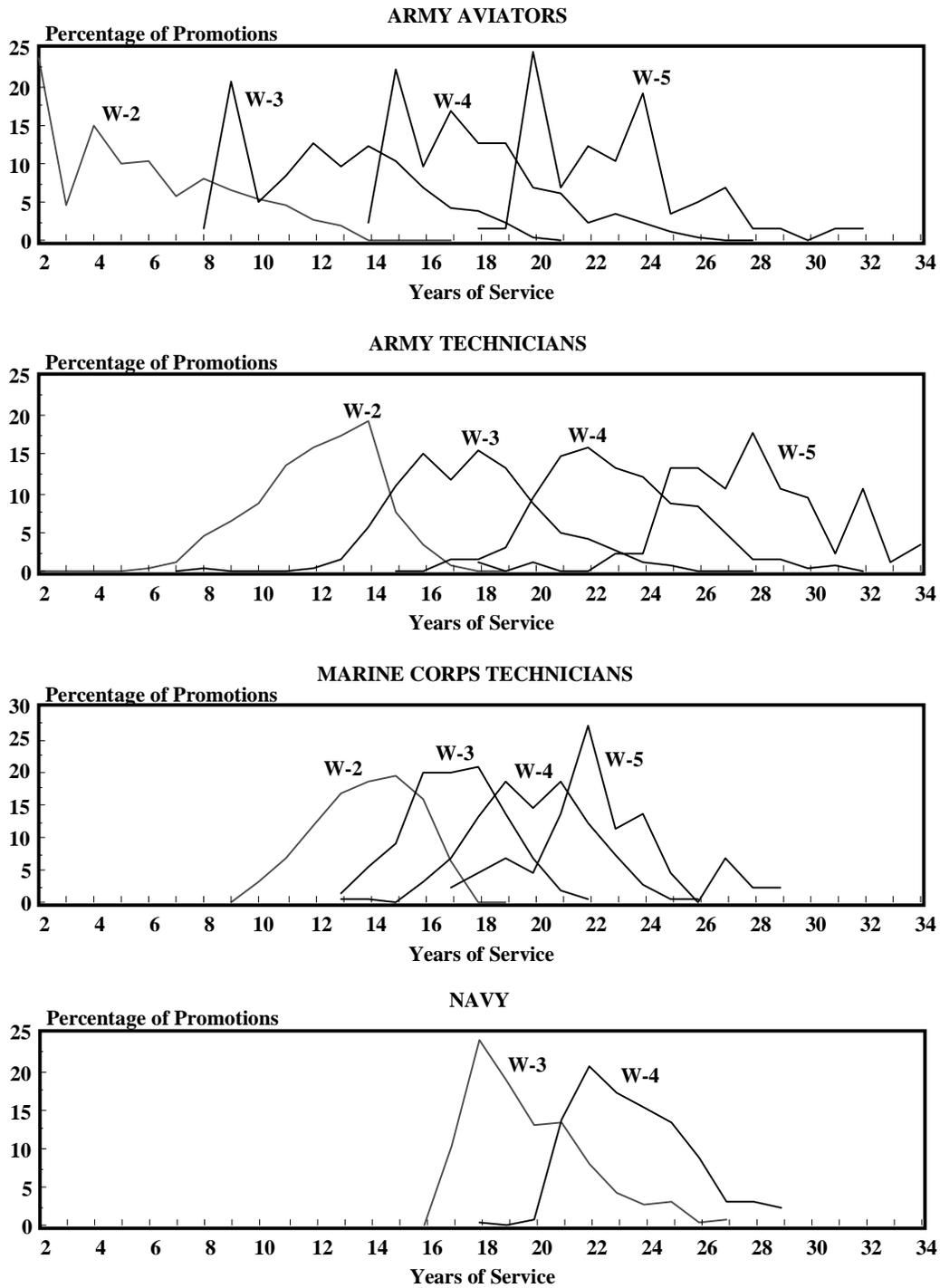
NOTES: * = not applicable.

The promotion opportunity measures, roughly, the probability that a randomly chosen warrant officer who remains in the service will be promoted to the grade indicated.

Army and Marine Corps figures are actual results for fiscal year 2000, as reported by those services. Navy figures are the opportunities announced for fiscal year 2001.

a. Includes marine gunners.

FIGURE 3. DISTRIBUTION OF WARRANT OFFICER PROMOTIONS, WITHIN PAY GRADE, BY YEARS OF SERVICE COMPLETED, FISCAL YEARS 1998-1999



SOURCE: Congressional Budget Office from data supplied by the Defense Manpower Data Center.

SEPARATION

A broad connection between management models and retention patterns is evident in the distribution of warrant officer separations by the year of service in which those personnel leave.⁶ In 1998 and 1999, preretirement losses among Navy warrant officers—selected for warrant service very late—were exceedingly rare, even though the Navy does not impose lengthy service obligations on new warrant officers. Most Army and Marine Corps technician warrant officers also waited to leave until they could collect retirement benefits; they had probably already decided to complete a military career when they applied for warrant status. By contrast, nearly half of all Army aviators who left the service were not yet eligible for retirement.

Once warrant officers are eligible to retire after completing 20 years of total service (enlisted and warrant), they tend to leave quickly (see Figure 4). Of every 100 Army aviators, Army technicians, and Marine Corps technicians who complete 20 years of total service, only about 35 can be expected to remain in the service for another four years—that is, the "survival rate" to year-of-service 24 is about 35 percent. For Navy warrant officers, the survival rate to that point is about 50 percent. Warrant officers in the Army and the Marine Corps typically serve for an additional three years once they become eligible to retire; in the Navy, they serve about four years more.

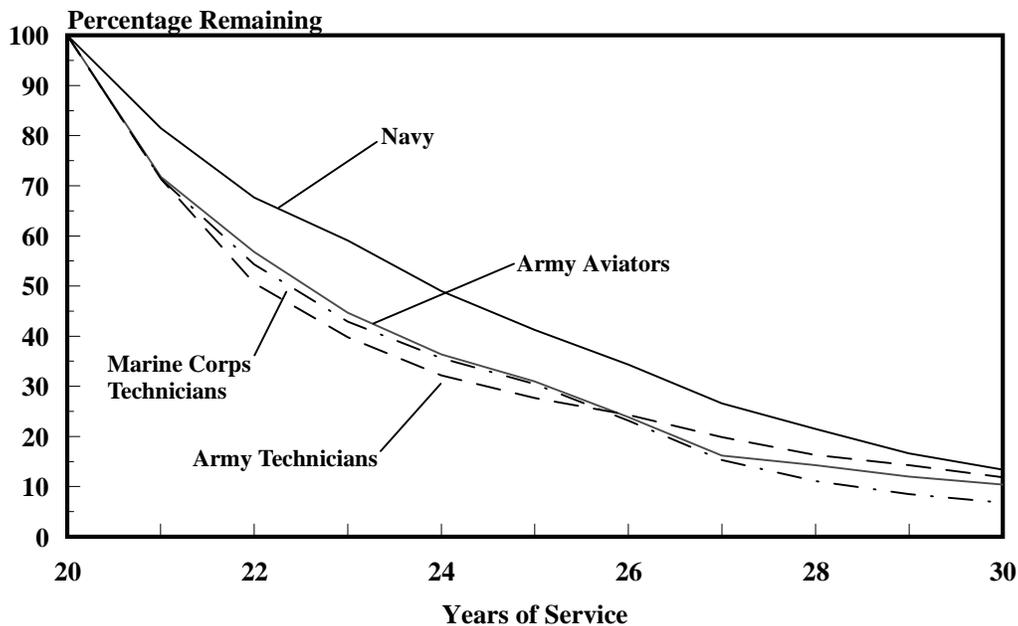
The provision in federal law that allows Army warrant officers in grade W-5 to remain in the service until they complete 30 years of warrant service, rather than 30 years of total service, appears to lengthen Army careers. In 1999, about 35 percent of Army W-5s had completed more than 30 years of total service, the point at which military pensions stop increasing as a fraction of basic pay. The option to stay longer may also explain why Army technician warrant officers who stay even a few years beyond 20 are substantially more likely to complete 30 years of service than their counterparts in the Navy and the Marine Corps.

Survival rates such as those depicted in Figure 4, as well as the loss patterns discussed above, must be interpreted cautiously because they combine individuals' voluntary decisions to stay or leave with the effects of mandatory separation policies. For example, most of the preretirement losses among Army aviators reflect those officers' voluntary decisions, but some of the losses occur when aviators are forced out because they are not promoted to grade W-3. Among Army technicians

6. Although it would be possible to compare continuation patterns for warrant officers with those for either enlisted personnel or commissioned officers, such a comparison would have limited value. The groups differ not only in how they are managed—including when they face mandatory separation—but also in their military pay, in personal characteristics (such as education) that affect their earnings prospects as civilians, and in when they chose their status (enlisted, warrant, or commissioned officer). Attributing differences in continuation patterns to any specific differences among the groups would be difficult at best.

completing 20 years of service, those who began their warrant service late, and thus can look forward to the possibility of at least one more promotion, may have a stronger incentive to remain in the service than officers who began early and have already received their last promotion. Finally, the high survival rate for Navy warrant officers may reflect, in part, a policy requiring enlisted personnel to separate after 24 years of service if they do not advance beyond grade E-7. As the next chapter discusses, there are reasons to suspect that some Navy personnel may seek warrant service because they believe their chances of being promoted to E-8 and E-9 are poor. For such people, becoming a warrant officer would allow a longer career.

