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# WOMEN IN THE ARMY POLICY REVIEW



OFFICE OF THE DEPUTY CHIEF OF STAFF FOR PERSONNEL

DEPARTMENT OF THE ARMY

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EXECUTIVE SUMMARY

→ This report presents the results of the Women in the Army Policy Review Group's analysis of Army personnel policies as they relate to mission, combat readiness, quality of life aspects, and the utilization of female enlisted soldiers in the United States Army. ←

Women have historically served the Nation and its Armed Forces with selfless distinction in both peace and war. This service has marked both the growth in number of women in the Army and the proliferation of positions to which they have been assigned. This report is the Review Group's assessment of needed changes in personnel management policies to provide an environment conducive to the continued growth and meaningful service of all soldiers while improving the combat readiness of the Army. The Army's commitment to provide meaningful opportunities for all soldiers remains an organizational imperative.

While this review was needed, in retrospect, its conduct under the aegis of "Women in the Army" was unnecessary. Problems identified resulted from inadequate planning and research as the Army assimilated increasing numbers of women into the force; not because women were in the Army. Large numbers of women in the Army are not new; but, as a percentage of the force, current ratios present both opportunities and challenges not before experienced.

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In World War II, the number of women serving in the Army increased from 939 in 1940 to a high of 153,644 in 1945 (3 percent of the force). From 1945 through 1968 the female content of the Army fluctuated between 10,000 and 15,000 women. A six-fold increase in enlisted women occurred between 1968 and 1981 when the strength rose from 10,000 to 65,000 women (9.4 percent of the active force). This rapid growth occurred without adequate analysis and planning. For example, the Army had not completely researched nor established policy on making job assignment according to an enlistee's physical capability. As a result, some female soldiers were assigned to jobs for which they lacked physical capacity to meet job requirements. Also, the Army had not made a thorough analysis of where women would serve on the battlefield.

As the female strength increased both internal and external concerns increased. General Accounting Office Report FPCD-76-26, "Job Opportunities for Women in the Military: Progress and Problems," recommended in 1976 that each service develop physical standards for its jobs and standards for measuring the strength, stamina and other requirements of its jobs. The report also urged that more jobs be made available to women and stressed that women should be encouraged to select jobs previously restricted to men. The report noted that women had been assigned to jobs for which they lacked requisite physical capacity and which were combat related. Army field commanders observed a disproportionately high female content in some units. They also

remarked that some women were having difficulties in performing the full range of some tasks and they noted that some women were serving in positions that would require routine engagement in direct combat.

The weight of these combined concerns led to a decision that a comprehensive review of all policies and programs relating to women in the Army be conducted to determine the effect these policies had on providing an environment conducive to the continual growth and meaningful service of all soldiers while improving combat readiness of the Army. In May 1981, the Women in the Army Policy Review Group was formed to make such a review.

Two principles guided the Policy Review Group's analysis. First, personnel policies must support fully the Army's principal mission which, simply stated, is to be ready for combat. Second, policies should maximize the potential of every soldier to contribute to the Army and its mission.

Nineteen issues were developed for analysis. Two, pregnancy and the Combat Exclusion Policy, were female-specific. The Army has identified the pregnancy issue as a Department of Defense policy matter and recommended to the Assistant Secretary of Defense for Manpower, Reserve Affairs, and Logistics that an Office of the Secretary of Defense joint study effort be initiated. Two issues--Military Occupational Specialty (MOS) Physical Demands Analysis and Direct Combat Probability Assessment (Combat

Exclusion Policy) are discussed in depth in this report, for they address the personnel policy changes which most affect combat readiness. The remaining issues affected all soldiers and have been or will be addressed by the Army staff through normal staff procedures.

Military Occupational Specialty Physical Demands Analysis provides the base on which a gender-free physical capacity test can be designed and validated. When determined effective, this test will be used to screen all new soldiers, male and female, to ensure that they enter only those Military Occupational Specialties for which they physically qualify.

To be combat effective, all soldiers must be physically capable of performing the full range of tasks associated with their Military Occupational Specialty. In manuals, regulations, testing documents, and occupational surveys, the Army has charted the duties of its soldiers. The physical capacity of soldiers has also been researched. However, the two have never been linked. To link these two independent bodies of knowledge for the classification of Military Occupational Specialities, the Department of Labor Physical Demands Classification methodology was selected.

Having established the physical classification to be used, the Review Group asked those commands having responsibility for doctrine and training in each enlisted career field to identify for each Military Occupational Specialty the physical demands

required of the job. In addition to the individual and organizational tasks that represent Army jobs, the Review Group also examined the non-combat, day-to-day environment to which soldiers are exposed.

The Army is currently validating the Physical Strength Capacity Test at Fort Jackson, South Carolina. The overall objective of the Military Enlistment Physical Strength Capacity Test (MEPSCAT) Battery is to match the soldier with the job. Initial physical capacity testing will assess work capacity of the soldier at the Military Enlistment Processing Station prior to his/her receiving Army Basic Training. Scores will provide a predicted level of physical work capacity by the end of Basic Training and Advanced Individual Training. Predicted physical capacity scores will then be used to qualify soldiers for jobs.

By implementing a Physical Capacity Military Enlistment Physical Strength Capacity Test Battery Screen, the Army expects to reduce turbulence and increase cohesion thereby improving Army combat readiness as soldiers do better at jobs for which they have the requisite physical capacity.

The second major component of the analysis is the Direct Combat Probability Assessment. This assessment began with a review of existing laws. There are two statutes specifically addressing the role of women in combat:

- (1) United States Air Force. Title 10, United States Code, Section 8549, provides that female members of the Air Force, except those designated under Section 8067 of this title (Medical, Dental, Chaplain, other "Professionals"), or appointed with a view to designation under this Section, may not be assigned to duty in aircraft engaged in combat missions.
  
- (2) United States Navy and United States Marine Corps. Title 10, United States Code, Section 6015 provides that the Secretary of the Navy may prescribe the manner in which women officers, women warrant officers, and enlisted women members of the Regular Navy and the Regular Marine Corps shall be trained and qualified for military duty. The Secretary may prescribe the kind of military duty to which such women members may be assigned and the military authority which they may exercise. However, women may not be assigned to duty on vessels or in aircraft that are engaged in combat missions, nor may they be assigned to other than temporary duty on vessels of the Navy except hospital ships,

transports, and vessels of a similar classification not expected to be assigned combat missions.

The Secretary of the Army has statutory authority to determine the assignment policies of all soldiers (Title 10, United States Code, Section 3012). Under this authority, the Secretary of the Army, in 1977, issued the following Combat Exclusion Policy:

"Women may not serve in Infantry, Armor, Cannon Field Artillery, Combat Engineer, or Low Altitude Air Defense Artillery units of Battalion/Squadron or smaller size."

A formal definition of Direct Combat did not exist at the start of the Review Group analysis. However, Department of Defense forwarded a definition of Close Combat to the Congress in February 1978. It defined close combat as to:

"Engage an enemy with individual or crew-served weapons while being exposed to direct enemy fire, a high probability of direct physical contact with enemy's personnel, and substantial risk of capture."

The Army definition of Direct Combat reads: Engaging an enemy with individual or crew served weapons while being exposed to direct enemy fire, a high probability of direct physical contact with the enemy's personnel and a substantial risk of capture. Direct combat takes place while closing with the

enemy by fire, maneuver, and shock effect to destroy or capture him or while repelling his assault by fire, close combat, or counterattack.

Based upon this definition, the Review Group made its analysis and developed a combat probability coding system for personnel distribution on the battlefield.

There are four dimensions to combat probability coding.

These are:

- (1) Duties of the job or Military Occupational Specialty.
- (2) Unit mission.
- (3) The battlefield location and, specifically, locations in the theater.
- (4) Army Doctrine.

Military Occupational Specialty duties and unit mission were initially considered in the original Combat Exclusion Policy; however, battlefield location and doctrine had never been fully incorporated into the existing Combat Exclusion Policy.

In developing the Combat Probability Coding System, seven codes, numbered P1 through P7, were defined. A soldier in a P1 position has the highest probability of participating in direct combat and a soldier in a P7 position has the least probability of participating in direct combat. Once this probability coding system is applied to each position in the Army and merged with the Physical Demands Categories, it enables the Army to classify each duty position based upon the risk of direct combat and the physical demands required by it.

The Physical Demands Analysis and Direct Combat Probability Coding System are forward looking systems. As new Tables of Organization and Equipment or Tables of Distribution and Allowances (the basic authorization documents for each unit or agency in the Army) are developed, Combat Probability Codes will be included. As equipment changes and physical demands become lighter or heavier, Military Occupational Specialties will be reclassified in conformance with the Physical Demands Analysis.

The Women in the Army Policy Review Group's conclusions were:

(1) The Army should implement a system whereby soldiers are matched to the physical demands of their jobs.

(2) Assignment policy for each MOS must recognize the combat probability of each MOS and restrict assignment of women in those with a high probability of routinely engaging in direct combat.

The Army will match the physical capacity of its soldiers with Military Occupational Specialty requirements. It will do so by accessing future soldiers into jobs they can physically perform and by reclassifying and retraining current soldiers at their reenlistment point to Military Occupational Specialities for which they physically qualify. The Army staff will develop a transition plan to be implemented at the reenlistment point. The plan will take into account the physical capacity of the

soldier to do a job, fairness to the individual and combat readiness.

Analysis of each MOS for Combat Probability Coding resulted in the recommended closure of 23 additional MOS to women. This action will not mean that female soldiers will never be in combat, for a fluid battlefield will dictate otherwise. What it does mean is that the probability of their being engaged routinely in direct combat will be reduced. The Army will implement the new combat probability codes by contracting new accessions into appropriate skills and by reclassifying and retraining existing personnel when they reenlist to new skills that do not have a high probability of direct combat.

Existing enlistment and reenlistment contracts will be honored.

As these personnel realignments proceed, enlisted women will be eligible to serve in 83 percent, over 300, of the Army Military Occupational Specialties. Furthermore, a growth in female managers (officers and noncommissioned officers) will result. Between Fiscal Year 1982 and Fiscal Year 1987, senior female noncommissioned officer strength is expected to grow from about 16,000 to about 18,000. Between Fiscal Year 1982 and Fiscal Year 1987, we expect the female officer strength to increase from 9,000 to 13,000.

It is important to note that the Army today has more female officers in its ranks than it had female enlisted members 20 years ago. It also has more female noncommissioned officers now

than the total Army female population, officer and enlisted, 20 years ago.

In summary, the Policy Review Group's findings respond directly to the recommendations of the May 1976 GAO report to Congress and the Secretary of Defense and will improve Army readiness to perform its combat mission by:

(1) Providing a gender-free capability to match people to Army Military Occupational Specialties.

(2) Providing a clearer understanding of where women will serve on the battlefield.

(3) Providing increased opportunity for both male and female soldiers to succeed.

This review did not analyze the implications of physical demands on the branching and assignment of male and female officers. The Army staff continues to study the optimal placement and employment of officers. This issue is complicated by the requirement for development and utilization in dual specialities and differences in the general nature of tasks performed by supervisors.

## CHAPTER 1

### INTRODUCTION

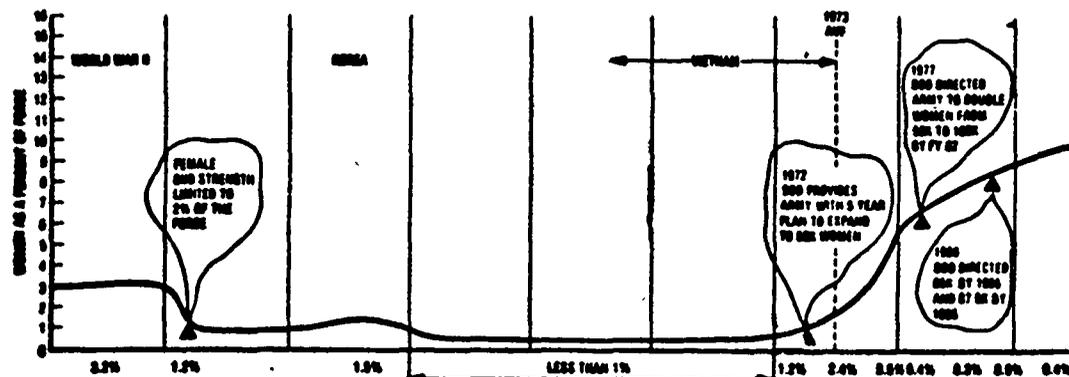
#### SECTION I - BACKGROUND

1-1. PURPOSE. This report presents the results of the Women in the Army Policy Review Group's (WITAPRG) analysis of Army personnel policies which deal with direct combat and physical demands as they relate to mission, combat readiness, quality of life and the utilization of female enlisted soldiers in the United States Army.

1-2. WOMEN IN THE ARMY--EVOLUTIONARY PERSPECTIVE. Women have historically served America's military and the Nation with distinction and honor during peace and war. Distinguished service has been marked by the increase of women in each Service and the proliferation of positions to which they have been assigned. Just as the military led and continues to lead the nation in expanding opportunities for minorities, the military has been and remains the country's leader in achieving similar objectives for women.

FIGURE 1-1

### WOMEN IN THE ARMY (EVOLUTIONARY PERSPECTIVE)



a. Women in the Army up to 1968. Although women have served in the Armed Forces throughout our nation's history, significant growth in their numbers did not occur until World War II. During World War II, the number of women in the Active Army increased from 939 in 1940 to a high of 153,644 in 1945 (3.2 percent of the Army). From 1945 through 1968, the female content of the Active Army fluctuated between 10,000 and 15,000 and never exceeded 1.5 percent of the force.

TABLE 1-1

WOMEN IN THE US ARMY (ACTIVE COMPONENT)

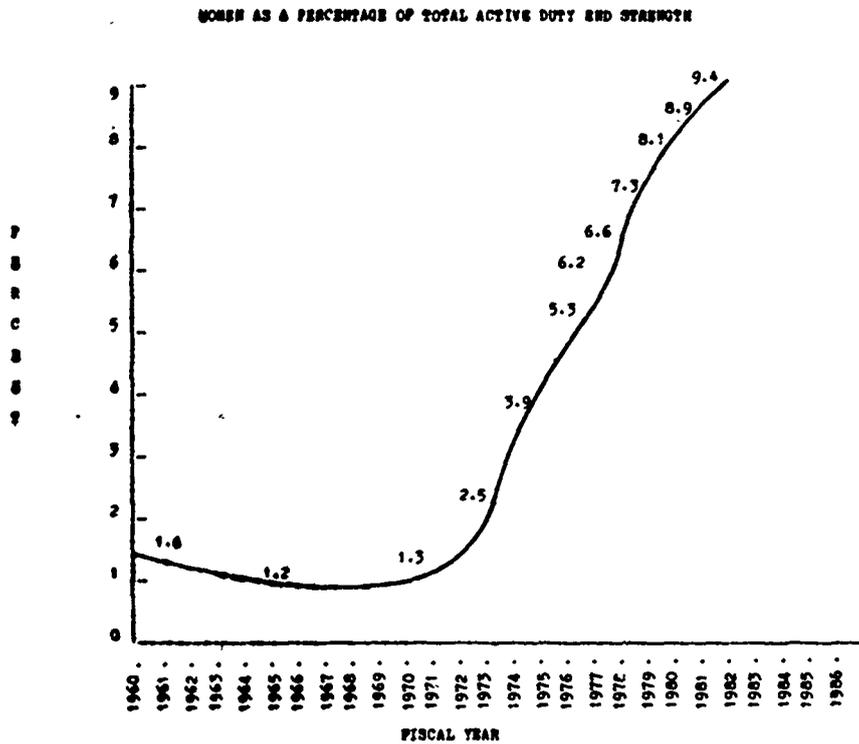
<u>FISCAL YEAR</u>	<u>OFFICER</u>	<u>WARRANT OFFICER</u>	<u>ENLISTED</u>	<u>TOTAL</u>
1960	4,211	39	8,279	12,529
1961	4,202	38	8,560	12,800
1962	4,292	48	8,721	13,061
1963	3,800	40	8,292	12,132
1964	3,723	37	7,958	11,718
1965	3,775	23	8,520	12,318
1966	4,112	22	9,179	13,313
1967	4,694	34	9,741	14,469
1968	5,052	27	10,711	15,790
1969	5,113	20	10,721	15,854
1970	6,376	13	11,476	17,865
1971	5,022	19	11,825	16,866
1972	4,403	19	12,349	16,768
1973	4,258	21	16,457	20,736
1974	4,369	19	26,328	30,716
1975	4,572	22	37,703	42,297
1976	4,815	29	43,806	48,650
1977	5,651	45	46,094	51,969
1978	6,224	68	50,292	56,841
1979	6,775	91	54,818	62,017
1980	7,496	113	61,351	69,338
1981	8,652	127	64,999 <sup>1/</sup>	73,778

<sup>1/</sup> Paused at 65,000 enlisted women; originally programmed at 69,000 enlisted women.

b. Growth from 1968 to 1981. As noted in Table 1-1, between 1968 and 1981, a six-fold increase in enlisted women occurred as their number rose from 10,000 to 65,000. While the female content of the Army in World War II had been numerically higher, never in our history have women constituted such a large percentage of the total force (9.4 percent in 1982). As Table 1-2 indicates, women as a percent of the total force, increased more than seven times from 1970 to 1981.

TABLE 1-2

GROWTH OF WOMEN IN THE US ARMY (ACTIVE COMPONENT)



c. Growth in Reserve Components. While the growth of women in the Active Army was significant, it was even greater in the National Guard (Table 1-3) where female enlisted strength grew from 0 to 18,000 in less than 10 years. USAR female strength increased tenfold over the decades of the 1960's and 1970's (Table 1-4).

TABLE 1-3

WOMEN IN THE ARMY NATIONAL GUARD

<u>FY END DATE</u>	<u>OFFICERS</u>	<u>WO</u>	<u>ENLISTED</u>	<u>TOTAL</u>
1970	36	0	0	36
1971	38	0	0	38
1972	41	0	15	56
1973	105	0	413	518
1974	200	0	2,579	2,779
1975	270	1	6,500	6,771
1976	452	10	9,887	10,349
1977	590	18	12,300	12,908
1978	789	28	12,898	13,715
1979	998	41	13,595	14,634
1980	1,310	47	15,511	16,868
1981	1,579	74	17,968	19,621

NOTE: Source is NGB-ARP-P. Data before 1970 is not available.

TABLE 1-4

WOMEN IN THE ARMY RESERVE (LESS RETIRED RESERVE)

<u>FY END DATE</u>	<u>OFFICERS</u>	<u>WO</u>	<u>ENLISTED</u>	<u>TOTAL</u>
1960	3,102	51	869	4,022
1961	2,946	45	756	3,747
1962	2,419	34	606	3,059
1963	2,117	34	526	2,677
1964	1,967	35	521	2,523
1965	1,767	32	538	2,337
1966	1,628	26	428	2,082
1967	1,726	29	386	2,141
1968	1,653	25	407	2,085
1969	1,813	26	444	2,283
1970	1,455	21	422	1,898
1971	1,542	20	420	1,982
1972	1,998	19	488	2,505
1973	2,253	20	1,586	3,859
1974	2,545	12	5,483	8,040
1975	2,865	24	14,376	17,265
1976	3,179	27	17,706	20,912
1977	4,229	39	21,004	25,272
1978	5,057	48	20,698	25,803
1979	5,495	57	22,423	27,975
1980	6,476	78	29,974	36,528
1981	7,481	104	42,373	49,958

NOTE: Source for 1960 thru 1981 is DCSPER 46.

1-3. EMERGING CONCERNS. Rapid distribution of large numbers of women throughout the Army's occupational and organizational structure generated both external and internal concerns.

a. External Concerns.

(1) In a letter to the President of the Senate and the Speaker of the House of Representatives in 1976, the Comptroller General of the United States, pursuant to the Budget and Accounting Act and the Accounting and Auditing Act (31 USC 53 and 31 USC 67), stated:

With the advent of the All-Volunteer Force and the anticipated passage of the Equal Rights Amendment, the Department of Defense intensified efforts to recruit women and to increase their use in a wider range of occupational specialties, including some previously restricted to men. GAO initiated a review to determine how effective the services' efforts have been to recruit, train and utilize women. <sup>1/</sup>

The results of this review were presented to the Congress and the following recommendations were made to, and accepted by, the Department of Defense:

The services have a unique opportunity to evaluate the extent to which women are interested in, and can perform, jobs traditionally restricted to men. To do this, GAO recommends that the Secretary of Defense have the services:

- 0 Reevaluate all jobs to identify those that can really be opened to women, considering jobs that (1) must be

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<sup>1/</sup> GAO Report FPCD-76-26, 1976, Job Opportunities for Women in the Military: Progress and Problems. Forwarding Letter, B-157371, from the Comptroller General of the United States to the President of the Senate and the Speaker of the House of Representatives.

restricted to men because all authorized positions are required by combat units or the rotation base and (2) primarily involve combat vessels.

- 0 Develop physical and other standards for jobs where either is a factor in effective performance.
- 0 Develop standards for measuring the strength, stamina, and other requirements for jobs where such attributes are factors in effective performance.
- 0 Tell women about the jobs for which they qualify and encourage them to select those previously restricted to men.
- 0 Require women to meet the same training and performance requirements as men in the jobs assigned.

Department of Defense officials agree with these recommendations and agree that the opportunities for women in the military should be newly evaluated. The Department of Defense has formed a study group to address these issues and will keep GAO informed on the group's progress. 2/

(2) GAO pinpointed the need for physical and operational job standards in its report to the Congress by continuing:

- 0 The services had no experience with women in the occupational specialties opened to them during 1972-74. Assignments were based on factors that were essentially the same as for men, such as overall health, aptitude, and personal choice, without regard to their ability to satisfy the specialties' strength, stamina, and operational requirements, that is, the sea-to-shore rotation problem.
  - Some women have been assigned to occupational specialties in

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2/ Ibid, p.ii.

which they cannot perform effectively because of strength limitations or because the job was combat related.

- Some have not been assigned to specialties in which they have been trained because of restrictions against combat service and because they either could not, or supervisors believed that they could not, do the work.
- Some have not been required to meet the same training and performance requirements as men.

The conclusions in this chapter are based primarily on interviews with females performing certain jobs requiring physical tasks and with their male supervisors. We determined that some women were not performing certain duties required by the job. In most cases both the males and females interviewed indicated that strength was a significant factor where females were not fulfilling the job requirements.

Sometimes, however, the answers we received might also reflect traditional attitudes toward male-oriented roles, such as bulldozer operators, as opposed to jobs traditionally female-oriented, such as clerks. Therefore, it is difficult or impossible to determine from the interviews the real reasons why females were not performing certain physical tasks. We have shown the results of our interviews because both the males and females agreed that the females were not, in fact, performing some tasks and, to whatever extent it is an attitude problem, it requires attention before it can be resolved. <sup>3/</sup>

(3) To obtain information about the performance of women in specialties which involved potentially strenuous physical and operational demands, the GAO interviewed commanding officers, supervisors, and women associated with, or assigned to, selected specialties in each of the services. What follows

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<sup>3/</sup> Ibid, p.13.

are GAO comments on selected Army specialties:

Ammunition storage specialist

This specialty includes manually and mechanically lifting, moving, and stacking rounds and boxes of ammunition and offers an enlistment bonus of \$1,500 to 4-year enlistees. The rounds weigh 58 pounds and the boxes weigh 120 pounds.

According to officials at the training school for this specialty, women and men receive the same training and women have no problems performing physical tasks. Heavy items are generally lifted by two people or with forklifts, and in field activities forklifts are usually used for lifting ammunition.

We interviewed supervisors and women in ammunition storage activities at two Army installations. One activity had two women ammunition storage specialists and the other had four. One of these specialists was hospitalized and the other five were performing clerical or administrative duties. Three had received enlistment bonuses.

Officials of both activities said that women had been tried as ammunition storage specialists but physically could not do the work. At one activity all ammunition has to be moved by hand, and at the other installation 90 percent has to be moved by hand. According to the official at one activity, his unit has a combat support mission and, since women cannot be assigned to combat, deployment would require replacing any women assigned to storage operations. The Department of the Army later explained to us that the only restriction is that women will not be assigned to Category I units (generally units which engage the enemy) nor to 35 combat or close combat support military occupational specialties.

Medical specialist (ambulance driver)

This specialty involves driving and maintaining truck-type ambulances and loading and unloading patients under field or deployed conditions.

Officials of a medical company said that women ambulance drivers, particularly small ones, have problems loading and unloading patients, braking and steering ambulances, and changing wheels and tires. They also said that, unlike the men, they do not perform guard duty at night because they were not required to take weapons training. The Department of the Army informed us that as of

July 1975, all enlisted women, except conscientious objectors, are required to take defensive weapon training.

We also interviewed five women ambulance drivers. One was performing clerical work and one had not participated in field exercises. The other three said that they have problems loading and unloading patients; one said that during field exercises, three women are assigned to lift patients normally lifted by two men. One also said that she cannot perform vehicle maintenance, including mechanics and changing tires and oil. She said that men drivers perform all the vehicle maintenance.

#### Wheel vehicle mechanic

The duties of this specialty include inspecting, maintaining, and repairing automotive vehicles up to and including 5-ton trucks. Persons assigned to this specialty are supposed to be capable of removing and replacing engine components, wheels, hubs, tires, and universal joints.

At the time of our review, 45 women were enrolled at the training school for this job. According to officials at the school, some women and some men have problems with tasks such as removing and lifting the wheels (100 to 125 pounds) and hubs of two and one-half (2-1/2) ton truck and applying the required torque (125 pounds) to axle nuts. But the officials said that persons unable to accomplish such tasks are provided assistance and not failed because they lack the strength. The officials also said that students work in pairs. One supervisor said that women do have more problems than men with the physically demanding tasks.

School officials also said that training does not really represent field conditions because students work in pairs on equipment repeatedly taken apart and limited to a maximum of two and one-half (2-1/2) ton trucks. In the field, they said, equipment will be heavier (up to 5-ton trucks) and more difficult to work on. <sup>4/</sup>

b. Internal Concerns. While missions remained unchanged and the Army's end strength held constant, the female content of the Army continued its rapid growth. Field commanders

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<sup>4/</sup> Ibid, p.23.

voiced four major concerns. Those were (1) the ability of some units to accomplish their mission because of high female content, (2) female attrition rates were increasing rapidly, (3) many women lacked the physical strength to perform the full range of tasks required of their Military Occupational Specialty (MOS), and (4) the location of women on the battle-field would require many of them to engage routinely in direct combat. During the 1980 Commanders' conference, field commanders again called for a review of their readiness concerns relative to the increased numbers of women in certain units, particularly medical battalions and units from which their tactical reserve would be drawn for commitment to direct combat.

c. The "Pause" at 65,000. Headquarters Department of the Army, concerned with the signals of a potential degradation of readiness, high attrition rates among women, claims of sexual harassment, and high injury rates among women in initial entry training, <sup>5/</sup> decided to review and assess current Army programs and policies to determine their impact on women soldiers and on the combat readiness of the Army. In February 1981, the Army temporarily paused at an enlisted female strength of 65,000 to allow time to assess the impact on readiness, develop an accurate strength assessment, identify career and

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<sup>5/</sup> Kowal, D.M. "The Nature and Causes of Injuries in Women Resulting from an Endurance Training Program." American Journal of Sports Medicine. Volume 9, No. 4, pp.256-69, 1980.  
(Appendix C.)

satisfaction impediments, and formulate recommendations for policy changes. In order to maintain the 65,000 strength, the Army recruited 18,302 women in FY 81 and an additional 15,195 women in FY 82. At the time of the "65,000 pause," the Army was proceeding toward a Department of Defense (DOD) directed goal of 87,500 enlisted women by 1987. This planning figure was not predicated on any empirical analysis. Given the internal and external concerns, a review of existing policies and programs was not only desirable but obligatory.

## SECTION II - FORMATION OF THE POLICY REVIEW GROUP

1-4. WOMEN IN THE ARMY POLICY REVIEW GROUP (WITAPRG). On 4 May 1981, the WITAPRG was established by the Department of the Army (See Appendices A and B for tasking and organization documents). The WITAPRG was tasked to review and assess current Army programs and policies affecting women soldiers as they relate to operational readiness, deployability and retention, combat effectiveness, quality of life, current approved doctrine, unit employment, and the classification and assignment of soldiers. The Review Group, as a result of its analysis, addressed the central issue of the female content planning figure. Two major research efforts were developed: Military Occupational Specialty (MOS) Physical Demands Analysis and Direct Combat Assessment (Combat Exclusion Policy). Although MOS Physical Demands Analysis and Physical Capacity Testing will apply to all entry level enlistees on a gender-free basis,

these areas are discussed within the context of women in the Army for the following reasons. First, the GAO observations and recommendations discussed in Section I; and second there are significant differences between men and women in certain physical strength categories, particularly upper body strength. <sup>6/</sup> Given the Army's operational combat mission and the composition of units which execute that mission, a rational approach in formulating an accession and retention policy must consider the probability of successfully recruiting and retaining soldiers who can meet the physical demands of Army jobs.

a. Issue Identification. WITAPRG was tasked to review a host of issues (Table 1-5). Analysis of the problems surrounding all of the issues, their genesis, cause and effect relationship, interrelationship, and potential for corrective action provided the basis for identification of issues as "female-specific," "soldier-specific" and "institutional." Two of these issues, pregnancy and the Combat Exclusion Policy, were unique to women (female-specific). The Army has identified the pregnancy issue as a Department of Defense policy matter. The remaining

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<sup>6/</sup> Kowal, D.; Vogel, J.; Sharp, D.; Knapik, J. Analysis of Attrition, Retention, and Criterion Task Performance of Recruits During Training. U.S. Army Medical Research and Development Command Technical Report T2/82., 1982.

issues dealt with all soldiers. What began as a review of "women issues" became an analysis and evaluation of factors that affect all Army enlisted personnel.

TABLE 1-5

ISSUE CLASSIFICATION

<u>SOLDIER - SPECIFIC</u>		<u>INSTITUTIONAL</u>
FEMALE	MALE AND	o Sole parents
SPECIFIC	FEMALE	o Direct Combat
o Pregnancy	o Fraternization	o Sexual Harrassment
o Combat Exclusion Policy	o In-Service Married Couples	o Female Clothing
		o Nutrition
		o Extreme Temperatures
		o Child Care
		o Career Development
		o MOS Physical Requirement
		o Lost Time
		o Attrition
		o Migration
		o Retention
		o Malutilization
		o Field Hygiene

b. Issue Focus. WITAPRG focused on assessing the extent to which personnel policies support the Army's principal statutory mandate to "organize, train, and equip primarily for prompt and sustained combat incident to operations on land - and to

prepare its land forces for the effective prosecution of war". 7/  
An Army ready to go to war today and win, anywhere in the world, is the hub around which all policies and programs revolve and is the basis for review, analysis, and change.

c. Issue Reduction and Disposition. Because most of the issues were not "female-specific", all but three were referred by the WITAPRG to other Army staff activities for resolution. The "female-specific" issue --pregnancy--has an impact on all services and is a DOD policy matter. The Army has recommended to the Assistant Secretary of Defense, Manpower, Reserve Affairs, and Logistics, that an Office of the Secretary of Defense Joint Study effort be initiated. The Combat Probability Coding and Physical Demand Analysis are addressed in this report.

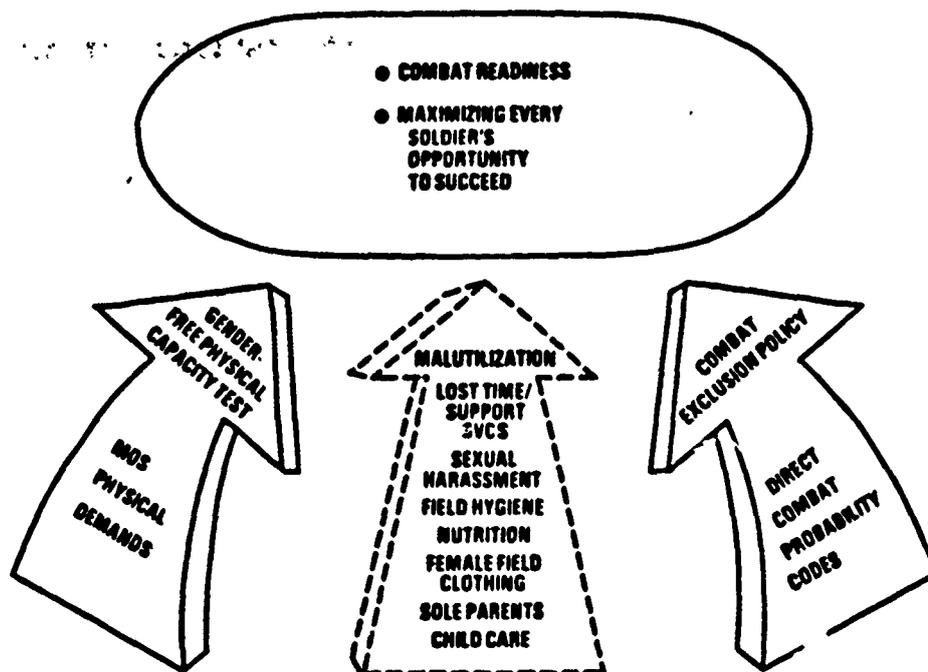
d. Focus of this Report. The focus of this report is portrayed graphically in Figure 1-2.

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7/ Title 10, United States Code, Section 3062.

FIGURE 1-2

**WOMEN IN THE ARMY**



e. Methodology. The methodological approach used by the WITAPRG incorporated appropriate features of widely accepted methods for research and statistical analysis. Combat readiness was the primary focus of the WITAPRG methodology and review. As a concept, it becomes the dependent variable in all analyses. The methodology is discussed at length in chapters 2, 3, and 4.

1-5. FINDINGS. Findings provided in this report are derived from consideration of information collected and developed by the WITAPRG, the United States Army Research Institute of

Environmental Medicine, the Army Research Institute for the Behavioral Sciences, the Army Audit Agency, the United States Army Military Personnel Center, the United States Army War College, the United States Military Academy, and major field commands during the period May 1981-August 1982. Recommendations for new or changed policies designed to present a more combat-ready, cost-effective force are contained in Chapter Five.

CHAPTER 2  
MILITARY OCCUPATIONAL SPECIALTY (MOS)  
PHYSICAL DEMANDS ANALYSIS

2-1. GENERAL. That enlisted soldiers must have the physical capacity to perform the full range of duties associated with their assigned Military Occupational Specialty (MOS) is an operational reality, not an administrative requirement. The Army's primary "high technology system"--its soldiers--ultimately determine the outcome of battle. Matching the physical demands of MOS with the physical capacity of soldiers to meet those demands is a common sense requirement long needed to enhance combat readiness.

a. A Long Recognized Organizational Need. For the past six years, the Army has conducted research to develop a screening mechanism designed to match people with jobs according to human physical capacity and the critical physical demands imposed by those jobs. Impetus for this research grew largely from recommendations made by the Comptroller General of the United States (Chapter 1) and the realization that a valid physical capacity screening mechanism would increase combat readiness, reduce injury, and improve management of human resources.

b. Previous Research Helpful But Incomplete. In July 1977, the Vice Chief of Staff, Army directed that research begin to establish gender-free occupationally related physical fitness standards which could be used for MOS selection and assignment.

This research provided significant procedural and equipment breakthroughs for the efficient, safe, and inexpensive screening of physical capacity. <sup>1/</sup> The need for a detailed physical task list for each MOS to facilitate their grouping into MOS clusters or categories according to physical demands was evident. However, a detailed task listing was not developed for all MOS nor was an objective and uniform methodology used to identify physically demanding tasks for each MOS. Five physical demand clusters were developed as listed in Table 2-1, using the criteria shown in Table 2-2. <sup>2/</sup>

TABLE 2-1  
MOS CLUSTERS

<u>LEVEL OF DEMAND</u>		<u>CLUSTER DESIGNATION</u>	<u>NUMBER OF MOS *</u>	<u>% OF TOTAL PERSONNEL</u>
<u>Strength</u>	<u>Aerobic</u>			
High	High	A	10	19
High	Medium	B	39	13
High	Low	C	63	21
Medium	Low	D	53	21
Low	Low	E	184	26

\* There were 349 MOS at the time of the initial study.

<sup>1/</sup> Screening for Physical Capacity in the U.S. Army: An Analysis of Measures Predictive of Strength and Stamina, US Army Research Institute of Environmental Medicine, 10 June 80, PP14-20.

<sup>2/</sup> A System for Establishing Occupationally-Related Gender-Free Physical Fitness Standards, USA Research Institute of Environmental Medicine and the USA Infantry School, 1979, pp.11-12.

TABLE 2-2

MOS CLUSTERING CRITERIA

<u>CATEGORY</u>	<u>MUSCLE STRENGTH (KILOGRAMS OF WEIGHT LIFTED)</u>	<u>STAMINA (CALORIES/ MINUTE)</u>
Low	30	7.5
Medium	30-40	7.5 - 11.25
High	40	11.25

The Army review of this MOS clustering resulted in the requirement for additional study in this area in that the task analysis was incomplete and physical capacity standards associated with each MOS cluster would have effectively eliminated women from Clusters A, B, and C, and the majority of Cluster D skills.

c. Filling the Research Gap. To develop the procedures and equipment needed for the physical capacity test battery, a more acceptable and rigorous methodology was needed to define the physical tasks associated with each MOS and devise a classification strategy for the grouping of these MOS according to physical demands.

2-2. PHYSICAL DEMANDS CLASSIFICATION. The first requirement in classifying jobs according to physical requirements is a detailed task analysis. Once this analysis is complete, the development of a suitable classification (grouping) strategy is required because of the large number of MOS in the Army. A rational classification system dictates that jobs should be classified according to their major physical requirement

(i.e. if the most physically demanding task can be performed, less demanding tasks can also be performed). U.S. Army Medical Research and Development Command has determined that the major physical demand present in over 90 percent of Army jobs is for upper body strength. <sup>3/</sup> This finding has been validated by the Navy in a recently completed task analysis of their occupational structure. <sup>4/</sup> Muscular strength, rather than cardiovascular endurance or stamina, becomes the limiting factor in the performance of most military tasks.

### 2-3. DISCUSSION.

a. Military Occupational Specialty Physical Demands Analysis is a detailed assessment of physical work requirements for every entry level MOS. Its purpose is to classify each MOS according to work requirements as they are required to be performed under combat conditions. It underpins the strategy designed to assign soldiers to jobs for which they are physically qualified. The overall objective of MOS Physical Demands Analysis is job-related support for the gender-free screening of soldiers.

b. The Army has charted the explicit duties of its soldiers (Field Manuals, Skill Qualification Tests, Army Regulations,

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<sup>3/</sup> US Army Medical Research and Development Command  
Screening for Physical Capacity in the U.S. Army: An Analysis of Measures Predictive of Strength and Stamina Report No. T 8/80, 10 June 1980 p. 106

<sup>4/</sup> Development of An Occupational Strength Test Battery (STB)  
David W. Robertson, Naval Research and Development Center  
San Diego, CA 1982

Occupational Surveys, etc.) and has measured the physical capacity of soldiers. These independent research efforts have never been linked (i.e., the physical capacity soldiers need to perform their job).

c. The Department of Labor Job Classification System provided the needed linking mechanism between physical capacity and physical work requirements and fills the research gap for objective and rational grouping of MOS according to physical demands. <sup>5/</sup>

(1) The Department of Labor Occupational Classification methodology evolved from an Act of Congress (Wagner-Peyser Act, 1933) that set in motion an occupational research program designed to facilitate the proper classification and placement of work-seekers. Supervised by the National Research Council, this research effort produced the Department of Labor Occupational Classification System in 1939. Since that time, 43 years of occupational research has expanded the scope and utility of the system. Over 75,000 on-site job analyses have been performed and 40,000 jobs classified. <sup>6/</sup> Several advantages accrue to the Army with the use of the Department of Labor methodology:

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<sup>5/</sup> Handbook for Analyzing Jobs (1981 Draft Edition), U.S. Department of Labor, Washington, D.C. Selected Characteristics of Occupations Defined in the Dictionary of Occupational Titles, U.S. Department of Labor, 1981

<sup>6/</sup> Work, Jobs and Occupations: A Critical Review of the Dictionary of Occupational Titles, Committee on Occupational Classification and Analysis, Assembly of Behavioral and Social Sciences, National Research Council, Washington, D.C. 1980 pp 1-77

- (a) It is widely used and accepted as rigorous;
- (b) Some military jobs have been classified by DOL;
- (c) It is an "off-the-shelf" methodology supported by over four decades of research; and
- (d) It can be modified to classify all military jobs at little research expense to the Army.

(2) The Department of Labor Occupational Classification methodology is widely used for many purposes. The major use within the United States Employment Service is as a placement tool in local Employment Service Offices for the matching of workers and jobs. It is also used in a variety of counseling and guidance activities. Secondary users of the Department of Labor (DOL) methodology include the Division of Testing and the Division of Labor Certification, which use the Dictionary of Occupational Titles in the certification process of foreign workers during the Immigration and Naturalization process. In addition to its use within the DOL, other United States Government agencies employ components of the methodology. The DOD is a major user, primarily in establishing the transferability between civilian and military occupations.

(a) Several events have caused the military services to become increasingly concerned with the interrelationship between military and civilian occupations. The advent of the All Volunteer Army has resulted in a need for the military to focus on the recruitment process to a much greater extent than was previously necessary. As a result, it has become

necessary to demonstrate to potential recruits what their military career prospects might be and how military training and experience relate to civilian occupations that could be pursued after the completion of military service. The difficulties encountered by returning Vietnam-era veterans in securing civilian employment also stimulated the military's concern with the transferability of military to civilian employment. <sup>7/</sup>

(b) A document used both by military recruiters and by counselors at separation centers is the Military/Civilian Occupational Source Book (United States Department of Defense, 1975), a joint effort by the Department of Defense Military Enlistment Processing Command and analysts from the occupational analysis staff of the DOL. Analysts trained military classifiers in the use of the Dictionary of Occupational Titles and were involved in assigning Dictionary of Occupational Titles codes to military occupations. The source book was created to serve as a single reference document for information on the military's enlisted occupations and, where possible, to equate those occupations with civilian occupations identified in the Dictionary of Occupational Titles. In preparing the source book, the Department of Defense formulated composite job statements for the five military services in those occupational areas in which commonality of job tasks existed. A second edition of the source book (United States Department of

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<sup>7/</sup> Ibid. pp 1-77

Defense, 1978) was prepared with the assistance of the Texas Occupational Analysis Field Center, and released in January 1978 to coincide with the publication of the fourth edition of the Dictionary of Occupational Titles. 8/ For each military occupation, the source book presents information on the military job title, the United States Office of Education career cluster to which it relates, the civilian (Dictionary of Occupational Titles) title, the nine-digit code that appears in the fourth edition of the Dictionary of Occupational Titles, a composite job statement, a qualifications summary, and information on related military service jobs. 9/

(3) The DOL has classified a small number of military jobs according to physical demands. A listing of these jobs, the Department of Labor physical demands rating, and the MOS physical demands rating are shown on the following page.

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8/ Ibid. pp 1-77

9/ Ibid. pp 1-77

TABLE 2-3

DEPARTMENT OF LABOR AND MILITARY OCCUPATIONAL  
SPECIALTY PHYSICAL DEMANDS RATINGS

<u>DOT TITLE FOR MILITARY SERVICE JOB</u>	<u>DOL PHYSICAL DEMANDS CATEGORY PLACEMENT</u>	<u>MOS PHYSICAL DEMANDS CATEGORY PLACEMENT</u>
Flash Ranging Crewmember (military service)	V	V
Reconnaissance Crewmember (military service)	V	V
Unattended-Ground-Sensor Spec (military service)	V	H
Vulcan Crewmember (military service)	V	V
Redeye Gunner (military service)	V	V
Smoke and Flame Specialist (military service)	H	V
Combat Rifle Crewmember (military service)	V	V
Field Artillery Crewmember (military service)	H	V
Infantry Indirect Fire Crewmember (military service)	V	V
Infantry Weapons Crewmember (military service)	V	V
Light Air Defense Artillery Crewmember (military service)	V	V
Combat Surveillance and Target Acquisition Crewmember (military service)	V	V

V = Very Heavy      H = Heavy

(4) While the use of the generic DOL physical demands classification categories is clearly utilitarian, practical, and sound, direct transfer of individual DOL job ratings to Army jobs is inappropriate because there are major operational differences and divergent legal guidance in effect.

(a) Physical demands classification of a civilian job by the Department of Labor is not necessarily indicative of the physical requirements or duties for a similarly titled job in the Army. An example of this difference is shown in Table 2-4.

