

PHYSICAL FITNESS AND THE 75TH RANGER REGIMENT:
THE COMPONENTS OF PHYSICAL FITNESS AND
THE RANGER MISSION

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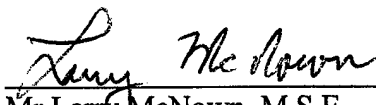
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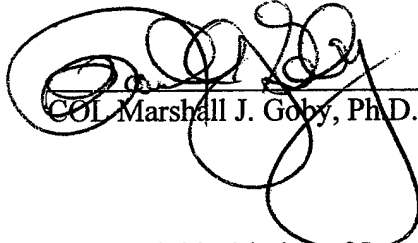
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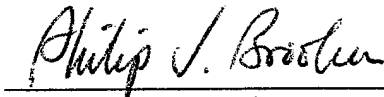
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ABSTRACT

PHYSICAL FITNESS AND THE 75TH RANGER REGIMENT: THE COMPONENTS OF PHYSICAL FITNESS AND THE RANGER MISSION by Major Michael D. Pemrick, USA, 85 pages.

This study attempts to determine how much each of the components of fitness; aerobic endurance, anaerobic and muscular endurance, strength, speed, coordination and flexibility are involved in the physically demanding tasks that a Ranger will most likely perform in combat. The extent to which each of the components of physical fitness are involved overall in the Ranger mission should be reflected in the type of physical training that the 75th Ranger Regiment conducts.

The U. S. Army and its physical training manual, FM 21-20 and the 75th Ranger Regiment stress that the purpose of physical training is to help prepare soldiers for the rigor of combat. To ensure that this intent is met leaders must first understand the extent to which each of the components of physical fitness are involved in the mission before they can design a physical training program that helps meet the demands of combat.

The results of this study indicate though the 75th Ranger Regiment maintains a high standard of physical fitness the physical training program, with its heavy emphasis on aerobic endurance, does not reflect the strength, flexibility, coordination and speed demands of combat.

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CHAPTER 1

INTRODUCTION

The 75th Ranger Regiment has the best-conditioned soldiers in the US Army. The question remains, despite the obvious physical fitness that Rangers possess, is the physical training they conduct and the standards they are required to meet an accurate reflection of the things they will have to do in combat? Today's Rangers are as physically fit and tough as any of the Rangers throughout history. Can Rangers given what is known today about physical fitness develop a physical fitness program that both pushes them to a higher level of fitness and supports the physical demands of their specific combat tasks. The focus of this thesis will be to use the lessons of past Ranger units and the current Ranger company Mission Essential Task List (METL) to determine the physical demands placed on a Ranger in combat and develop a physical fitness program to meet those demands.

Statement of the Problem

What are the components of physical fitness a Ranger needs to possess to successfully perform the individual and collective tasks of his company METL. A Ranger will perform numerous physically demanding tasks during combat to include moving long distances while carrying heavy loads, sprinting, climbing, and combating hand to hand. These activities are often done consecutively. The physical demands placed on a Ranger in combat can be determined by examining what they have done historically and what the METL expects them to do in the future. With this information,

it is possible to determine what type of physical fitness program a Ranger should conduct to prepare himself physically for combat.

History

Robert Rogers recruited and led his Rangers to fame during the French and Indian War from 1755 to 1762. The majority of their operations took place in the Lake George and Lake Champlain region of what are now modern-day New York and Vermont. The uniqueness of Roger's Rangers was their ability to move into territory controlled by the French and their Indian allies to gather intelligence and perform ambushes or raids. The most famous of these raids was conducted against the Abenaki village of Saint Francis in Canada. Saint Francis lies 170 miles from the Ranger's base at Crown Point; or approximately the first 100 miles of this journey was covered in whaleboats, moving north on Lake Champlain. The 200 Rangers with Rogers covered this distance over ten consecutive nights, averaging over ten miles a night. The remaining seventy miles were conducted on foot with the French in pursuit. The Rangers covered this distance in ten days. The fact that they averaged only seven miles a day might not seem impressive unless considering that they did this movement through swamp land with water often knee or waist high. After conducting the raid, the Rangers exfiltrated over 200 miles on foot. The raid had covered almost 400 miles of harsh terrain, over sixty days. The physical endurance of the Rangers that conducted this mission was extraordinary. How were they able to accomplish this feat of endurance? Roger's leadership and the morale of the Rangers were key factors, but would have meant little without the Rangers having the endurance to cover the distances required. How did the Rangers get in the condition

to make this movement? The Rangers were made up largely of woodsmen and farmers, who from an early age had lived physically demanding lives. They were hard and tough men who were accustomed to dawn-to-dusk work and precious little comfort. Was this enough to allow them to accomplish what they did? The Rangers' backgrounds were important in providing the endurance they needed to accomplish the Saint Francis raid, but more important was the on-the-job training they had received under Rogers the previous four years. By the time the Saint Francis raid was conducted, Roger's Rangers had been conducting missions on a regular basis for four years. The Rangers that Roger's took on the Saint Francis raid were a handpicked group, who had proven themselves on past missions. The Rangers that Rogers took had improved on the endurance they had acquired growing up and in their civilian work by taking part in regular scouting and patrolling missions. These missions had been conducted all-year around and included the use of ice skates, snowshoes, and canoes. At the time of the Saint Francis raid, they were in peak condition. They had gotten that way by doing physical training, be it "on-the-job training," that related directly to the mission they had to perform in combat.

The World War II Rangers of William O. Darby were the first Rangers to conduct formalized physical training. Darby was selected to recruit, train, and command the 1st Ranger Battalion in 1942. The battalion was formed from volunteers stationed in Northern Ireland. After being formed, the battalion moved to the British Commando Training Depot in Scotland. The focus of the physical training was speed marches and obstacle courses. The battalion started with shorter marches of three and five miles and

eventually moved up to twenty-five-mile road marches. The standard pace for these marches was four miles an hour and the Rangers carried full equipment. Colonel Darby speaks of the speed marches in his book *We Led the Way* co-authored by William H. Baumer. "Speed marches gave maximum development to lungs and legs and most importantly to the feet. On one occasion during the training in speed marching, the Rangers flew across ten miles in eighty-seven minutes, flashing the long stride that would become famous in the Mediterranean war" (Darby and Baumer 1980, 31). Darby clearly recognized the importance of physical conditioning in training Rangers. He also understood the nature of the Rangers' mission and designed the physical training to support accomplishing that mission. The Rangers' mission was intended to be hit-and-run raids behind enemy lines. These missions would normally begin and end with a long dismounted movement over rough terrain, using a route the enemy would not expect. The speed marching that Darby's Rangers did covered this aspect of the physical fitness component of the mission very well. The other part of the mission demanding a different aspect of physical fitness was the actions on the objective. The raids that Darby envisioned would be quick, violent, and involve the Rangers having to climb a building or mountain to complete. The marching gave the Rangers the aerobic fitness to get to the objective. They needed upper body strength and anaerobic conditioning to complete the actions on the objective. Darby used obstacle courses and log drills to give his Rangers this fitness. The obstacle courses they used consisted of walls, ropes, ladders, and tunnels, as well as natural obstacles, such as cliffs, trees, and streams. James Altieri describes his experience on these obstacle courses in his book *The Spearheaders* as

taking ten minutes to complete; though his company once made it in eight (Altieri 1960, 40). This ten minutes of intense exercise involving quick movements, climbing, and use of upper body strength would replicate well what the Rangers would experience physically during actions on the objective. The 1st Ranger Battalion was first used in combat during the North Africa campaign. During one mission in North Africa, the Rangers made a twelve-mile march through the mountains and conducted a raid on an Italian position. Darby describes this battle and the physically demanding feats the Rangers performed as “payoff” for their training (Darby and Baumer 1980, 77).

The 2nd Ranger Battalion was formed in 1943 for the upcoming Normandy invasion. The training and success of the 1st Ranger battalion was used as a model for the development of the 2nd battalion. Lieutenant Colonel James Rudder commanded the 2nd Ranger Battalion. His battalion was given the mission of destroying the German gun emplacements on the top of Point du Hoc. The only route available to the guns on Point du Hoc was up a 120-foot cliff at the water’s edge. This cliff could not be climbed without the aid of ropes and rope ladders. Prior to receiving his mission, Colonel Rudder had trained his men much like Colonel Darby had, using speed marches and obstacle courses. The attack on Pont du Hoc required a specific type of physical fitness, and Rudder designed a physical training program to give his Rangers this ability. The 2nd Ranger Battalion conducted much of this training at Bude in Western England. The cliffs in the Bude area offered the Rangers an opportunity to practice their climbing. Rudder started his men slowly on cliff climbing. After a matter of weeks they were able to rapidly climb ropes and ladders up to one hundred feet carrying their combat equipment.

Rudder understood that though his men were in great physical condition the upper body strength required for climbing was something they had to develop. He did this, and it greatly contributed to the Rangers being able to accomplish their mission at Point du Hoc.

Two other Ranger-type units of the Second World War were the First Special Service Force (FSSF) and Merrill's Marauders. The FSSF was a combined American and Canadian unit of reinforced brigade size originally organized and trained to conduct operations in Norway. The FSSF conducted its initial training at Fort Harrison in Montana. The commander Robert Fredrick established as one of his two baseline goals for the unit as being that every soldier reach an unusually high level of physical fitness (McMichael 1987, 173). To accomplish this, their training, much like Darby's Rangers, consisted of obstacle courses, climbing, and marching. In addition the FSSF was the first Ranger-type unit to be trained in parachute and ski operations. The level of physical fitness the FSSF achieved became legendary. A Canadian inspection report stated, "The physical training has been built up to such a pitch that an ordinary person would drop from sheer exhaustion in its early stages" (McMichael 1987, 172). During this training the FSSF conducted a sixty-mile march in full gear with one of the battalions covering that distance in twenty hours (McMichael 1987, 174). Soldiers unable or unwilling to handle this intensity of training were released from the unit. The strenuous physical training the FSSF conducted paid great dividends during combat operations. The most notable of these took place in Italy during November 1943. The 5th Army's advance up the boot of Italy had been stalled by the German strong point at Mount La Difensa. General Mark Clark, the commander of the 5th Army, had launched ten days of repeated

attacks before calling on the FSSF (Perret 1991, 210). The force was able to reduce the German strong point by scaling cliffs thought to be unclimbable and attack an undefended flank. General Eisenhower remarked about this feat in his book *Crusade in Europe*, "I never understood how, encumbered by their equipment, they were able to do it. In fact, I think any Alpine climber would of examined the place doubtfully before attempting to scale it" (Adleman and Walton 1966, 111). The ability of the FSSF to make a ten-mile approach march and the climb and still have the stamina to conduct a ferocious attack was directly attributable to the physical training Colonel Fredrick put his men through. The 1st Special Service Force continued to fight in Italy to include fighting at Anzio and took part in the invasion of southern France. The FSSF was deactivated near the end of the war having never been defeated and with a legendary reputation as possibly the fittest, toughest, and most-skilled small unit in the army.

Merrill's Marauders fought in the China-Burma-India Theater in 1943 and 1944. The Marauders were officially designated the 5307th Provisional Unit, consisted of 3,000 officers and men and was formed to conduct long-range penetrations against the Japanese rear areas. The Marauder's area of operations was the mountainous jungle of Burma; an area noted for both the difficulty of its terrain and its unhealthy climate. The Marauder's physical training was dominated by long jungle movements with heavy packs. The commander of the unit, Colonel Charles Hunter, had the men conduct a 140-mile march over a difficult mountain jungle road as their last training event before going into battle. The training, especially the final march increased the men's confidence and gave them a superb level of fitness. This fitness was put to good use during the Marauder's thirteen

week, 565-mile march through exhausting terrain to capture Myitkyina airfield. The final part of the march was over 6,000- and 8,000-foot mountains (Lock 1998, 305). The unit only had 1,000 effective soldiers after completing this extraordinary operation, but would have failed the mission completely if not for the vigorous physical training it received.

The leaders of the World War II Ranger battalions, the Marauders, and the FSSF, understood the types of missions they were expected to conduct and the physical fitness demands they would place on their men. They may not have understood how the components of fitness were involved in their mission, but they did design effective physical training programs that reflected their combat mission. This physical training was an essential ingredient in the establishment of their impressive combat records.

Ranger companies were formed for both the Korean War and Viet Nam War. The Korean War Rangers were employed as spearhead and raiding troops. Hard physical training similar to the World War II Rangers, was a cornerstone of their preparation for combat. They executed several successful missions to include spearheading the only airborne assault of the war. The Rangers of the Viet Nam War conducted long-range reconnaissance missions. These Ranger companies were generally formed from soldiers in country with little time for formalized physical training, instead relying on soldiers who had been trained and physically conditioned as individuals at the Army's Ranger school or unit Recon schools. Despite this limitation, the Rangers' companies compiled an enviable combat record.

