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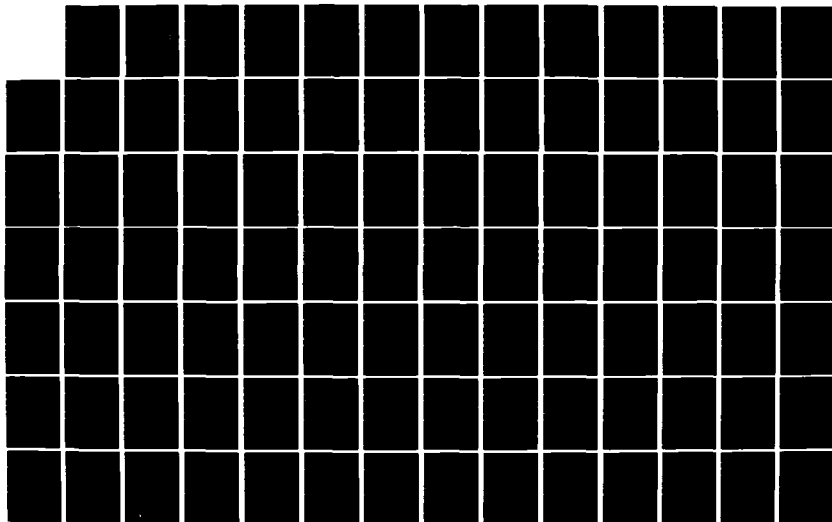
TECHNICAL SKILL TRAINING IN THE SELECTED MARINE CORPS
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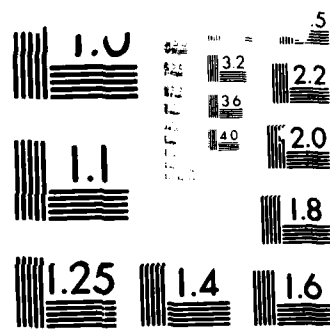
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Edward D. Simms, Jr.
Dayton S. Pickett

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LOGISTICS MANAGEMENT INSTITUTE
6400 Goldsboro Road
Bethesda, Maryland 20817-5886

**TECHNICAL SKILL TRAINING
IN THE SELECTED MARINE CORPS RESERVE**

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PREFACE

This working note describes current training strategies designed to build and sustain competence in logistics skills in the Selected Marine Corps Reserve. We invite comment and corrections to this document.

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TABLE OF CONTENTS

	<u>PAGE</u>
PREFACE	ii
 <u>CHAPTER</u>	
1. INTRODUCTION	1- 1
2. THE JOB	2- 1
Background	2- 1
MOS Distribution Between the Active and Reserve Components	2- 4
MOS Progression	2- 5
Wartime Utilization	2- 7
Units of Assignment	2- 7
Summary	2- 8
3. THE INCUMBENT POPULATION	3- 1
General	3- 1
Personal Attributes	3- 1
Experience	3- 4
Full-Time Support	3- 6
Summary	3- 8
4. LOGISTICS SKILL TRAINING SYSTEM	4- 1
Training Strategy	4- 1
The Reserve Component Training Environment	4- 5
Summary	4- 6
5. OBSERVATIONS	5- 1
 <u>APPENDIX</u>	
A. MARINE LOGISTICS/EMBARKATION SPECIALIST	
B. MARINE TRACKED VEHICLE REPAIRER, ASSAULT AMPHIBIOUS VEHICLE	
C. MARINE REPAIR SHOP MACHINIST	
D. MARINE RADIO TECHNICIAN	
E. MARINE INTERMEDIATE AUTOMOTIVE MECHANIC	
F. MARINE AIRCRAFT POWERPLANTS MECHANIC, J79	
G. MARINE HELICOPTER MECHANIC, CH-46	

1. INTRODUCTION

This working note describes the approach now used by the Marine Corps to build and sustain technical logistics skills in individual Marines of the Selected Marine Corps Reserve. The purpose of this work is to assess both the suitability and the adequacy of the policies and programs that support technical skill training for the men and women of the Marine Corps Reserve.

We address only the programs dealing with developing and sustaining specific, important technical logistics skills of individual enlisted personnel, rather than training programs for management and supervisory skills or training efforts in collective or unit proficiency. ^{It has} We have concentrated on seven Marine Corps logistics specialties as they occur in the Selected Marine Corps Reserve and have excluded consideration of the Individual Ready Reserve. In this working note, therefore, the terms "Reserve," "Selected Reserve," and "Selected Marine Corps Reserve" are used interchangeably.

For a full understanding of the requirements that must be met by individual training programs, we first analyze the military jobs -- the roles and responsibilities of the enlisted logistics specialists of the Selected Marine Corps Reserve -- considering wartime assignments as well as documented peacetime duties. ⁷ Second, we review data on the personal attributes and experience of the Marine Corps Reservists who now occupy these positions to understand whom the Marine Corps is training. Third, we analyze the overall training strategy¹ and the specific training programs that prepare logistics specialists of the Marine Corps Reserve for their wartime tasks. These analyses are presented in the following sections, while specific details for each Military Occupational Specialty (MOS) in our sample are presented separately in Appendices A through G.

¹A training strategy in this context is the overall approach that governs the training in these skills, including training plans, policies, and procedures.

2. THE JOB

BACKGROUND

Skill Level, Grade, and MOS

Throughout this report, and in related working notes dealing with other Military Services, the terms "apprentice," "journeyman," "master," and "supervisor/manager" indicate a logical progression of job competence and responsibility within each specialty. These terms are our own and, in the case of the Marine Corps, are not recognized formally. For purposes of general understanding and comparison, however, we have sought and achieved informal agreement on the general applicability of the terms and their use with Marine Corps specialties. We believe this is particularly helpful here because this Military Service does not identify skill levels or ranges by any numerical or alphabetical indicators within its MOS system.

Each of the terms¹ (apprentice, journeyman, master) denotes a general level of proficiency and a range of skills or tasks within the military job. In general, higher-skilled jobs require higher proficiency levels (including the ability to teach others) over a broader range of tasks than do lower-skilled jobs in the same MOS.

Apprentices are Marines who have successfully completed both Recruit Training (boot camp) and a basic technical training course and who have thereby attained basic knowledge within their specialty but lack the experience and proficiency to perform most tasks without supervision. In Marine Corps manning documents, apprentice positions or billets never appear without at least one accompanying journeyman billet.

Journeymen have shown proficiency in their military jobs. They can reasonably be expected to perform without direct supervision. They are also expected to teach apprentices during

¹Though the "supervisor/manager" term is helpful in describing levels of job skills, this study concentrates on those levels where technical competence and performance are emphasized: apprentice, journeyman, and master.

on-the-job training. The enlisted grade boundary between apprentice and journeyman skill levels in the Marine Corps differs between ground force skills and aviation skills.²

Masters have a high degree of technical knowledge and ability and have acquired supervisory capacity through training and experience. In the Marine Corps, the merging or combining of career ladders for purposes of supervision occurs routinely at the supervisor/manager level. Table 2-1 relates the skill progression terms used by the Logistics Management Institute (LMI) to the enlisted grade structure of the Marine Corps.

TABLE 2-1. SKILL LEVELS AND GRADES

LMI TERM	MARINE CORPS ENLISTED GRADE
Apprentice	E1, private (PVT) E2, private first class (PFC) E3, lance corporal (L/CPL) E4, corporal (CPL) (aviation skills only)
Journeyman (ground force skills)	E4, corporal (CPL)
Journeyman (aviation and ground force skills)	E5, sergeant (SGT) E6, staff sergeant (SSGT)
Master	E7, gunnery sergeant (GYSGT) E8, master sergeant (MSGT)
Supervisor/Managera	E9, master gunnery sergeant (MGYSGT)

^aPositions at this level are not included in this report.

²The Marine Corps considers the promotion from E3 to E4 of great significance. In ground force units, the corporal is accepted as being capable of independent work and responsible for conducting on-the-job training for E1-E3 apprentices -- the general criterion for journeyman status. In the aviation skills, the E5 sergeant is considered to be the lowest ranking journeyman, thereby bringing Marine Corps journeymen in line with the rest of Naval aviation.

The Marine Corps also recognizes levels of skill or expertise by means of the sequential arrangement of MOSs. Though some MOSs are authorized a full range of enlisted grades (E1, or private, through E8, or master sergeant³), many are limited in their grade authorizations (e.g., E3 through E6). The latter type of arrangement implies the existence of additional MOSs to round out the specialty through all enlisted grades and skill levels, as is shown schematically in Figure 2-1. The seven specialties chosen for this study are displayed in Figure 2-2.

FIGURE 2-1. HYPOTHETICAL SPECIALTY WITH MULTIPLE MOSs AND ENLISTED GRADE STRUCTURE

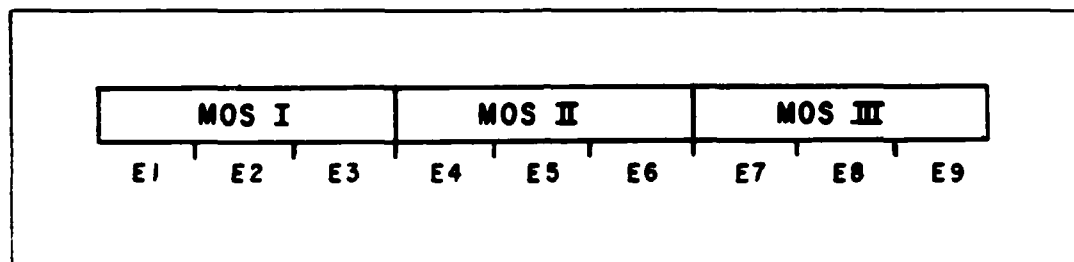


FIGURE 2-2. GRADE AUTHORIZATIONS FOR STUDY MOSs AND CONNECTING MOSs

STUDY MOS	ENLISTED GRADES							
	E1	E2	E3	E4	E5	E6	E7	E8
	APPRENTICE			JOURNEYMAN ⁽¹⁾			MASTER	
0431	0431					0491		
2142	2142						2149	
2161	2161						2181	
2861	2841				2861			
3522	3521		3522			3529		
6024				6024			6019	
6112				6112			6119	
MOS IN STUDY CONNECTING MOS								

(1) FOR THE MOSs OF THE GROUND FORCES, THE JOURNEYMAN RANGE IS E4 THROUGH E6. FOR AVIATION MOSs THE JOURNEYMAN RANGE IS E5 THROUGH E6.

³E9 master gunnery sergeants are considered manager/supervisors and are therefore not discussed as part of this study.

Military Occupational Specialty Descriptions

To assess the Marine Corps' training approach to enlisted logistics skills, we analyze seven MOSs in detail. These MOSs are chosen because (1) a moderate-to-high level of skill is required, (2) the skill is representative of Selected Marine Corps Reserve logistics specialties, or (3) one or more features of the training requirement or environment make training especially difficult in the Marine Corps Reserve. The MOSs are shown, accompanied by simplified job descriptions, in Table 2-2.

TABLE 2-2. MARINE CORPS MOSs SELECTED FOR STUDY

MOS	TITLE	SIMPLIFIED JOB DESCRIPTION
0431	Logistics/Embarkation Specialist	Plans and provides technical loading advice for troops, supplies, and equipment. Acts as logistics clerk.
2142	Tracked Vehicle Repairer, Assault Amphibious Vehicle	Maintains and repairs the Assault Amphibious Vehicle of the Marine Corps.
2161	Repair Shop Machinist	Repairs, builds, or changes equipment or assembly parts, using machine and hand tools. Welds. Maintains shop equipment.
2861	Radio Technician	Installs, maintains, repairs, and modifies many types of ground radios.
3522	Intermediate Automotive Mechanic	Maintains and repairs automotive equipment (at intermediate and depot levels).
6024	Aircraft Powerplants Mechanic, J79	Provides off-aircraft intermediate maintenance and repair of the J79 jet engine.
6112	Helicopter Mechanic, CH-46	Performs flightline organizational maintenance and repair of the CH-46 helicopter.

MOS DISTRIBUTION BETWEEN THE ACTIVE AND RESERVE COMPONENTS

With the reactivation of the Fourth Marine Division as a Selected Reserve unit in 1966, the Marine Corps emphasized organizationally the existence of a general three-to-one ratio of Active

billets to Reserve billets. The present force structure allocations⁴ influence the overall Active/ Reserve ratios in personnel and equipment. The distribution of logistics specialties between the Active Marine Corps and its Selected Reserve gives insight into the importance of Selected Reserve logistics specialists to the Total Force. One-fifth of the billets required for these seven MOSs in the force structure of the Fleet Marine Force⁵ in fiscal year 1985 are assigned to the Selected Reserve. Dependence on the Reserve for these specialists ranges from 10 to 25 percent of requirements. Table 2-3 presents specific information about this distribution.

TABLE 2-3. MARINE CORPS SKILLS: SELECTED RESERVE/DEPENDENCE

MOS	POSITIONS			RESERVE PORTION OF TOTAL (PERCENT)
	Total	Active	Reserve	
0431	1,148	872	276	24
2142	829	653	176	21
2161	189	142	47	25
2861	524	405	119	23
3522	964	765	199	17
6024	194	157	37	19
6112	822	742	80	10
TOTALS	4,670	3,736	934	20

MOS PROGRESSION

General

The Marine Corps specialties chosen for study represent two different approaches to skill progression. Figure 2-2 shows the range of grades authorized for each of the seven MOSs selected,

⁴Three Marine divisions, three force service support groups, and three Marine aircraft wings are assigned to the Active Component of the Marine Corps. One Marine division, one force service support group, and one Marine aircraft wing are assigned to the Selected Reserve.

⁵The Fleet Marine Force (FMF) is made up of all the deployable combat forces, both Active and Reserve, of the Marine Corps. The FMF does not include the complements of bases and stations, the staff of Headquarters Marine Corps, or other support or ancillary elements.

with the apprentice/journeyman/master classifications superimposed upon that display. The three MOSs with limited grade authorizations are connected to other MOSs, rounding out the full grade spectra of those specialties. Thus, the Logistics/Embarkation Specialist (0431) MOS includes no masters; all masters in this specialty are assigned to the MOS for Combat Support Chief (0491). Similarly, the Radio Technician (2861) MOS includes no apprentices; all apprentices working in this field bear the MOS for Ground Radio Repairer (2841).⁶ The MOS for Intermediate Automotive Mechanic (3522) is actually surrounded by the apprentice-only Organizational Automotive Mechanic (3521) and the journeyman/master Motor Transport Maintenance Chief (3529).

Apprentice

Marine Corps apprentices in technical logistics specialties (grades E1-E3 in ground force skills, grades E1-E4 in aviation skills) perform their duties under the supervision of journeymen. Across the MOSs selected for study, the key indicator of apprentice-level performance is lack of independence. The tasks required of the apprentice, where they appear to be the same as those required of the journeyman, differ in that they are performed under supervision.

Journeyman

Marines who are journeymen may be E4, corporals (ground forces only); E5, sergeants; or E6, staff sergeants. Technical supervisory duties, operation of more complex equipment, supervision of on-the-job training, and higher levels of task performance are job requirements of the journeyman logistics technician in the Marine Corps. The journeyman must perform apprentice tasks without supervision, review the work of apprentices (and of subordinate journeymen), and instruct them in improved work methods.

Master

The master may be an E7, gunnery sergeant, or an E8, master sergeant. The roles of shop foreman, section chief, or flight line supervisor, typical of master technicians in these

⁶The 2861/2841 relationship represents one of the few cases of MOS overlap among Marine Corps logistics skills. Specialists in grade E5 may be either 2841s or 2861s.

specialties, demonstrate the levels of technical supervision and experience expected of these senior noncommissioned officers. Work scheduling and other planning activities are accompanied by extensive diagnostic work (in the maintenance skills) and technical advisory efforts as tasks of the master. Occasionally, master skills are performed individually (as in the case of the master Repair Shop Machinist), but they usually involve extensive technical supervision of others.

WARTIME UTILIZATION

Arranged in order of priority, the roles of the Selected Marine Corps Reserve upon mobilization⁷ are to:

- Augment selectively the active forces in order to field the three active Marine Amphibious Forces (MAFs)⁸ at full wartime structure.
- Reinforce the active MAFs with selected units if warranted by threat assessment.
- Provide capability to reinforce with an additional Marine Amphibious Brigade (MAB).
- Provide a full division, wing, and Force Service Support Group (FSSG), if "augment/reinforce" is not ordered.
- If "augment/reinforce" is ordered, provide a nucleus to reconstitute a full division, wing, and FSSG.

The high priority attached to the augment/reinforce missions implies that logistics units in the Fourth Force Service Support Group may be required to support active MAFs in wartime. This priority of missions seems to imply that Selected Reservists who are logistics specialists will, upon mobilization, serve in the work centers, shops, teams, or companies to which they are now assigned.

UNITS OF ASSIGNMENT

The MOSs chosen for study represent a high degree of variation in the nature of the specialties themselves and in the length and intensity of training required for preparation. Similarly, these

⁷From the testimony of Major General J. J. Went, Deputy Chief of Staff for Reserve Affairs, U.S. Marine Corps, before the Subcommittee on Manpower and Personnel, Committee on Armed Services, U.S. Senate, 12 March 1985.

⁸A MAF consists of a Marine division, a force service support group, and a Marine aircraft wing.

skills are distributed among several different types of units of the FMF. Table 2-4 provides a summary of the billet distribution of the seven study specialties; a more detailed discussion appears in each appendix.

TABLE 2-4. DISTRIBUTION OF STUDY SPECIALTIES

(Fleet Marine Force)

MOS/TITLE	DISTRIBUTION
0431 Logistics/Embarkation Specialist	Widest dispersion of 7 MOSs: 2/3 in ground forces, 1/3 in aviation. Of those in ground forces, 25-30 percent ^a in FSSG. Many others serve in headquarters units.
2142 Tracked Vehicle Repairer, AAV ^b	55-65 percent in AAV battalions. The remainder serve in maintenance battalion of FSSG.
2161 Repair Shop Machinist	80-90 percent in ground forces. Most of those in maintenance battalion of FSSG. Aviation billets in H&MS ^c of Marine aircraft group.
2861 Radio Technician	Wide distribution in electronic repair units or cells. Over 3/4 in ground forces, most in maintenance battalion of FSSG and in communications company of division headquarters. Most aviation billets in wing communications squadron of Marine air control group.
3522 Intermediate Automotive Mechanic	More than 95 percent in ground forces. Almost all in maintenance battalion of FSSG.
6024 Aircraft Powerplants Mechanic, J79	All in aviation units -- in F-4 flying squadrons.
6112 Helicopter Mechanic, CH-46	All in aviation units. 80-95 percent in CH-46 flying squadrons; most of remainder (Active only) in large headquarters or (Reserve only) in H&MS.

^aDistribution figures are expressed in ranges because of differences between the Active and Reserve distributions. These differences are not large; they are discussed more explicitly for each skill in each appendix.

^bAssault Amphibious Vehicle.

^cHeadquarters and maintenance squadron.

SUMMARY

The seven specialties chosen for study are critical to sustained combat operations with a variety of weapon and support systems of the Fourth Marine Division and the Fourth Marine Aircraft

Wing. The specialties lie at the heart of limited -- but critically important -- combat logistics support in the Marine Corps. They represent examples of that logistics support built into Marine maneuver and flying units, as well as the combat service support provided by the force service support group or the Marine wing support group. Upon mobilization, the work of these specialists would be important in enhancing and reinforcing the battlefield support of the current Active Component elements of the FMF. We examine each of these specialties in separate appendices.