TABLE 2-4

DIFFERENCES BETWEEN DOL PHYSICAL DEMANDS RATING  
OF CIVILIAN JOBS AND SIMILARLY TITLED MILITARY JOBS

<u>DOL Job Title, Description, and Physical Demands Rating</u>	<u>Military Job Title, Description and Physical Demands Rating</u>
Interior Electrician (824.681)	Interior Electrician (MOS 51R)
<u>Physical Demands Rating:</u> Light	<u>Physical Demands Rating:</u> Very Heavy
<u>Job Description:</u> Installs and repairs wiring, electrical fixtures, and fuse boxes in prefabricated and modular homes, using handtools. Reads blueprints to determine locations of equipment and conformance to building and safety codes. Measures, cuts, and installs conduit in specified panels, using handtools. Measures for location of receptacles with tape measure and installs receptacles. Cuts and connects wires according to diagrams to install fixtures, such as switches, light fixtures, and fuse boxes. Tests continuity of circuits to insure safety, using ohmmeter. Repairs faulty systems. May direct workers in boring holes in studs and running wiring. May train new workers in electrical system installation procedures.	<u>Job Description:</u> Supervises or performs installation and maintenance of interior electrical systems and equipment. Duties: M0SC 51R10: Installs and maintains interior electrical systems up to 600 volts. <u>INSTALLATION.</u> Installs service entrances from weatherhead to service panel and branch circuits; Service protective panels, junction and outlet boxes; Thin wall, flexible, rigid, metallic, and nonmetallic conduit; Metallic and nonmetallic sheathed cable, switches, outlets, and special electrical equipment. Uses test equipment including multimeter, voltmeter, ammeter and megger to test operational condition of circuits. Installs motors and controls. <u>PREVENTIVE MAINTENANCE.</u> Performs operator and crew maintenance of vehicles and special equipment organic to electrical construction crew. <u>COMBAT ENGINEERING.</u> Performs combat engineer functions. Participates in laying and clearing minefields, priming and emplacing explosives and demolitions, constructing and removing wire, beach and river obstacles, hasty emplacements, expedient shelters and bunkers, and camouflage of fixed positions and equipment.
<u>SOURCE:</u> Dictionary of Occupational Titles, Fourth Edition, 1977, U.S. Department of Labor, Employment and Training Administration. p.838. <u>Selected Characteristics of Occupations Defined in the Dictionary of Occupational Titles, 1981.</u>	<u>SOURCE:</u> AR 611-201, C/15, p. 3-51-15, 15 February 1981.

Transfer of a Department of Labor physical demands classification to a similarly titled military occupation was accomplished through the service schools responsible for the doctrine and training of each MOS.

(b) Litigation in the area of job selection suggests that task analysis for any given job should be performed by those most familiar with the requirements of the job. Since occupational classifiers of the Department of Labor cannot satisfy this criteria, only Army MOS proponents can perform the required detailed task analysis.

#### 2-4. THE DEPARTMENT OF LABOR OCCUPATIONAL CLASSIFICATION SYSTEM.

a. The Department of Labor Occupational Classification System consists of two major components--work performed and worker characteristics.

(1) Worker function scales, which measure a job's complexity in relation to data, people and things, are used by all of the military services.

(2) Worker characteristics address physical demands, occupational hazards, and other considerations such as test batteries.

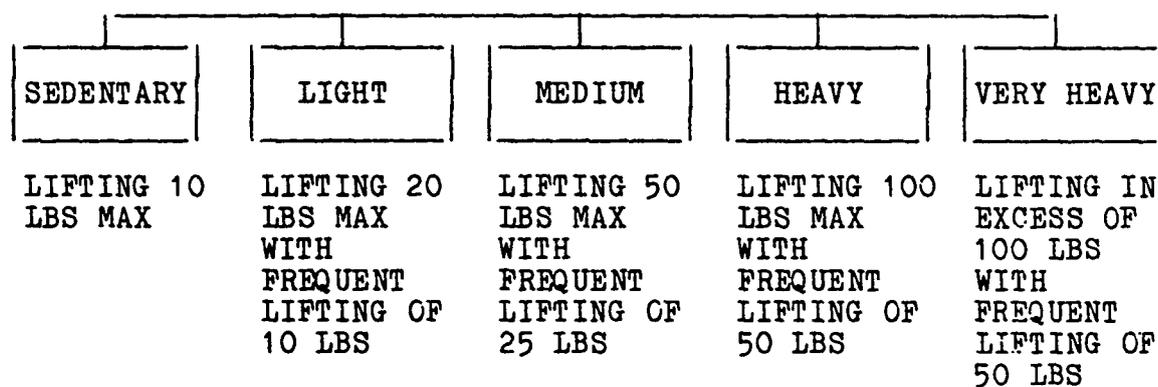
b. Included in the overall methodology is a manual containing gender-free occupational language for use in job description. It will be used by the Army in rewriting Army Regulation 611-201, Enlisted Career Management Fields and Military Occupational Specialities.

2-5. DEPARTMENT OF LABOR PHYSICAL DEMANDS CATEGORIES.

Physical demands categories are based on upper body strength. This compatibility between the physical demands of Army jobs and the DOL physical demands categories was a primary reason for the Army's selecting this strategy as the linking mechanism between duties and physical capacity. Figure 2-1 depicts the five physical demands categories used by the DOL.

FIGURE 2-1

FIVE PHYSICAL DEMAND CATEGORIES



ALSO INCLUDES CARRYING, PUSHING AND PULLING

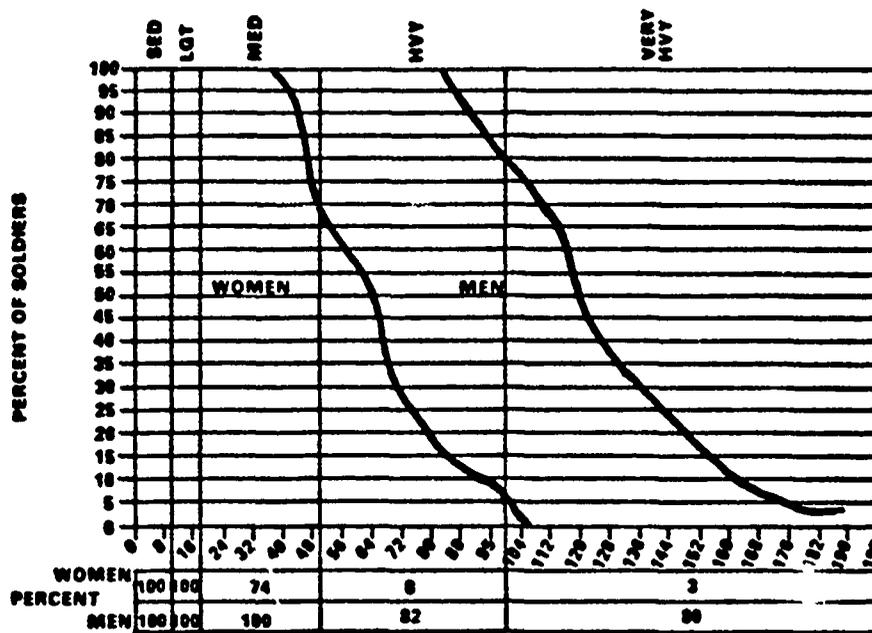
Army Training and Doctrine proponents for each MOS conducted the required detailed task analysis and forwarded their findings to Headquarters, Department of the Army. Each MOS was placed into one of the five physical demands categories. A review of these MOS classifications revealed a significant number of MOS exceeded the requirements for the medium category but fell below the upper limits for the heavy category. At this time, consideration was given to creating a new physical demands category labeled moderately heavy.

a. Profile of Male and Female Soldiers' Physical Capacity.

To determine compatibility of the five work categories with the physical lifting capacity of soldiers, the post-basic training lifting capacity profile of a large sample of soldiers was used. <sup>10/</sup> When the five DOL physical demands categories are overlaid on the profile, the theoretical capacity of soldiers to perform work in the five categories emerges. (Figure 2-2).

FIGURE 2-2

PROFILE OF MALE AND FEMALE PHYSICAL CAPACITY

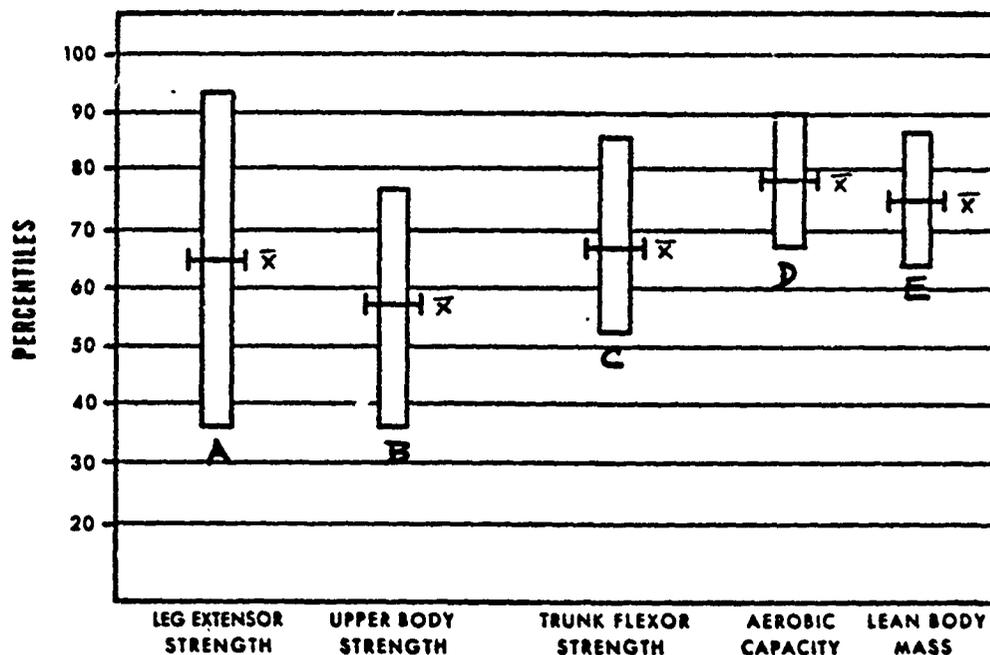


Other strength measurements collected from the same sample demonstrate the differences that exist between men and women.

<sup>10/</sup> U S. Army Research Institute of Environmental Medicine tested 923 men and 493 women at Fort Jackson, SC after completion of their basic training. James A. Vogel, Ph.D., USARIEM, Natick, MA, 17 July 1980. At the 95 percent confidence limit, the precision in the observed rate of occurrence in a sample of 493 women will differ from the actual rate of occurrence in a population ( $\geq 100,000$ ) by not more than  $\pm 4.5$  percent. At the same confidence level, the observed rate of occurrence in a sample of 923 men will differ from the actual rate of occurrence in a population ( $\geq 100,000$ ) by not more than  $\pm 2.5$  percent.

FIGURE 2-3

WOMENS PHYSICAL CHARACTERISTICS SHOWN AS PERCENT OF MENS.  
VALUES REPRESENT MEAN AND SD.



INTERPRETING THE GRAPH

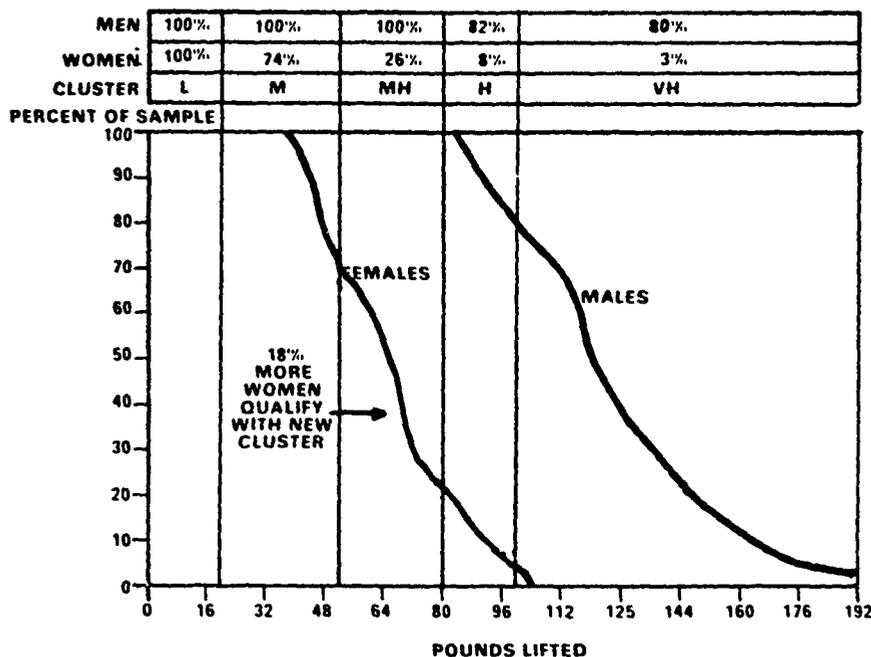
- A - Average female leg extensor strength  
65 percent of male leg extensor strength
- B - Average female upper body strength  
58 percent of male upper body strength
- C - Average female trunk flexor strength  
68 percent of male trunk flexor strength
- D - Average female aerobic capacity is  
78 percent of male aerobic capacity
- E - Average female lean body mass is  
75 percent of male lean body mass

SOURCE: Kowal, D.; Vogel, J.; Sharp, D.; Knapik, J. Analysis of Attrition, Retention and Criterion Task Performance of Recruits During Training. U.S. Army Medical Research and Development Command Technical Report T2/82, 1982.

One hundred percent of men and women in this sample possessed the physical strength for sedentary and light work. In the medium work category, 100 percent of men and 74 percent of women qualified. In the heavy work category, 82 percent of men, and 8 percent of women qualified. However, a significant number of women (18 percent) can lift over 50 pounds but not the upper category limit of 100 pounds. Given that a large number of MOS (64) require lifting over 50 pounds but less than 100 pounds, the heavy category neither conforms to the distribution of jobs nor does it optimize the physical capacity of women. Based on this evidence, a new category was justified. The new category, labeled "Moderately Heavy", requires a maximum lift of 80 pounds with frequent lifting of 40 pounds. Figure 2-4 illustrates the affects of the new category.

**FIGURE 2-4**

**LIFTING CAPACITY OF MEN AND WOMEN - DOL PHYSICAL DEMANDS  
CATEGORIES - OVERLAY (ADJUSTED)**



b. Factor Adjustment. Twenty-two factors were used in determining the physical demands of MOS. Twelve of the 22 factors are contained in the basic Department of Labor methodology; the remainder are not. However, the factors used to classify the MOS (Lift, Carry, Push, Pull), are contained in both. To insure that physical factors inherent or unique to military occupations were considered, factor adjustment/substitution was necessary. Adjustments or substitutions are noted by an asterisk in TABLE 2-5.

TABLE 2-5

DOL FACTORS AND MOS PHYSICAL DEMANDS FACTORS

<u>DOL FACTORS</u>		<u>MOS PHYSICAL DEMANDS FACTORS</u>	
Standing	Climbing	Lift/lower*	Run/Rush*
Walking	Balancing	Pull	Sit
Sitting	Stooping	Carry	Stand
Lifting	Kneeling	Load Bear*	Crouch
Carrying	Crouching	Push	Crawl
Pushing	Crawling	Walk/March*	Finger
Pulling	Reaching	Climb/Descend*	Recline*
Handling	Fingering	Dig*	Stoop
Feeling	Talking	Handle	Swim/Dive*
Hearing	Seeing	Throw*	Hammer/Pound*
		Reach	Kneel

These 22 factors are defined and discussed starting on page 2-21. Each MOS was sorted into one of five physical demands categories: light work, medium work, moderately heavy work, heavy work, and very heavy work. Each of these categories is discussed below. While the physical demands of an MOS will be categorized according to upper body strength criteria (lift, lower, carry push, pull), a soldier's capacity to perform these functions may be constrained by other factors such as awkward postural or positional requirement or the sustained nature of the work. Factors other than upper body strength are considered as constraints on performance.

c. Physical Demands Rating and Examples:

(1) Light Work. Lifting 20 pounds maximum with frequent lifting or carrying of objects weighing up to 10 pounds. Examples:

(a) Sits at desk, takes dictation and transcribes from notebook using typewriter. Soldier occasionally walks to various parts of the work area when called upon to take dictation.

(b) Sits at table in courtroom and records trial proceedings using a recording machine.

(c) Writes news stories for publication or broadcast using written notes supplied by reporting staff. Occasionally walks to reference library to obtain supplemental material.

(d) Drafts detailed drawings while seated at drawing board, and occasionally walks to obtain items of negligible weight such as paper, T-square, and other drafting equipment.

(e) Sits at desk and dispatches vehicles in response to telephone requests for service.

(f) Stands and walks behind counter of a Central Issue Facility and issues clothing and equipment to soldiers. Equipment weighs a maximum of 20 pounds.

(2) Medium Work. Lifting 50 pounds maximum with frequent lifting and/or carrying of objects weighing up to 25 pounds. Examples:

(a) Lifts material usually weighing 15-25 pounds, and occasionally weighing up to 50 pounds, to place in a truck.

(b) Carries lumber weighing up to 50 pounds from supply room to workbench, a distance of 20 feet. Stands greater part of the day, bending to lift lumber. Pushes and pulls lumber on workbench or machine.

(c) Walks and stands continuously when dismantling, testing, adjusting, repairing, and installing engine parts of an aircraft. Lifts and carries parts of engine weighing up to 50 pounds for inspection and repair. Pushes and pulls components into position.

(3) Moderately Heavy Work. Lifting 80 pounds maximum with frequent lifting of 40 pounds. Examples:

(a) Lifts ammunition container weighing 78 pounds and carries container for a distance of 20 feet.

(b) Pulls radio receiver weighing 80 pounds from storage shelf and carries the receiver a distance of 20 feet and installs in a vehicle.

(4) Heavy Work. Lifting 100 pounds maximum with frequent lifting and carrying of objects weighing up to 50 pounds. Examples:

(a) Frequently lifts and carries pipe and pipe connections weighing 50 pounds and occasionally up to 100 pounds. With the aid of others, soldier fits pipe assemblies into place.

(b) Pushes handtruck along warehouse aisle. Lifts

items with average weight of 100 pounds and places them on handtruck. Lifts cartons from truck in order to complete packing, wrapping, sealing, and labeling for shipment. Lifts and carries cartons to skids for shipping.

(5) Very Heavy Work. Lifting objects in excess of 100 pounds with frequent lifting or carrying of objects weighing up to 50 pounds. Examples:

(a) Lifts objects in excess of 100 pounds and carries them to a handtruck.

(b) Loads and unloads truck when transporting or delivering items such as ammunition rounds, furniture, machinery, etc., many of which weigh in excess of 100 pounds.

d. Physical Demands Factors and Examples.

(1) Lift/Lower. Raising and lowering an object from one level to another using the hands, arms, and/or shoulders. Includes upward pulling. Described in terms of weights and vertical distance. Examples:

(a) Lifts tool box weighing 70 pounds onto 52 inch high platform to service and repair aircraft engine.

(b) Lifts and positions ammunition containers weighing up to 140 pounds (usually a 2-person carry) carries container 20 feet, and uploads onto the bed of a truck (bed is 52 inches from the ground).

(c) Lifts box of computer paper weighing 40 pounds, carries the box 10 feet and places it beneath a computer unit.

(2) Carry. Moving an object, usually by holding it in the hands, arms, or on the shoulders. Describe in terms of weights, distances, and duration. Examples:

(a) Carries artillery round weighing 40 pounds from ammunition point to gun position 40 feet away.

(b) Carries requested reference material between shelving units and issue location. Material weighs no more than 10 pounds. Distance carried varies from 25-65 feet.

(3) Push. Exerting force upon an object so that the object moves away from the force. Describe in terms of weights, distances, duration, and/or type of surface (e.g. smooth, inclined, etc.). Example: Pushes drum of petroleum weighing 200 pounds by rolling it along level earthen surface. Drums are rolled for 50 feet.

(4) Pull. Exerting force upon an object so that the object moves toward the force. Includes jerking. Describe in terms of weights, distances, duration, and/or type of surface (e.g. smooth, inclined, etc.). Example: Pulls jail cell door weighing 75 pounds to open and shut positions. The door travels three feet and is mounted on rails to facilitate movement.

(5) Load Bear. Moving an object or equipment by attaching it to the body by means of straps or other fastening devices. Describe in terms of weights, distances and duration. This factor includes mission equipment that is moved in the manner described above. Example: Soldier load bears 54 pounds of equipment, ammunition, weapon and mission specific equipment.

Equipment is borne by the soldier while carrying out assigned tasks.

(6) Walk/March. Moving about on foot. Describe in terms of duration and distance. Examples:

(a) Covers 5 mile area on foot. Area to be covered four times in a 4 hour period. Soldier checks doors, fire lights, and furnaces.

(b) Covers area on foot while guarding against fire, theft, and vandalism. Area consists of 4 miles of fence line and patrolling is constant for 2 hours.

(c) Marches 8 kilometers in 4 hours while load bearing 54 pounds.

(7) Climb/Descend. Ascending or descending ladders, stairs, scaffolding, ramps, poles, and the like, using feet and legs and/or hands and arms. Describe in terms of height, steepness, duration, and type of structure climbed or descended. Example: Soldier climbs poles to repair damage to communication cable. Using gaffs and belt and carrying mission equipment weighing 22 pounds, soldier climbs 50 foot pole.

(8) Run/Rush. The act of running is self-explanatory. Describe in terms of distance and duration. Include any load bearing weight or other weight carried while running. Rushing is moving (running) at a high rate of speed for short distances. Describe as in running above. Example: Soldier, wearing 44 pounds of loadbearing equipment rushes 75 yards in 25 seconds with two stops of 4 seconds each.

(9) Swim/Dive. Swimming is moving/propelling oneself progressively in water by natural means (as by strokes of the hands and feet) or with swimming aids. Describe in terms of distance and duration. Diving is working underwater for extended periods of time using mechanical breathing and other specialized diving equipment. Describe in terms of work to be performed while in the water.

(10) Dig. Excavating soil by employing a constant cycle of pushing shovel into earth and lifting, carrying, and throwing earth. Shovel is often raised to shoulder height and weight lifted is concentrated at its end. Describe in terms of shovel weight (including soil), duration and depth of excavation.

(11) Crawl. Moving about on hands and knees or hands and feet. Describe in terms of distance and duration.

(12) Throw. Propelling an object through the air by a forward motion of the hand and arm. Describe in terms of weight and distance.

(13) Handle. Seizing, holding, grasping, turning, or otherwise working with hand or hands. Fingers are involved only to the extent that they are an extension of the hands, such as to turn a switch or shift the gears of a motor vehicle.

(14) Finger. Picking, pinching, or otherwise working primarily with fingers, rather than with the whole hand or arm as in handling.

(15) Hammer/Pound. Beating, driving, or shaping an object with repeated blows. Describe in terms of tool weight,

distance object is to be driven into a surface, and duration of activity.

(16) Sit. Remaining in the normal seated position. Describe in terms of duration.

(17) Recline. Lying on one's side or in a prone or supine position. Describe in terms of position and duration.

(18) Reaching. Extending the hand(s) and arm(s) in any direction. Describe in terms of duration and distance reached.

(19) Stand. Remaining on one's feet in an upright position at a work station without moving about. Describe in terms of duration.

(20) Stoop. Bending body downward and forward by bending spine at the waist.

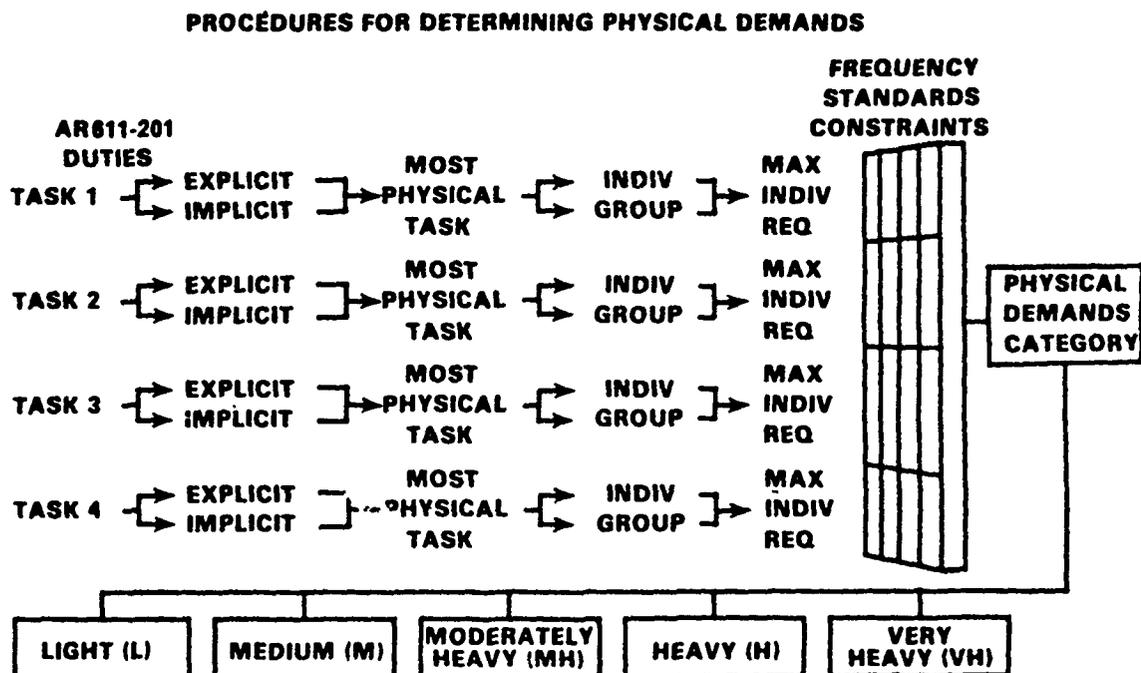
(21) Kneel. Bending legs at knees to come to rest on knee(s). Describe in terms of duration.

(22) Crouch. Bending body downward and forward by bending legs and spine. Describe in terms of duration.

e. Determining Physical Demands. To assess the physical demands of each MOS, each task specified in Army Regulation 611-201 was analyzed by MOS proponents to identify explicit and implicit tasks. The most physically demanding task was identified (either individual or group work). Once the maximum individual physical requirement was determined, that requirement was passed through a frequency, standards, and constraints screen which asked how often the task is performed; what the

standards are for performance; and, what the impact is of constraints imposed on task performance. Once through the screen, the MOS was placed in one of the five physical demands categories. Figure 2-5 illustrates this process.

FIGURE 2-5



(1) Explicit and Implicit Elements of Each Task. The explicit elements of an MOS task are normally well defined in Army literature. In physical demands analysis, implied tasks are included because they are often more physically demanding

than explicit tasks. Table 2-6 illustrates this point.

TABLE 2-6  
EXPLICIT/IMPLICIT ELEMENTS OF A  
MILITARY OCCUPATIONAL SPECIALTY TASK

	EXPLICIT	IMPLICIT
AR 611-201 TASK	Detects and locates	Negotiates terrain,
FCR 36C (Wire	opens, shorts,	often climbing trees/
Systems Installer)	crosses and grounds	poles to detect and
SKILL LEVEL 1	by using test sets.	locate opens, shorts,
		crosses and grounds.

(2) In identifying and analyzing the explicit and implicit physical elements of a MOS task, the MOS proponent described the task in terms of actual work performed and also insured that such work was intrinsic to the task. A 71L (Administrative Specialist) who climbs a flight of stairs to enter an office, for example, must be able to climb as a condition of working at that location; however, climbing is not regarded as intrinsic to the task of a 71L. Table 2-7 illustrates this point.

TABLE 2-7

INTRINSIC AND NON-INTRINSIC TASKS

INTRINSIC TASK	71L files documents and reports	71L must open and close cabinet drawers and safe doors.
NON-INTRINSIC		71L must climb document shelf ladder.

(3) Methods of Collecting Data:

(a) Observation. This method involved analyzing jobs (Military Occupational Specialties) and tasks by observing soldiers performing work.

(b) Observation-Interview. This method involved observing soldiers work and interviewing them and their supervisors on the details of that work. The Army Occupational Survey Program is an excellent reference (Appendix D).

(c) Publications. This method used official publications (Field Manuals, Technical Manuals, Special Texts, Soldiers Manuals, Bulletins, etc.) to describe the soldier functions and identify the equipment used by the soldier.

(d) Experience. The Army's experts for each Military Occupational Specialty (proponents) applied their knowledge of actual work conditions to define work requirements.

(4) Actual equipment specifications were obtained when the physical demands of Military Occupational Specialties tasks were analyzed. Accurate information was required on

equipment used by soldiers. For example, at Appendix E is an audit trail of information sources used in task analysing MOS 64C, Motor Transport Operator. Supply bulletins and manufacturers' data were also used.

(5) Environmental/Occupational Hazards. Each Military Occupational Specialty was analyzed to identify day-to-day (non-combat) occupational hazards. Biological and chemical hazards occurred most frequently, followed by electric shock and radiation hazard. The Surgeon General of the Army is continuing to review these risks for selected Military Occupational Specialties to establish guidance regarding all soldiers and will specifically address the assignment of pregnant soldiers.

(6) After the proponent completed its task analysis, determined the physical demands of each task and ultimately the job, this information was provided to and analyzed by the Review Group. The Review Group then assigned the MOS to a physical demands cluster and asked concurrence of this assignment from the proponent or recommended changes thereto. Each proponent was also asked to confirm those tasks most commonly performed in both a combat and garrison environment, identify the potential exposure to gas and other hazards, and to respond to known or reported physical capacity shortages of both men and women needed to perform their jobs. This action completed the process by which MOS were assigned to physical demand clusters.

f. Separating Military Occupational Specialties. The task analysis of each MOS identified five Military Occupa-

tional Specialties which had widely disparate physical demands: 36C (Wire Systems Installer/Operator); 55B (Ammunition Specialist); 64C (Motor Transport Operator); 91B (Medical Specialist); and 95B (Military Police). By separating these MOS, increased job opportunities for women are realized. Initially, all five of these Military Occupational Specialties were rated heavy or very heavy. However, when analyzed in terms of strength requirements, it was possible to separate the MOS so that the physical demand ratings were moderate or less for a portion of the jobs. Many variables enter an analysis of whether an MOS could be separated. Some of these are:

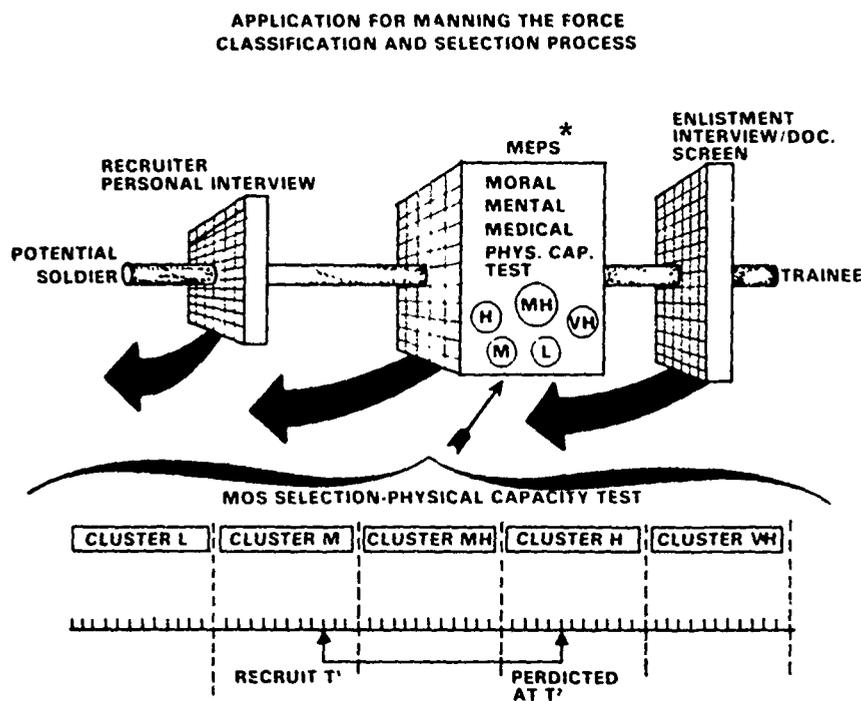
- (1) Unit mission/strength.
- (2) Battlefield location.
- (3) Functions/tasks performed.
- (4) Army end strength ceilings.
- (5) Career development/progression.

g. Military Enlistment Physical Strength Capacity Test.

The Military Enlistment Physical Strength Capacity Test (gender-free physical capacity test) will be administered in the Military Enlistment Processing Stations to screen new enlistees and obtain a prediction of the enlistee's physical capacity (strength and stamina) upon completion of MOS training. Physical capacity is a function of strength, stamina, and skill. Soldiers normally increase their physical strength and stamina during basic training and acquire skills in advanced individual training that can reduce physical strength require-

ments needed to perform given tasks. An enlistee will be tested once--at the Military Enlistment Processing Station site--and allowed to select a MOS for which he/she has the predictive physical capacity to perform. Figure 2-6 illustrates the process.

FIGURE 2-6



\* MEPS - Military Enlistment Processing Stations

The test will consist of:

(1) Skinfold measurement (a stamina correlate). This test determines body fat content and is firmly based in the medical and physiological literature as a powerful predictor

of stamina.

(2) Handstrength. A dynamometer will be used to measure the enlistees handstrength. This test is an overall body strength correlate.

(3) Isometric Lift. This test will be used to measure an enlistee's lifting capacity.

(4) Cardiovascular Fitness. An ergometer or a stepping test will be used to measure endurance capacity or stamina.

h. Military Enlistment Physical Strength Capacity Test Requirements. The test must be reliable, valid, rapidly administered, safe, and predictive of an individual's strength and stamina potential. The test equipment must be inexpensive and durable. The test must also be job-related. To establish this relationship to the job and satisfy the requirements mentioned above, a validation study is underway. Until the test and physical standards are validated, no enlistee can be or will be selected or rejected using the Military Enlistment Physical Strength Capacity Test.

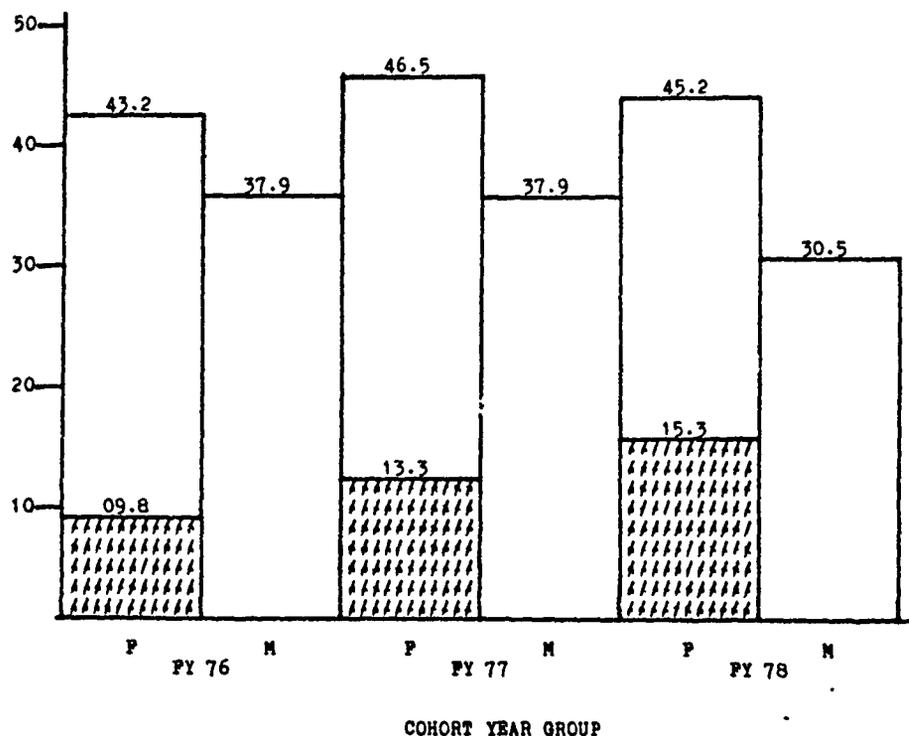
i. Military Enlistment Physical Strength Capacity Test Advantages. Although Physical Demands Analysis and implementation of MEPSCAT testing are not specifically designed and implemented for these purposes, the Army does expect to reduce attrition, malutilization, and migration through the use of this test as soldiers are matched with jobs for which they have physical capacity to perform. Yet, more information must be obtained as to why both male and female soldiers attrite before success in

reducing attrition can be assured. We do expect success in reducing malutilization and migration. The Army must and is studying the attrition problem. Data does, however, show that:

(1) Female attrition in the aggregate is higher than that of males. However, a part of their attrition results from pregnancy as shown in Figure 2-7. The three year groups of enlistees (COHORTS) for which complete attrition data exists represent those who enlisted in 1976 through 1978.

FIGURE 2-7

ATTRITION RATES FOR COHORT YEAR 1976-1978



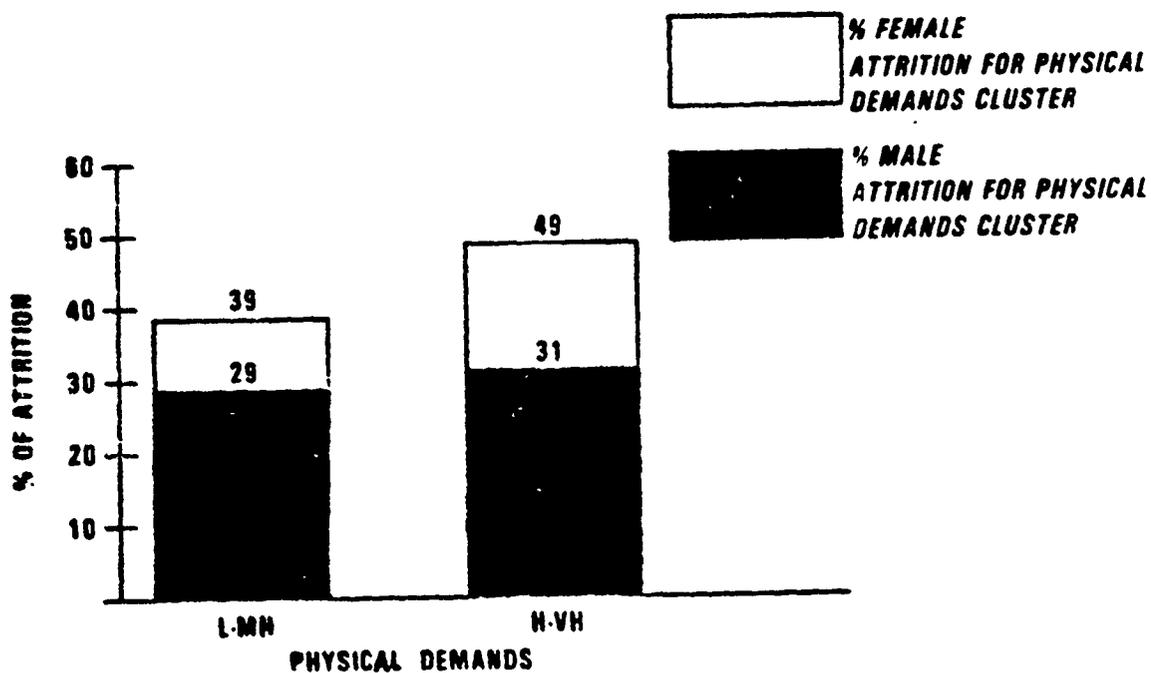
P = FEMALE

M = Male

[//] ATTRITION DUE TO PREGNANCY

(a) Attrition results from the heavy and very heavy MOS clusters are even higher for females, while that of males in the heavy and very heavy clusters remains about the same (FIGURE 2-8). About 50 percent of the women in the heavy and very heavy categories leave the service prior to completion of their first term of service.

FIGURE 2-8  
PERCENT ATTRITION FOR COHORT 78  
(BY SEX AND BY PHYSICAL DEMANDS CLUSTER)



(b) Soldiers leave the Army for numerous reasons.

The Army should continue to examine attrition rates of all soldiers and should specifically determine why greater percentages of female soldiers leave the Army prior to the end of their enlistment than do male soldiers. This examination, if causative factors can be identified and resolved, will assist the Army in improving productivity and job satisfaction of all soldiers.

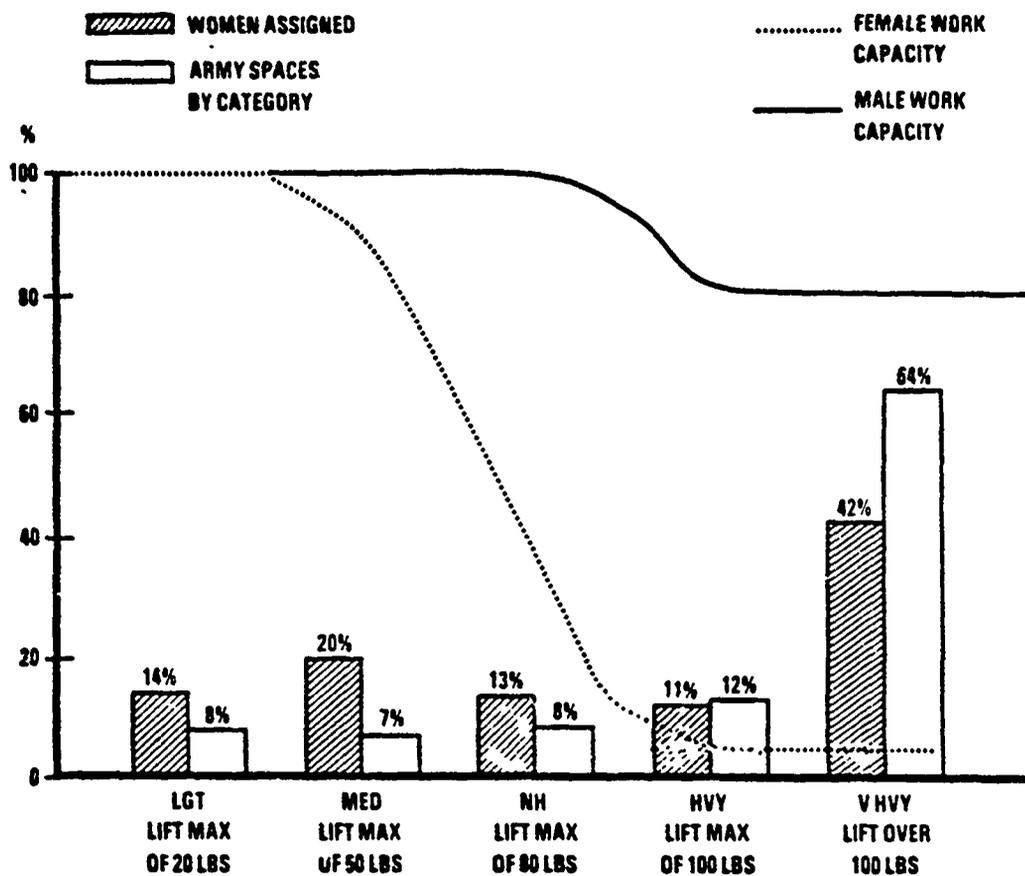
(2) Malutilization or under-utilization (a soldier not performing in the MOS for which trained, or not performing the full range of tasks for that Military Occupational Specialty) can be reduced significantly through physical capacity screening.

(3) Migration (the movement of a soldier from one job to another) creates turbulence in units and increases training requirements. Data indicates that male and female soldiers migrate at approximately the same rates from male traditional/female nontraditional Military Occupational Specialties. Migration of both male and female soldiers should be reduced as they are better matched physically to do their jobs.

j. Distribution of Current Army Jobs and Enlisted Women by Physical Demands Categories. Figure 2-9 shows the distribution of every enlisted duty position in the active Army by physical demands categories and the current distribution of women in these categories. Given the distribution of jobs and the physical capacity of men and women to perform those jobs, the Army may have difficulty recruiting qualified women to fill heavy and very heavy jobs. Figure 2-9 also graphically

portrays differences in the physical strength characteristics of male and female post-BCT Army enlistees.

FIGURE 2-9



k. A completed Military Occupational Specialty Physical Demands Analysis is at Appendix G. The distribution of active Army enlisted Military Occupational Specialties and duty positions is shown in Table 2-8.

TABLE 2-8  
 DISTRIBUTION OF ACTIVE ARMY MILITARY  
 OCCUPATIONAL SPECIALTIES AND DUTY POSITIONS  
 BY PHYSICAL DEMANDS CATEGORIES

<u>PHYSICAL DEMANDS CATEGORIES</u>	<u>NUMBER OF MOS</u>	<u>NUMBER OF DUTY POSITIONS</u>
Very Heavy	132	368.4K
Heavy	48	71.1K
Moderately Heavy	64	44.0K
Medium	65	42.0K
Light	<u>42</u>	<u>46.5K</u>
TOTAL	351	572.0K

Of the 351 active Army Military Occupational Specialties, at the outset of this study, 38 or 10.8 percent were closed to women. No MOS was closed to women because of physical requirements and none were recommended closed by this Review Group as a result of physical demands.

## CHAPTER 3

### VALIDATING A SELECTION STRATEGY FOR THE ALLOCATION OF HUMAN RESOURCES BY PHYSICAL DEMANDS REQUIREMENTS OF THE MOS

#### SECTION I - BACKGROUND

3-1. THE CHALLENGE. The military organization is a formal structure designed to fulfill a single goal: to fight and win in the eventuality of an armed conflict. However, it cannot begin to function until people have been recruited to fill the jobs necessary to perform specific activities that contribute to the accomplishment of this goal. A major challenge to the military is how to recruit, select, train, and allocate manpower to specific occupational specialties for maximum operational effectiveness.

3-2. RECRUITMENT, SELECTION, TRAINING, AND ASSIGNMENT STRATEGIES. The steps required for the selection of military personnel and policy development are:

a. Develop Performance Criteria. The occupational specialties of the organization must be described; the actual performance components (on the job) must be observable and measurable. These should include the need to meet mission demands in case of national emergency or war as well as the task to be accomplished in other than a mobilization posture.

b. Determine Predictor Variables. The personnel must be observed performing some tasks that are presumed to be a relevant predictor of the total performance selection criteria. These

tasks must be short, safe, reliable, simple, have predictive validity and meet the constraints of being able to screen large numbers of recruits upon entry into service.

c. Test a Sufficient Sample of Unselected Personnel. In order to determine whether the selection procedure is better than chance or the previously used selection strategy, it will be necessary to obtain subjects from both the high and low performance ranges on the predictor tasks. Without this variability, the resulting correlation will be negligible.

d. Rate Personnel on Standards of Actual Job Performance. This is necessary for developing the correlation between the predictor variables and the criteria and must include tasks that represent the whole spectrum of the job if validity is to be achieved. Standards must be developed that reflect the levels of performance of incumbents in the MOS.

e. Correlate Performance Scores on Predictor Variables with Criterion Performance in the Selected Group. This step is necessary to insure that the predictor is accurate. It is important to use a multivariate approach to insure the greatest variance is accounted for by the predictor variables. This can be optimized by using a predictive validity coefficient based on a combination of relevant variables. However, it must be kept in mind that this will result in a compensatory selection model of performance which has inherent limitations in terms of ultimate predictive validity.

f. Develop Multiple Cut-off Scores. Once the correlation has been established, decide on cut-off scores for the selected variables that optimize the ratio of selection to rejection. Some of the problems associated with this strategy are as follows:

(1) The actual performance variation in the criterion task performance between the best and the worst worker must be adequate.