The current 1st Ranger battalion was activated in 1974 by order of Army Chief of Staff Creighton Abrams to provide the army a rapidly deployable and skillful light

infantry and to help re-establish a cadre of tough and well-trained light infantry leaders and soldiers. The 2nd Ranger battalion was activated later that same year. The Ranger Creed written shortly after the activation of the two battalions states in separate stanzas that "my country expects me to move further, faster and fight harder than any other soldier" and that "I will always keep myself mentally alert, physically strong and morally straight." The entire Ranger Creed and these words relating to physical fitness are taken seriously by modern rangers and the importance of physical fitness was recognized by the leaders of the new ranger battalions. The battalions did not have an established standard physical training program. The army conducted a five-event physical training test during that period that consisted of the run, dodge and jump, crab walk, horizontal ladder, situps and a two-mile run in boots. The physical training conducted by the rangers was oriented toward that PT test and road marching. They did spend a majority of their training time in a field environment. The training conducted in the field though not specifically physical training was viewed as the best preparation for the physical demands of combat. The first operational use of the Rangers occurred during the failed Iran hostage rescue mission in 1980. The commander of the C Company, 1st Ranger Battalion, which was tasked with the mission, had six months to prepare his element. The commander, Captain David Grange, developed some unique physical training based on what he expected his men to do during the mission that included pulling C130 airplanes, pushing army trucks and carrying casualties over extended distances. This physical training continued a Ranger tradition of orienting physical training toward the expected and unexpected demands of the mission (Lock 1998, 445).

Both the 1st and the 2nd Ranger battalions took part in the October 1983 invasion of Grenada. During this mission the Rangers did the initial airfield seizure of Point Salinas Airport, followed by a series of air assault attacks on other locations around the Grenada. That these missions were successful is due in some part to the physical fitness the Rangers possessed which allowed them to conduct the almost five days of continuous operations. An example of this superior fitness occurred prior to the airborne assault when Rangers were told twenty minutes prior to jumping to again put on their parachutes and equipment in the aircraft, after having earlier taken them off in preparation for an air landing. The act of rigging equipment and donning a parachute is physically demanding in any situation but exhausting in the cramped confines of an aircraft. That the Rangers were able to prepare to jump and jump safely under these conditions prior to beginning combat operations is a testament to skill, discipline, and physical fitness.

The 3rd Ranger battalion was activated in 1984 and combined with the existing 1st and 2nd Ranger battalions to form the 75th Ranger Regiment. The current Ranger physical fitness standards date from this period.

The 75th Ranger Regiment conducted an airborne assault and airfield seizure of two separate airfields as part of the initial actions of Operation Just Cause in December 1989. The three Ranger battalions assembled at Fort Benning and Hunter Army Airfield in Georgia in twenty-degree temperatures prior to their departure for Panama. The airborne assault that followed was conducted in hot and humid weather. FM 21-20 suggests fourteen days of acclimatization when a soldier is introduced into a hot and humid climate and states that a high level of physical fitness quickens the process and

reduces the chance of heat injury (FM 21-20 1992, 12-1). That the Rangers were able to successfully conduct the mission despite the extreme temperature swing and no acclimatization is a tribute to their superb level of fitness. Ranger veterans of the Panama invasion describe the hard physical training, especially weekly road marches with loads designed to replicate the weight of the ammunition they would carry into combat, as the most important element in their success of their mission (Anders 1999).

The Rangers most recent combat operation took place in Somalia in 1993. A reinforced company from the 3rd Ranger Battalion deployed as part of the special operations element Task Force Ranger. The Rangers' mission was to assist in the capture of Somalis hostile to the United Nation's humanitarian mission. The 3 October mission resulted in an eighteen-hour firefight after two Blackhawk helicopters were shot down in the streets of Mogadishu, and the Rangers protected the crash sites from mobs of hostile Somalis until relief convoys arrived. This fighting is considered the most intense combat American infantrymen have taken part in since the Viet Nam War.

Modern Rangers

The present day Ranger Regiment traces its lineage back to the Rangers of Rogers, Darby, and Rudder. The PT program that the Rangers conduct is physically demanding and provides the Regiment with the best-conditioned Infantrymen in the US Army, if not the world. This PT program is largely based on the Army's FM 21-20 and geared toward preparing the Rangers to score over 240 on the Army Physical Fitness Test (APFT) which consists of two minutes of pushups and sit-ups and a two mile run. The regiment also requires its Rangers to complete a twelve-mile road march in under three

hours while carrying combat equipment and a forty-five-pound rucksack, run five miles in under forty minutes, and complete a minimum of six pull-ups. Most Rangers take pride in their physical fitness and greatly exceed these standards. While the author was serving in the Regiment almost all the Ranger leaders scored the maximum of 300 on the APFT, and company APFT averages were around 280. The average Ranger will conduct physical training five times a week. Though each element does PT slightly differently a typical week will usually include: three to four distance runs, a road march, hand-to-hand combat, pushups, pull-ups, sit-ups, crunches, and flutter kicks.

Assumptions

The largest assumption required for this thesis is that a physical fitness exercise can be directly related to a skill a Ranger will perform in combat. For example a platoon has a collective task of move tactically. This means that every member of that platoon must be able to move tactically. It is not much of an assumption to say that conducting conditioning road marches improves a Ranger's ability to conduct the physical fitness aspect of move tactically. The more dangerous assumption comes with the majority of the other tasks. A platoon has a task of enter and clear a building. An individual Ranger will have to climb in a window to be able to accomplish this for a platoon to accomplish its mission. The assumption required in this case is that a certain physical fitness exercise, for example pull-ups, will help that Ranger climb in that window. It is known that many of the same muscles are used to accomplish both tasks, but they are not exactly the same. At the same time it would be unsafe and largely unrealistic for a platoon to include the climbing in windows as a regular part of its PT program. Similar assumptions

will be necessary with the other tasks throughout this paper. Another assumption is that a unit's physical training program is a reflection of the physical fitness test a unit conducts. In the Ranger's case these tested events are the Army APFT consisting of push-ups, sit-ups, and two-mile run, five-mile run, pull-ups, and twelve-mile road march.

Definitions

The following terms are defined for understanding and clarification in further discussion.

Battle Focus. The Process of deriving peacetime training requirements from wartime missions (FM 25-101 1990, Glossary 1)

Battle Task. A task that must be accomplished by a subordinate organization if the next higher headquarters is to accomplish a mission essential task (FM 25-101 1990, Glossary 2).

Field Training Exercise. An exercise conducted under simulated combat conditions in a field environment (FM 25-101 1990, Glossary 4).

Mission Essential Task List. A compilation of collective mission essential tasks, which must be successfully performed if an organization is to accomplish its wartime, mission (FM 25-101 1990, Glossary 5).

Performance Oriented Training. Training that requires learning by doing. Performance to standard is required (FM 25-101 1990, Glossary 7).

Task. A clearly defined and measurable activity accomplished by soldiers and units. Tasks are specific activities that contribute to the accomplishment of missions or other requirements (FM 25-101 1990, Glossary 9).

Training. The instruction of personnel to individually and collectively increase their capacity to perform specific military functions and tasks (FM 25-101 1990, Glossary 9).

Aerobic. Meaning with oxygen. Aerobic exercises include running, road marching and biking. FM 21-20 uses the term cardiorespiratory endurance to describe this ability (FM 21-20 1992, 1-3).

Anaerobic. Meaning without oxygen. Anaerobic exercises include sprinting, soccer and boxing.

Muscular Strength. The ability to exert force for a short time. Examples of exercises requiring muscular strength are the bench press and squat. Upper body strength is muscular strength with the muscles of the upper body.

Speed. The ability to move quickly. Running the one hundred-meter dash requires speed.

Coordination. The ability to move the body efficiently and effectively in order to accomplish physical tasks. Shooting on the move, climbing and hitting a baseball demand coordination.

Muscular Endurance. The ability to exert muscular strength over a period of time. The push-up and sit-up events of the APFT test muscular endurance (FM 21-20 1992, 1-3). Muscular endurance and anaerobic endurance will be grouped together for the purposes of this paper.

Flexibility. The ability of the body to move joints or groups of joints through an entire normal range of motion (FM 21-20 1992, 3-1).

Limitations and Delimitations

The first limitation with this study is the testing of this thesis using scientific methods is not possible due to the limitations of time and ability. Testing the thesis would involve getting two or more control groups of Rangers, having one group conduct the PT program and another to do more traditional Ranger PT over a period of months and then testing and comparing the results in a performance-oriented test. Though it may be possible to solicit opinions from Ranger leaders about findings or have some units conduct the program these results though informative would not be scientific. Another limitation is that the PT program that results from this study must be able to be conducted by the Rangers. For example, it would be unrealistic to include rock or mountain climbing in the program because most Rangers do not have access to mountains. The PT program must only involve things that the Rangers have available to them (running and road marching areas, weight rooms, pull-up and dip bars, swimming pools, and obstacle courses). The result of this study will not be a series of recommended PT exercises including repetitions and duration, but rather a designation of the priority of effort towards each of the components of physical fitness. This study will be based largely on the tasks the Ranger riflemen will conduct in combat. The Ranger battalions have a variety of soldiers from different Military Operating Specialties (MOSs) to include radio operators, cooks and medics as well as staff officers and non-commissioned officers. All these Rangers have different jobs in combat but need the ability to perform the job of the Ranger riflemen for survivability reasons. The delimitation is the amount of historic evidence and Army information available.

Significance

The significance of this thesis will be directly related to how it is used. Currently the members of the Ranger regiment are not limited in their ability to complete missions by their physical fitness. On the contrary, their physical fitness, and the toughness and confidence that comes from it, is one of the regiment's strongest assets. Despite this, the regiment's leaders do need to better understand how the components of physical fitness effect their mission. This thesis will contribute to that understanding and help a leader in designing a physical training program for his unit.

CHAPTER 2

LITERATURE REVIEW

The works reviewed for this thesis fall into two general categories: Ranger history and military physical fitness literature written by the armed services or individual service members.

The purpose of reviewing Ranger history is to gain an understanding of both the physical fitness training, if any, the Rangers conducted and the physical demands placed on the Rangers conducting their missions.

The Spearheaders by James Altrieri is the best account of the actions of Darby's Rangers during World War II. James Altrieri started as a private and original member of 1st Ranger Battalion during its training in Ireland and Scotland and its initial mission in North Africa. He later commanded a company in 4th Ranger Battalion after the expansion of Darby's Rangers from one to three battalions. His discussion of the Ranger's physical fitness training during their initial training usually does not mention specific distances covered or repetitions of exercises conducted but does give a flavor of the physical demands placed on the Rangers by the speed marching, obstacle courses, and climbing. He discusses one of the culminating events of the training as being a ten-mile speed march followed by a cliff climb of "hundreds of feet" (Altrieri 1960, 88). He also describes how Darby continued to use the same physical training techniques during the period between missions. The physical training that Altrieri describes is very closely related to the missions that Darby's Rangers conducted and he indicates repeatedly that it was a key factor in their success. When describing an action that included a twenty-mile

movement while carrying casualties after conducting a raid, Altieri writes, "Now I fully understand Darby's unrelenting insistence on physical conditioning" (Altieri 1960, 216).

We Lead The Way by William O. Darby and William Bauer published in 1980, thirty-five years after Darby's death, discusses Darby's Rangers from the commander's point of view. Darby's discussion of the Ranger's physical training reinforces that of Altieri. He describes the progressively longer speed marches and obstacle courses that Altieri alludes to. The details of these marches are mentioned in the introduction of this thesis. *We Lead the Way* covers much of the same ground as Altieri's book and is important because it adds increased validity to physical training discussed by Altieri.

Rudder's Rangers by Ronald Lane was published in 1974. This book is about the 2nd Ranger Battalion and its preparation for and conduct of the D-Day mission to include the scaling and attack on Pointe du Hoc. The physical training that Lane describes the 2nd Ranger's conducting is very similar to that of Darby's Rangers. Darby's physical training techniques were seen as so successful that selected members of his Rangers were sent back to the United States to help in the 2nd Ranger Battalion's training. Lane also discusses the emphasis on cliff climbing and building its requisite upper body strength that the Rangers conducted in England while preparing for the Pointe du Hoc mission.

The World War II Ranger's are considered the first "modern" Rangers. Their training and combat actions, so well described in the three books discussed previously, are not only inspiring stories but also clearly illustrate the importance PT had on their success. The leaders of these Rangers clearly understood that the PT conducted should relate directly to the physical demands of the combat mission.

To Fight With Intrepidity by John D. Lock covers the Ranger's history from before Roger's Rangers up to the present time. This book is useful because it covers the period of Roger's Rangers in detail to include the distances they covered during some of their missions. *Robert Rogers of the Rangers* written by John Cuneo in 1988 covers Roger's Rangers in more detail and mentions Roger's training his men in "scout marching," which can be easily assumed that he used for both PT and tactical training.