FIGURE 4. SURVIVAL RATES FOR WARRANT OFFICERS ELIGIBLE TO RETIRE



SOURCE: Congressional Budget Office from data supplied by the Defense Manpower Data Center.

NOTES: The survival rate for a particular year of service is the percentage of personnel who complete at least that many years among those personnel who complete at least 20 years of service.

Data for the marine gunner group are not shown because there were too few to provide meaningful survival rates.

CHAPTER IV

WHO BECOMES A WARRANT OFFICER OR LIMITED DUTY OFFICER?

In 1999, there were nearly 30,000 Navy personnel in grade E-7 (chief petty officer) or higher who had served for between 12 and 24 years—the basic qualifications for warrant officer applicants. That year's selection board for warrant officers considered 1,008 applicants and selected 197 of them. Another 256 personnel out of 2,731 applicants from an even larger potential pool were selected to be limited duty officers.

Why do people apply for warrant officer and LDO service, and what distinguishes successful applicants in each of the services from their enlisted peers? This chapter, which explores those two questions, offers three main findings.

- o Although compensation is undoubtedly a factor in a person's decision to become a warrant officer, the monetary advantages of warrant service are not large, particularly for someone on a fast promotion track through the enlisted ranks.
- o Those personnel selected for warrant officer and LDO service generally surpass their enlisted peers on two measures of personnel quality, but only by modest amounts.
- o Whether people become warrant officers or limited duty officers depends in large part on their enlisted occupational specialty. Personnel in some enlisted specialties have no direct path to warrant service except through programs open to all, such as the Army's aviator program. Others serve in occupational areas that have very large warrant or LDO communities and correspondingly good opportunities for enlisted personnel to become warrant officers or LDOs.

COMPENSATION OF WARRANT OFFICERS

In a briefing for prospective warrant officers, the Army's recruiting command shows that an E-6 who became a warrant officer after eight years of service would receive a raise in basic pay of about 18 percent. Although true, that comparison is incomplete. Basic pay constitutes only a portion of service members' total pay; they also receive a housing allowance (or government housing at no cost), a subsistence

allowance, and an implicit payment—referred to as the tax advantage—that reflects the federal income taxes they do not have to pay because the allowances are nontaxable. Accounting for the allowances and the tax advantage, the raise in total pay—or regular military compensation (RMC)—for the new warrant officer is less than 9 percent.¹ (Appendix B gives annual basic pay and RMC for selected years of service, by pay grade.)

In addition to considering military compensation in total, pay comparisons between enlisted personnel and warrant officers or LDOs must account for two sources of variation in pay. One source is the management model applied to a warrant officer. Warrant officers selected early, for example, enjoy the largest pay advantage over enlisted personnel, even allowing for the relatively slow pace of promotion under the Army's early-select model. The second source of variation is the pace and extent of promotions that a warrant officer might have expected if he or she had remained in the enlisted ranks. The Navy's late-select model, for example, yields a substantial pay advantage over enlisted service for someone who would not have advanced beyond grade E-7 but little advantage for a fast-track individual who could have expected rapid promotion to E-8 and E-9.

-
1. As an officer, a new W-1 receives a subsistence allowance of \$160 a month compared with \$233 for enlisted personnel. The housing allowances of an E-6 and a W-1 (both with dependents) are virtually identical.

The equality of housing allowances for an E-6 and a W-1 is not apparent in published figures on the average basic allowance for housing (BAH). Those figures show a W-1 receiving substantially less than an E-6—\$737 a month versus \$846—but that comparison is deceptive. The BAH for each pay grade varies among areas of the country according to local housing prices and is greater for service members with dependents than for those without. In any given area, the allowance for an E-6 and a W-1, both with dependents, is generally almost identical (rates for personnel without dependents differ between the two grades). The average payments differ because people in grade W-1 tend to be assigned to locales where housing is inexpensive, probably a result of the large number of Army aviators among W-1s and the location of their training and assignments. The lower average allowance of W-1s does not imply that they are worse off in that respect than people in grade E-6; the BAH is designed to ensure that people in a given grade are equally well off with respect to housing regardless of where they are assigned. Thus, it is appropriate to say that the BAH for an E-6 and a W-1 at the with-dependents rate is the same, notwithstanding the published figures.

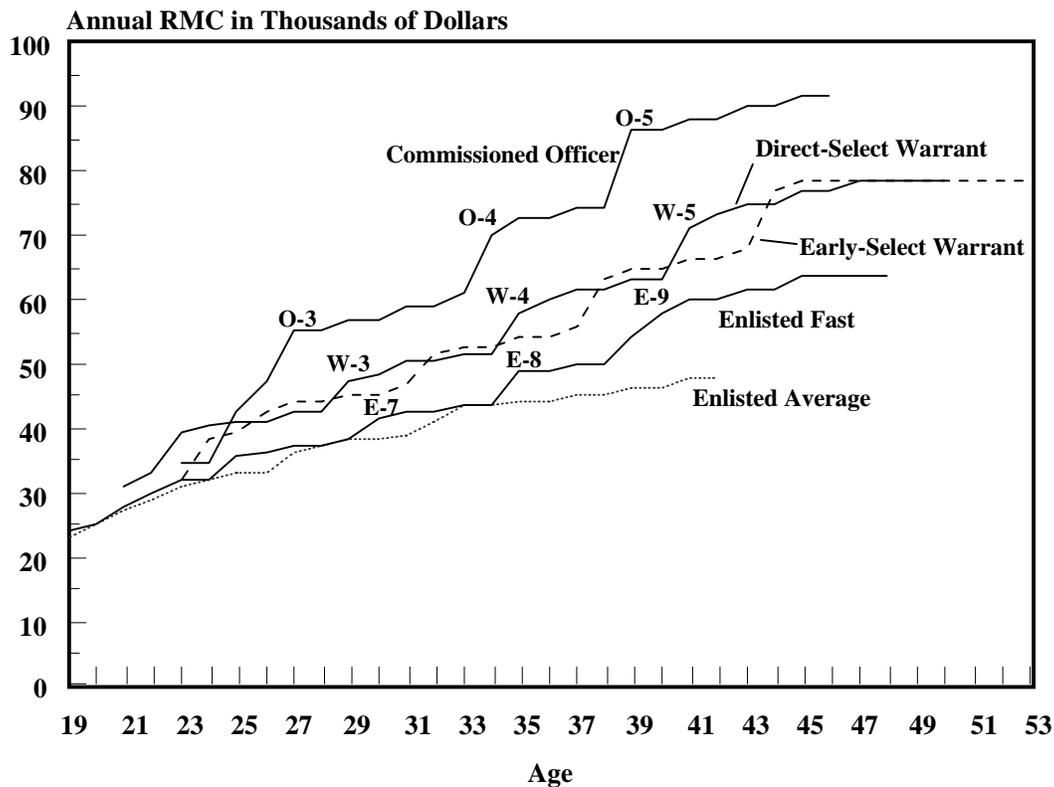
To derive the RMC amounts for warrant officers presented in this paper, the Congressional Budget Office adjusted the published BAH amounts to reflect the geographic distribution of personnel in corresponding officer and enlisted pay grades. The upward percentage adjustments, by pay grade, were as follows: W-1, 16.4; W-2, 4.2; W-3, 7.5; W-4, 5.9; and W-5, 5.7. A second adjustment corrected the published estimates of the tax advantage to account for the adjusted BAH.

For the published figures on average BAH payments, see Department of Defense, *Selected Military Compensation Tables, 1 January 2001*. To understand the calculation of the BAH, see Congressional Budget Office, *Housing Prices, Housing Choices, and Military Housing Allowances*, CBO Paper (October 1998).

The Early-Select Model

People selected early for warrant service earn substantially more than they would have in the enlisted ranks, regardless of whether they could have expected to progress through those ranks at a rapid pace or only a normal pace (see Figure 5). For an

FIGURE 5. TYPICAL PAY PROFILES FOR DIRECT-SELECT AND EARLY-SELECT WARRANT OFFICERS AND OTHER PERSONNEL, BY AGE, BASED ON ARMY SELECTION AND PROMOTION PRACTICES



SOURCE: Congressional Budget Office from data supplied by the Defense Manpower Data Center.

NOTES: RMC (regular military compensation) consists of basic pay, basic allowance for housing, basic allowance for subsistence, and the tax advantage that accrues to service members because the allowances are not subject to federal income tax. The figures shown assume that the allowances are paid in cash rather than in kind and that the housing allowance is paid at the rates for members with dependents.

The ages shown assume that enlisted personnel enter the military at age 19, direct-select warrant officers enter at age 21, and commissioned officers enter at age 23. The early-select warrant officer is assumed to be selected after completing five years of service.