(2) Criterion tasks must be reliable. If they are not reliably measured tasks, it will be difficult to establish a valid correlation between them and the predictive measures.

(3) A large enough manpower pool must be available to insure variability of criterion and predictor scores. If the size of the manpower pool is less than the available openings, i.e., if the selection ratio is high, it may not be worth the cost of an expensive selection procedure. As the manpower pool increases, it becomes increasingly more feasible to use a selection survey for assignment and training of personnel. Likewise, if most candidates could qualify for the jobs before a selection procedure were introduced, it makes no sense to develop a selection mechanism. Only if enough would do poorly or could not perform at an adequate level, does it make sense to use a selection mechanism as described. See statistical procedure section (para 3-7).

(4) Time is required to develop the relationship between the predictor and the criterion measures. It is tempting,

in a time limited setting, to skip or short-cut this procedure. This may result in poor cost effectiveness or, in the worst case, improperly assigning personnel because less obvious factors were involved in the criterion performance and its prediction rather than inter-subject variability.

(5) Another subtle but potentially risky practice is to use the criterion scores of the presently assigned personnel and correlate these scores with the performance of these individuals on a predictor task. The problem with this sample is that they have already been highly selected in terms of their performance and the variability experience on the job. This concurrent validation procedure may introduce a source of bias that would not be appropriate for the selection of personnel prior to assignment and needs to be considered in the decision making process.

(6) We must remember that the test may be able to predict what a person can do; but, it will not tell us how motivated he/she is to do it. The proposed Military Enlistment Physical Strength Capacity Test (MEPSCAT) battery will be used as a supplement to, and not to supplant, the other validated selection instruments and information that are currently used to predict success in the Army. The MEPSCAT provides a common set of physical tests that evoke an expression of work reflecting the major components that characterize the work capacity of a soldier, but are not independent of the soldiers' past experience,

training, or genetic endowment. With a measure such as the MEPSCAT, we can define the soldiers' potential and predict what can be done to maximize their performance through training. However, we can never forget that this prediction is a statement of probability and not a promise of what the soldier will do. Actual future performance is a product of their capacity, willingness, and leadership. What the MEPSCAT can provide is a measure that will assist the existing personnel selection system in matching the soldier to the job more effectively. This is accomplished by considering the physical job requirements as well as the mental and medical aspects of the MOS.

(7) The end of basic training and advanced individual training Criterion Performance Tasks (CPT) as measures of soldier success may be viewed as excessively restrictive; however, if a soldier does not make it through these two hurdles, he/she will not be around to achieve success in his/her first tour or to reenlist.

g. Create a Correlation High Enough to Improve the Selection Procedure. The validity of the predictor--its capacity to predict what it is supposed to--is necessary for a selection battery. How high it needs to be depends on the selection ratio and the base rate, and whether the military is

more concerned with obtaining successful performers or eliminating the unsuccessful performers for specific MOS categories (utility). The relationship between these factors has been developed to permit a decision maker to select a cut-off score which meets his/her standard for acceptance or rejection of a candidate. However, this decision should not be based on a worst case situation, since this would reduce the qualified manpower pool and undermine the utility of the selection procedure. Likewise, the frequency of worst case performance is usually small when compared to the tasks that have a high probability of occurrence.

h. Implementation of the Selection Strategy. The concept of assessing prospective soldiers for strength and stamina and matching these parameters to the physical requirements of the job has received support from both Department of the Army and Department of Defense. The Department of the Army and Department of Defense consensus is that this type of assessment will reduce the "mismatch" between the soldier and the job. The result will be an improvement of soldier job performance and a reduction in the incidence of occupational injury. Before applying a program which involves physical assessment and/or task performance requirements, the following points need to be considered:

(1) Testing must be specific for job category requirements, reliable, and administered to all individuals during pretraining examination (as the Armed Forces Qualification Test and medical examination are currently administered).

(2) Testing should reflect the jobs being assessed. The limiting factors of the job, as performed by trained incumbents, in combination with the limiting factors of the individual, should be evaluated. The task must be examined in terms of the strength and stamina requirements of soldiers to do the job.

(3) Task analysis should relate solely to critical task elements.

(4) A gender-free approach should be taken.

(5) "Risk of injury" criteria alone cannot be used in the selection of soldiers and can be used only to prepare the soldier for specific difficulties or to identify potential problem areas or physical restrictions.

3-3. A RISK ANALYSIS: Unlike many of the decision making techniques, technically, risk analysis is designed to quantify risk without generating a probability of success that can be validated. Risk analysis does not provide an optimum approach but rather supplies information to the decision maker about the possible outcomes and the risks of unfavorable results. Thus, the decision maker can use the risk analysis model to assess the uncertainty involved in making his/her decision.

## SECTION II - VALIDATION PROCESS

3-4. BACKGROUND. There is general recognition that effective performance in the majority of enlisted specialties requires above average physical strength and stamina. However, there has been little systematic research done on the specific physical task requirements of military jobs or the establishment of minimum standards for individual work capacity. <sup>1/</sup><sub>2/</sub> The Army has initiated a program to match the soldier's physical capacity with the physical demands of the job by developing a selection algorithm for the assignment of soldiers which considers their mental, technical and physical capabilities. Without these standards and means of measuring the ability of men and women to perform the MOS specific tasks, personnel may be and have been assigned to jobs which they cannot fully perform or may be at increased risk of injury to themselves or others.

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<sup>1/</sup> Patton, J.; Vogel, J.; and Kowal, D. Requirements for Fitness According to Job Assignment in the U.S. Army. Proceedings of the 1st Symposium on Physical Fitness in Military Forces. pp.87-92, 1978.

<sup>2/</sup> Kowal, D.; Vogel, J.; and Patton, J. Evaluation and Requirements for Fitness Upon Entry Into the U.S. Army. Proceedings of the Nato Symposium on Physical Fitness. pp. 58-66, 1978.

Basic research has been conducted by Fleishman <sup>3/</sup> and others to measure elements of fitness and strength contributing to the soldiers work performance capacity. A substantial amount of data on the comparative strength and stamina of Army men and women has also been gathered by Kowal.<sup>4/</sup> He concluded that in terms of strength of major muscle groups and stamina, women averaged from 55 to 75 percent of those for men with the greatest differences being that of upper body strength and the smallest difference being for leg strength and stamina. However, in 1978, at the time these data were collected, a valid task analysis of military jobs had not been completed. The objective of MOS Physical Demands Analysis was the development of a systematic and objective analysis of the critical task requirements for each entry level Army MOS to provide a foundation for the development of a predictive physical test battery to screen soldiers upon entry into service. These initiatives, when integrated, provide a predictive algorithm between individual work capacity and the critical task requirements of occupational specialties to facilitate the optimal assignment of soldiers.

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<sup>3/</sup> Fleishman, E. Toward a Taxonomy of Human Performance. American Psychologist. 30: 1127-1149, 1975.

<sup>4/</sup> Kowal, D.; Vogel, J.; Sharp, D.; Knapik, J. Analysis of Attrition, Retention, and Criterion Task Performance of Recruits During Training. U.S. Army Medical Research and Development Command Technical Report T2/82., 1982.

3-5. METHOD. The development and validation of a gender-free Physical Capacity Test Battery required full participation by several Army activities and commands. Specific contributions and duties are outlined below:

a. The Medical Research and Development Command (MRDC).

MRDC developed a prototype for the assessment of physical work capacity of individual soldiers that is safe, reliable, meets the space and manpower constraints of the Military Enlistment Processing Station and is an inexpensive and valid for the prediction of critical performance tasks.

b. The United States Army Training and Doctrine Command (TRADOC). This command accomplished a thorough task analysis of the 351 MOS using an accepted task analysis procedure developed by the Department of Labor and modified for Army use (MOS Physical Demands Analysis). The proponent schools for each career management field provided this input to DCSPER, Headquarters, DA for identification of the critical performance tasks involving lifting, lowering, carrying, pushing, pulling and climbing requirements of each MOS. These tasks were analyzed for their relevant parameters (i.e., weight of equipment, frequency of performance, distance moved or carried, height lifted or lowered), and provided the basis for the jobs being classified as having either light, medium, moderately heavy, heavy, or very heavy physical demands.

c. The Army Research Institute (ARI). The Institute is the Army's agency for the validation of all Army selection and

classification instruments. They developed the data base requirements necessary to use the physical work capacity test battery as a personnel selection instrument and insured that the study design met the highest standards of experimental rigor.

d. External Validation. The necessity for having an independent source of validation for the test battery and task analysis methodology was recognized. The Advanced Research Resources Organization (ARRO) was contracted in January 1982 to provide this external source of validation because --

(1) The President of ARRO, Dr. Edwin Fleishman is a recognized authority in human performance and task taxonomies with extensive experience in testifying as an expert witness in litigation involving physical standards for occupations;

(2) The staff has the in-house capability and personnel to perform the statistical procedure and develop the Criterion Performance Tasks (CPT) based on the task analysis provided by Army MOS proponents;

(3) They provide an independent source of validation (autonomous of the Army) for both the task analysis and the physical work capacity test battery. ARRO was not previously involved in research connected with this project.

3-6. CRITERIA. The ultimate application of the gender-free physical capacity test called the MEPSCAT (Military Enlistment Physical Strength Capacity Test) will be its inclusion in the assessment and inprocessing of soldiers at the Military Enlistment Processing Station (MEPS). The MEPSCAT must meet the following constraints and criteria if it is to be incorporated into the Army's Personnel Management System.

a. Safety. The procedure must not pose a hazard to the subject. Isometric strength and submaximal work capacity testing have been shown to be safe for screening purposes in several previous studies. (Laubach, 1976 <sup>6/</sup>; Kowal, <sup>7/</sup>; Knapik, <sup>8/</sup>)

b. Relevance of Job Requirements. The nature of the physical or cognitive task required of the worker determines the specific attributes of the worker. Therefore, the strength/stamina test used should be carefully designed to be relevant to the critical tasks required for duty performance.

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<sup>6/</sup> Laubach, L.L. Muscular Strength of Women and Men: A Comparative Study. (AMRL-TR-75-32) Wright Patterson Air Force Base, OH: May 1976.

<sup>7/</sup> Kowal, *ibid.*

<sup>8/</sup> Knapik, J.; Wright, J.; Kowal, D. Et al. The Influence of Basic Training on the Muscular Strength of Men and Women. Aviation Space and Environmental Medicine. 51: 492-496, 1980.

c. Reliability. Isometric strength tests yield a highly reliable indicator of the person's physical strength for the particular muscle group, and they have been shown to be highly reproducible with a low Standard Error of Measurement (SEM). 8'

d. Prediction of Actual On-The-Job Performance and Attrition/Injury/Disability. The strength assessment test's utility is in predicting individual job performance and identifying those who are at a high risk of attrition prior to completion of training or have a high probability of job-related injury or disability.

e. Practical, Inexpensive and Simple. Isometric/stamina testing can be accomplished with a minimum of inexpensive equipment and within the time and personnel constraints of the MEPS.

3-7. THE STATISTICAL BACKGROUND FOR THE DEVELOPMENT OF THE SELECTION ALGORITHM. The statistical technique used to analyze the results of a criterion related study design is the multiple regression analysis or a variation of the Pearson correlation coefficient ( $R_{xy}$ ). Alternatively, analysis of variance can be used to determine the test's ability to discriminate among contrasted groups. The criterion-related validity coefficient can then be interpreted in two general ways:

a.  $R^2$  and the standard error of estimate ( $\sigma_{EST}$ ). The criterion-related validity coefficient can be interpreted in terms of the proportion of the variance shared in common by

the test battery and the criterion task measures. This can be accomplished by squaring the value of  $R_{xy}$  and is used to calculate the standard error of the estimate ( $\sigma_{EST}$ ) thus providing a range of what the soldiers true criterion score is likely to be given his/her test battery score. The assumption is that the errors of estimate for any of the test battery factors or criterion measures are normally distributed so that the appropriate normalized Z score will encompass 95% of the distribution of soldiers scores on the performance tasks. This will produce a "band" of criterion performance scores in which 95% of the soldiers true score would fall if complete accuracy could be obtained. Thus if  $\sigma_{EST} = \sigma_Y (.85)$ , indicating that the  $\sigma_{EST}$  is 85% as large as the standard deviation of the criterion measures, we know that using the predictive test score reduces the uncertainty about the criterion score by 15% ( $1 - .85$ ).

b. Decision Theory. The criterion-related validity coefficient must be interpreted in light of the decision that is needed: to assign or not to assign a soldier to a job in a particular physical demands class based on the entire spectrum of their knowledge, skills and abilities (KSA). Now that we have a measure of the physical requirements for military jobs, the situation is considerably changed. A work capacity test battery can now be used to supplement, not supplant, the extensive information currently obtained during the accession process of the soldier. However, to determine the usefulness of this test battery with the new set of data, we must reanalyze the

data collected in the validation study to determine what would happen had the test been used to make a decision to accept or reject a soldier for assignment to a specific job cluster. The outcomes would be whether the soldier is a success (meets minimum standards) or a failure on the critical criterion tasks for the job cluster. When the predictive test battery is not used, the point which separates the successes from the failures is called the base rate of the population expressed as the number of successes divided by the total sample.

$$\text{BASE RATE} = \frac{\# \text{ of Success}}{\# \text{ of soldiers in sample}}$$

In figure 3-1, the vertical line indicates the division of soldiers into those accepted for duty in the MOS and those rejected based on the performance on the work capacity test battery. This is the selection ratio for the sample and is expressed as the number of soldiers assigned to the MOS cluster divided by the total number of soldiers in the sample.

$$\text{SELECTION RATIO} = \frac{\# \text{ of soldiers accepted in MCS Cluster}}{\# \text{ of soldiers in sample}}$$

The use of this decision matrix (Figure 3-1) provides the manager with a combination of predictions (accept or reject) and outcomes (success or failure). An algorithm can be developed that will optimize the assignment of soldiers into the "valid acceptance" quadrant. This could be considered the "hit rate" of the predictive test battery.

HIT RATE = # of validly accepted soldiers  
 # of soldiers scoring in acceptable range in test

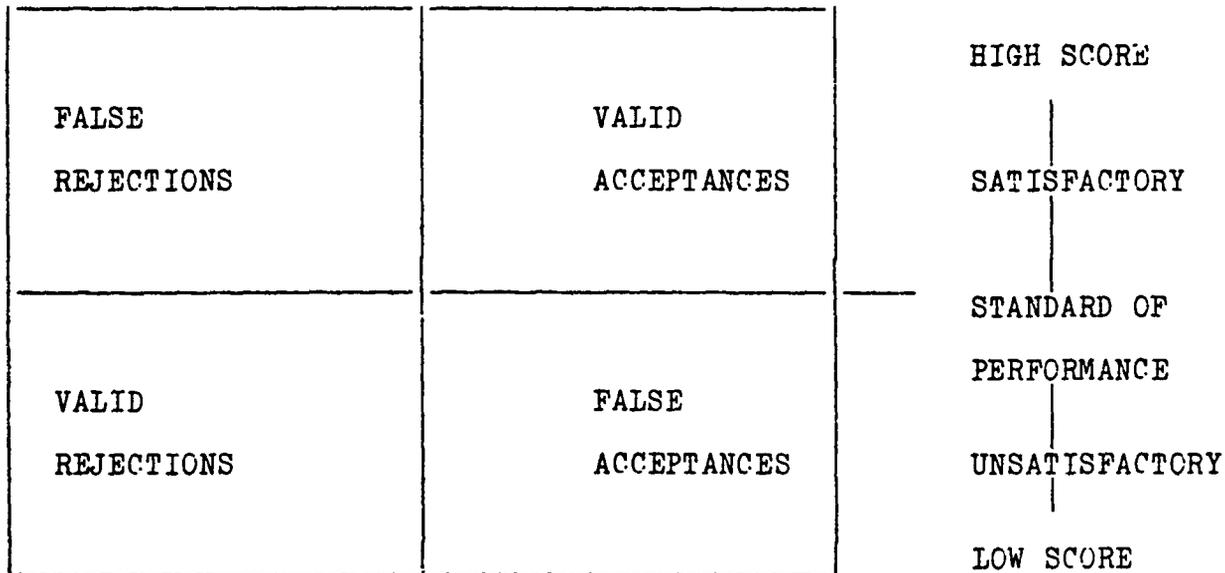
The validity of this predictive battery can be expressed for a sub-sample and represents a decision strategy for the selection and assignment of soldiers based on physical work capacity.

FIGURE 3-1

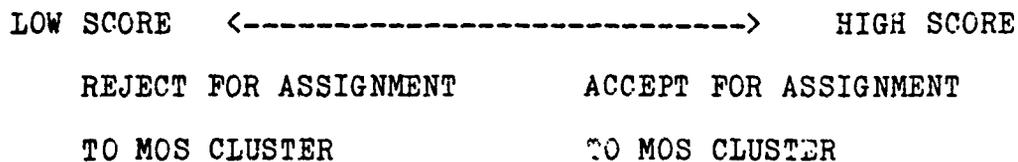
POLICY CAPTURING MODEL

FOR THE DEVELOPMENT OF AN ACCESSION STRATEGY

TEST BATTERY COMPOSITE SCORE



TEST BATTERY PERFORMANCE



This model would help in making decisions based on a particular selection strategy for assigning soldiers to physically demanding MOS.

3-8. CROSS-VALIDATION TO INSURE THAT THE SELECTION ALGORITHM REMAINS VALID. Once the optimum algorithm has been developed, it will be important to demonstrate the stability of this selection strategy by cross validating it and insuring its reliability over time and across different test facilities and/or testors. Cross validation is essential for determining how much chance variance affected the algorithm and how much was due to subject differences. On factors associated with criterion performances the criterion related algorithm's predictive power will be expected to "shrink" with cross validation. The degree of this shrinkage is a function of the number of subjects in the validation sample, the number of factors loaded into the algorithm, their reliability, the extent of theoretical basis for inclusion of factors in the test battery itself; i.e., the larger the sample size, the smaller the expected shrinkage. We have designed the study with these threats to its validity taken into consideration. However, this experimental rigor must be weighed against the practical considerations of administrative cost, time, resources available, and utility of the test battery. Ideally, for the prediction of complex criteria, a battery of tests should be used, each of which is internally consistent, has a good relation with the criterion performance tasks, and has a low correlation with other factors in the test battery. Once the test battery factors have been administered, this set of scores can be combined to yield either a classical

predicted criterion score (y) or to provide a basis for a decision in the form of a general regression equation  $Y = A + B_1 X_1 + B_2 X_2 \dots B_K X_K$

3-9. SCORING. The Multiple Cut-off Scoring procedure is required to insure that the soldier is fully qualified for the occupational specialty. The values of the regression weights (b) are derived from the results of the tests administered and the criterion performance scores provided. However, this approach may result in difficulty in making decisions regarding whether to accept or reject a soldier for an MOS cluster. If they do exceptionally well on one test factor, it will compensate for doing poorly on another factor in the test battery. But the poor performance on the one factor may cause inability to perform the job no matter how good his/her performance may have been on another factor of the test battery. For example, if the soldier did extremely well in terms of the stamina predictor, but could not lift a piece of equipment critical to the duty performance in the MOS, they should be disqualified for the MOS even if they were able to run a marathon. A more effective approach would be to use a multiple cutoff procedure in which the soldier would be assigned to an MOS cluster in which he/she met the minimum scores in each component of the test battery. Once the soldier had exceeded the cutoff point for each factor (e.g. strength, stamina, height/weight, mental category and medical clearance), he/she would be considered qualified to enter the MOS cluster.

3-10. ANALYSIS. Discriminant Analysis is an additional statistical procedure which will be necessary to meet equal opportunity concerns for testing and personnel selection. Since the decision involves several outcome groups and several predictors that are being measured, the effectiveness of the test battery will be maximized by using the policy capturing model based upon the expected utility of the decision considering its total organizational impact. Figure 3-2 outlines the management and research responsibilities for the decisions. While the research can be accomplished without management input, the management decision must be accomplished if the research findings are to be effectively applied. Decision makers are frequently presented with several alternative selection strategies. The utility analysis represents an approach to guide the decision maker in his/her choice of these alternatives, based on institutional considerations (i.e., manning levels, personnel strength in the career field) anticipated as a result of the various outcomes. (See Figure 3-3) Associated with each outcome is an institutional utility which may be positive or negative. Likewise there is a cost (negative associated with administering such a test battery ( $U_{TB}$ ). The decision strategy can then be evaluated in terms of the expected utility (EU) for the organization which can be expressed as follows:

$$EU = U_1P(VA) + U_2P(FA) + U_3P(VR) + U_4(FR) - U_{TB}.$$

FIGURE 3-2

APPLICATION OF A WORK CAPACITY  
TEST BATTERY AS A SELECTION STRATEGY

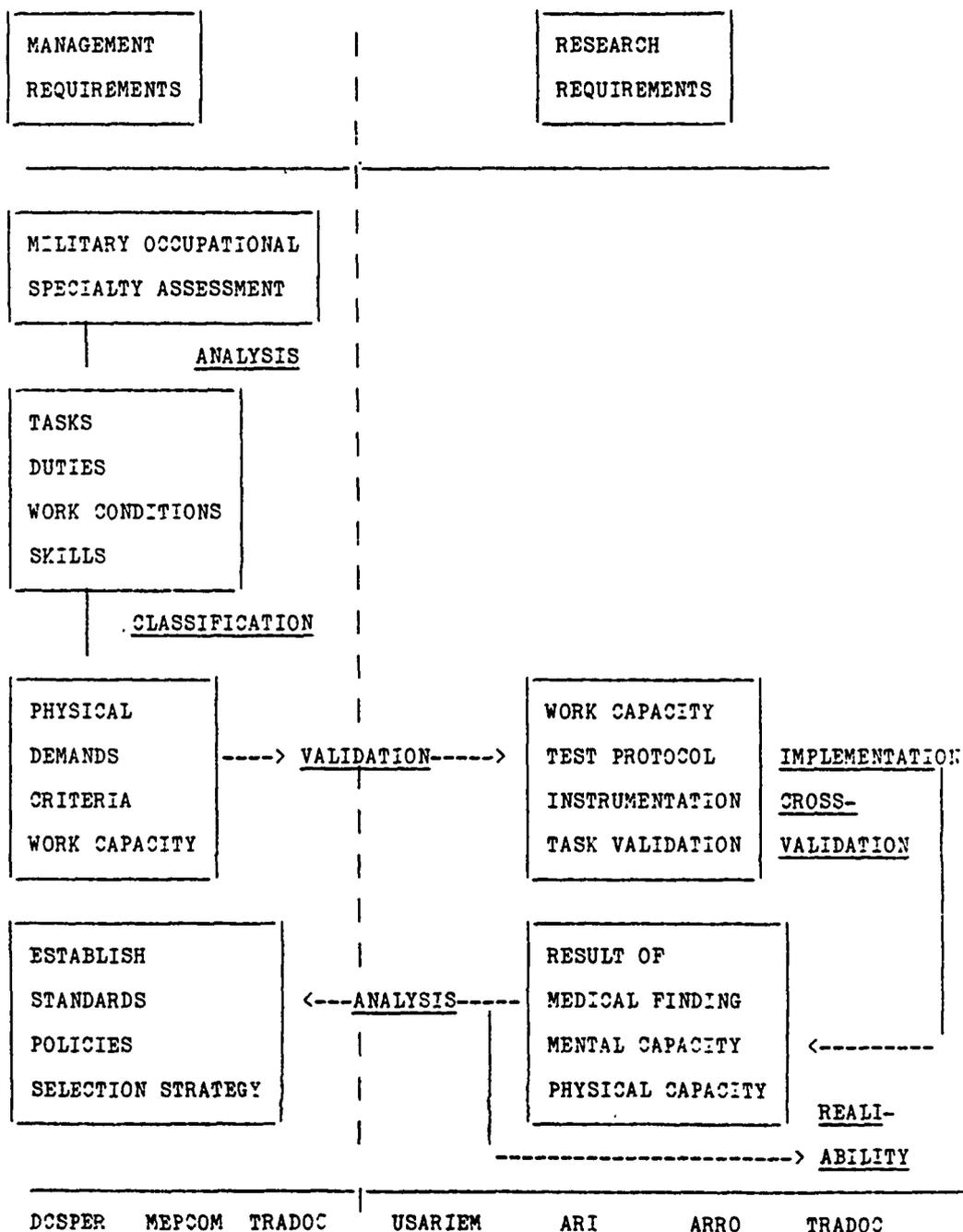
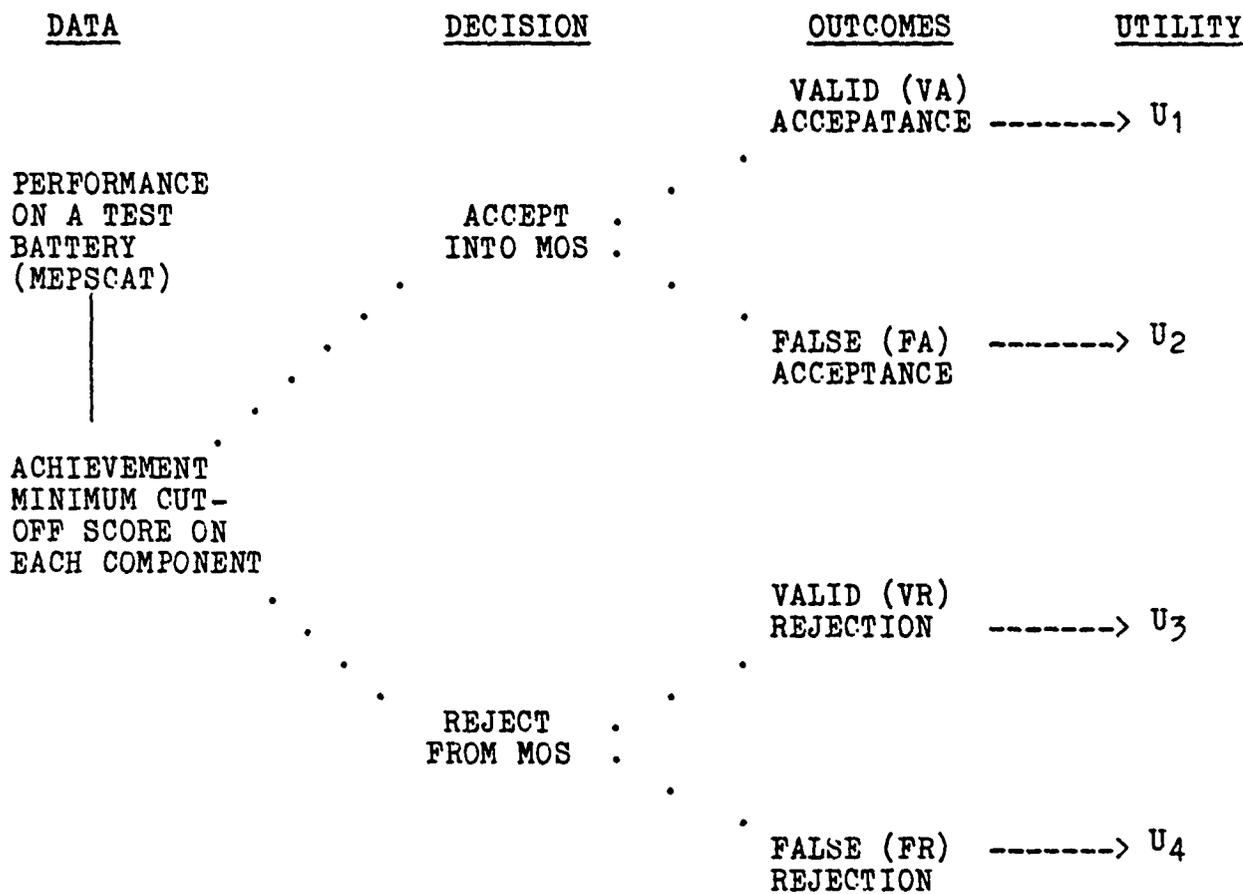


FIGURE 3-3

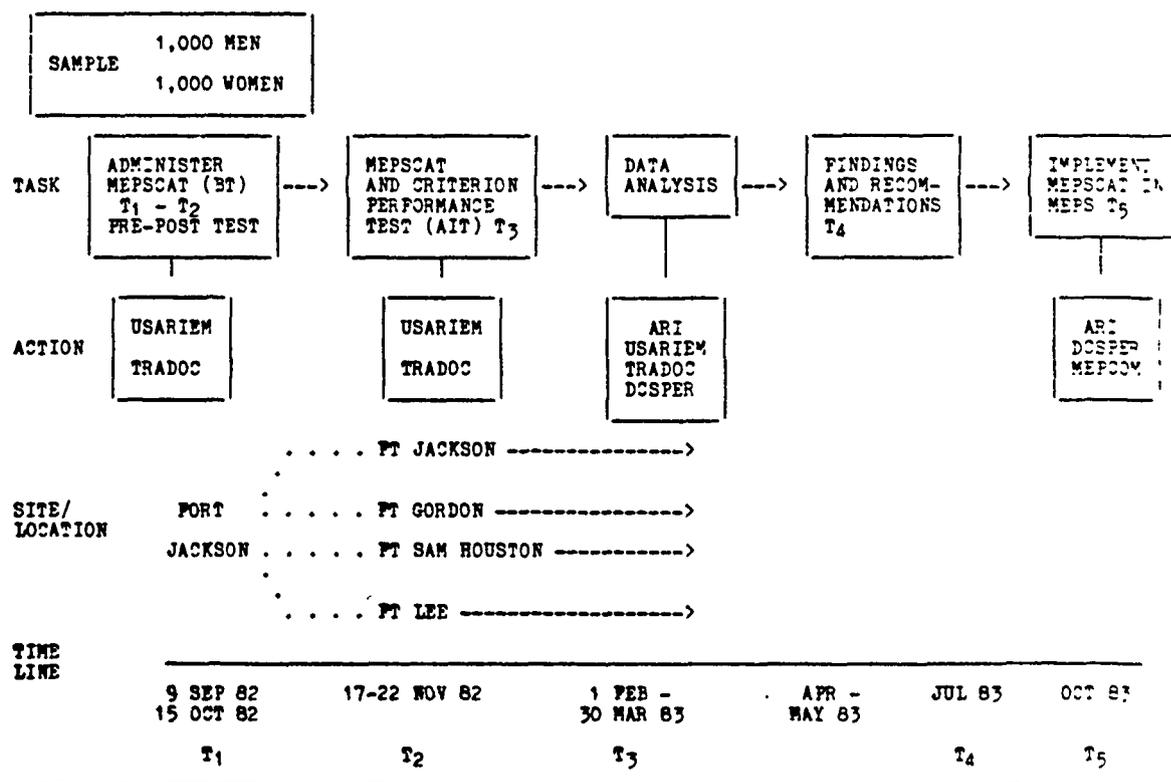
OUTCOMES AND UTILITY OF RECRUITMENT DECISION  
 BASED ON A MULTIPLE CUT-OFF SELECTION STRATEGY



3-11. STATUS. Current progress on the validation study can be seen in Figure 3-4. The development of an initial pre-test has been completed by US Army Research Institute of Environmental Medicine (USARIEM) at Ft. Jackson, South Carolina. Approximately 1,000 men and 1,000 women recruits will participate in testing (T<sub>1</sub>). The post Basic Training testing will involve a 20 percent sample to assess the reliability of the measurements and improvement in the measured parameters as a function of Basic Training (T<sub>2</sub>). The

development of the criterion performance tasks for the MOS clusters has been completed by ARRO and the test procedures and equipment requirements are being coordinated with the proponent schools. They will be distributed to the 4 Advanced Individual Training (AIT) sites for their preparation of end of training assessment to be accomplished by TRADOC (T<sub>3</sub>). It is anticipated that all testing will be completed by 1 April 1983 at the end of AIT and that data analysis and alternate selection strategies will be developed for decision during the summer of 1983 (T<sub>4</sub>). The projected date for implementation of a valid test battery into the MEPS is October 1983 (T<sub>5</sub>).

FIGURE 3-4  
MILITARY ENLISTMENT PHYSICAL STRENGTH CAPACITY TEST (TEST PLAN)



TEST PLAN FOR VALIDATION OF THE PHYSICAL WORK CAPACITY TEST BATTERY

CHAPTER 4  
DIRECT COMBAT ASSESSMENT

4-1 GENERAL. Participation of military women in combat operations has been the subject of legal and policy stipulation.

a. U.S. Air Force Statutory Provisions. Title 10, United States Code, Section 8549, states: "Female members of the Air Force, except those designated under Section 8067 of this Title (Medical, Dental, Chaplain, other 'professionals') or appointed with a view to designation under this section, may not be assigned to duty in aircraft engaged in combat missions."

b. U.S. Navy Statutory Provisions. Title 10, United States Code, Section 6015 states: "The Secretary of the Navy may prescribe the manner in which women officers, women warrant officers, and enlisted women members of the Regular Navy and the Regular Marine Corps shall be trained and qualified for military duty. The Secretary may prescribe the kind of military duty to which such women members may be assigned and the military authority which they may exercise. However, women may not be assigned to duty on vessels or in aircraft that are engaged in combat missions, nor may they be assigned to other than temporary duty on vessels of the Navy except hospital ships, transports, and vessels of a similar classification not expected to be assigned combat missions."

c. U.S. Army Statutory Provisions. Title 10, United States Code, Section 3012, provides that the Secretary of the Army may assign, detail and prescribe the duties of members of the Army.

4-2 COMBAT EXCLUSION POLICY.

a. Current Policy. The "Combat Exclusion Policy" is a regulatory exclusion of women from certain units and occupational specialties (AR 611-201 for enlisted, AR 611-101 for officers and AR 611-112 for warrant officers). The FY 1978 Department of Defense Appropriation Authorization Act (PL 95-79) required the Secretary of Defense to submit a definition of "combat" to the Congress together with recommendations for expanding job classifications for women. <sup>1/</sup> With the passage of PL 95-79, and under the authority of Title 10 Section 3012, the Secretary of the Army issued the Army's Combat Exclusion Policy which states: "Women are authorized to serve in any officer or enlisted specialty except those specified at any organizational level, and in any unit of the Army except Infantry, Armor, Cannon Field Artillery, Combat Engineer, and Low Altitude Air Defense Artillery Units of battalion/squadron size or smaller. Women may not serve on Scout or Attack helicopters".

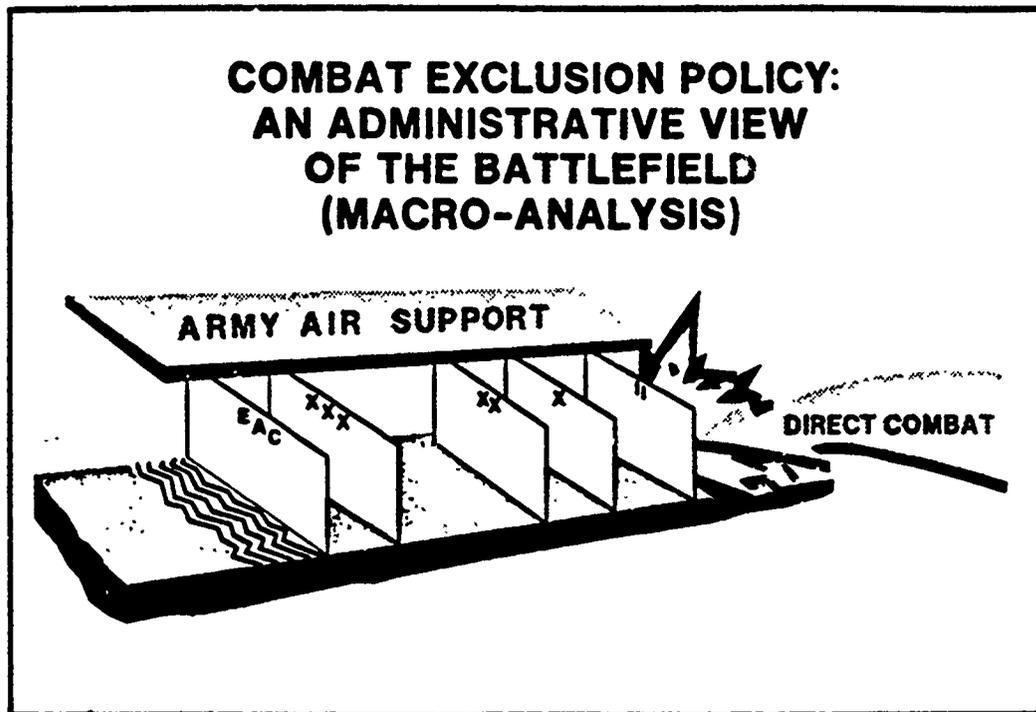
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<sup>1/</sup> Letter to Speaker of the House of Representatives, dated February 14, 1978, from the Deputy Secretary of Defense. Provides OSD response to Section 303 of PL 95-79.

b. Perceptual Inconsistencies and Functional Problems with the Current Combat Exclusion Policy. To some, the Combat Exclusion Policy implies that women are excluded from combat. If "in combat" is defined as presence in a combat theater of operations, then women have always been in combat. However, they have never been in duty positions or battlefield locations requiring their routine engagement in direct combat. The Combat Exclusion Policy sought to exclude women from direct combat by identifying certain units and specialties traditionally viewed and historically validated as "direct combat." (1)

When the Combat Exclusion Policy is viewed as a template overlaying the battlefield, a very simplistic and highly partitioned view of the battlefield emerges. (Figure 4-1.)

FIGURE 4-1



UNIT SYMBOLS

|| = Battalion

X = Brigade

XX = Division

XXX = Corps

EAC = Echelons above Corps

(2) Currently, women are assigned to duty positions and MOS that require them to engage routinely in direct combat. Women may be found in every battlefield sector including forward of, alongside of, or interspersed with direct combat units. Field commanders have voiced concern that women are in duty

positions destined for deployment with a Covering Force (a force that operates well forward of the front lines) and in the Main Battle Area. In these positions women would be routinely required to participate in close or direct combat. As an example, Table 4-1 depicts the battlefield areas where women would be found if the United States V Corps (Europe) participated in combat operations. 2/

TABLE 4-1  
 BATTLEFIELD LOCATIONS OF FEMALE SOLDIERS  
 ASSIGNED TO V CORPS AS OF JULY 1981

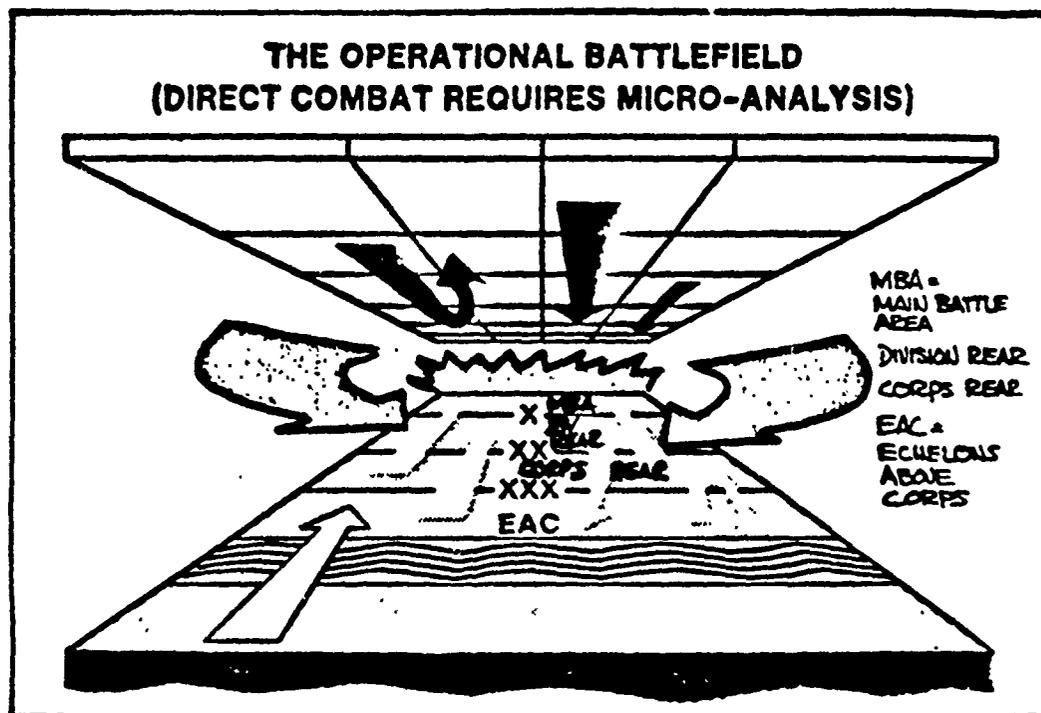
<u>LOCATION</u>	<u>NUMBER OF WOMEN</u>
Covering Force Area	175
Main Battle Area (Forward of Brigade Rear Boundary)	727
Division Area (Between Brigade and Division Rear Boundaries)	959
Corps Area (Between Division and Corps Rear Boundaries)	1,938
TOTAL	<u>3,799</u>

(3) Figure 4-2 more realistically portrays the modern battlefield as an extremely fluid environment where many soldiers, assigned to units located in rear areas, are required to perform duties in forward combat areas.

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3/ Corps Battlefield Area Analysis, U.S. Army MILPERCEN, 1981.

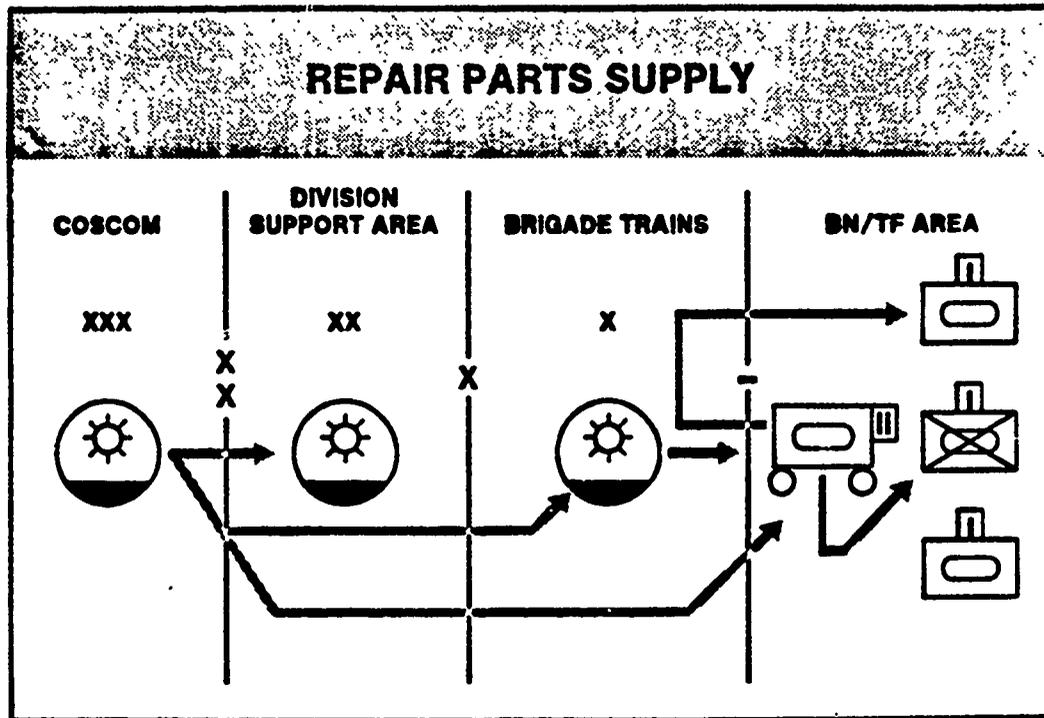
FIGURE 4-2



(4) Examples of this fluidity are the Corps Support Command ammunition and repair parts supply operations. During these operations, some Corps personnel habitually perform duties in the main battle area (Figure 4-3 and 4-4).

FIGURE 4-3

CORPS REPAIR PARTS LOGISTICS OPERATIONS

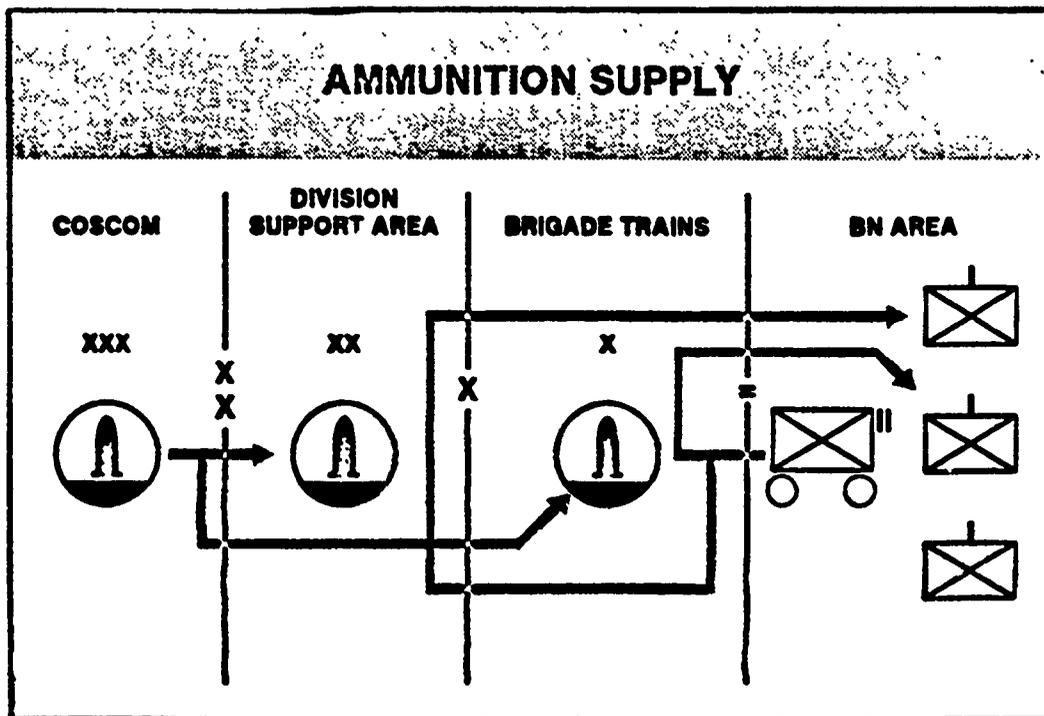


BN = BATTALION

TF = TASK FORCE

FIGURE 4-4

CORPS AMMUNITION LOGISTICS OPERATIONS



c. Formulating an Effective Combat Exclusion Policy.