It is difficult not to begin any discussion about the literature of physical fitness in combat without discussing *Soldiers Load and The Mobility of a Nation* written in 1950 by S.L.A. Marshall. This study does not develop or recommend a fitness program or even attempt to break down the components of physical fitness required to be successful on the battlefield. What his book does do is discuss the how fear during combat increases the physical fitness demands placed on the body. Simply stated marching ten miles in combat will be more physically demanding than marching ten miles during training, with all other things being equal. This fact is important because it reiterates the importance of demanding peacetime physical training. Standard marathon training will help explain this reasoning. The average running program designed to prepare someone to complete a marathon (26.2 miles) has the runner working up to a twenty-mile training run over a series of weeks. The wisdom behind running only twenty miles is that the excitement and adrenaline of the race will allow the runner to successfully complete the 26.2 miles. Marshal's book shows how in preparing soldiers physically for combat almost the opposite technique should be used. The stress and fear of combat has the opposite effect of race adrenaline. A leader who expects that his soldiers will usually march ten miles or less in combat should ensure that they could march significantly farther in training.

The United States Army uses FM 21-20, as is its primary source of physical fitness training information. The current edition of FM 21-20 was published in 1992. This manual has been updated throughout the years to reflect the changing nature of both the Army and current physical fitness research. The preface states that "if we fail to prepare our soldiers for their physically demanding wartime tasks, we are paying lip service to the principle of train as you fight"(FM 21-20 1992, iii). This field manual clearly states its purpose as a guide for preparing soldiers physically for combat and that unit PT should be geared for that same purpose rather than preparing for the APFT. FM 21-20 begins by defining five components of fitness: muscular strength, muscular endurance and cardiorespiratory endurance, flexibility, and body composition. The first four are key factors in this study. The manual goes on to explain how to train for each component of fitness using running, calisthenics, road marching, sports, obstacle courses, and numerous other activities. Overall, FM 21-20 is an excellent guide for preparing soldiers for the physical demands of combat. It stresses the importance of balance, specificity, and morale building in unit PT programs and contains fitness information that is easy to understand and implement. The first weakness of FM 21-20 for the purpose of this study is that it is geared toward taking a poorly conditioned person and developing him or her into a soldier able to meet soldier physical fitness standards. The second weakness is that, though it speaks of physically preparing soldiers for the physical demands of combat, it does not explain what those demands might be. Previous editions of FM 21-20 spoke in detail about the skills such as marching, crawling, climbing, and carrying; a soldier must be able to perform in combat. For some reason the current FM 21-20 did not include this useful information. Rangers, in addition to understanding and

training for these basic combat skills, need to have an extraordinary level of physical fitness to be successful. An illustration of this can be seen in the manual's sample road marching program that starts with a 3.1-mile march carrying twenty pounds and culminates six weeks later in a 6.2-mile march carrying forty pounds. The distances and weights involved in the sample program fall far below the standard expected for any Infantry or Special Operations unit in the Army, especially Rangers.

The Marines' current physical training manual is *FMFRP 0-1B, Physical Readiness Training for Combat*. This manual is similar to FM 21-20 in that it includes a discussion of the components of fitness while still covering in detail the combat skills of the soldier. The manual's physical readiness test, separate from the standard Marine Physical Fitness Test MPFT, consists of step-ups, a rope climb, an evacuation/casualty carry event, an advance by fire and maneuver event, and a three-mile combat run. All the events are done with Load Bearing Equipment (LBE), helmet, and weapon and are specifically related to combat skills. The physical readiness test, though not done throughout the Marine Corps, is an excellent example of focusing the physical fitness test and hence the PT on combat skills. The Marine manual also contains a very detailed chapter on road marching, a subject the Army covers in detail in *FM 21-18, Foot Marches*. This manual, though largely concerned with the tactical aspect of foot movement, does contain an excellent chapter on physically conditioning soldiers for foot marching. The program recommended addresses some of the current Ranger PT shortfalls that this study finds.

The Army has been publishing physical fitness manuals since before World War II. These early manuals, like the current addition of FM 21-20, are a reflection of the

both the current theory and science of physical fitness and the society as a whole. *The Basic Field Manual Chapter 4, Physical Training* was published by the War Department in 1936. One of the stated goals of the manual was “the development of muscular strength, coordination and endurance and their application to prescribed professional requirements” (Dept of the Army, 1936, 1). The basis of the recommended physical training program was setting up exercises, what we know today as calisthenics. The manual makes no mention of developing the physical skills for combat.

The 1941 addition of FM 21-20 does speak specifically of preparing a soldier for combat. This addition also speaks of the six basic skills of a soldier. These skills, though no longer discussed in the current FM 21-20, are little or no different from what is expected of a modern Ranger in combat: (1) marching/running; (2) jumping/vaulting; (3) climbing; (4) crawling; (5) lifting/carrying; and (6) throwing.

This version of FM 21-20 also mentions the use of obstacle courses and recommends a physical fitness test comprised of the one hundred-yard dash, high jump, long jump, and 440-yard run. An interesting aspect of this manual is that it is the version used by the Army during World War II. The World War II Rangers used very little of the PT discussed in the manual, instead using the British Commandos’ physical conditioning techniques.

The FM 21-20 published in 1946 is the first to discuss components of physical fitness, which the manual designates as strength, endurance (both muscular and circulo-respiratory), agility, and coordination. Road or speed marching and obstacle courses, techniques largely borrowed from the British Commandos and used to train World War II Rangers, are also discussed.

The 1957 version of FM 21-20 is the first to provide for task, conditions, and standards for PT tests. The manual has two tests, a physical fitness test to determine a soldier's general fitness and a physical achievement test specifically oriented on testing the skills a soldier needs for combat. The five events of the physical achievement test are the seventy-five yard dash, five-second-rope climb, triple broad jump, 150-yard man carry and one-mile run. This test is very focused on speed and the muscular endurance and strength of both the upper and lower body. The events are a reflection of the soldier's combat skills the manual discusses, with the seventy-five yard dash and the mile representing the marching and running, the rope climb the climbing, the triple broad jump the jumping and vaulting and the 150 yard man carry the carrying. This test does a better job of covering the combat skills of the soldier than our current APFT in which only the two mile run can be directly related to a combat skill. An interesting aspect of the physical achievement test was the standards for the maximum score. To receive a one-hundred points on each event a soldier would have to sprint seventy-five yards in eight seconds, climb twenty feet of rope in five seconds, do a standing triple jump of twenty-six feet and six inches, carry a man of equal weight 150 yards in thirty seconds and run a mile in five minutes, all while wearing boots and fatigue pants. Only a soldier of extraordinary athletic ability who trained hard could achieve the maximum on all five events. Another interesting aspect of this test is that there was no failing grade, soldiers were expected to match or exceed a designated average score, which was significantly less than the maximum. The physical achievement test was soon replaced by the combat proficiency test which consisted of a forty yard low crawl, horizontal ladder, dodge, run

and jump, grenade throw, and the same one mile run. This test also does a better job testing the combat skills than our current APFT.

The reason the physical fitness tests of the past are discussed is that one of the assumptions this paper makes is that a unit's PT program is largely a reflection of the physical fitness exam it is required to take. The Army obviously thought this to be true when it oriented the test to combat skills. The current APFT does not test combat skills and despite leaders demanding otherwise, the Army does a poor job conducting combat focused PT.

The Masters of Military Art and Science thesis by Major John McLean "Amphibious Assault: How Fit Are Our Marines?" was completed in 1992. McLean's conclusion is that though the Marine physical fitness test may accurately measure a Marine's general level of fitness, it does not reflect the kind of physical tasks he will perform during an amphibious assault. He identified the following six general tasks that a Marine will perform during an amphibious assault: (1) lifting, loading, and unloading; (2) climbing; (3) negotiating obstacles; (4) wading; (5) swimming; and (6) loaded marching.

The obstacle course was used as a representative event for the first three tasks listed above. Swimming was used as a representative event for the next two. He did not use a representative event for loaded marching because there was no available data for the Marines he was using for his study. McLean then compared the scores of the Marine PFT events (pull-ups, sit-ups and three-mile run) to their scores in the obstacle course and swim events to identify the level of correlation. His results are surprising in that even the strongest correlation between a PFT event and a representative event, the pull-ups and the

obstacle course, is still only at a coefficient of .349. The correlation between the run and the swim had a coefficient of .067. The correlation between the events within the PFT was much higher (McLean 1992, 74). Though Rangers and Marines have different missions and PFTs, the results of Major McLean's study indicate that the PT test the military uses is often not an accurate measure of the physical fitness components a soldier will need in combat.

The 1992 MMAS thesis by Major Bradley W. May, "A Progressive Resistance Weight Training Program Designed To Improve the Armored Crewman's Strength," discusses the armored crewman's increased need for strength with the advent of heavier tank equipment and ammunition and develops a weight-training program to support it. May does not attempt to relate specific armored crewmen combat tasks with types of exercises, as McLean does with his Marine study. He uses the heavy weights of the items a crewman must lift as the reason for the need of overall muscular strength. May returns to the published recommended weight-lifting programs of a number of respected civilian experts as a solution. He averages the recommended frequency and percentage of maximum repetitions and sets of these programs to come up with his recommended program. May's study takes an interesting approach to arrive at his conclusion. His methodology is less applicable to this study than McLean's, but his target audience, the armored crewmen and their leaders, is closely related to the target audience for this thesis which is the junior leaders of the Ranger regiment.

"Physical Training for the Modern Battlefield: Are We Tough Enough?" a SAMS monograph by Major Mark Phillip Hertling is an excellent discussion of the importance of physical readiness on the modern battlefield. Hertling's bottom line is that the current

physical fitness training techniques employed by the US Army are not adequately preparing soldiers for the modern battlefield. He feels physical readiness, the ability to accomplish the physical tasks the battlefield requires (i.e., marching, carrying casualties) is being neglected for the sake of physical fitness and the ability to do well on the APFT.

The relationship between the APFT and the Ranger's PT program is applicable because Rangers, like the rest of the Army, focus their PT on preparing for the APFT and other tested events. He uses a quote from the former Commandant of the Marine Corps, General Alfred Gray, that encompasses much of what this thesis is trying to find.

There are those who pride themselves on the number of push-ups, sit-ups and chin-ups they can perform, but no one has stressed how they can carry a wounded Marine the length of the parade ground without killing him. This is what we should know and be able to do. If some want to run in their silk shorts and Adidas that is fine with me: but the Corps is going to return to physical readiness training vs. physical fitness (Grey 1987).

CHAPTER 3

RESEARCH DESIGN

The Research design of this thesis will begin by identifying and describing the primary Ranger company missions. These missions will be analyzed and broken into phases. The phases of the missions will be furthered analyzed to reveal how each phase of the mission is most likely to be conducted. Each of these phases will have supporting platoon collective tasks and subsequently supporting individual tasks. From these supporting individual tasks can be determined what physically demanding tasks a Ranger will have to accomplish for his unit to be successful. Once these tasks are determined, they can be identified how likely and important they are based in how many phases they appear. The next step will be to analyze each of these tasks to determine if and how much each component of fitness is involved. The extent each component of fitness is involved in the Ranger mission will be determined by adding the importance of each to the Ranger physical tasks and the weight of those tasks. This will give each component of fitness a total number total indicating greater importance. This order of importance will be then be compared with the amount of importance each component receives in the physical training program as reflected by the tested events push-ups, sit-ups, pull-ups, two-mile run, five-mile run and twelve-mile road march.

The first step in this thesis' methodology will be determining the primary Ranger missions. This will be accomplished by reviewing the Ranger company mission essential task list (METL). From the METL the most important missions based on history and discussions with current Ranger leaders can be designated. Once these missions are identified and described the current applicable field manuals will be used to determine

the phases of the missions and how they are likely to be conducted. For simplicity, three phases for each mission will be identified: how the force gets to the objective, the actions conducted on the objective, and how the force leaves the objective. Army field manuals and the Ranger regiment's critical task list will identify key platoon collective tasks that support the company METL task. For example, if the company METL task were raid, a supporting platoon task would be overwatch/support by fire. Each platoon collective task has a detailed list of supporting skill level one common tasks, those that all soldiers are expected to be able to accomplish, and 11B skill level one tasks. From these lists, the tasks that are physically demanding will be examined further. For example, a task like load, unload, and reduce stoppage in your individual weapon would not be included because it is largely technical, while the task conduct individual movement technique would be individual because it is very physical. This analysis should yield from five to ten individual tasks that are physically demanding and done repeatedly. To avoid confusion with nonphysical tasks, the tasks analyzed will be referred to as physical events.