The pay profile denoted "enlisted average" assumes that the service member is promoted at a typical pace and does not progress beyond pay grade E-7. The profile "enlisted fast" assumes promotion at a fast pace and eventual promotion to the highest enlisted pay grade (E-9).

Profiles end at the typical mandatory separation point for the final pay grade.

Army aviator who becomes a warrant officer after five years of enlisted service, the pay advantage in terms of RMC averages about 23 percent each year through the 20th year of service in comparison with the pay of someone progressing at a normal pace through the enlisted ranks.² Compared with someone who progresses rapidly through the enlisted ranks, reaching grade E-8 in his or her 17th year of service, the warrant officer's pay advantage averages about 16 percent.³ Both comparisons assume that the warrant officer passes every promotion hurdle at the usual time for Army aviators, including promotion to W-4 after 19 years of service. The ages shown in the figure assume an initial entry to the Army at 19 years of age for someone selected from the enlisted ranks and 21 years of age for someone selected directly from civilian life.

The Midcareer Model

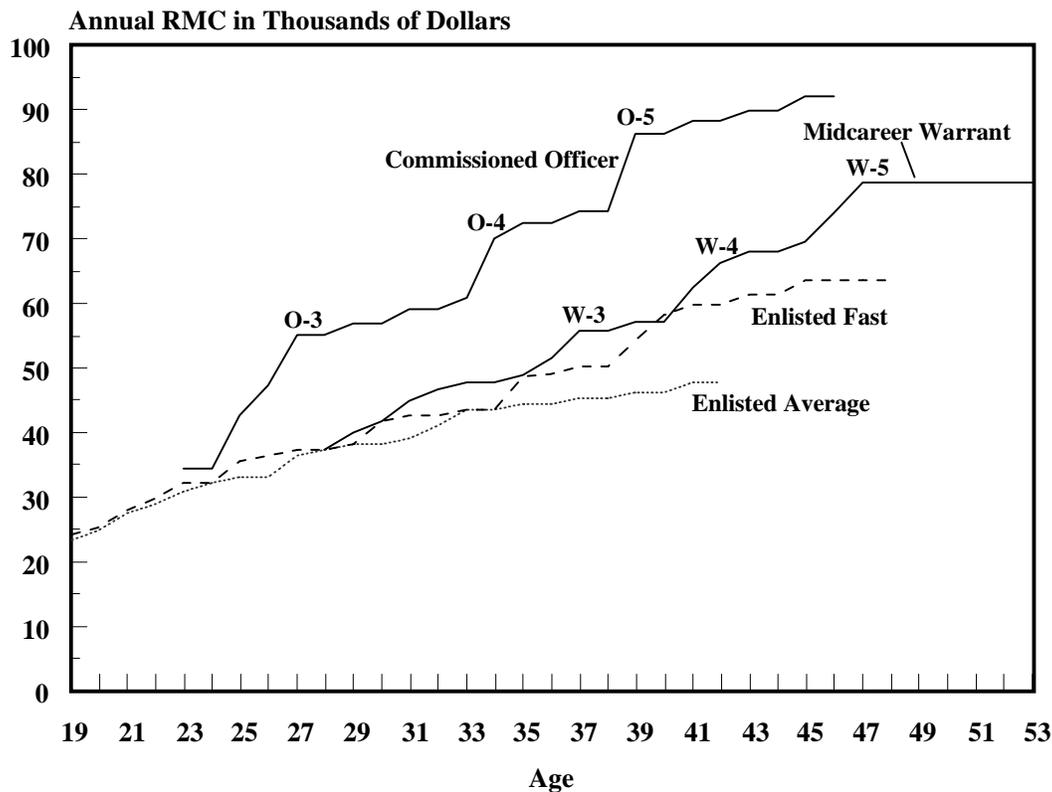
For enlisted personnel in midcareer, the monetary appeal of warrant service is much less than it would have been earlier in their career and more heavily dependent on their prospects for advancement in the enlisted ranks (see Figure 6). At 11 years of service in the Army, most enlisted personnel are in grade E-6, and the best among them are already E-7s or about to be promoted to that grade. Those whose promotion prospects in the enlisted ranks are only average and who cannot expect to advance beyond E-7 would receive an increase in RMC through 20 years of service of about 14 percent if they became warrant officers. For those who expect rapid advancement, the gain is only half as large. Such people may see retirement benefits as a stronger lure; the pension for a W-3 is about 16 percent larger than that for an E-8 if both leave after 20 years of service. Indeed, retirement benefits would be an important consideration for anyone who was unsure about his or her prospects for promotion. Retiring as a W-2 would be much better than retiring as an E-7, and even slightly better than retiring as an E-8.

-
2. Reenlistment bonuses and other special pays could narrow the gap for personnel in eligible enlisted specialties, although large bonuses are not common in the Army. A later section discusses how reenlistment bonuses could affect the timing of individuals' decisions to apply for warrant officer status. Appendix A briefly discusses reenlistment bonuses.
 3. CBO's estimates of typical promotion timings may show smaller differences between normal and fast promotions than estimates used in other studies. Within a service, people may be promoted at different speeds for two reasons—some people perform better than others, and some specialties tend to offer faster promotions than others. CBO attempted to focus on performance differences by looking only at within-specialty variations in the timing of promotions.

The Late-Career Model

Despite the Navy's policy of appointing new warrant officers in grade W-2, the short-term financial incentives for Navy personnel to apply for warrant service are weak,

FIGURE 6. TYPICAL PAY PROFILES FOR MIDCAREER WARRANT OFFICERS AND OTHER PERSONNEL, BY AGE, BASED ON ARMY SELECTION AND PROMOTION PRACTICES



SOURCE: Congressional Budget Office from data supplied by the Defense Manpower Data Center.

NOTES: RMC (regular military compensation) consists of basic pay, basic allowance for housing, basic allowance for subsistence, and the tax advantage that accrues to service members because the allowances are not subject to federal income tax. The figures shown assume that the allowances are paid in cash rather than in kind and that the housing allowance is paid at the rates for members with dependents.

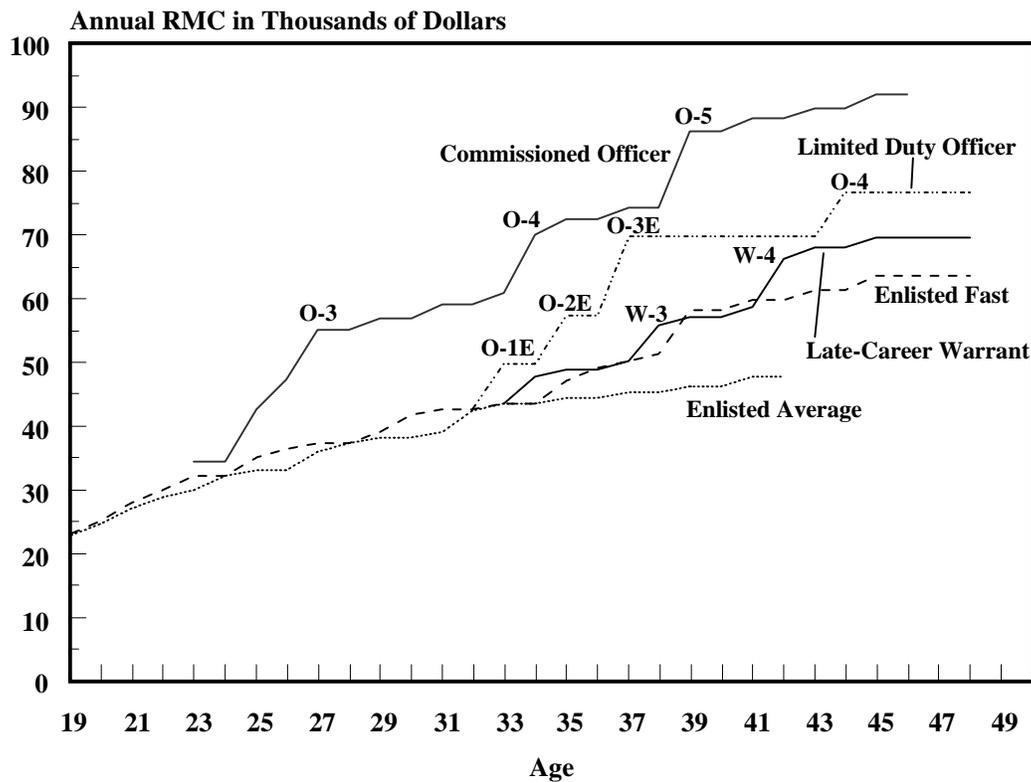
The ages shown assume that enlisted personnel enter the military at age 19, and commissioned officers enter at age 23. The midcareer warrant officer is assumed to be selected after completing 10.5 years of service.

The pay profile denoted "enlisted average" assumes that the service member is promoted at a typical pace and does not progress beyond pay grade E-7. The profile "enlisted fast" assumes promotion at a fast pace and eventual promotion to the highest enlisted pay grade (E-9).