Formulating a combat policy for women requires a detailed assessment of every officer, warrant officer, and enlisted position in the Total Army (Active, National Guard and Army Reserve). To determine the relative risks of a service member in a given position routinely engaging in direct combat, four major variables must be reviewed:

- (1) Duties/tasks required by the MOS/Special Skill Identifier.
- (2) Unit mission and employment.
- (3) Battlefield location.
- (4) Tactical doctrine.

4-3. METHODOLOGY. Despite repeated reference to "Direct Combat," no such term currently exists in any dictionary of military terms. The term "combat" refers to "engaging an enemy or being engaged by an enemy in armed conflict." With this definition a service member is considered to be "in combat" when he or she is in a geographic area designated as a combat/hostile fire zone by the Secretary of Defense. The term "close combat" was defined by the Department of Defense as "engaging an enemy with individual or crew-served weapons while being exposed to direct enemy fire, a high probability of direct physical contact with the enemy's personnel, and a substantial risk of capture." 4/

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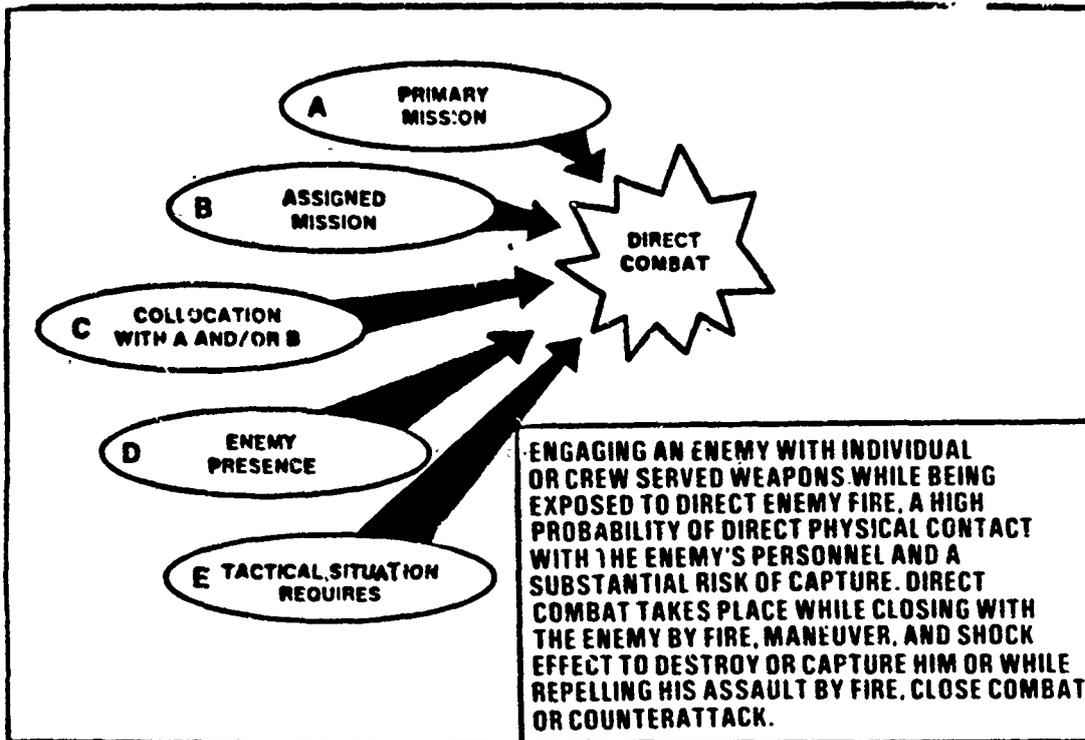
4/ Letter to Speaker of the House of Representatives, dated February 14, 1978, from the Deputy Secretary of Defense. Provides OSD response to Section 303 of PL 95-79.

Within the Army, "direct combat" is traditionally viewed as taking place while closing with the enemy by fire, maneuver, or shock effect in order to destroy or capture him, or while repelling his assault by fire, close combat or counterattack.

a. Definition of Direct Combat. A definition of direct combat was developed by combining the Department of Defense definition of close combat and the Army's traditional view of direct combat: "Direct combat is engaging an enemy with individual or crew-served weapons while being exposed to direct enemy fire, a high probability of direct physical contact with the enemy's personnel, and a substantial risk of capture. Direct combat takes place while closing with the enemy by fire, maneuver, or shock effect in order to destroy or capture him, or while repelling his assault by fire, close combat or counterattack." Using this definition as a guide, Figure 4-5 graphically shows how a soldier is involved in direct combat.

FIGURE 4-5

HOW A SOLDIER BECOMES ENGAGED IN DIRECT COMBAT



(1) Primary Mission. Soldiers engage in direct combat because of their primary duty assignment (e.g., Infantrymen must close with and destroy the enemy).

(2) Assigned Mission. Soldiers/units may have an assigned direct combat (e.g., Military Police responsible for closing with and destroying the enemy located in rear areas-Rear Area Combat Operations).

(3) Collocation. Soldiers must collocate with direct combat elements (e.g., Radio Operators, Ground Surveillance Equipment Operators, Target Acquisition Specialists, and Smoke Generator Operators), and can be required to participate in direct combat.

(4) **Enemy Presence.** A soldier becomes involved in direct combat when the enemy is present. Given the threat doctrine (how the enemy fights), this may occur anywhere on the battlefield.

(5) **Tactical Situation.** Finally, the tactical situation may require that every available soldier be committed to battle as reserves are committed or the unit's rear area is attacked.

b. Use of These Situations. These situations can be relatively ordered according to direct combat risks and serve as a basis for a detailed inspection of unit mission, tactical doctrine, battlefield location, and MOS or special skill assigned duties.

4-4. DIRECT COMBAT PROBABILITY CODING. Direct Combat Probability Coding is the classification of each officer, warrant officer, and enlisted job in the Army according to the probability of participating in direct combat. Seven codes are used to classify jobs, with a code of 1 representing high combat probability and a code of 7 representing no direct combat probability. Direct Combat Probability Coding is needed to provide assignment alternatives and impacts when deciding which Army jobs should be closed to women because of direct combat considerations. Though current Army policy states that women soldiers may not be assigned to MOS that routinely engage in direct combat, it fails to provide assignment restrictions for those Army jobs requiring collocation with soldiers routinely participating

in direct combat or locating in areas where direct combat routinely occurs. This failure places women soldiers in jobs and locations with a high probability of experiencing direct combat. By coding all Army jobs to reflect the risk of direct combat, assignment alternatives can be provided.

a. Integration. Neither the modern battlefield nor direct combat can be partitioned by MOS or unit. Personnel with "non-combat" MOS are collocated with "combat" MOS personnel, and while so collocated have a high probability of routinely engaging in direct combat. Additionally, an MOS traditionally viewed as "non-combat" may have direct combat missions (e.g., military police are the primary Rear Area Combat Operations Force and as such must routinely participate in direct combat). Assessment of direct combat must, therefore, consider MOS duties, unit mission, battlefield location and tactical doctrine.

b. Review of Positions in the Total Army. To assess accurately and realistically the relative risks of a soldier's engaging in direct combat, each position in the Total Army must be reviewed. Because soldiers serve as part of a unit, the enormity of this task was reduced to a review of the paragraph and line numbers of the Tables of Organization and Equipment (TOE) and Tables of Distribution and Allowance (TDA) currently used by the Army. Doctrinal and tactical proponents for each of these units performed this review because they understand how and where a given unit (to include its sub-elements) is employed in combat, the individual tasks of soldiers

in that unit, and the employment of unit weapons and equipment.

c. Ordinal Coding Scale. To capture the relative combat risks of each position, an ordinal coding scale (ranging from 1 to 7) was developed with 1 representing the highest risk of routine engagement in direct combat and 7 representing a position not found in the Theater of Operations. The ordinal scale is used to code positions and not people. Every position in the Total Army has been assigned a code. Therefore, any soldier in a given position acquires the direct combat risks associated with that position. These codes are defined at Appendix H. Hereafter, these codes will be shown as P1, P2 . . . P7.

d. Direct Combat Risk Assessment. Using the four variables: unit mission, tactical doctrine, assigned duties, and battlefield locations, the relative risk of a soldier's engaging in direct combat can be assessed with reasonable accuracy. For example, a soldier serving in MOS 11B (Infantryman) has the primary mission of closing with and destroying the enemy and therefore has a very high probability of engaging routinely in direct combat.

e. Risk of Combat Support and Combat Service Support Soldiers.

(1) Though not in a combat MOS, many Combat Support and Combat Service Support soldiers have virtually the same risk of engaging in direct combat as infantry. While these

personnel may not be immediately identified with direct combat positions, they collocate with "combat personnel." Table 4-2 is used to illustrate this point.

TABLE 4-2

MOS TITLE	DIRECT COMBAT DUTIES
<p><b>CMF 51</b>  <b>INTERIOR ELECTRICIAN</b>            (Int Elet)  <b>★MOS 51R</b></p>	<p style="text-align: center;"><b>COMBAT</b></p> <p><b>ENGINEERING.</b> Performs combat engineer functions. Participates in laying and clearing minefields, priming and emplacing explosives and demolitions, constructing and removing wire, beach and river obstacles, hasty emplacements, expedient shelters and bunkers, and camouflage of fixed positions and equipment.</p>
<p><b>CMF 51</b>  <b>PLUMBER</b>  <b>★MOS 51K</b></p>	<p style="text-align: center;"><b>COMBAT</b></p> <p><b>ENGINEERING.</b> Assists in laying and clearing minefields. Primes and emplaces explosives and demolitions. Constructs and removes wire, beach, and river obstacles and hasty emplacements, expedient shelter, and bunkers. Camouflages fixed positions and equipment.</p>
<p><b>CMF 51</b>  <b>CARPENTRY AND MASONRY SPECIALIST</b>            (Carpentry &amp; Masonry Sp)  <b>MOS 51B</b></p>	<p style="text-align: center;"><b>COMBAT</b></p> <p><b>ENGINEERING.</b> Assists in performance of combat engineer missions. Assists in laying and clearing minefields, priming and emplacing explosives, and demolitions, constructing, and removing wire, beach, and river obstacles, hasty emplacements, expedient shelters, and bunkers, and camouflage of fixed positions and equipment.</p>
<p><b>CMF 51</b>  <b>DIVER</b>  <b>MOS 00B</b></p>	<p><b>★MOSC 00B10:</b> Performs as diver in underwater reconnaissance, salvage, repair and demolition using self-contained underwater breathing apparatus, and surface-supplied air diving equipment (hardhat). <b>RECONNAISSANCE.</b> Performs underwater reconnaissance of breakers, beach approaches, riverbeds, and harbors. Collects and reports information and data on hydrographic conditions, obstacles, beach and riverbank characteristics, terrain and routes for use in river crossing and beach operations.</p>

(2) Task organization of the Covering Force and Main Battle Area units and the requirement to "fix and fuel forward" place many Combat Support and Combat Service Support personnel in a position to engage routinely in direct combat. Presence in the Covering Force Area and the Main Battle Area of maintenance and recovery personnel, communicators, military police, intelligence specialists, and supply personnel is illustrative of this fact.

(3) Though the current Army Combat Exclusion Policy proscribes the assignment of female soldiers to MOS that routinely engage in direct combat, it fails to address the numerous duty positions within an MOS requiring the incumbent to share virtually the same risk as infantrymen, armor crews, scouts, and field artillery personnel.

f. Application of the Codes. Doctrinal proponents applied the Direct Combat Probability Codes to each paragraph and line number in every active Table of Organization and Equipment (TOE) and Table Distribution and Allowance (TDA) in the Total Army.

(1) In March 1980, the U.S. Army War College conceptualized and defined the coding strategy. After field and pilot testing, the coding system was expanded and refined in November 1981. In December 1981, instructions were prepared by the Women in the Army Policy Review Group for use by doctrinal proponents in applying the codes to all TOE (Appendix H).

(2) The procedures outlined in the instructions required proponents to review each TOE for which they had responsibility. To assist them, questionnaires requiring "yes" or "no" responses were used to encourage the objective review of each TOE and to facilitate automation. Based on the results, the appropriate "P" code could be determined.

(3) After the TOE were reviewed by the proponents, they were checked by the Women in the Army Policy Review Group to insure the review was conducted according to instructions. The questionnaires were sent to the United States Army Management System Support Agency (USAMSSA) where the data was key-punched and processed. The result was a "P" code for each paragraph and line number of each TOE.

(4) Since TDA units do not have combat missions, "P" codes were applied to each TDA using a computer program developed by USAMSSA. The logic for the program was provided to USAMSSA by the Women in the Army Policy Review Group, thus retaining coding consistency between TOE and TDA type units.

(5) Before the Direct Combat coding could be completed, data from two other automated systems had to be addressed. These systems are the Force Accounting System (FAS) and the Personnel Structure and Composition System (PERSACS).

(a) The FAS selects the appropriate force based upon user (Deputy Chief of Staff for Operations) parameters and identifies the appropriate requirements and authorization documents (TOE, TDA) which provide detailed personnel data

required to reflect resource requirements.

(b) PERSACS is a computer program that computes requirements as a function of the composition and size of the force. It produces current and projected personnel requirements to support the Force.

(6) The final step in the coding process involved using the Women Enlisted Expansion Model (WEEM). The WEEM is a computerized model used by the Military Personnel Center (MILPERCEN) to determine the maximum number of women by MOS which can be supported in a given force structure. Input to the WEEM is provided by authorization data extracted from the PERSACS. Critical factors considered by the WEEM in determining the maximum theoretical number of women the Army can support include promotion equity, rotation equity, and the need to provide a sufficient number of combat replacements.

#### 4-5 RESULTS.

a. Enlisted Duty Positions. There are 572,000 enlisted duty positions in the Active Army at its current authorized end strength. Fifty-three percent of these duty positions (302,000) are P1 positions as defined by MOS duties, unit mission, battlefield locations, and tactical doctrine.

b. Closure of MOS to Women. WITAPRG concluded that 23 additional MOS should be closed to women because these jobs require soldiers to perform their duties in the forward area of the battlefield, where the highest risk of direct combat occurs and, in some cases, where the job description clearly

specifies and requires performance of direct combat tasks.

The MOS are:

<u>MOS</u>	<u>TITLE</u>
00B	Diver
13R	Firefinder Radar Operator
16J	Defense Acquisition Radar Operator
17B	Field Artillery Radar Crewmember
17C	Field Artillery Target Acquisition Specialist
23U	NIKE HP Radar Simulator Repairer
26F	Aerial Photo Sensor Repairer
26K	Electronic Warning/Defense Equip Repairer
45G	Fire Control Systems Repairer
51B	Carpentry and Masonry Specialist
51K	Plumber
51R	Interior Electrician
52G	Transportation and Distribution Specialist
54C	Smoke Operations Specialist
54E	NBC Specialist
62E	Heavy Construction Equipment Operator
62G	Quarrying Specialist
62H	Concrete and Asphalt Equipment Operator
62J	General Construction Equipment Operator
67T	Tactical Transportation Helicopter Repairer
67U	Medium Helicopter Repairer
82B	Construction Surveyor
82C	Field Artillery Surveyor

Specific reasons for closing the 23 MOS:

- 00B: Places, detonates, or directs the detonation of explosives to expedite the clearing of beaches, rivers and harbors in the forward combat area.
- 13R: Operates radar in the forward combat area of the battlefield to locate hostile fire weapons and register and adjust friendly artillery (i.e., Forward Artillery Observer using radar equipment).
- 16J: Operates forward combat area alerting radar unit to obtain early warning and target identification.
- 17B: Operates radar in the forward combat area to locate firing weapons, bursts from friendly weapons and moving targets.
- 17C: Establishes observation posts in the forward combat area to locate enemy targets.
- 23U: The MOS is obsolete and will be deleted.
- 26F,26K: Performs maintenance on equipment on equipment located in the forward combat area.
- 45G: Performs maintenance on fire control systems and related equipment mounted in combat vehicles to include forward combat areas.
- 51B,51K, : Performs combat engineer missions in the forward combat area. Assists in laying and clearing minefields; 51R,62E, primes and emplaces explosives and demolitions; 62G,62H, constructs and removes wire, beach and river obstacles and hasty emplacements, expedient shelters and bunkers; 62J

and camouflages fixed positions and equipment.

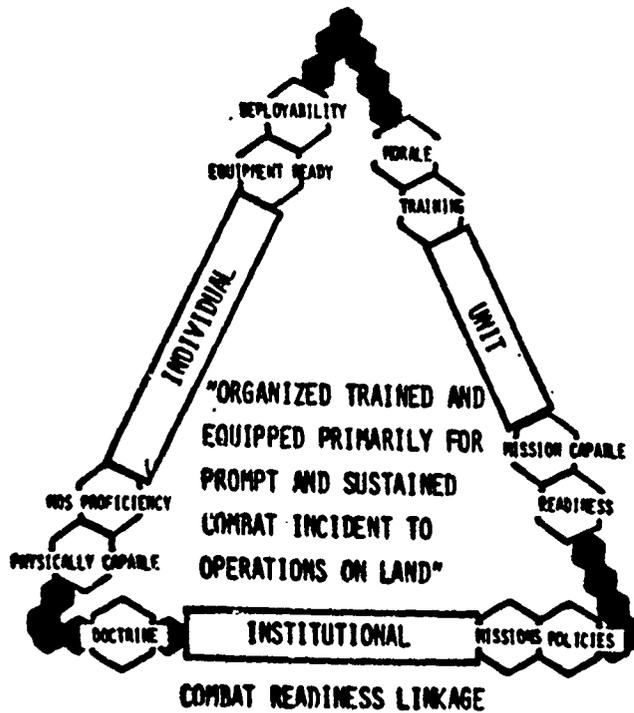
- 52G: Installs and maintains electrical distribution systems in the forward combat area.
- 54C: Operates and maintains generating equipment in producing smoke screens to hide ground targets from enemy and to screen movement of friendly troops; operates in the forward combat area.
- 54E: Conducts area reconnaissance for Nuclear, Biological & Chemical contamination. Decontaminates equipment, material, supplies, terrain, and personnel in the forward combat area.
- 67T, 67U: Performs maintenance on equipment located in the forward combat area.
- 82B: Performs construction surveys including surveys in forward combat areas.
- 82C: Performs field artillery survey operations, constructs fortifications, bunkers and crew-served weapons emplacements; performs crater and shell fragment analysis in the forward combat area.

CHAPTER 5

RESEARCH FINDINGS AND CONCLUSIONS

5-1 GENERAL. Improving the combat readiness of the Army and maximizing the potential of every enlisted soldier are twin pillars upon which the Women in the Army Policy Review Group conducted its review and analysis. MOS Physical Demands Analysis and Direct Combat Probability Coding will, when totally implemented, provide an environment conducive to the continued growth and meaningful service of all soldiers and significantly improve combat readiness by improving the individual, unit, and institutional readiness of the Army. Such a combat readiness linkage is shown in Figure 5-1.

FIGURE 5-1  
COMBAT READINESS LINKAGE



5-2. PHYSICAL DEMANDS ANALYSIS. The data on overall work capacity and the physical demands of Army jobs has been described in Chapters 2 and 3. Findings are:

a. The average female recruit has from 50-75 percent of the strength, stamina and muscle mass of the average male recruit with the greatest disparity existing in the female soldier's upper body strength.

b. The major physical capacity requirements for the majority of military jobs are lifting and carrying.

c. The majority of Army jobs have heavy or very heavy work requirements.

d. Upper body strength, rather than cardiovascular fitness or stamina, appears to be the limiting factor in the performance of military jobs.

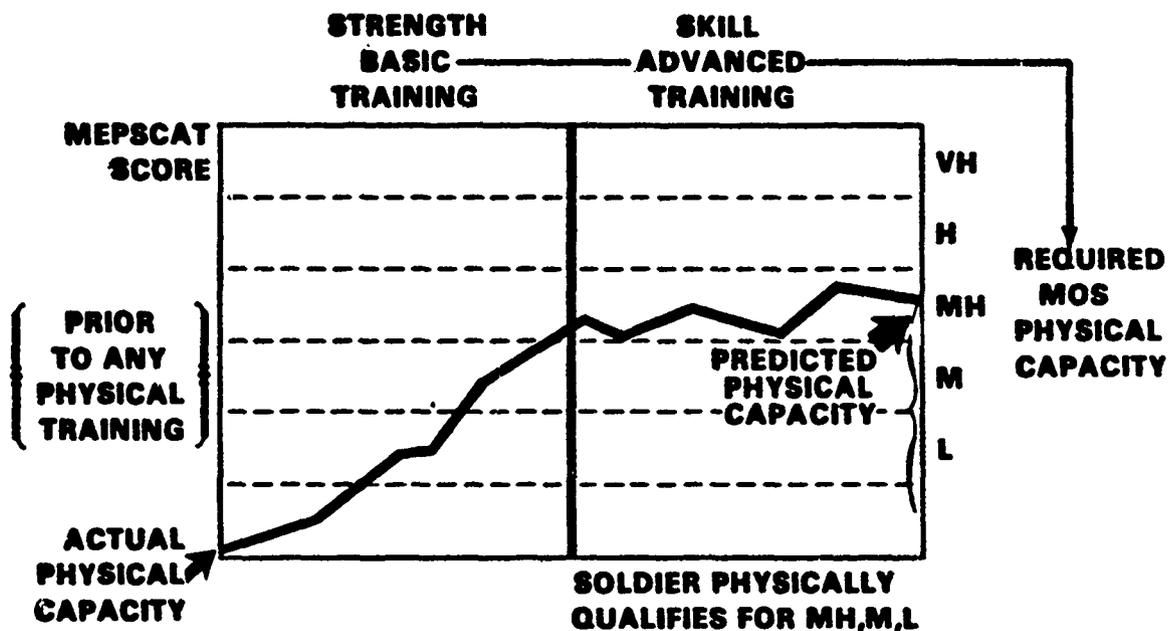
e. Performance can be predicted with respect to criterion tasks by measuring a variety of predictors that are associated with the strength and stamina of the soldier.

f. Entry level assessment of physical work capacity during induction screening will provide a useful tool for the selection and assignment of all enlisted military personnel entering the Army.

g. Soldiers' strength and stamina can be substantially improved with an appropriate training regimen. Figure 5-2 displays the expected improvement in physical capacity as a soldier undergoes basic and advanced training.

**FIGURE 5-2**

**MATCHING THE SOLDIER WITH THE JOB**



h. The current distribution of women by physical category is shown in Table 5-1.

TABLE 5-1

DISTRIBUTION OF ACTIVE ARMY MILITARY  
OCCUPATIONAL SPECIALTIES AND DUTY POSITIONS  
BY PHYSICAL DEMANDS CATEGORIES

<u>PHYSICAL DEMANDS CATEGORIES</u>	<u>NUMBER OF MOS</u>	<u>NUMBER OF DUTY POSITIONS</u>
Very Heavy	132	368.4K
Heavy	48	71.1K
Moderately Heavy	64	44.0K
Medium	65	42.0K
Light	<u>42</u>	<u>46.5K</u>
TOTAL	351	572.0K

5-3. DIRECT COMBAT ASSESSMENT. A complete description of the Direct Combat Assessment is in Chapter 4. Following is a summary of the findings:

a. Of the 572,000 enlisted duty positions in the Active Army, 302,000 have the highest probability of routinely engaging in direct combat. The complete distribution of duty positions by Direct Combat Probability Codes is shown in Table 5-2.

TABLE 5-2

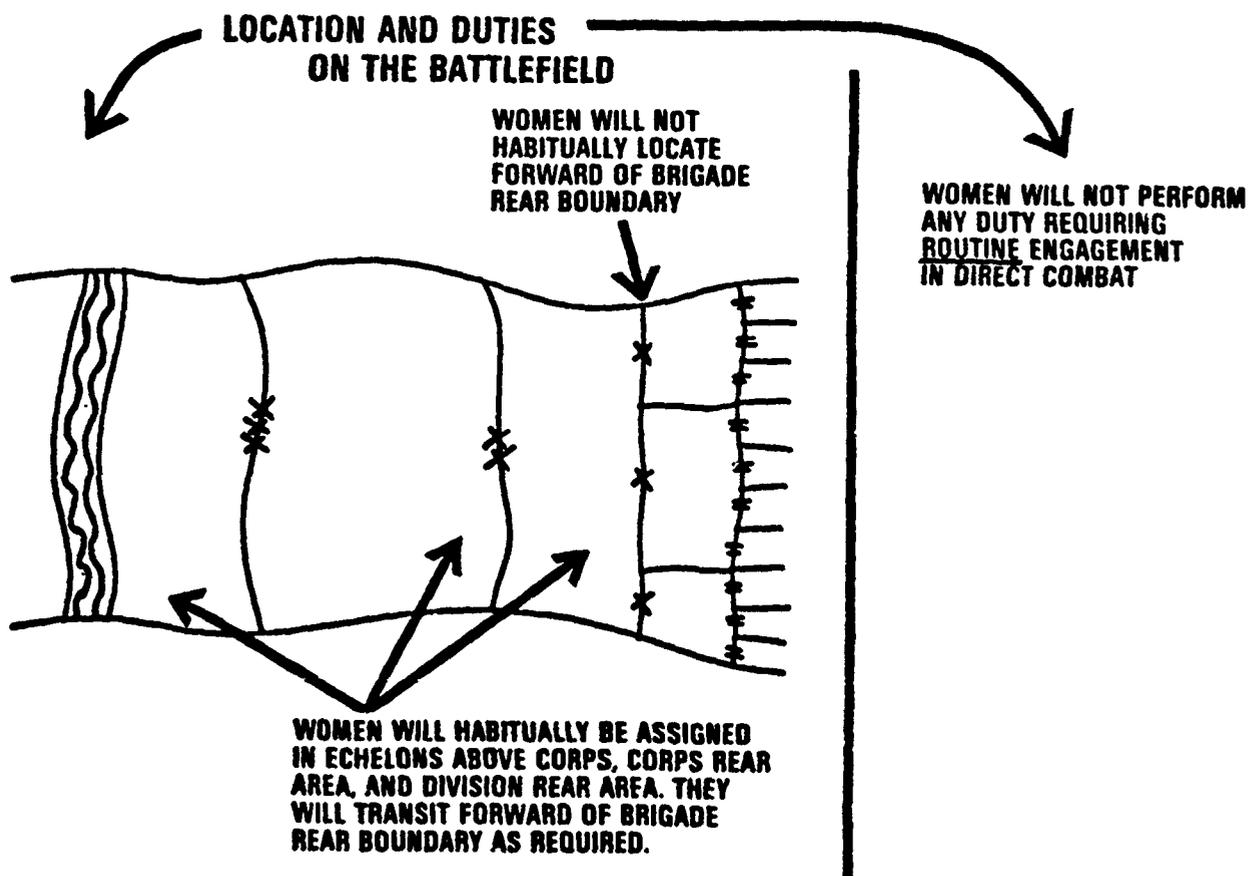
DISTRIBUTION OF POSITIONS BY DIRECT COMBAT PROBABILITY CODES

<u>P1</u>	<u>P2</u>	<u>P3</u>	<u>P4</u>	<u>P5</u>	<u>P6</u>	<u>P7</u>
302,000	25,400	35,500	23,300	57,900	50,300	77,600

b. Women are excluded from serving in positions coded P1. These are positions primarily found forward of the brigade rear boundary where the highest probability exists of routinely engaging in direct combat. Regardless of battlefield location, women will not perform duty requiring routine engagement in direct combat as a normal part of their job. Figure 5-3 displays this concept.

FIGURE 5-3

## WOMEN IN THE ARMY



c. Thirty-eight MOS were excluded under the original Combat Exclusion Policy. Based on Direct Combat Probability Coding an additional 23 MOS were recommended for closure (Table 5-3).

TABLE 5-3

38 MOS SKILLS NOW CLOSED TO WOMEN			23 ADDITIONAL MOS SKILLS TO BE CLOSED TO WOMEN AS ANNOUNCED IN DR. KORB'S, 26 AUG PRESS BRIEFING				
MOS	TITLE		MOS	TITLE	FIRST TERM REUP	CAREER REUP	
11B	INFANTRYMAN	17K	8ND SURVL RDR CRMN	00B	DIVER	0	1
11C	INDIRECT FIRE INFMN	17M	REMOTE SENSOR SP	13A	FIREFINDER RADAR OPERATOR	11	7
11H	MV ANTI-ARMOR WPM INFM	19D	CAVALRY SCOUT	16J	DEF ACO RADAR CRMR	0	1
11M	FV INFANTRYMAN	19E	M48-M60 ARMOR CREWMAN	17B	FA RADAR CRMR	49	12
12B	COMBAT ENGINEER	19K	M1 ABRAMS ARMOR CRMN	17C	FA TGT ACO SPECIALIST	109	43
12C	BRIDGE CREWMAN	19Z	ARMOR SENIOR SGT	23U	MIKE HP RDR SIM REP	1	2
12E	ADM SPECIALIST	24M	VULCAN SYS MECH	26F	AERIAL PHOTO SEN REP	0	0
12F	ENGR TRVEN CRMN	24N	CHAPARRAL SYS MECH	26K	EL WARNING/DEF EQ REP	1	0
12Z	COMBAT ENGR SR SGT	24S	ROLAND MECH	48G	FC SYSTEMS REP	5	1
13B	CANNON CREWMAN	27C	ROLAND REP	81B	CARPENTRY & MASONRY SPEC	18	22
13C	TACFIRE OPNS SP	27D	ROLAND FMTS REP	81K	PLUMBER	5	4
13E	CANNON FD SP	48D	SP FA TRT MECH	81R	INTERIOR ELEC	3	2
13F	FIRE SUPPORT SP	48E	M1 ABRAMS TRT MECH	82G	TRANS & DISTR SPEC	1	3
13M	MLRS CREWMEMBER	48N	M60A1/A3 TRT MECH	84C	SMOKE OP SPEC	17	13
16F+	LIGHT ADA CRWMN	48T	ITV/IFV/CFV TURRET MECH	84E	MBC SPECIALIST	378	244
16G	ROLAND CREWMEMBER	83D	SP FA SYSTEM MECHANIC	82E	NAVY CONST EQUIP OP	29	12
16P	ADA SHORT RG MSL CRMN	83E	M1 ABRAMS TANK SYS MECH	82G	QUARRYING SPEC	0	0
16R	ADA SHORT RG GNRV CRMN	83N	M60A1/A3 TANK SYS MECH	82M	CONC & ASPHALT EQUIP OP	1	0
16S	MANPADS CREWMAN	83T	ITV/IFV/CFV SYS MECH	82J	GEN CONST EQUIP OP	11	1
				87T	TAC TRANS HEL REP	3	6
				87U	MED HEL REP	20	16
				82B	CONSTRUCTION SURVEYOR	10	4
				82C	FA SURVEYOR	86	41
						066	435

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5-4. CONCLUSIONS AND RECOMMENDATIONS.

a. The Physical Demands Analysis and Direct Combat Probability Coding System are dynamic decision making tools which will maximize the effective utilization of scarce human resources. They should be adopted and institutionalized.

b. The Army should validate expeditiously the MEPSCAT as is being done at Fort Jackson, South Carolina.

c. All soldiers should be matched to their job through demonstrated physical capability at least equivalent to that required of the job. This assignment policy should be implemented upon validation of the MEPSCAT.

d. The Army has recognized the high probability that soldiers assigned to the 23 MOS in Table 5-3 will engage routinely in direct combat and has closed those MOS to female soldiers.

5-5. THE TRANSITION PLAN.

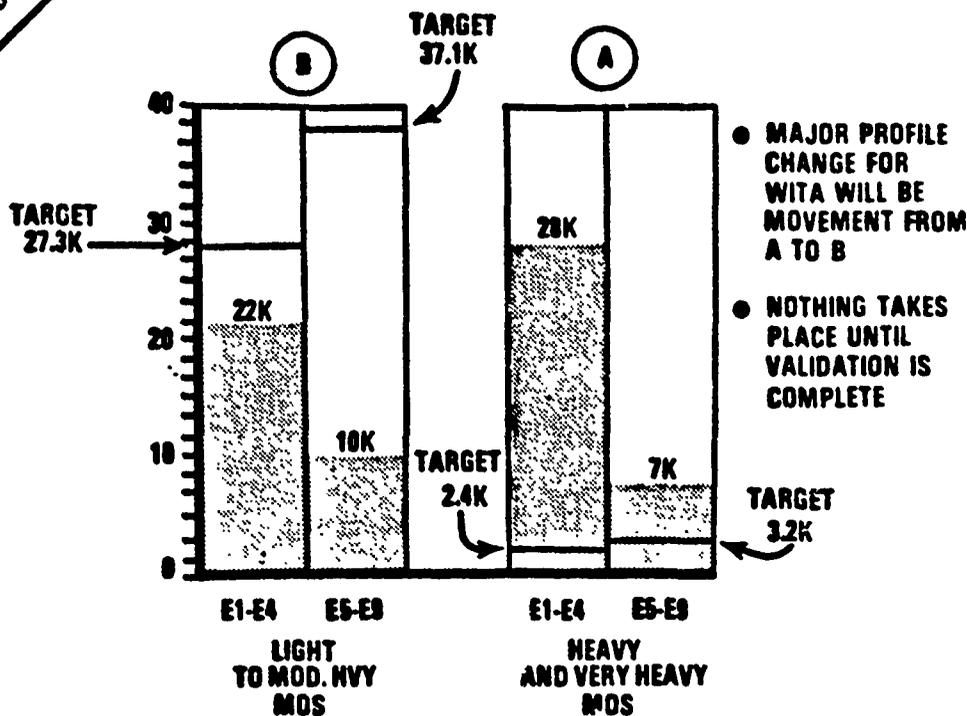
a. A detailed transition plan to align enlisted personnel with skills matching their physical capacity is under development. The Army Staff will have responsibility for detailed development and execution of the plan.

b. The size of the problem and hence the extent of the transition plan to match women to jobs for which they have physical capacity is reflected in Figure 5-4. The target figures are those representative of physical capacities predicted in the current enlisted female force.

FIGURE 5-4

NOTHING HAPPENS IN THIS AREA UNTIL MOS PHYSICAL DEMANDS ANALYSIS AND GENDER-FREE PHYSICAL CAPACITY TEST IS VALIDATED.

REDISTRIBUTION CONCEPT IS MOVEMENT FROM HEAVY/VERY HEAVY TO LIGHT/MODERATELY HEAVY MOS.



c. The transition planning concept envisions the following actions upon successful validation of the Physical Demands Analysis through the MEPSCAT:

(1) New accessions. These soldiers will, after testing, be assigned only to MOS for which they meet both mental and physical qualifications. This is a gender-free action.

(2) Currently serving soldiers. Currently serving soldiers who do not meet physical capacity requirements for their current MOS may undergo reclassification training at their reenlistment point and enter another MOS for which they qualify.

(3) Existing enlistment and reenlistment contracts will be honored.

d. A comparable planning concept applies to those 1291 female soldiers assigned to MOS which have a high probability of engaging in direct combat. The action plan to implement this recommendation would proceed along these conceptual lines.

(1) Halt enlistments of female soldiers into the 23 additional MOS shown in Table 5-3. (This has been accomplished.)

(2) Plan for the voluntary reclassification training for those female soldiers electing a second MOS for which they qualify and for which an Army need exists and require mandatory reclassification training upon reaching their reenlistment point.

(3) Ensure all existing enlistment and reenlistment contracts are honored.

(4) The concept envisions a transition period of up to six years as maximum reenlistment options terminate. Every effort must be made to serve the interest of both the female soldier and the Army as this plan is implemented.

#### 5-6. CONTRIBUTION OF THE WOMEN IN THE ARMY POLICY REVIEW

GROUP'S ANALYSIS. The Review Group's findings respond directly to the recommendations of the May 1976 GAO report to Congress and

the Secretary of Defense and will improve Army readiness to perform its combat mission by:

a. Providing a gender-free capability to match people to Army Military Occupational Specialties.

b. Providing a clearer understanding of where women will serve on the battlefield.

c. Reducing personnel turbulence caused by attrition (the premature loss of soldiers) and migration (the transfer of a soldier out of a job for which he/she has been formally trained).

d. Providing increased opportunity for both male and female soldiers to succeed.

APPENDIX A



DEPARTMENT OF THE ARMY  
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR PERSONNEL  
WASHINGTON, D.C. 20310

REPLY TO  
ATTENTION OF

DAPE-2A

4 May 1981

MEMORANDUM FOR THE DIRECTOR, WOMEN IN THE ARMY POLICY REVIEW  
GROUP

SUBJECT: Tasking

1. The Women in the Army Policy Review Group is tasked to:
  - a. Assess how current Army policies concerning women or which affect women impact on the Army's mission and readiness, to include mobility and deployment. Further, the Policy Review Group should assess how these policies affect the retention of female soldiers and quality of life aspects.
  - b. Develop long-range policies and/or policy changes which will ensure a combat-ready, cost-effective force. In this regard, the following are paramount considerations:
    - (1) What is best for the Army?
    - (2) Will the policy/change enhance readiness?
    - (3) How will the policy/change affect the Army's mission accomplishment?
2. You should be prepared to present your preliminary results, rationale, and recommendations to the Chief of Staff by mid-September. All ODCSPER resources will support you.

A handwritten signature in dark ink, appearing to read "Robert G. Yerks".

ROBERT G. YERKS  
Lieutenant General, GS  
Deputy Chief of Staff  
for Personnel

APPENDIX A      WOMEN IN THE ARMY POLICY REVIEW GROUP  
TASKING LETTER

APPENDIX B



DEPARTMENT OF THE ARMY  
OFFICE OF THE ADJUTANT GENERAL  
WASHINGTON, D.C. 20310

HQDA Ltr 616-81-1

REPLY TO  
ATTENTION OF

DAPE-ZAW (M) (6 May 81)

11 May 81

Expires 1 May 1982

SUBJECT: Women in the Army Policy Review

SEE DISTRIBUTION

1. References:

- a. 1980 Army Commander's Conference.
- b. SAMR Memorandum dated 27 February 1981, subject: Women in the Army.

2. OSD has been informed (ref 1b) that the Army will level off at an enlisted women end strength of about 65,000 to permit a review of policies and programs and to determine the effect use of women may have on combat effectiveness and force readiness. The purpose of this letter is to define responsibilities with regard to this policy and program review.

3. The following responsibilities will apply:

- a. The Deputy Chief of Staff for Personnel will:
  - (1) Establish a policy review group to assess the appropriateness of current Army policies and programs pertaining to women soldiers.
  - (2) Determine relationship of policy pertaining to women soldiers to operational readiness.
  - (3) Determine the effect the use of women soldiers may have on combat effectiveness and force readiness.
  - (4) Continue data collection pertaining to utilization factors, attrition, retention, and lost time.
  - (5) Review personnel policies relating to pregnancy, single and in-service parents, and married soldier couples.
  - (6) Evaluate role women soldiers should assume in the Army.

APPENDIX B      WOMEN IN THE ARMY POLICY REVIEW GROUP  
TASKING LETTER

(7) Consult with civilian resources for expertise and comparative data relating to women in the workforce.

(8) Recommend policy changes and strategies which will ensure a combat ready force, peopled in the most cost effective manner, which will provide the men and women in the Army the best quality of life consistent with the Army mission of ground combat.

(9) DCSPER has authority to task other ARSTAF agencies as required to accomplish responsibilities.

(10) Brief Chief of Staff at Army Staff Council on 27 May 1981. Provide concept plan and milestone schedule for approval.

b. ARSTAF agencies are requested to support the DCSPER in accomplishing this review.

c. Chief, Army Reserve and Director, Army National Guard will assist as required.

d. Commander, Training and Doctrine Command is requested to:

(1) Assist in review and determination of personnel qualifications and standards for initial skill classification.

(2) Review current and proposed tactical doctrine and unit employment and recommend classification and assignment policies for women which are consistent with national policies.

(3) Assess the impact of changes in the number of enlisted women on training and training policy.

e. MACOM commanders are requested to support the DCSPER review.

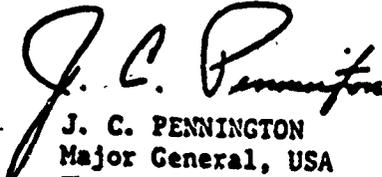
4. The following milestones are provided:

<u>DATE</u>	<u>EVENT (Responsible Agency)</u>
27 May 1981	Brief Army Staff Council on concept plan and milestone schedule
August 1981	GO IPR (DCSPER)
September 1981	Present preliminary results to CSA (DCSPER)

**SUAJECT: Women in the Army Policy Review**

October 1981	Forward preliminary results to MACOM for 1981 Army Commander's Conference discussion (21-27 Oct 81) (DCSPER).
November 1981	Revise as necessary after 1981 ACC (DCSPER)
November 1981	GO Implementation IPR
December 1981	Final Report (DCSPER)

**BY ORDER OF THE SECRETARY OF THE ARMY:**

  
J. C. PENNINGTON  
Major General, USA  
The Adjutant General

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**US ARMY TRAINING AND DOCTRINE COMMAND**

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**US ARMY, JAPAN**

**EIGHTH US ARMY**

**US ARMY CONCEPTS AND ANALYSIS AGENCY**

**US ARMY OPERATIONAL TEST AND EVALUATION AGENCY**

**US ARMY RECRUITING COMMAND**

**US ARMY RESERVE COMPONENTS PERSONNEL & ADMIN CENTER**

APPEND 1

MEMBERS  
WOMEN IN THE ARMY  
POLICY REVIEW GROUP

FULL TIME

<u>NAME</u>	<u>ORGANIZATION</u>	<u>POSITION</u>
MG ROBERT L. WETZEL	OCSA (Holding Detachment)	Director (27 Apr-30 Jul 81)
BG RONALD W. ZELTMAN	ODCSPER, DA	Director (Effective 31 Jul 81)
COL MARCIA RINKEL	ODCSPER, DA	Deputy Director
COL CHARLES A. HINES	ODCSPER, DA	Member
MAJ ANTHONY DURSO	ODCSPER, DA	Member
MAJ DENNIS M. KOWAL	ODCSPER, DA	Member
MAJ STEPHEN B. WILLIAMS	ODCSPER, DA	Member
SP5 SANDRA L. SIMON	HQDA	Clerk-Stenographer
MRS. CECILE S. LANDRUM	ODCSPER, DA	Member

SPECIAL DUTY

LTC NANCY JURGEVICH	OTIG, DA	Member
MAJ PATRICIA GREEN	National Guard Bureau	Member
MAJ JAMES MALONEY	ODCSPER, DA	Member
MAJ PATRICK NEARY	HQ, MILPERCEN	Member
MAJ JACK SLIMP	USAR	Member
CHAP(MAJ) RICHARD STENBAKKEN	Chaplains' School	Member
MAJ GARY TUCKER	HQ, FORSCOM	Member
CPT JOHN EGAN	USAR	Member
CHAP(CPT) JANET HORTON	Chaplains' School	Member
CPT JOYCE POLLEY	OTJAG, DA	Legal Advisor
CPT DORENE STEKLASA	HQ, MILPERCEN	Member
SGM ADDIE BARNES	SGM Academy	Member
SGM SYLVIA DOBSON	HQ, MILPERCEN	Member
SGM DAVID HUBBARD	Ft Riley, Kansas	Member
MSG ANGEL SERRANO	HQ, MILPERCEN	Member
MR. TOM KELLY	DELTA FORCE	Member
DR. DAVID MARLOWE	WRAMC	Member
MR. RON MILLER	Soldier Support Center	Member

## Nature and causes of injuries in women resulting from an endurance training program

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*From the Health and Performance Division, United States Army Research Institute of Environmental Medicine, Natick, Massachusetts*

### ABSTRACT

Women entering the Army are exposed to considerable physical stress due to the intense physical training program encountered. At the beginning of a basic training cycle, a prospective study was initiated to identify exercise-related injuries and performance-limiting conditions that resulted from an 8-week physical training program and to identify some of the factors that may contribute to their occurrence. Four hundred women recruits (age 18 to 29 years) participated in the study. All had passed an initial physical examination and were without any limiting disabilities. An initial assessment of physical fitness was accomplished to determine the current status of body composition, strength of the major muscle groups (e.g., legs, trunk, arms, and upper torso), aerobic capacity, previous athletic history, self-perception of physical fitness, and psychosomatic predisposition. The training and conditioning program (1 hr daily, five to six times a week) involved a series of standard warm-up calisthenics and stretching exercises followed by a run, beginning at  $\frac{1}{2}$  mile at a 10 min per mile pace and increasing to 2 miles at 9½ min per mile by the end of training. Extensive road marches and military training activities were also included. At the end of training, a self-report injury questionnaire was used to collect injury data. These data were documented with the records from the unit dispensary and data provided by the installation physical therapy, orthopaedic, and podiatry clinics. Fifty-four percent (215) of the women sustained

some reportable injury. These injuries resulted in an average training time loss of 13 days. Forty-one percent of these injuries prevented participation in all activity, 31% resulted in only limited participation. Early training "overuse syndrome" accounted for 42% (92) of the reported injuries. Significant injuries were: tibial stress fracture (45), chondromalacia of the patella (21), hip or neck of femur stress fracture (20), sprains (12), Achilles tendinitis (10), calcaneus or metatarsal stress fracture (8), and fascial and anterior compartment strains (6). The injury data were correlated with prior-fitness measures. The results indicated that a major cause of injury in women can be attributed to the lack of prior conditioning, greater body weight and fat percent, and limited leg strength. These factors, coupled with some inherent physiologic characteristics of women (i.e., wide pelvis, less strength, and greater joint flexibility), probably contributed to the increased risk of injury in these women. It is concluded that susceptibility to these potential orthopaedic and medical conditions can be identified before the beginning of training and minimized through proper remedial activity before a strenuous physical training program is initiated.