The physical events will be further examined to determine the number of phases in which it appears. That number will determine its frequency and importance. A physical event that appears in three phases is more important than a physical event that appears in only one and will be weighted by a factor of three. If more than one physical event appears in a phase, all the events will be given the same value. For example, if physical events only 1 and 2 appear in one phase and they are that phase's only physical event, they will both receive a weight of one. This is the same value, as event 3 would get if it were the single event in a phase. At the completion of this step there will be have

a list of physical events and their corresponding weight based on the amount of phases in which they appear.

The Army's FM 21-20 describes five components of physical fitness. These components are: (1) muscular strength, (2) muscular endurance, (3) cardiorespiratory endurance, (4) flexibility, and (5) body composition.

From FM 21-20's designated physical fitness components, body composition will not be used as a factor in this study. The amount of body fat a Ranger has is a reflection of the frequency, intensity, and type of exercise he performs but also his diet, which is not within the scope of this study. The manual also mentions to a lesser degree the components of motor fitness. These components also "affect a soldier's survivability on the battlefield." Speed and coordination are the two components of motor fitness that will be used in this study. Other motor fitness components, such as agility and power, will not be considered because they are so closely related to speed and muscular strength and would cause unnecessary redundancy. The six components of physical fitness that will be used are: (1) muscular strength, (2) muscular endurance (anaerobic), (3) cardiorespiratory endurance (aerobic), (4) speed, (5) coordination, and (6) flexibility.

The next step will be to examine each physical event to determine the involvement of each of the six components of fitness. By examining the Army's FM 21-20, FM 21-18 and the Marine physical readiness manual, and conducting interviews with civilian and military fitness professionals, the amount of involvement of each component of fitness in each physical event will be determined. From this determination, the component that is most involved in the successful completion of a physical event will be

weighted twice. Those components moderately involved will be weighted once.

Components with little or no involvement will not be weighted.

The definitions of involvement to be utilized:

Most involved. The primary component of fitness involved in the event. The lack of proper conditioning in this component of fitness will cause the Ranger to not complete the event successfully.

Moderately involved. This component of fitness will contribute to the successful completion of the event. The lack of proper conditioning in this component of fitness may cause the Ranger to fail to successfully complete this event.

Little or no involvement. This component of fitness has little or no involvement in the event and lack of this component will not cause the Ranger to fail to complete the event.

Table 1 will be used to present this information.

Table 1. Physical Event/Component Matrix

Component Event	Strength	Anaerobic	Aerobic	Speed	Coordination	Flexibility
Event 1 (3)	1 (3)					
Event 2 (2)	2 (4)					
Event 3 (2)	0 (0)					
Event 4	1					
Event 5	1					
Event 6	1					
Total	10					

2-most involved

1-moderately involved

0-little or no involvement

*Task weights in parenthesis

From this example table, strength is given a total value of 10. If the same methodology is followed and anaerobic fitness receives a total value of 20 it can be realistically stated that the anaerobic conditioning is twice as important to the individual Ranger in completing his mission than strength. The totals of all six components of fitness will be added and from that a percentage for each component will be determined. The next step in the methodology will be examining the Ranger physical fitness program to determine the percentage of time they spend on each component of fitness and how it compares to the results of my study. The study will also examine the relationship between upper and lower body strength and endurance. For example does the strength portion of the combat events stress the lower body while the tested events focuses on the upper body. These results will also be compared on a table to determine how well the tested events reflect the specific type of strength the combat events demand.

CHAPTER 4

ANALYSIS

The missions that a military unit is expected be able to perform are contained on the unit's Mission Essential Task List (METL). The Ranger Rifle Company METL contains the following missions: (1) perform airborne assault, (2) perform air assault, (3) protect the force, (4) perform airfield seizure, and (5) perform raid. By definition all these missions are important or they would not appear on the METL. Raid and airfield seizure are the most important of these missions for the following reasons:

1. The current Regimental Commander has designated them as such both directly and indirectly.

2. The Rangers of Darby and Rudder conducted raids. The primary Ranger missions of Grenada and Panama were airfield seizures.

3. The two primary training exercises the Rangers currently take part in are the Joint Readiness Training Center (JRTC) and Joint Readiness Exercises (JRX). The missions at JRTC are primarily raids while the JRX mission is normally an airfield seizure. Ranger training at company, platoon, and squad level is geared toward preparing those elements for different aspects of these missions.

4. The airborne assault and air assault missions on the METL are usually only conducted as part of a raid or airfield seizure. Force protection is also a factor in both primary missions.

The raid and the airfield seizure each can be broken down into three phases:

- (1) how the force gets to the objective, (2) the action it takes on the objective, (3) how the

force leaves the objective. Each of these phases must be completed successfully for the unit to accomplish its mission and will be treated as equal in importance for the purpose of this study

Raid

The FM 7-85, *Ranger Unit Operations*, "defines raid as a strike operation conducted behind enemy lines against strategic objectives, targets of high tactical value, time sensitive targets or key personnel and facilities in the rear area" (FM 7-85 1987, 5-1). The Ranger force will move to a raid objective by foot using dismounted infiltration or by air assault. The choice of method is dependent on the situation. For the purposes of this study I will analysis foot infiltration because it is the most physically demanding. The reasoning being that a Ranger who can move dismounted to an objective will have the physical fitness to move the significantly shorter distance from the helicopter landing zone to the objective. As the definition implies, the majority of raid objectives are in build up or urban areas. The October 1993 Task Force Ranger action in Somalia is a recent illustration of an urban raid. The JRTC training raids are also largely conducted on urban areas. Like the movement to the target the movement away from the target can be conducted on foot or by helicopter. Movement on foot or dismounted exfiltration will be analyzed for this study. There is no normal raid mission but by using the JRTC example you can identify what an average raid may entail. The Ranger force would depart friendly lines after last light (EENT) and move dismounted using infiltration techniques until prior to first light (BMNT) for a total movement time of approximately eight hours. The force would stay in a hide position during daylight hours and after EENT move the final

distance to the objective. The raid on the build up objective could last one to six hours. At the completion of the raid the force would return by foot to friendly lines. The three phases of Raid analyzed are: (1) dismounted infiltration, (2) raid actions on a build up objective, and (3) dismounted exfiltration.

Airfield Seizure

The Rangers will conduct airfield seizure as part of the initial invasion of a hostile country. The purpose of the airfield seizure is to both to gain control of the airfield so it can be used for follow on friendly forces, equipment, and supplies and to deny its use to the enemy. The airfield seizure can be divided into the same three phases as the raid. The difference being the method of arriving at the airfield will be airborne assault rather than dismounted infiltration. Airfield seizures can be also conducted by helicopter air assault but for the purposes of this study I will use airborne assault because it is more physically demanding. A typical airfield seizure mission would start with an airborne assault sometime after EENT, seizing the airfield objective and waiting until follow on forces take over its security. Once the airfield is secured the Rangers could depart the airfield for other missions by fixed or rotary wing aircraft or move dismounted for continued offensive action. All these techniques are considered viable and prepared for in training and in planning but for the purposes of this study I will analyze dismounted movement. From this I arrive at the following three phases of airfield seizure:

(1) airborne assault, (2) actions on the objective, and (3) dismounted exfiltration.

The analysis of the two primary Ranger missions has revealed six phases:

(1) dismounted infiltration, (2) airborne assault, (3) actions on the raid objective,

(4) actions on the airfield objective, (5) dismounted exfiltration (raid), and (6) dismounted exfiltration (airfield).

There are three criteria will be used to determine whether a platoon collective task will be further analyzed. These criteria are:

1. The task is likely to be conducted within the phases of the Ranger mission.
2. The task will place significant physical demands on the individual Rangers conducting it.

The Ranger squads and platoons have collective critical tasks that are designed to support the company METL. These designated tasks are: (1) platoon attack, (2) overwatch/support by fire, (3) clear building, (4) conduct initial breach of a mined wire obstacle, and (5) perform linkup.

All these tasks may be required of a platoon to support the company raid or airfield seizure mission. The two from this list that best support the identified phases are clear building for raid actions on the objective and platoon attack for airfield actions on the objective. The other collective tasks will be conducted as part of the primary missions but are not as physically demanding or as likely. The other source for identifying critical collective tasks is *ARTEP 7-8 MTP's Operation to Critical Task Matrix*. There are numerous collective tasks that support each operation. This study will concentrate on those collective tasks that are physically demanding and fit into one of the six phases. The following collective maneuver tasks that are not already listed on the Ranger critical collective list are identified to support Raid (ARTEP 7-8 MTP 1994, 2-5).

Execute assault	Execute disengagement
Knock out a bunker	Clear trench line
Perform raid	Occupy assembly area
Move tactically	Perform actions at danger area
Perform tactical road march	Perform passage of lines
Perform stay behind operation	Perform infiltration/exfiltration
Take actions on contact	Break contact
React to ambush	Airborne assault

From this list the task that most clearly fits into the phases is perform infiltration/exfiltration. All the tasks listed above are important and could possibly be executed as part of a Ranger raid mission. The platoon and squad collective tasks are only vehicles to allow me to discover the physically demanding tasks individual Rangers will have to conduct. An analysis of these missions shows that the difference between them is usually at the leader task level. Each collective task has a list of individual skill level one 11B infantryman tasks that support them. For example the individual tasks that support clear building also support knock out bunker and clear trench-line. The same is true for infiltration/exfiltration and perform tactical road march. Also included in the matrix are supporting tasks for the other Battlefield Operating Systems. A discussion of the Battlefield Operating Systems is not within the scope of this study. The physically demanding and very likely task of treat and evacuate casualties appears here and will also be included. Using this technique and combining the manual and the Ranger critical collective task list the following tasks will be further analyzed for each phase of the raid. The Ranger critical task platoon attack is not included because its' supporting individual tasks are also included in the task clear building: (1) dismounted infiltration-perform infiltration/exfiltration, (2) actions on the objective-clear building, treat and evacuate

casualties, breach mine/wire obstacle, Overwatch/SBF, and (3) dismounted exfiltration-perform infiltration/exfiltration.

This same technique is used to analyze the phases of an airfield seizure. The task of conduct airborne assault is the obvious supporting task for the airborne assault phase of the airfield seizure. Airfield seizure is not listed in the ARTEP 7-8 MTP matrix so we have to rely on the Ranger critical collective task list to determine the appropriate platoon collective supporting tasks for the actions on the objective phase of this operation. From the list the best choice would be platoon attack. As discussed earlier, conduct link up is largely a leader task. Breaching mine wire obstacles is rarely part of an airfield seizure and though the majority of airfields do have some buildings they are generally not the dominant terrain. The task platoon attack best supports the actions on the objective phase of this mission. Like the raid, treating and evacuating casualties should also be included during the actions on the objective phase. The task infiltration/exfiltration supports the dismounted exfiltration phase. This gives me the following tasks for the airfield seizure: (1) airborne assault-perform airborne assault, (2) actions on the objective-platoon attack, treat and evacuate casualties, and (3) dismounted exfiltration-infiltration/exfiltration.

The next step is to analyze the individual tasks that support the seven platoon tasks and determine which of those are physically demanding. The seven critical collective tasks analyzed are: (1) infiltration/exfiltration, (2) perform airborne assault, (3) clear building, (4) overwatch/support by fire, (5) platoon attack, (6) breach mine wire obstacle, and (7) treat and evacuate casualties.

The criteria for determining whether an individual task is chosen for further analysis are: (1) The task is physically demanding and (2) The task is likely to happen and will be conducted by the majority of rangers during the mission.

Perform Infiltration/Exfiltration

The task perform infiltration/exfiltration appears three times during the six phases of the two primary missions. The 11B skill level one tasks and Soldiers Manual of Common tasks that support perform infiltration/exfiltration are listed below (ARTEP 7-8 MTP 1994, 5-111):

CTT skill level 1

- Camouflage yourself/individual equipment
- Camouflage equipment
- Report enemy information
- Estimate Range
- Move over, through and around obstacles
- React to indirect fire while dismounted
- Select temporary fighting position
- Practice noise, light and litter discipline
- Perform surveillance
- Use challenge and password
- Perform search and scan procedures
- Conduct combat operations according to the law of war
- Recognize threat and friendly vehicle and aircraft

11B skill level 1

- Locate mines using visual means
- Operate night vision devices AN/TAS-5, AN/PVS-4, AN/PVS-5, AN/PAS-7
- Identify threat weapons
- Move as a member of a fire team

From this list of tasks the following task was determined to meet the criteria:

Move as a member of a fire team.

The task of move through, over or around obstacles was initially thought to be physically demanding until further examination revealed it dealt with moving over or around wire fences. This task is more technical than physical. The only task that fully meets the criteria is move as a member of a fire team. Reacting to indirect fire while dismounted is important but it is much less likely to happen and will also not be examined further. Both these tasks will appear as supporting individual tasks for the platoon critical collective tasks but will not be analyzed further.

