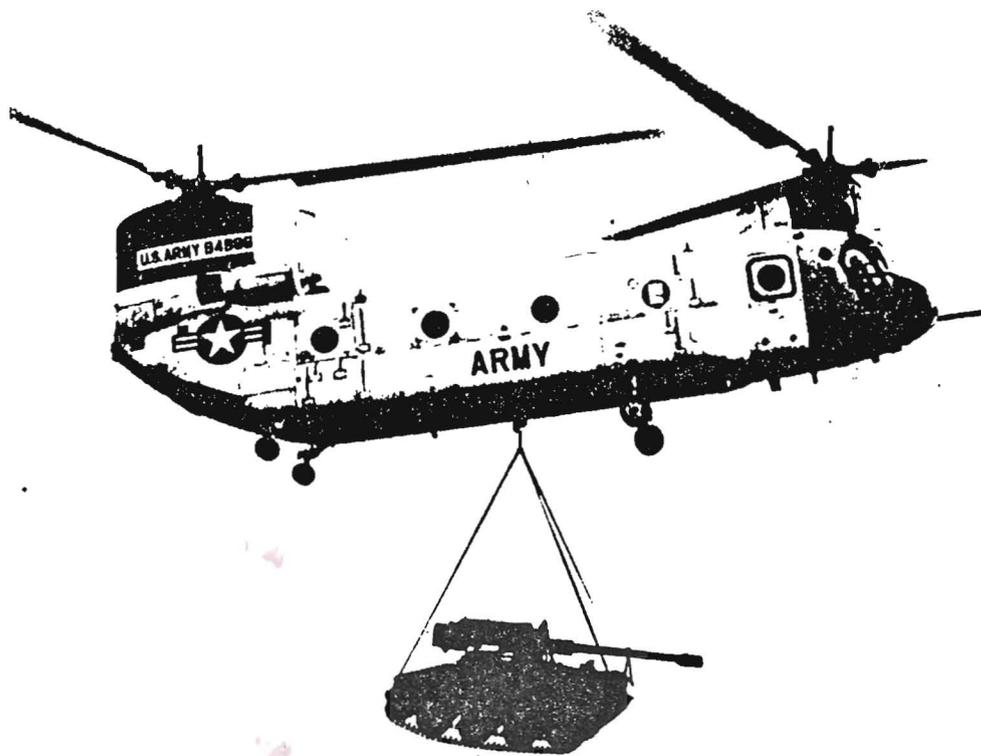


THE CHINOOK STORY



OCTOBER 1975

INTRODUCTION

This booklet has been prepared to collect facts which are historically significant in the life of the CH-47 helicopter, ranging from the birth of an idea for the first turbine powered helicopter to the present planning to modernize the fleet.

The information contained herein is factual and was obtained from a variety of sources, including news releases, historical program studies, periodicals and a scrap book containing clippings on the growth of the Chinook and maintained by the AVSCOM Historical Office.

This booklet was prepared by the staff of the Chinook Project Manager's Office for information purposes only.

THE CHINOOK

Background -

In 1956, the US Army announced plans to replace its piston powered transport helicopter with turbine powered equipment and to develop a new multi-turbined medium transport helicopter. In September 1958, a joint US Army - US Air Force selection board recommended that the Vertol Division, of the Boeing Company be selected to produce the CH-47 medium transport helicopter.

The first CH-47A model helicopter was delivered to the Army operational units in April 1963, or approximately four years after contract go-ahead.

3 (In response to an urgent requirement developed by the US Army in Vietnam, the Army Materiel Command (AMC) in mid 1966, formulated and launched a two step airframe improvement program plus supporting engine and ancillary programs to provide substantial improvements in payload, speed and endurance of the Chinook. In addition to the performance improvements, modifications were incorporated to improve flying qualities to allow full utilization of the expanded flight/performance envelope, to improve reliability, reduce maintenance and increase aircraft availability.

The first step in the airframe improvement program resulted in the CH-47B model, which was delivered in May 1967. Except for

{ slightly larger rotor blades, it was identical in size and similar in appearance to the CH-47A. The flight performance of the CH-47B however, was appreciably superior, being achieved primarily through the use of a more powerful twin Lycoming gas turbine engines (T55-L7C) and new rotor blades of advanced design.