With the rising recruitment of women into the armed forces, data are needed on their response to physical training and the physical differences that may limit their performance capacity. Although insights have been gained regarding the beneficial effects of physical training on the stamina, muscular strength, and endurance of both men and women in the armed forces,<sup>1-3</sup> little information is available concerning the risk of injury involved in exposing previously sedentary women to a rigorous physical training program.

In the past, it has been extremely difficult to study the incidence and distribution of injuries in normal young women because of the relatively small number participating in stren-

\* Presented at the Fifth Annual Meeting of the American Orthopaedic Society for Sports Medicine, Innsbrook, Florida, July 9 to 12, 1979. The views of the author do not purport to reflect the position of the Department of the Army or the Department of Defense (Para. 4-3, AR 360-5).

† Present address: Psychology-Podiatry Service, Walter Reed Army Medical Center, Washington D.C. 20342

uous physical activity and the self-selected nature (athletic) of those who do.<sup>4,7</sup> However, this has changed with the growing interest and participation of women in the whole spectrum of sport activities. The purpose of this prospective research was to (1) determine the incidence and nature of injuries in a female population as a result of a rigorous supervised endurance training program and (2) identify the predisposing factors that may be related to their occurrence.

## METHODS

We followed a group of 400 women recruits, age 18 to 29 years old (average age 21), through a complete 8-week basic training cycle (January 15 to March 12, 1978). (See Table 1 for other descriptive characteristics.) A complete medical history was available, and they were given a complete physical examination before training began. An initial assessment of physical work capacity also was accomplished. This assessment included the determination of body composition by using skinfold estimation and the equation of Durnin and Wormsley,<sup>8</sup> strength of the major muscle groups (legs, trunk, arms, and upper torso), aerobic capacity ( $\text{VO}_2$  max),<sup>9</sup> psychosomatic predisposition by using the Health Opinion Survey,<sup>10</sup> activity history (previous athletic participation), and self-perception of fitness level compared to other women of comparable age.

These women participated in an integrated (male and female) endurance training and conditioning program for 1 hr per day, five to six times a week that involved a series of standard warm-up calisthenics including situps, pushups, side straddle hop, leg overs, and modified knee bends. These exercises preceded each training session and progressed from 6 to 12 repetitions per session over the course of the training program. Running began with  $\frac{3}{4}$  miles a day at a 10 min per mile pace and increased to 2 miles in 18:30 min by the end of the 8-week training period. The training program also involved extensive marching and other activities germane to military training.<sup>‡</sup>

For the purposes of this study, an injury was defined as any disability that was incurred during or as a result of physical training-conditioning which required attention from the medical facility. Only 327 of the 400 women were available for evaluation after the training period; 20 other women were followed up because they had sustained injuries which required them to be hospitalized. The remaining 53 women were administratively discharged or unavailable for testing; no information was available on them.

The injury data were gathered through the use of a self-report medical disposition questionnaire given to the women after training. These data were supplemented with records from the dispensary, consultation reports, and radiographic data provided by the installation's physical therapy, orthopaedic, and podiatry clinics.

A discriminant function analysis was performed using injury during training as the criterion variable and using the variables gathered during initial assessment as predictors

‡ The training program is outlined in the *Drill Sergeant Guide for Pre-Baseline Physical Training*, Fort Benning, Georgia, Dated December 20, 1977.

TABLE 1

Comparison of selected parameters for injured vs. uninjured women prior to participation in 8 weeks of physical training

Variables	Injured n = 195	Uninjured n = 132
Body weight (kg)	59.2 ± 7.3	59.3 ± 6.8
Height (cm)	162.3 ± 6.8	162.5 ± 6.3
Body fat (%)	28.4 ± 4.9	27.7 ± 4.4*
Static strength of leg extensors		
Leg strength (kg of force)	91.2 ± 32	95.7 ± 28*
$\text{VO}_2$ max (ml/kg min)	37.9 ± 4.6	36.2 ± 3.3
Previous athletic participation (1 very inactive-5 very active)	3.18 ± 0.9	3.25 ± 0.8
Physical fitness compared to other women (1 poor to 5 superior)	2.82 ± 0.7	2.90 ± 0.5
HOS <sup>§</sup> score (psychosomatic predisposition)	31.3 ± 6.6	30.3 ± 5.5

\*  $P \leq 0.05$ .

§ HOS, Health Opinion Survey<sup>10</sup>.

## RESULTS

The self-report questionnaire data indicated that 54% (215 of 347) of the women had sustained some sort of injury requiring medical attention over the 8 weeks of training. The incidence as tabulated from the questionnaire is presented in Table 2. (It should be noted that the incidence of injury in women compared unfavorably with the incidence reported for men undergoing the same training (26% or 202 of 770.) These injuries resulted in an average loss of 13 training days during the basic training cycle, 41% (80) of the injuries prevented participation in all physical activity (major profile), and 31% (61) resulted in limited participation (minor profile). Table 3 presents a summary of the specific diagnoses and structural involvement of these injuries as documented by the hospital consultation sheets and radiographic evidence. The majority were either overuse syndrome or stress fractures.

Injuries usually resulted from a combination of (1) continued hard training after onset of symptoms, (2) inherent structural weakness, or (3) biomechanical anomaly. Tibial and femoral stress fractures accounted for one-third of all of the injuries identified and represented the most serious sequelae of this endurance training program. Figure 1 presents stress fracture data as a function of the onset of symptoms during the 8-week training cycle. The incidence of tibial stress fractures increased during February and dropped off in March. The hip-femoral stress fractures increased throughout training and reached the maximum during the last 2 weeks of training.

A discriminant function analysis was used to identify the underlying variables that contributed to the prediction of injury. We found that body composition, muscular strength of the legs, previous athletic participation, self-perception of fitness and psychosomatic predisposition were correlated with injury (Table 4). The discriminant analysis resulted in a linear combination of the variables that maximally differentiated between the two groups. For the present data (Table 4), the discriminant function is 0.507 physical fitness + 0.683 weight minus 0.662 leg strength minus 0.552% body fat. However,

**TABLE 2**  
Self-report of the incidence of injuries sustained by men and women during basic training

Type of injury	Women (215)		Men (202)		% difference (W-M)
	n	%	n	%	
Fracture (break)	8	3	4	2	1
Stress fracture	45	21	9	4	17
Joint problems	30	14	47	24	-10
Foot problems	28	12	54	27	-15
Tendon inflammations	67	31	23	12	19
Muscle strain	27	12	26	13	-1
Other	10	4	39	20	-16

**TABLE 3**  
Diagnosed injury sustained by women during basic training (n = 215)

Structure	No.	%
Overuse syndrome (leg soreness, lowered general energy level, clumsiness, and poor coordination)	92	43
Tibial stress fracture	45	21
Chondromalacia of patella	21	10
Hip or neck or femur stress fracture	20	9
Ankle sprain	12	6
Achilles tendinitis	10	4
Calcaneus stress fracture	6	3
Anterior compartment and fascial strain	6	3
Metatarsal stress fracture	2	1

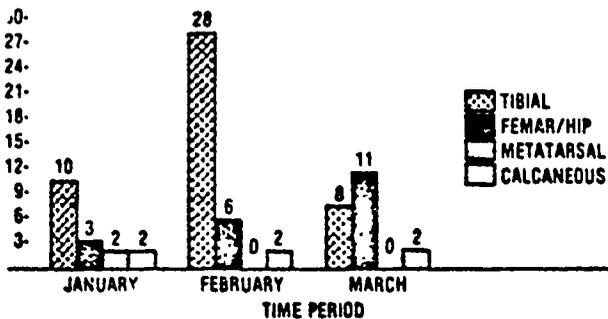


Fig. 1. Number of stress fractures as a function of onset of symptoms during training period.

only 55% of the cases could be correctly classified. Table 5 presents a breakdown of the different degree of injury (major, minor, overuse) within the group of injured women. As can be seen, the variables of percent of body fat and leg strength are both significantly different across the group and correspond to the previous comparison of injured vs. uninjured women.

## DISCUSSION

The data presented document that weight, percent of body fat, and limited leg strength were related to the increased incidence of injury in women during training and may have attributed to lack of prior fitness or conditioning. With the assessment techniques described in this paper, it may be possible to identify women "at risk" for orthopaedic injury before training.

There are several physiologic factors reported in the literature<sup>12</sup> which are generally considered to predispose women to these injuries. The elasticity in the connective tissue, which allows women to be more flexible, may also make them more vulnerable to ligament or joint injury. Women's biomechanics and wide pelvis appear to contribute to the increased risk of injury to the hip and the outer aspect of the knee, leg, and foot because of the varus tilt. This is further aggravated by the apparent lack of heel stability inherent in the Army boot used by the women during basic training. Although the standard Army boot has proved quite satisfactory for men during basic training, women report that the heel width is too great even in the narrow sizes used by them. The resulting heel instability

**TABLE 4**  
Discriminant analysis of factors contributing to classification of individuals who were injured or uninjured

Actual group	% Predicted	
	Injured	Uninjured
Injured 195	52.9	47.1
Uninjured 132	41.1	58.9

% of cases correctly classified, 55.16

Summary of table variables					
Step no.	Variable entered	Approximate F	Rao's V-test	DF	Level of significance
1	Physical fitness	2.56	2.56	1/295	0.10
2	Leg strength	1.97	3.97	2/294	0.13
3	Weight	1.55	4.70	3/293	0.19
4	Body fat (%)	1.67	6.74	4/292	0.15

**TABLE 5**  
Comparison of pretraining parameters for the levels of injury sustained by women during 8 weeks of physical training (n = 215)

Variables	Major injury (n = 80)	Minor injury (n = 66)	Overuse syndrome (n = 64)
Body weight (kg)	59.7 ± 7.4	58.0 ± 6.9	59.8 ± 7.6
Height (cm)	162.1 ± 6.9	161.3 ± 6.7	163.6 ± 6.9
Body fat (%)	29.5 ± 4.4	28.3 ± 5.3	27.4 ± 4.9*
Static strength of leg extensors (kg of force)	93.5 ± 3.2	92.9 ± 3.2	103.1 ± 3.3*
Previous athletic participation (1 very inactive-5 very active)	3.18 ± 0.7	3.19 ± 0.9	3.20 ± 0.8
Physical fitness compared to other women (1 poor to 5 superior)	1.85 ± 0.5	1.91 ± 0.4	2.10 ± 0.5
HOS score (psychosomatic predisposition)	31.9 ± 6.7	31.6 ± 6.4	31.3 ± 6.7

\* P ≤ 0.05.

\* HOS, Health Opinion Survey.

**TABLE 2**  
Self-report of the incidence of injuries sustained by men and women during basic training

Type of injury	Women (215)		Men (202)		% difference (W-M)
	n	%	n	%	
Fracture (break)	8	3	4	2	1
Stress fracture	45	21	9	4	17
Joint problems	30	14	47	24	-10
Foot problems	28	12	54	27	-15
Tendon inflammations	67	31	23	12	19
Muscle strain	27	12	26	13	-1
Other	10	4	39	20	-16

**TABLE 3**  
Diagnosed injury sustained by women during basic training (n = 215)

Structure	No	%
Overuse syndrome (leg soreness, lowered general energy level, clumsiness, and poor coordination)	92	43
Tibial stress fracture	45	21
Chondromalacia of patella	21	10
Hip or neck or femur stress fracture	20	9
Ankle sprain	12	6
Achilles tendinitis	10	4
Calcaneus stress fracture	6	3
Anterior compartment and fascial strain	6	3
Metatarsal stress fracture	2	1

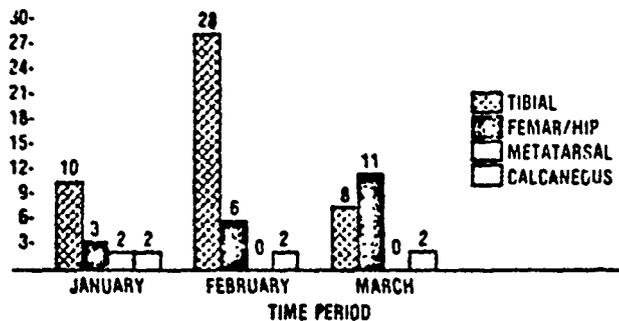


Fig. 1. Number of stress fractures as a function of onset of symptoms during training period.

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Height (cm)	162.1 ± 6.9	161.3 ± 6.7	163.6 ± 6.9
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surely aggravates existent ankle weakness or foot disorder. Likewise, since women are smaller in structure, the 30-inch step, the very basis of the military drill and ceremony, is often an aggravating factor in the incidence of stress fractures and overuse syndromes. Another factor contributing to injuries in women may be their inability to differentiate between "pushing themselves" beyond the pain threshold and exposing themselves to undue risk of injury. It is evident from the data that many of the symptoms of overuse which occurred early in the training program culminated in injury later on, having been neglected or considered inconsequential initially. Likewise, returning to training before the symptoms had fully disappeared was courting disaster later in training.

A major factor in the development of injuries in this sample is believed to be the rapid onset of training which did not allow for a progressive exposure to stress and the development of tolerance. The more sedentary and unconditioned women were exposed to a greater risk of injury to the lower extremities when they were put under this physical stress. Initially, the bones attempt to become stronger by remodeling their internal architecture in response to the chronic physical demand. In doing so, they actually become weaker in the area of mechanical stress, and continued training during this period may have led to injury. The second phase of this remodeling involves actual deposition and hypertrophy of the bone along the lines of stress. However, during the lag time between these two phases, the bone is also more susceptible to fracture.<sup>13</sup> If training had been staged progressively, some of these injuries might have been avoided.

Stress fractures have been widely studied in men<sup>7</sup> because they can potentially prevent an individual from performing his normal duties for a prolonged period of time. However, with the increasing number of women participating in various physical activities, the occurrence of stress fracture has risen dramatically.<sup>6</sup> These findings were supported by another source of morbidity data (in *Health in the Army*, January 1979, pp 52-53. Health Services Command, Fort Sam Houston, Texas) which reported that during basic training women had greater than twice the rate of fractures as that reported for men (19.6 per 1,000 compared to 9.4 per 1,000 for women and men, respectively). With regard to the causes of stress fractures, the results of Gilbert and Johnson<sup>11</sup> apply equally well to women as to men. The stress fractures are related to body structure and are found to be more common among overweight recruits and those with little exercise experience. However, the majority of the fractures in men reported by Gilbert and Johnson<sup>11</sup> were fractures of the metatarsals and os calcis, i.e., "march fracture," whereas in the present study we found only eight cases of these types of stress fractures in women. The majority of those found in women recruits were tibial and femoral fractures. A large number of cases of symptomatic chondromalacia of the patella were also reported.

Although the conventional statistical criterion for significance was not achieved, it must be kept in mind that in this case the increased probability of a Type I error ( $P \geq 0.15$ ) still provides for a substantial improvement (over no information at all) regarding an individual's susceptibility to injury.

After monitoring training programs of 3 days a week or less,<sup>8</sup>

we have deduced that training over 3 days per week results in a significant increase in the injury rate for previously sedentary women. However, the program that maintained a 3 day per week schedule with 1 day of rest in between, or at least 1 day of activities that did not involve continual pounding on the legs, had a salutary effect on the incidence of injury in these individuals. A soft running surface or shoes designed to absorb the shock of running on hard surfaces would be beneficial in reducing injuries still further.

There can be little doubt that disorders of the lower extremities for the woman recruit, like those in men, are costly in terms of medical care and utilization, recruit training time lost, hospitalization, and other duty restriction. The solution to the problem is not clear-cut because of the multidimensional nature of the problem. Preventive programs such as thorough pre-enlistment screening, that include an assessment of the factors discussed in this paper (e.g., prior physical activity, leg strength, body composition, and weight), would provide a means of identifying individuals at risk of injury and allow for appropriate action. This could be in the form of remedial physical training and toughening programs, orthotics, and proper breaking in of footwear. Personnel must be aware of signs and symptoms of overuse syndrome. Early identification and treatment of overuse symptoms are necessary to reduce further the incidence of lower extremity injuries in all recruits during training, especially in women because of their increased susceptibility to injury.

#### ACKNOWLEDGMENTS

I would like to express my appreciation for assistance in data collection to Dr. M. Kish, Podiatry Service, and LTC S. Ozburn, Physical Therapy Service, Moncrief Army Hospital, Ft. Jackson, South Carolina, and to L. Kundla and D. Caruso for statistical assistance and manuscript preparation. I have incorporated into this manuscript the suggestions made by Arthur J. Pearl, M.D., the discussant of the paper at the Fifth Annual Meeting of the American Orthopaedic Society for Sports Medicine, Innsbrook, Florida, July 9 to 12, 1979. I gratefully acknowledge his contributions. Lottie Applewhite, M.S., Technical Publications Editor, Letterman Army Institute of Research, Presidio of San Francisco, California, offered a number of editorial suggestions while the manuscript was in preparation.

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MOS 64C SUMMARY OF DUTY/TASK PERFORMANCE

WPSUMI PAGE 1

REPORTS ON THE FOLLOWING GROUPS HAVE BEEN RECEIVED

GROUP IDENTITY = 3CNRDS MOS 64C 3 CHARACTER MISS REPORT CONTAINING 1643 MEMBERS  
 GROUP IDENTITY = P4 L-9 MOS 64C AUTHORIZED GRADE L-9 ICPHS SL 11 CONTAINING JUNE/ JULY MEMBERS  
 GROUP IDENTITY = P6 L5 MOS 64C AUTHORIZED GRADE L5 ICPHS SL 21 CONTAINING JUNE MEMBERS  
 GROUP IDENTITY = P6 L9 MOS 64C AUTHORIZED GRADE L9 ICPHS SL 31 CONTAINING JAN. MEMBERS  
 GROUP IDENTITY = P6 L7 MOS 64C AUTHORIZED GRADE L7 ICPHS SL 91 CONTAINING 77 MEMBERS



NO5 OTC SUMMARY OF OUT/TASK PERFORMANCE

TASK GROUP SUMMARY	NO5	1-4	5	6	7
PRECEDENT MEMBERS PERFORMANCE					
BY-TSK					
1 CHECK VEHICLE GENERAL CONDITION	93	97	94	82	83
2 CHECK VEHICLE FOR REMOVAL PUNCTURES AND LEAKS	78	80	78	73	80
3 CHECK VEHICLE TOOLS	83	86	84	75	57
4 CHECK VEHICLE FUEL SYSTEMS	72	80	78	72	64
5 CHECK VEHICLE FOR LEAKS	89	93	91	76	50
6 REMOVE HOSES AND OTHER OBJECTS FROM DUAL WHEELS	82	80	83	58	72
7 CHECK OIL LEVEL AND ADD OIL	75	80	79	50	72
8 SERVICE PUMP ON 5000 GALLON TANKER	88	86	88	84	74
9 CHECK AND SERVICE FUEL FILTERS	87	75	70	35	19
10 CHECK AND SERVICE AIR FILTERS	88	71	68	33	18
11 CHECK AND SERVICE AIR FILTERS	76	89	78	97	19
12 CHECK AND SERVICE WINDSHIELD WIPER SYSTEM	78	83	74	83	18
13 CHECK COOLANT SYSTEM FOR LEAKS	73	77	74	81	38
14 CHECK AND SERVICE BRAKES	81	85	82	81	31
15 TEST LIGHTS AND TURN INDICATORS	88	95	91	86	48
16 LAST MBR	86	85	88	88	74
17 CHECK AND SERVICE FIFTH WHEEL COUPLING	50	51	59	80	14
18 CHECK AND SERVICE VEHICLE MIRROR AND LABEL	70	82	84	24	18
19 CHECK VEHICLE ENGINE OPERATION	83	88	85	85	31
20 CHECK VEHICLE ELECTRICAL WIRING	82	82	82	82	18
21 CHECK AND SERVICE VEHICLE COOLING SYSTEM	79	89	89	58	72
22 CHECK VEHICLE INSTRUMENT PANELS	86	82	88	85	32
23 CHECK VEHICLE AIR TANKS	77	82	80	59	72
24 CHECK VEHICLE AIR COMPRESSOR	81	86	85	83	18
25 TEST CLUTCH PEDAL FOR FREE PLAY	79	89	80	85	35
26 CHECK BRAKE PEDAL	85	90	88	87	80
27 CHECK FOR BRAKING IRREGULARITIES DURING OPERATION	81	88	85	84	45
28 CHECK PARKING BRAKE	88	80	86	85	32
29 CHECK STEERING WHEEL FREE PLAY	79	84	82	58	48
30 CHECK AND SERVICE PUMP STEERING SYSTEM	80	84	87	55	31
31 CHECK STEERING IRREGULARITIES DURING OPERATION	76	82	82	49	42
32 CHECK AND SERVICE AUTOMATIC TRANSMISSION SYSTEM	87	83	80	18	13
33 CHECK TRANSMISSION AND TRANSFER LEVERS	88	75	89	48	21
34 CHECK AXLE VALVES	85	88	88	50	21
35 CHECK SEAT BELTS AND SHOULDER HARNESSES	39	38	77	35	21
36 CHECK VEHICLE BLACKOUT LIGHT SYSTEM	81	71	58	18	28
37 SERVICE REFRIGERATION UNIT	80	88	81	52	26
38 CHECK AND CLEAN CAB INTERIOR AND AIR FILTERS	31	32	25	25	11
39 CHECK TANKS, HOSES, TUBES AND CURTAINS	57	62	57	31	11
40 CHECK TIRE CHAINS FOR PROPER FITTING	92	94	97	31	19
41 CHECK FOR REMOVAL GENERAL OFFENSE OR VIOLATIONS	28	31	30	18	11
42 CHECK FOR ABNORMAL INSTRUMENT READINGS DURING OPERATION	80	88	83	49	21
43 CHECK FOR GAS, SMOKE AND OTHER UNDESIRABLE DURING OPERATION	72	82	78	50	28
44 CHECK VEHICLE DEFICIENCIES TO SUPERVISION	77	84	77	58	42

005 69C SUMMARY OF DUTY/TASK PERFORMANCE

TASK GROUP SUMMARY  
PERCENT MEMBERS PERFORMING

06M 07 08 09 10 11 12 13 14 15 16 17

07-15R

1	DRIVE VEHICLE UNDER 2 1/2 TONS IN TACTICAL FORMATION	30	25	20	11	11
2	DRIVE VEHICLE UNDER 2 1/2 TONS IN COMBAT	31	30	30	15	11
3	DRIVE VEHICLE UNDER 7 1/2 TONS OVER CROSS-COUNTRY OBSTACLES	30	25	20	15	11
4	DRIVE VEHICLE UNDER 7 1/2 TONS ON SMOB/ICE/SILICA ROADS	28	27	25	15	11
5	DRIVE VEHICLE UNDER 2 1/2 TONS IN MOUNTAINOUS TERRAIN	27	21	20	13	10
6	DRIVE VEHICLE UNDER 2 1/2 TONS IN STILL MOUNTAINOUS TERRAIN	25	20	20	11	11
7	DRIVE VEHICLE UNDER 2 1/2 TONS IN SAND AND MUD	22	20	20	10	10
8	DRIVE VEHICLE UNDER 2 1/2 TONS ON SMOB/ICE/SILICA ROADS	20	20	20	10	11
9	DRIVE VEHICLE UNDER 2 1/2 TONS ON FLEETWAY/ROADS/HIGHWAYS	20	25	24	20	13
10	DRIVE VEHICLE FROM 2 1/2 TONS TO 5 TONS IN TACTICAL FORMATION	24	22	21	20	10
11	DRIVE VEHICLE FROM 2 1/2 TONS TO 5 TONS IN COMBAT	24	22	21	20	10
12	DRIVE VEHICLE FROM 2 1/2 TONS TO 5 TONS IN CURVE	20	20	20	22	10
13	DRIVE VEHICLE FROM 2 1/2 TONS TO 5 TONS OVER CROSS-COUNTRY OBSTACLES	23	20	20	21	10
14	DRIVE VEHICLE FROM 2 1/2 TONS TO 5 TONS ON SMOB/ICE/SILICA ROADS	22	20	20	20	10
15	DRIVE VEHICLE FROM 2 1/2 TONS TO 5 TONS IN MOUNTAINOUS TERRAIN	21	20	20	22	10
16	DRIVE VEHICLE FROM 2 1/2 TONS TO 5 TONS IN STILL MOUNTAINOUS TERRAIN	20	20	20	21	10
17	DRIVE VEHICLE FROM 2 1/2 TONS TO 5 TONS ON SMOB/ICE/SILICA ROADS	20	20	20	20	10
18	DRIVE VEHICLE FROM 2 1/2 TONS TO 5 TONS ON FLEETWAY/ROADS/HIGHWAYS	20	20	20	20	10
19	DRIVE VEHICLE OVER 5 TONS IN TACTICAL FORMATION	24	20	20	12	7
20	DRIVE VEHICLE OVER 5 TONS IN COMBAT	24	20	20	12	7
21	DRIVE VEHICLE OVER 5 TONS OVER CROSS-COUNTRY OBSTACLES	22	20	20	10	7
22	DRIVE VEHICLE OVER 5 TONS ON SMOB/ICE/SILICA ROADS	20	20	20	21	7
23	DRIVE VEHICLE OVER 5 TONS IN MOUNTAINOUS TERRAIN	24	20	20	10	7
24	DRIVE VEHICLE OVER 5 TONS IN STILL MOUNTAINOUS TERRAIN	22	21	20	10	7
25	DRIVE VEHICLE OVER 5 TONS IN SAND AND MUD	25	20	20	10	7
26	DRIVE VEHICLE OVER 5 TONS ON SMOB/ICE/SILICA ROADS	20	20	20	10	7
27	DRIVE VEHICLE OVER 5 TONS ON FLEETWAY/ROADS/HIGHWAYS	20	20	20	20	10
28	RECEIVE VEHICLE STATUS REPORT	24	21	20	20	10
29	PREPARE VEHICLE DISPATCH SCHEDULE	21	20	20	20	10
30	PREPARE VEHICLE DISPATCH ORDERS	20	20	20	21	10
31	PREPARE VEHICLE LEADER ORDER	21	20	20	20	10
32	MAINTAIN VEHICLE STATUS BOARD	22	20	20	20	10
33	POST AND MAINTAIN VEHICLE STATUS BOARD	23	20	20	20	10
34	ASSIGN DRIVERS TO DISPATCH COMMITMENT	23	20	20	20	10
35	ASSIGN DRIVERS TO DISPATCH COMMITMENT	23	20	20	20	10
36	DISPATCH VEHICLES TO DISPATCH COMMITMENT	23	20	20	20	10
37	DISPATCH VEHICLES TO DISPATCH COMMITMENT	23	20	20	20	10
38	DISPATCH VEHICLES OVER 5 TON RATED CAPACITY	19	11	17	23	17



105 ORC SUMMARY OF DUTY/TASK PERFORMANCE 6P3001 PAGE

TASK GROUP SUMMARY PERCENT MEMBERS PERFORMING	DT-13K					
	NO5	1-9	15	24	34	47
0 21 REPORT VEHICLE DEFICIENCIES TO COMPANY COMMAND	10	7	12	19	16	10
0 22 INSTRUCT PERSONNEL IN PREVENTIVE MAINTENANCE TECHNIQUES	19	9	20	33	24	14
0 23 COORDINATE VEHICLE MAINTENANCE WITH MAINTENANCE PERSONNEL	24	14	26	41	31	14
0 24 CONDUCT "POT" CHECKS FOR PROPER VEHICLE LOADING	21	18	21	31	24	14
0 25 SUPERVISE PERSONNEL LOADING/UNLOADING EQUIPMENT ONTO	24	20	29	36	23	13
0 26 VEHICLES						
0 26 INSTRUCT PERSONNEL IN LOADING/UNLOADING TECHNIQUES	19	12	21	31	21	11
0 27 SUPERVISE PERSONNEL TRANSFERRING VEHICLE LOADS	14	8	17	28	24	14
0 28 INSTRUCT PERSONNEL IN LOAD TRANSFER TECHNIQUES	11	7	12	25	24	14
0 29 INSTRUCT PERSONNEL IN DANGEROUS CARGO HANDLING TECHNIQUES	12	7	13	24	24	14
0 30 INSTRUCT PERSONNEL IN CARGO/SHIPMENT PROCEDURES	9	6	10	22	25	14
0 31 INSTRUCT PERSONNEL IN MISSILE TRANSPORT PROCEDURES	4	0	2	11	14	14
0 32 SUPERVISE VEHICLE LOADING/UNLOADING BY SHIPPER/CONSIGNEE	12	10	16	24	24	14
0 33 SUPERVISE UNITS IN IMPORTING PERSONNEL	12	6	16	31	24	14
0 34 SUPERVISE UNITS ENTRAINING/DETACHING PERSONNEL	9	5	11	22	25	14
0 35 INSTRUCT PERSONNEL IN UNLOADING/LOADING PERSONNEL	0	0	0	0	0	0
0 36 SUPERVISE PERSONNEL PERFORMING WINCH AND TOWING OPERATION	10	6	12	24	22	14
0 37 INSTRUCT PERSONNEL IN WINCH AND TOWING OPERATION	11	6	13	24	21	14
0 38 SUPERVISE PERSONNEL PERFORMING VEHICLE RECOVERY	10	6	13	24	21	14
0 39 INSTRUCT PERSONNEL IN VEHICLE RECOVERY PROCEDURES	10	6	11	24	24	14
0 40 COORDINATE OPERATION OF MOTOR VEHICLES WITH SUPPORTING/	10	6	14	21	25	14
0 41 COORDINATE OPERATION OF MOTOR VEHICLES WITH SUPPORTING/	11	6	14	27	23	14
0 42 COORDINATE DAILY VEHICLE REQUIREMENTS WITH SUPPORTING/	11	7	12	23	25	14
0 43 SUPERVISE UNITS						
0 43 COORDINATE DAILY COMMITMENTS WITH DISPATCH CONTROL PERSONNEL	17	8	18	30	24	14
0 44 COORDINATE AVAILABILITY OF DRIVERS FOR ASSIGNMENTS WITH	15	7	18	32	21	14
0 45 CHECK TO ENSURE DRIVER SAFETY RULES AND TECHNIQUES ARE	19	9	20	34	24	14
0 46 ADVISE COMMANDER OF PERSONNEL ELIGIBLE FOR SAFE DRIVING	11	5	12	28	24	14
0 47 ADVISE COMMANDER OF PERSONNEL ELIGIBLE FOR SAFE DRIVING	9	4	8	19	24	14
0 48 CONDUCT INVESTIGATION OF VEHICLE ACCIDENTS	42	45	40	36	29	14
0 49 DETERMINE VEHICLE LOAD CAPACITY	42	45	42	32	24	14
0 50 DETERMINE DISTRIBUTION OF VEHICLE LOAD	35	38	33	25	24	14
0 51 DETERMINE SECURITY REQUIREMENTS OF VEHICLE LOAD	27	27	25	21	14	14
0 52 UNLOAD CARGO AND EQUIPMENT FROM VEHICLES	25	20	22	16	7	14
0 53 UNLOAD VEHICLES FROM VEHICLE CARRIERS	18	19	17	13	14	14
0 54 UNLOAD VEHICLES FROM VEHICLE CARRIERS	15	17	15	10	8	14
0 55 UNLOAD TANKER PRODUCTS INTO TANKERS AND TRAILERS	16	17	14	11	8	14
0 56 UNLOAD TANKER PRODUCTS FROM TANKERS AND TRAILERS	15	15	17	9	10	14
0 57 UNLOAD AND SECURE TANKS ON TANK TRANSPORTERS	11	12	11	5	4	14
0 58 UNLOAD CARGO AND EQUIPMENT FROM UNUSABLE VEHICLES	17	18	16	10	7	14
0 59 TRANSFER VEHICLE LOAD TO AND FROM MAIL BAYS	11	11	13	3	7	14
0 60 TRANSFER VEHICLE LOAD TO AND FROM VESSELS	7	8	8	5	3	14

705 64C SUMMARY OF DUTY/TASK PERFORMANCE

TASK GROUP SUMMARY

PERCENT MEMBERS PERFORMANCE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT
	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89
DUTY									
1 14 TRANSPORT VEHICLE LOAD TO AND FROM AIRCRAFT	13	19	13	7	0				
2 15 TAKE MEASURES TO PROTECT LOAD IN UNDESIRABLE WEATHER	10	17	17	24	12				
3 16 TAKE MEASURES TO PROTECT LOAD FROM PILLAGE	33	25	43	28	15				
4 17 TAKE MEASURES TO PROTECT LOAD FROM SWIFTING	28	24	40	32	14				
5 18 GUARD SECURITY ON CLASSIFIED LOADS	23	24	20	15	4				
6 19 TRANSPORT CARGO IN VEHICLES LESS THAN 2 1/2 TONS	20	23	12	2	10				
7 20 TRANSPORT CARGO IN VEHICLES FROM 2 1/2 TONS TO 5 TONS	44	51	42	17	0				
8 21 TRANSPORT CARGO IN VEHICLES OVER 5 TONS	21	22	22	15	0				
9 22 TRANSPORT PERISHABLE CARGO IN VEHICLES OVER 5 TONS	15	15	19	12	7				
10 23 TRANSPORT PERISHABLE CARGO IN VEHICLES OVER 5 TONS	11	12	18	4	0				
11 24 TRANSPORT TANKER PRODUCTS TO TANKERS	14	14	19	0	7				
12 25 TRANSPORT TANKER PRODUCTS IN TANKER TRAILERS	13	13	12	0	0				
13 26 TRANSPORT TANKER PRODUCTS IN TANKER TRAILERS	9	9	10	0	0				
14 27 TRANSPORT TANKS ON TANK TRANSPORTERS	15	16	12	0	0				
15 28 TRANSPORT VEHICLES OR VEHICLE CARRIERS	92	91	52	40	13				
16 29 COUPLE AND UNCOUPLE TRACTORS AND TRAILERS	58	66	58	26	0				
17 30 POSITION VEHICLE TO LOAD CARGO/EQUIPMENT/VEHICLES	99	55	99	25	0				
18 31 LOAD PASSENGERS INTO SLUDGS	17	18	17	13	0				
19 32 TRANSPORT GENERAL OFFICERS IN SLUDGS	15	15	17	12	7				
20 33 TRANSPORT GENERAL OFFICERS IN SLUDGS	14	14	18	11	2				
21 34 TRANSPORT VESSEL IN SLUAP	10	10	41	12	10				
22 35 TRANSPORT OTHER PASSENGERS IN SLUDGS	15	14	18	12	0				
23 36 DISCHARGE PASSENGERS FROM SLUDGS	11	12	11	11	0				
24 37 LOAD PASSENGERS INTO STATION WAGONS	11	12	11	11	0				
25 38 DISCHARGE PASSENGERS FROM STATION WAGONS	10	10	11	12	0				
26 39 LOAD PASSENGERS INTO BUSES	14	14	17	12	0				
27 40 TRANSPORT PERSONNEL IN BUSES	15	14	18	13	7				
28 41 DISCHARGE PASSENGERS FROM BUSES	11	11	12	11	7				
29 42 LOAD PATIENTS/CASUALTIES INTO AMBULANCES	5	5	5	0	0				
30 43 UNLOAD PATIENTS/CASUALTIES IN AMBULANCES	5	5	5	0	0				
31 44 UNLOAD PATIENTS/CASUALTIES FROM AMBULANCES	24	22	16	0	0				
32 45 LOAD PASSENGERS INTO TROOP CARRIERS UP TO 2 1/2 TONS	24	30	16	0	0				
33 46 TRANSPORT PASSENGERS IN TROOP CARRIERS UP TO 2 1/2 TONS	22	28	17	0	0				
34 47 MISCHARGE PASSENGERS FROM TROOP CARRIERS UP TO 2 1/2 TONS	15	17	12	7	0				
35 48 LOAD PASSENGERS INTO TROOP CARRIERS OF MORE THAN 2 1/2 TONS	14	12	13	0	0				
36 49 TRANSPORT PASSENGERS IN TROOP CARRIERS MORE THAN 2 1/2 TONS	14	12	13	0	0				
37 50 DISCHARGE PASSENGERS FROM TROOP CARRIERS OF MORE THAN 2 1/2 TONS	14	17	13	7	0				
38 51 ASSIST VEHICLE MECHANICS IN PERFORMING ORGANIZATIONAL	60	68	57	37	11				
39 52 ASSIST VEHICLE MECHANICS IN PERFORMING DIRECT SUPPORT	38	46	30	17	7				
40 53 SELECT VEHICLE HAND TOOLS	44	52	38	21	11				
41 54 CLEAN AND STORE VEHICLE REPAIR TOOLS	50	40	24	18	11				
42 55 REFER MAJOR REPAIR ITEMS TO SUPERVISOR FOR DISPOSITION	53	61	48	24	0				
43 56 CHANGE VEHICLE TIRES AND WHEELS	21	41	20	14	0				
44 57 REPAIR VEHICLE TIRES	54	68	58	30	7				

	MOS	1-4	5-6	7-8	9-10	11-12	13-14	15-16	17
DUTY/TASK									
6	0	23	21	21	21	21	21	21	21
6	0	23	21	21	21	21	21	21	21
6	10	23	21	21	21	21	21	21	21
6	11	23	21	21	21	21	21	21	21
6	12	23	21	21	21	21	21	21	21
6	13	23	21	21	21	21	21	21	21
6	14	23	21	21	21	21	21	21	21
6	15	23	21	21	21	21	21	21	21
6	16	23	21	21	21	21	21	21	21
6	17	23	21	21	21	21	21	21	21
6	18	23	21	21	21	21	21	21	21
6	19	23	21	21	21	21	21	21	21
6	20	23	21	21	21	21	21	21	21
6	21	23	21	21	21	21	21	21	21
6	22	23	21	21	21	21	21	21	21
6	23	23	21	21	21	21	21	21	21
6	24	23	21	21	21	21	21	21	21
6	25	23	21	21	21	21	21	21	21
6	26	23	21	21	21	21	21	21	21
6	27	23	21	21	21	21	21	21	21
6	28	23	21	21	21	21	21	21	21
6	29	23	21	21	21	21	21	21	21
6	30	23	21	21	21	21	21	21	21
6	31	23	21	21	21	21	21	21	21
6	32	23	21	21	21	21	21	21	21
6	33	23	21	21	21	21	21	21	21
6	34	23	21	21	21	21	21	21	21
6	35	23	21	21	21	21	21	21	21
6	36	23	21	21	21	21	21	21	21
6	37	23	21	21	21	21	21	21	21
6	38	23	21	21	21	21	21	21	21
6	39	23	21	21	21	21	21	21	21
6	40	23	21	21	21	21	21	21	21
6	41	23	21	21	21	21	21	21	21
6	42	23	21	21	21	21	21	21	21
6	43	23	21	21	21	21	21	21	21
6	44	23	21	21	21	21	21	21	21
6	45	23	21	21	21	21	21	21	21
6	46	23	21	21	21	21	21	21	21
6	47	23	21	21	21	21	21	21	21
6	48	23	21	21	21	21	21	21	21
6	49	23	21	21	21	21	21	21	21
6	50	23	21	21	21	21	21	21	21
6	51	23	21	21	21	21	21	21	21
6	52	23	21	21	21	21	21	21	21
6	53	23	21	21	21	21	21	21	21
6	54	23	21	21	21	21	21	21	21
6	55	23	21	21	21	21	21	21	21
6	56	23	21	21	21	21	21	21	21
6	57	23	21	21	21	21	21	21	21
6	58	23	21	21	21	21	21	21	21
6	59	23	21	21	21	21	21	21	21
6	60	23	21	21	21	21	21	21	21
6	61	23	21	21	21	21	21	21	21
6	62	23	21	21	21	21	21	21	21
6	63	23	21	21	21	21	21	21	21
6	64	23	21	21	21	21	21	21	21
6	65	23	21	21	21	21	21	21	21
6	66	23	21	21	21	21	21	21	21
6	67	23	21	21	21	21	21	21	21
6	68	23	21	21	21	21	21	21	21
6	69	23	21	21	21	21	21	21	21
6	70	23	21	21	21	21	21	21	21
6	71	23	21	21	21	21	21	21	21
6	72	23	21	21	21	21	21	21	21
6	73	23	21	21	21	21	21	21	21
6	74	23	21	21	21	21	21	21	21
6	75	23	21	21	21	21	21	21	21
6	76	23	21	21	21	21	21	21	21
6	77	23	21	21	21	21	21	21	21
6	78	23	21	21	21	21	21	21	21
6	79	23	21	21	21	21	21	21	21
6	80	23	21	21	21	21	21	21	21
6	81	23	21	21	21	21	21	21	21
6	82	23	21	21	21	21	21	21	21
6	83	23	21	21	21	21	21	21	21
6	84	23	21	21	21	21	21	21	21
6	85	23	21	21	21	21	21	21	21
6	86	23	21	21	21	21	21	21	21
6	87	23	21	21	21	21	21	21	21
6	88	23	21	21	21	21	21	21	21
6	89	23	21	21	21	21	21	21	21
6	90	23	21	21	21	21	21	21	21
6	91	23	21	21	21	21	21	21	21
6	92	23	21	21	21	21	21	21	21
6	93	23	21	21	21	21	21	21	21
6	94	23	21	21	21	21	21	21	21
6	95	23	21	21	21	21	21	21	21
6	96	23	21	21	21	21	21	21	21
6	97	23	21	21	21	21	21	21	21
6	98	23	21	21	21	21	21	21	21
6	99	23	21	21	21	21	21	21	21
6	100	23	21	21	21	21	21	21	21

MOB AND SUMMARY OF DUTY/TASK PERFORMANCE

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LAST GROUP SUMMARY  
PERCENT MEMBERS PERFORMING

	MOS	1-9	10	11	12	13	14	15	16	17
18 TALLY CARGO ONTO VEHICLE		15	10	13	5	4				
19 TALLY CARGO OFF VEHICLE		12	17	12	5	4				
20 PLAN AND ORGANIZE DRIVER TRAINING PROGRAM		6	3	6	26	22				
21 ASSIST IN DRIVER TRAINING PROGRAM		7	3	7	24	26				
22 DIRECT DRIVER TRAINING PROGRAM		7	3	7	24	26				
23 MONITOR DRIVER TRAINING PROGRAM		7	3	7	24	26				
24 CONDUCT DRIVER TRAINING		9	9	9	27	26				
25 PREPARE DRIVER TRAINING SCHEDULE		5	3	5	18	18				
26 PREPARE DRIVER TRAINING SUP AND DIRECTIVES		9	2	3	8	17				
27 EVALUATE DRIVER TRAINING PROGRAM		6	2	6	15	15				
28 ADVISE COMMANDER ON DRIVER TRAINING EFFECTIVENESS		6	2	6	15	15				
29 ISSUE LICENSES PERMIT		5	3	5	8	8				
30 ISSUE MOTOR VEHICLE OPERATOR IDENTIFICATION CARD (SF 90)		5	3	7	10	8				
31 INSTRUCT PERSONNEL IN CONDUCTING VEHICLE CHECKS AND SERVICES		19	2	12	25	26				
32 INSTRUCT PERSONNEL IN PASSENGER HANDLING		2	2	2	11	11				
33 SUPERVISE DRIVER TRAINING INSTRUCTIONS		9	2	3	12	19				
34 IDENTIFY PROSECUTIVE DRIVERS		6	3	6	21	22				
35 ASSIGN PERSONNEL TO DRIVER TRAINING		5	1	5	4	4				
36 INSTRUCT PERSONNEL IN DRIVING TECHNIQUES/PROCEDURES		12	2	12	33	38				
37 INSTRUCT PERSONNEL IN CONDUCTING VEHICLE CHECKS AND SERVICES		19	2	12	25	26				
38 INSTRUCT PERSONNEL IN PASSENGER HANDLING		2	2	2	11	11				
39 ADMINISTER WRITTEN DRIVING TESTS		2	2	2	9	9				
40 ADMINISTER PRACTICAL DRIVING TESTS (MANEUVERS)		2	2	2	9	9				
41 SCORE DRIVING TESTS		2	2	2	9	9				
42 REVIEW AND EVALUATE DRIVING TEST RESULTS		5	3	5	15	15				
43 ADVISE PERSONNEL OF DRIVER TRAINING PROGRESS		5	3	5	15	15				
44 SCHEDULE PERSONNEL FOR MEDICAL/HEALTH TRAINING		5	3	5	15	15				
45 CONDUCT MEDICAL DRIVER TRAINING		5	3	5	15	15				
46 MAINTAIN DRIVER TRAINING RECORDS		3	1	3	7	7				
47 PREPARE DRIVER TRAINING REPORTS		3	1	3	7	7				
48 ORGANIZE MOTOR CONVOY OPERATION		3	1	3	7	7				
49 PLAN MOTOR CONVOY OPERATION		3	1	3	7	7				
50 ESTABLISH CONVOY COMMUNICATIONS		3	1	3	7	7				
51 DIRECT CONVOY OPERATIONS		3	1	3	7	7				
52 SELECT SEPARATION OF VEHICLES FOR CONVOY OPERATION		3	1	3	7	7				
53 PREPARE CONVOY ROUTES AND SPECIAL INSTRUCTIONS		3	1	3	7	7				
54 PREPARE CONVOY ROUTES		3	1	3	7	7				
55 CONDUCT ROAD RECONNAISSANCE OF CONVOY ROUTE		3	1	3	7	7				
56 SCHEDULE VEHICLES FOR CONVOY OPERATION		3	1	3	7	7				
57 DETERMINE TYPE OF VEHICLE MARKINGS FOR CONVOY		3	1	3	7	7				
58 ORGANIZE MOTOR PARK		3	1	3	7	7				
59 SUPPLIES MOTOR PARK PERSONNEL		3	1	3	7	7				
60 ORGANIZE MOTOR PARK OPERATION		3	1	3	7	7				
61 SUPERVISE TRUCK TERMINAL PERSONNEL		2	1	2	6	6				
62 INSTRUCT PERSONNEL IN TRUCK TERMINAL DUTIES		2	1	2	6	6				
63 INSTRUCT PERSONNEL IN MOTOR PARK DUTIES		2	1	2	6	6				
64 INSTRUCT PERSONNEL IN MOTOR PARK CHECKLIST		2	1	2	6	6				

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UBS ARE SUMMARY OF DUTY/TASK PERFORMANCE  
TASK GROUP SUMMARY  
PERCENT MEASURES PERFORMING

DT-TSR

31M PA 24 24 24 24  
MUS 1-4 L5 L6 L7

	10	11	12	13	14	15	16	17
J 19 PREPARE ROAD MOVEMENT GRAPHS AND TABLES	2	1	2	3	5	6		
J 20 INTERPRET ROAD MOVEMENT GRAPHS AND TABLES	2	1	2	3	4	7		
J 21 PREPARE ARCH GRAPHS	2	1	3	4	7			
J 22 SUPERVISE PERSONNEL PERFORMING CONVOY UNLOADING UTILITIES	2	1	6	28	16			
J 23 INSTRUCT PERSONNEL IN CONVOY DRIVING PROCEDURES/TECHNIQUES	2	1	6	26	42			
J 24 CONTROL VEH AND MOVEMENT OF PERSONNEL AND VEHICLES IN CONVOY	5	1	5	18	31			
J 25 INSTRUCT PERSONNEL IN RULES OF THE ROAD	10	3	9	18	36			
J 26 INSTRUCT PERSONNEL IN CONVOY SECURITY	7	1	6	27	7			
J 27 INSTRUCT PERSONNEL IN USE OF INTERNATIONAL SIGNS/SIGNALS/ MARKINGS	2	2	3	28				
K 1 INSTRUCT PERSONNEL IN USE OF MAIN SIGNS/SIGNALS/MARKINGS	2	2	4	18	17			
K 2 PREPARE UNIT MOVEMENT STANDING OPERATING PROCEDURES (SOP)	2	1	2	4	10			
K 3 EVALUATE UNIT MOVEMENT SOP	2	1	2	4	10			
K 4 ANNOUNCE UNIT MOVEMENT SOP	2	1	2	2	11			
K 5 INSTRUCT PERSONNEL IN USE OF UNIT MOVEMENT SOP	2	1	2	5	14			
K 6 CHECK TO INSURE OPERATION IS IN ACCORDANCE WITH UNIT MOVEMENT SOP	4	2	3	16	17			
K 7 PLAN EMPLOYMENT OF MOTOR TRANSPORT UNIT	2	1	2	4	10			
K 8 COLLECT MOTOR TRANSPORT MOVEMENT INFORMATION	2	1	2	5	10			
K 9 DETERMINE NUMBER/TYPE VEHICLES FOR TRANSPORT MOVEMENT	3	1	3	8	17			
K 10 COORDINATE VEHICLE COMMITMENTS WITH HIGHER ECHELON	4	2	5	10	22			
K 11 PREPARE UNIT MOVEMENT REGULATION PLAN	1	1	1	2	4			
K 12 PREPARE TRAFFIC CIRCULATION PLAN	1	1	2	1	4			
K 13 PREPARE HIGHWAY TRAFFIC SCHEDULE	1	1	2	1	4			
K 14 PREPARE VEHICLE LOADING PLANS	4	1	6	12	19			
K 15 ACQUISITION MAPS AND AERIAL PHOTOGRAPHS	2	1	2	2	5			
K 16 CHECK TO ENSURE DRIVERS COMPLY WITH SOP	6	3	7	27	29			
K 17 CHECK TO ENSURE DRIVERS COMPLY WITH SECURITY LOAD LIMITS	4	2	5	22	18			
K 18 EVALUATE LIMITATION AND CAPABILITY OF SUBORDINATE UNITS IN MOTOR TRANSPORT OPERATIONS	2	1	2	5	6			
K 19 COLLECT AERIAL/TERRESTRIAL DATA ON MOTOR TRANSPORT OPERATIONS	3	2	3	7	13			
K 20 PREPARE STUDIES/REPORTS ON MOTOR TRANSPORT OPERATIONS	2	1	3	3	10			
K 21 REVIEW STUDIES/REPORTS ON MOTOR TRANSPORT OPERATIONS	2	2	2	6	6			
K 22 COLLECT AERIAL/TERRESTRIAL DATA ON MOTOR TRANSPORT TRAINING	2	1	1	7	11			
K 23 PREPARE STUDIES/REPORTS ON MOTOR TRANSPORT TRAINING	2	1	2	6	10			
K 24 REVIEW STUDIES/REPORTS ON MOTOR TRANSPORT TRAINING	2	1	1	7	8			
K 25 ASSIST IN DETERMINING UNIT OPERATIONAL READINESS	2	2	3	3	19			
K 26 PREPARE ROUTE MAPS	3	2	3	8	13			
K 27 PREPARE DIVUAC AREA PLAN	3	1	3	7	17			
K 28 SELECT DIVUAC AREA	3	1	1	7	14			
K 29 PREPARE DIVUAC DEFENSE PLAN	4	1	2	12	19			
K 30 PREPARE DIVUAC SECURITY PLAN	11	9	6	21	26			
K 31 SET UP DIVUAC AREA	5	2	7	21	31			
K 32 SUPERVISE PERSONNEL PERFORMING DIVUAC UTILITIES	7	2	7	27	32			







**TAB A - AUDIT TRAIL    MOS 64C**

The information in this report primarily was derived from Army regulations, field manuals, technical manuals, technical bulletins, and DA pamphlets. Some of the information, however, had to be obtained from the following sources. NOTE: Four (4) digit phone numbers are local Fort Eustis numbers. AUTOVON numbers are preceded by a seven (7).