Perform Airborne Assault

The following individual tasks support airborne assault (ARTEP 7-8 MTP 1994, 5-136):

CTT skill level 1

- Camouflage yourself/individual equipment
- Camouflage equipment
- Report enemy information
- Estimate Range
- React to indirect fire while dismounted
- Select temporary fighting position
- Practice noise, light and litter discipline
- Perform surveillance
- Use challenge and password
- Perform search and scan procedures
- Conduct combat operations according to the law of war
- Recognize threat and friendly vehicle and aircraft
- Identify topographic symbols on a map
- Identify terrain features on a map
- Orient a map
- Determine grid coordinates
- Determine location by terrain association
- Determine a magnetic azimuth
- Measure distance on a map

11B skill level 1

Operate night vision devices AN/PVS-4, AN/PVS-5, AN/PAS-7
Identify threat weapons
Move as a member of a fire team

With some minor exceptions the individual tasks that support airborne assault are the same as those that support perform infiltration/exfiltration. The same task meets the criteria: Move as a member of a fire team.

Clear building

The following individual tasks support the collective task clear a building (ARTEP 7-8 MTP 1996, 5-136):

CTT Skill level 1

Camouflage self and individual equipment
Camouflage equipment
Report enemy information
Estimate range
Load an M4 rifle
Unload an M4 rifle
Correct malfunctions of an M4 rifle
Engage targets with an M4 rifle
Prepare an M136 launcher for firing
Restore an M136 launcher to carrying configuration
Perform misfire procedures on an M136 launcher
Engage targets with an M136 launcher
Load an M203 grenade launcher
Unload an M203 grenade launcher
Correct malfunctions of an M203 grenade launcher
Engage targets with an M203 grenade launcher
Load an M240B MG
Unload an M240B MG
Correct malfunctions of an M240B MG
Engage targets with an M240B MG
Prepare a LAW for firing
Engage targets with a LAW

Restore LAW to carrying configuration
Perform misfire procedures with a LAW
Perform safety checks on hand grenades
Employ hand grenades
Move under direct fire
Move over, through and around obstacles
React to indirect fire while dismounted
React to flares
Select a temporary fighting position
Practice noise, light and litter discipline
Perform surveillance
Use challenge and password
Send a radio message
Perform search and scan procedures
Engage hostile aircraft with small arms

MOS 11B skill level 1

Engage targets with an M4 using NVD
Engage targets with an M249 MG
Engage targets with an M203 using NVD
Operate NVD AN/TAS-5, AN/PAS-4, AN/PVS-5, AN/PAS-7
Identify threat weapons
Move as a member of a fire team
Perform movement techniques during MOUT
Prepare position for individual and crew-served weapon during MOUT

The tasks that support clear a building are more numerous than the other
Tasks examined so far but the additional tasks are largely weapons oriented and
technical in nature. The tasks that meet the criteria are: (1) move under direct fire,
(2) perform movement techniques during MOUT, and (3) move as a member of a fire
team.

Overwatch/Support by Fire

The following individual collective task support the platoon collective task:
Overwatch/support by fire.

CTT Skill level 1

Camouflage self and individual equipment
Camouflage equipment
Report enemy information
Estimate range
Load an M4 rifle
Unload an M4 rifle
Correct malfunctions of an M4 rifle
Engage targets with an M4 rifle
Prepare an M136 launcher for firing
Restore an M136 launcher to carrying configuration
Perform misfire procedures on an M136 launcher
Engage targets with an M136 launcher
Load an M203 grenade launcher
Unload an M203 grenade launcher
Correct malfunctions of an M203 grenade launcher
Engage targets with an M203 grenade launcher
Load an M240B MG
Unload an M240B MG
Correct malfunctions of an M240B MG
Engage targets with an M240B MG
Prepare a LAW for firing
Engage targets with a LAW
Restore LAW to carrying configuration
Perform misfire procedures with a LAW
Perform safety checks on hand grenades
Employ hand grenades
Move under direct fire
Move over, through and around obstacles
React to indirect fire while dismounted
React to flares
Select a temporary fighting position
Practice noise, light and litter discipline
Conduct operations according to the law of land warfare
Perform surveillance
Use challenge and password
Send a radio message
Perform search and scan procedures
Engage hostile aircraft with small arms

MOS 11B skill level 1

Engage targets with an M4 using NVD
Engage targets with an M249 MG
Engage targets with an M203 using NVD
Operate NVD AN/TAS-5, AN/PAS-4, AN/PVS-5, AN/PAS-7
Identify threat weapons
Move as a member of a fire team
Load an M249 MG

The two supporting individual tasks that meet the criteria are: (1) Move under direct fire, and (2) Move as a member of a fire team.

Platoon attack

CTT Skill level 1

Camouflage self and individual equipment
Camouflage equipment
Locate mines by probing
Report enemy information
Estimate range
Identify topographic symbols on a map
Identify terrain features on a map
Orient a map
Determine grid coordinates
Determine location by terrain association
Determine a magnetic azimuth
Measure distance on a map
Load an M4 rifle
Unload an M4 rifle
Correct malfunctions of an M4 rifle
Engage targets with an M4 rifle
Prepare an M136 launcher for firing
Restore an M136 launcher to carrying configuration
Perform misfire procedures on an M136 launcher
Engage targets with an M136 launcher
Load an M203 grenade launcher
Unload an M203 grenade launcher
Correct malfunctions of an M203 grenade launcher
Engage targets with an M203 grenade launcher
Load an M240B MG

Unload an M240B MG
Correct malfunctions of an M240B MG
Engage targets with an M240B MG
Prepare a LAW for firing
Engage targets with a LAW
Restore LAW to carrying configuration
Perform misfire procedures with a LAW
Perform safety checks on hand grenades
Employ hand grenades
Move under direct fire
Move over, through and around obstacles
React to indirect fire while dismounted
React to flares
Select a temporary fighting position
Practice noise, light and litter discipline
Conduct operations according to the law of land warfare
Perform surveillance
Use challenge and password
Send a radio message
Perform search and scan procedures
Engage hostile aircraft with small arms

MOS 11B skill level 1

Locate mines by visual means
Perform self-extraction from minefield
Engage targets with an M4 using NVD
Engage targets with an M249 MG
Engage targets with an M203 using NVD
Operate NVD AN/TAS-5, AN/PAS-4, AN/PVS-5, AN/PAS-7
Identify threat weapons
Move as a member of a fire team
Load an M249 MG
Maintain an M240B MG
Zero an M240G MG

The two supporting individual tasks that meet the criteria are: (1) move under direct fire, and (2) move as a member of a fire team.

Breach Mined Wire Obstacle

CTT Skill level 1

Camouflage self and individual equipment
Camouflage equipment
Report enemy information
Estimate range
Load an M4 rifle
Unload an M4 rifle
Correct malfunctions of an M4 rifle
Engage targets with an M4 rifle
Prepare an M136 launcher for firing
Restore an M136 launcher to carrying configuration
Perform misfire procedures on an M136 launcher
Engage targets with an M136 launcher
Load an M203 grenade launcher
Unload an M203 grenade launcher
Correct malfunctions of an M203 grenade launcher
Engage targets with an M203 grenade launcher
Load an M240B MG
Unload an M240B MG
Correct malfunctions of an M240B MG
Engage targets with an M240B MG
Prepare a LAW for firing
Engage targets with a LAW
Restore LAW to carrying configuration
Perform misfire procedures with a LAW
Perform safety checks on hand grenades
Employ hand grenades
Move under direct fire
Move over, through and around obstacles
React to indirect fire while dismounted
React to flares
Select a temporary fighting position
Practice noise, light and litter discipline
Conduct operations according to the law of land warfare
Perform surveillance
Use challenge and password
Send a radio message
Perform search and scan procedures
Engage hostile aircraft with small arms

MOS 11B skill level 1

- Locate mines using visual means
- Perform self-extraction from a minefield
- Engage targets with an M4 using NVD
- Engage targets with an M249 MG
- Engage targets with an M203 using NVD
- Operate NVD AN/TAS-5, AN/PAS-4, AN/PVS-5, AN/PAS-7
- Identify threat weapons
- Move as a member of a fire team
- Load an M249 MG
- Maintain a M240b MG
- Engage targets with an M240B MG using NVD

The two supporting individual tasks that meet the criteria are: (1) move as a member of a fire team, and (2) move under direct fire.

Treat and Evacuate Casualties

- Decontaminate your skin and personal equipment
- Evaluate a casualty
- Administer first aid to a nerve agent casualty
- Clear an object from the throat of a conscious casualty
- Perform mouth to mouth resuscitation
- Put on a field or pressure dressing
- Put on a tourniquet
- Apply a dressing to an open abdominal wound
- Apply a dressing to an open chest wound
- Apply a dressing to an open head wound
- Prevent shock
- Splint a suspected fracture
- Give first aid for burns
- Give first aid for heat injuries
- Give first aid for frostbite
- Transport a casualty using a one-man carry
- Transport a casualty using a two-man carry
- Perform search, recovery evacuation or burial of remains
- Send a radio message
- Perform search and scan procedures
- Recognize friendly and threat armored vehicles and aircraft

MOS 11B skill level 1

Guide a helicopter to a landing point

The tasks that meet the criteria are: (1) Transport a casualty using a one-man carry, and (2) Transport a casualty using a two-man carry.

After analyzing all the supporting individual tasks we are left with the following physical tasks that will be furthered analyzed: (1) Move as a member of a fire team, (2) Move under direct fire, (3) Conduct movement techniques in MOUT, (4) Transport a casualty using a one-man carry, and (5) Transport a casualty using a two-man carry.

Move as a Member of a Fire Team

Move as a member of a fire team appears as a supporting task for all the platoon critical collective tasks analyzed except treat and evacuate casualties. That the task is physically demanding is implied by the word move. To decide how and why the task is physically demanding can only be understood through analysis of the collective task it supports. Moving as member of a fire team is different when conducting an infiltration or exfiltration than it is when conducting an airborne assault.

During infiltration and exfiltration moving as a member of a fire team means long dismounted cross-country movements carrying the weapons and equipment needed to sustain the members and conduct the mission. The time and distance of these movements will vary depending on the situation. *FM 21-18* gives the rate of march for cross-country movement at night as 1.6 kilometers per hour (*FM 21-18* 1990, 3-9). Experience on dismounted cross-country infiltrations and exfiltrations, always conducted at night by the Rangers, showed that published rate to be on average correct. According to *FM 21-18*

the weight a soldier would carry on this type of approach march movement should not exceed seventy-two pounds (FM21-18 1990, 5-9). Though the loads carried by Rangers or other infantrymen can exceed seventy-two pounds, that weight is an appropriate average. An infiltration or exfiltration as conducted by the Rangers is understood to be the cross-country, dismounted approach march movement conducted at night discussed above. Physically the actual task the Ranger conducts as part of move as a member of a fire team while infiltrating or exfiltrating is move dismounted while carrying an approach march load. During an airborne assault, the most physically demanding aspect of move as a member of a fire team is running from the point on the drop zone where the Ranger landed to the unit's assembly area. Ideally this movement should be only a few hundred meters for the Ranger travelling the farthest, but often the movement can exceed 1,000 meters. The movement during infiltration is a walk that won't exceed four miles per hour in the best of conditions and will only average 1 MPH, the Ranger is expected to run from his point of landing to his designated assembly area during an airborne assault at a rate no less than six MPH. This run will be completed carrying a weight similar to that carried on the infiltration or exfiltration. The difference in the physical demands of running and walking is enough so a separate physical task of run from parachute landing point to assembly area is designated for further analysis.

Move as a member of a fire team is also a supporting individual task for platoon attack, breach a wire mine obstacle, overwatch/SBF and enter and clear a building. When analyzed as part of these collective tasks, moving as a member of a fire team, is secondary in importance and physical demands to move under direct fire. A separate

physical task does not need to be designated for move as a member of a fire team as it supports these missions. The two combat physical events for move as a member of a fire team are: (1) move dismounted while carrying an approach march load or ruck, and (2) run from parachute landing point to assembly area or run.

Move Under Direct Fire

Move under direct fire is a physically demanding supporting individual task for platoon attack, breach a mined wire obstacle, overwatch/SBF, and enter and clear building. The task move under direct fire is discussed in the soldier's manual of common tasks, skill level 1(CTT). The task, as described in the CTT manual, requires a soldier to move as a member of a two man team 150 to 200 meters over varied terrain to within a hundred meters of an enemy position while carrying an individual weapon (STP 21-1-SMCT 1994, 221). There are three individual movement techniques that can be used while moving under direct fire. The low crawl requires the soldier to lay as flat as possible to the ground while using a push-pull movement with the arms and one leg to move between covered positions. The low crawl is used when there is very little cover and concealment along the route and speed is not required. The high crawl allows the soldier to keep his head up and move along the ground using his knees and elbows. The high crawl is appropriate when there is more cover available and a certain amount of speed is required. The final movement technique is the 3-5 second rush. The soldier will perform the 3-5 second rush by raising from a prone position, rushing forward quickly for 3 to 5 seconds to another covered position, hitting the ground, rolling, and repeating the rush to another position. The 3-5 second rush should be used with another soldier as a

two-man buddy team when speed is essential. All three of these movement techniques are physically demanding and will be conducted repeatedly by Rangers during an airfield seizure and raid. The difference in the physical demand of the high crawl and low crawl is not significant and Rangers will alternate their use while under direct fire. These two individual movement techniques will be combined for further analysis. The physical demands of the 3-5 second rush are different from those of the high and low crawl and it will be analyzed as a separate physical event. The individual task of move under direct fire has the two tasks as combat physical events: high/low crawl or crawl and 3-5 second rush or rush.

