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WHAT MISSIONS ARE APPROPRIATE FOR HELICOP-  
TERBORNE FORCES IN ACTIVE ATOMIC WARFARE

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## PREFACE

29 January 1959

The author desires to express his appreciation to Mr. Boyd Israel, Principal, Custer Terrace School, for the assistance given in editing this report.

Acknowledgement is also gratefully given for assistance in gathering information and material utilized in this monograph to the following persons or groups: Miss Laurie Jones, Librarian, The Infantry School Library; Members of the Airborne Air Mobility Department, United States Army Infantry School; The Director and Staff, Department of Tactics, United States Army Aviation School; and the Director and Staff, Department of Combat Developments, United States Army Aviation School.

The author desires to state the following personal qualifications related to the subject matter of this monograph. First he is a qualified parachutist. He is also a rated army aviator. The author is helicopter rated and has experience in all types of helicopters currently found in the Army's inventory. A two year tour of duty as an instructor and supervisor in the Air Mobility Branch, Department of Tactics, United States Army Aviation School, Fort Rucker, Alabama, has just been completed. During this tour the author's primary duty was writing and instructing in the organization and employment of tactical transport aviation units.

The point of view expressed in this paper is that of the author - not necessarily that of the United States Infantry School or the United States Army.

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## INTRODUCTION

In any type conflict or war, past, present or future, atomic or conventional, we will always find three basic elements: firepower, mobility, and shock action. If firepower is greater than mobility, shock action is negligible and the battlefield becomes a vacuum. If this condition exists neither side can impose his will on the other and a decision cannot be reached. If firepower and mobility parallel each other or if mobility is a predominant element, we have that third element which can create and stimulate fear in any soldier.

Today's nuclear firepower has outdistanced yesterday's mobility. The ground vehicles are still limited by the terrain over which they must operate. The airborne units, because of their specialized training and strategic value, will be at a premium in today or tomorrow's conflict. Some other means of mobility must be made available to our field commanders if they are to cope with the fluid, uncertain, rapidly changing, and widely dispersed situations with which they will be faced, even in a war of limited employment of atomic weapons. Today this means of mobility is the helicopter.

The purpose of this monograph is to determine what missions are appropriate for helicopterborne forces in active atomic warfare.

Due to the limitation imposed on this monograph as to number of words it is virtually impossible to adequately cover all of the missions that are appropriate for helicopterborne operations. Therefore the scope of this monograph will be limited to the authorization for the Army Ground Forces to have and employ organic rotary wing aviation, the organization and capabilities of tactical transport rotary wing units, concepts of employment, representative missions that can be performed by a

helicopterborne force, and a determination of some of the missions that are appropriate for a helicopterborne force in offensive and defensive operations. Only tactical transport rotary wing units will be covered in this monograph.

Two assumptions must be made. These are that both ground and aviation units are combat proficient in their basic roles; and that both ground and aviation units are proficient in helicopterborne operations to include detail planning and execution.

This monograph contains four annexes for ready reference. In the order of listing they are Annex "A" - Glossary of Terms; Annex "B" - Department of Defense Directive No 5160. 22; Annex "C" - Tables, Organization and Equipment for Rotary Wing Tactical Transport Companies; and Annex "D" - Pictures and Characteristics of Army Tactical Transport Helicopters.

## DISCUSSION

Mobility as defined by German General Bechtolsheim, means quick decisions; quick movements; surprise attacks with concentrated force; to do always what the enemy does not expect; to constantly change both the means and the methods; and to do the most improbable things whenever the situation permits. It means to be free of all set rules and preconceived ideas. (5:32)

Today mobility, and particularly air mobility, is a word on the tip of every soldier's tongue. In an atomic war battlefield mobility is mandatory. The Army must be able to combine complete dispersion in defense with the capability of rapidly massing for an attack. Top Army commanders have recognized the urgent need for greater mobility. One of General Matthew B. Ridgway's last official acts as Chief of Staff was the issuance of a directive in which he established policies for the emphasis of air transportability. (14:14) General Maxwell D. Taylor, present Chief of Staff, has further emphasized the need for air mobility. He stated that all of our troops and their organic equipment, except the heaviest tanks, must be capable of movement by air. (14:14)

Organic aviation to the Army Ground Forces was established in June of 1942, at which time two piper cubs, two pilots, and one mechanic were made organic to each field artillery battalion, divisional field artillery headquarters, and the headquarters of each field artillery brigade. (2:37)

Today organic aviation is authorized to Infantry, Armor, Artillery, Engineers, Transportation Corps, Signal Corps, and Medical Service Corps units. This organic aviation consists of many types and classes of fixed and rotary wing aircraft ranging from single engine two place fixed wing

to twin engine 26 place helicopters.