3. THE INCUMBENT POPULATION

GENERAL

This chapter describes the Selected Marine Corps Reserve population assigned to the seven sample specialties and compares it with its Active Component counterpart. We examine two general sets of characteristics -- personal attributes and experience factors -- that affect trainability and job performance.

PERSONAL ATTRIBUTES

Logistics specialists of the Selected Marine Corps Reserve are similar to their Active Component counterparts. Despite some variations between the groups in the three attributes reviewed (age, aptitude area scores, and civilian education), the populations resemble one another to a great degree. Tables 3-1 through 3-3 show grouped personal attribute information across the entire Marine Corps population of the seven specialties studied.

Age

Reservists assigned to these logistics specialties are only slightly older than their Active Marine Corps counterparts. There are some age differences in every enlisted grade, but the two populations are remarkably similar overall. Table 3-1 contains information about the average age of incumbents.

Aptitude Area Scores

There are no consistent differences in aptitude area scores¹ between the Active and Reserve Components for the seven MOSs. The scores on the pertinent subtest composites of the

¹Aptitude area scores are derived from a combination of subtest scores in the Armed Services Vocational Aptitude Battery (ASVAB), which is administered at the time of entry into the Marine Corps. They are used to predict an individual's potential for success in training in a Marine Corps specialty.

**TABLE 3-1. INCUMBENT PERSONAL
ATTRIBUTES -- AGE**

GRADE	COMPONENT	MEAN AGE (YEARS)
E1-E3	Active	21.4
	SMCR ^a	21.9
E4	Active	23.3
	SMCR	23.4
E5	Active	26.4
	SMCR	26.8
E6	Active	29.9
	SMCR	32.9
E7	Active	34.8
	SMCR	37.1

^aSelected Marine Corps Reserve.

ASVAB for each MOS show both groups of incumbents -- Active and Reserve -- to have about the same potential for successful completion of training. Unfortunately, the relatively small population of incumbents in some specialties, particularly among the Reservists, makes some groupings assigned to specific enlisted grades too small for comparison. Table 3-2 lists comparative data on aptitude area scores for the specialties studied.

Civilian Education

Members of the Selected Reserve assigned to the study specialties are somewhat less likely to have completed high school and slightly less likely to go on to college than their Active Component counterparts. Despite these differences, the Active and Reserve populations are quite similar. Table 3-3 displays information about civilian education of incumbent Marines.

TABLE 3-2. INCUMBENT PERSONAL ATTRIBUTES -- MEAN APTITUDE AREA SCORES

GRADE	COMPONENT	SPECIALTIES						
		0431 ^a	2142 ^b	2161 ^c	2861 ^d	3522 ^e	6024 ^f	6112 ^g
E1-E3	Active SMCR	107.2	103.9	110.0		103.4	106.8	108.0
		103.3	105.1	IDA ^h		105.7	IDA	IDA
E4	Active SMCR	103.5	105.2	108.0		102.1	102.6	107.5
		105.3	114.4	IDA		108.1	IDA	105.4
E5	Active SMCR	99.8	104.8	105.5	116.7	100.4	106.8	106.1
		104.6	108.7	101.6	IDA	104.2	113.7	108.8
E6	Active SMCR	103.1	105.5	102.1	118.4		103.0	100.9
		111.3	IDA	IDA	118.6		IDA	DUR
E7	Active SMCR		IDA	IDA	130.7		DUR ⁱ	IDA
			IDA	IDA	126.0		IDA	IDA

^aMinimum acceptable score in this subtest (General Technical) is now 100.

^bMinimum acceptable score in this subtest (Mechanical Maintenance) is now 100.

^cMinimum acceptable score in this subtest (Mechanical Maintenance) is now 100.

^dMinimum acceptable score in this subtest (Electronics) is now 115. Data on E8 Marines in this specialty were not requested.

^eMinimum acceptable score in this subtest (Mechanical Maintenance) is now 90.

^fMinimum acceptable score in this subtest (Mechanical Maintenance) is now 100.

^gMinimum acceptable score in this subtest (Mechanical Maintenance) is now 100.

^hInsufficient data available.

ⁱData under review.

NOTE: Blank areas indicate grades not authorized for that specialty.

TABLE 3-3. INCUMBENT PERSONAL ATTRIBUTES -- CIVILIAN EDUCATION COMPLETED

(Percentage of Total)

COMPONENT	HIGH SCHOOL			SOME COLLEGE ^b	UNK ^c
	Nongraduate	GED ^a	Diploma Graduate		
Active	2.8	0.0	92.5	4.6	<0.1
SMCR	6.2	4.5	76.0	2.3	11.0

^aIncumbents who have completed high school through General Education Development (GED) equivalency.

^bIncumbents who have completed some college or university work.

^cUnknown -- Incumbents for whom data on civilian education are missing.

EXPERIENCE

Four experience factors for Selected Marine Corps Reserve populations are reviewed: prior active military service, length of total service, time in grade, and level of full-time support. Information about related civilian occupations of Reservists was also sought, but those data are not systematically captured and stored for ready review.

Within each specialty, if a significant portion of the incumbents bring related experience to their military jobs, training is easier, and technical skills are easier to sustain with moderate training than if the group had no experience related to their military jobs. Skills are also easier to sustain where Reservists have reasonable opportunities to obtain technical help from a large enough full-time support staff qualified in the same specialties.

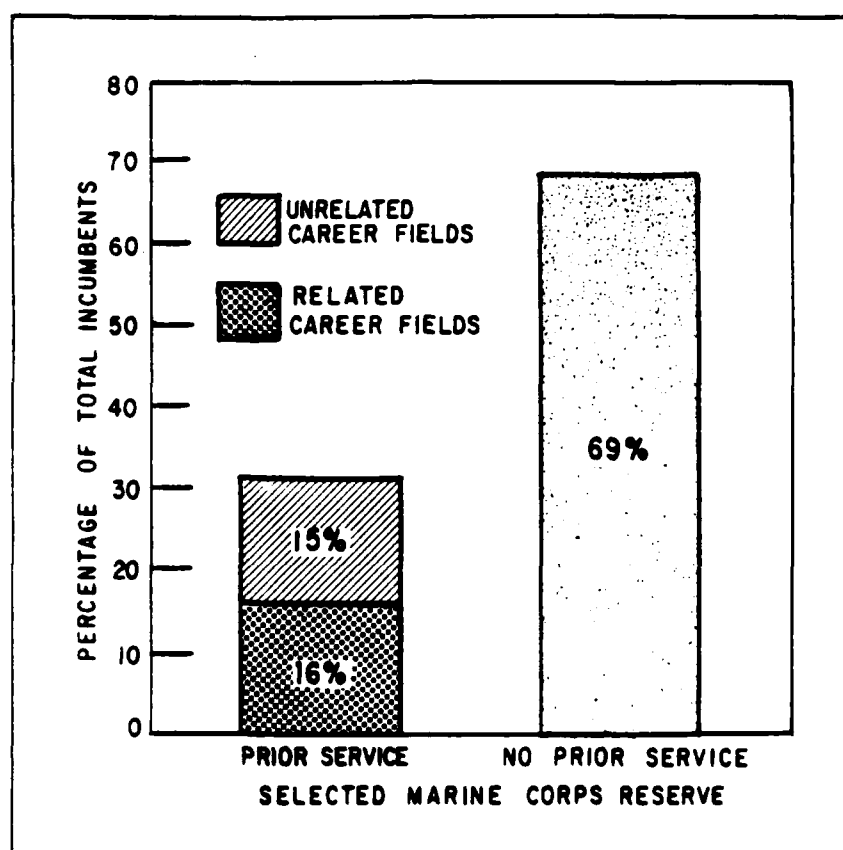
Prior Military Service

Almost one-third (31 percent) of all Marine Corps Reservists assigned to the MOSs in this study have had prior military service² of some kind in the Active Component. Just under one-sixth (16 percent) of all incumbents have had active military service in related career fields.³ Figure 3-1 displays prior active military service.

²All estimates of prior active military service discussed in this section are based on data supplied by the Defense Manpower Data Center (DMDC) and derived from cumulative active duty loss records, by specialty, since 1971. We have enhanced these data by projecting an additional prior service increment based on seniority in the enlisted population of the Marine Corps Reserve. This was done to compensate for the early (1971) data cutoff at DMDC.

³Service in "related career fields" means (1) service in the Marine Corps in the same MOS; (2) service in the Marine Corps, not in the same MOS but in the same Department of Defense (DoD) occupational code; and (3) service in a different Military Service in the same DoD occupational code.

**FIGURE 3-1. INCUMBENT EXPERIENCE --
PRIOR ACTIVE MILITARY SERVICE**



Length of Service/Time in Grade

The Reserve and Active Marine Corps populations of incumbents are remarkably similar, when compared, grade by grade, for these two experience factors. Table 3-4 lists the information.

**TABLE 3-4. INCUMBENT EXPERIENCE -- LENGTH OF SERVICE/
TIME IN GRADE**

GRADE	COMPONENT	AVERAGE LENGTH OF SERVICE ^a (YEARS)	AVERAGE TIME IN GRADE (YEARS)
E1-E3	Active	2.5	1.2
	SMCR	3.1	1.3
E4	Active	4.3	1.3
	SMCR	3.8	0.8
E5	Active	7.4	2.6
	SMCR	6.7	2.7
E6	Active	10.7	3.1
	SMCR	11.3	2.8
E7	Active	15.7	3.4
	SMCR	16.5	2.9

^aIncludes all prior military service, if any.

FULL-TIME SUPPORT

Full-time technical support for the Selected Marine Corps Reserve is provided by Marines on active duty.⁴ Though a small amount of clerical and other administrative support for the Reserve is provided by civilian employees, that nontechnical support is not considered in this study.

Full-time technical support for units of the Fourth Marine Division and Fourth Force Service Support Group is provided by Marines assigned to instructor-inspector (I-I) staffs at the home station of each unit served. These Marines are not members of Selected Reserve units, but are "slotted against" appropriate unit vacancies for readiness reporting purposes. Upon mobilization, the I-I staff members will mobilize and deploy with the Reserve unit they have served, if that unit has vacancies of the proper MOS and grade. If it does not, the I-I staff members will be reassigned as individuals.

⁴Over 80 percent of these support people are Regular Marines serving normal tours of duty, while the remainder are designated full-time support, or FTS. This latter group consists of Marine Reservists serving 2- or 4-year contract tours of active duty in support of Selected Reserve units. The size of the FTS group is growing steadily.

For the Fourth Marine Aircraft Wing (MAW), the assignment of full-time support staff differs from that of the ground force units. Marines supporting the Fourth MAW are assigned directly to Reserve billets of the proper grade and MOS. This means that full-time support Marines of the Fourth MAW will mobilize and deploy with the units they serve in peacetime.

Full-time support levels are highest in the aircraft maintenance skills, reaching almost 50 percent in the military job of Helicopter Mechanic, CH-46. Elsewhere (except for the highly skilled Radio Technician), full-time support levels are routinely below 10 percent of the total number of Reserve billets. Table 3-5 displays these data for all seven study specialties.

**TABLE 3-5. FULL-TIME SUPPORT FOR SELECTED
MARINE CORPS RESERVE (SMCR)**

SPECIALTY	TOTAL SMCR BILLETS REQUIRED	FULL-TIME SUPPORT	
		Assigned	Percentage of Required Strength
0431	276	19	7
2142	176	9	5
2161	47	1	2
2861	119	41	35
3522	199	9	5
6024	37	14	38
6112	80	39	49
TOTALS	934	132	14

Position Turbulence

During our early work on this project, we tried to determine the length of time each incumbent had served in the specific position now held. We believed that average time in job across a large population is a reasonable measure of personnel turbulence, a factor which affects ability to sustain individual skills. We intended to compare the Active and Reserve populations using this measure. Difficulties were encountered in matching individual personnel files with personnel transaction files; we are therefore unable to make the desired comparisons.

SUMMARY

The Active and Selected Marine Corps Reserve populations with the MOSs selected for study are remarkably similar. Variations or differences are neither consistent nor striking. Marine Reservists appear to be no easier to train than their Active Component counterparts.

The similarity exists not only when personal attributes are considered, but also when experience factors are taken into account. Marine Selected Reservists do not bring appreciable levels of prior service experience to their Reserve military jobs. They do not show longer periods of military service, nor do they serve longer in each enlisted grade, than Active Component Marines of the same MOS.

Finally, the levels of full-time support for these Selected Reserve specialists vary dramatically among the MOSs studied. Aviation skills are supported heavily, as is the Radio Technician MOS. Marine Reservists in the other four MOSs studied, however, have more restricted levels of full-time support.

4. LOGISTICS SKILL TRAINING SYSTEM

TRAINING STRATEGY

General

For the seven MOSs studied, the standard training program for the Reservist is identical to that for training the Active Marine Corps logistics specialist. Training developers concentrate on the Active Component of the Marine Corps as the target audience when designing training programs, including skill progression plans after formal institutional training.

The training model for the Active Component in these technical fields calls for 2 to 71 weeks of technical training. This follows recruit training (boot camp), which takes 8 weeks for females and 10 weeks for males. Two of the specialties -- Radio Technician (2861) and Intermediate Automotive Mechanic (3522) -- require some accumulation of mid-career work experience as a prerequisite for completing the training that ends with the award of the MOS. The Marine Corps does not waive this experience requirement for Reservists.

Some mid-career courses are available, but they are required for the 2861 and 3522 MOSs only. Reservists do not normally attend these courses. Table 4-1 shows the Marine Corps' overall training strategy associated with the seven specialties considered.

Apprentice Training

In the Marine Corps, apprentice training is provided most often by Initial Skill Training (IST), which is "Training undertaken by each Marine subsequent to recruit . . . training to initially qualify for a basic MOS."¹ Five of the seven MOSs selected for this study are awarded as a result of this type of training (see Table 4-1).

¹As defined in Marine Corps Order 1500.40, "Marine Corps Training Philosophy, Definitions, Priorities, and Training Requirements," 13 November 1980, pp. 3-4.

TABLE 4-1. TECHNICAL SPECIALTY TRAINING STRATEGY

SPECIALTY	RECRUIT TRAINING (WEEKS)	INITIAL SKILL TRAINING FOR MOS AWARD (WEEKS)	SKILL PROGRESSION TRAINING FOR MOS AWARD (WEEKS)	CAREER MATURATION (FOR FURTHER SKILL DEVELOPMENT)
0431	8 or 10 ^a	2.0	N/A ^b	OJT/OJE ^c through E6 (3 courses available)
2142	10	8.0	N/A ^b	OJT/OJE through E7 (3 courses available)
2161	8 or 10 ^a	15.3	N/A ^b	OJT/OJE through E7 (1 course available)
2861	8 or 10 ^a	36.6 ^d	34.6 ^e	OJT/OJE through E8 (no courses available)
3522	8 or 10 ^a	17.0 ^f	19.0 ^e	OJT/OJE through E5 (4 courses available)
6024	8 or 10 ^a	10.1	N/A ^b	OJT/OJE through E7 (4 courses available)
6112	10	14.0	N/A ^b	OJT/OJE through E7 (4 courses available)

^aEight weeks for females, ten for males.^bNot applicable.^cOn-the-job training/on-the-job experience.^dResults in award of MOS 2841, Ground Radio Repairer.^eAdmission to this course requires work experience at the lower-skilled MOS.^fResults in award of MOS 3521, Organizational Automotive Mechanic.

In isolated cases, apprentice training may be followed by institutional training called Skill Progression Training, which is "...training received subsequent to initial skill qualification training, which provides a Marine with additional skills and knowledge in his/her MOS to perform at a more skilled level or in a supervisory position."² One of the MOSs selected for study, 3522, is awarded at the apprentice level after Skill Progression Training.

²As defined in Marine Corps Order 1500.40, "Marine Corps Training Philosophy, Definitions, Priorities, and Training Requirements," 13 November 1980, pp. 3-4.

Journeyman Training

Journeyman status is achieved either through on-the-job training and experience³ or by completion of Skill Progression Training, as with Radio Technician (MOS 2861). On-the-job training is discussed elsewhere in this chapter.

Master Training

Master training is conducted by means of on-the-job training and experience or formal Skill Progression Training courses. Where formal, mid-career Skill Progression Training courses are required for award of an MOS, the requirement for that training is not waived for Selected Reservists.

On-the-Job Training: Present

On-the-job training is the main vehicle for sustaining skills in the Marine Corps. In all ground force units of the Marine Corps, on-the-job training in the various MOSs is now based on the duties and tasks listed in the Corps' MOS Manual, which is updated twice each year. These duties and tasks are expressed in general language, not accompanied by performance standards applicable to individual tasks. Because, moreover, the unit file of each Marine includes no formal record of this kind of training, unit-based on-the-job training programs are somewhat uneven and informal.

Furthermore, the Performance Evaluation System of the Marine Corps (for E5s and above) does not place the same emphasis on technical proficiency in job performance as it does on leadership and common military skills. This lack of emphasis on technical job performance is also true of the semiannual Proficiency and Conduct ("Pro & Con") evaluations of enlisted Marines of the lower (E1-E4) grades, as called for in the Individual Record Accounting Manual. Technical job proficiency is therefore not an important factor in the reward system of the enlisted logistics specialist.

³On-the-job experience refers to a continuing workload that is characteristic of a section, department, or other work center and that requires some work output on a regular basis from the work center specialists. In the course of conducting training flights, for example, a Marine aircraft squadron generates on-the-job experience for its maintenance personnel, who must perform maintenance so that sorties can continue. On-the-job experience, though not mentioned in Marine Corps training literature, plays an important role -- where it is present during peacetime -- in skill sustainment and improvement.

On-the-Job Training: Future

In 1981, the Marine Corps published Marine Corps Order 1510.34, "Individual Training Standards (ITS) System." This marked the beginning of a major effort to revamp on-the-job training (and institutional training as well) throughout the Marine Corps. That effort is continuing. If successful, it will make detailed job task descriptions and performance standards called Individual Training Standards available in all units. Tasks identified as unit training responsibilities are to be taught by managed-on-the-job training (MOJT). While it is not yet clear whether or to what extent the ITS System will affect fitness ratings or "Pro & Con" evaluations of enlisted Marines, the new system will undoubtedly increase the amount of information about job tasks and performance standards for on-the-job training in units.

Marine Corps plans call for the publication of an ITS System for each occupational field (OccFld). One such system -- for OccFld 40, Data Systems -- has been published. No ITS System has yet been developed for the MOSs in our review, however. The schedule for ITS development calls for publication of ITS Systems for all 38 OccFlds by the end of fiscal year 1989. These systems will incorporate the Maintenance Training Management and Evaluation Program (MATMEP) now operating in all aviation units of the Selected Marine Corps Reserve. This program represents a thorough and structured approach to on-the-job training in the aircraft maintenance specialties, and is being incorporated as Marine Corps-wide policy under the ITS System development. MATMEP is discussed further in Appendices F and G.