Transport a Casualty Using a One-Man Carry

The Soldiers Manual of Common Tasks STP 21-1-SMCT lists nine types of individual casualty carries (STP 21-1-SMCT 1994, 527-528): (1) fireman's carry, (2) support carry, (3) arms carry, (4) saddleback carry, (5) pack-strap carry, (6) pistol-belt carry, (7) neck drag, and (8) cradle drop drag.

The use of these carries is dependent on the tactical situation and the injuries of the casualty. Though the techniques for each of the carries are different the physical demands of each of the techniques are similar. The combat physical event for the individual task of transport a casualty using a one-man carry is the casualty carry.

Transport a Casualty Using a Two-Man Carry

STP 21-1 SMCT discusses six types of two man casualty carries. (STP 21-1-SMCT 1994, 535): (1) two-man support carry, (2) two-man arms carry, (3) four-hand seat carry, (4) two men fore-and-aft carry, (5) two-hand seat carry, and (6) litter

carry. Like the one man carries, the use of these carries depends on the tactical situation and the injuries of the casualty, with the physical demands being similar. The similarity of the physical demands for each of the one-man and two-man casualty carry techniques allows the techniques to be combined into the combat physical event casualty carry.

Conduct Movement Techniques during MOUT

FM 90-10-1, An Infantryman's Guide to Combat in Built-up Areas, discusses nine basic movement skills an individual Ranger must be proficient in to survive in a MOUT environment. These essential movement skills are (FM 90-10-1 1995, 5-1-5-10): (1) crossing of a wall, (2) movement around corners, (3) movement past windows, (4) use of doorways, (5) movement parallel to buildings, (6) crossing open areas, (7) movement between positions, and (8) movement inside a Building.

The key to successfully performing each of these skills is technical. For example, when a Ranger moves past a window, the key to his being successful is executing the technique of ducking below or stepping over the window depending on it's height. Speed or the ability to move quickly, is mentioned as essential in crossing a wall (FM 90-10-1 1995, 5-1), and crossing open areas (FM 90-10-1 1995,5-6). The platoon task in *ARTEP 7-8-MTP* reinforces the need for speed in task step 4-c. Which states "crosses open areas rapidly...." (*ARTEP 7-8-MTP* 1994, 5-93) Built-up areas are generally a series of buildings and open areas. Ideally a Ranger will use the protection of a building when moving forward, but he will have to cross open areas both when entering the built-up area and when moving between buildings that are not connected. The physically demanding

aspect of this rapid movement between buildings will be described as the physical event sprinting with combat load between buildings or sprint.

FM 90-10-1 states that buildings should ideally be cleared from the top down. This technique requires the individual Ranger to be able to climb to a second story window or higher to enter the building. The FM describes the following techniques of entering the top level of a building (FM 90-10-1 1995, 5-11-5-16): (1) ladders, (2) grappling hook, (3) scaling walls, and (4) rappelling. The physically demanding aspect of each of these techniques, with the exception of the rappelling, is climbing by whatever means. The combat physical event, which covers these entry techniques, is climbing while wearing combat equipment or climb.

The analysis of the physically demanding supporting individual tasks determined that the following are the physical events a Ranger will conduct repeatedly in combat.

<u>Event no.</u>	<u>Physical event (abbreviation)</u>
1.	Move dismounted while carrying an approach march load (ruck)
2.	Run from parachute landing point to assembly area (run)
3.	Parachute jump and landing fall (PLF)
4.	High/low crawl (crawl)
5.	3-5 second rush (rush)
6.	Casualty Carry (CX carry)
7.	Sprint between buildings with combat load (sprint)
8.	Climb while wearing combat equipment (climb)

Each of the six phases described earlier has these supporting physical events designated by event number:

<u>Phase</u>	<u>Supporting Physical event</u>
Raid infiltration	1
Raid actions on Objective	4, 5, 7, 8
Raid exfiltration	1
Airfield seizure airborne assault	2, 3
Airfield seizure actions on objective	4, 5, 6
Airfield Seizure exfiltration	1

Based on the amount of phases they appear in the physical events have the following weights:

<u>Physical Event</u>	<u>Weight</u>
1	3
2	1
3	1
4	2
5	2
6	2
7	1
8	1

Physical Event Analysis

As discussed in Chapter 3, each of the physical events will now be further analyzed to determine how much each of the six components of fitness are involved. The importance of each component will receive a rating. A rating of two will be given to the component of fitness that is most involved. Components that are moderately involved will receive a rating of one. Components of fitness that have little or no involvement will receive zero for a rating.

Physical event one is move dismounted with an approach march load or ruck. The question, what does it take to make a soldier able to march long distances while carrying heavy loads, is probably almost as old as the military profession itself. FM 21-

18, *Foot Marches* does not specifically discuss the amount of involvement of the six components of fitness, but it does mention that a program of progressive foot marches meets the requirement for both aerobic endurance and muscular endurance or what this study refers to as anaerobic training (FM 21-18 1990, 5-19). The need for strength training is also emphasized in the same chapter (FM 21-18 1990, 5-19). FM 21-20 lists foot marches in the chapter on aerobic exercise and describes marching as “an excellent aerobic activity” (FM 21-20 1992, 2-10). The same manual’s chapter on developing a physical training program displays an activity selection chart that recognizes the involvement of the strength, anaerobic, and aerobic components of fitness but not the flexibility, speed, and coordination components (FM 21-20 1992, 10-4). From the information contained in the two Army manuals, as well as from experience, it is clear that the aerobic component is most involved in move dismounted with an approach march load or ruck. It is also clear that the strength and anaerobic components are moderately involved. As mentioned, the other three components have little or no involvement in foot marching. The rating for each component is listed below.

Aerobic	2
Anaerobic	1
Strength	1
Flexibility	0
Speed	0
Coordination	0

The second physical event is run from the point of landing to the assembly area (run) during an airborne assault. This event is not specifically discussed in FM 21-20 or in its own field manual like foot marching. Since the physical aspects of this event are

not specifically discussed in appropriate manuals, the best technique to discover the level of involvement for each of the components is to focus on the running part of the event. Running from the landing point to the assembly area in what is often referred to as a "combat run" entails the Ranger to run with an approach march load of seventy-two pounds or more at six MPH for a distance of 400 meters to a mile. Running is considered one of the primary aerobic exercises (FM 21-20 1992, 2-6) and involves both the aerobic and anaerobic fitness components (FM 21-20 1992, 10-4). The strength, flexibility, speed, and coordination components are not involved in this event. How is running while carrying seventy-two pounds or more of equipment different from running in just standard physical training uniform? The obvious difference is the weight. As in foot marching, carrying that type of weight also requires strength (FM 21-20 1992, 10-4). The component rating for this event is the same as the foot march.

Aerobic	2
Anaerobic	1
Strength	1
Speed	0
Flexibility	0
Coordination	0

The third physical event is actually two events in one. The first being the act of standing up in an aircraft for the ten minutes prior to jumping and the second being the execution of a parachute landing fall (PLF) The third physical event is actually two events in one. The first being the act of standing up in an aircraft for the 10 minutes prior to jumping and the second being the execution of a parachute landing fall. Standing up in an aircraft with combat equipment to include parachute while keeping the static line arm

up requires a combination of strength and muscular endurance. Withstanding the force of your feet hitting the ground during a parachute landing requires strength while the fall after the feet impact requires strength, coordination and flexibility. The component rating of this event is,

Strength	2
Anaerobic	1
Coordination	1
Flexibility	1
Speed	0
Aerobic	0

The fourth physical event is the 'high or low crawl'. The importance of the 'high and low crawl' cannot be over emphasized as it is one of the Ranger's primary method of moving under direct fire. Failure to high or low crawl properly, executing the act either too slowly or incorrectly because of lack of proper physical conditioning, can cause the mission to fail and the Ranger to be killed or wounded. The faculty at the Army Physical Fitness School feels that the component of fitness most involved in the high and low crawl is anaerobic (McMillian, 16 Feb 99). This designation makes sense since high and low crawling is used to cover short distances and are conducted at a high intensity. The task-condition-standard for move under direct fire requires a soldier to move 150 to 200 meters using the two types of crawls and the 3-5 second rush (STP 21-1-SMCT 1994, 221). An accurate assumption is that the longest distance a Ranger would be expected to crawl would be approximately 100 meters. Strength, aerobic endurance, flexibility, and coordination are also involved in performing the high and low crawl. Strength is required because the Ranger is pulling both his body weight and the approximately forty-eight

pounds of equipment (boots, LBE, weapon, ammunition, water, helmet) included in his fighting load. Aerobic conditioning is required because, though the majority of the task is done at an intensity that does not allow the heart and lungs to supply adequate oxygen to the working muscles, the system is still taxed. Flexibility and coordination are involved because high and low crawling require the Ranger to synchronize the movements of his arms, legs, and torso to move efficiently over the ground. The rating for each of the fitness components is listed below.

Anaerobic	2
Aerobic	1
Strength	1
Coordination	1
Flexibility	1
Speed	0

The 3-5 second rush is an individual movement technique like the high and low crawl. The 3-5 second rush is a series of sprints interspersed with diving on the ground and rolling. The Army Physical Fitness School feels that speed is the primary component involved in conducting this event with anaerobic conditioning being the second most important (McMillian 17 Feb 99). This is accurate if the event involved the Ranger making only one or two 3-5 second rushes. The task-condition-standard for this event is combined with the high and low crawl and requires a Ranger to move approximately a hundred meters using the 3-5 second rush (STP 21-1-SMCT 1994, 221). Considering the fact that the three to five seconds also includes the Ranger both rising from and diving into the prone position. The maximum distance covered in each rush will be less than twenty meters and realistically closer to ten meters. This means a Ranger would have to

make a minimum of five rushes to complete the hundred meters successfully. This, combined with the fact that he will be wearing and carrying approximately forty-eight pounds of equipment, requires that the anaerobic component be given priority over speed. Speed is important, but a Ranger with superior speed and little anaerobic conditioning will quickly lose his ability to make any rushes at all, regardless of how far he can move in three to five seconds. An anaerobically conditioned Ranger will be able to cover the required distance successfully regardless of how much distance his speed allows him to cover in each rush. The physical fitness school also does not include aerobics as a component of the 3-5 second rush. In this case, the same argument is true, aerobics would not be involved if a ranger were required to do only one or two rushes. But as discussed, he will have to do at least five and most likely more to successfully complete the event, thus causing the aerobic system to be involved. Strength and flexibility also play a role in conducting 3-5 second rushes. The ratings for this event are below.

Anaerobic	2
Aerobic	1
Strength	1
Speed	1
Flexibility	1
Coordination	0

Though there are numerous types of casualty carries as discussed earlier, the demands placed on the components of fitness differ little. The Army Physical Fitness School designated strength as the primary component of fitness involved in conducting casualty carries (McMillian 17 Feb 1999). Neither the Army's FM 21-20 or the Marines FMFRP 0-1B specifically mention to what extent the different components of fitness are

involved in carrying casualties. The Marine manual does mention that lower body strength and stamina are required for carrying a casualty (FMFRP 0-1B P 1988, 1-3). FM 21-20 includes 'casualty carries' as part of guerrilla drill training, which according to the activity selection guide, develop strength, aerobic, and anaerobic fitness (FM 21-20 1992, 10-4). The soldier's manual does not include a distance for carrying a casualty as part of the Task-Condition-Standard. The Marines physical readiness test requires a Marine to carry the casualty fifty meters. Moving a casualty fifty meters is a realistic distance to get him out of the direct line of fire. The other aspect of moving a casualty is the movement to the casualty collection point, which could be another a hundred or more meters away. The determining factor that causes this event to be more strength than anaerobically oriented is the fact that the casualty can be of equal or greater weight than the person carrying him. If the weight being carried were significantly lighter anaerobic fitness would be more important. An anaerobically fit soldier who does not have the strength to lift a casualty weighing as much as himself would be unable to complete the task, while a strong soldier who lacks anaerobic fitness would be able to complete the task though the time needed would be significant. Aerobic endurance, flexibility, and coordination are also involved in carrying casualties. Aerobic endurance becomes more involved as the distance covered increases. Coordination and flexibility allow a Ranger to efficiently pick-up and carry the casualty without wasting energy or harming him further.