Profiles end at the typical mandatory separation point for the final pay grade.

suggesting that retirement considerations may play a particularly important role in individuals' decisions to apply for warrant service under a late-career model of management (see Figure 7). People who become warrant officers after 15 years of service do not enjoy a substantial pay advantage over their enlisted counterparts who

FIGURE 7. TYPICAL PAY PROFILES FOR LIMITED DUTY OFFICERS, LATE-CAREER WARRANT OFFICERS, AND OTHER PERSONNEL, BY AGE, BASED ON NAVY SELECTION AND PROMOTION PRACTICES



SOURCE: Congressional Budget Office from data supplied by the Defense Manpower Data Center.

NOTES: RMC (regular military compensation) consists of basic pay, basic allowance for housing, basic allowance for subsistence, and the tax advantage that accrues to service members because the allowances are not subject to federal income tax. The figures shown assume that the allowances are paid in cash rather than in kind and that the housing allowance is paid at the rates for members with dependents.

The ages shown assume that enlisted personnel enter the military at age 19, and commissioned officers enter at age 23. The limited duty officer is assumed to be selected after completing 14 years of service and the late-career warrant officer after completing 15 years of service.

The pay profile denoted "enlisted average" assumes that the service member is promoted at a typical pace and does not progress beyond pay grade E-7. The profile "enlisted fast" assumes promotion at a fast pace and eventual promotion to the highest enlisted pay grade (E-9).

Profiles end at the typical mandatory separation point for the final pay grade.

advance to grade E-9 until they have served eight years as warrant officers and are promoted to W-4 (at age 42 in the figure). At that point, their RMC is about 11 percent greater than that of an E-9; if they retire in that grade they earn about 13 percent to 15 percent more in retirement benefits.

People who do not expect to advance beyond grade E-7 if they remain in the enlisted ranks could have two reasons to apply for warrant service. First, the pay advantage, although initially only about 10 percent, would rise to more than 23 percent if they were promoted to W-3. Second, as E-7s they would be forced to retire—under current Navy rules—after completing 24 years of service. Reaching grade W-4, which they might think more likely than promotion to E-8, would allow them a longer career as well as offer substantially higher pay and retirement benefits. As noted earlier, the Navy announced a promotion opportunity to W-4 of 90 percent for 2002. By contrast, less than 20 percent of Navy E-7s can expect to be promoted to E-8.

Selection as a limited duty officer, which typically occurs earlier than selection as a warrant officer, places people on a much more attractive pay path. After the promotion to O-3E, which is almost certain after four years of LDO service (all "fully qualified" personnel are promoted), the pay of LDOs is almost 40 percent greater than they could have expected at that point as an enlisted person, even with an early promotion to E-8. A promotion to O-4, which 70 percent to 80 percent of LDOs receive, would allow an LDO to retire with benefits about 23 percent greater than those of an E-9 and 9 percent greater than those of a W-4. Promotion to O-5 could add another 15 percent to 20 percent to the difference in retirement benefits. The LDO's pay even approaches that of someone of the same age who began as an officer, both because of the special pay rates for officers who served at least four years as enlisted personnel (O-1E through O-3E) and because an officer who entered from civilian life or through the Naval Academy would typically have been older when he or she entered the Navy.

Reenlistment Bonuses and Other Special and Incentive Pays

Depending on their individual circumstances, service personnel are eligible for a number of additional types of pay beyond their basic pay and allowances. Some of those could affect individuals' decisions to apply for warrant service. Selective reenlistment bonuses (SRBs), for example, are paid only to enlisted personnel when they reenlist for the first, second, and even third times—formally, at up to six years of service, six to 10 years of service, and 10 to 14 years of service, respectively. Although nominally targeted at "critical skills" with severe staffing problems, SRBs have recently been offered very widely. The largest of those bonuses have the potential to affect the timing of warrant applications under a midcareer or early-

career management model because potential warrant officers could find it financially advantageous to delay their warrant applications until after their next reenlistment.

Other types of pay can widen or narrow the gap in total pay between warrant officers and enlisted personnel. Submarine duty incentive pay, for example, is greater for warrant officers than for all enlisted personnel except E-9s. In contrast, career sea pay is generally greater for senior enlisted personnel than it is for warrant officers who have served on sea duty for the same number of years.

THE "QUALITY" OF NEW WARRANT OFFICERS

Does the opportunity to serve as a warrant officer or limited duty officer attract the best people from the enlisted ranks? Personnel quality is a difficult concept to measure, but based on two measures of quality—scores on the Armed Forces Qualification Test (AFQT) and speed of promotion—the answer is a qualified yes. People selected for warrant officer and LDO service are generally superior to their enlisted peers, but not markedly so.

The two measures provide only a limited assessment of personnel quality, certainly less of one than the boards who select warrant officers and LDOs can draw from the applicants' personnel records. The services use the AFQT as a measure of general trainability. Some studies have shown that AFQT scores can predict performance during the first enlistment term. Beyond that point, however, the relationship between individual performance and AFQT scores is harder to assess, and the speed with which individuals are promoted would seem a better measure of their quality.

Arguably the best indication that new warrant officers and LDOs are superior to their enlisted peers is that most who apply are not selected, particularly in the Navy and the Marine Corps. The Marine Corps reported that 22 percent of applicants were selected to become warrant officers in 2000. Navy results for 2000 show 26 percent of warrant officer applicants and 13 percent of LDO applicants were selected. In the Army, selection rates for some warrant officer specialties are equally low, but for others the Army struggles to find enough qualified applicants. Examples of the latter include criminal investigation agent, some intelligence specialties, and special forces, all areas in which the number of warrant officer positions is large relative to the number of enlisted positions. Overall, about 40 percent of Army applicants for technician warrant officer specialties were selected in recent years.⁴

4. The reported selection rate for the Army may be inflated somewhat by that service's practice of prescreening individuals' application packages before submitting them to the selection boards as "applicants."

Although competition may be keen among those who apply for selection as warrant officers, many eligible people apparently do not apply. In the Army, for example, the number of applicants for technician warrant officer positions in 2000 represented less than one-quarter of the nominally qualified people in a one-year cohort of enlisted personnel. Correcting for the large number of Army specialties that do not feed into any warrant officer specialty still leaves more than one-half of potential warrant officers who chose not to apply. Whether those people were more or less qualified than the applicants, however, is difficult to assess. Navy application rates for warrant officer positions appear to be slightly higher, despite the small pay advantage warrant service offers in the Navy. Only in the Marine Corps do a large fraction of the potentially qualified personnel apparently apply for warrant officer service.

Scores on the Armed Forces Qualification Test suggest that the quality of new warrant officers and Navy LDOs is modestly better than that of their enlisted peers. Army aviators were the most exceptional group; with an average AFQT score of 78, they scored 18 points above their peers in 1998 and 1999 (see Table 9).⁵ People who became Army technician warrant officers in those years, by contrast, scored only about seven points higher on the AFQT, on average, than E-6 personnel in their enlisted specialties. About two-thirds of the new technician warrant officers had higher scores than the average for their enlisted specialties. The corresponding differences for Marine Corps warrant officers and Navy LDOs were smaller; for Navy warrant officers the difference was negative—more scored below average than above average for their specialties.

Speed of promotion provides a more consistent indication that new warrant officers outperformed their enlisted peers. In the Army, for example, new warrant officer technicians whose last enlisted pay grade was E-6—the most common among accessions—reached that grade an average of nearly 15 months earlier than was typical among E-6s in their enlisted specialties. That placed them ahead of 73 percent of their peers. (The comparison is with personnel in the same enlisted specialty as the new warrant officer or LDO because promotion speeds vary among specialties.) Army aviators appear to have been promoted less rapidly than technicians, but that appearance derives from the pay grade underlying the comparison—there is less variation in the time it takes to reach grade E-5 than to reach grade E-6. Warrant officer technicians in the Marine Corps reached grade E-6 only a few months earlier than their peers, but that service allows less variation in promotion speeds than the other services allow.

5. AFQT scores represent percentiles of the distribution of scores among the general youth population.

OPPORTUNITIES TO BECOME A WARRANT OFFICER OR LDO

People in the enlisted ranks may be top performers, and they may be attracted to warrant or LDO service by higher pay. But if they are serving in the wrong enlisted specialties, they will have little or no opportunity to become a warrant officer or LDO. Except in the case of Army aviators, the services do not train their warrant officers from scratch; they expect candidates to have gained experience in a relevant enlisted specialty. And they do not create warrant officer positions to provide advancement opportunities, at least according to their official policies. As a result, the opportunities for enlisted personnel to become warrant officers or limited duty officers vary widely among occupational areas. People in some specialties have

TABLE 9. COMPARISON OF THE QUALITY OF WARRANT OFFICER AND LIMITED DUTY OFFICER ACCESSIONS WITH THAT OF PEERS IN THEIR ENLISTED OCCUPATIONAL SPECIALTIES, FISCAL YEARS 1998-1999

	Army		Marine Corps	Navy	
	Aviator	Technician	Technician	Warrant	LDO
AFQT Score					
Average Points Higher than Specialty Mean ^a	17.7	6.9	5.6	-1.3	2.6
Percentage with Scores Above Specialty Mean	85	64	65	47	57
Months of Service at Last Promotion					
Average Months Earlier than Specialty Median	9.2	14.9	4.3	6.7	16.9
Percentage Promoted Earlier than Specialty Median	70	73	63	63	80

SOURCE: Congressional Budget Office from data supplied by the Defense Manpower Data Center.