There has been a great amount of friction between the ground forces and air forces over the issue of aviation support throughout this period. The final climax came in March 1957, when the Department of Defense issued Directive Number 5160. 22. (See Annex B) This directive states in part, "The U.S. Army Aviation program will consist of those types of aircraft required to carry out the following army functions envisaged within the combat zone, and shall be used by the Army exclusively as a basis for developing army requirements for aircraft and for the normal employment of Army Aviation. The capability of operation from unimproved fields should be adopted as a basic objective for the development of Army Aviation. This capability is essential to the quality of responsiveness, and responsiveness is a quality essential to that aviation where day-to-day operations must be intimately coordinated with the actions of surface forces. Army organic aircraft will be used by the responsible army commander as he considers necessary for the discharge of his military mission." The directive further states under function C, Airlift of army personnel and material, "Transportation of Army supplies, equipment, personnel, and small units within the army combat zone in the course of combat and logistical operations. Includes the movement of small units to execute small-scale airlanded operations, the movement of reserves, and the shifting or relocation of small units and individuals within the combat zone as the situation may dictate. Includes expeditious movement of critically needed supplies or equipment, or both, within the combat zone, supplementing the ground transportation system operating within the field army. Function D - Aeromedical Evacuation. Aeromedical evacuation within the army combat zone to include battlefield pickup of casualties, air transport to initial point of treatment, and any subsequent moves to hospital facilities within the army combat zone. For purposes of this directive, the combat zone is defined as extending not more than 100 miles forward of the general line of contact between U.S. and enemy ground forces. Its extension to the rear of the general line of

contact will be designated by the appropriate field commander and normally extends back of the front lines about 100 miles." (2:66) (See Annex "B")

The rotary wing aircraft that the field army commander has to carry out the functions in this directive are found in four tactical transport aviation battalions. Each tactical transport aviation battalion has organic three rotary wing light transport companies and one rotary wing medium transport company. Each of the three light rotary wing companies has 20 helicopters organic. The medium rotary wing company has 16 helicopters organic. (12:4) (13:4)

These aviation units are normally assigned to a field army. They may be subsequently attached to a corps and employed as corps troops. They may support units of the corps by being further attached to or placed under operational control of subordinate corps units for specific missions. Normally they are not attached below division level, but operational control may be delegated to subordinate units. Such control is exercised by the commander responsible for the overall mission and for the duration of the mission only. (4:11)

The detail lift capabilities of the organic rotary wing tactical transport units may be computed by using the organization found in Annex "C" and the aircraft characteristics found in Annex "D". Generally for a one time lift, 50 mile radius of action and 1 to 5000 feet altitude, the light companies can transport 243 combat equipped troops and the medium company can transport 368 combat equipped troops. The light companies can transport from 30 to 43 tons of supplies or equipment and the medium company can transport 48 tons. Each battalion has a lift capability of 1088 combat equipped troops and from 138 to 177 tons of supplies and equipment. A pool of all four battalions will give a field army commander, for a 50 mile radius of action at 1 to 5000 feet, a one time lift capability of 4352 combat equipped troops and from 552 to 708 tons of supplies and equipment.

Missions that helicopterborne forces are capable of performing are

determined by the physical capabilities of the helicopter and the concepts of employment. The capabilities of helicopters include the following:

1. Under normal conditions, helicopters can ascend and descend at a relatively steep angle, enabling them to operate from confined and unimproved areas.
2. While hovering, troops and cargo can be loaded and unloaded.
3. Cargo can be transported as an external load and delivered to areas otherwise inaccessible.
4. Helicopters are capable of horizontal flight in any direction; forward, backward, sideways and obliquely.
5. Helicopters possess a wide speed range, from 0 to approximately 120 knots.
6. They can fly safely and efficiently at low altitudes, using the terrain and vegetation for cover and concealment.
7. Their turn-around time is short, making possible rapid shuttle movements.
8. They can be landed in the objective area in a tactical formation, landing zones permitting.
9. Their ability to decelerate their airspeed rapidly, combined with their capacity for slow forward speed and near vertical landing, enables them to operate under very marginal weather conditions. (4:15)

Concepts of employment developed by the Infantry School are as follows:

1. Air-landed forces are used to overcome distances and barriers and to bypass enemy defenses.
2. Forces in reserve with an airlanded capability may compel the enemy to disperse his forces for the protection of vital installation and terrain.
3. Air-landed operations should be conducted in mass, with surprise, and should be completed in the shortest possible time.
4. An air-landed force may be employed in an objective area to

seize one airhead when a large force is needed to secure critical objectives relatively close together. On the other hand, the force may be employed in an objective area with subordinate units dispersed to minimize the effects of enemy atomic weapons.