Strength	2
Anaerobic	1
Aerobic	1
Flexibility	1
Coordination	1
Speed	0

One of the keys to successful movement techniques in a MOUT environment is the ability to move quickly or sprint between covered positions. The speed at which a Ranger can sprint between positions offering cover can be a matter of life and death. This being the case, speed, the basis of sprinting, is the most important component of fitness in the successful completion of this task. The difference between this event and the 3-5 second rush is that the sprint between covered positions is not conducted in a series of repetitions as the 3-5 second rush is. Normally after conducting the sprint a Ranger will be involved in a series of other tasks before being required to sprint again. This, and the fact that the distance sprinted will usually be less than thirty meters, gives speed the priority over anaerobic conditioning. Strength is involved in this task because strength is a factor in speed and the Ranger will be carrying a combat load of equipment while conducting this task. Aerobic conditioning and flexibility are also involved in this event (McMillian 17 Feb 1999).

Speed	2
Anaerobic	1
Aerobic	1
Strength	1
Flexibility	1
Coordination	0

The final physical event is climb while wearing combat equipment. The items that a Ranger may be required to climb in a MOUT environment include ropes, ladders,

windowsills, roof ledges and drainpipes. The technique used to climb each of these items may be different, but the component of fitness most heavily involved is strength. The act of climbing in a MOU environment closely resemble the climbing involved in standard Army obstacle courses and the pull-up exercise. FM 21-20 uses a figure of three to seven repetitions of an exercise with a heavy weight as being optimal for developing strength (FM 21-20 1992, 1-5). The act of climbing is in effect a small number of repetitions of an exercise similar to the pull-up with a heavy weight (body weight plus combat equipment). Anaerobic and aerobic conditioning are required for this event because they enable a Ranger to climb more than once and be effective once the climb is complete. Flexibility and coordination allow a Ranger to maximize his technique while climbing thus reducing fatigue and lessening the chance of injury. The ratings for this event are below.

Strength	2
Anaerobic	1
Aerobic	1
Flexibility	1
Coordination	1
Speed	0

The component evaluation of each of the tasks is complete and the ratings can be inserted into the Event /Component Matrix.

Table 2. Combat Physical Event/Physical Fitness Component Matrix

Component Event	Strength	Anaerobic	Aerobic	Speed	Coordination	Flexibility
Event 1 (3) Ruck	1 (3)	1 (3)	2 (6)	0	0	0
Event 2 Run	1	1	2	0	0	0
Event 3 PLF	2	1	0	0	1	1
Event 4 (2) Crawl	1 (2)	2 (4)	1 (2)	0	1 (2)	1 (2)
Event 5 (2) Rush	1 (2)	2 (4)	1 (2)	1 (2)	0	1 (2)
Event 6 (2) CX Carry	2 (4)	1 (2)	1 (2)	0	1 (2)	1 (2)
Event 7 Sprint	1	1	1	2	0	1
Event 8 Climb	2	1	1	0	1	1
Total	17	17	14	4	8	10

Using this technique, anaerobic conditioning is slightly more important than both strength and aerobic conditioning with the other 3 components being of less importance. The total value of all the components is 69.

Strength	17
Anaerobic	17
Aerobic	14
Speed	4
Flexibility	10
Coordination	9

Total = 70

Each component's percentage (rounded off) of that total is below.

Strength	24 percent
Anaerobic	24 percent
Aerobic	20 percent
Speed	6 percent
Flexibility	14 percent
Coordination	11 percent

The percentages for the components of strength, aerobic, and anaerobic endurance when the values for the other three components are not included are:

Anaerobic	35 percent
Strength	35 percent
Aerobic	29 percent.

The Rangers do not have a standard physical training program and the physical training conducted varies between units. The Rangers do have physical fitness events as part of the entrance requirement. These events are the APFT of push-ups, sit-ups and two-mile run, with the addition of pull-ups, a five-mile run and a twelve-mile road march carrying a forty-five pound rucksack, LBE, weapon, and kevlar helmet. Which of these events held the most importance would vary with each person asked, but a fact is that failing any one of the events will disqualify a soldier from serving with the Rangers. Because of this, for the purposes of this study, all events will be weighted equally. They will be analyzed using the same technique as used for the physical events discussed earlier in this chapter. The events analyzed are: (1) two minutes of push-ups, (2) two minutes of sit-ups, (3) pull-ups, (4) two-mile run, (5) five-mile run, and (6) twelve-mile road march.

The Army Physical Fitness Test (APFT) task, condition, and standard for the push-up and sit-up describe the events as being a measure of the endurance of chest, shoulder, and triceps muscle and the endurance of the abdominal and hip flexor muscles respectively. The type of endurance the APFT is speaking of is muscular or anaerobic endurance. Anaerobic endurance is the component of fitness most involved in both events. Strength and aerobic fitness are moderately involved in both events. Speed is also moderately involved because the ability to move quickly will improve a Ranger's score. The other components have little or no involvement. The ratings for push-up and sit-up are:

Anaerobic	2
Strength	1
Aerobic	1
Speed	1
Coordination	0
Flexibility	0

Pull-ups, or chin-ups, are used to measure the strength of the back, shoulders, forearms, and biceps. The standard for the Ranger regiment is six pull-ups, or chin-ups. When performed in this manner the event is primarily a measure of strength. Anaerobic endurance is moderately involved. The other components are not involved:

Strength	2
Anaerobic	1
Aerobic	0
Speed	0
Flexibility	0
Coordination	0

The two-mile run is described by the APFT task-condition-standard as a measure of aerobic and leg muscle endurance. Aerobic endurance is the component of fitness

most involved with this event. The intensity and pace at which the run must be completed means that anaerobic endurance and speed are also involved. The other components have little or no involvement:

Aerobic	2
Anaerobic	1
Speed	1
Strength	0
Flexibility	0
Coordination	0

The difference between successful completion of the two-mile and the five-mile run is pace. A twenty-year-old Ranger will need to run two sub-seven minute miles to meet the required thirteen minutes and fifty-four second two-mile run time he will need to be in the regiment. The five-mile run, though obviously longer, only requires an eight-minute per mile pace. Aerobic endurance is still the primary component in the five-mile run. Anaerobic endurance is involved to a lesser extent. Speed and the other components have little or no involvement in the five-mile run.

Aerobic	2
Anaerobic	1
Strength	0
Speed	0
Flexibility	0
Coordination	0

The amount each component of fitness is involved in the twelve-mile road march event is the same as the move dismounted with approach march load or ruck discussed during the physical event analysis.

Aerobic	2
Anaerobic	1
Strength	1
Speed	0
Flexibility	0
Coordination	0

The totals for each of the components of the tested events are presented in the same table format as the combat physical events.

Table 3. Tested Event/Physical Fitness Component Matrix

Component Event	Strength	Anaerobic	Aerobic	Speed	Coordination	Flexibility
Pushups	1	2	1	1	0	0
Sit-ups	1	2	1	1	0	0
Pull-ups	2	1	0	0	0	0
2 mile run	0	1	2	1	0	0
5 mile run	0	1	2	0	0	0
12 mile roadmarch	1	1	2	0	0	0
Total	5	8	8	3	0	0

Using this technique anaerobic and aerobic endurance are equally important with strength a distant third in order of involvement. Speed is involved, but the other two components have no involvement in any of the six events. The following are the ages of the tested events:

Anaerobic	33 percent
Aerobic	33 percent
Strength	20 percent
Speed	12 percent
Coordination	0 percent
Flexibility	0 percent

Anaerobic endurance is the highest rated component of fitness for both the combat and the tested events. The difference between the 33 percent rating it received for the tested events and the 24 percent rating it received is misleading because the ratings coordination and flexibility received for the combat events is significantly higher than the tested events and effected anaerobic endurance's percentage of the total. If we remove the non-energy system ratings of flexibility, speed and coordination from the percentages of both types of events and conduct the comparison with the aerobic and strength components the ratings are closer, the same 35 percent for the tested events and 38 percent for the combat events.

Strength is the second highest rated component for the combat events but third behind anaerobic and aerobic endurance in the tested events. The 20 percent rating for tested events and the 23 percent for combat events are close because of the significance given the non-energy system components in the combat event ratings. Using the same method as used in the previous paragraph the difference is significant. Strength receives a rating of 35 percent for the combat events but only 24 percent for the tested events.

Aerobic endurance received a rating of 33 percent for the tested events and 20 percent for the combat events. The difference between the ratings remains significant

when using the same technique as the previous paragraphs. The tested event rating is 38 percent while the combat event rating is 29 percent.

Table 4. Combat Physical Events/Tested Events Matrix

COMPONENT/EVENT	COMBAT EVENTS	TESTED EVENTS	DIFFERENCE
STRENGTH	35 percent	24 percent	11 percent
ANAEROBIC	35 percent	38 percent	3 percent
AEROBIC	29 percent	38 percent	9 percent

Ratings are rounded off to the nearest whole number.

The most significance difference this table reveals is that of the lack of emphasis on strength in the tested events. The reason for this is the tested events heavier emphasis on aerobic endurance over strength. The difference of 3 percent between the event's emphasis on anaerobic endurance is less significant.

Flexibility and coordination both have rankings of 0 percent in the tested events but receive rankings of 14 and 11 percent in the combat events. While the ranking percentage may not be important in itself the fact that flexibility is moderately involved in 75 percent and coordination involved in 50 percent of the combat events, while they have no involvement in the tested events is significant. Though it may not be necessary to add events that test coordination and flexibility to the tested events these components should receive consideration when designing a PT program.

More detailed analysis of the tested events reveals that they also don't address the subsets of the components of fitness. The strength that is tested by the only significant strength event in the tested events, the pull-up is that of the upper body, specifically the back, biceps, and forearms. The pull-up supports the combat event, climb, but does not support the other strength dominated combat events, casualty carry and parachute jump and PLF. The lower body strength that is required to perform those two events successfully is not significantly evaluated in any of the other tested events with the possible exception of the road march. Strength received a total of 17 points for the combat events, these points are broken down between upper and lower body strength with the waist being the dividing line on how much each is involved.

Table 5. Combat Physical Event/Upper and Lower Body Strength Matrix

COMBAT EVENT	# STRENGTH PTS	UPPER BODY	LOWER BODY
Ruck	3	1	2
Run	1	1/2	1/2
Cx Carry	4	2	2
Crawk	2	1	1
Rush	2	1	1
Sprint	1	0	1
PLF	2	0	1
Climb	2	1 1/2	1/2
Total	17	7	10

This means that almost 60 percent of the strength involved in the combat events is lower body strength. The same method will be used for the tested events.

Table 6. Tested Event/Upper and Lower Body Strength Matrix

TESTED EVENTS	#STRENGTH PTS	UPPER BODY	LOWER BODY
Push-ups	1	1	0
Sit-ups	1	1/2	1/2
Pull-ups	2	2	0
Two-mile run	0	0	0
Five-mile run	0	0	0
Twelve-mile march	1	1/2	1/2
Total	5	4	1

Strength

	UPPER BODY	LOWER BODY
COMBAT EVENTS	41 percent	59 percent
TESTED EVENTS	80 percent	20 percent

This indicates that the tested events and the resulting physical training program neglect strength, especially lower body strength. This same methodology will reveal similar results when examining anaerobic endurance.

Table 7. Combat Physical Event Upper and Lower Body Anaerobic Matrix

COMBAT EVENT	#ANAEROBIC PTS	UPPERBODY	LOWERBODY
Ruck	3	1	2
Run	1	0	1
PLF	1	1/2	1/2
Crawl	4	2	2
Rush	4	1	3
CX Carry	2	1	1
Sprint	1	0	1
Climb	1	1	0
Total	17	6 1/2	10 1/2

Table 8. Tested Event Upper and Lower Body Anaerobic Matrix

TESTED EVENT	# ANAEROBIC	UPPERBODY	LOWERBODY
Push-ups	2	2	0
Sit-ups	2	1	1
Pull-ups	1	1	0
Two-mile run	1	0	1
Five-mile run	1	0	1
Twelve-mile ruck	1	1/2	1/2
Total	8	4 1/2	3 1/2

Anaerobic Endurance

	UPPER BODY	LOWER BODY
COMBAT EVENT	39 percent	61 percent
TESTED EVENT	56 percent	44 percent

Like strength, the tested events fail to give enough emphasis to the anaerobic endurance of the lower body.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

The primary research question the paper attempted to answer was how much each of the components of physical fitness is involved in the Ranger combat mission. The research technique used revealed that the physical fitness component muscular strength and anaerobic endurance were equally involved in the Ranger mission with aerobic endurance being slightly less involved. The difference between the score given to each of these three components was fairly insignificant. This fact, and the fact that the actual involvement ratings were gained using a combination of deduction and the opinion of experts and not through a physiological study of each event, makes it unrealistic to say definitively that muscular strength for example is four percent more important than aerobic fitness and thus should have four percent more training time and effort. What the research does reveal is that the three primary components of fitness are involved in the Ranger mission on an almost equal basis. The other three physical fitness components analyzed, flexibility, speed, and coordination are involved less, but their involvement is significant enough for them to be considered as part of the Ranger's PT program.