Training Support

Requirements for training simulators, devices, and other support materials are identified by Marine Corps units and schools. Those requests with merit are ultimately reviewed by Headquarters Marine Corps. It is Marine Corps policy that Active and Reserve Component Marines use the same simulators and devices. But it is not Marine Corps policy to develop training devices and simulators specifically for use at Reserve armories. We could not discover any instance where training devices or simulators had been developed with Reserve logistics specialists primarily in

mind. Some alteration of published training course support materials does occur in association with the shortening of training courses to accommodate Reserve participants.

THE RESERVE COMPONENT TRAINING ENVIRONMENT

The training environment of the Selected Marine Corps Reserve differs markedly from that of the Active Marine Corps. The main training difficulties caused by the Reserve Component training environment are related to limits on training time available and to the geographic dispersion of Reserve units.

In general, members of Selected Marine Corps Reserve units have about 38 days of military duty a year. These days are divided between an Inactive Duty for Training (IDT) phase (about 24 days) and an active-duty Annual Training Duty (ATD) phase (about 14 days). Additional periods of training may be authorized on special occasions when the need is demonstrated.

Geographic dispersion of Selected Marine Corps Reserve units affects each unit in several negative ways. From a training perspective, support units that are separated from the activities they support lose most of the opportunities for on-the-job experience that are normally available to maintenance and other units of their kind. Though imaginative local arrangements, such as repairing equipment for nearby Army National Guard units, are sometimes possible, only rarely is a Reserve support unit able to work at the mission-oriented operating tempo conducive to good technical work experience. This difficulty occurs more often with ground force units than with aviation units, where maintenance work centers are routinely located with the flying units they serve. Peacetime sorties provide important and relevant workload for training the Marines supporting those sorties.

The Marine Corps Reserve has some difficulty in keeping its logistics specialist billets filled with trained people. During this study, for instance, manning levels of MOS-qualified people in the Fourth Force Service Support Group stood at 61 percent of required totals in the specialties selected for review.

SUMMARY

The Marine Corps' approach to training both Active and Reserve Component logistics specialists is designed for the Active Component. That approach requires intensive Initial Skill Training followed by what heretofore has been somewhat informal on-the-job training, except for aircraft maintenance skills. The program of on-the-job training is being altered in a major way by development of the ITS Systems, incorporating the well-established MATMEP of the aircraft maintenance fields. Some mid-career training courses are available, but they are not well attended by representative numbers of Reservists.

5. OBSERVATIONS

TRAINING REQUIRED

Logistics specialists of the Marine Corps Selected Reserve are required to maintain the same levels of performance ability as Active Marine logistics specialists. Though the Marine Corps does not depend heavily upon specialists in these fields, there is some difficulty in keeping adequate numbers of qualified Marines in the billets authorized, particularly in the force service support group. Thus far, the Marine Corps has not mounted remedial programs to produce the training required.

TRAINING STRATEGY

The present strategy for training in technical logistics skills is the same for Marine Reservists as for Active Component Marines. On-the-job training and experience constitute the basic approach to sustainment training. The on-the-job training and experience phase of that training performed during Inactive Duty for Training does not account for the unique and difficult aspects of the Reserve Component training environment (including the fact that extended and continuous on-the-job training and experience are not feasible in the Reserve Component training environment). Thus the current strategy does not meet the needs of members of the Selected Marine Corps Reserve. That situation should improve somewhat with the fielding of the ITS Systems.

APPENDIX A

MARINE LOGISTICS/EMBARKATION SPECIALIST

SPECIALTY: 0431 (Military Occupational Specialty (MOS)).

TITLE: Logistics/Embarkation Specialist.

PHYSICAL WORK DEMAND: The Marine Corps does not classify its specialties according to the physical demands the job places on incumbents.

QUALIFICATIONS FOR THE AWARD OF THE MOS

General

The following general requirements must be met for the award of this MOS.

- Successful completion of the Basic Logistics/Embarkation specialist course
- Completion of 6 months' on-the-job training
- Successful completion of the Team Embarkation Officer/Assistant course
- Ability to type 20 words per minute
- A score of at least 100 in the General Technical (GT) aptitude area of the Armed Services Vocational Aptitude Battery (ASVAB)
- A physical profile of at least 222221.

Additional Specialty Information

The Marine Corps depends solely upon its system of MOSs to identify military jobs and to describe supplemental skills. MOSs are used both as "billet designators" (or job designators) and as indicators of each Marine's specialty qualifications. In addition to one of the 479 Primary MOSs, enlisted Marines (or enlisted Marine billets) may carry one or more of 28 Category B MOSs, as an indicator of additional qualifications (e.g., MOS 8611, Interpreter). Further, a group of 13 Identifying and Reporting MOSs (e.g., MOS 9962, Parachutist) is used to identify additional skills required by billets or possessed by enlisted Marines.

THE JOB

General

The Logistics/Embarkation Specialist is a logistics general clerk and an embarkation planning and loading technician. In addition to general clerical duties, the Marine provides technical loading and embarkation planning support for the movement of troops, supplies, and equipment. That movement may involve motor vehicles, aircraft, or ships.

At the apprentice level, this specialist works as a logistics clerk and as a computer terminal operator for the Marine Corps' Standard Embarkation Management System (SEMS).¹ Some Marine Reserve units still work with a manual-input management system that predates SEMS.

As a journeyman, the 0431 Marine plans, organizes, and loads battalion- or squadron-sized units for movement by ship or by aircraft; or estimates the land transportation and materials-handling equipment required for moving these units overland. All these embarkation preparations involve packaging, marking, and loading. They require a knowledge of the characteristics of the vehicles (including any rail equipment), aircraft, and vessels to be used for embarkation, as well as familiarity with Marine Corps embarkation procedures, technical publications, SEMS, and unit supply and maintenance operations. Loads are planned with the help of templates and diagrams of the craft to be loaded and by use of SEMS. Some supervision of other 0431s is required of all journeymen.

No master-level activities occur within this specialty. Those activities are performed by the Combat Support Chief (gunnery sergeant, MOS 0491) who supervises all 0431 Logistics/Embarkation Specialists.

Areas of Assignment

Because of the Marines' quick-response and combat-loading requirements, 0431 positions are dispersed widely throughout the Corps. Distribution of 0431 billets among units of the

¹SEMS is an automated system that helps plan loads for aircraft and ships. The system performs arithmetic computations as a result of user decisions, and is based on direct input to three separate data files: Vehicle, Cargo, or Pallet.

Selected Marine Corps Reserve is comparable in every way to distribution of this specialty among units of the Active Marine Corps. About twice as many 0431s (66 percent of Active, 63 percent of Reserve) are assigned to ground forces units as are assigned to aviation units (33 percent of Active, 37 percent of Reserve). The force service support group (FSSG) has the highest concentration of this specialty, with 27 percent of the Active billets and 35 percent of the Reserve billets.

Peacetime Versus Wartime

Combat embarkation loading is the only type of embarkation loading taught in the Marine Corps. Though some embarkation loads are "administrative" loads, combat loading principles are normally followed in planning and preparing even these. The embarkations planned and executed by 0431 technicians and other embarkation workers in peacetime are designed to mirror those to be performed in war.

Implications of Force Modernization

SEMS is now used by only a portion of the Fourth Division/Wing Team. In Reserve units that are not yet supplied with this system, an older, paper-and-pencil-based planning system is used to feed information to central computers, which then batch-process the formatted input supplied by 0431s. As SEMS hardware is supplied to increasing numbers of Reserve units, mobile training teams from training centers provide 0431s and others with transition training.

Career Progression/Merging

The Marine Logistics/Embarkation Specialist is normally awarded the 0431 MOS while still an E1 (private, or PVT),² and begins duty in the unit of first assignment as an apprentice. Successful performance of duty (and the availability of promotion vacancies) leads successively to promotion to E2 (private first class, or PFC) about 3 months after training, and to E3 (lance corporal, or L/CPL) about 11 months after training. An additional 8 months' duty as L/CPL completes this Marine's duty as an apprentice Logistics/Embarkation Specialist.

²Training installation commanders have authority to offer accelerated promotion to a small number of outstanding trainees, but those extraordinary cases are not considered in this report.

Promotion to E4 (corporal, or CPL), about 19 months after the completion of training, marks the beginning of journeyman-level work in this specialty. For the remainder of this specialist's assignment as an 0431 -- through the grades of E5 (sergeant, or SGT) and E6 (staff sergeant, or SSGT) -- journeyman-level performance is expected. E6 is the highest enlisted grade authorized for 0431 specialists.

No merger or combination of career ladders occurs within this specialty. Merging does take place just beyond the upper enlisted grade limit of the specialty, where the 0431 specialty merges with the 0451 (Air Delivery Specialist) and the 0481 (Landing Support Specialist) skills. This means that, as a journeyman, the 0431 Logistics/Embarkation Specialist exercises technical job supervision over subordinate Marines with the same MOS.

THE INCUMBENT POPULATION

Personal Attributes

Age. The Marines assigned to this specialty display a similar age pattern, whether Active or Reserve Component, except for those of the highest grade authorized (E6), where Marines of the Selected Reserve are more than 4 years older than their Active Component counterparts. Table A-1 displays these data.

**TABLE A-1. 0431 INCUMBENT PERSONAL
ATTRIBUTES -- AVERAGE AGE**

GRADE	COMPONENT	MEAN AGE (YEARS)
E1-E3	Active	21.6
	SMCR ^a	22.3
E4	Active	23.7
	SMCR	22.8
E5	Active	26.5
	SMCR	26.1
E6	Active	29.4
	SMCR	33.6

^aSelected Marine Corps Reserve.

Aptitude Area Scores. Except for those in the lowest enlisted grades, Selected Reserve 0431s score consistently higher in the applicable ASVAB subtest than do their Active Component counterparts. Table A-2 contains this information.

**TABLE A-2. 0431 INCUMBENT PERSONAL
ATTRIBUTES -- AVERAGE ASVAB APTITUDE
AREA SCORES**

(General Technical)

GRADE	COMPONENT	MEAN SCORE
E1-E3	Active	107.2
	SMCR	103.3
E4	Active	103.5
	SMCR	105.3
E5	Active	99.8
	SMCR	104.6
E6	Active	103.1
	SMCR	111.3

NOTE: The minimum acceptable score for training in this specialty is 100.

Civilian Education Completed. Except for those in grade E5, the proportion of 0431s who have completed high school is higher in the Active Component than in the Selected Reserve. Unfortunately, there also is a sizable group of Reservists for whom civilian education data are not available. Table A-3 presents additional information.

**TABLE A-3. 0431 INCUMBENT PERSONAL ATTRIBUTES --
CIVILIAN EDUCATION COMPLETED**

(Percentage of Total)

GRADE	COMPONENT	NONGRADUATE ^a	GED ^b	HSDG ^c	SOME COLLEGE ^d	UNK ^e
E1-E3	Active	6.4	0.0	88.0	5.6	0.0
	SMCR	7.1	5.9	82.3	0.0	4.7
E4	Active	2.3	0.0	90.7	6.5	0.5
	SMCR	6.5	8.7	78.3	0.0	6.5
E5	Active	4.0	0.0	90.3	5.4	0.0
	SMCR	3.6	3.6	72.8	3.6	16.4
E6	Active	1.8	0.0	91.4	6.8	0.0
	SMCR	0.0	12.5	49.5	4.7	33.3
AVERAGE	Active	4.0	0.0	89.9	6.0	0.1
	SMCR	5.1	7.0	75.3	1.4	11.2

^aIncumbents who have not graduated from high school.

^bIncumbents who have completed high school through General Education Development (GED) equivalency.

^cIncumbents who are high-school-diploma graduates (HSDG) but have no college experience.

^dIncumbents who have completed some college or university work.

^eUnknown -- incumbents for whom civilian education data are missing.

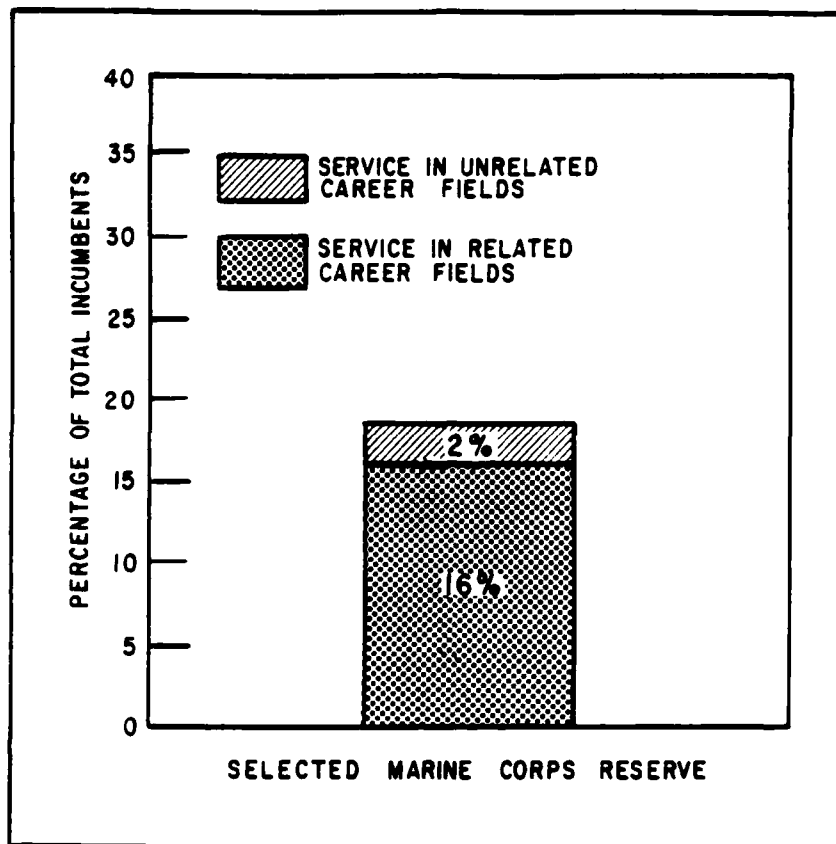
Experience

Prior Military Service. Not many Marine Reservists bring extensive active duty experience to their present military jobs. Our estimate³ is that 18 percent of the Reserve incumbents have prior active duty military experience. Some 16 percent of that incumbent population bring the experience of active military service in related career fields⁴ to their present jobs. Figure A-1 displays this information graphically.

³All estimates of prior service discussed in this section are based on active military service data supplied by the Defense Manpower Data Center and derived from cumulative active duty loss records, by specialty, since 1971. Those raw data have been enhanced by projecting an additional prior service increment based on seniority factors of the Marine Corps Reserve enlisted population. This was done to compensate for the early (1971) data cutoff.

⁴Service in "related career fields" means: (1) service in the Marine Corps in the same MOS; (2) service in the Marine Corps, not in the same MOS but in the same Department of Defense (DoD) occupational code; and (3) service in a different Military Service in the same DoD occupational code.

FIGURE A-1. 0431 INCUMBENT EXPERIENCE --
PRIOR ACTIVE MILITARY SERVICE



Length of Service. The Active and Reserve 0431 incumbent populations are remarkably similar in total military service. Table A-4 contains these data

Time in Grade. As with length of total service, the Active and Reserve 0431 incumbent populations have served very similar lengths of time in their present enlisted grades. This information is shown in Table A-5.

TABLE A-4. 0431 INCUMBENT EXPERIENCE --
LENGTH OF TOTAL MILITARY SERVICE

GRADE	COMPONENT	MEAN LENGTH OF SERVICE (YEARS)
E1-E3	Active	2.5
	SMCR	2.4
E4	Active	4.4
	SMCR	3.5
E5	Active	7.5
	SMCR	6.1
E6	Active	10.4
	SMCR	11.4

TABLE A-5. 0431 INCUMBENT EXPERIENCE --
TIME IN GRADE

GRADE	COMPONENT	TIME IN GRADE (YEARS)
E1-E3	Active	0.9
	SMCR	1.1
E4	Active	1.8
	SMCR	0.6
E5	Active	2.0
	SMCR	1.6
E6	Active	2.5
	SMCR	2.7

Full-Time Support. The Active Marines who serve as full-time support staff comprise only 7 percent of the Selected Marine Reserve 0431 billets they support. The level is slightly higher in the Fourth Marine Division than in the Fourth Marine Aircraft Wing. These data are found in Table A-6.

**TABLE A-6. 0431 FULL-TIME SUPPORT FOR SELECTED
MARINE CORPS RESERVE (SMCR)**

ORGANIZATION	TOTAL SMCR POSITIONS REQUIRED	FULL-TIME SUPPORT ^a	
		Assigned	Percentage of Required Strength
4th MARDIV ^b	170	13	8
4th MAW ^c	106 ^d	6	6
TOTALS	276	19	7

^aDoes not include civilian clerical and administrative employees of the Department of the Navy.

^bFourth Marine Division.

^cFourth Marine Aircraft Wing.

^dThis quantity includes those Selected Reserve billets routinely occupied by full-time support personnel.

THE TRAINING PROGRAM

Apprentice Training

Marines attend a relatively long period (10 weeks for males, 8 weeks for females) of Recruit Training (boot camp). Following completion of this training, the Marine (Active or Reserve) who will become an 0431 Logistics/Embarkation Specialist completes a 2-week period of Initial Skill Training (IST) before being awarded this MOS. Half of all 0431 candidates attend IST under the auspices of the Navy's Landing Force Training Command, Pacific, at the Naval Amphibious Base Coronado, located at San Diego, California. The other half attends IST conducted by the Landing Force Training Command, Atlantic, at the Naval Amphibious Base Little Creek, located at Norfolk, Virginia. The IST training site of each individual Marine is determined by the location (San Diego or Parris Island, South Carolina) of that person's Recruit Training. This IST is conducted under the

overall responsibility of the Navy, but specific instruction in this MOS is conducted by Marines stationed there.

Journeyman Training/Sustainment Training

Upon reaching the unit of first assignment, the Logistics/Embarkation Specialist begins an informal training program of on-the-job training under the supervision of noncommissioned officers who are also 0431s. The informal program continues officially throughout the remainder of this Marine's duties as an 0431 (that is, through grade E6, SSGT).

Active Component 0431s who are corporals or higher are encouraged -- but not required -- to attend the 28-day Team Embarkation Officer/Assistant Course offered 8 times yearly at both Coronado and Little Creek. This course is too long to be offered to Reservists. While precise data are not available, attendance of present Active Component E6s is estimated at well above 50 percent. Those 0431s of both components who are not able to attend this course complete their career development in the specialty through on-the-job training and experience.

Master Training

No master training is conducted in this specialty.

APPENDIX B

MARINE TRACKED VEHICLE REPAIRER, ASSAULT AMPHIBIOUS VEHICLE

SPECIALTY: 2142 (Military Occupational Specialty (MOS)).

TITLE: Tracked Vehicle Repairer, Assault Amphibious Vehicle.

PHYSICAL WORK DEMAND: The Marine Corps does not classify its specialties according to the physical demands the job places on incumbents.

QUALIFICATIONS FOR THE AWARD OF THE MOS

General

The following general requirements must be met for the award of this MOS:

- Successful completion of the Assault Amphibian Repairman Course
- A score of at least 100 in the Mechanical Maintenance (MM) aptitude area of the Armed Services Vocational Aptitude Battery (ASVAB)
- A physical profile of at least 222221
- Normal color vision
- Qualification as Swimmer, Second Class (enter water from height of 10 feet and remain afloat 10 minutes while demonstrating 3 survival swimming strokes over a distance of 100 yards)
- Open to males only.