NOTES: Comparisons are with values for personnel in the most common enlisted pay grade among accessions in each group, which are the following: Army aviator, E-5; Army technician, E-6; Marine Corps technician, E-6; Navy warrant and LDO, E-7.

Scores on the AFQT (Armed Forces Qualification Test) represent percentiles of the distribution of scores among the general youth population.

- a. Measured against servicewide averages, the differences were generally slightly greater; except in the Navy, warrant officers tend to be drawn from enlisted specialties in which people have above-average AFQT scores.
-

almost no chance at all, others have a limited chance, and still others may be actively recruited to serve as warrant officers.

The Marine Corps offers people the greatest overall opportunity to serve as a warrant officer or LDO; the Army, excluding its aviators, offers the smallest (see Table 10). In 1998 and 1999, the Marine Corps selected about 8.4 warrant officers for every 100 enlisted personnel in their 10th year of service—the Army selected about half as many. (The 10th year was chosen for uniformity among the services, but as noted previously, the Army chooses some warrant officers earlier.) Opportunities for enlisted personnel to serve as warrant officers in the Navy are limited, but that service also selects most of its LDOs from among enlisted personnel.

The Army excludes personnel in many enlisted specialties from warrant service. Nearly half of Army personnel who reach the grade at which they might apply for warrant service are in occupational specialties that do not directly feed into any warrant officer occupation. Of those personnel, more than 40 percent are in the combat arms—infantry, armor, and artillery. Other large groups without warrant officer opportunities include the medical specialties and truck drivers (motor transport operators).

TABLE 10. MEASURES OF THE OPPORTUNITY FOR ENLISTED PERSONNEL TO SERVE AS NONAVIATOR WARRANT OFFICERS OR LIMITED DUTY OFFICERS (In percent)

Opportunity	Army	Navy		Total	Marine Corps
		Warrant Officer	Limited Duty Officer		
Average Opportunity Among All Personnel ^a	4.2	2.4	3.5	5.8	8.4
Personnel with No Opportunity ^b	48.0	9.8	11.1	7.3	14.9

SOURCE: Congressional Budget Office.

- a. Average number of accessions of warrant officers or LDOs in 1998 and 1999 divided by the number of enlisted personnel in their 10th year of service.
- b. The fraction of enlisted personnel in the most common pay grade for accession as a warrant officer or LDO (E-6 in the Army and the Marine Corps; E-7 in the Navy) serving in occupational specialties that do not directly feed into any warrant officer or LDO occupation.
-

The Navy and the Marine Corps offer warrant officer and LDO opportunities to a much larger fraction of enlisted personnel than the Army does. In the Marine Corps, the largest excluded group is again the combat arms, except for the infantry. Infantry personnel can become marine gunners, but that group of warrant officers is very small; treating infantry personnel as ineligible pushes the total excluded personnel to 26 percent. In the Navy, about 10 percent of personnel are in enlisted specialties that do not directly feed into any warrant officer occupation, and about 7 percent are in specialties that feed into neither a warrant officer nor an LDO occupation. (Of those specialties, hospital corpsman and dental technician account for almost all of the excluded group.)

At the other extreme from the group of specialties with no direct path to warrant officer positions are a few specialties in which becoming a warrant officer or LDO amounts to almost a normal career progression. The criminal investigations (CID) field in the Army falls into that category—for every E-6 CID agent there are two warrant officer agents, and there are nearly as many CID warrant officers as enlisted CID personnel of all ranks. Counterintelligence is another field in which the opportunity to become a warrant officer is very high in the Army, as well as in the Marine Corps. In the Navy, nuclear power offers very good opportunities. There are roughly 900 nuclear-qualified E-7s compared with about 400 warrant officers and LDOs who specialize in nuclear power; in addition, those E-7s have other opportunities based on their broader specialty. Nuclear power is also the area in which the Navy offers enlisted personnel the largest reenlistment bonuses of any of the services, as much as \$45,000 for a first reenlistment and \$60,000 for a second.

Between the extremes, differences in opportunities tend to mirror the occupational mix for warrant officers and limited duty officers (see Table 4 on pages 14 and 15).

CHAPTER V

ADAPTING THE WARRANT OFFICER SYSTEM

TO MEET NEW GOALS

Some analysts and policymakers, concerned about the services' ability to compete with private firms for people who have the technical skills needed by the modern military, have discussed expanding the warrant officer ranks. Offering both higher pay and greater status than enlisted service, warrant service might provide a more competitive career path for potential recruits who aspire to more than just a high school education, for experienced service members with skills that are valuable to the military, and for very capable people whose superior abilities may not be adequately recognized in the enlisted ranks. The first part of this paper sought to inform the debate over possible roles for the warrant officer ranks by describing the services' current management practices. This chapter illustrates how the services might expand their warrant officer programs to help satisfy their personnel needs.

The chapter describes three illustrative approaches to using the warrant officer ranks to improve recruiting or retention in occupational areas traditionally assigned to enlisted personnel. Because the services' current programs for warrant officers are very diverse, none of the approaches would require entirely new management practices. The first approach, which focuses on attracting some of the growing number of high school graduates who proceed directly to college, could draw on the Army's experience with its early-select model for managing warrant officer aviators. The second approach aims to improve retention among personnel whom the services have trained in technical occupations that offer high pay in the private sector, and the third seeks to retain top performers regardless of their occupation. Both approaches could adapt the midcareer model that the Army and the Marine Corps use to manage their technician warrant officers.

The chapter does not formally compare the cost-effectiveness of alternative approaches to improving recruiting and retention, but it does identify some of the considerations that would enter into such comparisons. Like enlistment and reenlistment bonuses, an expanded warrant officer program could focus on specific occupational areas, providing an important advantage over a general pay raise. The advantage of an expanded program in comparison with bonuses, however, is less clear. Some of the factors affecting that comparison include the value that people place on current compensation in comparison with deferred compensation and what worth potential warrant officers place on the status conferred by that position.

Although the services could adapt current management practices for warrant officers to serve new goals in the areas of recruiting and retention, doing so would require them to fundamentally change their views about appropriate roles for those

personnel. Opponents of expanding the use of warrant officers could argue that the decision to classify a position as enlisted, warrant, or officer should depend only on the job requirements—the nature of the work and the level of authority required—and not on concerns about recruiting or retention. In response, supporters of a broader role for the warrant officer ranks might point out that decisions about requirements for personnel in different ranks are already influenced by the realities of recruiting and retention. For example, some officer positions do not require an officer's authority but merely the college education that is generally a prerequisite for officer status. Similarly, positions for junior enlisted personnel in many occupational areas exist largely to supply a flow of trained personnel into more senior positions.

AN EARLY-SELECT MODEL TO AID RECRUITING

Analysts looking for ways to expand the pool of potential recruits in the face of high college attendance rates have noted the services' limited ability to offer higher pay to already-trained recruits within the existing system for enlisted personnel, and some have suggested that the warrant officer ranks might offer a solution. A warrant officer program designed to make military service more attractive to people with high aptitudes in technical areas could build on the Army's experience with its early-select model for aviators. The approach examined here would allow people with relevant skills acquired in two-year colleges or technical schools to enter directly as warrant officers; others could begin as enlisted personnel with the expectation of advancing to the warrant officer ranks once they demonstrated their abilities in military training schools and on the job. Under such a program, selected occupations might be largely transferred from the enlisted ranks to the warrant officer ranks.

What types of occupations might be transferred? Likely candidates would probably have some or all of the following characteristics: a need for people with strong technical skills or aptitudes, close counterparts in the civilian world, relevant training available in civilian institutions, and lengthy training required for full competence. Perhaps the most obvious candidates are the Navy's nuclear propulsion specialties, which require high aptitude and lengthy training, and in which the Navy has consistently offered high reenlistment bonuses. Other candidates are specialties involved with data and communications networks, electronics repair, and possibly air traffic control. The intelligence area generally, and linguists in particular, might also be considered.

Expanding the warrant officer ranks as a tool to attract individuals with some college into technical military occupations could require fundamental changes in how the services perceive warrant officers. Each of the services currently views warrant officers—to one degree or another—as senior technical experts. But under an early-select program, the levels of technical expertise of junior and senior warrant officers

could differ greatly. In some cases, junior warrant officers might be expected to work under the supervision of their senior counterparts.

If the services adopted an early-select model for some occupations, they might find that introducing new warrant officer pay grades—one below the current grade of W-1 and one above the grade of W-5—would help to accommodate the greater variation in technical expertise and seniority that would be seen. At current rates of pay, a W-1 with no military experience receives nearly as much in regular military compensation as a starting commissioned officer. A new warrant officer grade below W-1 would put the pay of direct-accession warrant officers more clearly between that of officers and enlisted personnel but might still be attractive to graduates of two-year college programs. The introduction of a grade above W-5 would give top performers a greater incentive to remain in the military for an extended career.