The CH-47C model was the third generation Chinook to evolve from the product improvement program, which provided the capability for air mobility to achieve its full effectiveness. While being identical in size to both the A and B models and similar in appearance, the CH-47C was powered by a Lycoming T55-L-11A engine with a drive system qualified for over 6000 shaft horse power at 245 rotor RPM. The fuel capacity was increased to 1,129 US gallons for the extended range/endurance required by some tactical missions.)

Description -

The CH-47 Chinook is a twin-turbine, tandem rotor helicopter with a normal crew complement of three: pilot, co-pilot and crew chief. Internal cabin space is sufficiently large to carry up to 44 combat equipped troops, or 24 litter patients plus two medical attendants. The 30 foot 2 inch long cabin features straight-in rear loading and has an unobstructed cross section 6½ feet high by 7½ feet wide. Usable cabin volume is 1,474 cubic feet. The fuselage is sealed during manufacture to provide water landing capabilities.

To support the heavy equipment the Chinook is capable of carrying, the cargo compartment floor is designed for a distributed load of 300 pounds per square foot. The cargo and personnel hoist system consists of a winch capable of being used for cargo loading through the rear ramp, or for personnel hoisting operations through the rescue hatch. The rear ramp allows one-man loading and unloading of heavy or bulky cargo. An external cargo hook capable of suspending 20,000 pounds is installed in the rescue hatch.

Project Management -

The CH-47 Chinook project office was established in August 1962, at headquarters, US Army Materiel Command, located in Washington, DC by US AMC planning directive No. 24 dated 12 Jun 62 and by letter, AGAM-P(M) 310-1, DCSLOG, dated 28 Sep 62 subject: "Policy Guidance on Weapon/Equipment System Management in the Army.

At approximately the same timeframe, the CH-47 Chinook Field Office was established at AVSCOM by general order of the Commanding General, AVSCOM.

On 30 Jun 68, the CH-47 Chinook Project Office transferred all responsibility for this aircraft system to AVSCOM and established the Chinook Project Office.

On 22 Jun 1970, the Chinook Project Office and the CH-54 Project Office combined forces and became the Heavy Lift Project Office. Management of the Chinook activity continued in this Office until 26 Nov 1971, at which time, USAMC advised by message 261910Z, 26 Nov 1971, that the Project Manager, Heavy Lift Office,

was relieved of responsibility for the CH-47 service aircraft effective this date and that the Commanding General, AVSCOM, assumed responsibility for the aircraft to include as applicable, development, procurement, production, testing, distribution and logistical support. All actions effecting transfer of responsibility was completed by 1 Jan 1972. On 13 Dec 1971, the CG, AVSCOM, directed the responsibility of system support management for the CH-47 aircraft to the Directorate for Materiel Management.

Effective 18 February 1973, the responsibility for all CH-47 functions being administered by the AVSCOM Directorate of Materiel Management Systems Manager, was transferred to the Chief, Special Items Management Office (SIMO).

By message 041743Z, dated 4 December 1974, AMC named LTC James M. Hesson as Project Manager Designee for the CH-47 Modernization Program effective 6 January 1975. The CDR, AVSCOM is to provide the necessary technical and administrative personnel by detail from within the resources of AVSCOM to staff the Project Manager's Office until approval of the TDA and charter.

General Order Number 127, issued 15 August 1975, organized this unit as "Office of the Project Manager CH-47 Modernization Program" with an approved TDA consisting of thirty (30) civilians, and eight military (7 officers, 1 warrant officer).

The Project Manager is responsible for project management of the CH-47 system to include the CH-47 Modernization Program, current CH-47 series aircraft and, as applicable, procurement of new aircraft and logistic support.

The effective date of this action is 15 July 1975.

Combat Operation -

The initial deployment of the Chinook to Vietnam began in July 1965, when all the aircraft of the 228th Assault Support Helicopter Battalion (ASHB), 1st Cavalry Division (Airmobile), including 57 CH-47A helicopters left Ft. Benning, Georgia for Mayport, Florida, where they were preserved, covered with special waterproof covers and loaded aboard the carrier USS Boxer. After a 25 day trip to Vietnam, aircraft were flown from the carrier deck, flying to An Khe to support the divisions operation.