Additional Specialty Information

The Marine Corps depends solely upon its system of MOSs to identify military jobs and to describe supplemental skills. MOSs are used both as "billet designators" (or job designators) and as indicators of each Marine's specialty qualifications. In addition to one of the 479 Primary MOSs, enlisted Marines (or enlisted Marine billets) may carry one or more of 28 Category B MOSs, as an indicator of additional qualifications (e.g., MOS 8611, Interpreter). Further, a group of 13 Identifying

and Reporting MOSs (e.g., MOS 9962, Parachutist) is used to identify additional skills required by billets or possessed by enlisted Marines.

THE JOB

General

The Tracked Vehicle Repairer, Assault Amphibious Vehicle (AAV), maintains and repairs the Marine Corps' principal assault amphibious vehicle, the AAV7A1. This Marine is qualified to work on all major components of the vehicle: the powertrain; the electrical, hydraulic, and water propulsion systems; the tracks; and the hull.¹

At the apprentice level, this specialist performs preventive maintenance and simple repairs under the supervision of more experienced 2142s. The apprentice operates the vehicle to test repairs, assists in complex repairs, and operates the recovery amphibious vehicle,² including its winches and hoisting equipment.

As a journeyman, the 2142 is responsible for care of the precision tools used in this work and is required to read schematic diagrams and blueprints for the first time. In addition to performing personally more difficult repair work than the apprentice, the 2142 journeyman supervises apprentices, conducts recovery operations with the recovery vehicle, prepares shop records and reports, diagnoses malfunctions, welds and cuts, and winterizes and waterproofs the AAV.

Master technicians in this specialty are often shop foremen. The master is responsible for the organization and operation of work centers, including allocation of tasks among subordinates and control of quality in the work being done.

¹All 2142s are trained to perform limited repair work on the AAV's weapon station as well, but an additional, 2-week training course is provided for 10 percent of all 2142s to prepare them to perform more difficult weapon station repairs. This training is provided at the end of the Assault Amphibian Repairman Course and is taken by both Reserve and Active Component Marines.

²There are three basic versions of the Marine Corps' AAV: AAVP7A1 for personnel, AAVC7A1 for command and control, and AAVR7A1 for recovery. Most of these vehicles are AAVP7A1s, which carry a crew of 3 and 25 fully equipped Marines.

Areas of Assignment

Tracked Vehicle Repairer, AAV positions are generally found in two places in the Fleet Marine Force (FMF): (1) within the force service support group (FSSG) -- in the Ordnance Maintenance Company and the General Support (GS) Maintenance Company of the FSSG's Maintenance Battalion -- and (2) within the AAV battalions of the Marine divisions. A majority of 2142 billets (61 percent of the Active Component and 55 percent of the Selected Marine Corps Reserve) are assigned to these AAV battalions. The proportion is higher for Active AAV units because, in addition to the AAV battalions in the three Active Marine divisions of the FMF, several small, additional AAV units are now operating, principally at Twentynine Palms, California.

Of the 2142 billets in the FSSGs, the proportion assigned to ordnance repair units is virtually the same for the Reserve as for the Active Component: almost three times as many billets to the ordnance companies as to the GS companies.

Peacetime Versus Wartime

Each Selected Reserve unit equipped with the AAV trains in peacetime with a training allowance -- a small portion -- of the vehicles actually authorized (a typical training allowance for an assault amphibious company is 17 of 47 vehicles authorized). Upon mobilization, the unit moves to rendezvous with its remaining equipment (stored in peacetime at Marine Corps logistics bases at Albany, Georgia, and Barstow, California) for deployment with other Marine units. All the vehicles in storage are of the same type as those in the training allowance; the Reserve unit trains on the same type of equipment with which it will deploy and fight. Though the operating tempo and workload of the 2142 will undoubtedly increase and the technicians may now face battle damage for the first time, the general nature and specifics of the work should not change.

Implications of Force Modernization

The Marine Corps is now in the final stages of the Service Life Extension Program for its AAVs. By the autumn of 1985, the final units of the Fourth Marine Division (the Selected Reserve division) will complete the program, which calls for new engines, final drive, smoke generators, and driver's display panel, as well as weapons station modification on all AAVs. Selected Reservist 2142s

and other AAV-related Marines have been trained for this transition by the inspector-instructor (I-I) staffs of Active Component Marines assigned to the Fourth Division. The I-I trainers use fleet training packages prepared by the Assault Amphibian School at Camp Pendleton, California. Completion of this program means that the entire Marine Corps is equipped with the same type and model of assault amphibian vehicle. The new version is expected to last 10 years before further modification or replacement is required.

Career Progression/Merging

The new apprentice 2142 (Active and Reserve) arrives at his unit while still an E1 (private, or PVT).³ After approximately 1 month of satisfactory service, he is eligible for promotion to E2 (private first class, or PFC). After 8 more months of increasingly demanding apprentice work on AAVs, he is eligible for promotion to E3 (lance corporal, or L/CPL). Eight additional months of satisfactory apprenticeship as a 2142 -- bringing the duration of the apprenticeship to about 1½ years after completion of institutional training -- prepare the AAV repairer for duty as an E4 (corporal, or CPL) and journeyman status.

Journeyman-level work is expected of the 2142 through grades E5 (sergeant, or SGT) and E6 (staff sergeant, or SSGT). This progression in rank and in complexity of technical work lasts approximately 6½ years from its inception.

The E7 (gunnery sergeant, or GYSGT) 2142 performs as a master specialist. This is the highest grade authorized for this MOS.

No merging or combination of career ladders occurs within this specialty. Such a merging does take place just beyond the upper enlisted grade limit of the specialty, where the 2142 merges with four other tracked vehicle repairer skills. This means that, as a journeyman and master, the 2142 exercises technical job supervision over subordinate Marines who are assigned the same MOS.

³Training installation commanders have authority to offer accelerated promotion to a small number of outstanding trainees, but those extraordinary cases are not considered in this report

THE INCUMBENT POPULATION

Personal Attributes

Age. The Active and Reserve Marine Corps incumbent populations studied are similar in age. The Selected Reservists average less than a half-year older than the Active Marine population of 2142s. Table B-1 contains this information.

TABLE B-1. 2142 INCUMBENT PERSONAL ATTRIBUTES -- AVERAGE AGE

GRADE	COMPONENT	MEAN AGE (YEARS)
E1-E3	Active	20.8
	SMCR ^a	21.1
E4	Active	22.3
	SMCR	22.8
E5	Active	25.7
	SMCR	26.2
E6	Active	30.3
	SMCR	IDA ^b
E7	Active	34.0
	SMCR	IDA

^aSelected Marine Corps Reserve.

^bInsufficient data available.

Aptitude Area Scores. The Selected Reservists assigned to this specialty have slightly higher scores on the Mechanical Maintenance subtest of the ASVAB than do their Active Component Marine counterparts. The comparative data are displayed in Table B-2.

**TABLE B-2. 2142 INCUMBENT PERSONAL
ATTRIBUTES -- AVERAGE ASVAB APTITUDE
AREA SCORES**

(Mechanical Maintenance)

GRADE	COMPONENT	MEAN SCORE
E1-E3	Active	103.9
	SMCR	105.1
E4	Active	105.2
	SMCR	114.4
E5	Active	104.8
	SMCR	108.8
E6	Active	105.5
	SMCR	IDA
E7	Active	IDA
	SMCR	IDA

NOTE: The minimum acceptable score for training in this specialty is 100.

Civilian Education Completed.

From the data available, 2142s in the Active Component are almost three times as likely as their Reserve counterparts to have graduated from high school. Otherwise, the populations are quite similar. Unfortunately, information about the education of almost 10 percent of the Reservists is not available. Table B-3 contains information on civilian education.

**TABLE B-3. 2142 INCUMBENT PERSONAL ATTRIBUTES --
CIVILIAN EDUCATION COMPLETED**

(Percentage of Total)

GRADE	COMPONENT	NONGRADUATE ^a	GED ^b	HSDG ^c	SOME COLLEGE ^d	UNKE ^e
E1-E3	Active	2.5	0.0	96.1	1.4	0.0
	SMCR	15.4	0.0	79.5	0.0	5.1
E4	Active	7.1	0.0	88.6	4.4	0.0
	SMCR	4.2	8.3	66.7	8.3	12.5
E5	Active	3.8	0.0	93.7	2.5	0.0
	SMCR	4.2	4.2	79.2	0.0	12.5
E6	Active	2.7	0.0	93.2	4.1	0.0
	SMCR	IDA	IDA	IDA	IDA	IDA
E7	Active	0.0	0.0	96.8	3.2	0.0
	SMCR	IDA	IDA	DA	IDA	IDA
AVERAGE	Active	3.9	0.0	93.4	2.8	0.0
	SMCR	9.5	4.2	74.7	2.1	9.5

^aIncumbents who have not graduated from high school.

^bIncumbents who have completed high school through General Education Development (GED) equivalency.

^cIncumbents who are high-school-diploma graduates (HSDG) but have no college experience.

^dIncumbents who have completed some college or university work.

^eUnknown -- incumbents for whom civilian education data are missing.

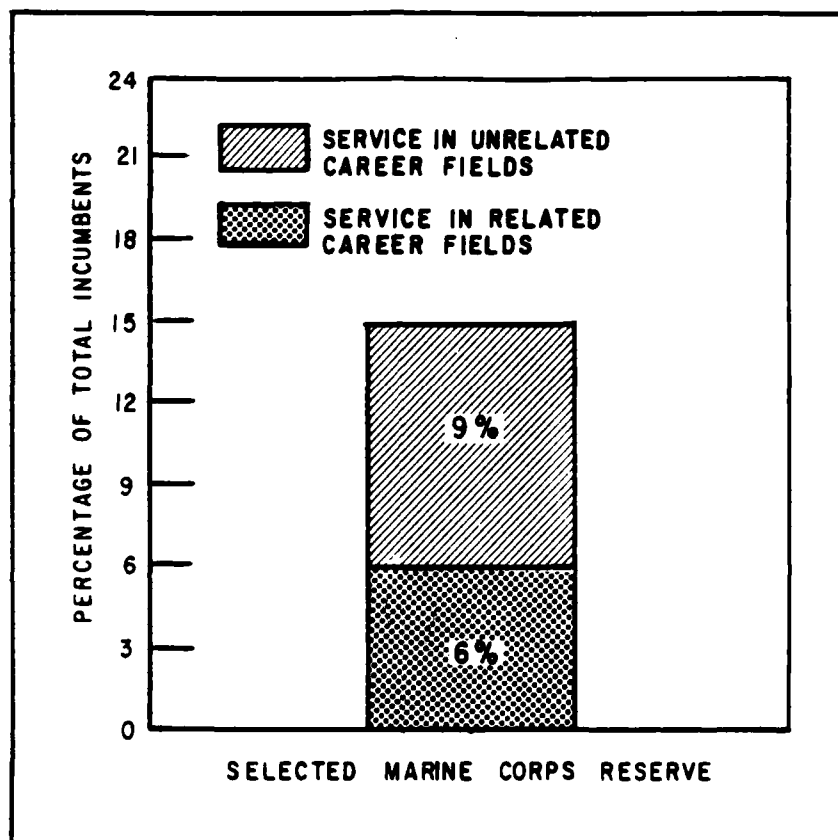
Experience

Prior Military Service. Not many Reservist 2142s bring prior active military service experience to their present jobs in the Marine Corps Reserve. Our estimate⁴ is that 15 percent of the 2142s in the Selected Reserve have served in one of the Armed Services in some capacity during an

⁴All prior military service estimates discussed upon prior active military service data supplied by the Defense Manpower Data Center and derived from cumulative active duty loss records, by specialty, since 1971. Those raw data have been enhanced by projecting an additional prior service increment based on seniority factors of the Marine Corps Reserve enlisted population. This was done to compensate for the early (1971) data cutoff.

earlier extended tour of active duty. Only 6 percent of the incumbent population bring the experience of service in related career fields⁵ to their present military jobs. Figure B-1 shows this information.

**FIGURE B-1. 2142 INCUMBENT EXPERIENCE --
PRIOR ACTIVE MILITARY SERVICE**



Length of Service. Reservists assigned to 2142 positions in the Selected Reserve do not have longer terms of total military service than their counterparts in the Active Component. Table B-4 contains data on length of total military service.

⁵Service in "related career fields" means: (1) service in the Marine Corps in the same MOS. (2) service in the Marine Corps, not in the same MOS but in the same Department of Defense (DoD) occupational code; and (3) service in a different Military Service in the same DoD occupational code

TABLE B-4. 2142 INCUMBENT EXPERIENCE --
LENGTH OF TOTAL MILITARY SERVICE

GRADE	COMPONENT	MEAN LENGTH OF SERVICE (YEARS)
E1-E3	Active	1.8
	SMCR	2.0
E4	Active	3.1
	SMCR	2.9
E5	Active	6.5
	SMCR	6.2
E6	Active	11.1
	SMCR	IDA
E7	Active	15.3
	SMCR	IDA

Time in Grade. Comparisons of time in grade between components on a grade-by-grade basis are inconclusive, as shown in Table B-5.

TABLE B-5. 2142 INCUMBENT EXPERIENCE --
TIME IN GRADE

GRADE	COMPONENT	TIME IN GRADE (YEARS)
E1-E3	Active	0.4
	SMCR	0.8
E4	Active	0.6
	SMCR	0.5
E5	Active	2.1
	SMCR	1.5
E6	Active	3.2
	SMCR	IDA
E7	Active	2.9
	SMCR	IDA

Full-Time Support. The members of the inspector-instructor staff of the Fourth Marine Division with the 2142 MOS amount to 5 percent of the Selected Marine Corps Reserve billets with the same specialty. Table B-6 contains this information.

TABLE B-6. 2142 FULL-TIME SUPPORT FOR SELECTED MARINE CORPS RESERVE (SMCR)

ORGANIZATION	TOTAL SMCR POSITIONS REQUIRED	FULL-TIME SUPPORT ^a	
		Assigned	Percentage of Required Strength
4th MARDIV ^b	176	9	5
4th MAW ^c	None	None	None
TOTALS	176	9	5

^aDoes not include civilian clerical and administrative employees of the Department of the Navy.

^bFourth Marine Division.

^cFourth Marine Aircraft Wing.

THE TRAINING PROGRAM

Apprentice Training

After 10 weeks of Recruit Training (boot camp), all Marines (Active and Reserve alike) who are to become 2142s attend the 8-week Assault Amphibian Repairman course at the Assault Amphibian School at Camp Pendleton, California. A small portion (10 percent) of the graduates (Active and Reserve) are sent for 2 weeks additional training in weapon station repair at Camp Pendleton, the others report to their units.

Journeyman Training/Sustainment Training

Upon reaching the unit of assignment, the new 2142 begins an informal program of on-the-job training under the supervision of noncommissioned officers who are also 2142s. That program continues for about 1½ years, or until the 2142 reaches the grade of E4 (corporal, or CPL).

Before promotion to corporal, most Active Component Marines assigned to this specialty are now being sent to one of two additional schools: the 11-week Intermediate Tracked Vehicle Repairman course at the Assault Amphibian School at Camp Pendleton, or the 10-week Fuel and Electrical Systems Repair course at Aberdeen Proving Ground, Maryland. While these courses are officially open to Reserve 2142s, and while school quotas are easy for Selected Reservists to obtain, virtually no Reservists attend either course.

Master Training

After promotion to corporal and journeyman status, the 2142 works as a journeyman for about 6 additional years. On-the-job training has been the principal preparation for master status in the Selected Reserve. No institutional courses, other than the two offered at the journeyman level, exist for the Marine preparing to be a master. From the time the 2142 Marine (Active or Reserve) is promoted to sergeant, his job performance is assessed periodically in a fitness report, which reports on leadership and other military qualities, as well as technical proficiency.

APPENDIX C

MARINE REPAIR SHOP MACHINIST

SPECIALTY: 2161 (Military Occupational Specialty (MOS)).

TITLE: Repair Shop Machinist.

PHYSICAL WORK DEMAND: The Marine Corps does not classify its specialties according to the physical demands the job places on incumbents.

QUALIFICATIONS FOR THE AWARD OF THE MOS

General

The following general requirements must be met for the award of this MOS:

- Successful completion of the Machinists Course at the U.S. Army Ordnance Center and School, Aberdeen Proving Ground, Maryland
- A score of at least 100 in the Mechanical Maintenance (MM) aptitude area of the Armed Services Vocational Aptitude Battery (ASVAB)
- Normal color vision
- A physical profile of at least 222221.

Additional Specialty Information

The Marine Corps depends solely upon its system of MOSs to identify military jobs and to describe supplementary skills. MOSs are used both as "billet designators" (or job designators) and as indicators of each Marine's specialty qualifications. In addition to one of the 479 Primary MOSs, enlisted Marines (or enlisted Marine billets) may carry one or more of 28 Category B MOSs, as an indicator of additional qualifications (e.g., MOS 8611, Interpreter). Further, a group of 13 Identifying and Reporting MOSs (e.g., MOS 9962, Parachutist) is used to identify additional skills required by billets or possessed by enlisted Marines.

THE JOB

General

The Marine Repair Shop Machinist repairs, changes, and builds equipment or assembly parts (usually of metal) or members, using a variety of machine and hand tools. This specialist also welds and maintains shop equipment.

As an apprentice, the 2161's duties at first involve general machine shop assistance, with considerable work as an oxyacetylene welder. Some metal alloy work with machine tools -- under supervision -- also occurs.

Journeyman duties for the Repair Shop Machinist include more welding, the making of dies and jigs for metal work, and general operation of lathes, grinders, shapers, and similar machines. Precision measuring devices (e.g., calipers and vernier gauges) and testing equipment are routinely used. In addition, the 2161 journeyman installs, repairs, and aligns the shop's machine tools and equipment, and applies metal finishing and forge procedures. This specialist also supervises other, less skilled 2161s.

The Master Repair Shop Machinist assesses work to be done and assigns it to others, instructing them in work technique if necessary. General repair shop operation, including quality control and production supervision, are other responsibilities of this experienced technician.

Areas of Assignment

The foundational and basic nature of the work of the Repair Shop Machinist, MOS 2161, dictates the assignment of 2161 billets to the support units of the Fleet Marine Force (FMF). Almost all of these positions (87 percent of all Active billets and 79 percent of all Reserve) are found in ground force units, the largest portions (68 percent of all Active billets and 60 percent of all Reserve) being in the force service support group (FSSG). Within the FSSG, the General Support Maintenance Companies account for the largest population of 2161s; the second largest is in Ordnance Maintenance Companies. Outside the FSSG, engineer and armor/amphibious units contain smaller numbers of Repair Shop Machinists. The distribution of these positions is about the same for the Reserve as for the Active Component.

The Headquarters and Maintenance Squadrons of the Marine Aircraft Groups, for both helicopter and high-performance aircraft, account for 2161 billets in Marine aviation units. The distribution of these positions is about the same for the Reserve as for the Active Component.

Peacetime Versus Wartime

The work of the Marine 2161 is largely unaffected by mobilization and war. Other than a foreseeable increase in operating tempo and intensity, the fabrication, repair, and modification of metal alloy parts -- whether required because of negligence, accident, normal wear, or enemy action -- should not change in character or quality.

Implications of Force Modernization

Of all the seven specialties studied, the 2161 is affected least by force modernization. Aside from the potential use of new metal alloys with the introduction of new weapons and support systems, the foundational nature of the Repair Shop Machinist's work dictates no real change in basic job tasks.