**½ Ton**

Tire chain weight  
Mike Brown (TARCOM)  
7-786-6142

Dimensions  
Mr. Christenson  
5996

**1½ Ton**

Tire chain size  
Jack's Auto Supply  
595-2263

Tire chain weight  
Mike Brown (TARCOM)  
7-786-6142

Dimensions  
Mr. Christenson  
5996

**2½ Ton**

Tailgate weight  
Fred Girup (TARCOM)  
7-786-7398

Tarp weight  
Mike Brown (TARCOM)  
7-786-6142

Dimensions  
Fred Girup (TARCOM)  
7-786-7398

Dimensions  
Mr. Christenson  
5996

Tire chain weight  
Mike Brown (TARCOM)  
7-786-6142

**5 Ton**

50. caliber machine gun ammo weight  
Mr. Kelly  
2118

Tailgate weight  
Fred Girup (TARCOM)  
7-786-7398

Tarp weight  
Mike Brown (TARCOM)  
7-786-6142

Tire chain weight  
Mike Brown (TARCOM)  
7-786-6142

Dimensions  
Fred Girup (TARCOM)  
7-786-7398

Dimensions  
Mr. Christenson  
5996

**5 Ton Tractor**

Tarp weight  
Mike Brown (TARCOM)  
7-786-6142

Tire chain weight  
Mike Brown (TARCOM)  
7-786-6142

Dimensions  
Mr. Christenson  
5996

14 Ton

Tarp kit weight  
Theurer Corp  
Greenville, Mississippi  
601-335-5231

Distance of sideboard movement  
104th Trans Bn  
7-256-2628

Gear ratio  
Dick Shultz (AM Gen)  
219-237-6532

Dimensions  
Mr. Christenson  
5996

Sedan/Bus

Tire chain size  
Ward Pontiac  
703-893-4600

Commercial Heavy Equipment Transporter

Dimensions  
Mr. Christenson  
5996

Operation  
1SG Roy Brown  
3791

Dimensions  
Adam Gapstan (TARCOM)  
7-786-5465

Gear ratio  
Oshkosh, Wisconsin  
414-235-9150

Tire bracket  
Mr. Rood (TARCOM)  
7-786-8070/6678

Operation  
SFC Milligan  
5032

Expansible Van

Manufacturer Code  
Mr. Slavitsky  
3901

Manufacturer Code  
Mr. Paul (TARCOM)  
7-786-5204

Gear ratio  
Mr. Roy Riggs (AM Gen)  
219-237-6222

Expandable side weight  
Mr. Art Dicker (Boyertown Body)  
215-367-2091

5000 Gallon Tanker

Hose weight  
Mr. Sanders (Heil Manufacturer)  
414-647-3333

GENERAL

National Stock Number  
Mr. Craig  
3901

Tarp information  
Defense Personnel Center  
Text Specialist  
7-444-3177

Stock control  
Richmond Army Depot  
7-695-4835

TARCOM Representative  
2040

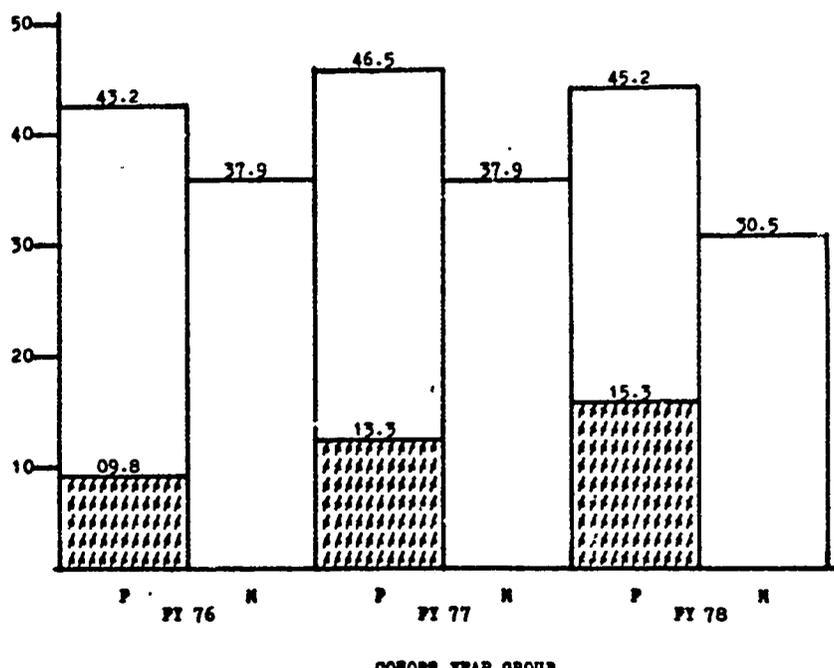
Control Numbers  
Mrs. Martin  
3891

National Stock Numbers  
Tank/Auto Supply Clerk  
3308

Trailers  
John Rardell (TARCOM)  
7-786-5386

**OVERALL ATTRITION RATES FOR  
COHORT YEARS 1976-1979**

The overall attrition rates for men and women during the four cohort years is displayed in this histogram. The dark bar represents the percentage of attrition accounted for by pregnancy.



COHORT YEAR GROUP

• INCOMPLETE COHORTS (25 MONTHS)  
P = FEMALE  
N = Male  
[//] ATTRITION DUE TO PREGNANCY

**APPENDIX F SUMMARY OF ANALYSIS FOR ATTRITION BY  
COHORT YEAR GROUP AND MILITARY  
OCCUPATIONAL SPECIALTIES**

**OVERALL ATTRITION RATES COHORT YEAR  
GROUPS 1976 - 1979**

	MOS	05A	05C	05F	05H	26L	31M	36C	54E	55B	62B	63B	63M	64C	67M	71C	71D	74D	75D	75E	76D	76M	93M	94B	95B		
FY 76	Male-Female			NS	F	F	F		NS		F	F	F						N	F			NS	NS			
	Male-Female Less Pregnancy			NS	F	NS	NS		NS		F	NS	NS							N	F			N	N		
	(Female) Race-Discharge Type			NS	NS	NS			NS		NS	NS	NS							NS	NS			NS	NS		
	(Female) Mental Category Discharge Type	NO	→																								
FY 77	Male-Female			F	F	F			F	F	F	F							N		F			F			
	Male-Female Less Pregnancy			NS	F	NS			F	F	F	F								N		F			F		
	(Female) Race-Discharge Type			NS	NS				NS	NS	NS	NS								NS		NS		NS	NS		
	(Female) Mental Category Discharge Type	NO	→																								
FY 78	Male-Female	F		F	F				F	F	F	F	N	F	F	N	F	F	N		F			F	F		
	Male-Female Less Pregnancy	NS		NS	F				F	F	F	F	N	NS	NS	N				NS	NS	N		NS	F	F	
	(Female) Race-Discharge Type	NS		NS	NS				NS	F	NS	NS		NS	NS		NS	F	NS								
	(Female) Mental Category Discharge Type	NO	→																								
FY 79	Male-Female	F	F	F	F	F			F	F									N					F	F		
	Male-Female Less Pregnancy	NS	NS	NS	NS	F			F	F										N				NS	F		
	(Female) Race-Discharge Type	NS	NS	F	NS	NS			NS	F										NS				NS	NS		
	(Female) Mental Category Discharge Type	NS	NS	NS	NS	NS			NS	NS	NS									NS				NS	NS		

.05 level 

F	Female Significant
N	Male Significant

NS	Not Significant
	Not Tested

NO	Not Observed
----	--------------

This table represents an analysis of selected MOS that had attrition rates above the average for the cohort year. A comparison was made between men and women in these MOS, controlling for pregnancy, race and mental category. The data indicates that (1) pregnancy accounts for 30 percent of the female attrition (2) female attrition rates are significantly higher in non-traditional MOS and (3) race and mental category have no statistically significant impact on pregnancy attrition. It also suggests that

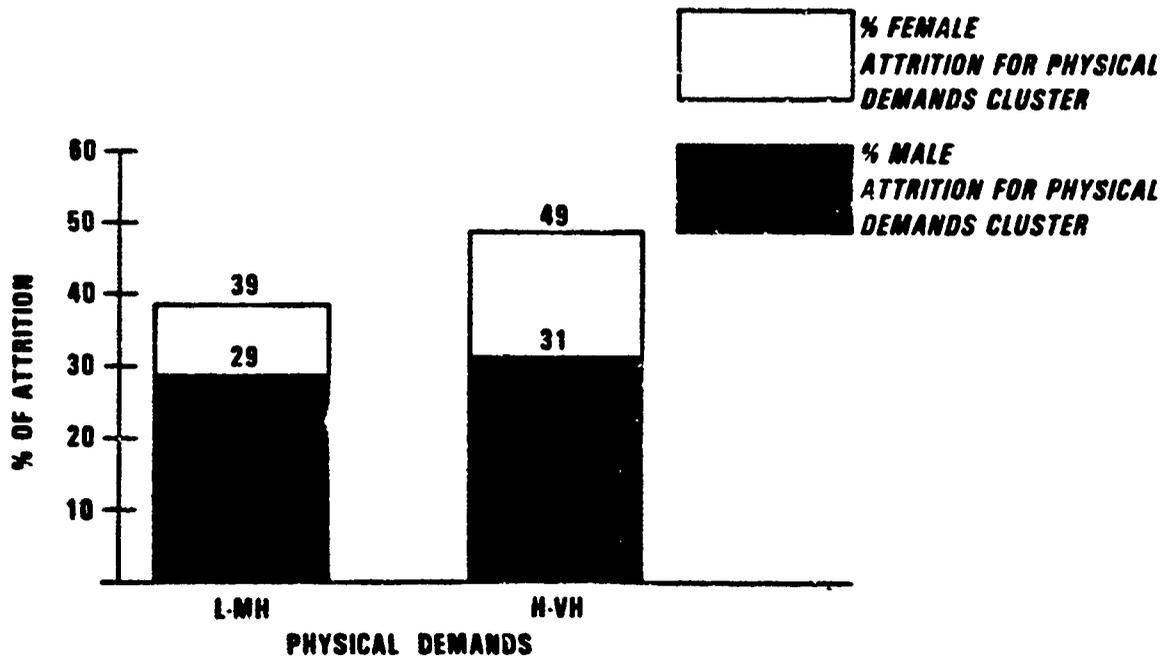
a. In Military Occupational Specialties 63B (Light Wheel Vehicle and Power Generator Mechanic), 63H (Track Vehicle Repairer), and 64C (Motor Transport Operator) women consistently have a more significant attrition rate than the men. For the 1979 cohort, 63H (Track Vehicle Repairer) was not analyzed because a sufficient number of females were not accessed. It is clear that in these Military Occupational Specialties women attrite higher than men (even after pregnancy is excluded). The causes, however, are not clear; attrition could be an indicator of either a lack of physical strength, attitude, or both, particularly in that they are non-traditional jobs.

b. In Military Occupational Specialty 05F (Radio Teletype Operator, Non-Morse) there was no significant difference between men and women, and both are attriting at higher rates than the average. This could be an indicator that attrition is a result of the job being unpleasant for both men and women, and that both leave at higher rates as a result.

c. With Military Occupational Specialty 75D (Personnel Records Specialist) men consistently attrite at higher rates than women, although both attrite at significantly higher rates than their respective average. The cause of attrition within this Military Occupational Specialty remains unknown.

This graph compares male and female attrition rates between MOS with light to moderately heavy physical demands and MOS with heavy to very heavy physical demands. The difference in attrition rates for males in the two groupings is not statistically significant. However, there is a statistically significant difference between women in the two work groupings ( $\alpha=.05$ ) Women in heavy and very heavy MOS have a higher attrition rate than women in light to moderately heavy MOS and this difference is statistically significant.

**PERCENT OF ATTRITION FOR COHORT 1978  
BY PHYSICAL DEMANDS CLUSTER  
(BY SEX)**



PART TWO  
PROCEDURES FOR CONDUCTING THE  
MOS PHYSICAL DEMANDS ANALYSIS 1/

2-1. General. This portion of the manual describes the procedures to be followed in conducting the MOS Physical Demands Analysis.

2-2. Step One - Obtain the Right People. The first step in conducting the physical demands analysis is to insure that those performing the analysis are thoroughly familiar with the technology, characteristics and literature of the MOS. Analysts must be thoroughly familiar with:

- a. Soldier actions and functions inherent in MOS task performance.
- b. The methods, procedures, processes, skills, and work objectives of an MOS at all skill levels.
- c. What the soldier does in using the official/authorized materials, equipment, machines, tools, work aids (MHE), and other mission essential devices associated with an MOS.

1/ HQ, TRADOC, Procedures Manual "Assessing the Physical Demands and Direct Combat Probability of United States Army Organizations, Military Occupational Specialities and Duty Positions" (prepared Jan 82). Contents of PART 1 are in Chapter 2, pages 14 to 32 of this report.

APPENDIX G      COMPLETED MOS PHYSICAL DEMANDS ANALYSIS  
AND PROCEDURES.

d. The performance standards, work rates, and work conditions applicable to the MOS under analysis.

e. The doctrinal combat employment of personnel in the MOS and the tasks soldiers in the MOS must perform under combat conditions.

f. The personnel authorization documents pertaining to the MOS.

g. The literature (Technical Bulletins, Supply Bulletins, and Catalogs, Technical Manuals, Field Manuals, Soldier's Manuals, Army Training Programs, Army Regulations, etc.).

2-3. Step Two - Assemble the Literature. Assemble all the literature pertaining to the MOS under analysis. A large percentage of the information needed to complete the analysis is contained in existing literature. Proponents of classified MOSs should perform the MOS Physical Demands Analysis (provided such an analysis does not violate security regulations or procedures). If such an analysis would violate security, proponents should coordinate directly with Headquarters, TRADOC to determine how they should proceed.

2-4. Step Three - Review AR 611-201 Tasks for the MOS. AR 611-201 MOS tasks constitute the base of departure for the

analysis. Since entry level classification is the focus of the analysis, skill level 1 tasks are of immediate interest. Other skill level tasks may be brought into the analysis if the skill level 1 tasks are linked to higher skill level tasks (e.g., assist in the performance of a skill level 2, 3, 4, 5 task). Survey AR 611-201 tasks by inspection, explicit skill level 1 tasks that appear most physically demanding. While only explicit task statements should be recorded during this survey, implied tasks must be recognized as having a significant bearing on the assessment of work demands. Following is one method to achieve this end:

TABLE 4  
TASK SURVEY FOR MOS 91B

TASKS 91B	Sed		Light		Med	Hvy		Very Hvy		
	1	2	3	4	5	6	7	8	9	10
1. Surveys casualties.....	X									
2. Performs EMT procedures, performs basic lifesaving techniques.....	X									X
3. Establish and maintain airway.....	X									
4. Assists with respirations...			X							X
5. Monitors circulation.....	X									
6. Control bleeding.....	X			X						
7. Protects open wounds.....	X									X
8. Initiates FMC.....	X									

TABLE 4 Cont'd

TASKS	Sed		Light		Med		Hvy		Very Hvy	
	1	2	3	4	5	6	7	8	9	1
'91B										
9. Starts IV fluids.....	X									
10. Splinting.....	X									X
11. Administration of vaccine/drugs.....	X									
12. Assists with casualty management/trauma/NBC/ thermal.....	X									X
13. Provides care during evacuation/litters.....	X									X
14. Carries patients/ casualties using 1-2 and 4 man carries.....								X		X
15. Uses improvised litters to carry casualties.....						X				X
16. Carries litter over irregular terrain.....										X
17. Performs loading and un- loading of ground and air ambulance vehicles.....						X				X
18. Attends to patients during transport.....	X									X
19. Operates vehicles to transport sick and wounded.....	X									X
a. Changes tire/operator maintenance.....						X				X
b. Loads medical equip- ment.....			X							X

TABLE 4 Cont'd

TASKS	Sed		Light		Med	Hvy		Very Hvy	
	1	2	3	4	5	6	7	8	9 10
91B									
20. Assists in erection and breakdown of tentage:									
a. Erection and take-down.....					X				X
b. Loading and unloading.....					X				X
21. Other medical field shelters:									
a. Erection and tear-down of MUST inflatable hospital.....					X				X
b. Loading, packing, MUST inflatable hospital.....								X	X
c. Unloading MUST inflatable shelters.....					X				
d. Erection and tear-down of MUST expandable.....					X				X
e. Dolly attachment container/expandable.....					X				
22. Fills and resupplies field aid bag.....		X							
23. Performs field sanitation procedures:									
a. Supervises field sanitation.....		X							
b. Performs procedures...		X							X
24. Assists in routine nursing procedures.....		X							X

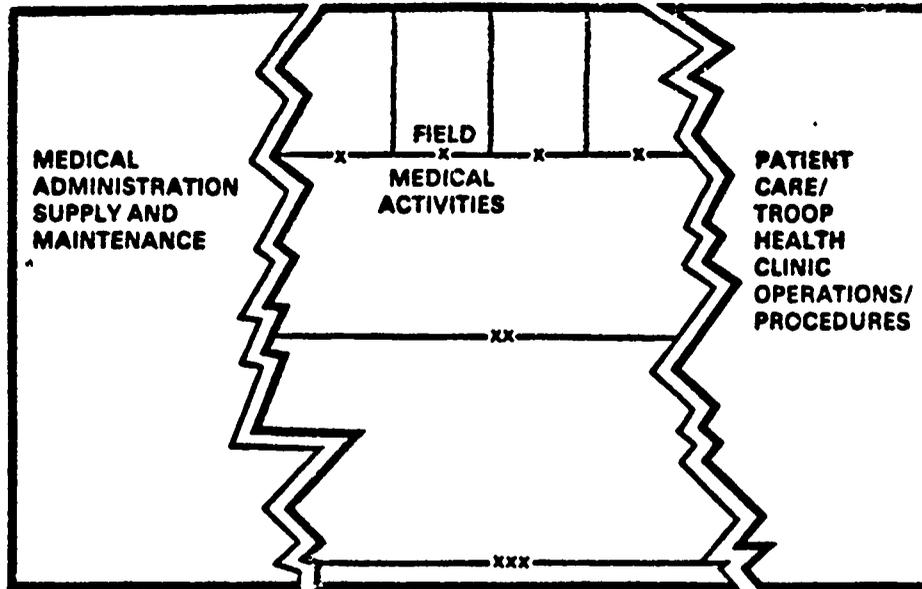
TABLE 4 Cont'

TASKS	Sec		Light		Med	Hvy	Very	Hvy		
	1	2	3	4	5	6	7	8	9	10
91B										
25. Performs procedures necessary to function in a toxic environment....										X

This survey of AR 611-201 MOS tasks provides insight into those tasks having a range of physical demands and that are most physically demanding. This survey assists analysts in establishing priorities for task analysis and reduces the number of tasks requiring detailed analysis. All analysts participating in the survey of physical demands should generally agree on the survey rating before dropping a task from consideration for analysis. In the foregoing example, pursuing detailed analysis of tasks number 1, 3, 5, 8, 9, 11, and 22 should not surface significant physical demands compared to tasks 12, 13, or 17. Information obtained through this survey is also very useful in determining whether an MOS should be considered for restructuring (creating additional MOSs based on grouping of similar tasks and physical demands). Figure 4 illustrates a hypothetical restructuring of the 91B MOS.

FIGURE 4

MOS PROLIFERATION MAY BE REQUIRED  
MEDICAL SPECIALIST 91B



2-5. Step Four - Identify Explicit and Implicit Tasks.

Important to a complete and accurate physical demands analysis is the identification of explicit (AR 611-201) tasks and the significant physically demanding implied tasks. What are implied tasks? They are tasks that must be performed in a field environment (combat operations) and are linked to the performance of an explicit task. The following example illustrates this linkage.

TABLE 5

EXPLICIT AND IMPLIED TASKS FOR MOS 36C

EXPLICIT TASK	IMPLIED PHYSICAL TASKS
<p>MOSC36C10</p> <p>1. Interprets line route maps, overlays, circuit diagrams, wire/cable route prints and symbols used in wire and cable communications.</p>	<p>Necessary visual capacity to perform task. (Vision is a function of PULHES profile).</p>

TABLE 5 Cont'd

EXPLICIT TASK	IMPLIED PHYSICAL TASKS
<p style="text-align: center;">MOSC36C10</p> <p>2. Detects and locates opens, shorts, crosses and grounds by using test sets.</p> <p>3. Performs operator maintenance as outlined in appropriate publications.</p> <p>5. Installs and operates telephones and switchboards. Install Manual Telephone Switchboard SB 86-P.</p> <p style="padding-left: 20px;">a. Prepare cover assembly as base for switchboard. Lift, carry and revolve outer cover assembly (41 lbs).</p> <p style="padding-left: 20px;">b. Install switchboard on base. Lift and carry SB 248/P and circuit cords (75 lbs). Lift SB 248/P to a height of 22", and install.</p>	<p>Walking over irregular terrain carrying mission essential equipment and load bearing required gear (weapon, LBE); climbs trees, poles to locate opens, shorts, etc.</p> <p>While suspended from a tree/pole, reach to repair overhead communication wire/cable.</p> <p>Performs operator's preventive maintenance on Manual Telephone Switchboard SB 86/P, Switchboard Telephone Cordless Manual SB-3082.....(through all required equipment, each with varying physical demands).</p> <p>Load and unload SB 86/P onto transportation for movement to installation site. Unload SB 86/P from conveyance upon arrival at installation site. Group task (total weight of 196 pounds).</p> <p>Two personnel must lift SB 86/P 52 inches to bed of truck.</p>

There are additional implied tasks associated with the explicit task of installing and operating the SB 86/P. For example, the equipment must be grounded, generators transported and installed (and sandbagged), and the operational site (if

tentage) erected. To assist in the identification of implied tasks, a physical requirements list (when available) will be provided. (Appendix B).

2-6. Step Five - Obtaining the Data. The Department of Labor employs the Observation-Interview method of data collection whenever possible to record the work requirements of a specific job. This method involves analyzing jobs by observing workers actually performing their jobs under normal conditions and interviewing workers, supervisors, and others who have information pertinent to the work being performed, and the constraints that may exist, i.e. weather, clothing or tools. When the worker may not be observed because of security reasons or requirements of the job, the most experienced technical personnel and supervisors are interviewed and applicable literature concerning the job is employed to obtain information on job-worker actions. Fortunately, the Army has already done most of this work. Work performed has been observed and documented, workers have been interviewed (Army Occupations Survey Program), and extensive technical and operational literature compiled. Consolidating this vast array of data and experience to identify the physically demanding tasks of an MOS is the job of the physical demands analyst. Measuring the human energy costs associated with these tasks will be accomplished by the medical and human engineering experts.

2-7. Step Six - Recording the Physical Work Demands. A Physical Demand Worksheet has been devised to assist the analyst in recording the physical demands of the MOS under analysis. The specifications of the worksheet are shown below:

a. CMF. Career Management Field (See AR 611-201 if formal definition required).

b. MOS. Military Occupational Specialty being subjected to physical demands analysis.

c. Level. The MOS skill level being analyzed. (Always Skill Level 1).

d. Duties (Section I). The summarized duties for the MOS skill level (See example).

e. Task Summary (Section II). A single MOS task list for a specific skill level as indicated in AR 611-201 (See example).

f. Critical Task Element. The smallest step into which it is practical to subdivide a task for the purpose of recording physical demands.

g. Critical Performance Measure. The physical work demands imposed by a critical task (Section IV).

h. Analysis (Section V):

(1) Section V-A 1-22. Factors are defined in Part I, 2/ para 1-2.

(2) Section V-B, C, D. Quantitative measures for physical demand factors.

(3) Section V-E. Work Rate/Performance Standards. The standards that should be met by the soldier in task performance, or the conditions that govern task completion (e.g., soldier must install SB 86/P Switchboard in 25 minutes; soldier must dig defensive position in one hour, etc.).

(4) Section V-F. Physical Demands Category. These categories are defined and explained in Part I 3/ of this pamphlet. Analysts are not required to complete this subsection of the worksheet. Occupational classification personnel, Soldier Support Center, are responsible for category determination.

(5) Section V-G. MOS Frequency. This frequency scale is defined in Part I 4/ of this pamphlet. In assessing the range of tasks performed by personnel in an MOS, what percent of the

2/ Chapter 2, this report, page 2-21

3/ Chapter 2, this report, page 2-19

4/ Tab A, Appendix G, this report, page G-74

soldier's MOS task performance time is spent on this task. Task performance in the field (tactical environment) may vary considerably depending upon mission, enemy, terrain, and troops available.

(6) Section VI. Explanation/Comment - Physical Demand Factors. This section is used to comment/clarify information contained in Sections I through V. Examples of information that might be commented upon in this section are:

(a) Group tasks, and the number of personnel required to perform the task.

(b) Mechanical handling equipment or other physical demand modifiers approved for use by the Department of the Army.

(c) Any clarifying data that might assist in the proper categorization of the MOS or the determination of human energy costs.

2-8. Completion of this work will:

a. Dictate a revision of AR 611-201. Figure 5 is an example of proposed revised format.

FIGURE 5

CMF 31

WIRE SYSTEMS INSTALLER/OPERATOR  
(Wire Sys Inst/Op)

MOS 36C

Summary

Installs, operates and performs operator maintenance on wire and cable communication systems.

Duties

- MOSC36C10 Installs, operates, and performs operator maintenance on unattended carrier repeaters, restorers, voltage and current protection devices, telephones, and manual semi-automatic and automatic switchboards and auxiliary equipment.
- MOSC36C20 Installs, operates, performs operator maintenance on wire and cable communications equipment and supervises the installation, operation and performance of operator maintenance by subordinate personnel.
- MOSC36C30 Supervises the installation, operation and performance of operator maintenance by subordinate personnel engaged in wire and cable communication system and installation operations.
- MOSC36C40 Supervises all phases of wire and cable communications systems installation, operation and the performance of operator level maintenance
- MOSC36C50 Plans, monitors and/or supervises the installation, operation and operator maintenance activities performed by unit, wire and cable communications system personnel.

FIGURE 5 Cont'd

TASK SUMMARY	36C10	36C20	36C30	36C40	36C50
1. Interprets line route maps, overlays, circuit diagrams, wire/cable route prints and symbols used in wire and cable communications.	X	X			
2. Detects and locates opens, shorts, crosses and grounds by using test sets.	X	X			
3. Performs operator maintenance as outlined in appropriate publications.	X	X			
4. Connects wire or cable to test board terminal lugs to facilitate test during operation.	X	X			
5. Installs and operates telephones and switchboards.	X	X			
6. Employs operator procedures to obtain caller's requests, makes necessary connections. Places long distance calls through successive exchanges.	X	X			
7. Responds rapidly and resourcefully to high priority or emergency requests.	X	X			
8. Employs maximum communication security consistent with operational requirements.	X	X			
9. Climbs poles to perform cable operations. X	X				

FIGURE 5 Cont'd

TASK SUMMARY	36C10	36C20	36C30	36C40	36C50
10. Clears and maintains right of ways.	X	X			
11. Performs routine tasks relative to wire and cable systems when maneuver elements are not limited or restricted.	X	X			
12. Ties wire or cable to stakes, posts, or trees.	X	X			
13. Ties identification tags on cable at critical points.	X	X			
14. Erects lance poles to install cable or wire above roads, streams and crossings.	X	X			
15. Makes splices in wire cable when necessary.	X	X			
16. Places loading coils in wire and cable systems when required.	X	X			
17. Strings messenger on poles to secure wire and cable.	X	X			
18. Installs poles, sets anchors and brace poles.	X	X			
19. Identifies electronic countermeasures and applies electric countermeasures.	X	X			
20. Coordinates and supervises the construction, rehabilitation and installation of tactical field wire and cable communication systems, to include telephones and switchboards.		X			

FIGURE 5 Cont'd

TASK SUMMARY	36C10	36C20	36C30	36C40	36C50
21. Conducts training in preventive maintenance of all tools and equipment.		X			
22. Schedules operator shift personnel as needed to conform with the requirements of traffic workload.		X			
23. Estimates time, supplies, personnel and equipment required to construct field wire or cable communications systems in various situations and over various types of terrain.		X			
24. Identifies nomenclature, supplies, and materials used in field wire and cable constructions.		X			
25. Supervises operators for technique and conformance with procedures.		X			
26. Monitors conversations between operator and callers to determine operator proficiency, responsiveness, cooperation and tact.		X			
27. Instructs on routine of long distance and trunk calls.		X			
28. Maintains updated traffic diagrams for operator reference and corrects faulty operator techniques by demonstration and instruction.		X			
29. Maintains station logs to reflect an operating record of central switchboard activities.		X			
30. Requisitions supplies.		X	X	X	

**FIGURE 5 Cont'd**

TASK SUMMARY	36C10	36C20	36C30	36C40	36C50
31. Receives, consolidates and prepares operational and administrative reports.		X	X	X	
32. Coordinates and supervises all phases of wire/cable and distribution and operator maintenance activities.			X	X	
33. Assigns working crews, coordinates activities and shift personnel to meet workload demands.			X	X	
34. Prepares material list and requisitions supplies.			X	X	
35. Directs, corrects, demonstrates and instructs in techniques of wire and cable installation.			X	X	
36. Coordinates and supervises operation and maintenance of field telephone exchanges.			X	X	
37. Interprets maps, overlays, and field wire/cable construction requirements.			X	X	
38. Assists in unit training.			X	X	X
39. Keeps commander and staff advised on communication matters.			X	X	X
40. Interprets telephone distribution system engineering and planning techniques.				X	X
41. Appraises wire and cable installation operations.				X	X
42. Assigns crews or teams.				X	X
43. Coordinates activities and shifts of personnel to meet workload demands.				X	X

**FIGURE 5 Cont'd**

TASK SUMMARY	36C10	36C20	36C30	36C40	36C50
44. Prepares technical and administrative reports on cable or wire construction and maintenance activities.					X
45. Coordinates and supervises organizational training and technical operation activities of unit.					X
46. Supervises organization, training, and technical operation activities of unit or organization.					X
<b>BASIC MEDICAL, APTITUDE, KNOWLEDGE                      PHYSICAL CAPACITY AND OTHER QUALIFICATIONS                      (Qualifications are cumulative)</b>					
QUALIFICATION CATEGORY	36C10	36C20	36C30	36C40	36C50
1. Medical Qualifications:					
a. Physical Profile of 121222.....	X				
b. Normal color vision.....	X				
2. Aptitude Qualifications:					
Aptitude Area (EL).....	X				
3. Knowledge Qualifications:					
a. Wire, sound and transmission principles.....	X				
b. Telephone principles.....	X				
c. Safety precautions.....	X				
d. Electronic warfare principles.....	X				
e. Transportation theory	X				
f. Installation procedures and operating characteristics of tactical unattended telephone repeater equipment.....	X				
g. Operational test of unattended repeaters and restorers.....	X				

FIGURE 5 Cont'd

QUALIFICATION CATEGORY	36C10	36C20	36C30	36C40	36C50
h. Operator maintenance of telephones, un-attended repeaters and restorers, and other associated telephone substation equipment.....	X				
i. Cable and wire characteristics and effects of natural elements.....	X				
j. Telephone installation procedures.....	X				
k. Identification of supplies and materials used in cable/wire construction.....	X				
l. Telephone and Central Office switchboard operation.....	X				
m. Operator maintenance procedures applicable to telephone switchboards, power equipment and auxiliary equipment.....	X				
n. Safety precautions to be exercised in the vicinity of high voltage.....	X				
o. Army organization as it pertains to communication network in which operating.....	X				
p. Fundamentals of telephone switchboard installation and operation relationship of integrated switchboard systems.....	X				
q. Administrative and supply procedures....		X			
r. Regulations pertaining to security and safeguarding of classified material.....	X				
s. Purpose, use, and preventive maintenance procedures pertinent to tools, testing devices and technical equipment used in construction and maintenance of wire/cable systems and telephone exchanges.....	X				

**FIGURE 5 Cont'd**

QUALIFICATION CATEGORY	36C10	36C20	36C30	36C40	36C50
t. Phonetic alphabet and radio telephone procedures.....	X				
u. Nomenclature and identification of supplies and materials used in wire/cable construction requirements.....	X				
4. Physical Capacity Qualifications:  (To be announced)					

**PHYSICAL DEMANDS RATING**

S			L					M					H				VH				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

**Additional Skill Identifiers**

<b>Code</b>	<b>Title</b>
B2	Telephone Key System Installer
N4	Emergency Action Console

**Related Civilian Occupations**

<b>DOT Classification</b>	<b>Code</b>
(omitted)	

<b>Federal Civil Service Classification</b>	<b>Code</b>
(omitted)	

**PROPOSED FORMAT**

**CMF 55**

**AMMUNITION SPECIALIST**

**MOS 55B**

**Summary**

Supervises, performs, or assists in ammunition storage, receipt issue, stock control, accounting and maintenance operations.

**Duties**

- MOSC55B10**     *Assists in receipt, issue and maintenance of ammunition components and explosives*
- MOSC55B20**     *Receives, stores, issues and transports, conventional and special ammunition components and explosives*
- MOSC55B30**     *Supervises 55B10 and 55B20 duties, with additional supervisory functions for receipt, storage, issue and transportation of containers, rockets, chemical and non-nuclear special ammunition. Supervises the establishment and maintenance of ammunition stock control records.*
- MOSC55B40**     *Supervises ammunition storage platoon receipt, storage and issue operations. Supervises stock control and accounting operations. Supervises non-nuclear ammunition maintenance operations*

<b>TASKS</b>	<b>55B10</b>	<b>55B20</b>	<b>55B30</b>	<b>55B40</b>
1. Loads, unloads, stacks and stores ammunition supplies.	X	X		
2. Stores explosives and all types of ammunition, including guided missiles, using materials handling equipment in magazines, warehouses and open storage areas.	X	X		
3. Prepares ammunition for shipment on all types of transportation and performs necessary bracing and staving of loads.	X	X		
4. Inventories ammunition in storage and issues ammunition supplies.	X	X		
5. Assists in upkeep of operations area and facilities.	X	X		
6. Performs organizational maintenance operations involving removing rust and corrosion, package repair and painting and marking, using equipment such as buffers, brushers and strapping machines.	X	X		
7. Performs direct support maintenance functions to include replacement of fuzes, performance of electrical checks and provision of assistance to missile maintenance personnel.	X	X		
8. Assists in ammunition serviceability inspections.	X	X		
9. Employs and performs preventive maintenance on mechanics' common handtools and power tools and specialized ammunition maintenance tools. Applies safety precautions to ammunition storage, handling and maintenance.	X	X		
10. Identifies ammunition by types and physical characteristics.	X	X		
11. Utilizes quantity distance tables.	X	X		
12. Determines correct item description, national stock number markings and other storage data.	X	X		
13. Posts records and documents.	X	X		
14. Operates materials handling equipment.	X	X		
15. Packs, packages, crates, stencils, weighs and bands ammunition for shipment or storage.	X	X		
16. Prepares loads using webbing slings, containers, platforms, skid boards and ancillary hardware.	X	X		

TASKS	55B10	55B20	55B30	55B40
17. Makes visual inspections and monitors ammunition in storage.	X	X		
18. Assists explosive ordnance disposal personnel in routine destruction of unserviceable and irreparable conventional and chemical ammunition and explosives.	X	X		
19. Performs detection and decontamination procedures involving chemical agents.	X	X		
20. Applies Army Regulations and other publications governing ammunition supply procedures, inventory procedures, storage location systems and lot control.	X	X		
21. Provides technical guidance to lower grade personnel.		X	X	X
22. Performs emergency destruction of conventional and chemical ammunition.		X		
23. Prepares periodic reports by compiling statistics on issue, receipt and storage functions.		X	X	X
24. Plans and organizes ammunition storage facilities.			X	X
25. Supervises loading, unloading, movement and storage of ammunition.			X	X
26. Supervises ammunition packaging operations.			X	X
27. Plans maintenance operations.			X	X
28. Estimates requirements for personnel, tools, equipment and supplies for maintenance operations.			X	X
29. Prepares unit activities report.				X
30. Insures proper and safe handling of ammunition.				X
31. Supervises setting up and camouflaging of ammunition supply/maintenance units or installations.				X
32. Assigns duties to subordinate personnel.				X
33. Coordinates unit requirements relative to personnel, equipment, transportation and maintenance.				X
34. Performs as technical advisor.				X

### BASIC MEDICAL AND APTITUDE QUALIFICATIONS

Must possess the following cumulative qualifications:

*a. Physical*

- (1) Profile 22221 .....
- (2) Normal color vis. ....

*b. Aptitude area:*

- (1) AApr-1973: GM .....
- (2) ACB-1973: GM .....

*c. Other: Not allergic to explosive compositions*

	MOSC 55B10	MOSC 55B20	MOSC 55B30	MOSC 55B40
(1) Profile 22221 .....	X			
(2) Normal color vis. ....	X			
(1) AApr-1973: GM .....	X			
(2) ACB-1973: GM .....	X			
Other: Not allergic to explosive compositions	X			

### Additional Skill Identifiers

Code	Title
J5 .....	Technical Escort
L4 .....	Ammunition Stock Control and Accounting

### RELATED CIVILIAN OCCUPATIONS

DOT classification	Code	Federal Civil Service classification	Co
Magazine Keeper .....	223.387	Munition Handler .....	WG 65:
Inventory Clerk .....	223.388	Powder Handler .....	WG 65:
Explosive Operator II .....	737.887	Supply Clerk .....	GS 20:
Renovation Plant Foreman .....	694.132	Distribution Facilities and Storage Manager .....	GS 20:
		Ammunition Loading Inspector .....	WG 65:
		Explosives Operator .....	WG 65:
		Explosives Operator, Breakdown .....	WG 65:
		Explosives Operator, Loading .....	WG 65:
		G-22 Powder and Explosives Inspector .....	WG 65:

**PHYSICAL DEMANDS ANALYSIS WORKSHEET**  
**CMF 55**

MOS 55B10

LEVEL 1

DATE Feb 82

PAGE 1 OF 21

**I. DUTIES**  
Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**  
Loads/unloads ammunition.

**III. CRITICAL TASK ELEMENT**  
Loads/unloads small arms ammunition boxes.

**IV. CRITICAL PERFORMANCE MEASURE**  
Lift/lower, carry, push, pull, handle.

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORZ. DISTANCE	D VERTICAL DISTANCE	E WORKRATE/PERFORMANCE STANDARD	F PHYS. D. CATEGORY					G MOS FREQ				
					S	L	M	H	VH	NP	O	F	C	
1. LIFT/LOWER	72 lbs		4 ft	Ammunition to be lifted to truck bed at rate of 20 boxes per hour.									X	
2. CARRY	72 lbs	10 ft		Carry ammunition from stack to truck.									X	
3. PUSH	72 lbs	1 ft		Push boxes to gain lifting hold and position on truck.									X	
4. PULL	72 lbs	1 ft		Pull boxes to gain lifting hold and position on truck.									X	
5. LOAD BEAR														
6. WALK/MARCH														
7. CLIMB/ DESCEND														
8. RUN/RUSH														
9. SWIM/DIVE														
10. DIG														
11. CRAWL														

FACTOR	WEIGHT/ LOAD	HORZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.									
					S	L	M	H	V	P	O	F	C						
12. THROW																			
13. HANDLE																			
14. FINGER																			
15. HAMMER/ POUND . .																			
16. SIT																			
17. RECLINE																			
18. REACH																			
19. STAND																			
20. STOOP																			
21. KNEEL																			
22. CROUCH																			

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Typical load is boxed 5.56mm small arms ammunition, 72 lbs per box. SM must lift/lower, carry, push and pull boxes. Task is done when ammunition is unpalletized. For palletized ammunition, MHE is used to load complete pallets of ammunition. Task usually done as a group task, however, individual SM can be expected to do the task without assistance with supervision.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY <input type="checkbox"/>					LIGHT <input type="checkbox"/>					MEDIUM <input type="checkbox"/>					HEAVY <input type="checkbox"/>					VERY HEAVY <input type="checkbox"/>				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22			

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

**PHYSICAL DEMANDS ANALYSIS WORKSHEET**  
**CMF 55**

MOS **55B10**

LEVEL **1**

DATE **Feb 82**

PAGE **2** OF **21**

**I. DUTIES**

Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**

Stacks ammunition.