The services might also find that changing their promotion policies would help to accommodate an early-select plan to aid recruiting. Allowing more variation in the timing of promotions within warrant officer occupations would mirror practices in the enlisted ranks, where technical competence is more important than completing a specific pattern of assignments. That change would make a warrant officer career more attractive to very capable recruits. In addition, the services might choose to manage promotions separately for each occupational specialty, which could allow pay to vary among warrant officer occupations without requiring the creation of a new system of specialty pays or bonuses.

A MIDCAREER APPROACH TO IMPROVE RETENTION

A program designed to improve retention in occupational areas in which training is lengthy and experience particularly valuable might draw on the Army's and the Marine Corps' experience with a midcareer management model. Expanded opportunities for warrant service could be offered to enlisted personnel in selected specialties starting at about their eighth year of service, when many are deciding whether to complete a military career. Depending on the degree of improvement in retention that was sought, warrant officer positions might completely replace senior enlisted positions in the selected occupations (as with the recruiting-based approach) or the replacement could be only partial.

Many of the occupational areas that would be chosen for an early-select plan to aid recruiting might also be considered for a midcareer program oriented toward retaining valuable skills, but some of the selection criteria could differ. For example, candidates might include specialties that required repeated attendance at training schools or in which many specialized occupations currently collapse into a single specialty when personnel reach grade E-6 or E-7. Occupations in which the required

skills are specific to the military, such as some mechanical maintenance specialties, might also be candidates.

To better support a midcareer plan designed to improve retention, some of the services might alter their policies dealing with promotion to grade W-3 and possibly seek a change in the law governing mandatory separation of warrant officers. Depending on how early enlisted personnel were selected for warrant service, consideration for W-3 could come at a very awkward time for them—some would be forced to leave only a few years short of qualifying for retirement benefits.¹ Among the services, the Army currently has the lowest opportunity for promotion to W-3; if it adopted an expanded midcareer program, it might want to raise that promotion opportunity or ask the Congress to modify the law mandating separation of warrant officers who have been passed over for promotion. That would make it easier for the services to keep such officers on active duty.

As part of a program aimed at improving retention in specific occupational areas, the services might consider managing promotions separately for each specialty, using differences in promotion timing and opportunity to create differences in pay among occupations. Warrant officers in occupations offering high pay in the private sector would rise more rapidly through the ranks, and with greater certainty, than those in occupations with less attractive civilian alternatives.

A MIDCAREER APPROACH TO IMPROVE THE QUALITY OF CAREER PERSONNEL

Expanded opportunities for top performers in the enlisted ranks to serve as warrant officers might also be managed under a midcareer model, although the program probably would spread warrant positions more widely across occupational areas and not completely replace enlisted personnel with warrant officers in any specialty. Under such a program, selection as a warrant officer would recognize a person's ability to readily master a broader range of tasks than is required in individual enlisted specialties. The program could be expected to appeal both to people who otherwise would rise through the enlisted ranks so rapidly that a long military career would have nothing further to offer, and to people without strong leadership ability whose technical skills would nonetheless earn them high salaries in the private sector. Selecting warrant officers at the end of their second enlistment term, or perhaps even earlier, would make the possibility of warrant service more apparent to people considering a military career.

1. Indeed, the Army may find that its current plan to select as warrant officers people with between five and eight years of service is hampered by the reluctance of qualified candidates to trade a secure enlisted career for a somewhat risky one as a warrant officer.

To make the plan attractive to the most-capable personnel, the services might want to permit more variation in the timing of promotions, allowing top performers to rise as rapidly as they can demonstrate the necessary technical competence. Current promotion systems for warrant officers—modeled after the system for commissioned officers—sharply limit both the number of people who are promoted early to each grade and how early they can be promoted. Such systems are consistent with a perceived need for officers to serve in positions of successively higher responsibility to prepare them for leadership roles. For technical experts, that slow preparation might not be necessary; top performers could qualify very quickly for the highest positions (and expect correspondingly high pay if they left for the private sector).

Although the services have the discretion to promote some warrant officers much more rapidly than they currently do, two changes in law could make a system that varied the timing of promotions more effective. First, much faster promotions for some personnel would create the need for an additional warrant officer pay grade above the existing grades, to encourage people who are promoted rapidly to remain in the military. Second, relief from the provision that caps the percentage of early (below-the-zone) promotions would allow the services to differentiate among individuals over a wider range of performance and make early promotion a realistic possibility for more people. Top enlisted personnel are not likely to be attracted by a system that says no more than 10 percent of them can expect to break out of the promotion lockstep.

Current rates of pay for warrant officers may not be adequate to induce top performers who now leave the enlisted ranks for civilian employment to remain in the military. As discussed earlier, service as a warrant officer offers only a modest increase in pay for people with good promotion prospects in the enlisted ranks. Raising the pay of warrant officers across the board would be the most obvious means of improving the appeal of warrant service. Top performers, however, might find warrant service more attractive if that pay raise was combined with a promotion system that better recognized their individual talents, as discussed above.

COMBINING APPROACHES

The previous discussion implicitly assumes that service officials will identify only one of three problems requiring attention in the management of enlisted personnel. Multiple problems could arise, however, requiring different solutions, or broad problems could be attacked in multiple ways. The first two approaches, for example, focus on specific occupations, offering alternative ways to improve staffing for occupational areas in which skilled workers are in high demand in the private sector. One aims to improve recruiting, the other to hold on to trained personnel, which would indirectly ease pressures on recruiting.

Combining the two occupation-oriented approaches could prove desirable. The early-select approach might be appropriate for occupations in which technical training that is commonly available in civilian institutions could substitute for much of the services' in-house training. In other occupational areas, the skills taught by the services might be unique to the military or could require extensive hands-on experience to master; such areas would be better suited to a midcareer approach. No technical obstacle would prevent the two plans from coexisting within a service, although the service would have to decide on starting pay grades and promotion timings under each program.

The third approach, which seeks to retain top performers in all occupational areas, might prove to be incompatible with either of the approaches that focus on selected occupations. The difficulty would be conceptual rather than technical. The occupation-based approaches would retain the services' current view of warrant officer positions as existing to serve occupational staffing needs, although they would expand the definition of what generated those needs. The performance-based approach, by contrast, would use the warrant officer ranks to recognize superior talents. Although there would probably be considerable overlap between the groups of people who would be selected for warrant service under the two types of approaches, some exceptional performers would be found in occupations with no shortages of personnel. The question of how to define appropriate warrant officer roles for such people might be resolved by allowing them to retrain in another area.

Related to the issue of how different approaches could be combined is the question of whether any plan that expanded warrant officer opportunities to deal with enlisted staffing problems could coexist with the services' current warrant officer programs. The Navy, in particular, might be reluctant to consider a program that selected warrant officers early because of its long warrant officer tradition, but there are at least two reasons to think it might consider change. First, the Navy has been the most aggressive of the services in the use of selective reenlistment bonuses for enlisted personnel. Warrant service might offer sufficiently attractive career earnings to replace the large SRBs offered in some specialties. Second, the Navy does not have very many warrant officers—they make up only about 0.5 percent of all Navy personnel and are outnumbered more than two-to-one by the service's limited duty officers. If the Navy wished to retain the positions of senior technical experts in broad fields that are now occupied by warrant officers, it might consider transferring those positions to the LDO ranks. Alternatively, it could retain something like its current warrant officer program in those occupational areas not covered by the early-select plan. As noted above, no technical obstacle would prevent an early-select plan for some occupations from coexisting with a midcareer or even a late-career model for others within a single service.

COST-EFFECTIVENESS CONSIDERATIONS

The finding that warrant officer programs could be expanded as a tool to improve recruiting and retention does not imply that expansion would be less costly than traditional tools such as enlistment and reenlistment bonuses. Several general considerations would be involved in comparing the costs of warrant officer and traditional approaches to improving recruiting and retention.

An expanded warrant officer program could be a cost-effective alternative to a raise in military pay as a tool to improve recruitment or retention. In general, programs designed to improve military staffing tend to be more cost-effective the more narrowly focused they are on the people and decisions that they are intended to affect. An expanded warrant officer program could be limited to specific occupational areas, an important advantage in comparison with the across-the-board effects (and costs) of a general pay raise; every 1 percent increase in military basic pay adds more than \$600 million to defense costs after the first year of the raise (pay raises typically take effect in the fourth month of the fiscal year).² That capacity to focus on specific occupations, or even on specific people such as top performers, gives an expanded warrant system a cost advantage even over pay raises limited to certain pay grades. Some analysts have pointed out that growing numbers of midcareer and senior enlisted personnel have substantial college training, which current military pay scales may not adequately recognize. Instead of raising the pay of all midcareer and senior enlisted personnel, however, DoD could focus the raise by offering warrant officer positions—with their higher pay—to those people it most wanted to retain or to those who were serving in military occupations with the best-paying civilian alternatives. A 5 percent raise in basic pay for personnel in grades E-6 and above could fund the conversion of roughly 60,000 enlisted positions in the top four grades to warrant officer positions.³

Although a warrant officer approach would tend to have clear cost advantages over either general raises in pay or raises limited to certain pay grades, enlistment and

2. Assuming the pay raise was effective on January 1, 2002, it would add about \$450 million to defense costs in 2002 and \$620 million in 2003. Those figures reflect the personnel strength numbers reported in Department of Defense, *Selected Military Compensation Tables: 1 January 2001*.