Career Progression/Merging

When training is completed and the 2161 MOS is awarded, the apprentice has probably reached the grade of E2 (private first class, or PFC).¹ After about 8 months of satisfactory work of growing difficulty, the apprentice is eligible for promotion to E3 (lance corporal, or L/CPL). Eight additional months as an increasingly experienced apprentice bring this Marine to the threshold of journeyman status: promotion to E4 (corporal, or CPL).

The new journeyman-corporal faces at least a year of satisfactory duty before being eligible for promotion to E5 (sergeant, or SGT). Once that hurdle is cleared, the journeyman Repair Shop Machinist has an additional 27 months of duty before the possibility of promotion to E6 (staff sergeant, or SSGT). As an E6, this specialist finishes his/her journeyman duties.

¹Training installation commanders have authority to offer accelerated promotion to a small number of outstanding trainees, but those extraordinary cases are not considered in this report

Promotion to E7 (gunnery sergeant, or GYSGT), after at least 3 years' work as an SSGT, implies a level of technical expertise and experience that is considered qualification as a master. This Marine will spend at least 4 years as a GYSGT and an additional 3 years as an E8 (master sergeant, or MSGT) performing the duties of a master Repair Shop Machinist.

Promotion to E9 (master gunnery sergeant, or MGYSGT) brings a change in MOS (to 2181) and supervisory duties beyond the scope of this study.

No merging or combination of career ladders occurs within this specialty. Such merging does take place at the E9 level in MOS 2181, but that is beyond the scope of this work. In general, therefore, the 2161 supervises other 2161s throughout the normal career development within this MOS.

THE INCUMBENT POPULATION

Personal Attributes

General. The number of Repair Shop Machinists assigned to the Selected Marine Corps Reserve is small. When that group is distributed by enlisted grade for comparison purposes, the population cell sizes become too small for analysis in most cases.

Age. In the only enlisted grade group that can be compared properly (E5), the Reserve and Active 2161s are almost identical in age. Table C-1 contains these data.

Aptitude Area Scores. As with the comparison of ages, only one group (E5s) can be compared on the basis of component. Active Component Marines score slightly higher in the Mechanical Maintenance aptitude area of the ASVAB than do the Reservists. Table C-2 contains this information.

Civilian Education Completed. As a group, Repair Shop Machinists who are Reservists include a higher proportion of members who have not finished high school and a smaller proportion who attend college than do their Active Component counterparts. Unfortunately, the civilian

**TABLE C-1. 2161 INCUMBENT PERSONAL
ATTRIBUTES -- AVERAGE AGE**

GRADE	COMPONENT	MEAN AGE (YEARS)
E1-E3	Active SMCR ^a	21.1 IDA ^b
E4	Active SMCR	22.5 IDA
E5	Active SMCR	25.3 25.7
E6	Active SMCR	30.6 IDA
E7	Active SMCR	35.0 IDA

^aSelected Marine Corps Reserve.

^bInsufficient data available.

**TABLE C-2. 2161 INCUMBENT PERSONAL
ATTRIBUTES -- AVERAGE ASVAB APTITUDE
AREA SCORES**

(Mechanical Maintenance)

GRADE	COMPONENT	MEAN SCORE
E1-E3	Active SMCR	110.0 IDA
E4	Active SMCR	108.0 IDA
E5	Active SMCR	105.5 101.6
E6	Active SMCR	102.1 IDA
E7	Active SMCR	IDA IDA

NOTE: The minimum acceptable score for training in this specialty is 100.

education files of more than 6 percent of the Reservists who hold the 2161 MOS are not available for use in this study. Table C-3 shows this information.

**TABLE C-3. 2161 INCUMBENT PERSONAL ATTRIBUTES --
CIVILIAN EDUCATION COMPLETED**

(Percentage of Total)

GRADE	COMPONENT	NONGRADUATE ^a	GED ^b	HSDG ^c	SOME COLLEGE ^d	UNK ^e
E1-E3	Active SMCR	3.7 IDA	0.0 IDA	85.2 IDA	11.1 IDA	0.0 IDA
E4	Active SMCR	3.5 IDA	0.0 IDA	93.0 IDA	3.5 IDA	0.0 IDA
E5	Active SMCR	1.6 0.0	0.0 0.0	96.8 100.0	1.6 0.0	0.0 0.0
E6	Active SMCR	0.0 IDA	0.0 IDA	97.4 IDA	2.6 IDA	0.0 IDA
E7	Active SMCR	0.0 IDA	0.0 IDA	96.1 IDA	3.9 IDA	0.0 IDA
AVERAGE	Active SMCR	1.7 3.1	0.0 3.1	94.4 87.5	3.9 0.0	0.0 6.3

^aIncumbents who have not graduated from high school.

^bIncumbents who have completed high school through General Education Development (GED) equivalency.

^cIncumbents who are high-school-diploma graduates (HSDG) but have no college experience.

^dIncumbents who have completed some college or university work.

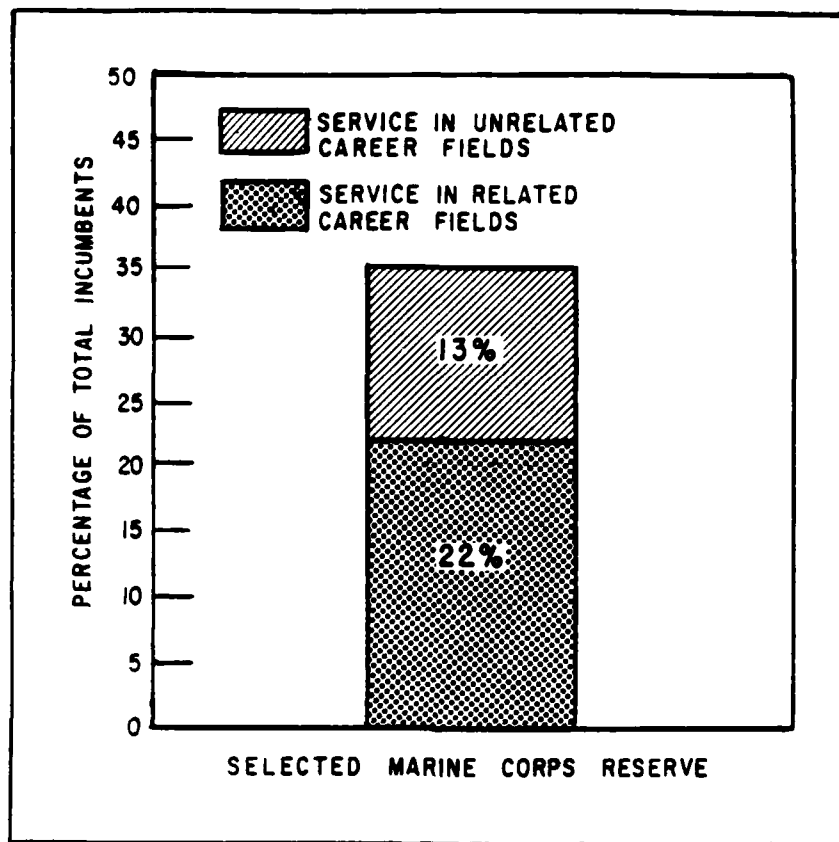
^eUnknown -- incumbents for whom civilian education data are missing.

Experience

Prior Military Service. Only about a third (35 percent) of the Marine Reservists assigned as 2161s to the Selected Reserve bring active military service experience to their present military jobs, according to our estimate.² Some 22 percent of incumbent 2161s have served on extended active duty in related career fields³ during their prior active military service. Figure C-1

²All prior military service estimates discussed in this section are based upon prior active military service data supplied by the Defense Manpower Data Center and derived from cumulative active duty loss records, by specialty, since 1971. Those raw data have been enhanced by projecting an additional prior service increment based on seniority factors of the Marine Corps Reserve enlisted population. This was done to compensate for the early (1971) data cutoff.

FIGURE C-1. 2161 INCUMBENT EXPERIENCE --
PRIOR ACTIVE MILITARY SERVICE



shows this information graphically.

Length of Service. The E5 groups of Active and Reserve 2161s show similar lengths of total service, with Reservists having slightly less total service experience. Table C-4 contains these data.

³Service in "related career fields" means: (1) service in the Marine Corps in the same MOS; (2) service in the Marine Corps, not in the same MOS but in the same Department of Defense (DoD) occupational code; and (3) service in a different Military Service in the same DoD occupational code.

TABLE C-4. 2161 INCUMBENT EXPERIENCE --
LENGTH OF TOTAL MILITARY SERVICE

GRADE	COMPONENT	MEAN LENGTH OF SERVICE (YEARS)
E1-E3	Active SMCR	2.3 IDA
E4	Active SMCR	3.5 IDA
E5	Active SMCR	6.3 5.8
E6	Active SMCR	11.3 IDA
E7	Active SMCR	15.6 IDA

Time in Grade. Comparison of E5 Reserve and Active 2161s shows identical time-in-grade experience. Table C-5 contains this information.

TABLE C-5. 2161 INCUMBENT EXPERIENCE --
TIME IN GRADE

GRADE	COMPONENT	TIME IN GRADE (YEARS)
E1-E3	Active SMCR	0.4 IDA
E4	Active SMCR	0.9 IDA
E5	Active SMCR	1.7 1.7
E6	Active SMCR	3.3 IDA
E7	Active SMCR	2.9 IDA

Full-Time Support. A single Active Marine 2161 gives full-time support to the Selected Marine Corps Reserve, representing 2 percent full-time support of the 47 Reserve billets. Table C-6 has this information.

**TABLE C-6. 2161 FULL-TIME SUPPORT FOR SELECTED
MARINE CORPS RESERVE (SMCR)**

ORGANIZATION	TOTAL SMCR POSITIONS REQUIRED	FULL-TIME SUPPORT ^a	
		Assigned	Percentage of Required Strength
4th MARDIV ^b	37	1	3
4th MAW ^c	10	0	0
TOTALS	47	1	2

^aDoes not include civilian clerical and administrative employees of the Department of the Navy.

^bFourth Marine Division.

^cFourth Marine Aircraft Wing.

THE TRAINING PROGRAM

Apprentice Training

Following the standard period (10 weeks for males, 8 weeks for females) of Recruit Training (boot camp), all Marines (Active and Reserve alike) destined to become Repair Shop Machinists are sent to the U.S. Army Ordnance Center and School at Aberdeen Proving Ground, Maryland, for the 15.4-week Machinist Course. When that training is completed, the new 2161 moves to the unit of first assignment.

Journeyman Training/Sustainment Training

Upon reaching the unit, the new Repair Shop Machinist begins an informal program of on-the-job training under the supervision of noncommissioned officers who are also 2161s. That informal program continues officially for the next 7 or 8 years, or until the Marine has reached the grade of GYSGT and master status.

Master Training

The 2161 reaches master status through successful experience and demonstrated expertise as a journeyman without formal, institutional training. Since the time this Marine was a sergeant, the fitness report assessment of job proficiency has been the best indicator of growth in quality of job performance. As a GYSGT, the new master Repair Shop Machinist faces the review and tutelage of the next supervisor, the MSGT 2161. In that way, master skills are sharpened.

APPENDIX D
MARINE RADIO TECHNICIAN

SPECIALTY: 2861 (Military Occupational Specialty (MOS)).

TITLE: Radio Technician.

PHYSICAL WORK DEMAND: The Marine Corps does not classify its specialties according to the physical demands the job places on incumbents.

QUALIFICATIONS FOR THE AWARD OF THE MOS

General

The following general requirements must be met for the award of this MOS:

- Successful completion of all the following courses:
 - Basic Electronics (13.6 weeks)
 - Radio Fundamentals (6.0 weeks)
 - Ground Radio Repair (17.8 weeks)
 - Technician Theory (15.8 weeks)
 - Radio Technician (18.0 weeks)
- A score of at least 115 in the Electronics (EL) aptitude area of the Armed Services Vocational Aptitude Battery (ASVAB)
- Completion of high school, including at least 1 year of algebra
- Eligibility for SECRET security clearance
- Holder of MOS 2841 (Ground Radio Repairer) or MOS 5937 (Aviation Radio Repairer)
- Grade of sergeant (or sergeant selectee) or higher, with either 2 years' experience as repairman or completion of technician- level course plus 5 years' experience
- Normal color vision
- A physical profile of at least 222221

Additional Specialty Information

The Marine Corps depends solely upon its system of MOSs to identify military jobs and to describe supplemental skills. MOSs are used both as "billet designators" (or job designators) and as indicators of each Marine's specialty qualifications. In addition to one of the 479 Primary MOSs, enlisted Marines (or enlisted Marine billets) may carry one or more of 28 Category B MOSs, as an indicator of additional qualifications (e.g., MOS 8611, Interpreter). Further, a group of 13 Identifying and Reporting MOSs (e.g., MOS 9962, Parachutist) is used to identify additional skills required by billets or possessed by enlisted Marines.

THE JOB

General

The Marine Radio Technician installs, maintains, repairs, and modifies -- and supervises this work by others -- more than 25 types of Marine Corps ground radios, including limited work on cryptographic devices used with these radios. Performance expectations are high. The MOS is awarded only after extensive experience and training.

The specialty begins at such an elevated level of training, enlisted grade, and experience that no apprentice-level duties and tasks are associated with the MOS. The 2861 Marine begins work as a journeyman.

The journeyman duties include performance of limited second echelon (organizational) maintenance work. Most 2861 work is concentrated at the third echelon (intermediate) maintenance level, with some fourth echelon (depot) maintenance also required. This means that the 2861 specialist makes difficult and unusual repairs and difficult modifications of radio equipment and systems. Journeyman work also includes giving technical advice to others concerning the requisitioning of components and repair parts, and requires the calibration of test instruments used with radio systems. Diagnosis and resolution of reliability problems with radio systems are also part of the journeyman Radio Technician's work.

At the master level, this specialist serves as an adviser concerning system compatibility among communications and data systems. Duties also include responsibility for installation and

maintenance of radio systems at division or wing level or for larger shore installations. Technical supervision of Marine ground radio technicians is also a normal part of the master's work.

Areas of Assignment

Because of the skilled technical nature of the work of the Radio Technician (MOS 2861), billets are generally found in communications units (or in communications cells within larger units that have different mission designations), and in electronics repair units (or in electronics repair cells within larger units that have more general repair responsibilities). Even so, 2861s are distributed throughout the Fleet Marine Force (FMF). More than three-quarters of all 2861 billets (78 percent in the Active Marine Corps, 80 percent in the Selected Reserve) are assigned to ground force units. Of those, the greatest portion (28 percent of all Active billets, 32 percent of all Reserve) are part of the force service support group (FSSG); the largest groups of 2861s within the FSSG belong to the electronics maintenance company and the general support maintenance company of the Maintenance Battalion, FSSG. Outside the FSSG, relatively large groups of 2861s are found in the communications company of division headquarters and in infantry battalion headquarters and service companies. In all these units, Active/Reserve distribution patterns are similar.

In aviation units, the largest concentration of Radio Technician billets is assigned to the Marine Wing Communications Squadrons of the Marine Air Control Group. Anti-air units and air base squadrons also have small groups of 2861s assigned. As with the ground force units, Active/Reserve distribution patterns are similar.

Peacetime Versus Wartime

All the training this specialist receives is concentrated on the tactical ground radios of the Marine Corps. As long as the Radio Technician is assigned to FMF units (which include the Fourth Division/Wing Team of the Selected Reserve), the specialist's peacetime duties are equivalent to wartime duties in every way. Those 2861s who are assigned to the staffs of Marine Corps posts and stations in peacetime, however, maintain and repair commercial radio systems, rather than the tactical systems on which they were trained. This small group is faced, upon mobilization, with the task of refreshing skills that have not been exercised during the "posts and stations" assignment.

Implications of Force Modernization

At present, one small family of high-frequency/ultra-high-frequency (HF/UHF), jeep-mounted tactical radio systems constitutes a force-modernization problem for Marine trainers and planners concerned with the work of 2861 specialists and others.

Until the early 1970s, one of the Marine Corps' standard, jeep-mounted HF/UHF tactical radios was the AN/MRC 124, then in the hands of all FMF units. About 1972, replacement of the AN/MRC 124 with the newer AN/VRC 85 system began. Unfortunately, not enough AN/VRC 85s were bought to meet the needs of the Marine Corps. Of the approximately 25 new systems needed by Marine Reserve units, only about 10 were procured and distributed, leaving the Fourth Division/Wing Team with about 15 of the older AN/MRC 124 radio systems along with 10 AN/VRC 85s.

Because of rapidly developing communication technology, the Marine Corps decided early in the 1980's that neither the AN/MRC 124 nor the AN/VRC 85 would meet its overall communications needs. Therefore, contracts were let for the new AN/VRC 83 HF/UHF jeep-mounted radio system, to replace both older systems.

Distribution of AN/VRC 83 sets will begin in October 1985 and is to be completed in about 2 years. That distribution is described as "horizontal"; that is, Reserve units will receive them simultaneously with Active Component units.

The Marine Radio Technician performs third and fourth echelon maintenance on all three of these radio systems. Though each of these systems contains some components from earlier ones, major repair of the new systems without additional, special training will be difficult.

Career Progression/Merging

A Marine is normally an E5 (sergeant, or SGT) by the time the training that leads to the award of MOS 2861 is completed. This lengthy training and the normal job experience associated with work as a 2841 add up to enough expertise to qualify the new Radio Technician immediately as a journeyman. The transition from apprentice to journeyman has occurred while the Marine is still a 2841, Ground Radio Repairer, a more basic specialty requiring fewer skills than the 2861.

Satisfactory duty performance leads to promotion of the 2861 Radio Technician to E6 (staff sergeant, or SSGT). Duty at that grade level completes the journeyman work.

Master-level work is performed by the E7 (gunnery sergeant, or GYSGT) and E8 (master sergeant, or MSGT). The Marine Corps' time-in-grade requirements for promotion result in approximately 7 years' duty as a 2861 master in these two grades.

No merging or combination of career ladders occurs within this specialty. Such merging does take place at the E9 level in MOS 2891 (Data/Communications Maintenance Chief), but that is beyond the scope of this study. The 2861 Radio Technician, therefore, characteristically supervises other 2861s as well as 2841 Ground Radio Repairers throughout normal career development.

THE INCUMBENT POPULATION

Personal Attributes

Age. Marine Reserve 2861s are slightly older than their Active Component counterparts. Table D-1 compares average ages, grade by grade.

TABLE D-1. 2861 INCUMBENT PERSONAL
ATTRIBUTES -- AVERAGE AGE

GRADE	COMPONENT	MEAN AGE (YEARS)
E5	Active SMCRA	25.8 IDA ^b
E6	Active SMCR	29.6 33.5
E7	Active SMCR	34.9 37.2

^aSelected Marine Corps Reserve.

^bInsufficient data available.

NOTE: Data on E8 Marines assigned to this specialty were not requested.

Aptitude Area Scores. Scores on the electronics aptitude area subtest of the ASVAB are comparable, when the Active and Reserve incumbent populations are examined grade by grade. Table D-2 contains this information.