(The Chinook was employed in Vietnam according to the same doctrines developed during Air Assault II, i. e., support of infantry, rapid movement of artillery and logistical resupply. In addition, the Chinook developed a new role, that of an aircraft recovery vehicle. The Chinook fleet recovered the remarkable total of over 10,000 aircraft in Vietnam that represented a replacement value of more than 2.7 billion dollars. One assault support helicopter company equipped with CH-47B helicopters established a record by recovering 73 aircraft in a one month period.)

2 (The armed Chinook was unveiled in November 1965, sent to Aberdeen Proving Ground for testing and evaluation, then sent to Vietnam for action. Equipped with 40MM grenade launcher, five 50 caliber machine guns, a pair of 20MM cannon and either two rocket pods of 19 rockets each or two gatling type guns capable of firing 3,000 rounds a minute. Each Chinook (three in all) carried 2½ tons of ammunition.

These aircraft, during combat operations, were controlled by the Army concept team in Vietnam (~~ACTIV~~). The missions were usually flown by two armed Chinooks for mutual support and included armed suppression, counter ambush, close-in fire support against point targets, road block destruction, aerial coverage and others.

About this same timeframe, the AH-1G Huey Cobra was introduced into Vietnam and follow-up production of armed Chinooks was not initiated. Eventually, all but one armed Chinook was lost in combat, with the lone survivor being turned into a maintenance training aircraft.)

Disaster Relief -

January, 1964 - Chinook airlifts mercy cargo in flood area in northern California. A CH-47A helicopter stationed at Edwards Air Force Base, California for high altitude testing took part in the massive rescue and resupply effort in flood-stricken northern California. Approximately 47% of all the cargo transported by all the helicopters stationed at Murray Airfield during the emergency was performed by the Chinook.

May, 1964 - CH-47A Chinook performs rescue missions in Alaska. Emergency operations were performed following the Alaska earthquake disaster. The Chinook was utilized for a variety of missions including evacuation of women and children from the disaster area.

December, 1966 - CH-47A Chinooks from Edwards AFB, California and Ft. Sill, Oklahoma flew mercy missions during disastrous snowstorms in Arizona and Utah by supplying isolated groups of Navajo and Zuni Indians with food and medicine located on the Navajo reservation in Arizona.

October, 1966 - The US Joint Task Force "Bold Party" completed airlift assistance to the Mexican Government in and around Tampico, Mexico, aiding victims of hurricane Inez. A fleet of four CH-47 Chinooks from the 154th Aviation Company, Ft. Sill, Oklahoma, participated in these rescue missions.

December, 1972 - The Joint Chief of Staff directed deployment of four CH-47 helicopters from the 227th Aviation Battalion, 1st Cavalry Division, Ft. Hood, Texas to Managua, Nicaragua to support disaster relief operations after an earthquake had leveled the city.

DEPLOYMENT HISTORY

CH-47 HELICOPTER

1st "A" to RVN	September 1965
1st "B" to RVN	December 1967
1st "C" to RVN	September 1968
1st "A" to Alaska	February 1969

1st "A" to Korea	July 1969
1st "A" to Europe	August 1970
1st "C" to Thailand (BH)	August 1972
1st "C" to Korea	February 1973
1st "C" to Hawaii	April 1973
1st "C" to Europe	August 1973

AIRCRAFT PRODUCTION

FY 59 Contract 39492	5 CH-47A
FY 60 Contract 39492 (Follow-On)	5 CH-47A
FY 61 Contract 42055	18 CH-47A
FY 62 Contract 7004	24 CH-47A
FY 63 Contract 4986	24 CH-47A
FY 64 Contract 12258	60 CH-47A
FY 65 Contract 13529	60 CH-47A
FY 65 Contract 13529 (Add-On)	12 CH-47A
FY 66 Contract 14888	145 CH-47A
FY 66 Contract 14888	46 CH-47B
FY 67 Contract 4087	62 CH-47B
FY 67 Contract 4087	58 CH-47C
FY 68 Contract 0577	60 CH-47C
FY 68 Contract 1784	33 CH-47C
FY 69 Contract 1566	27 CH-47C
FY 70 Contract 0505	36 CH-47C
FY 71 Contract 0811	12 CH-47C
FY 74 Contract 0802 (A/F Payback)	24 CH-47C

In addition, delivery of production CH-47C helicopters (12 CH-47C) for the Australian Government were produced under Army contract .00636, with deliveries beginning in October 1973.