3. The estimate for the number of enlisted positions that could be converted to positions for warrant officers was derived by comparing average rates of compensation for personnel in grades E-6 through E-9 and personnel in grades W-1 through W-5, excluding Army aviators. Thus, the estimate reflects a steady state rather than the transition period in which the new warrant officers would be in the lower pay grades. Aviators are excluded because they begin their warrant service much earlier in their military careers than other warrant officers do and so tend to receive less in basic pay at a given pay grade. The elements of compensation were basic pay, the allowances for food and housing, the employer's share of Social Security taxes, and the amount that the Department of Defense sets aside to fund the future retirement benefits of current military personnel. The pay rates were those in effect on July 1, 2001.

reenlistment bonuses can be focused more easily than a warrant officer approach on the specific points at which people decide whether to complete a military career. Because individuals discount future payments—typically at rates much higher than the government does in evaluating future costs—service members might tend to favor an enlisted career that offered up-front reenlistment bonuses over a warrant officer career in which much of the financial reward came in the form of higher pay late in the career and in retirement, even if the two alternatives were equally costly from the government's perspective.⁴ A common criticism of the military compensation system is that, in comparison with private-sector systems, it overemphasizes deferred compensation. Compared with bonuses, the warrant-officer approach would continue that emphasis.

Nonmonetary factors associated with warrant service might offset the appeal of up-front bonuses. Some people might be attracted by the greater status of warrant officers, particularly in comparison with the junior and even midlevel enlisted ranks. Graduates of two-year colleges, for example, might appreciate being recognized immediately as professionals instead of having to serve a long enlisted apprenticeship. Depending on how it was structured, an expanded warrant officer system might also appeal to people who would rather remain technical specialists than assume leadership responsibilities. As discussed earlier, the warrant system could base promotions primarily on technical competence, rather than expect people to assume leadership positions as a condition of advancement and, thus, of continuing in the military.⁵

A warrant officer approach to improve recruiting or retention might be considered, even if it proved more costly than traditional approaches, if institutional rigidities limited the services' ability or willingness to exploit the traditional tools to the degree indicated by an analysis of costs and benefits. For example, enlistment and reenlistment bonuses, and the differences they create in pay among occupations, have been a part of the military compensation system for many years, yet some service officials have always felt uneasy about bonuses. In recent testimony before the Congress, personnel officials of the Marine Corps expressed that unease: "The disparity of pay among Marines who enter the Corps together is becoming more apparent and the cultural outcome of major pay differences can only be divisive

4. The services might also prefer the bonus approach because it gives them the flexibility to adjust pay differences among occupations in response to changes in retention rates. That flexibility, however, comes at the expense of making service members more uncertain about their future pay. The warrant officer approach that selected personnel early in their enlisted careers would reduce pay uncertainty in the selected occupations while also reducing the services' ability to manage staffing patterns.

5. Among the issues that David S. C. Chu, the current Undersecretary of Defense for Personnel and Readiness, recently discussed with members of the press was the effect of the military's up-or-out promotion system in limiting the careers of personnel who are unwilling to accept leadership responsibilities. See Department of Defense News Briefing (August 8, 2001).

within our Corps."⁶ At current rates of pay, for the armed services to offer personnel the same financial incentive to remain in the military as the pay a warrant officer receives would require larger bonuses than any of them now offer for second and third reenlistments. Redefining some occupations as belonging in the warrant ranks would allow the services to offer those large pay incentives without further expanding their reenlistment bonus programs.

As an alternative to enlarging reenlistment bonuses, the services could consider offering more promotions in selected enlisted occupations, but that option could also encounter institutional resistance. It would amount to creating positions for senior noncommissioned officers that did not require the responsibility or leadership normally associated with an NCO. Creating a separate set of ranks for technicians, as the warrant officer options discussed here would essentially do, might be easier to accomplish than trying to create those ranks for selected occupations within the system for enlisted personnel.⁷

Because predicting the effects of an expanded program for warrant officers could prove difficult, the impetus for trying such an approach is likely to come from small-scale but well-identified problems in enlisted staffing. As discussed at the beginning of this paper, for example, Undersecretary Rostker complained of computer-network administrators leaving the military only to return as higher-paid contractors. Concerns about retaining people in the information-technology area might lead a service to test the concept of converting positions in that area from the enlisted to the warrant officer ranks. Such a test could eventually reveal both how effective the approach could be in encouraging retention and to what extent a more experienced workforce could reduce personnel requirements.

CONCLUSION

This chapter has illustrated some of the ways in which the services could use the warrant officer ranks to assist in meeting their personnel needs. Because current management practices are so diverse, the approaches discussed here could all draw on a management system that already exists within one or more of the services. And because the legislation governing warrant officer programs gives the services considerable discretion in how they manage personnel, many of the adaptations that

6. Joint statement of Lieutenant General Jack W. Klump, United States Marine Corps, Deputy Chief of Staff for Manpower and Reserve Affairs, and Major General Gary L. Parks, Commanding General, Marine Corps Recruiting Command, before the Military Personnel Subcommittee, House Committee on Armed Services, March 8, 2000.

7. During the Vietnam era, the Army maintained parallel specialist and leadership ("hard-stripe"—corporal, sergeant, and so forth) ranks for enlisted personnel. The rank of specialist (E-4) is the only vestige of that long-abandoned system.

might be needed if the warrant officer ranks were to serve an expanded role would require only policy changes. Nonetheless, expanding the role of warrant officers as a means of helping to meet personnel goals could require the services to alter fundamentally their views of what a warrant officer is.

APPENDIX A

AN OVERVIEW OF MANAGEMENT PRACTICES

FOR ENLISTED PERSONNEL AND COMMISSIONED OFFICERS

This appendix provides an overview of management practices for commissioned officers and enlisted personnel in the active-duty military. It is intended to make the paper's discussion of warrant officers and limited duty officers more accessible to readers who have little or no knowledge of those practices. The appendix necessarily glosses over some of the differences among the four services (the Army, Navy, Air Force, and Marine Corps) and omits entirely certain special classes of personnel, such as physicians and lawyers. Any numbers given refer to fiscal year 2000 unless otherwise noted.

In broad terms, junior enlisted personnel are analogous to the workers in a private company and officers to the executives. Between those two groups lie the noncommissioned officers (NCOs), or petty officers in the Navy, who operate as direct supervisors and middle managers. NCOs generally direct the same tasks that they had previously performed; the military allows no lateral entry of civilians, and lateral moves within the enlisted ranks are generally limited to those needed to correct occupational imbalances. Certain groups within the officer ranks—doctors and lawyers, for example—owe their status to the professional nature of their occupations. Any officer, however, even those not in the normal leadership tracks, has the authority to command the obedience of more junior officers and enlisted personnel.

ENLISTED PERSONNEL

The services draw most of their enlisted recruits from among recent high school graduates—most are under 20 years of age and almost all have either a high school diploma or some form of high school equivalency certificate. Recruits are generally promised training in a specific military occupation or occupational area, and they agree to serve for fixed periods ranging from two years for some recruits in particular occupations (primarily in the Army) to six years for others, with four-year terms being by far the most common. The services use enlistment bonuses to attract well-qualified recruits, channel them into specific occupations, and induce them to agree to longer enlistment terms. Some of the services also offer enhancements to the basic program of postservice education benefits (G.I. Bill) to attract and channel recruits.

Individual occupational specialties range in number from about 75 in the Navy to more than 200 in the Marine Corps. The Navy calls its basic enlisted

occupations ratings; personnel also qualify in subspecialties called navy enlisted classifications. In the Air Force, occupations are identified by Air Force specialty codes. The Army and the Marine Corps refer to military occupational specialties.

Through at least their first 10 years of service, enlisted personnel continue to serve on fixed-length enlistment contracts, choosing a new term length of two to six years each time they reenlist. (After their 10th year, they may reenlist either for a fixed period or for an unspecified period.) Depending on their occupational specialty, they may be eligible for a reenlistment bonus the first few times they reenlist (through their 14th year of service). The services regularly adjust the bonuses they offer to encourage retention in occupations with current or projected personnel shortages and may, as a condition of reenlisting, require people in occupations with too many personnel to retrain for occupations with too few personnel. The largest reenlistment bonuses can add as much as one-third to a person's pay over a four-year reenlistment, but bonuses adding 10 percent or less are far more common.