**TABLE D-2. 2861 INCUMBENT PERSONAL
ATTRIBUTES -- AVERAGE ASVAB APTITUDE
AREA SCORES**

(Electronics)

GRADE	COMPONENT	MEAN SCORE
E5	Active SMCR	116.7 IDA
E6	Active SMCR	118.4 118.6
E7	Active SMCR	130.7 126.0

NOTES: (1) The minimum acceptable score for training in this specialty is 115. (2) Data on E8 Marines assigned to this specialty were not requested.

Civilian Education Completed. The civilian educational records of more than 25 percent of the Marine Reservists assigned to this specialty are not available for study. Comparison between Active and Selected Reserve incumbents is therefore very difficult. Table D-3 displays the data that are available.

**TABLE D-3. 2861 INCUMBENT PERSONAL ATTRIBUTES --
CIVILIAN EDUCATION COMPLETED**

(Percentage of Total)

GRADE	COMPONENT	NONGRADUATE ^a	GED ^b	HSDG ^c	SOME COLLEGE ^d	UNK ^e
E5	Active SMCR	1.2 IDA	0.0 IDA	95.1 IDA	3.7 IDA	0.0 IDA
E6	Active SMCR	0.0 0.0	0.0 0.0	88.7 61.5	11.3 7.7	0.0 30.8
E7	Active SMCR	0.5 0.0	0.0 7.1	79.5 42.9	20.0 21.4	0.0 28.6
AVERAGE	Active SMCR	0.4 0.0	0.0 3.4	85.9 55.2	13.7 13.8	0.0 27.6

^aIncumbents who have not graduated from high school.

^bIncumbents who have completed high school through General Education Development (GED) equivalency.

^cIncumbents who are high-school-diploma graduates (HSDG) but have no college experience.

^dIncumbents who have completed some college or university work.

^eUnknown -- incumbents for whom civilian education data are missing.

NOTE: Data on E8 Marines assigned to this specialty were not requested.

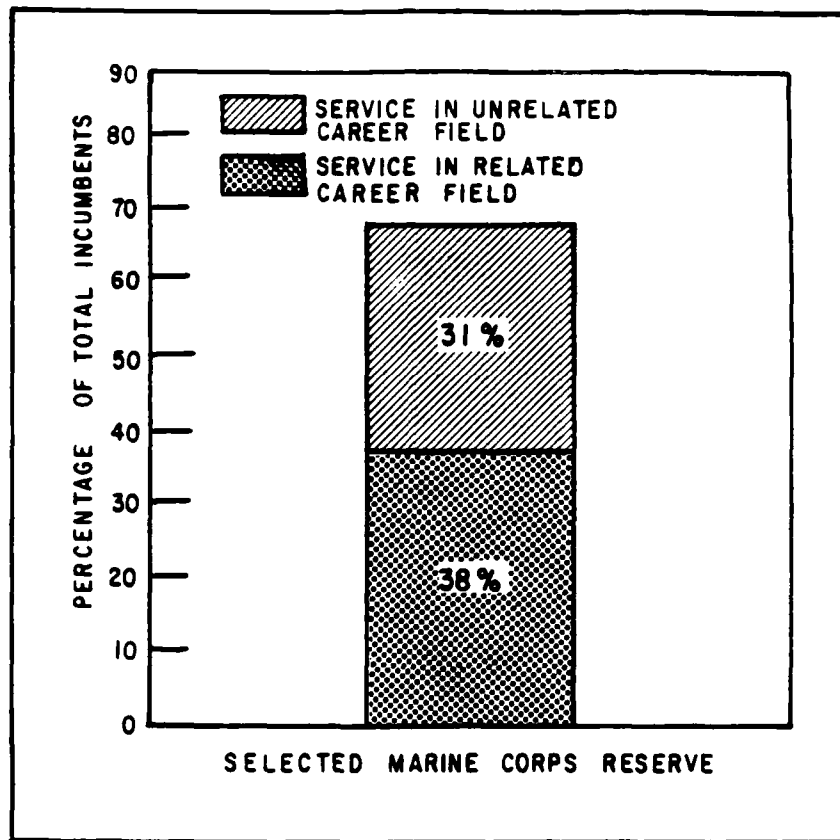
Experience

Prior Military Service. We estimate¹ that almost 70 percent of all Selected Reserve Radio Technicians bring some form of extended active duty military experience to their present military job. Over a third of all 2861 Reserve incumbents (38 percent) have served in related career fields² during their earlier active military service. Figure D-1 shows this information graphically.

¹All prior military service estimates discussed in this section are based upon prior active military service data supplied by the Defense Manpower Data Center and derived from cumulative active duty loss records, by specialty, since 1971. Those raw data have been enhanced by projecting an additional prior service increment based on seniority factors of the Marine Corps Reserve enlisted population. This was done to compensate for the early (1971) data cutoff.

²Service in "related career fields" means: (1) service in the Marine Corps in the same MOS; (2) service in the Marine Corps, not in the same MOS but in the same Department of Defense (DoD) occupational code; and (3) service in a different Military Service in the same DoD occupational code.

FIGURE D-1. 2861 INCUMBENT EXPERIENCE --
PRIOR ACTIVE MILITARY SERVICE



Length of Service. Reserve 2861s have slightly more total service experience than their Active Component counterparts. Table D-4 contains these data.

Time in Grade. Reservist 2861s advance more rapidly (have averaged less time in their present grades) than their Active Component counterparts. Table D-5 displays this information, grade by grade.

Full-Time Support. Full-time support of the Radio Technician specialty is extremely important to peacetime operation and training of the Selected Marine Corps Reserve. Part of the reason is the continuing difficulty of recruiting and training Marines to the degree of skill required for the award of this MOS, or of recruiting already-trained Marines. At the time of this study, the Fourth Division/Wing Team (4th DWT) had approximately 25 percent of its authorized manning level

**TABLE D-4. 2861 INCUMBENT EXPERIENCE --
LENGTH OF TOTAL MILITARY SERVICE**

GRADE	COMPONENT	MEAN LENGTH OF SERVICE (YEARS)
E5	Active SMCR	6.9 IDA
E6	Active SMCR	10.6 11.6
E7	Active SMCR	15.9 16.5

NOTE: Data on E8 Marines assigned to this specialty were not requested.

**TABLE D-5. 2861 INCUMBENT EXPERIENCE --
TIME IN GRADE**

GRADE	COMPONENT	TIME IN GRADE (YEARS)
E5	Active SMCR	2.9 IDA
E6	Active SMCR	3.6 2.8
E7	Active SMCR	2.6 2.3

NOTE: Data on E8 Marines assigned to this specialty were not requested.

of Radio Technicians. This means that the peacetime radio maintenance workloads that would normally fall to Reserve 2861 specialists are now the responsibility of the full-time, active-duty Marines who support the 4th DWT.

Full-time support of this specialty is sizable. Over a third (35 percent) of Selected Reserve 2861 billets are matched by full-time support staff from the Active Component. Table D-6 shows this information.

TABLE D-6. 2861 FULL-TIME SUPPORT FOR SELECTED MARINE CORPS RESERVE (SMCR)

ORGANIZATION	TOTAL SMCR POSITIONS REQUIRED	FULL-TIME SUPPORT ^a	
		Assigned	Percentage of Required Strength
4th MARDIV ^b	95	32	34
4th MAW ^c	24 ^d	9	38
TOTALS	119	41	35

^aDoes not include civilian clerical and administrative employees of the Department of the Navy.

^bFourth Marine Division.

^cFourth Marine Aircraft Wing.

^dThis quantity includes those Selected Reserve billets routinely occupied by full-time support personnel.

THE TRAINING PROGRAM

Apprentice Training

Since the grade requirements for MOS 2861 are E5 through E8, and since this specialty is fed by MOS 2841 at the E5 level, the Marine would have completed all apprentice training some time before being awarded the 2861 MOS.³

Journeyman Training/Sustainment Training

In the sense that the Marine can accomplish complex tasks without supervision, the E5 2841 Ground Radio Repairer is a journeyman when reclassification training as a 2861 begins. Because of the greater skills required of the 2861 specialty, however, we believe that the additional,

³The apprenticeship training, which consists of three courses, all conducted after Recruit Training (10 weeks for males, 8 for females), is held at the U.S. Marine Corps Communication and Electronics School, Twentynine Palms, California. These courses are: the Basic Electronics Course (13.6 weeks), the Radio Fundamentals Course (6.0 weeks), and the Ground Radio Repair Course (17.8 weeks). Upon completion of these courses, the Marine is awarded the 2841 MOS.

2861-awarding courses do produce an E5 2861 Radio Technician whose work is also that of a journeyman.

Two consecutive courses, both conducted at the Marine Corps Communication-Electronics School at Twentynine Palms, California, produce the E5 journeyman 2861 Radio Technician from the E5 journeyman 2841 Ground Radio Repairman. The first is a 15.8-week Technician Theory Course, followed by an 18-week Radio Technician Course. The first course is a prerequisite for the second, and both are required for the 2861 MOS. Requests for waivers of this requirement are not usually granted by Headquarters Marine Corps.

When the new Radio Technician completes the Radio Technician Course and reaches his/her unit, a long-term, informal program of on-the-job training and experience begins. The purpose is acquisition of experience and job skills leading to master status in this specialty.

The extensive training requirements of this specialty are difficult for Reservists to meet. At the time of this study, the Fourth Marine Division could fill only 20 of its 95 SMCR Radio Technician positions with qualified 2861s. The remaining positions were vacant. The Division has eased the situation somewhat by assigning 32 instructor-inspectors who are qualified E5 and E6 2861s to units of the division as full-time support. The situation is similar -- though smaller in scale -- in the Fourth Marine Aircraft Wing, where Active Component Marines are now assigned directly to 9 of the 24 Reserve positions authorized.

Master Training

The on-the-job training and experience of the journeyman Radio Technician (which typically continues for 7 or 8 years) produces a master 2861 as an E7 GYSGT. That same type of informal development, marked periodically by Marine Corps fitness reports, which reflect the quality of duty performance, continues throughout this Marine's duty as a 2861.

APPENDIX E

MARINE INTERMEDIATE AUTOMOTIVE MECHANIC

SPECIALTY: 3522 (Military Occupational Specialty (MOS)).

TITLE: Intermediate Automotive Mechanic.

PHYSICAL WORK DEMAND: The Marine Corps does not classify its specialties according to the physical demands the job places on incumbents.

QUALIFICATIONS FOR THE AWARD OF THE MOS

General

The following general requirements must be met for the award of this MOS:

- Successful completion of all the following courses:
 - Basic Automotive Mechanic (17.0 weeks)
 - Intermediate Automotive Maintenance (17.6 weeks)
- A score of at least 90 in the Mechanical Maintenance (MM) aptitude area of the Armed Services Vocational Aptitude Battery (ASVAB)
- A physical profile of at least 222111
- Normal color vision
- Visual acuity of at least 20/20, uncorrected
- Holder of MOS 3521 with at least 6 months' work experience in that MOS.

Additional Specialty Information

The Marine Corps depends solely upon its system of MOSs to identify military jobs and to describe supplemental skills. MOSs are used both as "billet designators" (or job designators) and as indicators of each Marine's specialty qualifications. In addition to one of the 479 Primary MOSs, enlisted Marines (or enlisted Marine billets) may carry one or more of 28 Category B MOSs, as an indicator of additional qualifications (e.g., MOS 8611, Interpreter). Further, a group of

13 Identifying and Reporting MOSs (e.g., MOS 9962, Parachutist) is used to identify additional skills required by billets or possessed by enlisted Marines.

THE JOB

General

The Marine who is a 3522 Intermediate Automotive Mechanic services, inspects, maintains, and repairs motor transport equipment, primarily at the intermediate maintenance (or 3rd and 4th echelon) level.¹

The apprentice 3522 performs major repair work on vehicle assemblies and components under the supervision of more senior Intermediate Automotive Mechanics, usually in an automotive shop. The work involves disassembly and repair of portions of the automotive system whose problems have been diagnosed by journeymen or masters. The apprentice 3522 must be familiar with and maintain all the tools used within this specialty.

The journeyman 3522 performs limited technical inspections on vehicles, estimates repair time, assigns work to subordinates, instructs others in proper work technique, and demonstrates more difficult repair procedures. The journeyman also determines the proper echelon of repair, supervises the work of a maintenance section, completes quality deficiency reports, and monitors the Marine Corps' maintenance reporting system.

Limitation of this MOS to E5s and lower means that no master-level work is done in this specialty. Work of that quality is reserved for the E7 through E9 Motor Transport Maintenance Chief (MOS 3529).²

¹The nature and limits of the work of the 3522 skill designator specialist can best be understood by noting the two other MOSs with which this Marine works most closely: 3523 Recovery Vehicle Mechanic and 3524 Fuel and Electrical Systems Mechanic (in addition to the 3521 Organizational Maintenance Mechanic).

²MOS 3529 is first awarded at Grade E6 (staff sergeant, or SSGT), but we regard specialists of that grade and MOS journeymen also.

Areas of Assignment

Almost all (97 percent) of the Intermediate Automotive Mechanic positions in the Marine Corps are allocated to ground force units. The few that are found in aviation units are assigned to the wing transportation squadrons of the Marine wing support groups and the headquarters and headquarters squadrons of the Marine air control groups in about 2-to-1 ratios. This distribution pattern is the same for both Selected Reserve and Active units.

Of the much larger number of 3522 positions assigned to ground force units, all the Reserve billets and almost all (95 percent) the Active billets are assigned to the for service support groups (FSSGs). Over half of those (56 percent of the Active, 65 percent of the Reserve) are located in the motor transport maintenance companies of the FSSG's maintenance battalions. The remainder, with the exception of a small group of Active Marine positions (which are located in small, separate detachments), are assigned to the General Support Maintenance Companies of the maintenance battalions.

Peacetime Versus Wartime

The 3522 specialist works on the same vehicles and performs the same repair duties in peacetime as will be expected in war. Except where an individual Intermediate Automotive Mechanic is transferred to a shop supporting a newer generation of motor transport equipment (see the following paragraph), peacetime training and experience should carry over well to wartime conditions.

Implications of Force Modernization

Units of the Marine Corps Reserve are receiving new, 5-ton, M939 series vehicles with diesel engines to replace the older, 2½-ton, M44 series vehicles, which have multi-fuel engines. The new vehicles have reached about 20 percent of Selected Marine Corps Reserve units; the remainder continue to operate M44 vehicles. Though many of the components of these two series are identical or quite similar, some difficulty in updating the work of this repair specialist is to be expected as the transition among major systems continues. Careful management is required.

Career Progression/Merging

The new 3522 is normally an E3 (lance corporal, or L/CPL). The successful completion of the MOS-awarding training means that this Marine is approaching the end of apprenticeship status (most of that work having been performed as a 3521 Organizational Maintenance Mechanic). After about 8 months of satisfactory work in the repair shop, the L/CPL will be eligible for promotion to E4 (corporal, or CPL) and journeyman status.

All the remaining work of the Intermediate Automotive Mechanic is performed as a journeyman. Promotion to E5 (sergeant, or SGT) takes place after about another year. When consideration for promotion to E6 (staff sergeant, or SSGT) begins, this specialist prepares to move on to the more advanced 3529.

No merging or combination of career ladders occurs within this specialty. Merging (of 5 MOSs) does take place at the E6 level in MOS 3529, but that event occurs beyond the scope of this study. The 3522 Intermediate Automotive Mechanic, therefore, supervises other, subordinate 3522s and 3521s throughout normal career development.

THE INCUMBENT POPULATION

Personal Attributes

Age. Intermediate Automotive Mechanics of the Marine Corps Selected Reserve are slightly younger than their Active Component counterparts, grade by grade, but the two populations are quite similar. These data are shown in Table E-1.

Aptitude Area Scores. In a grade-by-grade comparison, 3522s who are Reservists score slightly higher on the Mechanical Maintenance subtest of the ASVAB than their counterparts in the Active Component. Table E-2 contains this information.

Civilian Education Completed. The civilian education records of over 8 percent of the Selected Marine Corps Reservist 3522s are not available for review in this study. From the data

**TABLE E-1. 3522 INCUMBENT PERSONAL
ATTRIBUTES -- AVERAGE AGE**

GRADE	COMPONENT	MEAN AGE (YEARS)
E1-E3	Active	22.3
	SMCR ^a	21.9
E4	Active	24.2
	SMCR	23.6
E5	Active	27.3
	SMCR	26.9

^aSelected Marine Corps Reserve.

**TABLE E-2. 3522 INCUMBENT PERSONAL
ATTRIBUTES -- AVERAGE ASVAB APTITUDE
AREA SCORES**

(Mechanical Maintenance)

GRADE	COMPONENT	MEAN SCORE
E1-E3	Active	103.4
	SMCR	105.7
E4	Active	102.1
	SMCR	108.1
E5	Active	100.4
	SMCR	104.2

NOTE: The minimum acceptable score for training in this specialty is 90.

available, however, it is obvious that a higher proportion of those in the Active Component than Reservists have graduated from high school. Table E-3 contains comparative data on civilian education.

**TABLE E-3. 3522 INCUMBENT PERSONAL ATTRIBUTES --
CIVILIAN EDUCATION COMPLETED**

(Percentage of Total)

GRADE	COMPONENT	NONGRADUATE ^a	GED ^b	HSDG ^c	SOME COLLEGE ^d	UNKE ^e
E1-E3	Active	2.2	0.0	97.3	0.5	0.0
	SMCR	2.3	0.0	90.7	0.0	7.0
E4	Active	2.7	0.0	94.6	2.7	0.0
	SMCR	8.5	2.1	89.4	0.0	0.0
E5	Active	2.1	0.0	95.5	2.4	0.0
	SMCR	8.2	1.6	72.2	1.6	16.4
AVERAGE	Active	2.3	0.0	95.6	2.1	0.0
	SMCR	6.5	1.3	83.0	0.7	8.5

^aIncumbents who have not graduated from high school.

^bIncumbents who have completed high school through General Education Development (GED) equivalency.

^cIncumbents who are high-school-diploma graduates (HSDG) but have no college experience.

^dIncumbents who have completed some college or university work.

^eUnknown -- incumbents for whom civilian education data are missing.

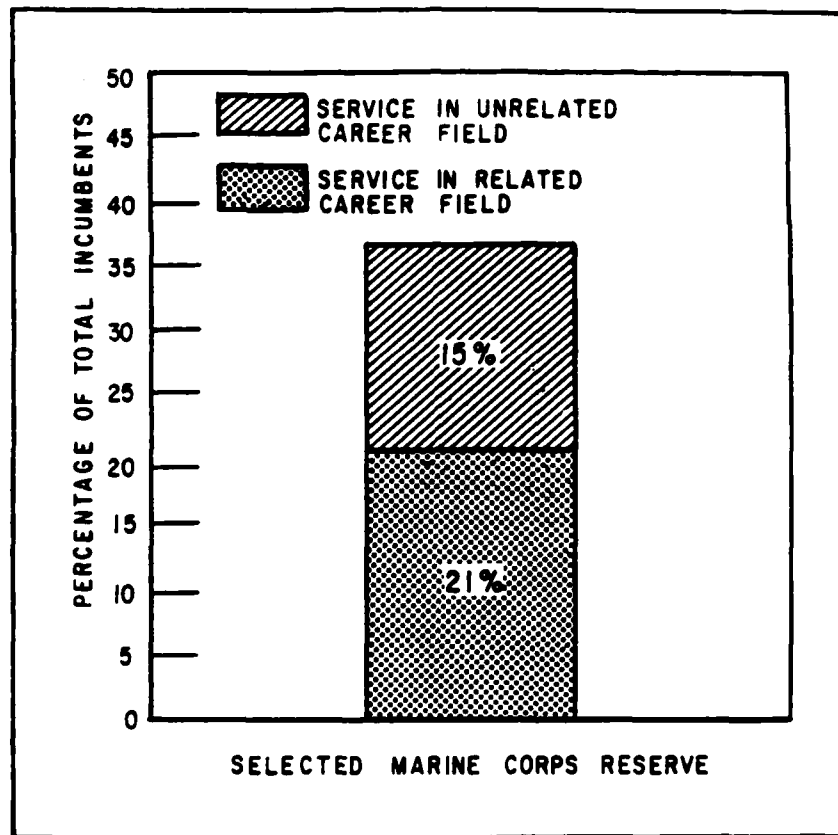
Experience

Prior Military Service. Our estimate³ is that just over a third (36 percent) of the 3522s who are Selected Marine Corps Reservists bring some kind of active military experience to their present military jobs. Of all Reservist 3522 incumbents, 21 percent have performed that active service in related career fields.⁴ Figure E-1 shows this information graphically.