5. Army air-landed operations reduce troop vulnerability to enemy atomic weapons by using aircraft within the objective area to extend the depth of operations of reconnaissance and security forces; by reducing defensive forces in the battle position, and by holding strong reserves in dispersed locations prepared for rapid delivery in Army tactical transport aircraft to threatened or affected areas.

6. Air-landed operations conducted with ground or amphibious operations are launched to give maximum assistance to the main effort.

7. Air-landed operations usually are launched into lightly defended areas or into areas subjected to extensive pre-assault preparation by atomic or non-atomic fires.

8. Air-landed forces can rapidly exploit the effects of nuclear weapons.

9. Air-landed operations may be conducted day or night and during periods of limited visibility.

10. Air superiority over the area of operation is required for large-scale air-landed operations. However, limited operations may be conducted without air superiority by using surprise techniques and tactics such as low level flight, operations during periods of limited visibility, and smoke.

11. Ground forces should link up early if the air transported assault force is not displaced or reinforced in the objective area.

12. Air-landed forces may be employed in conjunction with other airborne forces. (4:5)

A comparison of the physical capabilities of helicopters and the concepts of employment determine what specific missions helicopterborne forces can perform. To list all of these missions is to undertake the compilation of a giant volume.

The field manual on Army Transport Aviation Combat Operations lists the following missions as inclusive but not limiting:

1. Rapidly exploiting the effects of nuclear weapons.
2. Enveloping defended areas or traversing natural barriers which hinder the seizure of an objective.
3. Assisting all types of tactical maneuvers.
4. Assisting armored, mechanized, or motorized forces in exploitation or pursuit operations.
5. Seizing critical terrain features particularly in fluid operations such as pursuit, exploitation, and advances to contact.
6. Reinforcing units cut off, surrounded, or isolated.
7. Moving reserves particularly in defense or a wide front or mobile defense.
8. Resupplying by air.
9. Concentrating dispersed forces in preparation for a tactical operation.
10. Dispersing forces as may be required following a phase of operations.
11. Combating partisan or guerilla forces.
12. Attacking enemy airborne or air-landed forces.
13. Moving reconnaissance forces and patrols.
14. Evacuating casualties.
15. Assisting in ship to shore movements in the conduct of amphibious operations. (4:6)

No country has employed helicopters in atomic warfare. The United States Armed Forces has not employed tactical transport helicopters in active combat. The smaller helicopters were employed by the Marine Corps in limited actions during the Korean War. The statistics furnished by other countries that have employed them in limited combat cannot be relied on too heavily as none of these countries have employed them in mass, nor in a full scale war.

Tactics and doctrine for the employment of tactical transport heli-

copters are written based on maneuvers, tests, and the feasibility of employment by experts on their characteristics and capabilities.

To determine what missions are appropriate for a helicopterborne force in active atomic warfare, an analysis must be made of conventional force requirements in offensive and defensive operations. A comparison of these requirements with the capabilities of a helicopterborne force will determine if they are appropriate and the advantages to be gained by the commander when employing these type forces.

The mission of the infantry in offensive action is to close with and destroy or capture the enemy. This mission is accomplished by firepower, maneuver, and shock action. Firepower is furnished by a combination of atomic and non atomic weapons organic to or supporting the unit. Maneuver is accomplished by the subordinate units, either moving under the protection of supporting firepower or exploiting its effect, engaging the enemy in close combat. The shock action is the cumulative effect of the firepower and the assault of the maneuvering forces. (6:1)

There are four basic types of attack maneuvers: the envelopment, the penetration, the turning movement, and the frontal attack. An envelopment is basically an attack against an enemy's flank, with a secondary attack against his front. A double envelopment is an attack against both of the enemy's flanks with a third attack against his front. This type envelopment usually requires a superior force. (6:1)

A penetration is basically an attack which passes through some portion of the enemy's front and is directed against an objective in the rear. (6:2)

A turning movement is an attack in which the attacking force seeks to pass around and avoid the enemy's main force and to secure an objective deep in the hostile rear. (6:2)

A frontal attack is designed to maintain continuous pressure along the entire front. A frontal attack is usually confined to secondary attacks with the primary object of maintaining pressure and thus preventing enemy disengagement. (6:2)

Specific missions that will be required of a conventional force in offensive operations include but are not limited to: Reconnaissance and security missions, meeting engagements, attack delaying positions, attack of a river line, pursuit missions, and conducting raids.