The fact that all three of the primary components of fitness are almost equally involved in the mission is not revolutionary news. The Army Physical Readiness manual has stressed the need for a balanced PT program involving all three of the primary components since its 1946 edition. This being the case why has the Army and the Ranger Regiment continued to use distance running, which does little or nothing to develop muscular strength, as their primary measure of physical fitness and not geared their programs more toward the realities of their mission? The most likely answer is that the

Army's and the Ranger's physical fitness programs were heavily influenced by the Army Physical Fitness Test (APFT), of push-ups, sit-ups and a two-mile run being introduced in the early eighties at the same time as the United States was experiencing a distance running boom. FM 21-20 stresses that PT should be geared toward improving a soldier's ability to perform his mission in combat and not solely toward doing well on the APFT. There is no quantifiable method for determining "combat fitness" so the APFT with its' easily understandable score becomes the primary method by which a unit reports its' level of fitness.

Distance running is important to both the Army and the Rangers for numerous reasons. The primary reason is that distance running is one of the best developers of aerobic fitness and an excellent method to control weight. The weight control aspect of the distance running is important because the Army weight scale punishes not only soldiers who are too fat but also soldiers who are muscular. Distance running is also easily measurable. The Ranger Regiment requires soldiers to run five miles in forty minutes with each of the miles run at an eight-minute per mile pace plus or minus fifteen seconds. The 18th Airborne Corps requires soldiers to run four miles in thirty-six minutes. These standards are not bad or unfair but should be understood for what they are, an indicator of a unit's distance running ability not an indicator of physical readiness for combat.

Unit distance runs are an excellent technique for developing unit morale and esprit de corps. Commanders can use distance runs as a test of a unit's discipline and mental toughness. Running requires no special equipment and can be performed almost anywhere. Distance running should remain an important part of PT for the reasons

discussed but it should not be the primary or dominate aspect of the Army's or the Ranger's PT programs. Running is also important to the Army for less noble reasons. Commanders and leaders have complete control during unit runs. The commander or squad leader who leads his unit on a run, in a sense, always "wins the race". Used correctly this technique can improve a soldier's fitness and morale, used incorrectly it does nothing but feed the commander's ego and lead to injury. Distance running is easier than the marching and obstacle courses the Rangers of World War II used as their primary method of conditioning. Commanders are usually at an age where they can still compete with their younger soldiers in distance running, but are behind them in sprinting speed, flexibility and general athleticism. This being the case the commander is more likely to use distance running, something he is good at, as the backbone of his unit's fitness program. Commanders should ask themselves a question when evaluating the amount of running his unit does. Are we running a lot because I think it's the best way to prepare my soldiers for combat or are we doing it because it's what I'm comfortable with? The unit distance run has become and should remain part of the Army's and Ranger's culture, but should not be the primary aspect of their PT programs.

Distance running replaced road marching as the primary means of aerobically conditioning Rangers in the 1970s when the 1st and 2nd Ranger Battalions were reactivated. The Ranger units of World War II and Korea had included very little distance running in their PT programs. Road marching did remain part of Ranger PT after the battalions were reactivated, but its emphasis was largely dependent on the commander and remained secondary to distance running. Soon after taking command of the Ranger Regiment in 1997 Colonel McCrystal issued a policy on roadmarching. This

policy stated that every Ranger will roadmarch ten miles with a fifty-pound rucksack every week. Additionally, all Rangers were required to road march twenty miles with a fifty-pound rucksack and thirty miles with an assault pack during alternating quarters. This road march policy was intended to not only increase the fitness of the Rangers but to also improve their mental toughness. Prior to Colonel McCrystal's policy the only Regimental standard for road marching was the completion of a quarterly twelve-mile march.

The individual battalions used road marching as part of their training to differing degrees. The 1st Ranger Battalion's policy called for weekly eight-mile road marches with soldiers carrying forty-five percent of their body weight, quarterly twelve-mile marches and semi-annual twenty-five-mile marches. The issues that usually arise with the inclusion of weekly road marching as part of the PT program are that it will break soldiers down physically and that it takes time away from other physical fitness test activities, especially running. Neither of these arguments is legitimate for Rangers. The Army did a study that found that road marching twice a month and marching four times a month produced similar benefits (FM 21-20 1992, 2-13). In the same FM 21-20 they prescribe a road marching program for initial entry soldiers that has them road marching once a week. *FM 21-18* recommends a PT program that includes two sessions per week of marching (FM 21-18 1990, 5-20). Army Special Forces units recommend a program of three weekly marches when preparing for their training. How much and how often should a Ranger march? We know that the ability to move on foot while carrying a heavy load is an essential part of the primary Ranger missions, raid and airfield seizure.

Marching was the most heavily weighted of all the Ranger combat physical events. Road marching, though primarily an aerobic activity also developed the anaerobic and strength components of physical fitness. The fact that marching is an essential part of the Ranger mission and that it develops all three of the primary physical fitness components is ample reason to include road marching in the PT program on a weekly basis.

Anaerobic and muscular endurance conditioning is the least understood component of physical fitness by Army and Ranger personnel. This component is, in a sense, the link between strength and endurance. The Army Physical Fitness test is largely an evaluation of a soldier's muscular and anaerobic endurance. Despite this the Rangers and the Army could do a better job developing this type of fitness. The reason for this is that the muscular and anaerobic endurance that the APFT tests is largely that of the upper body with the push-up and sit-up events while the lower body is more stressed in combat. FM 21-20 details numerous activities that will improve the muscular and anaerobic endurance of the lower body. These activities include wind sprints, guerrilla drills, grass drills, and sports. These activities are not included in most Ranger PT because they are seen do to little for a Ranger's ability to score well on the APFT.

Strength is the most neglected component of fitness by the Ranger's and the Army as a whole. The most common problem with strength development is that the upper body is the only area trained for strength, while the lower body, specifically the legs, is trained for endurance. The reason for this is that the APFT only measures upper body strength and the majority of emphasis for Rangers who lift weights is on upper body exercises. Lower body strength training is often viewed as a possible impediment to distance

running. This neglect of lower body or leg strength was not the case prior to the new APFT. The 1957 five-event physical achievement test had two events; the triple broad jump and man carry, primarily to test lower body strength (TM 21-200 1957, 503-505). Upper body strength is required for the Ranger mission, especially climbing, but it is less important than lower body strength. Lower body strength is what gives a Ranger the ability to carry a casualty, withstand the rigors of an airborne assault, and support the weight of his equipment during IMTs.

How should strength training be included in the Ranger PT program? The first point must be that Rangers should not be solely power lifters or body builders. These pursuits in themselves are not harmful, but must be balanced with aerobic and anaerobic endurance training. Running and occasional road marching are usually viewed as all the lower body exercise a Ranger needs. These activities are excellent for aerobic endurance, but do little to develop lower body strength. Strength of the lower body can be developed using casualty carries, partner resistance exercises, and weight lifting. The upper body strength that a Ranger needs is largely based in the back, arms, and shoulders. These are the muscle groups that allow a Ranger to climb, lift and support a casualty, carry a crew served weapon, and support the straps of a rucksack.

The most emphasized muscle group unfortunately is the chest. The reason for this muscle's importance is the push-up event of the APFT and our culture's love affair with the bench press. A man's one repetition maximum weight lifted on the bench press is the standard by which strength is judged. The bench press and the push-up are good developers of upper body strength but should not be used as a replacement for pull-ups,

chin-ups, rope climbing, or weight lifting exercises that develop the muscles of the back, shoulders, and arms.

The other aspect of strength that must be explored is its relationship to body weight. While a heavier Ranger will most likely have an advantage when carrying weight or in hand-to-hand combat, a lighter Ranger with more strength relative to his body weight will be a better climber. The ideal is that a Ranger has enough size to better support the weight of a heavy rucksack or a fellow Ranger while being strong enough relative to his body weight to climb effectively. To put it simply a 140 pound Ranger who can climb and do pull-ups all day long will be less able to carry eighty or a hundred pounds of combat equipment, while the 220 pound Ranger who can handle that weight with less stress may have trouble pulling his own body weight while climbing. When designing strength training leaders need to consider the needs of the individual Ranger. The 140 pound Ranger should conduct strength training that improves his overall size and strength while maintaining his strength relative to his weight. The larger Ranger should be given a program to improve his strength relative to his weight and should avoid a program that increases that body weight.

Speed, flexibility, and coordination are a part of the Ranger mission and increase survivability on the battlefield. Leaders should ensure that these components of fitness are not neglected. A PT program that only includes running, road marching, and push-ups, sit-ups and pull-ups does little or nothing to improve those three components. FM 21-20 recommends many activities that do and these should be included in the PT program on a regular basis.

The best way to change the focus of PT to reflect the realities of the combat mission is to change the physical fitness test. While the current APFT is a good indicator of general fitness, it is not an accurate reflection of the physical fitness components required by the Ranger combat mission. What should this Combat Physical Fitness Test (CPFT) consist of? The test needs to be conducted during the normal hours of Ranger PT (i.e. no more than two hours) and require equipment already available. The recommendation for the CPFT is a five-mile road march, rope climb, and casualty carry. These events are combat related and require all six components of fitness discussed in this paper. The test would begin with the five-mile road march while carrying forty-five pounds of equipment. The standard to pass would be fifteen minutes per mile, while maintaining a pace of ten minutes per mile would give a maximum score. Immediately upon completing the march the Ranger would drop his rucksack and move to the thirty foot rope climb. He would be given two minutes to climb the rope as many times as possible. The Ranger would need to complete one climb to pass, three climbs would result in a maximum score. The Ranger would next move to the casualty carry and pair off with a Ranger of equal weight. The event would require the Ranger to carry the man of equal weight for 150 meters. The recommended passing time would be sixty seconds with forty-five seconds or below receiving a maximum score. This CPFT replicates the actions a Ranger faces in combat with the road march replicating the infiltration to the target, the rope climb replicating the climbing required for MOUT operations, and the casualty carry event replicating that actual occurrence during consolidation and reorganization. The test could be completed in two hours and it accurately represents the involvement of the six components of fitness. The road march event is primarily aerobic

with some strength and anaerobic benefit. The rope climb, because of the two-minute duration, would test strength and anaerobic endurance of the arms, shoulders, and back on a relatively equal basis. Only including a one-rope climb for speed would be primarily a strength event. The same is true of the casualty carry, which, with its length of 150 meters, incorporates anaerobic endurance on almost an equal basis with strength. The casualty carry is also a good measure of lower body strength. Coordination and flexibility are required for both the rope climb and casualty carry while speed is also tested during the casualty carry.

The CPFT is not intended to replace the APFT. Ideally the CPFT would be included in the Ranger physical fitness standards as an additional event. If there was a requirement to replace an event, the event replaced should be the five-mile standard run.

The primary goal of the physical fitness test events tested is to evaluate a Ranger's physical readiness. The secondary goal should be to orient and focus the PT program. Testing soldiers on physical events with little relationship to combat is similar to a baseball team doing blocking and tackling drills. It may test their fitness and toughness but will not be a true indicator of their preparation for baseball.

What then should the average Ranger PT program consist of? The best recommended outline for a PT program may be in *FM 21-18, pages 5-20*. The program recommended has two upper body (push-ups, pull-ups, sit-ups, ropes) and two lower body strength (sprints, casualty carries, step-ups) and muscular endurance periods per week, two runs of three to five miles and one run of two miles as well as two road marches per week. This program would serve as a good baseline for the Ranger PT program, especially the inclusion of the two upper and lower body strength and muscular

endurance exercise periods. The two road marches per week could be reduced to one unless a Ranger was having significant trouble making the weekly longer marches. In that case, twice-weekly marches of shorter duration should be used until the soldier has built up the fitness needed to complete the longer marches.

The Rangers of the 75th Ranger Regiment are extremely well conditioned and their PT program leaves little to be desired. The conclusion and recommendations of this thesis are the following items.

1. Reduce the importance of long distance running.
2. Maintain the standard of weekly road marches, ensuring weights replicate those carried in combat.
3. Add exercises that train lower body strength and muscular and anaerobic endurance.
4. Focus upper body strength training on the arms, back, and shoulder muscles needed for climbing and carrying rather than pushups and bench presses.
5. Include coordination, speed, and flexibility exercises on a regular basis.
6. Incorporate a CPFT similar to the one discussed in this chapter that will evaluate physical readiness for combat and focus the PT program on developing that readiness.

Many of these recommendations are included in the PT programs of the individual companies, platoons, and squads within the regiment. Educating Ranger leaders on the components of Ranger fitness, rather than issuing a new more detailed requirement for PT programs, is the best way to ensure that all Rangers get the PT they need to excel in combat.

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