³All prior military service estimates discussed in this section are based upon prior active military service data supplied by the Defense Manpower Data Center and derived from cumulative active duty loss records, by specialty, since 1971. Those raw data have been enhanced by projecting an additional prior service increment based on seniority factors of the Marine Corps Reserve enlisted population. This was done to compensate for the early (1971) data cutoff.

⁴Service in "related career fields" means: (1) service in the Marine Corps in the same MOS; (2) service in the Marine Corps, not in the same MOS but in the same Department of Defense (DoD) occupational code, and (3) service in a different Military Service in the same DoD occupational code

FIGURE E-1. 3522 INCUMBENT EXPERIENCE --
PRIOR ACTIVE MILITARY SERVICE



Length of Service. Reservist Intermediate Automotive Mechanics have less total military service than their Active Component Marine counterparts. Table E-4 contains these data, grade by grade.

Time in Grade. The time spent in each enlisted grade by 3522s is comparable, when Active and Reserve Component populations are compared grade by grade. Table E-5 shows this information.

Full-Time Support. Those Marines on active duty who make up the full-time support staff of the Fourth Marine Division/Wing Team are important to the smooth functioning of Selected Reserve unit maintenance activities, primarily because of the Reserves' continuing difficulty in filling their 3522 billets. At the time of this study, the Fourth Marine Division had only 46 percent of

**TABLE E-4. 3522 INCUMBENT EXPERIENCE --
LENGTH OF TOTAL MILITARY SERVICE**

GRADE	COMPONENT	MEAN LENGTH OF SERVICE (YEARS)
E1-E3	Active	3.5
	SMCR	2.7
E4	Active	5.2
	SMCR	4.4
E5	Active	8.2
	SMCR	7.0

**TABLE E-5. 3522 INCUMBENT EXPERIENCE --
TIME IN GRADE**

GRADE	COMPONENT	TIME IN GRADE (YEARS)
E1-E3	Active	1.4
	SMCR	1.0
E4	Active	1.7
	SMCR	1.1
E5	Active	3.0
	SMCR	4.8

its 3522 positions filled, while the Fourth Marine Aircraft Wing (MAW) was able to fill all of its ten billets. The Fourth MAW has elected to fill half of the ten positions with full-time support staff members, thus reducing significantly any potential shortage in these highly trained specialists. The full-time support level in the Division remains low, while that organization continues to depend for maintenance expertise on the 3522s who are assigned, as well as on the less-well-trained Organizational Automotive Mechanics (3521s) who are both authorized and assigned. Table E-6 contains information on full-time support in this specialty.

**TABLE E-6. 3522 FULL-TIME SUPPORT FOR SELECTED
MARINE CORPS RESERVE (SMCR)**

ORGANIZATION	TOTAL SMCR POSITIONS REQUIRED	FULL-TIME SUPPORT ^a	
		Assigned	Percentage of Required Strength
4th MARDIV ^b	416	4	1
4th MAW ^c	10 ^d	5	50
TOTALS	426	9	2

^aDoes not include civilian clerical and administrative employees of the Department of the Navy.

^bFourth Marine Division.

^cFourth Marine Aircraft Wing.

^dThis quantity includes those Selected Reserve billets routinely occupied by full-time support personnel.

THE TRAINING PROGRAM

Apprentice Training

The apprentice Intermediate Automotive Mechanic, who serves out that apprenticeship within a single enlisted grade (L/CPL) has attended Recruit Training (boot camp) -- 10 weeks for males, 8 weeks for females -- and has successfully completed the Basic Automotive Mechanic Course (17.0 weeks) and the Intermediate Automotive Mechanic Course (17.6 weeks) conducted by the Marine Corps Service Support Schools (Motor Transport), Camp Lejeune, North Carolina. In addition to that formal training, this Marine has compiled at least 7 months' experience as an apprentice 3521 Organizational Automotive Mechanic.⁵ At least 6 months' experience as a 3521 is required for admission to the intermediate course. Both Active and Reserve 3521s face this requirement, which is not normally waived by Headquarters Marine Corps. After the second course, the new 3522

⁵Based upon time-in-grade requirements for promotion to L/CPL, which is the lowest grade permissible for admission to the intermediate course.

undergoes informal on-the-job training in the unit for several more months before being eligible for promotion to corporal and journeyman status.

Journeyman Training/Sustainment Training

That brief on-the-job training, coupled with the formal Skill Progression Training of the Intermediate Automotive Mechanic Course, prepares the 3522 to become a corporal and, hence, a journeyman. The intermediate course is discussed here as an apprentice training course, but it goes a long way toward preparing the 3522 to be a journeyman, emphasizing as it does the 3rd and 4th echelon work characteristic of the fully qualified 3522.

Journeyman training for the 3522 specialist continues in the unit as informal on-the-job training. That type of training continues through the grades of corporal and sergeant

Master Training

There are no 3522 masters in the Marine Corps. That work is performed by the 3529 Motor Transport Maintenance Chief upon promotion to E7 GYSGT.

APPENDIX F

MARINE AIRCRAFT POWERPLANTS MECHANIC, J79

SPECIALTY: 6024 (Military Occupational Specialty (MOS)).

TITLE: Aircraft Powerplants Mechanic, J79.

PHYSICAL WORK DEMAND: The Marine Corps does not classify its specialties according to the physical demands the job places on incumbents.

QUALIFICATIONS FOR THE AWARD OF THE MOS

General

The following general requirements must be met for the award of this MOS:

- Successful completion of the following courses:
 - Enlisted Basic Aviation Training (2.0 weeks)
 - Aviation Machinist Mate Class A-1 (6.0 weeks)
 - Basic Corrosion Control (0.6 weeks)
 - J79-GE-8/10 Intermediate Maintenance (4.4 weeks) or F-4/RF-4B J79 Powerplant Intermediate Maintenance (2.6 weeks)¹
- A score of at least 100 in the Mechanical Maintenance (MM) aptitude area of the Armed Services Vocational Aptitude Battery (ASVAB)
- Voluntary service in aviation duty
- Mechanical experience or training (desirable)
- A physical profile of at least 222221
- Normal color vision
- Visual acuity of at least 20/50 with corrective lenses.

¹The course the Marine attends depends on which type of F-4 aircraft is the principal equipment of the unit to which the new 6024 is (or will be) assigned.

Additional Specialty Information

The Marine Corps depends solely upon its system of MOSs to identify military jobs and to describe supplemental skills. MOSs are used both as "billet designators" (or job designators) and as indicators of each Marine's specialty qualifications. In addition to one of the 479 Primary MOSs, enlisted Marines (or enlisted Marine billets) may carry one or more of 28 Category B MOSs, as an indicator of additional qualifications (e.g., MOS 8611, Interpreter). Further, a group of 13 Identifying and Reporting MOSs (e.g., MOS 9962, Parachutist) is used to identify additional skills required by billets or possessed by enlisted Marines.

THE JOB

General

The Marine Aircraft Powerplants Mechanic, J79, performs off-aircraft intermediate maintenance and repair of the General Electric J79 jet engine, which is the powerplant for the F-4 and RF-4 aircraft. The 6024 normally works in a repair shop because installing and removing engines are the responsibility of another specialty (6014, Aircraft Mechanic, F-4/RF-4).

The apprentice 6024 works under the supervision of more experienced, senior mechanics. Apprentice duties include supervised inspection, disassembly, and repair of the powerplant (including components), and of related air, fuel, ignition, lubrication, and starting systems. The apprentice 6024 must use technical publications, as well as measuring and repair equipment, and must follow safety procedures associated with the J79 engine.

As a journeyman, the 6024 performs difficult repair tasks without supervision. Duties also involve supervision of apprentices, including the planning, scheduling, and directing of work center assignments. Conduct of on-the-job training and preparation of the J79 powerplant for storage and shipping are also expected. As a more experienced and senior journeyman Aircraft Powerplants Mechanic, J79, this Marine acts as a maintenance work center supervisor and quality assurance inspector.

The master 6024 supervises the technical training of all subordinate mechanics in the work center, oversees work center operations as a technical supervisor, and performs extraordinary and difficult repair work personally, when the job demands it.

Areas of Assignment

All Selected Reserve billets for Aircraft Powerplants Mechanic, J79, of the Fleet Marine Force are assigned directly to the F-4 flying squadrons of the Fourth Marine Aircraft Wing. For Active units, 88 percent of the 6024 billets are assigned to F-4 and RF-4 units; the remainder are found in small composite supplements to some of the headquarters and maintenance squadrons of the Marine aircraft groups.

Peacetime Versus Wartime

These 6024 technicians are specialists on the General Electric J79-8 or the J79-10 jet engine, the main powerplant for the Marine Corps' F-4 aircraft. Since all the F-4s in the Marine Corps inventory, whether assigned to Reserve or Active units, use one or the other of these similar engines, transition from peace to war should occur smoothly for the 6024. Even if the Reservist holding this specialty is reassigned as an individual replacement upon mobilization, the technical work encountered in the new unit should be similar or identical.

Implications of Force Modernization

The Marines expect no major, new changes in the J79 series engines during the life of their F-4 aircraft. The 6024 specialists are, therefore, expected to encounter no serious problems related to force modernization.

Skill Progression/Merging

Most Aircraft Powerplants Mechanics, J79, begin work as apprentices in their first unit repair shop about the time they reach the grade of E2 (private first class, or PFC).² Because of the technical nature of the work, as well as the supervisory structure of naval aviation intermediate

²Training installation commanders have authority to offer accelerated promotion to a small number of outstanding trainees, but those extraordinary cases are not considered in this report.

maintenance activities, this apprenticeship continues through the grade of E4 (corporal, or CPL). That means, for both Active and Reserve Component Marines, about 16 to 18 months as an apprentice after training.

The 6024's journeyman duties begin as an E5 (sergeant, or SGT) and continue for more than 5 years through grades E5 and E6 (staff sergeant, or SSGT).

Master duties for this technician are appropriate for all E7 (gunnery sergeant, or GYSGT) 6024s. With promotion to E8, the MOS for this specialist changes to 6019, Aircraft Maintenance Chief.

No merging or combination of career ladders occurs within the 6024 specialty. Such a merging (of 15 MOSs) does take place at the E8 level in MOS 6019, but that event occurs beyond the scope of this study.

THE INCUMBENT POPULATION

Personal Attributes

General. The population of Selected Marine Reservists who are Aircraft Powerplants Mechanics, J79 (6024), is very small. When that population is grouped by enlisted grade for comparison purposes in a study such as this, some of the resulting groups become too small to use with confidence. That situation occurs throughout the several comparisons that follow.

Age. Reservists are slightly older than their Active Component counterparts at the grade of E5. All other groups of Reservists are too small to use. Table F-1 shows this information.

Aptitude Area Scores. Though both groups' scores are well above the acceptable minimum, E5 Reservist 6024s score slightly higher than E5 Active Marine 6024s in the Mechanical Maintenance subtest of the ASVAB. Table F-2 displays the data.

Civilian Education Completed. Unfortunately, the civilian education records of almost a third (30.8 percent) of the Reservist 6024 population reviewed for this study are not available for

**TABLE F-1. 6024 INCUMBENT PERSONAL
ATTRIBUTES -- AVERAGE AGE**

GRADE	COMPONENT	MEAN AGE (YEARS)
E1-E3	Active SMCR ^a	21.6 IDA ^b
E4	Active SMCR	23.1 IDA
E5	Active SMCR	26.5 29.5
E6	Active SMCR	29.7 IDA
E7	Active SMCR	34.2 IDA

^aSelected Marine Corps Reserve.

^bInsufficient data available.

**TABLE F-2. 6024 INCUMBENT PERSONAL
ATTRIBUTES -- AVERAGE ASVAB APTITUDE
AREA SCORES**

(Mechanical Maintenance)

GRADE	COMPONENT	MEAN SCORE
E1-E3	Active SMCR	106.8 IDA
E4	Active SMCR	102.6 IDA
E5	Active SMCR	106.8 113.7
E6	Active SMCR	103.3 IDA
E7	Active SMCR	DCR ^a IDA

^aData under review.

NOTE: The minimum acceptable score for training in this specialty is 100.

comparison. Table F-3 lists whatever information is available. We do not know how the Reserve data displayed here would be affected if the missing records were available.

TABLE F-3. 6024 INCUMBENT PERSONAL ATTRIBUTES --
CIVILIAN EDUCATION COMPLETED

(Percentage of Total)

GRADE	COMPONENT	NONGRADUATE ^a	GED ^b	HSDG ^c	SOME COLLEGE ^d	UNK ^e
E1-E3	Active SMCR	2.9 IDA	0.0 IDA	94.2 IDA	2.9 IDA	0.0 IDA
E4	Active SMCR	6.0 IDA	0.0 IDA	90.0 IDA	4.0 IDA	0.0 IDA
E5	Active SMCR	6.7 7.7	0.0 15.4	91.1 23.1	2.2 7.7	0.0 46.1
E6	Active SMCR	1.7 IDA	0.0 IDA	96.6 IDA	1.7 IDA	0.0 IDA
E7	Active SMCR	0.0 IDA	0.0 IDA	96.8 IDA	3.2 IDA	0.0 IDA
AVERAGE	Active SMCR	3.6 7.7	0.0 7.7	93.7 46.2	2.7 7.7	0.0 30.8

^aIncumbents who have not graduated from high school.

^bIncumbents who have completed high school through General Education Development (GED) equivalency.

^cIncumbents who are high-school-diploma graduates (HSDG) but have no college experience.

^dIncumbents who have completed some college or university work.

^eUnknown -- incumbents for whom civilian education data are missing.

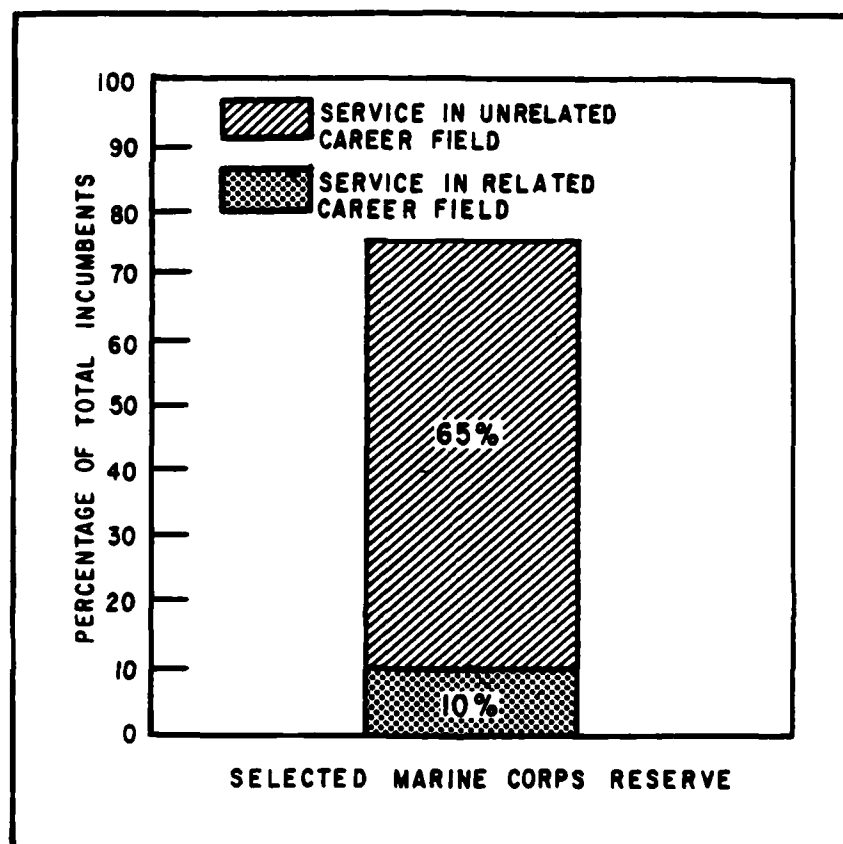
Experience

Prior Military Service. Our estimate³ is that 75 percent of all Selected Reservist 6024s have had prior active military service of some kind before coming to their present military jobs. Only

³All prior military service estimates discussed in this section are based upon prior active military service data supplied by the Defense Manpower Data Center and derived from cumulative active duty loss records, by specialty, since 1971. Those raw data have been enhanced by projecting an additional prior service increment based on seniority factors of the Marine Corps Reserve enlisted population. This was done to compensate for the early (1971) data cutoff.

10 percent of all 6024 Reserve incumbents, on the other hand, bring active military experience in related career fields⁴ to their present military jobs. Figure F-1 shows this information graphically.

**FIGURE F-1. 6024 INCUMBENT EXPERIENCE --
PRIOR ACTIVE MILITARY SERVICE**



Length of Service. In the single group of 6024s that is large enough for comparison -- E5 Reservists and Active Component Marines -- Reservists show slightly more total service experience. Table F-4 contains this information.

⁴Service in "related career fields" means: (1) service in the Marine Corps in the same MOS; (2) service in the Marine Corps, not in the same MOS but in the same Department of Defense (DoD) occupational code; and (3) service in a different Military Service in the same DoD occupational code.

TABLE F-4. 6024 INCUMBENT EXPERIENCE --
LENGTH OF TOTAL MILITARY SERVICE

GRADE	COMPONENT	MEAN LENGTH OF SERVICE (YEARS)
E1-E3	Active SMCR	3.0 IDA
E4	Active SMCR	4.1 IDA
E5	Active SMCR	7.7 8.3
E6	Active SMCR	11.0 IDA
E7	Active SMCR	15.1 IDA

Time in Grade. None of the data concerning Reservists assigned to this specialty is of high enough quality to be used for comparisons. Information about the time-in-grade characteristics of Active Component 6024s is shown in Table F-5.

TABLE F-5. 6024 INCUMBENT EXPERIENCE --
TIME IN GRADE

GRADE	COMPONENT	TIME IN GRADE (YEARS)
E1-E3	Active SMCR	0.8 IDA
E4	Active SMCR	1.0 IDA
E5	Active SMCR	2.6 DUR
E6	Active SMCR	3.5 IDA
E7	Active SMCR	8.6 IDA

Full-Time Support. The Marine Corps provides full-time support in the form of Marines on active duty (each is assigned directly to a Reserve billet) in 38 percent of the positions authorized in the Fourth Marine Aircraft Wing. Table F-6 contains these data.