In comparing these maneuvers and missions to the capabilities of helicopterborne forces it is found that each of them can be performed by a helicopterborne force, and in each case a commander gains definite advantages. In the attack maneuvers a helicopterborne force gains the capability to combine the four basic maneuvers into one maneuver, the vertical envelopment. Now the unit can execute a single, double, or vertical envelopment forcing the enemy to defend in two, three, or four directions at the same time. By having a highly mobile reserve the size of the force required to accomplish these missions is reduced. The units and their fire support can be supplied, redisposed, or withdrawn immediately. The force can be dispersed rapidly if enemy atomic weapons employment is imminent. If friendly atomic weapons are used in support the force commander can rapidly exploit their effect. Casualties may be evacuated immediately. Obstacles and terrain barriers may be traversed rapidly. Enemy reserves may be attacked rapidly at their most vulnerable period. Reconnaissance and security forces can operate over larger areas with fewer men. In meeting engagements the enemy can be engaged before he has time to deploy. In attacks against delaying positions, objectives in the rear may be attacked forcing the enemy to withdraw from his delaying positions before the attacking ground force has to deploy for an attack. In attack of a river line a force may secure bridgeheads before the enemy can destroy them. The entire force may be lifted over the river rapidly without having to use engineer assault boats, without losing tactical integrity, and maintaining dispersion at all times. In pursuit operations a helicopterborne force can maintain contact with the enemy or if desired, encircle him. Raids may be conducted deep in the enemy rear in a very short period of time. In all of these operations increased speed, mobility, flexibility, and shock action is ob-

tained by the employment of a helicopterborne force.

An example of a raid is one which was performed by the 45th Infantry Division in Korea in 1954. A small task force, supported by utility helicopters from the 6th Helicopter Company, conducted a raid behind the aggressor lines. This raiding force moved 30 miles, destroyed an enemy command post and communications center, and returned in 1 hour and 30 minutes. (Author participation)

The infantry employs defensive operations to deny a vital area to the enemy, to protect a flank, to contain an enemy force, to gain time, to economize forces, or to bring about maximum destruction and disorganization of the enemy, frequently as a prelude to offensive action. (6:54)

There are two basic types of defense, position defense and the mobile defense. The mission in position defense is to stop the enemy by fire forward of the battle area, repel his assault by close combat if he reaches it, and destroy or eject him by counterattack if he succeeds in penetrating it. (6:65) The mission in a mobile defense may be either to slow, block, canalize, and delay the enemy or to stop, repel, or eject him. (6:76)

*defense*  
Specific missions that will be required of a conventional force in defensive operations include but are not limited to: manning the general and combat out post lines; making aggressive reconnaissance and patrols; maintain a strong highly mobile reserve; conduct counterattacks; combat airborne and air-landed attacks; perform deception; reinforce, relieve in place, or withdraw subordinate units; resupply all units; and evacuate casualties.

In comparing these missions to the capabilities of helicopterborne forces it is found that each of these can be performed by a helicopterborne force and in each case a commander gains definite advantages. The commander has the ability to position, redispense, and withdraw security forces on the general and combat outpost line rapidly. He may conduct highly mobile reconnaissance and patrol action over a larger area with fewer men. By having a highly mobile reserve capable of striking with

speed, surprise, and shock action, the size of the reserve can be reduced. When executing counterattacks supported by atomic weapons, friendly forces can be moved to maximum safety distances while the weapon is being fired and then rapidly exploit its effect. Enemy airborne and air-landed forces can be attacked immediately. By flying over and landing momentarily at several areas on the flanks of or in rear of the enemy, a deception can be executed causing the enemy to split his attacking forces and thereby lose some of the momentum of his attack. The force commander can reinforce, relieve in place, or withdraw subordinate units that are cut off or isolated by enemy action or terrain. Two major advantages are rapid resupply of all units by air and the evacuation of casualties to include mass casualties in the event of atomic weapons employment by the enemy.

An example of relieving a unit in place is found in "Operation Switch" which was performed in Korea on 11 November 1951 by the United States Marine Corps. This operation involved the relief of the 2d Battalion, 1st Marines, by the 2d Battalion of the 5th Marines. There were no tactical transport helicopters at this time. The type used was the utility type which has a lift capability of only six troops. Following are the statistics of "Operation Switch":

Number of helicopters used	12
Number of flights	262
Overall time	7 Hours and 30 Minutes
Number of troops lifted	1902
Average weight of each man	240 Pounds (9:174)

If the statistics of this operation are compared with the capability that a tactical transport battalion possessed today, it is found that the time required to perform a mission of this type would now be measured in minutes.

In summary, the author would like to make a statement on the subject of what missions are appropriate for helicopterborne forces. In the past six years I have seen the army progress in the field of rotary

wing aviation from the small two place reconnaissance helicopter to the "Mohave" (H-37) 26 place helicopter now found in operational units of tactical transport aviation battalions.

The mission of Army Aviation is to augment the capability of the Army to conduct effective combat operations. (15:1) To support the other arms and services is its only reason for existence. This support is characterized by speed, range, mobility, accuracy, flexibility, and its immediate availability and responsiveness to the commander.