As their careers progress, enlisted personnel may rise through a series of nine pay grades—designated E-1 through E-9—each of which a service associates with one, or in some cases two, titles of rank. An E-7 in the Navy, for example, is called a chief petty officer; in the Army, he or she may be designated either a platoon sergeant or a sergeant first class. The first few promotions tend to occur on a fairly fixed schedule, but by the grade of E-4, more variation among individuals begins to appear. In the middle grades, promotions are generally based on a point system; individuals receive points on the basis of such factors as time in the service, time in grade, special qualifications (including college coursework), and commanders' evaluations. When positions in the next grade open up, those personnel with the most points are promoted. Promotions become increasingly competitive at each successive grade, and most personnel cannot expect to advance beyond grade E-6 or E-7. Some services provide more rapid promotions in some occupations than in others to balance retention patterns and occupation-specific personnel requirements; other services attempt to maintain roughly similar promotion timings for all occupations.

For each pay grade, the services establish a high year of tenure, limiting the careers of personnel who do not continue to advance. The Air Force, for example, forces most enlisted personnel who have not advanced beyond grade E-4 to leave after 10 years of service and those in grades E-5 and E-6 to leave after 20 years. All the services generally limit E-7s to no more than 24 years of service and allow only E-9s to complete 30 years. Like other service members, enlisted personnel may retire after 20 years of service with an immediate annuity equal to 50 percent of their monthly basic pay; if they leave earlier, they receive no retirement benefits. The amount of the annuity rises steadily if they stay in the military beyond 20 years, reaching a maximum of 75 percent of basic pay after 30 years of service.

COMMISSIONED OFFICERS

A college degree is the basic prerequisite for service as a commissioned officer. Most officers also receive their initial military training while in college, either at one of the service academies or in a reserve officer training corps (ROTC) program at one of numerous participating colleges and universities. Others attend one of the services' officer candidate schools after graduating from college. In addition, the services offer programs designed to assist enlisted personnel who wish to become officers to complete their college education. Academy and ROTC graduates are generally under 25 years of age when they become officers; those who enter through officer candidate school tend to be older, some of them because they served first in the enlisted ranks.

Officers' initial service obligations range from 3 years to 10 years, depending on the program through which they became officers and the occupational areas in which they are trained. Once they complete those initial obligations, officers may generally request separation at any time unless they are under a specific obligation incurred as a result of service-supported schooling, a promotion, or the acceptance of certain assignments.

Officers' occupational specialties are more broadly defined than those of enlisted personnel and thus are much fewer in number. Moreover, the services generally group those occupations even more broadly when considering officers for promotion. In every service but the Navy, all officers compete together for available promotions (excluding the occupations with special requirements, such as physician and lawyer). In the Navy, unrestricted line officers—those in the surface, submarine, or aviation warfare specialties—compete in one group. Those in other specialties, including engineering duty, cryptography, oceanography, and supply, compete for promotions only within their own specialties. Many of those specialties draw their personnel from among officers who first served in the unrestricted line.

Officers begin in pay grade O-1, with the rank of ensign in the Navy and second lieutenant in the other services, and may advance as high as O-10 (admiral or general). Most officers who complete at least 20 years of service end their careers as an O-5 (commander or lieutenant colonel) or O-6 (captain or colonel).

Officer promotions—and much of officer management—are constrained by provisions of the Defense Officer Personnel Management Act (DOPMA), which was enacted in 1980. DOPMA sets out the procedures for promotions and gives guidelines for the timing of promotions and the fraction of eligible officers who will be promoted to successive grades. For example, it says that promotion to O-5 should occur at between 15 and 17 years of service and that approximately 70 percent of eligible officers should be promoted.

Under DOPMA, the services must convene boards of officers to select from among those eligible the best qualified for promotion for each grade starting with O-3. Before convening a board, a service determines how many officers the board will select and establishes three zones of consideration based on the date of officers' promotion to their current grade. Most selections come from among officers in the *primary zone*, which includes the senior-most officers who were not in the primary zone for the previous board. In the Army and the Air Force, the primary zone typically encompasses exactly one year's worth of officers—the Army board for major (O-4) in 2001, for example, considered in the primary zone those officers who had been promoted to captain between October 2, 1994, and October 1, 1995. The other services vary the length of the primary zone from one board to the next. Smaller numbers of officers are selected from *below the zone*—those promoted to their current grade during a specified later period than the primary zone—and from among officers *above the zone*, who were not selected (“passed over”) when they were considered in the primary zone by a previous board.

Officer separations are governed by an up-or-out system, also part of DOPMA, that is designed to ensure a steady flow of personnel through the ranks. Those who are passed over twice for a particular grade—once in the primary zone and again above the zone—must leave shortly after the second rejection unless they are specifically selected for continuation. The services typically allow those passed over twice for O-5 to stay until they become eligible for retirement benefits.

APPENDIX B

MILITARY BASIC PAY AND REGULAR MILITARY COMPENSATION

Service members' basic pay depends on their pay grade and how long they have served in the military. In general, raises for longevity (length of service) come every two years, with the last occurring after 26 years. The full table of basic pay gives pay levels for 15 longevity points—Table B-1 shows four representative points and omits the pay rates for generals and admirals (pay grades O-7 through O-10).¹

Regular military compensation (RMC) provides a basis for comparing military pay with pay in civilian employment. In addition to basic pay, all service members receive either cash allowances for housing and subsistence costs or government-supplied housing and food. RMC consists of basic pay, the two allowances, and the so-called federal tax advantage—the extra amount that members would have to be paid, in order to have the same after-tax income, if the allowances were subject to federal income tax. (Calculations of the tax advantage necessarily require some rough assumptions about service members' tax situation.) In general, RMC does not vary among members in percentage terms as much as does basic pay; subsistence allowances differ only between enlisted personnel and officers (including warrant officers), and housing allowances differ less among pay grades than does basic pay and do not depend on length of service.

1. The full table of military basic pay can be found in Department of Defense, *Selected Military Compensation Tables* (various years) or on the World Wide Web at www.dfas.mil/money/milpay.

TABLE B-1. ANNUAL BASIC PAY AND REGULAR MILITARY COMPENSATION FOR SELECTED YEARS OF SERVICE, BY PAY GRADE, AS OF JULY 1, 2000

Pay Grade	Basic Pay				Regular Military Compensation ^a			
	2 Years	8 Years	16 Years	24 Years	2 Years	8 Years	16 Years	24 Years
Commissioned Officers								
O-6	53,539	59,720	69,494	80,629	78,182	84,363	94,137	105,272
O-5	45,767	51,502	63,432	69,023	68,738	74,473	86,403	91,994
O-4	40,007	47,765	57,107	57,704	58,944	66,702	76,044	76,641
O-3	34,610	44,431	49,669	49,669	49,294	59,115	64,353	64,353
O-2	30,326	36,853	36,853	36,853	42,668	49,195	49,195	49,195
O-1	24,059	29,077	29,077	29,077	35,441	40,460	40,460	40,460
Commissioned Officers with Over Four Years' Active Service as Enlisted Members								
O-3E	0	44,431	51,502	53,003	0	61,315	68,385	69,887
O-2E	0	38,023	42,674	42,674	0	52,714	57,365	57,365
O-1E	0	32,206	36,108	36,108	0	45,799	49,702	49,702
Warrant Officers								
W-5	0	0	0	57,395	0	0	0	76,789
W-4	33,462	38,606	45,043	51,476	49,929	55,074	61,511	67,944
W-3	30,665	33,779	39,578	45,360	45,384	48,498	54,297	60,079
W-2	26,791	30,665	35,388	40,540	40,373	44,246	48,970	54,121
W-1	23,652	27,994	32,818	34,931	36,287	40,629	45,453	47,566
Enlisted Personnel								
E-9	0	0	39,258	44,928	0	0	55,769	61,439
E-8	0	30,341	34,081	39,546	0	45,370	49,110	54,575
E-7	23,134	26,651	30,168	35,114	37,393	40,911	44,428	49,374
E-6	20,138	23,677	26,935	27,428	33,775	37,313	40,571	41,065
E-5	17,928	21,474	23,234	23,234	30,328	33,874	35,634	35,634
E-4	16,477	19,127	19,127	19,127	27,921	30,571	30,571	30,571
E-3	15,127	16,031	16,031	16,031	26,027	26,931	26,931	26,931
E-2	13,529	13,529	13,529	13,529	24,419	24,419	24,419	24,419
E-1	12,067	12,067	12,067	12,067	22,575	22,575	22,575	22,575

SOURCES: Congressional Budget Office from Department of Defense, *Selected Military Compensation Tables: 1 July 2000*, and other DoD sources.

- a. Regular military compensation consists of basic pay, basic allowance for subsistence, basic allowance for housing, and the tax advantage that accrues to military personnel because the allowances are not subject to federal income tax. The basic allowance for housing differs between service members with and without dependents and varies regionally. The figures shown are for members with dependents. For all but the warrant officer pay grades, the figures for the housing allowance and the tax advantage are DoD's estimates of nationwide averages. CBO adjusted the figures for the warrant officer pay grades to eliminate the effects of unusual regional distributions of personnel in those grades.



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