TABLE F-6. 6024 FULL-TIME SUPPORT FOR SELECTED MARINE CORPS RESERVE (SMCR)

ORGANIZATION	TOTAL SMCR POSITIONS REQUIRED	FULL-TIME SUPPORT ^a	
		Assigned	Percentage of Required Strength
4th MARDIV ^b	None	None	None
4th MAW ^c	37 ^d	14	38
TOTALS	37	14	38

^aDoes not include civilian clerical and administrative employees of the Department of the Navy.

^bFourth Marine Division.

^cFourth Marine Aircraft Wing.

^dThis quantity includes those Selected Reserve billets routinely occupied by full-time support personnel.

THE TRAINING PROGRAM

Apprentice Training

After attending Recruit Training (boot camp) -- 10 weeks for males, 8 weeks for females -- the Marine who is to become an Aircraft Powerplants Mechanic, J79, moves to begin technical training. As a member of the naval aviation community, the Marine goes through a combination of Navy and Marine Corps training. The first technical course, Enlisted Basic Aviation Training, lasts 1.6 weeks and is conducted at the Naval Air Station, Memphis, at Millington, Tennessee. That course is closely followed by the Navy's "A" school for intermediate maintenance personnel, the Aviation Machinist Mate Class A-1 (6 weeks), also held at Millington. Then the Marine trainee moves to the Marine Corps Air Station at Beaufort, South Carolina, to attend either the J79-GE-8/10 Intermediate Maintenance Course (4.4 weeks) or the F-4/RF-4B J79 Powerplant

Intermediate Maintenance Course (2.6 weeks). The type of training depends on the unit to which the Marine is assigned. A short course (3 days) in corrosion control completes 6024 training.

Once in the unit of assignment, the new Aircraft Powerplants Mechanic, J79, begins a structured, graduated program of on-the-job training called Maintenance Training Management and Evaluation Program (MATMEP).⁵ Under MATMEP, the job tasks of the 6024 specialty are listed in logical, developmental order in the specialist's training file. The Marine is required to learn and to perform those tasks under supervision. Once the most rudimentary tasks are performed to the satisfaction of the supervisor, the 6024 moves to a more complex set of tasks associated with a higher skill level, and so on. This type of apprentice on-the-job training continues through the E4, corporal, grade. The 6024 is then ready for promotion to E5 and journeyman status.

Journeyman/Sustainment Training

The MATMEP approach is used for all aviation maintenance training in Selected Reserve aviation units. The normal requirement of flying aviation units to generate sorties inevitably assists the maintenance training program by creating a need for mission-oriented tasks and skills. By the time the Aircraft Powerplants Mechanic, J79, is completing work as an E6 SSGT (about 8 to 9 years after enlistment), this specialist is approaching master status.

Master Training

Training of the new E7 GYSGT master has been conducted under MATMEP in the Reserve Component. For Active Component Marines, training has consisted of less formal on-the-job training and experience. The Navy and Marine Corps offer the 6024 four additional, formal courses. None is required for promotion. All are helpful in general career development and preparation for specific assignments. The shortest is 5 days, the longest is 21.

⁵This program is now conducted only in Selected Reserve aviation units. Headquarters Marine Corps has completed an extensive review of the program and is now adjusting portions of MATMEP for application throughout the Corps.

APPENDIX G

MARINE HELICOPTER MECHANIC, CH-46

SPECIALTY: 6112 (Military Occupational Specialty (MOS)).

TITLE: Helicopter Mechanic, CH-46.

PHYSICAL WORK DEMAND: The Marine Corps does not classify its specialties according to the physical demands the job places on incumbents.

QUALIFICATIONS FOR THE AWARD OF THE MOS

General

The following general requirements must be met for the award of this MOS:

- Successful completion of all of the following courses:
 - Enlisted Basic Aviation Training (1.6 weeks)
 - Basic Helicopter Class A-1 course (6.0 weeks)
 - CH-46E Helicopter Mechanic course (4.4 weeks)
 - Basic Corrosion Control (0.6 weeks)
- A score of at least 100 in the Mechanical Maintenance (MM) aptitude area of the Armed Services Vocational Aptitude Battery (ASVAB)
- A physical profile of at least 222221
- Normal color vision
- Visual acuity of at least 20/50 with corrective lenses.

Additional Specialty Information

The Marine Corps depends solely upon its system of MOSs to identify military jobs and to describe supplemental skills. MOSs are used both as "billet designators" (or job designators) and as indicators of each Marine's specialty qualifications. In addition to one of the 479 Primary MOSs, enlisted Marines (or enlisted Marine billets) may carry one or more of 28 Category B MOSs, as an

indicator of additional qualifications (e.g., MOS 8611, Interpreter). Further, a group of 13 Identifying and Reporting MOSs (e.g., MOS 9962, Parachutist) is used to identify additional skills required by billets or possessed by enlisted Marines.

THE JOB

General

The Marine Helicopter Mechanic, CH-46, performs organizational, on-aircraft maintenance on the CH-46E helicopter in a flight line or on a hangar deck. This technician is a generalist, with responsibility for the aircraft's structural condition, as well as its avionics, electrical and hydraulic systems, powerplant, and rotors. The 6112 summons other mechanics with more specific qualifications in cases where serious breakdowns or major malfunctions occur.

The apprentice 6112 works under the supervision of senior, more experienced mechanics. Early work concentrates on lubrication, fueling, and preventive maintenance on the CH-46, and care of its ground support equipment. Minor repairs under supervision and limited ground tune-up work are also included.

As a journeyman, the 6112 supervises on-the-job training for apprentices and performs tasks that are technically more demanding than those expected of apprentices. The journeyman also acts as section leader or check crew leader on the CH-46 flight line.

The master helicopter mechanic performs technical supervision of flight-line operations (ashore) and of hangar-deck operations (afloat). On-the-job training of journeymen is also part of the master's duties.

Areas of Assignment

In both the Active Marine Corps and in the Selected Reserve, the great majority of Helicopter Mechanic, CH-46, billets are assigned directly to medium helicopter flying squadrons of the Fleet Marine Force. Seventy-seven percent of Active billets and fully 95 percent of Reserve positions are located there. Another 18 percent of Active 6112 billets are distributed among large concentrations of helicopters at major headquarters (e.g., Marine Helicopter Squadron One at Quantico, Virginia, and the station operations and maintenance squadron at Kaneohe Bay, Hawaii,

headquarters of Fleet Marine Force, Pacific) and among Marine Corps training units. About 5 percent of the 6112 billets of the Selected Reserve, but only 1 percent of Active 6112 billets, are assigned to the headquarters and maintenance squadrons of the two Reserve Marine aircraft groups that have helicopters.

Peacetime Versus Wartime

The peacetime job experience of the 6112 seems to coincide closely with the work expected in war -- on the same aircraft, in the same setting. Naval aviation maintenance procedures are highly standardized, and the role of the 6112 Helicopter Mechanic, CH-46, within those procedures is clear. Transition from peace to war should occur relatively smoothly.

Implications of Force Modernization

Military aircraft are modified and improved almost continuously. At present, the CH-46E helicopters of the Marine Corps are undergoing a major series of changes as part of a "Safety, Reliability and Maintainability (SRM)" program. SRM changes are concentrated in the avionics and hydraulics of the CH-46, but other modifications are included as well. The training of maintenance personnel in SRM changes will begin in October 1985. Selected Reservists of the Fourth Marine Aircraft Wing are scheduled to receive training from Naval Aviation Maintenance Training Detachment people or from factory technical representatives as the actual SRM modifications approach.

Skill Progression/Merging

The typical Helicopter Mechanic, CH-46, will begin work as an apprentice in a Marine unit (Active or Reserve) about the time he or she is eligible for promotion to E2 (private first class, or PFC).¹ Because of the technical nature of the work and the supervisory structure of naval aviation intermediate maintenance activities, this apprenticeship continues for approximately 1½ years (in both Active and Reserve units), until the grade of E5 (sergeant, or SGT).

¹Training installation commanders have authority to offer accelerated promotion to a small number of outstanding trainees, but those extraordinary cases are not considered in this report.

Journeyman status typically lasts more than 5 years, through grade E6 (staff sergeant, or SSGT).

The master 6112 is an E7 (gunnery sergeant, or GYSGT). With promotion to E8, the 6112 becomes a 6119, Helicopter Maintenance Chief.

No merging or combination of career ladders occurs within the 6112 specialty. The merging that does take place at the 6119 level is beyond the scope of this study.

THE INCUMBENT POPULATION

Personal Attributes

Age. Marine Reservists assigned to this specialty are slightly, but consistently, older than their Active Marine counterparts. These data are displayed, grade by grade, in Table G-1.

TABLE G-1. 6112 INCUMBENT PERSONAL
ATTRIBUTES -- AVERAGE AGE

GRADE	COMPONENT	MEAN AGE (YEARS)
E1-E3	Active SMCRA	21.2 IDA ^b
E4	Active SMCR	22.6 25.4
E5	Active SMCR	25.6 27.9
E6	Active SMCR	29.9 31.6
E7	Active SMCR	35.0 38.4

^aSelected Marine Corps Reserve.

^bInsufficient data available.

Aptitude Area Scores. Inconsistent relationships mark the ASVAB subtest scores of these incumbents, grade by grade. The Active and Reserve populations are similar. Table G-2 contains this information.

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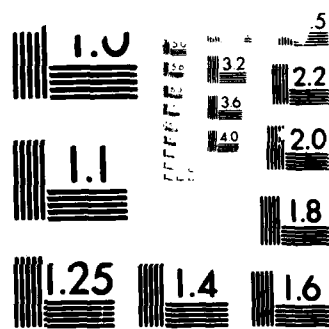
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MICROCOPY RESOLUTION TEST CHART

**TABLE G-2. 6112 INCUMBENT PERSONAL
ATTRIBUTES -- AVERAGE ASVAB APTITUDE
AREA SCORES**

(Mechanical Maintenance)

GRADE	COMPONENT	MEAN SCORE
E1-E3	Active SMCR	108.0 IDA
E4	Active SMCR	107.5 105.4
E5	Active SMCR	106.1 108.8
E6	Active SMCR	100.9 DUR ^a
E7	Active SMCR	IDA IDA

^aData under review.

NOTE: The minimum acceptable score for training in this specialty is 100.

Civilian Education Completed. Fewer Reservists than Active Marines who hold the 6112 MOS have completed high school. Unfortunately, the civilian education records of 25 percent of all Reservist 6112s are not available for analysis. Table G-3 contains such information as is available.

**TABLE G-3. 6112 INCUMBENT PERSONAL ATTRIBUTES --
CIVILIAN EDUCATION COMPLETED**

(Percentage of Total)

GRADE	COMPONENT	NONGRADUATE ^a	GED ^b	HSDG ^c	SOME COLLEGE ^d	UNKE
E1-E3	Active SMCR	2.9 IDA	0.0 IDA	94.9 IDA	2.2 IDA	0.0 IDA
E4	Active SMCR	2.6 6.3	0.0 0.0	94.9 56.2	2.6 0.0	0.0 37.5
E5	Active SMCR	2.4 4.8	0.0 14.3	93.5 57.1	3.5 0.0	0.6 23.8
E6	Active SMCR	1.0 10.0	0.0 0.0	98.0 50.0	1.0 10.0	0.0 30.0
E7	Active SMCR	1.3 7.7	0.0 0.0	90.9 61.5	7.8 7.7	0.0 23.1
AVERAGE	Active SMCR	2.3 7.4	0.0 4.4	94.7 60.3	2.9 2.9	0.1 25.0

^aIncumbents who have not graduated from high school.

^bIncumbents who have completed high school through General Education Development (GED) equivalency.

^cIncumbents who are high-school-diploma graduates (HSDG) but have no college experience.

^dIncumbents who have completed some college or university work.

^eUnknown -- incumbents for whom civilian education data are missing.

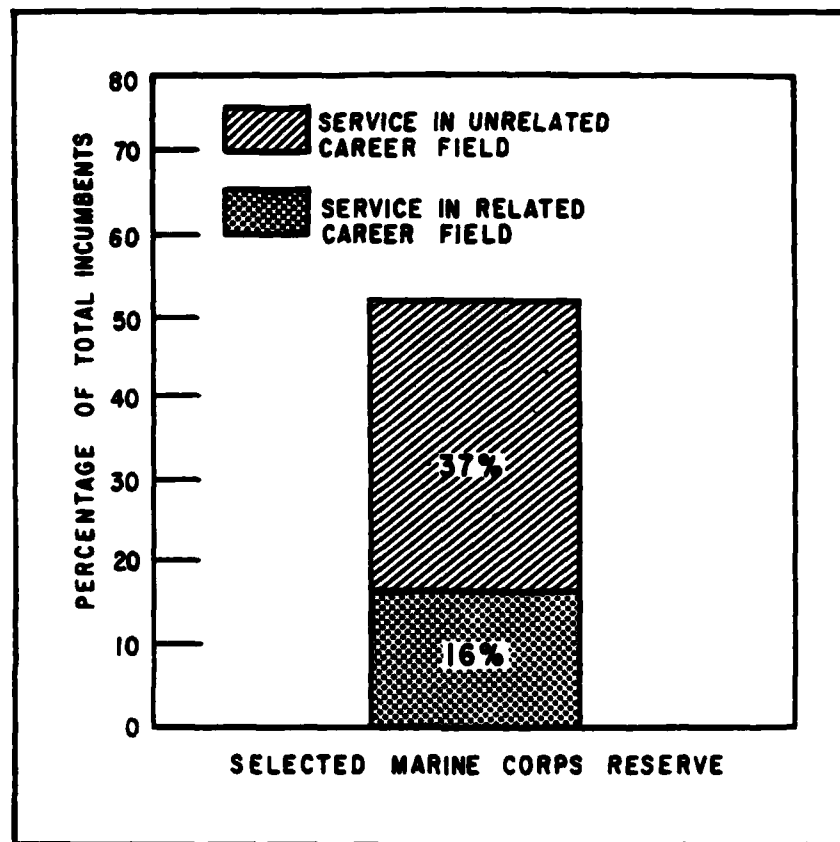
Experience

Prior Military Service. We estimate² that over half (53 percent) of all Selected Marine Corps Reservists assigned to this specialty have had active duty military experience. About 16 percent of all Reserve incumbents bring military service experience in related career fields³ to their present military jobs. Figure G-1 displays this information graphically.

²All prior military service estimates discussed in this section are based upon prior active military service data supplied by the Defense Manpower Data Center and derived from cumulative active duty loss records, by specialty, since 1971. Those raw data have been enhanced by projecting an additional prior service increment based on seniority factors of the Marine Corps Reserve enlisted population. This was done to compensate for the early (1971) data cutoff.

³Service in "related career fields" means: (1) service in the Marine Corps in the same MOS; (2) service in the Marine Corps, not in the same MOS but in the same Department of Defense (DoD) occupational code; and (3) service in a different Military Service in the same DoD occupational code.

**FIGURE G-1. 6112 INCUMBENT EXPERIENCE --
PRIOR ACTIVE MILITARY SERVICE**



Length of Service. Compared, grade by grade, Active and Reserve Marine 6112s show an inconsistent relationship regarding total military service. Overall, the two populations are similar. Table G-4 contains this information.

Time in Grade. As with length of service, time-in-grade relationships between Active and Reserve 6112s are uneven, when compared grade by grade. These populations are also remarkably similar from this perspective. Table G-5 contains these data.

**TABLE G-4. 6112 INCUMBENT EXPERIENCE --
LENGTH OF TOTAL MILITARY SERVICE**

GRADE	COMPONENT	MEAN LENGTH OF SERVICE (YEARS)
E1-E3	Active SMCR	2.6 IDA
E4	Active SMCR	4.1 4.2
E5	Active SMCR	6.9 7.6
E6	Active SMCR	11.2 10.5
E7	Active SMCR	15.7 17.8

**TABLE G-5. 6112 INCUMBENT EXPERIENCE --
TIME IN GRADE**

GRADE	COMPONENT	TIME IN GRADE (YEARS)
E1-E3	Active SMCR	0.8 IDA
E4	Active SMCR	1.1 0.8
E5	Active SMCR	2.1 1.9
E6	Active SMCR	3.0 2.3
E7	Active SMCR	3.8 3.9

Full-Time Support. The Active Marines who provide full-time support for Selected Reservists assigned to this specialty occupy almost half (49 percent) of the total number of Selected Reserve billets or positions assigned. These full-time support people are routinely assigned directly to Reserve billets, as opposed to being assigned to advisory or adjunct positions. Full-time support Marines assigned to aviation units will mobilize and deploy with the units they now support. Table G-6 contains information on full-time support.

TABLE G-6. 6112 FULL-TIME SUPPORT FOR SELECTED MARINE CORPS RESERVE (SMCR)

ORGANIZATION	TOTAL SMCR POSITIONS REQUIRED	FULL-TIME SUPPORT ^a	
		Assigned	Percentage of Required Strength
4th MARDIV ^b 4th MAW ^c	None 80 ^d	None 39	None 49
TOTALS	80	39	49

^aDoes not include civilian clerical and administrative employees of the Department of the Navy.

^bFourth Marine Division.

^cFourth Marine Aircraft Wing.

^dThis quantity includes those Selected Reserve billets routinely occupied by full-time support personnel.

THE TRAINING PROGRAM

Apprentice Training

After attending Recruit Training (boot camp) -- 10 weeks for males, 8 weeks for females -- the Marine who is to become a Helicopter Mechanic, CH-46, begins technical training, a combination of Navy and Marine Corps training. The first of the technical aviation courses for the 6112 is Enlisted Basic Aviation Training (EBAT), lasting 1.6 weeks, and held at the Naval Air Station, Memphis, at Millington, Tennessee. That course is followed by the 6-week Navy "A" school for helicopter mechanics, the Basic Helicopter Class A-1, which is also held at Millington. Next

comes a 4.4-week CH-46E Helicopter Mechanic course at the Marine Corps Air Station (Helicopter), at Tustin, California. A short (3-day) course in corrosion control completes technical training for all 6112s. All this institutional training is undertaken by both Active and Reserve Component Marines.

Once in the unit of assignment, the new Reserve 6112 begins a structured and regulated program of on-the-job training. That program, called the Maintenance Training Management and Evaluation Program (MATMEP),⁴ lists the job tasks of the 6112 in logical, developmental order in the specialist's training file. The Marine is required to learn and perform those tasks in order, under supervision. Once the simplest tasks are performed and judged satisfactory, the mechanic moves to a more complex set of tasks associated with a higher skill level, and so on.

Journeyman/Sustainment Training

MATMEP is continued through all skill levels for Marine aviation maintenance workers. The continuing requirement of helicopter units for sortie generation in peacetime creates mission-oriented practice for 6112s.

Master Training

As with preparation for journeyman status, MATMEP continues with the training for master status at grade E7. This grade is reached for both Active and Reserve Marines about 8 to 9 years after enlistment. The Marine Corps offers four additional, institutional courses for 6112s with considerable experience. None is required for promotion. The shortest of the four is 5 days, the longest is 36.

⁴This program is now conducted in Selected Marine Corps Reserve aviation units only. Headquarters, Marine Corps has completed an extensive review of the program and is presently adjusting portions of MATMEP for application throughout the Corps.

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