I believe the helicopter is only an interim vehicle. The aviation industry is continually striving to give army aviation a smaller, more maneuverable aircraft which can transport larger loads over greater ranges. They are working to reduce the complication of operation, and have actually flown helicopters by remote control. Maintenance problems are being reduced by the use of sealed unit engine kits.

Army aviation is also striving to better its capability to support the combat arms and services. A helicopter instrument program is now in progress. This is being done in an attempt to give helicopters an all weather capability. In the field of armed helicopters the aviation school has fired machine guns, rockets and missiles from tactical transport helicopters. Aerial reconnaissance companies have been formed and are undergoing extensive tests in performing tactical reconnaissance by fire and maneuver, using tactical transport aviation. Television and infra-red equipment are being tested to determine their capabilities. Other concepts such as amphibious units and mobile forces are continually being written and tested.

As the helicopter becomes more rugged, less complicated to operate, and inexpensive, their presence in small units will become more common. Commanders of all arms and services should strive to plan and train with tactical transport aviation units at all times.

In my opinion appropriate missions for helicopterborne forces are limited only by the imagination and ingenuity of the commander. Helicopterborne operations if properly planned and aggressively executed will

give the commander the decisive element of mobility. One of Fulton's laws of motion is that for every action there is an equal and opposite reaction. For firepower the equal and only reaction is mobility.

## CONCLUSIONS

In active atomic warfare the missions that field commanders will have to accomplish are numerous and varied. By employing helicopterborne forces to assist in the accomplishment of these missions the commanders gain advantages that will greatly assist in reducing the manpower, time, and material required to insure success. The missions that are appropriate for helicopterborne forces are limited only by the imagination and ingenuity of the commander.

**ANNEX A - (Glossary of Terms) (11:2) (4:173)**

## GLOSSARY OF TERMS

Active atomic warfare - A level of usage which envisions the extensive use of atomic weapons as an important, very powerful, normal, and often decisive adjunct to ground operations. This type warfare requires forces and tactics specifically designed to conduct sustained offensive operations in the face of enemy atomic attacks and to capitalize on effective employment of friendly atomic weapons against targets of tactical significance. Under this level of usage, either fire or maneuver will exert a dominant influence on tactical operations. (11:2)

Aeromedical evacuation - The employment of aircraft to evacuate casualties within the combat zone. (4:173)

Airhead - An area in hostile or threatened territory which, when seized and held, insures the continuous air-landing of troops and material and provides maneuver space necessary for projected operations. (4:173)

Air-landed - Moved by air and unloaded after the aircraft has landed. (4:173)

External load - Cargo attached externally to aircraft by containers, nets, slings, or pallets. (4:173)

Helicopterborne force - A force composed of transport helicopter units and the units to be transported for the purpose of executing a tactical mission. (4:174)

Helicopterborne operation - An operation involving the movement of a unit by helicopter transportation into an objective area for ground combat. (4:174)

Hovering - Maintaining a fixed position in space over a spot on the ground. (4:174)

Landing zone - A specified zone, consisting of one or more landing sites and landing strips, and/or drop zones within which all or part of an air-transported unit can be landed. (4:174)

Objective area - A defined geographical area within which is located the objective (s) to be seized or reached by an air-transported unit. The area includes the airhead if one is designated for the operation. (4:174)

Radius of action - Maximum distance an aircraft can travel from its base along a given course with a normal load and return without refueling, allowing for all safety and operating factors. (4:175)

Reconnaissance and security line - The location of a series of outposts, roadblocks, observation posts, and reconnaissance detachments established beyond the airhead line. It is the security echelon of the transported unit. (4:175)

ANNEX B - (Department of Defense Directive No 5160.22). (2:65)

ANNEX C - (Tables of Organization and Equipment for Rotary Wing  
Tactical Transport Companies). (12:1) (13:1)

COMBINED SUBJECTS BRANCH  
DEPARTMENT OF TACTICS  
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File No. 2-483-3

ANNEX B

MARCH 1957

ARMY AVIATION ORIENTATION

Following is the full text of the new Department of Defense Directive (No. 5160.22) clarifying roles and missions of the Army and Air Force as they pertain to the Army's own integral aviation.

The Directive lists three references: (a) The 1952 Memorandum of Understanding between the Army and the Air Force, which it cancels; (b) DoD Directive 5100.1 "Function of the Armed Forces and the Joint Chiefs of Staff"; and (c) the Secretary of Defense's Memorandum of 26 Nov. 1956 on roles and missions.