**III. CRITICAL TASK ELEMENT**

Stacks boxes of small arms ammunition.

**IV. CRITICAL PERFORMANCE MEASURE**

Lift/lower, carry, push, pull, walk.

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORIZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE/PERFORMANCE STANDARD	F PHYS. D. CATEGORY					G MOS FREQ				
					S	L	M	H	VH	NP	C	F	C	
					1. LIFT/LOWER	72 1b		5 ft	Boxes to be lifted, arranged and lowered on stacks or pallets.					
2. CARRY	72 1b	10 ft		Boxes to be carried from one location in mag to another.									X	
3. PUSH	72 1b	1½ ft		Push boxes of ammunition along roller conveyors.									X	
4. PULL	72 1b	1 ft		Pull boxes to assure proper alignment in stacks.									X	
5. LOAD BEAR														
6. WALK/MARCH	72 1b	10 ft		Carry boxes from one stack to another as required.									X	
7. CLIMB/ DESCEND														
8. RUN/RUSH														
9. SWIM/DIVE														
10. DIG														
11. CRAWL														

FACTOR	WEIGHT/ LOAD	HORZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.				
					S	L	M	H	V	NP	O	F	C	
12. THROW														
13. HANDLE														
14. FINGER														
15. HAMMER/ POUND . .														
16. SIT														
17. RECLINE														
18. REACH														
19. STAND														
20. STOOP														
21. KNEEL														
22. CROUCH														

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Typical load is boxed ammunition average weight 72 lbs. Push/Pull, carry and walk as required to stack ammunition on pallets or dunnage. This is normally a group task. However, SM may be expected to do the task alone with supervision.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY <input type="checkbox"/>		LIGHT <input type="checkbox"/>		MEDIUM <input type="checkbox"/>		HEAVY <input type="checkbox"/>		VERY HEAVY <input type="checkbox"/>														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

**PHYSICAL DEMANDS ANALYSIS WORKSHEET  
CMF 55**

MOS 55B10

LEVEL 1

DATE Feb 82

PAGE 3 OF 21

**I. DUTIES**

Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**

Inventory ammunition to determine location and quantity.

**III. CRITICAL TASK ELEMENT**

Climbs stacks of ammunition to gain access to stocks.

**IV. CRITICAL PERFORMANCE MEASURE**

Climb/descend, stand, reach, push/pull.

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HDRZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE/PERFORMANCE STANDARD	F PHYS D. CATEGORY					G MOS FREQ								
					S	L	M	H	VH	NP	O	F	C					
1. LIFT/LOWER																		
2. CARRY																		
3. PUSH	120 lb	2 ft		Push items to gain access.														X
4. PULL	120 lb	2 ft		Pull items to gain access.														X
5. LOAD BEAR																		
6. WALK/MARCH																		
7. CLIMB/ DESCEND			8 ft	Climb/descend stacks to observe markings.														X
8. RUN/RUSH																		
9. SWIM/DIVE																		
10. DIG																		
11. CRAWL																		

FACTOR	WEIGHT/ LOAD	HORZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.										
					S	L	M	H	HP	O	F	C								
12. THROW																				
13. HANDLE																				
14. FINGER																				
15. HAMMER/ POUND . .																				
16. SIT																				
17. RECLINE																				
18. REACH		3 ft	3 ft	Reach to retrieve ammunition items.																X
19. STAND				Stays on feet and counts ammunition.																X
20. STOOP																				
21. KNEEL																				
22. CROUCH																				

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Climbs stacks of ammunition at storage locations to see markings on ammunition and containers. Reaches into storage bins to remove items. Stands for prolonged periods of time up to 2 hours without sitting. Push/pull items to enable identification for inventory purposes. This task is done as a group task. Calculations are based on 105mm HE 2 per box, total weight of 120 lbs.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY <input type="checkbox"/>																						LIGHT <input type="checkbox"/>																						MEDIUM <input type="checkbox"/>																						HEAVY <input type="checkbox"/>																						VERY HEAVY <input type="checkbox"/>																					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22																																																																																								

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

**PHYSICAL DEMANDS ANALYSIS WORKSHEET  
CMF 55**

MOS 55B10

LEVEL 1

DATE Feb 82

PAGE 4 OF 21

**I. DUTIES**

Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**

Prepare ammunition for shipment by blocking, bracing, strapping, and staying.

**III. CRITICAL TASK ELEMENT**

Strap/block and tie down ammo.

**IV. CRITICAL PERFORMANCE MEASURE**

Lift, carry, push, pull, climb, descend, handle, reach, hammer.

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORIZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE/PERFORMANCE STANDARD	F PHYS D CATEGORY					G MOS FREQ					
					S	L	M	H	V	NP	O	F	C		
1. LIFT/LOWER	150 Lb		5 Ft	Lifting and lowering boxed ammunition.										X	
2. CARRY	150 Lb	10 Ft		Carrying boxes from stack to vehicle.										X	
3. PUSH	150 Lb	1 Ft		Pushes boxes to align loads.										X	
4. PULL	150 Lb	1 Ft		Pulls boxes to align loads.										X	
5. LOAD BEAR															
6. WALK/MARCH															
7. CLIMB/ DESCEND			4 Ft	Climb/descend truck bed.										X	
8. RUN/RUSH															
9. SWIM/DIVE															
10. DIG															
11. CRAWL															

FACTOR	WEIGHT/ LOAD	HORZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.				
					S	L	M	H	V	INP	O	F	C	
12. THROW														
13. HANDLE														
14. FINGER														
15. HAMMER/ POUND . . .														
16. SIT														
17. RECLINE														
18. REACH														
19. STAND														
20. STOOP														
21. KNEEL														
22. CROUCH														

**VI. EXPLANATION/COMMENT – PHYSICAL DEMAND FACTORS**

Typical load is small arms boxed ammunition. Shipment is loaded on flat bed truck. Average weight is 72 lbs per box. Blocking, bracing and staving is required to secure the load. Steel strapping is used. Sometimes web straps are used depending on load and type vehicle. Calculations are based on a 72 lb box of 5.56 small arms ammunition. Estimated weight of steel banding material is 150 lbs per roll.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY       LIGHT       MEDIUM       HEAVY       VERY HEAVY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

# PHYSICAL DEMANDS ANALYSIS WORKSHEET

CMF 55

MOS 55B10

LEVEL 1

DATE Feb 82

PAGE 5 OF 21

**I. DUTIES**

Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**

Moves ammunition during rewarehousing operations.

**III. CRITICAL TASK ELEMENT**

Lifts and carries boxes of ammunition

**IV. CRITICAL PERFORMANCE MEASURE**

Lift/lower, carry, push/pull

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORIZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE/PERFORMANCE STANDARD	F PHYS C CATEGORY					G MOS FREQ			
					S	L	M	H	VH	NP	O	F	C
					1. LIFT/LOWER	120 lb		4 Ft	Lift/lower boxes of ammunition.				
2. CARRY	120 lb	10 Ft		Carry boxes to different location.								X	
3. PUSH	120 lb	2 Ft		Push boxes to align in position.								X	
4. PULL	120 lb	2 Ft		Pull boxes to align in position.								X	
5. LOAD BEAR													
6. WALK/MARCH													
7. CLIMB/ DESCEND													
8. RUN/RUSH													
9. SWIM/DIVE													
10. DIG													
11. CRAWL													

FACTOR	WEIGHT/ LOAD	HORZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.										
					S	L	M	H	VH	I	P	C	F	C						
12. THROW																				
13. HANDLE																				
14. FINGER																				
15. HAMMER/ POUND . .																				
16. SIT																				
17. RECLINE																				
18. REACH																				
19. STAND				Stand while working.															X	
20. STOOP				Stoop while working.															X	
21. KNEEL																				
22. CROUCH																				

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Lift and carry boxes of 105mm ammunition to storage location. Push/pull ammunition boxes to align in rows. Moves ammunition from one location to another within a magazine or between magazines. Stand and stoop while doing task. Calculations based on 105mm HE 2 per box, total weight 120 lbs. Group task.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY       LIGHT       MEDIUM       HEAVY       VERY HEAVY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**



FACTOR	WEIGHT/ LOAD	HORZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.												
					S	L	M	H	VH	YD	C	F										
12. THROW																						
13. HANDLE																						
14. FINGER																						
15. HAMMER/ POUND . .																						
16. SIT																						
17. RECLINE																						
18. REACH																						
19. STAND				Standing for prolong periods is required.																		X
20. STOOP																						
21. KNEEL																						
22. CROUCH																						

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Typical weight is based on a box of G872 fuzes. Personnel performing this task are required to lift, carry, lower, walk and stand for long periods of time. This task is normally performed as a group.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY       LIGHT       MEDIUM       HEAVY       VERY HEAVY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

**PHYSICAL DEMANDS ANALYSIS WORKSHEET**  
**CMF 55**

MOS 55B10

LEVEL 1

DATE Feb 82

PAGE 7 OF 21

**I. DUTIES**

Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**

Segregate ammo/check unit returns.

**III. CRITICAL TASK ELEMENT**

**IV. CRITICAL PERFORMANCE MEASURE**

Physically separate ammo.

Lift/lower, carry.

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORIZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE PERFORMANCE STANDARD	F PATE 2 CATEGORY					G MCS FREQ				
					S	L	M	H	VH	NP	O	F	C	
1. LIFT/LOWER	100 lb		4 ft	Lift/lower ammunition items, segregate by type size.									X	
2. CARRY	100 lb	10 ft		Carry items from one stack to another.									X	
3. PUSH														
4. PULL														
5. LOAD BEAR														
6. WALK/MARCH	100 lb			Walk from stack to stack is required to segregate items.									X	
7. CLIMB/DESCEND														
8. RUN/RUSH														
9. SWIM/DIVE														
10. DIG														
11. CRAWL														

FACTOR	WEIGHT/ LOAD	HORIZ. DISTANCE	VERTICAL DISTANCE	WORK. RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.				
					S	L	M	H	VH	NP	O	F	C	
12. THROW														
13. HANDLE														
14. FINGER														
15. HAMMER/ POUND . .														
16. SIT														
17. RECLINE														
18. REACH														
19. STAND				Standing for long periods is required.										X
20. STOOP														
21. KNEEL														
22. CROUCH														

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Typical weight is based on the weight of 1 ea 155mm round of ammunition. Personnel performing this task are required to lift/lower, carry, walk, and stand for long periods of time. This task is normally performed as a group task.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY       LIGHT       MEDIUM       HEAVY       VERY HEAVY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

**PHYSICAL DEMANDS ANALYSIS WORKSHEET**  
**CMF 55**

MOS 55B10

LEVEL 1

DATE Feb 82

PAGE 8 OF 21

**I. DUTIES**

Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**

Prepare ammo for helicopter slingout.

**III. CRITICAL TASK ELEMENT**

Place ammo on net.

**IV. CRITICAL PERFORMANCE MEASURE**

Lift/lower, carry, crouch.

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORIZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE/PERFORMANCE STANDARD	F PHYS D. CATEGORY					G MOS FREQ			
					S	L	M	H	VH	NP	O	F	C
					1. LIFT/LOWER	72 lbs		4 ft	Position boxes on net to assure proper load.				
2. CARRY	72 lbs	10 ft		Carry boxes from vehicle to net.							X		
3. PUSH													
4. PULL													
5. LOAD BEAR													
6. WALK/MARCH													
7. CLIMB/ DESCEND													
8. RUN/RUSH													
9. SWIM/DIVE													
10. DIG													
11. CRAWL													

FACTOR	WEIGHT/ LOAD	HORZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.										
					S	L	M	H	VP	NP	G	F	C							
12. THROW																				
13. HANDLE																				
14. FINGER																				
15. HAMMER/ POUND . .																				
16. SIT																				
17. RECLINE																				
18. REACH																				
19. STAND																				
20. STOOP																				
21. KNEEL																				
22. CROUCH			3 ft	Crouch to stay low under helicopter.																X

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Typical load is based on average weight handled by 1 person (small arms) on partial lift by 2 personnel. Boxes and projectiles must be unloaded from vehicle and positioned on net prior to airlift by helicopter. This is a group task with individual SM doing a share of the work.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY <input type="checkbox"/> LIGHT <input type="checkbox"/> MEDIUM <input type="checkbox"/> HEAVY <input type="checkbox"/> VERY HEAVY <input type="checkbox"/>																					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
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# PHYSICAL DEMANDS ANALYSIS WORKSHEET

CMF 55

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LEVEL 1

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PAGE 9 OF 21

**I. DUTIES**  
Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**  
Destruction of unserviceable conventional ammunition.

<b>III. CRITICAL TASK ELEMENT</b>	<b>IV. CRITICAL PERFORMANCE MEASURE</b>
Off-Load ammo from truck and place the ammo in destruction pit.	Lift/lower, carry & dig hole.

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORIZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE PERFORMANCE STANDARD	F PPE CATEGORY					G MOS FREQ.				
					S	L	M	VH	NP	O	P	C		
1. LIFT/LOWER	72 lbs		4 ft	Lift/lower items from vehicle to pit for destruction.								X		
2. CARRY	72 lbs	20 ft		Carry items from vehicle to destruction site.								X		
3. PUSH														
4. PULL														
5. LOAD BEAR														
6. WALK/MARCH														
7. CLIMB/DESCEND														
8. RUN/RUSH														
9. SWIM/DIVE														
10. DIG	20 lbs			Dig hole for destruction of unserviceable ammunition.								X		
11. CRAWL														

FACTOR	WEIGHT/ LOAD	HORIZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.				
					S	L	M	H	VH	NP	C	F	C	
12. THROW														
13. HANDLE														
14. FINGER														
15. HAMMER/ POUND . .														
16. SIT														
17. RECLINE														
18. REACH														
19. STAND														
20. STOOP														
21. KNEEL														
22. CROUCH														

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Dig holes approx 2 X 4 X 6, carry various sizes and wt of ammunition as required. Load can vary from 72 to 120 lbs, from 5.56mm small arms to 105mm. Some 8" rounds weigh 200 lbs. Group task.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY       LIGHT       MEDIUM       HEAVY       VERY HEAVY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

**PHYSICAL DEMANDS ANALYSIS WORKSHEET**  
**CMF 55**

MOS 55B10

LEVEL 1

DATE Feb 82

PAGE 10 OF 21

**I. DUTIES**

Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**

Perform care and preservation of ammunition.

**III. CRITICAL TASK ELEMENT**

Lift, carry tool box & ammunition being worked on.

**IV. CRITICAL PERFORMANCE MEASURE**

Lift, carry, hammer/pound, stoop, and crouch.

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORIZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE/PERFORMANCE STANDARD	F PHYS D CATEGORY					G MOS FREQ				
					S	L	M	H	VH	NP	O	P	C	
1. LIFT/LOWER	120 lbs		4 ft	Lift/lower tools and ammunition item to be worked on.									X	
2. CARRY	120 lbs	10 ft		Carry items to be worked on to work site.									X	
3. PUSH														
4. PULL														
5. LOAD BEAR														
6. WALK/MARCH	120 lbs	30 ft		Walk from storage site or transport vehicle to work site.									X	
7. CLIMB/ DESCEND														
8. RUN/RUSH														
9. SWIM/DIVE														
10. DIG														
11. CRAWL														

FACTOR	WEIGHT/ LOAD	HORIZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.								
					S	L	M	H	VH	D	F	C						
12. THROW																		
13. HANDLE																		
14. FINGER																		
15. HAMMER/ POUND . .																		
16. SIT																		
17. RECLINE																		
18. REACH																		
19. STAND				Standing for long periods is required.														X
20. STOOP																		
21. KNEEL																		
22. CROUCH																		

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Typical weight is based on the weight of 1 box of 105mm ammunition. Personnel performing this task are required to lift/lower, carry, walk, and perform maintenance on ammunition. This task is performed as a group task.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY       LIGHT       MEDIUM       HEAVY       VERY HEAVY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

**PHYSICAL DEMANDS ANALYSIS WORKSHEET**  
**CMF 55**

MOS 55B10

LEVEL 1

DATE Feb 82

PAGE 11 OF 21

**I. DUTIES**

Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**

Maintain storage site.

**III. CRITICAL TASK ELEMENT**

Dig fire breaks & drainage

**IV. CRITICAL PERFORMANCE MEASURE**

Lift/lower, carry, push, pull, walk

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORIZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE/PERFORMANCE STANDARD	F PHYS D CATEGORY						G MOS FREQ				
					S	L	M	H	VH	NP	O	F	C		
1. LIFT/LOWER	20 lbs		2-4 ft	Lower and lift shovel, remove dirt or debris to clear area.									X		
2. CARRY	40 lbs	10 ft		Carry bags filled with dirt to clear areas.									X		
3. PUSH	40 lbs	1 ft		Push bags to align load/stack.									X		
4. PULL	40 lbs	1 ft		Pull bags to align load/stack.									X		
5. LOAD BEAR															
6. WALK/MARCH															
7. CLIMB/ DESCEND															
8. RUN/RUSH															
9. SWIM/DIVE															
10. DIG				Dig trenches and fire breaks.									X		
11. CRAWL															

FACTOR	WEIGHT/ LOAD	HORIZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.											
					S	L	M	K	VH	NP	O	F	C								
12. THROW																					
13. HANDLE																					
14. FINGER																					
15. HAMMER/ POUND . .																					
16. SIT																					
17. RECLINE																					
18. REACH																					
19. STAND																					
20. STOOP																					
21. KNEEL																					
22. CROUCH																					

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Typical load is shovel filled with dirt and standard sand bags filled with dirt/sand, estimated weight 20-40 lbs. Shovels and sand bags are used to move earth to clear areas for fire breaks and drainage. This is normally a group task. However, SM may be expected to do the task alone with supervision.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY       LIGHT       MEDIUM       HEAVY       VERY HEAVY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

**PHYSICAL DEMANDS ANALYSIS WORKSHEET**  
**CMF 55**

MOS 55B10

LEVEL 1

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<b>I. DUTIES</b> Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.														
<b>II. TASK SUMMARY</b> Repair and repaint ammunition and containers.														
<b>III. CRITICAL TASK ELEMENT</b>				<b>IV. CRITICAL PERFORMANCE MEASURE</b>										
Lift and carry boxes from pallet to work bench.				Lift, carry and stand.										
<b>V. ANALYSIS</b>														
A FACTOR	B WEIGHT/ LOAD	C HORIZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE/PERFORMANCE STANDARD	F PHYS D CATEGORY					G MCS FREQ				
					S	L	M	H	VH	NP	O	F	C	
1. LIFT/LOWER	72 lb		4 Ft	Lift/lower boxes to gain access.								X		
2. CARRY	72 lb	10 Ft	6 Ft	Carries boxes to work area.								X		
3. PUSH	72 lb	2 Ft		Pushes boxes to align with stack.								X		
4. PULL	72 lb	2 Ft		Pulls boxes to align with stacks.								X		
5. LOAD BEAR														
6. WALK/MARCH														
7. CLIMB/ DESCEND														
8. RUN/RUSH														
9. SWIM/DIVE														
10. DIG														
11. CRAWL														

• CMF Form 392 (One-Time)  
1 Jul 81

FACTOR	WEIGHT/ LOAD	HORZ. DISTANCE	VERTICAL DISTANCE	WORF. RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY						MO	
					S	L	M	H	V	A		P
12. THROW												
13. HANDLE												
14. FINGER												
15. HAMMER/ POUND . .												
16. SIT												
17. RECLINE												
18. REACH												
19. STAND												
20. STOOP												
21. KNEEL												
22. CROUCH												

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Repairs and repaints ammunition and containers as needed. Stands holding paint sprayer or paint brush as required when painting.

Calculations are based on boxed 5.56mm small arms ammunition. Boxes must be carried to flat bed trailer for return to warehouse location. This task is usually done as a group task. However, SM may be expected to do the task single handed with supervision.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY <input type="checkbox"/>		LIGHT <input type="checkbox"/>		MEDIUM <input type="checkbox"/>		HEAVY <input type="checkbox"/>		VERY HEAVY <input type="checkbox"/>												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

# PHYSICAL DEMANDS ANALYSIS WORKSHEET

CMF 55

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LEVEL 1

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PAGE 13 OF 21

**I. DUTIES**

Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**

Operate M.H.E. (pallet jack)

**III. CRITICAL TASK ELEMENT**

Push and pull pallets of ammunition using pallet jack.

**IV. CRITICAL PERFORMANCE MEASURE**

Push, pull, walk.

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORIZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE/PERFORMANCE STANDARD	F PHYS D CATEGORY					G MOS FREQ				
					S	L	M	H	VH	NP	O	P	C	
1. LIFT/LOWER														
2. CARRY														
3. PUSH	2000 Lb	20 Ft		Push pallet jack with pallet of ammunition in to storage location.										X
4. PULL	2000 Lb	20 Ft		Pull pallet jack with pallet in to storage location and into position.										X
5. LOAD BEAR														
6. WALK/MARCH	2000 Lb	20 Ft		Walks while position- ing pallet jack with load into storage location.										X
7. CLIMB/ DESCEND														
8. RUN/RUSH														
9. SWIM/DIVE														
10. DIG														
11. CRAWL														

FACTOR	WEIGHT/ LOAD	HORIZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.											
					S	L	M	H	VH	NP	O	F	C								
12. THROW																					
13. HANDLE																					
14. FINGER																					
15. HAMMER/ POUND																					
16. SIT																					
17. RECLINE																					
18. REACH																					
19. STAND																					
20. STOOP																					
21. KNEEL																					
22. CROUCH																					

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Push and/or pull ammunition in magazine with use of pallet jack. Approximate load weight 2000 lbs. This task is normally performed as a group task due to weight and bulk of items being handled.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY       LIGHT       MEDIUM       HEAVY       VERY HEAVY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

**PHYSICAL DEMANDS ANALYSIS WORKSHEET**  
**CMF 55**

MOS 55B10

LEVEL 1

DATE Feb 82

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**I. DUTIES**

Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**

Safety inspections.

**III. CRITICAL TASK ELEMENT**

Walk approximately 2 miles.

**IV. CRITICAL PERFORMANCE MEASURE**

Walk.

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE/PERFORMANCE STANDARD	F PHYS D CATEGORY					G MOS FREQ				
					S	L	M	H	VH	NP	D	F	C	
1. LIFT/LOWER														
2. CARRY														
3. PUSH														
4. PULL														
5. LOAD BEAR														
6. WALK/MARCH		2 mi		Walk perimeter to assure fences are in good condition.								X		
7. CLIMB/ DESCEND														
8. RUN/RUSH														
9. SWIM/DIVE														
10. DIG														
11. CRAWL														

FACTOR	WEIGHT/ LOAD	HORIZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.			
					S	L	M	H	VH	NP	O	F	C
12. THROW													
13. HANDLE													
14. FINGER													
15. HAMMER/ POUND . .													
16. SIT													
17. RECLINE													
18. REACH													
19. STAND													
20. STOOP													
21. KNEEL													
22. CROUCH													

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Walk approximately 2 miles in performance of safety inspections.  
Checks perimeter fences etc. Group task.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY       LIGHT       MEDIUM       HEAVY       VERY HEAVY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

**PHYSICAL DEMANDS ANALYSIS WORKSHEET**  
**CMF 55**

MOS 55B10

LEVEL 1

DATE Feb 62

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**I. DUTIES**  
Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**  
Fill, stack, move sandbags.

<b>III. CRITICAL TASK ELEMENT</b> Carry and stack sandbags.	<b>IV. CRITICAL PERFORMANCE MEASURE</b> Lift/lower, carry, walk, push, pull.
--	---

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORIZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE PERFORMANCE STANDARD	F PHYS D CATEGORY					G MOS FREQ			
					S	L	M	H	VH	NP	O	F	C
1. LIFT/LOWER	50 1b			Lift/lower shovels of sand, sandbags.							X		
2. CARRY	50 1b			Carry filled sandbags from fill site to stack site.							X		
3. PUSH	50 1b			Push filled sandbags to align stacks.							X		
4. PULL	50 1b			Pull filled sandbags to align stacks.							X		
5. LOAD BEAR													
6. WALK/MARCH	50 1b	100 ft		Walk from fill site to stack site with full sandbags.							X		
7. CLIMB/DESCEND													
8. RUN/RUSH													
9. SWIM/DIVE													
10. DIG													
11. CRAWL													

FACTOR	WEIGHT/ LOAD	HORZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.				
					S	L	M	H	V	INP	O	F	C	
12. THROW														
13. HANDLE														
14. FINGER														
15. HAMMER/ POUND . .														
16. SIT														
17. RECLINE														
18. REACH														
19. STAND				Standing for long periods of time is required.									X	
20. STOOP														
21. KNEEL														
22. CROUCH														

**VI. EXPLANATION/COMMENT – PHYSICAL DEMAND FACTORS**

Typical weight is based on the average weight of a full sandbag. Personnel performing this task is required to lift/lower, stand, push, pull and walk carrying full sandbags. Sandbags must be filled and stacked.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY       LIGHT       MEDIUM       HEAVY       VERY HEAVY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

**PHYSICAL DEMANDS ANALYSIS WORKSHEET**

**CMF 55**

MOS 55B10

LEVEL 1

DATE Feb 82

PAGE 16 OF 21

**I. DUTIES**

Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**

Perform electrical checks on ammunition item.

**III. CRITICAL TASK ELEMENT**

Carry voltmeter.

**IV. CRITICAL PERFORMANCE MEASURE**

Carry, walk.

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORIZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE/PERFORMANCE STANDARD	F PHYS D. CATEGORY						G MOS FREQ							
					S	L	M	H	VH	NP	O	A	C					
1. LIFT/LOWER																		
2. CARRY	5 lb			Carry voltmeter while testing ammunition items														X
3. PUSH																		
4. PULL																		
5. LOAD BEAR																		
6. WALK/MARCH	5 lb	200 ft		Walk from items to items to perform electrical check.														X
7. CLIMB/DESCEND																		
8. RUN/RUSH																		
9. SWIM/DIVE																		
10. DIG																		
11. CRAWL																		

FACTOR	WEIGHT/ LOAD	HORZ. DISTANCE	VERTICAL DISTANCE	WC	RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.									
						S	L	M	H	V-H	P	O	F							
12. THROW																				
13. HANDLE																				
14. FINGER																				
15. HAMMER/ POUND . .																				
16. SIT																				
17. RECLINE																				
18. REACH																				
19. STAND					Standing for long periods is required.															X
20. STOOP																				
21. KNEEL																				
22. CROUCH																				

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Typical load is based on the weight of the average issue voltmeter. Personnel performing this task are required to carry items from item to item and from storage site to storage site. This task is normally performed as a team.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY       LIGHT       MEDIUM       HEAVY       VERY HEAVY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**



FACTOR	WEIGHT/ LOAD	HORIZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ									
					S	L	M	H	V	A	P	O	F	C					
12. THROW																			
13. HANDLE				Various sizes of lumber and tools.														X	
14. FINGER																			
15. HAMMER/ POUND . .				Hammers & pounds for prolong periods of time.														X	
16. SIT																			
17. RECLINE																			
18. REACH																			
19. STAND				Stands for prolong periods of time.														X	
20. STOOP																			
21. KNEEL																			
22. CROUCH																			

**VI. EXPLANATION/COMMENT – PHYSICAL DEMAND FACTORS**

Typical load is based on the approximate weight of a 2" x 4" x 10 ft piece of lumber, the weight of a common hammer and saw. This task is done when ammunition is stored, shipped, received, boxes are repaired or palletized. This task is normally performed as a group.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY       LIGHT       MEDIUM       HEAVY       VERY HEAVY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

**PHYSICAL DEMANDS ANALYSIS WORKSHEET  
CMF 55**

MOS 55B10

LEVEL 1

DATE Feb 82

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**I. DUTIES**

Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**

Remove rust and corrosion from projectiles.

**III. CRITICAL TASK ELEMENT**

Lift and carry artillery projectiles.

**IV. CRITICAL PERFORMANCE MEASURE**

Lift, carry, push, handle, stand.

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORIZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE/PERFORMANCE STANDARD	F PHYS D CATEGORY					G MOS FREQ				
					S	L	M	H	VH	NP	O	F	C	
1. LIFT/LOWER	120 lb		6 ft	Projectiles to be lifted to roller conveyors, derusted & painted.								X		
2. CARRY	120 lb	4 ft		Boxes and projectiles to be carried and placed on pallets.								X		
3. PUSH	120 lb	3 ft		Projectiles and boxes to be pushed along conveyors.								X		
4. PULL														
5. LOAD BEAR														
6. WALK/MARCH														
7. CLIMB/ DESCEND														
8. RUN/RUSH														
9. SWIM/DIVE														
10. DIG														
11. CRAWL														

FACTOR	WEIGHT/ LOAD	HORZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS D. CATEGORY						MOS FREQ.							
					S	L	M	H	VM	INF	O	E	C					
12. THROW																		
13. HANDLE	50 lb			As required.													X	
14. FINGER																		
15. HAMMER/ POUND . . .																		
16. SIT																		
17. RECLINE																		
18. REACH																		
19. STAND				For long periods of time as required.														X
20. STOOP																		
21. KNEEL																		
22. CROUCH																		

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Lift and carry artillery projectiles and electric wire brushes as required. Standing for prolong periods of time handling wire brushes (elec) wt approx 10-15 lbs. Calculations based on 105mm HE w/fuze 2 ea per box 120 lbs. Group task.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY       LIGHT       MEDIUM       HEAVY       VERY HEAVY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

**PHYSICAL DEMANDS ANALYSIS WORKSHEET  
CMF 55**

MOS 55B10

LEVEL 1

DATE Feb 82

PAGE 19 OF 21

**I. DUTIES**

Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**

Perform CBR detection and decontamination procedures.

**III. CRITICAL TASK ELEMENT**

Decontamination of ammunition

**IV. CRITICAL PERFORMANCE MEASURE**

Stoop/kneel, lift/lower, carry, walk.

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORIZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE/PERFORMANCE STANDARD	F PHYS D. CATEGORY					G MOS FREQ				
					S	L	M	H	VH	NP	O	F	C	
					1. LIFT/LOWER	50 lb		4 ft	Lift/lower detector kits, load unload decon material.					
2. CARRY	50 lb		20 ft	Carry decon material to required location								X		
3. PUSH	15 lb	2 ft		Required to scrub equipment with decon material								X		
4. PULL	15 lb	2 ft		Required to scrub equipment with decon material.								X		
5. LOAD BEAR														
6. WALK/MARCH				Walk thru area to test for contamination, carries decon material.								X		
7. CLIMB/ DESCEND														
8. RUN/RUSH														
9. SWIM/DIVE														
10. DIG														
11. CRAWL														

FACTOR	WEIGHT/ LOAD	HORZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.										
					S	L	M	H	VH	N	O	F	C							
12. THROW																				
13. HANDLE																				
14. FINGER																				
15. HAMMER/ POUND																				
16. SIT																				
17. RECLINE																				
18. REACH																				
19. STAND					Stays on feet for duration of task.															X
20. STOOP					As required.															X
21. KNEEL					As required.															X
22. CROUCH																				

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Typical load is based on containers of decon material approx 50 lbs ea. Individuals are required to perform under extreme adverse conditions in protective clothing. Duration of this task is based on the extent of contamination and protective clothing required. *if* self contained breathing apparatus is required. Time is limited accordingly.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY       LIGHT       MEDIUM       HEAVY       VERY HEAVY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

**PHYSICAL DEMANDS ANALYSIS WORKSHEET**  
**CMF 55**

MOS 55B10

LEVEL 1

DATE Feb 82

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**I. DUTIES**

Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**

Erect general purpose tent.

**III. CRITICAL TASK ELEMENT**

Erect tent.

**IV. CRITICAL PERFORMANCE MEASURE**

Lift/lower, pull, Pound, dig.

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORIZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE: PERFORMANCE STANDARD	F PHYS D CATEGORY					G MOS FREQ				
					S	L	M	H	VH	NP	O	F	C	
1. LIFT/LOWER	400 lbs		2 ft	Assist other personnel in erecting GP Tent.								X		
2. CARRY	400 lbs		10 ft	Assist group in carrying GP Tent to erection site.								X		
3. PUSH	400 lbs	1 ft		Assist in pushing poles into position.								X		
4. PULL	400 lbs	1 ft		Assist in pulling tent into position.								X		
5. LOAD BEAR														
6. WALK/MARCH														
7. CLIMB/ DESCEND														
8. RUN/RUSH														
9. SWIM/DIVE														
10. DIG														
11. CRAWL														

FACTOR	WEIGHT/ LOAD	HCAZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.										
					S	L	M	H	VH	HP	O	F	C							
12. THROW																				
13. HANDLE																				
14. FINGER																				
15. HAMMER/ POUND . .																				
16. SIT																				
17. RECLINE																				
18. REACH																				
19. STAND																				
20. STOOP																				
21. KNEEL																				
22. CROUCH																				

**VI. EXPLANATION/COMMENT – PHYSICAL DEMAND FACTORS**

Typical load is based on a percentage of the total weight on 1 GP tent to be erected by a 4 member crew. Average weight will be approximately 100 lbs per person. This is a group task. Tents are used for shelter and work performance.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY       LIGHT       MEDIUM       HEAVY       VERY HEAVY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**

# PHYSICAL DEMANDS ANALYSIS WORKSHEET

CMF 55

MOS 55B10

LEVEL 1

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**I. DUTIES**

Assists in receipt, storage, issue, and maintenance of ammunition components and explosives.

**II. TASK SUMMARY**

Replace/install fuzes on artillery rounds.

**III. CRITICAL TASK ELEMENT**

Replace and maintain fuzes.

**IV. CRITICAL PERFORMANCE MEASURE**

Lift, lower, carry, walk, reach, stand, push, pull.

**V. ANALYSIS**

A FACTOR	B WEIGHT/ LOAD	C HORZ. DISTANCE	D VERTICAL DISTANCE	E WORK RATE PERFORMANCE STANDARD	F PHYS C CATEGORY						G MOS FREQ			
					S	L	M	H	VH	NP	O	F	C	
					1. LIFT/LOWER	66 1b	5 ft	4 ft	Lift rounds onto table or work area. Lower round into boxes or pallets.					
2. CARRY	66 1b	5 ft		Carry rounds from 1 work area to 2d work area.								X		
3. PUSH	66 1b	5 ft		Push rounds along conveyors to next stations.								X		
4. PULL	66 1b	5 ft		Pull rounds along conveyors.								X		
5. LOAD BEAR														
6. WALK/MARCH		5 ft		Walk from station to station on main-tenance line.								X		
7. CLIMB/ DESCEND														
8. RUN/RUSH														
9. SWIM/DIVE														
10. DIG														
11. CRAWL														

FACTOR	WEIGHT/ LOAD	HORZ. DISTANCE	VERTICAL DISTANCE	WORK RATE/PERFORMANCE STANDARD	PHYS. D. CATEGORY					MOS FREQ.										
					S	L	M	H	VH	O	F	C								
12. THROW																				
13. HANDLE																				
14. FINGER																				
15. HAMMER/ POUND . .																				
16. SIT																				
17. RECLINE																				
18. REACH	66 lbs			Reach into boxes to remove rounds & fuzes.															X	
19. STAND				Stand along maintenance line to perform task.															X	
20. STOOP																				
21. KNEEL																				
22. CROUCH																				

**VI. EXPLANATION/COMMENT - PHYSICAL DEMAND FACTORS**

Typical load is based on weight of 1 ea 105mm projectile. This task is performed on an as required basis. Personnel performing this task are required to lift/lower, carry, push, pull, and stand for long periods of time.

**VII. PHYSICAL DEMANDS RATING  
(FOR USE BY TRAINING AND DOCTRINE COMMAND)**

SEDENTARY       LIGHT       MEDIUM       HEAVY       VERY HEAVY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

**VIII. PHYSICAL CAPACITY MEASURES FOR MOS QUALIFICATION  
(FOR USE BY US ARMY RESEARCH INSTITUTE FOR ENVIRONMENTAL MEDICINE)**



DEPARTMENT OF THE ARMY  
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR PERSONNEL  
WASHINGTON, DC 20310

REPLY TO  
ATTENTION OF

DAPE-ZAW

25 March 1982

SUBJECT: MOS Physical Demands Analysis (MOS 55B10, Ammunition Specialist)

TO: Commander  
US Army Ordnance Center and School  
ATTN: ATSL-CD-OR (Mr. Schultz)  
Aberdeen Proving Ground, Maryland 21005

1. Reference undated TRADOC Pamphlet, "Assessing the Physical Demands and Direct Combat Probability of US Army Organizations, MOS, and Duty Positions".

2. Your physical demands analysis for MOS 55B10 has been reviewed. Based on this review, the physical requirements you identified place this MOS in the category shown below for the reasons indicated.

PHYSICAL DEMANDS CATEGORY	PHYSICAL DEMANDS CLASSIFICATION CRITERION	RATIONALE FOR PHYSICAL DEMANDS CLASSIFICATION
Very Heavy Lifting Lowering Pushing Pulling Carrying Handling	Lift over 100 pounds with frequent lifting of 50 pounds	Soldier required to lift up to 100 pounds with frequent lifting or constant lifting of weights up to 72 pounds. The cumulative and sustained nature of this work requires that MOS be classified Very Heavy.

DAPE-ZAW

25 March 1982

SUBJECT: MOS Physical Demands Analysis (MOS 55B10, Ammunition Specialist)

3. To complete the Physical Demands Analysis for this MOS, please respond to the following:

- a. Do you concur with the physical demands classification?
- b. If you nonconcur with the physical demands classification, please provide the reasons for your nonconcurrency.
- c. If you, as the MOS proponent, were asked by the courts to select one individually and constantly (80% of the time) performed physical task that is most representative of the MOS, what task would you select:
  - (1) for a combat environment?
  - (2) for a garrison environment?
- d. If you, as the MOS proponent, were asked by the courts to select one team (group) and constantly (80% of the time) performed task that is most representative of the MOS, what task would you select:
  - (1) for a combat environment?
  - (2) for a garrison environment?
- e. Describe the most physically demanding organizational task a soldier in this MOS must perform (e.g., erect tentage, load unit equipment, construct unit defensive positions) that is not related to MOS duties explicitly or implicitly stated in AR 611-201.
- f. Is the soldier working in this MOS exposed to toxic fumes, gases, or mists? If so please describe type (if feasible) and ventilation environment (i.e., outside, inside).
- g. Is the soldier working in this MOS exposed to nerve gas agents?
- h. Have any problem areas come to your attention regarding the:
  - (1) ability of men to physically perform in this MOS?
  - (2) ability of women to physically perform in this MOS?

DAPE-ZAW

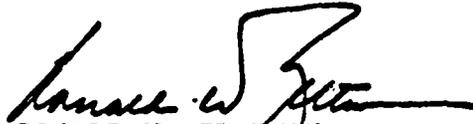
25 March 1982

SUBJECT: MOS Physical Demands Analysis (MOS 55B10, Ammunition Specialist)

1. What physical conditioning/training/exercise strategy do you believe is needed to improve the physical performance of soldiers in this task?

4. Attached is a sample response to questions in paragraph 3 above. Use sample as a reference in preparing your report which should be forwarded NLT 26 May 1982 to HQDA, ATTN: DAPE-ZAW, Room 2D663, Pentagon, Washington, DC 20310.

FOR THE DEPUTY CHIEF OF STAFF FOR PERSONNEL:



RONALD W. ZELTMAN  
Brigadier General, USA  
Director, Women in the Army  
Policy Review Group

2 Incl

1. Classification notes
2. Sample response

## CLASSIFICATION NOTES

MOS 55B10

1. GENERAL DESCRIPTION OF DUTIES. Assists in receipt, storage, issue, and maintenance of ammunition, ammunition components, and explosives.
2. RECOMMENDATION FOR MOS PROLIFERATION. None.
3. SIGNIFICANT TASKS USED TO CLASSIFY THE MOS. Load/unload small arms ammunition boxes. Stack boxes of small arms ammunition. Climb stacks of ammunition to gain access to stock. Strap/block and tie down ammunition. Lift and carry boxes of ammunition. Move ammunition items to gain access for inspection. Physically separate ammunition. Place ammunition on a net. Off-load ammunition from truck and place the ammunition in a destruction pit. Lift and carry tool box and ammunition being worked on. Dig fire breaks and drainage. Lift and carry boxes from pallet to work bench. Push and pull pallets of ammunition using pallet jack. Walk a perimeter fence line during safety inspections. Carry and stack sandbags. Lift and carry artillery projectiles. Decontaminate ammunition. Replace and maintain fuses.
4. CRITICAL PERFORMANCE MEASURES USED TO CLASSIFY THE MOS:
  - a. Lift/lower 72 pounds a distance of 4 feet. Push and pull 72 pounds for a distance of 1 foot. Ammunition is being lifted to truck bed at the rate of 20 boxes per hour. Ammunition is being carried from stack to truck. Boxes are being pushed to gain lifting hold for positioning on truck. Lift 72 pounds to a height of 4 feet, carry the 72 pounds for a distance of 10 feet, and push and pull that weight for a distance of 1 foot. Repeat this process 20 times for one hour.
  - b. Climb a stack of crates for a vertical distance of 8 feet. Push and pull items weighing 120 pounds for a distance of 2 feet while gaining access to items in the stack. Soldier climbs stacks of ammunition at storage locations to observe markings on ammunition and containers. Reaches into storage bins to remove items. Stands for prolonged periods of time (up to 2 hours). Push and pull items weighing 120 pounds for identification purposes. Calculations are based on 105mm HE ammunition, two rounds per box for a total weight of 120 pounds. Work can be shared by two persons (approximate weight per person is 60 pounds).

INCLOSURE 1

c. Lift and carry 150 pounds of steel banding equipment for a distance of 10 feet. Push and pull boxes weighing 72 pounds for proper alignment necessary for bracing, blocking, and staying. Calculations are based on 72 pound boxes of 5.565 small arms ammunition.

d. Lift and carry boxes of ammunition weighing 120 pounds. Lift 120 pounds to a height of 4 feet, carry the weight for a distance of 10 feet, and push/pull 120 pounds for a distance of 2 feet. Work based on two soldiers sharing the weight load.

e. Lift 100 pounds to a height of 4 feet and carry for a distance of 10 feet. Calculation is based on the weight of 1 each 155mm round of artillery.

f. Erect a 400 pound general purpose tent for shelter and working. A four soldier team erects the tent. Work requires individual soldier to lift, carry, push/pull, and handle 100 pounds until tent is erected.

5. CLASSIFICATION RATIONALE. Soldier required to lift over 100 pounds with frequent or constant lifting of 72 pounds. The cumulative and sustained nature of this work creates a very heavy work environment that imposes significant human energy costs on the soldier. MOS is classified as Very Heavy. Physical Demands Rating is V 1, 2, 3, 4, 13, and 18.

**SUBJECT: MOS Physical Demands Analysis (MOS 36C)**

**TO: Headquarters, Department of the Army  
Office of the Deputy Chief of Staff for Personnel  
ATTN: DAPE-ZAW, Room 2D663, Pentagon  
Washington, DC 20310**

1. Reference letter, DAPE-ZAW, dtd subject as  
above.
2. Remarks are keyed to paragraphs of reference letter:
  - a. Paragraph 3a. Concur.
  - b. Paragraph 3c(1). Soldiers climb poles and trees to install, repair and replace communications cable and wire. Soldiers navigate terrain (walk, climb) installing, repairing, and retrieving telephone wire.
  - c. Paragraph 3c(2). Soldiers operate switchboards and other communications equipment.
  - d. Paragraph 3d(1). Soldier, as part of a team, carries wire reels over irregular terrain, or negotiates terrain to repair and replace wire/cable.
  - e. Paragraph 3d(2). None.
  - f. Paragraph 3e. Upload unit equipment such as camouflage kits, and other items weighing from 25 lbs to 65 lbs.
  - g. Paragraph 3f. No.
  - h. Paragraph 3g. No.
  - i. Paragraph 3h(1). No.
  - j. Paragraph 3h(2). Some women have experienced difficulty in working for sustained periods while repairing and replacing cables mounted on telephone poles.

**INCLOSURE 2**

OFFICE SYMBOL

SUBJECT: MOS Physical Demands Analysis (MOS 36C)

k. Paragraph 3i. School has recommended to ODCSOPS, DA that strategies for improving upper torso strength be developed.