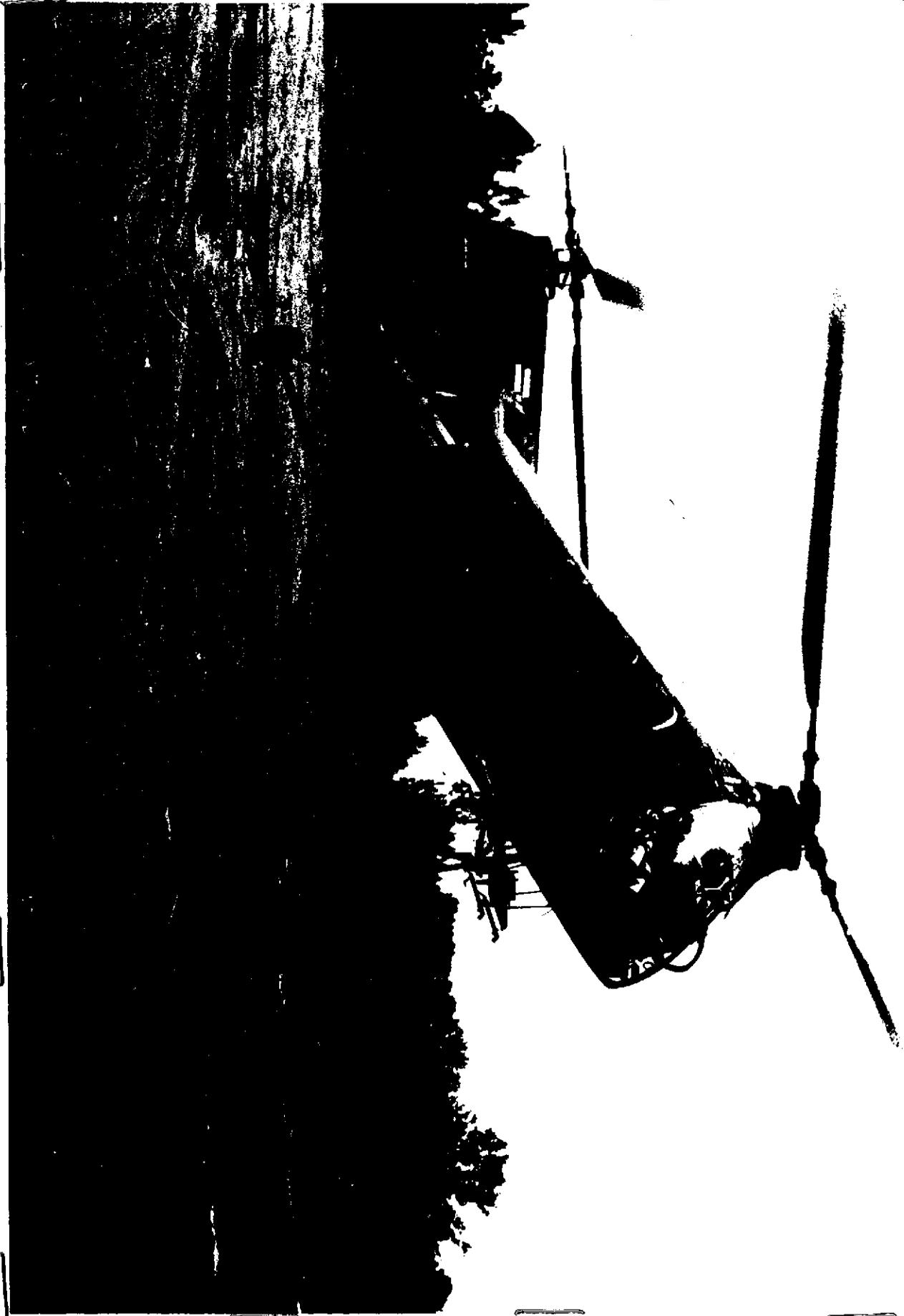
The full text of the new Directive follows:

I. AUTHORITY AND PURPOSE

Pursuant to the authority contained in the National Security Act of 1947, as amended, and in consonance with reference (b), this directive is issued for the purpose of:

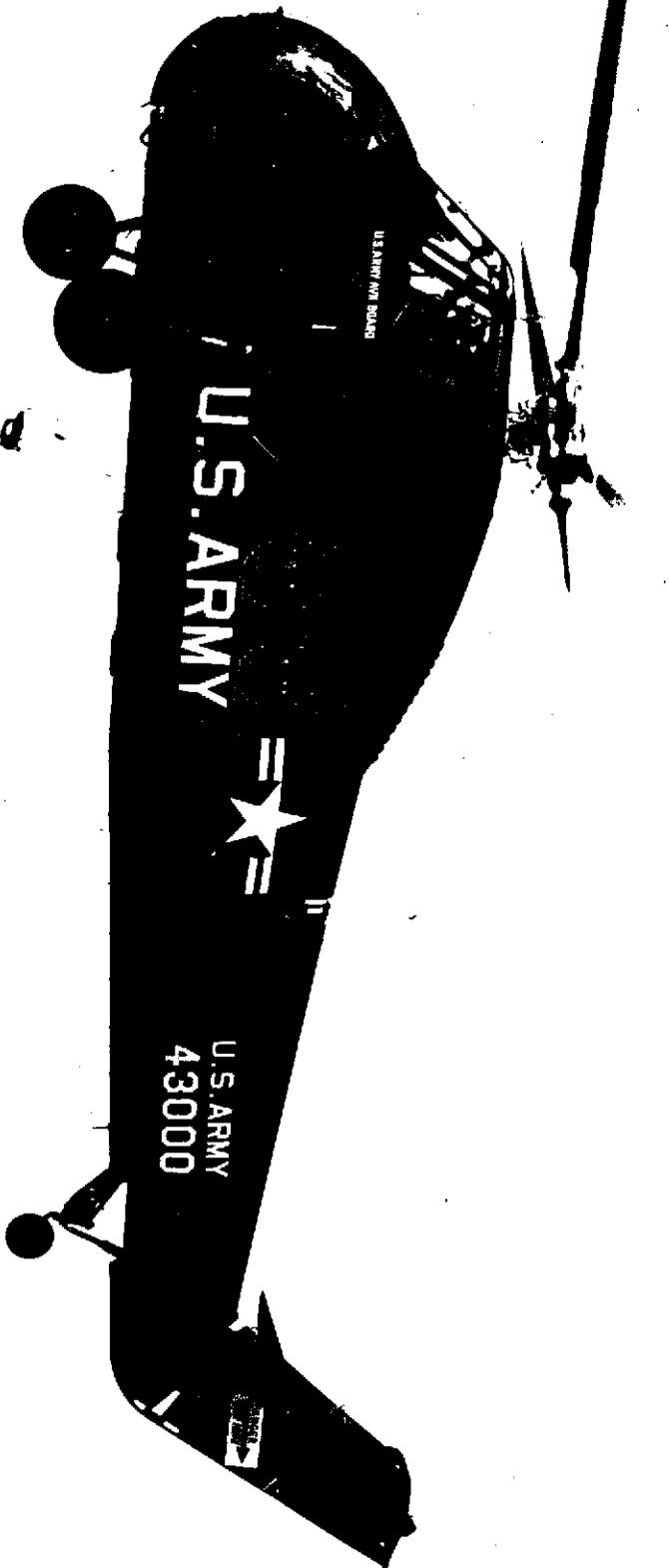
1. Defining the scope of the U. S. Army aviation program and establishment.
2. Insuring that the U. S. Army may employ aircraft necessary for its internal requirements in the conduct of operations on land, without duplicating the functions assigned to the U. S. Air Force.
3. Stressing and clarifying the responsibilities of the U. S. Air Force with regard to providing aviation support for the U. S. Army.

ANNEX D - (Pictures and characteristics of Army Tactical Transport Helicopters). (2:108)



## CHARACTERISTICS OF H-21 SHAWNEE HELICOPTER (LIGHT)

- a. Description. The H-21C is a single engine, tandem rotored, light transport helicopter.
- b. Speed. Cruise, 85 knots.
- c. Allowable Cargo Load/Radius. 3,000 #/50 nautical miles  
2,400 #/100 nautical miles
- d. Cargo Transport provisions.
  - (1) Cargo compartment:
    - (a) Length: 19 feet, 9 inches
    - (b) Width: 5 feet, 8 inches (floor width, 4 feet, 7 inches)
    - (c) Height: 5 feet, 3 inches.
  - (2) Cargo door: A rectangular sliding door on the left side at the rear of the cabin (5 feet X 3 feet, 9 inches).
  - (3) External sling capacity: 5,000 pounds (Structural limit).
  - (4) A hydraulically operated hoist, capable of lifting 250 pounds for rescue operations, may be installed forward and above the rescue door on the right side at the front of the cargo compartment. This hoist has 100 feet of usable cable.
- e. Troop Transport Provisions.
  - (1) Maximum number of troop seats: 20.
  - (2) Maximum number of litters: 12
- f. Rotor Diameter. 44 feet.
- g. Maximum Gross Weight. 13,500 pounds.
- h. Endurance. 3.5 hours. (2:108)



## CHARACTERISTICS OF H-34 CHOCTAW HELICOPTER (LIGHT)

a. Description. The H-34 is a single engine, light transport helicopter.

b. Speed. Cruise, 80 knots.

c. Allowable Cargo Load/Radius. 4,300 #/50 nautical miles  
3,000 #/100 nautical miles

d. Cargo Transport Provisions.

(1) Cargo Compartment:

(a) Length: 11 feet, 6 inches. (Compartment length is 13 feet, 7 inches, but utilization of entire length may block internal access to pilots compartment.)