SIGNATURE BLOCK



DEPARTMENT OF THE ARMY Mr. Powell/jp/746-47C  
UNITED STATES ARMY MISSILE AND MUNITIONS CENTER AND SCHOOL  
REDSTONE ARSENAL, ALABAMA 35897

12 MAY 1982

ATSK-TDA-M

SUBJECT: MOS Physical Demands Analysis (MOS 55B)

Headquarters, Department of the Army  
Office of the Deputy Chief of Staff for Personnel  
ATTN: DAPE-ZAW, Room 2D663, Pentagon  
Washington, DC 20310

1. Reference letter, DAPE-ZAW, dtd 25 Mar 82, subject as above.
2. Remarks are keyed to paragraphs of reference letter:
  - a. Paragraph 3a. Concur.
  - b. Paragraph 3c(1). Soldiers load/unload small arms ammunition boxes weighing 72 pounds. Soldiers stack boxes of small arms and lift and carry ammunition.
  - c. Paragraph 3c(2). Same as b above.
  - d. Paragraph 3d(1). A soldier, as part of a team, must lift and carry 150 pounds of steel banding equipment, lift and carry boxes of ammunition weighing 120 pounds, and push/pull 120 pounds for a distance of two feet.
  - e. Paragraph 3d(2). Same as d above.
  - f. Paragraph 3e. Soldier must dig fire breaks and drainage, walk a perimeter fence line, carry and stack sandbags, and erect a 400 pound general purpose tent with assistance.
  - g. Paragraph 3f. Soldier may be exposed to toxic fumes resulting from storage of ammunition/explosives inside magazines and at outside storage locations.

12 MAY 1982

ATSK-TDA-M

SUBJECT: MOS Physical Demands Analysis (MOS 55B)

h. Paragraph 3g. Soldiers may be exposed to nerve gas agents if assigned to units responsible for maintaining munitions containing this substance.

i. Paragraph 3h(1). No.

j. Paragraph 3h(2). Most women experience difficulty in working for sustained periods while lifting and/or carrying ammunition.

k. Paragraph 3i. Recommend that strategies be developed for improving upper torso and leg strength for soldiers in MOS 55B.

FOR THE COMMANDANT:



DELBERT R. BROOKS  
Colonel, Ordnance Corps  
Director of Training Developments

TAB A 5/

Frequency of Physical Demands Factors. When assessing the presence of a physical demands factors in work activity, the frequency of each factor in task performance may have a bearing on the criticality of tasks, and on the ultimate classification of the MOS. The following frequency scale applies to MOS physical demands analysis:

(1) Not Present. Activity or condition does not exist.

(2) Occassionally. Activity or condition exists under 20 percent of the time.

(3) Frequently. Activity or condition exists between 20 percent and 80 percent of the time.

(4) Constantly. Activity or condition exists over 80 percent of the time.

NOTE: The intensity of strength-related factors, such as lifting, carrying, pushing, pulling, and load bearing must be described in terms of frequency or duration.

5/ HQ, TRADOC, Procedures Manual "Assessing the Physical Demands and Direct Combat Probability of United States Army Operations, Military Occupational Specialties and Duty Position" (prepared Jan 82), page 28.

Direct Combat Probability Code  
(P1)

Personnel in this category have a high probability of routinely engaging in direct combat

1. Soldiers serve in P1 positions if: (Either a, b, or c)
- a. According to ARs 611-1D, 611-1E, and 611-201, their duties/tasks specifically require participation in direct combat.
- (Direct combat is defined as engaging an enemy with individual or crew served weapons while being exposed to direct enemy fire, a high probability of direct physical contact with the enemy's personnel, and a risk of capture. Direct combat takes place while closing with the enemy by fire, maneuver, and shock effect to destroy or capture him or while repelling his assault by fire, close combat, or counterattack).
- b. They are assigned to:
- (1) Units no higher than battalion level that have a mission of direct combat (or)
  - (2) Units no higher than battalion level that provide forward deployed combat elements close and continuous support in any of the following areas:
    - (a) Field Artillery (Cannon)
    - (b) Field Artillery (Rocket)
    - (c) Indirect Fire (e.g. Mortar)
    - (d) Anti-tank
    - (e) Ground Surveillance
    - (f) Aerial Scouting/Security
    - (g) Command & Control Aircraft
    - (h) Low Altitude Air Defense
    - (i) Air Assault/Tactical Mobility
    - (j) Attack Aviation
    - (k) Combat Engineering
- c. The tactical doctrine governing the employment of their unit or position within that unit, (regardless of the organizational level or echelon or echelon to which assigned) requires their continual:
  - (1) Presence in the forward combat area (e.g. Main Battle Area) (or)
  - (2) Collocation with direct combat personnel or units cited in 1A or 1B
- (3) Brigade level units providing command, control and supervision of tactical operations

DIRECT COMBAT PROBABILITY CODE  
(P2)

Personnel in this category may be expected to engage in direct combat

2. Soldiers serve in P2 positions if: (Either a or b)
- a. They are assigned to a division unit not coded P1, and their duties require that they enter the forward combat areas on a transient basis. (or)
  - b. Regardless of the organizational level or echelon to which assigned, (and not coded P1) they engage in combat offensive and defensive operations against minor enemy elements.

DIRECT COMBAT PROBABILITY CODE  
(P3)

Personnel in this category could be required to engage in direct combat.

3. Soldiers serve in P3 positions if: (Either a or b)
- a. They are assigned to:
- (1) Division level combat support/ combat service support (not coded P1) and their respective command and control elements. (or)
  - (2) The division headquarters. (or)
  - (3) Brigade size headquarters (not previously coded) assigned or routinely operating with the division.
- b. The tactical doctrine governing the employment of their unit, or position within that unit, requires that they:
- (1) Regardless of the organizational level or echelon to which assigned, maintain continual presence in the division rear area. (or)
  - (2) Provide air defense support using ADA systems located in the division area (and not coded P1).

DIRECT COMBAT PROBABILITY CODE  
(P4)

Personnel in this category may be infrequently exposed to direct combat

4. Soldiers serve in P4 positions if they: (Either a or b)
- a. Perform their duties at echelons above division and are required to enter the forward combat areas on a transient basis. (or)
  - b. Provide air defense support using ADA systems located at echelons above division.

DIRECT COMBAT PROBABILITY CODE  
(P5)

Personnel in this category are not normally expected to engage in direct combat

5. Soldiers serve in P5 positions if they perform their duties at corps level and are not required to enter the division area.

DIRECT COMBAT PROBABILITY CODE  
(P6)

Personnel in this category are not expected to engage in direct combat.

6. Soldiers serve in P6 positions if they: (Either a or b)
- a. Perform their duties at echelons above corps and along the lines of communication leading thereto and are not required to enter the combat zone. (or)
  - b. Perform their duties external to the Theatre of Operations, (including COMUS), but are required to enter the Theatre of Operations (but not enter the combat zone) on a transient basis.

DIRECT COMBAT PROBABILITY CODE  
(P7)

7. Personnel in this category serve in positions that will not be found in a Theatre of Operations.

**DIRECT COMBAT PROBABILITY ASSESSMENT  
FOR UNITED STATES ARMY ORGANIZATIONS, MILITARY  
OCCUPATIONAL SPECIALTIES AND DUTY POSITIONS**

PART I

Record MTOE or TDA Identification. For MTOE units, record only the SRC. For TDA units, record only the UIC.

UIC  
SRC 07-018H

QUES	YES	NO
1	X	
2	X	
3		

1. Is this unit of battalion or smaller size?
2. Does this unit have a primary mission of direct combat?
3. Does this unit provide close and continuous support to forward deployed combat elements (support in any of the following areas)?
  - a. Cannon Field Artillery
  - b. Rocket Field Artillery
  - c. Indirect Fire (e.g. Mortar Fire)
  - d. Anti-tank
  - e. Ground Surveillance/Remote Sensor
  - f. Aerial Scouting/Security
  - g. Command and Control Aviation
  - h. Low Altitude Air Defense
  - i. Air Assault/Tactical Mobility (Aviation)
  - j. Attack Aviation
  - k. Combat Engineering

If the answer to Questions 1 and 2 are both YES, or the answers to Questions 1 and 3 are both YES, do not answer any additional questions. Otherwise, proceed to Question 4.

NOTE

The following rationale is provided for instructional purposes only. It is not required by those filling out this questionnaire.

RATIONALE

1. This MTOE is a rifle company, organic to an infantry battalion.
2. A unit with this MTOE has the mission of closing with the enemy by means of fire and maneuver in order to destroy or capture him or to repel his assault by fire, close combat, and counter-attack.

**TABLE OF ORGANIZATION  
AND EQUIPMENT  
NUMBER 0701840**

**HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, D. C., 30 NOVEMBER 1970**

**RIFLE COMPANY, INFANTRY BATTALION, INFANTRY DIVISION  
OR  
RIFLE COMPANY, INFANTRY BATTALION, SEPARATE INFANTRY BRIGADE  
DESIGNATION: COMPANY -----, ----- BATTALION, ----- INFANTRY**

**SECTION I**

**GENERAL**

**ORGANIZATION**

1. MISSION. TO CLOSE WITH THE ENEMY BY MEANS OF FIRE AND MANEUVER IN ORDER TO DESTROY OR CAPTURE HIM OR TO REPEL HIS ASSAULT BY FIRE, CLOSE COMBAT AND COUNTERATTACK.
2. ASSIGNMENT. ORGANIC TO:
  - A. INFANTRY BATTALION, INFANTRY DIVISION, TOE 7-15.
  - B. INFANTRY BATTALION, SEPARATE INFANTRY BRIGADE, TOE 7-15.
3. CAPABILITIES. A. AT LEVEL 1, THIS UNIT:
  - (1) PROVIDES A BASE OF FIRE AND MANEUVER.
  - (2) CLOSES WITH THE ENEMY IN ORDER TO DESTROY OR CAPTURE HIM.
  - (3) REPELS ENEMY ASSAULT BY FIRE, CLOSE COMBAT AND COUNTERATTACK.
  - (4) SEIZES AND HOLDS TERRAIN.
  - (5) MANEUVERS IN ALL TYPES OF TERRAIN AND UNDER ALL CLIMATE CONDITIONS.
  - (6) CAPITALIZES ON ALL FORMS OF MOBILITY.
- B. THE COLUMNS UNDER LEVELS 2 AND 3 ADAPT THIS TABLE FOR REDUCED OPERATIONAL CAPABILITY IN DECREMENTS OF 10%, FROM APPROXIMATELY 90% FOR LEVEL 2 TO 80% FOR LEVEL 3.
- C. THIS UNIT IS NOT APPLICABLE TO TYPE B ORGANIZATION.
- D. THE COLUMNS DESIGNATED BY LEVELS 1 THROUGH 3 ARE DESIGNED TO RELATE TO THE CATEGORIES ESTABLISHED IN AR 220-1, UNIT READINESS AND AR 135-B, RESERVE COMPONENT UNIT READINESS.
- E. INDIVIDUALS OF THIS ORGANIZATION, EXCEPT MEDICAL PERSONNEL, CAN ENGAGE IN EFFECTIVE, COORDINATED DEFENSE OF THE UNIT'S AREA OR INSTALLATION.
- F. THIS UNIT IS DEPENDENT UPON:
  - (1) THE HEADQUARTERS AND HEADQUARTERS COMPANY, TOE 7-16, FOR MEDICAL AND MESS SUPPORT AND FOR MAINTENANCE OF ORGANIC VEHICLES AND COMBAT SUPPORT COMPANY, TOE 7-28, FOR HEAVY ANTI-TANK SUPPORT.
  - (2) HEADQUARTERS AND HEADQUARTERS BATTERY, FIELD ARTILLERY BATTALION, 105MM, TOWED, TOE 6-756, OR HEADQUARTERS ANTI-TANK BATTERY, FIELD ARTILLERY BATTALION, 105MM, TOWED, SEPARATE INFANTRY BRIGADE, TOE 6-168, FOR FIRE SUPPORT. TOWNS TO PROVIDE OBSERVED FIRE SUPPORT AND FIRE SUPPORT COORDINATION.
  - G. DRAGON GLANNERS MUST BE DESIGNATED AS REQUIRED.
4. BASIS OF ALLOCATION. THREE PER:
  - A. INFANTRY BATTALION, INFANTRY DIVISION, TOE 7-15.
  - B. INFANTRY BATTALION, SEPARATE INFANTRY BRIGADE, TOE 7-15.
5. CATEGORY. THIS UNIT IS DESIGNATED A CATEGORY I UNIT.

- (REFERENCE UNIT CATEGORIES, AR 310-25.)
6. MOBILITY. THIRTY PERCENT MOBILE IN ORGANIC VEHICLES. WHEN UNIT REPLACES ADDITIONAL GENERAL PURPOSE TRANSPORTATION IS REQUIRED FOR FIVE TONS OF SUPPLIES AND EQUIPMENT, 135 PERSONNEL AND 165 CUBIC FEET OF SUPPLIES/EQUIPMENT CANNOT BE MOVED WITH ORGANIC VEHICLES.
7. THIS TABLE IS IN ACCORDANCE WITH AR 310-SERIES AND, TOGETHER WITH DOCUMENTS LISTED IN PARAGRAPH 10, IS THE AUTHORITY TO REQUISITION AND ISSUE, IN ACCORDANCE WITH PERTINENT DEPARTMENT OF THE ARMY DIRECTIVES, ALL ITEMS LISTED HEREIN UNLESS OTHERWISE INDICATED.
8. IN ACCORDANCE WITH PERTINENT DEPARTMENT OF THE ARMY AND/OR THEATER DOCUMENTS, UNITS ARE AUTHORIZED THE FOLLOWING (DEFINITION OF TERMS IN ACCORDANCE WITH AR 310-25 AS APPLIED BY SB 78-26):
  - A. BASIC LOAD.
  - B. PRESCRIBED LOAD.
9. WHEN THERE APPEARS TO BE A DISCREPANCY IN SECTION III BETWEEN THE ALLOWANCES SHOWN IN THE "EQUIPMENT LEVEL" COLUMN AND THE BASIS OF DISTRIBUTION AS INDICATED IN THE "REMARKS" COLUMN, THE AMOUNT SHOWN IN THE LEVEL COLUMN WILL GOVERN.
10. BASIC DA PUBLICATIONS PERTAINING TO ALLOWANCES OF EQUIPMENT, SECTION III OF THIS TOE, ARE LISTED BELOW. ALSO, SPECIFIC ITEMS OF CLOTHING, EQUIPMENT, COMPONENTS OF SETS AND KITS, REPAIR PARTS, ACCESSORIES, SPECIAL TOOLS AND ALLOWANCES OF EXPENDABLE ITEMS, AS CONTAINED IN PUBLICATIONS REFERENCED BELOW, ARE AUTHORIZED SO FAR AS THEY PERTAIN TO THE ALLOWANCES FOR THE ORGANIZATION AND/OR INDIVIDUALS COVERED BY THIS TABLE.
  - A. ARMY REGULATIONS (AR).
    - AR 40-61, MEDICAL MATERIEL POLICIES AND PROCEDURES.
    - AR 700-84, ISSUE AND SALE OF PERSONAL CLOTHING.
    - AR 725-8, REQUISITION AND REMOVAL OF MAJOR FEMO COMPONENTS FROM ASSEMBLAGES AND SETS OF EQUIPMENT.
    - AR 840-10, DESCRIPTION AND USE OF FLAGS, GUIDONS, TABARDS AND AUTOMOBILE PLATES.
  - B. COMMON TABLES OF ALLOWANCES (CTA).
    - CTA 20-2, EQUIPMENT FOR TRAINING PURPOSES.
    - CTA 23, TARGETS AND TARGET EQUIPMENT.
    - CTA 23-100-3, AMMUNITION FOR TRAINING IN OVERSEA THEATERS.
    - CTA 23-100-6, AMMUNITION, ROCKETS AND MISSILES FOR UNIT TRAINING -- ACTIVE AND RESERVE COMPONENTS.
    - CTA 23-101, MISCELLANEOUS AMMUNITION AND EXPLOSIVES.

**DIRECT COMBAT PROBABILITY ASSESSMENT  
FOR UNITED STATES ARMY ORGANIZATIONS, MILITARY  
OCCUPATIONAL SPECIALTIES AND DUTY POSITIONS**

**PART I**

Record MTOE or TDA Identification. For UIC  
MTOE units, record only the SRC. For  
TDA units, record only the UIC. SRC **119-676H**

QUES	YES	NO
1	<b>X</b>	
2		<b>X</b>
3		<b>X</b>

1. Is this unit of battalion or smaller size?
2. Does this unit have a primary mission of direct combat?
3. Does this unit provide close and continuous support to forward deployed combat elements (support in any of the following areas)?
  - a. Cannon Field Artillery
  - b. Rocket Field Artillery
  - c. Indirect Fire (e.g. Mortar Fire)
  - d. Anti-tank
  - e. Ground Surveillance/Remote Sensor
  - f. Aerial Scouting/Security
  - g. Command and Control Aviation
  - h. Low Altitude Air Defense
  - i. Air Assault/Tactical Mobility (Aviation)
  - j. Attack Aviation
  - k. Combat Engineering

If the answer to Questions 1 and 2 are both YES, or the answers to Questions 1 and 3 are both YES, do not answer any additional questions. Otherwise, proceed to Question 4.

NOTE

The following rationale is provided for instructional purposes only. It is not required by those filling out this questionnaire.

RATIONALE

1. This is a HHD, organic to a battalion.
2. A unit with this MTOE provides command, control and staff planning, crime investigation, and supervision of administration, training, operations, and logistics for assigned or attached military police units.
3. Based on the rationale for question 2, a unit with this MTOE does not provide this type of support.

<p>4. Does this unit provide Air Defense Artillery support (other than low altitude ADA) while located in the division area?</p> <p>If the answer to Question 4 is YES, do not answer any additional questions. Otherwise, proceed to Question 5.</p>	<p>QUES</p> <p>YES</p> <p>NO</p> <p>X</p>
<p>5. Does this unit provide Air Defense Artillery support (other than low altitude ADA) while located in echelons above division?</p> <p>If the answer to Question 5 is YES, do not answer any additional questions. Otherwise, proceed to Question 6.</p>	<p>QUES</p> <p>YES</p> <p>NO</p> <p>X</p>
<p>6. Is the unit a brigade level unit? (i.e., Headquarters and Headquarters Co, Det).</p> <p>Does the unit provide command, control, and supervision of combat operations?</p> <p>If the answers to Questions 6 and 7 are both YES, do not answer any additional questions. Otherwise, proceed to Question 8.</p>	<p>QUES</p> <p>YES</p> <p>NO</p> <p>X</p>
<p>8. Does every soldier in this unit perform his/her duties solely at echelons above corps, but within a Theatre of Operations?</p> <p>If the answer to Question 8 is YES, do not answer any additional questions. Otherwise, proceed to Question 9.</p>	<p>QUES</p> <p>YES</p> <p>NO</p> <p>X</p>
<p>9. Does every soldier in this unit perform his/her duties solely in CONUS?</p> <p>If the answer to Question 9 is YES, do not answer any additional questions. Otherwise, proceed to Part II.</p>	<p>QUES</p> <p>YES</p> <p>NO</p> <p>X</p>

4,5. Based on the rationale for question 2, a "yes" response is not appropriate.

6. Based on the response to question 1, a "yes" response is not appropriate.

7. Same as question 3.

8,9. A "yes" response is not appropriate.

**DIRECT COMBAT PROBABILITY ASSESSMENT  
FOR UNITED STATES ARMY ORGANIZATIONS, MILITARY  
OCCUPATIONAL SPECIALTIES AND DUTY POSITIONS**

**PART II**

Record MTOE or TDA Identification. For TOE units, record the SRC. For TDA units, record the UIC. For either type unit, provide the paragraph and line number in the space provided.

UIC  
SRC 19-076H  
PAR 01  
LNS 01

QUES	YES	NO
1		X
2		X
3	X	

- Are soldiers carried in the above paragraph and line number required to be continually present or collocated with a unit in the forward combat area (i.e. Main Battle Area) by tactical doctrine? Commanders and principal staff of combat units, division level and below, automatically meet this criteria and should be given a YES response.
- Are soldiers carried in the above paragraph and line number required to possess an MOS, that according to AR 611-101/611-112/611-201, require the participation in direct combat?
- Are soldiers carried in the above paragraph and line number required to participate in offensive and defensive combat operations against minor enemy elements, regardless of the organizational level or echelon to which assigned, or do they provide routine support and services to those participating in such operations (including the chaplain)?

- This unit is generally found in the Corps area.
- This paragraph and line number is the battalion commander's. The authorized MOS is 31A, not one that requires participation in direct combat.
- A unit with this MTOE has this capability.

**NOTE:** This response is also appropriate for all members of the battalion staff, including the chaplain. The chaplain is included because he/she would be collocated with the rest of the staff and is exposed to the same risks.





PAR	LN#	QUES	YES	NO
02	04	4. Are soldiers carried in the above paragraph and line number assigned to a division and required to enter forward combat areas on a transient basis?		X
		5. Are soldiers carried in the above paragraph and line number assigned to a division level combat support/combat service support type unit?		X
		6. Are soldiers carried in the above paragraph and line number assigned to a division headquarters? (This includes the division headquarters company).		X
		7. Are soldiers carried in the above paragraph and line number assigned to a brigade level headquarters that does not engage in direct combat, and is organic to, or routinely operates with a division?		X
		8. Regardless of the organizational level or echelon to which assigned, would soldiers carried in the above paragraph and line number maintain continual presence in the division rear area?		X
		9. Do soldiers carried in the above paragraph and line number usually perform their duties at echelons above division and do these duties include entry into any portion of the division area on a transient basis?		X
		10. Do soldiers carried in the above paragraph and line number perform their duties only at corps level? (This includes the corps headquarters company).	X	
		11. Do soldiers carried in the above paragraph and line number perform their duties solely within echelons above corps?		

4. Same as 1 on previous page.
5. Same as 1 on previous page.
6. Not appropriate.
7. Not appropriate.
8. Not appropriate.
9. Not appropriate.
10. Soldiers in this paragraph and line number usually perform their duties in the Corps area. Similar responses are appropriate for the following positions also found in this MTOE:

- a. Cook (94B)
- b. Unit clerk (75B)
- c. Telecom Ctr Oper (72E)
- d. Equipment Maint Clk (76D)
- e. Power Gen/W Veh Mech (63B)
- f. Reenlistment NCO (79D)
- g. Legal Clerk (71D)
- h. Journalist (71Q)
- i. Chapel Act Sp (71M)
- j. Clerk Typist (71L)
- k. Illustrator (81E)
- l. Reports Clerk (71L)
- m. Comm Chief (31V)
- n. Auto Maint Tech (630A - War Off)
- o. Supply Sgt (76Y)
- p. General Supplyman (76Y)

**DIRECT COMBAT PROBABILITY ASSESSMENT  
FOR UNITED STATES ARMY ORGANIZATIONS, MILITARY  
OCCUPATIONAL SPECIALTIES AND DUTY POSITIONS**

**PART II**

Record MOE or TDA Identification. For TOE units, record the SRC. For TDA units, record the UIC. For either type unit, provide the paragraph and line number in the space provided.

UIC									
SRC	1	9	-	0	7	6	4		
PAR	0	2							
LN#	1	2							

	QUES	YES	NO
1. Are soldiers carried in the above paragraph and line number required to be continually present or collocated with a unit in the forward combat area (i.e. Main Battle Area) by tactical doctrine? Commanders and principal staff of combat units, division level and below, automatically meet this criteria and should be given a YES response.	1		X
2. Are soldiers carried in the above paragraph and line number required to possess an MOS, that according to AR 611-101/611-112/611-201, require the participation in direct combat?	2		X
3. Are soldiers carried in the above paragraph and line number required to participate in offensive and defensive combat operations against minor enemy elements, regardless of the organizational level or echelon to which assigned, or do they provide routine support and services to those participating in such operations (including the chaplain)?	3	X	

1. This paragraph and line number belongs to a Tactical Wire Operations Specialist. A "yes" response is not appropriate.
2. Same as 1 above.
3. Soldiers in this paragraph and line number are frequently collocated with forward elements of the unit. Since the unit has a capability to participate in offensive/defensive operations against minor enemy elements, a "yes" response is appropriate for all elements of the unit that are forward deployed.

**DIRECT COMBAT PROBABILITY ASSESSMENT  
FOR UNITED STATES ARMY ORGANIZATIONS, MILITARY  
OCCUPATIONAL SPECIALTIES AND DUTY POSITIONS**

**PART II**

Record MTOE or TDA Identification. For TOE units, record the SRC. For TDA units, record the UIC. For either type unit, provide the paragraph and line number in the space provided.

UIC					
SRC	1	9	-	0	764
PAR	0	2			
LN#	1	5			

QUES	YES	NO
1		X
2		X
3	X	

- Are soldiers carried in the above paragraph and line number required to be continually present or collocated with a unit in the forward combat area (i.e. Main Battle Area) by tactical doctrine? Commanders and principal staff of combat units, division level and below, automatically meet this criteria and should be given a YES response.
- Are soldiers carried in the above paragraph and line number required to possess an MOS, that according to AR 611-101/611-112/611-201, require the participation in direct combat?
- Are soldiers carried in the above paragraph and line number required to participate in offensive and defensive combat operations against minor enemy elements, regardless of the organizational level or echelon to which assigned, or do they provide routine support and services to those participating in such operations (including the chaplain)?

- This paragraph and line number belongs to a Military Policeman (95B). A "yes" response is not appropriate.
- Same as 1 above.
- A unit with this MTOE has a capability of participating in offensive/defensive operations against minor enemy elements. All Military Police positions found in this MTOE (Officer: 31A, Enlisted: 95B) would receive similar responses to the above questions.

TABLE OF ORGANIZATION  
AND EQUIPMENT  
NUMBER 19-76H

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
Washington, D.C. \_\_\_\_\_

HEADQUARTERS AND HEADQUARTERS DETACHMENT  
MILITARY POLICE BATTALION

Designation: Headquarters, \_\_\_\_\_ Military Police Battalion  
Headquarters Detachment, \_\_\_\_\_ Military  
Police Battalion

Section		Page
I.	General:	
	Organization-----	1
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II.	Personnel Allowances:	
	Distribution-----	8
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	Remarks-----	11
III.	Equipment Allowances:	
	Distribution-----	12
	Recapitulation-----	15
	Remarks-----	16

SECTION I

GENERAL

ORGANIZATION

1. MISSION. To provide command, control, and staff planning, crime investigation, and supervision of administration, training, operations, and logistics for assigned or attached military police units.

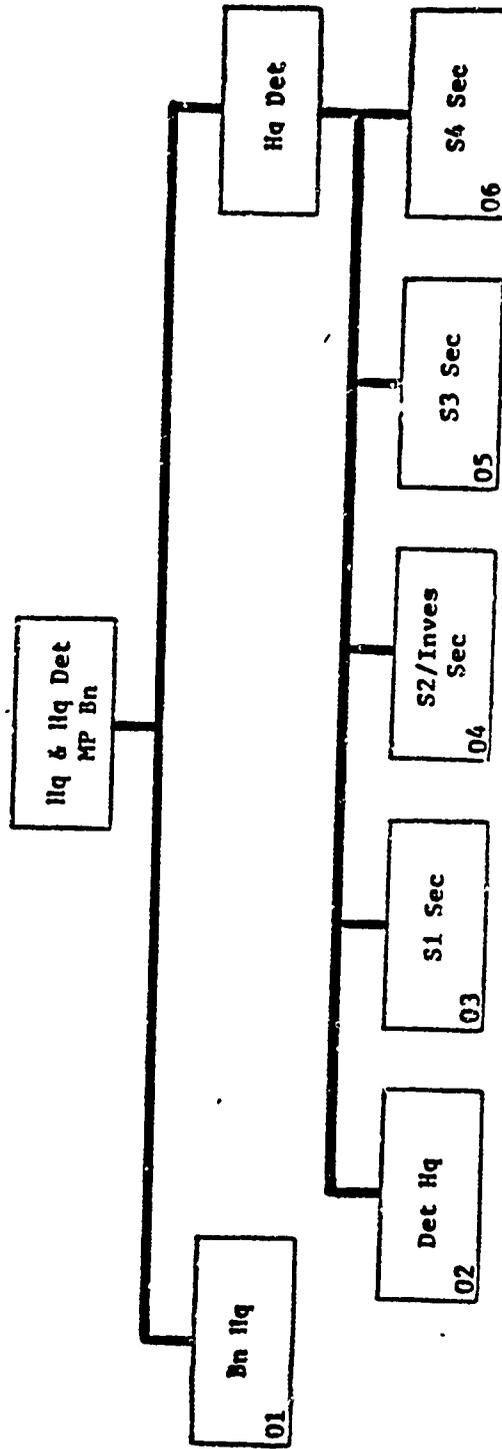
2. ASSIGNMENT. a. To Headquarters, Independent Division Task Force.

b. To corps, assigned to Headquarters and Headquarters Company, Military Police Group, TOE 19-272.

c. To theater army, assigned to Headquarters and Headquarters Company, Military Police Brigade, TOE 19-262.

3. CAPABILITIES. a. At Level 1, this unit provides:

HEADQUARTERS AND HEADQUARTERS DETACHMENT  
MILITARY POLICE BATTALION



(1) Command, staff planning, administration, and supervision of battalion operations for two to six military police companies.

(2) Supervision of subordinate unit's organizational supply, communications, and maintenance.

(3) Military police investigation support within the battalion area of responsibility.

(4) Supervision of and assistance to subordinate units in training and administration.

(5) Operation of the battalion communications system.

(6) Coordination of battalion activities to include rear area protection, populace and resources control, and participation in combat offensive and defensive operations against minor enemy elements when required.

(7) Within capability, support for a rear area operations center, when directed.

(8) Liaison with appropriate headquarters and agencies.

(9) Supervision of selecting, organizing, training, equipping, and employing indigenous military and paramilitary police units.

b. The columns under Levels 2 and 3 adapt the table for reduced operational capabilities, in decrements of 10%, from approximately 90% for Level 2 to approximately 80% for Level 3.

c. This unit is not adaptable to a type B organization.

d. The columns designated by Levels 1 through 3 are designed to relate to the categories established by AR 220-1, Unit Readiness.

e. Augmentation increases the capabilities of this unit to the extent provided by the augmentation personnel and equipment.

f. Individuals of this organization, except the chaplain, can engage in effective, coordinated defense of the unit's area or installation.

g. This unit is dependent upon:

(1) Personnel Service Company, TOE 12-67, for personnel administration services.

(2) Appropriate teams from Finance Service Organization, TOE 14-500, for finance service.

**TOE 19-76H**

(3) Appropriate teams from Medical Department Organization, TOE 8-600 series, to provide unit level medical support.

(4) One of its subordinate Military Police Companies, TOE 19-77, for food service support. A first cook is provided to augment the supporting food service facility.

(5) One of its subordinate Military Police Companies, TOE 19-77, for organizational maintenance of vehicles and communications equipment. One wheeled vehicle mechanic is provided to augment the supporting maintenance facility.

4. BASIS OF ALLOCATION. Normally one per two to six military police companies or their equivalent and as indicated below:

- a. One per Headquarters, Independent Division Task Force.
- b. Two per Military Police Group, TOE 19-272, supporting a 3-division corps.
- c. Four per Military Police Group, TOE 19-272, supporting a 6-division corps.
- d. Three per Military Police Brigade, (TAACOM), TOE 19-262, supporting a 3-division force.
- e. Six per Military Police Brigade (TAACOM), TOE 19-262, supporting a 6-division force.
- f. To CONUS armies as required.

5. CATEGORY. This unit is designated a category II unit. (For unit categories, see AR 310-25.)

6. MOBILITY. a. Forty-five percent mobile in organic vehicles.
- b. One-hundred percent air transportable in US Air Force aircraft.

**EQUIPMENT**

7. This table is prepared in accordance with AR 310-series and, together with documents listed in paragraph 10, is the authority to requisition and issue all items listed herein in accordance with Department of the Army directives. Chapter 12, AR 725-1 has been considered and changes to equipment have been made accordingly.

8. In accordance with pertinent Department of the Army and/or theater documents, units are authorized the following (definition of terms in accordance with AR 310-25 as amplified by SB 38-26):

- a. Basic load.
- b. Prescribed load.

9. When there appears to be a discrepancy in section III between the allowances shown in the "Equipment Level" column and the basis of distribution as indicated in the "Remarks" column, the amount shown in the level column will govern.

10. Other publications which provide a basis upon which allowances may be developed for the purpose of determining requirements and authorizations are certain selected Army regulations, technical manuals and supply bulletins. These documents will not constitute separate authorizations but must be used and applied selectively in conjunction with the specific TOE to fulfill the mission of the TOE unit. Basic DA publications pertaining to allowances of equipment, section III of this TOE, are listed below:

a. Army Regulations (AR).

- AR 40-61, Medical Materiel Policies and Procedures.
- AR 700-84, Issue and Sale of Personal Clothing.
- AR 725-1, Requisitioning and Issue of Supplies and Equipment Special Authorization and Procedures for Issues, Sales and Loans.
- AR 840-10, Description and Use of Flags, Guidons, Tabards and Automobile Plates.

b. Common Tables of Allowances (CTA).

- CTA 20-2, Equipment for Training Purposes.
- CTA 23, Targets and Target Equipment.
- CTA 23-100-3, Ammunition for Training in Oversea Theaters.
- CTA 23-100-6, Ammunition, Rockets and Missiles for Unit Training -- Active Army and Reserve Components.
- CTA 23-101, Miscellaneous Ammunition and Explosives
- CTA 23-103, Dummy, Drill and Inert Ammunition.
- CTA 45-8, US Army Command Information Activities.
- CTA 50-900, Clothing and Individual Equipment (Active Army, Reserve Components, and DA Civilian Employees).
- CTA 50-911, Equipment for Food Service Facilities Serving Field Installations, Troop and Hospital Trains and Army Vessels.
- CTA 50-913, Office Type Furniture and Equipment.
- CTA 50-915, Allowances for Miscellaneous Field and Garrison Equipment.
- CTA 50-918, Dayroom Furnishings.

- CTA 50-919, Furnishings for Government-Controlled Non-Housekeeping Personnel Quarters and All Types Bachelor Officers Quarters.
- CTA 50-922, Chaplain and Chapel Facilities.
- CTA 130-7, Equipment for Army National Guard Organization Units and Activities.

c. Publications indexes.

- DA Pam 108-1, Index of Army Motion Pictures and Related Audio-Visual Aids.
- DA Pam 310-1, Index of Administrative Publications (Regulations, Circulars, Pamphlets, Posters, Joint Chiefs of Staff Publications, and General Orders).
- DA Pam 310-2, Index of Blank Forms.
- DA Pam 310-3, Index of Doctrinal, Training and Organizational Publications (Field Manuals, Reserve Officers' Training Corps Manuals, Training Circulars, Army Training Program, Army Subject Schedules, Army Training Tests, Firing Tables and Trajectory Charts, Tables of Organization and Equipment, Type Tables of Distribution and Tables of Allowances)
- DA Pam 310-4, Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8 and 9), Supply Bulletins and Lubrication Orders.
- DA Pam 310-6, Index of Supply Catalogs and Supply Manuals (Excluding Types 7, 8 and 9).
- DA Pam 310-7, US Army Equipment Index of Modification Work Orders.
- (C) DA Pam 310-9, Index of Communications Security (COMSEC) Publications (U).
- DA Pam 310-12, Index and Description of Army Training Devices.

d. Field Manuals.

- FM 19-4, Military Police Support, Theater of Operations.
- FM 19-50, Military Police in Stability Operations.

e. Other publications.

- SB 3-40, Herbicides, Pest Control Agents and Disinfectants.
- SB 8-100, Army Medical Department Expendable Supplies.
- SB 11-131, Vehicular Radio Sets and Authorized Installations.
- SB 700-50, Expendable Items (Except: Medical, Class V, Repair Parts and Heraldic Items).

11. The abbreviations used herein are in accordance with AR 310-50, except as required for preparing TOE by machine methods.

12. Unless otherwise indicated, items of equipment herein are the latest adopted type articles. Priorities of issue and/or issue of

substitute items pending availability of later models are established by current supply directives.

13. This table contains the minimum essential quantities and types of personnel and equipment necessary to accomplish the mission of the unit under each operational level. Requests for additional personnel and equipment must be submitted in accordance with AR 310-49.

14. Allowances of equipment authorized herein may be decreased or omitted at the direction of the commanders of major commands. Units will requisition only the authorized items which they are able to receive, store, maintain and utilize unless otherwise directed by Headquarters, Department of the Army. If authorized quantities are not required action will be taken to reduce the authorization by submission of an initial MTOE or changes to the existing MTOE that are in consonance with AR 310-34 and AR 310-49.

15. When assigned military personnel exceeds that authorized in section II (Personnel Allowances), items of equipment authorized on an individual basis are increased accordingly.

#### SPECIAL INSTRUCTIONS

16. In accordance with AR 310-31 and AR 310-34, recommendations for changes to sections I, II and III will be submitted to Headquarters, United States Army Training and Doctrine Command, through command channels. Emphasis will be placed on recommending changes designed to accomplish the most efficient and economical use of personnel and equipment.

17. Personnel whose position may require them to drive an assigned vehicle as an additional duty position have been identified with standard personnel remarks 01, 02 or 03 in section II. In some instances the number of positions associated with these remarks may exceed the number of vehicles the unit is allowed. Discretion should be used to identify and train only as many drivers as the commander feels are needed to meet mission requirements.

THE 10-67044

CHANGE OF

UNIT OF ORGANIZATION AND REPORT  
SECTION 5: PERSONNEL ALLOWANCES  
For use of this form, see AFMFP, paragraph 5.100000.

THE 10-67044

CHANGE OF

UNIT	ORGANIZATION	CHARGE NUMBER	GRADE	RANK	STRENGTH LEVELS										TOTAL			
					1	2	3	4	5	6	7	8	9	10	11	12		
	SEC 10070400																	
	MGD, OF BATTALION																	
01	01 BATTALION COB	04	LTC	31400	NP	1	2	3									3 11	
		04	MAJ	31400	NP	1	2	3										3 11
		04	MAJ	31400	NP	1	2	3										3 11
		04	CPT	25400	SC	1	2	3										3 11
		04	CPT	04200	CH	1	2	3										3 11
		04	CPT	31441	NP	1	2	3										3 11
		04	CPT	31400	NP	1	2	3										3 11
		04	CPT	31492	NP	1	2	3										3 11
						0	0	0										0
						0	0	0										0
02	01 DETACHMENT COB	04	LT	31400	NP	1												1 10
		04	E-7	05040	EC	1	2	3										1 10
		01																0
		04	ADD TT OP TEAM	00	E-6	07020	EC	1	2	3								1 04
		04	SUPPLY SERGEANT	03	E-6	70720	EC	1	2	3								1 04
		04	COOK	04	E-3	04010		1	2	3								1 04
		04	UNIT CLERK	05	E-3	70020		1	2	3								1 04
		04	TELECOM CTR OPERATOR	06	E-4	72010		1	2	3								1 04
		04	EQUIP MAINT CLERK	05	E-4	70010					1							1 04
		04	PWR GEN & WREN RECH	00	E-3	03010		1	2	3								1 04
		04	RADIO TT OPERATOR	00	E-4	05010		1	2	3								1 04
		04	TACT WIRE OPNS SP	00	E-4	04010		1	2	3								1 04
		04	PWR GEN & WREN RECH	00	E-4	03010		1	2	3								1 04
		04	TACT WIRE OPNS SP	00	E-3	04010		1	2	3								1 04
		04	MILITARY POLICE	04	E-3	05010		1	2	3								1 04
		04	RADIO TT OPERATOR	00	E-3	05010		1	2	3								1 04
		04	TELECOM CTR OPERATOR	00	E-3	72010		1	2	3								1 04
						25	04	22		1								3
03	02 RECRUITMENT MGD	06	E-4	70030	EC	1	2	3										1 04
		06	LEGAL CLERK	07	E-5	71020		1	2	3								1 04
		06	JOURNALIST	04	E-6	71020					1							1 04
		06	CHapel ACT SP	07	E-4	71010		1	2	3								1 04
		06	CLERK TYPIST	07	E-4	71110		1	2	3								1 04
						3	3	3		2								2
04	03 INTEL OFF	04	LT	31400	NP	1	2	3										1 04
		04	NP LIVES OFF	04	LT	31400	NP	1	2	3								1 04
		04	NP LIVES SUPV	00	E-6	70030	EC	1	2	3								1 04
		04	NP INVESTIGATOR	02	E-6	70030	EC	1	2	3								1 04
		04	CLERK TYPIST	07	E-4	71110		1	2	3								1 04
		04	DELETE	07														1 04

DA FORM 2049 1-60

22-01



**PART I  
INSTRUCTIONS**

The following questions were designed to determine Direct Combat Probability Codes (DCPC) for entire MTOE/TDA.

For each MTOE/TDA in which a determination of a DCPC is to be made, please do the following:

- a. For a TDA, enter the six digit UIC in the space provided. For an MTOE, enter the first six digits of the SRC in the space provided. Enter zeroes where appropriate, e.g., MTOE #7-18H should be coded 07018H. Do not worry about the dash, it is already entered on the coding sheet.
- b. Answer Questions 1, 2, and 3. If your answers correspond to the instructions following Question 3, do not answer any further questions.
- c. Continue to answer Questions 4-9, as appropriate.
- d. If the answer to Question 9 is "no", continue on to Part II. Otherwise, do not answer any further questions.

**DIRECT COMBAT PROBABILITY ASSESSMENT  
FOR UNITED STATES ARMY ORGANIZATIONS, MILITARY  
OCCUPATIONAL SPECIALTIES AND DUTY POSITIONS**

**PART I**

Record MTOE or TDA Identification. For TOE units, record only the SRC. For TDA units, record only the UIC.

UIC									
SRC			-						

1. Is this unit of battalion or smaller size?
2. Does this unit have a primary mission of direct combat?
3. Does this unit provide close and continuous support to forward deployed combat elements (support in any of the following areas)?
  - a. Cannon Field Artillery
  - b. Rocket Field Artillery
  - c. Indirect Fire (e.g. Mortar Fire)
  - d. Anti-tank
  - e. Ground Surveillance/Remote Sensor
  - f. Aerial Scouting/Security
  - g. Command and Control Aviation
  - h. Low Altitude Air Defense
  - i. Air Assault/Tactical Mobility (Aviation)
  - j. Attack Aviation
  - k. Combat Engineering

QUES	YES	NO
1		
2		
3		

**If the answer to Questions 1 and 2 are both YES, or the answers to Questions 1 and 3 are both YES, do not answer any additional questions. Otherwise, proceed to Question 4.**



**PART II  
INSTRUCTIONS**

The following questions were designed to determine Direct Combat Probability Codes (DCPC) on a line by line basis, within a MTOE/TDA. In the case of an MTOE, a determination of the DCPC for each paragraph and line number will be made. In the case of a TDA, a determination of the DCPC will be made for those paragraphs and line numbers that are authorized to be filled only by military personnel.

For each paragraph and line number in which a determination of a DCPC is to be made, please do the following:

- a. Indicate the MTOE/TDA number in the space provided.
- b. Indicate the paragraph and line number in the space provided.
- c. Answer the following questions provided in strict numerical order. Once a YES response is achieved, do not answer any further questions for that particular paragraph and line number.
- d. Continue answering the provided questions, in like fashion, for each paragraph and line number within an MTOE and for each required paragraph and line number within a TDA.

**DIRECT COMBAT PROBABILITY ASSESSMENT  
FOR UNITED STATES ARMY ORGANIZATIONS, MILITARY  
OCCUPATIONAL SPECIALTIES AND DUTY POSITIONS**

**PART II**

Record MTOE or TDA Identification. For TOE units, record the SRC. For TDA units, record the UIC. For either type unit, provide the paragraph and line number in the space provided.

UIC									
SRC									
PAR									
LN#									

1. Are soldiers carried in the above paragraph and line number required to be continually present or collocated with a unit in the forward combat area (i.e. Main Battle Area) by tactical doctrine? Commanders and principal staff of combat units, division level and below, automatically meet this criteria and should be given a YES response.

QUES	YES	NO
1		

2. Are soldiers carried in the above paragraph and line number required to possess an MOS, that according to AR 611-101/611-112/611-201, require the participation in direct combat?

QUES	YES	NO
2		

3. Are soldiers carried in the above paragraph and line number required to participate in offensive and defensive combat operations against minor enemy elements, regardless of the organizational level or echelon to which assigned, or do they provide routine support and services to those participating in such operations (including the chaplain)?

QUES	YES	NO
3		

	PAR			
	LN#			
	QUES	YES	NO	
4. Are soldiers carried in the above paragraph and line number assigned to a division and required to enter forward combat areas on a transient basis?	4			
	QUES	YES	NO	
5. Are soldiers carried in the above paragraph and line number assigned to a division level combat support/combat service support type unit?	5			
	QUES	YES	NO	
6. Are soldiers carried in the above paragraph and line number assigned to a division headquarters? (This includes the division headquarters company).	6			
	QUES	YES	NO	
7. Are soldiers carried in the above paragraph and line number assigned to a brigade level headquarters that does not engage in direct combat, and is organic to, or routinely operates with a division?	7			
	QUES	YES	NO	
8. Regardless of the organizational level or echelon to which assigned, would soldiers carried in the above paragraph and line number maintain continual presence in the division rear area?	8			
	QUES	YES	NO	
9. Do soldiers carried in the above paragraph and line number usually perform their duties at echelons above division and do these duties include entry into any portion of the division area on a transient basis?	9			
	QUES	YES	NO	
10. Do soldiers carried in the above paragraph and line number perform their duties only at corps level? (This includes the corps headquarters company).	10			
	QUES	YES	NO	
11. Do soldiers carried in the above paragraph and line number perform their duties solely within echelons above corps?	11			

	PAR			
	LN#			
	QUES	YES	NO	
12. Do soldiers carried in the above paragraph and line number normally perform their duties external to a Theatre of Operations (including CONUS) but may be required to enter the Theatre of Operations on a transient basis?	12			
	QUES	YES	NO	
13. Do soldiers carried in the above paragraph and line number perform their duties in positions that will not be found in a Theatre of Operations?	13			