(b) Width: 5 feet, 5 inches.

(c) Height: 6 feet

(2) Cargo door: 4 feet, 5 inches by 4 feet, on the right side of the cargo compartment.

(3) External sling capacity: 4,000 pounds.

e. Troop Transport Provisions.

(1) Maximum number of troop seats: 12.

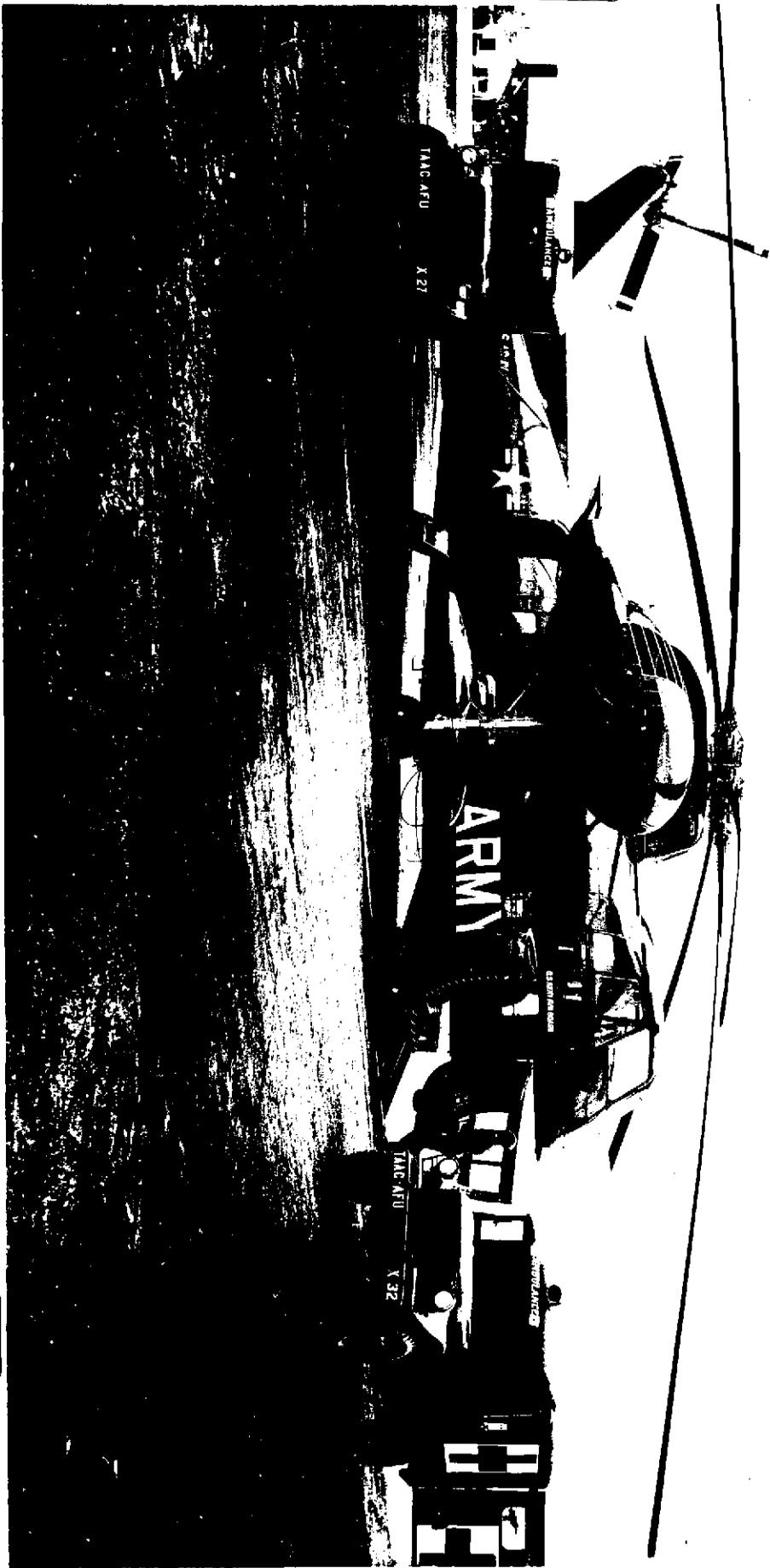
(2) Maximum number of litters: 8

Expected modification will permit seating 18 troops.

f. Rotor Diameter. 56 feet.

g. Maximum Gross Weight. 13,300 pounds

h. Endurance. 3.5 hours. (2:109)





(2) Maximum number of litters: 24.

f. Rotor Diameter. 72 feet.

g. Maximum Gross Weight 31,000 pounds.

h. Endurance. 1.25 hours. (2:110)

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