Another production delivery began in October 1974 for Canada, produced on US Army contract 0032 (8 CH-47C). The initial aircraft crashed and was totally destroyed while being delivered with a Canadian crew to Ottawa.

Chinook Milestones -

1. Military Characteristics Approved - September 1957
2. Design Proposal Solicited - June 1958
3. Source Selection Submitted to DA - October 1958
4. Source Selection Approved - February 1959
5. Development Contract Awarded - May 1959
6. Airframe Mock-Up Inspection Completed - January 1960
7. First Production Contract Awarded - February 1961
8. First Official Flight - CH-47A - October 1961
9. First 150 Hour Military Qualification - T55 Engine - October 1961
10. Chinook Project Management Initiated - August 1962
11. Completion of 150 Hour Qualified Flight - October 1962
12. Completion of Initial Army Pilot Training - November 1962
13. First Production Aircraft Delivered - December 1962
14. First Field Company Equipped With Chinooks - September 1963
15. Chinook Type Classified Standard "A" - October 1963
16. Production Rate Increased to 4 Per Month - December 1964

17. Production Rate Increased to 5 Per Month - March 1965
18. First Company Deployed to Vietnam - August 1965
19. Acceptance of Four (4) Armed Chinooks - December 1965
20. Production Rate Increased to 10 Per Month - April 1966
21. First Chinook to Fly 2000 Hours in 1 Year - May 1966
22. Production Rate Increased to 15 Per Month - October 1966
23. First "B" Model Accepted - May 1967
24. Project Management Functions Transferred to St. Louis - June 1968
25. First "C" Model Accepted - July 1968
26. Initial Aircraft Distribution to Korea - July 1969

Configuration of the CH-47 Fleet -

For some time there has been a considerable variance between the total quantity of Modification Work Order (MWO) kits procured for CH-47 aircraft versus the recorded quantity of those installed. During FY 69, the Project Manager initiated a three phase program to reconcile this difference:

- a. Phase I. Determine present configuration of the CH-47 fleet.
- b. Phase II. Locate and place all unapplied MWO kits.
- c. Phase III. Establish a program for installation of all unapplied MWO kits.

Phase I. Current AVSGOM and AMC Logistic Data Center (LDC) records were used as a basis to determine the present configuration of the CHINOOK fleet. Separate letters were forwarded to every major command and/or activity where CH-47 aircraft were located. The letters requested a one-time inspection of CH-47 aircraft and associated

records to determine MWO application. Applicable AVSCOM and LDC data accompanied each letter to permit verification of present data and appropriate updating wherever necessary. The data received from this one-time inspection provided a reasonably accurate configuration of the CHINOOK fleet. The information obtained was fused into the AVSCOM data for subsequent updating of LDC records.

Phase II. The letters cited in Phase I also requested a report on all excess and/or unapplied MWO kits. All agencies reporting excess MWO kits were directed to turn them in to New Cumberland Army Depot. Subsequent reports were received relative to the "finding" of unaccounted for or unreported?" As a result, the Project Manager established a search team to perform a physical inventory of each CONUS depot and operational facility where CH-47 components and/or aircraft were located to search for MWO kits, AIMI items and other repairables. The search team was provided with a letter of introduction signed by the Commanding General of the US Army Materiel Command. A similar type search effort was conducted in USARV by the CHINOOK Project Manager's Liaison Officer. The results of this combined search effort were rewarding. The total value of components and MWO kits unearthed by the team in CONUS was approximately \$4.1 million. The value of MWO kits returned from USARV was approximately \$328,846.

Phase III. With the present aircraft configuration determined and nearly all the unapplied MWO kits accounted for, the next step was to implement the plan for installing these modifications. With the MWO kits under NICP inventory control, the Project Manager

directed that only those requisitions for safety of flight and selected MWO kits be honored. All CONUS and USARV activities were given this information and provided with the specific MWO's that could be requisitioned. Emphasis was then placed on installing unapplied kits on CH-47 aircraft processed through cyclic maintenance in CONUS and Air Vietnam in USARV. Ship sets of MWO kits are made up for each serial numbered CHINOOK aircraft entering the cyclic maintenance program. For those aircraft in USARV, the ship sets are made up at New Cumberland Army Depot and air-shipped as a package to Air Vietnam.

The three phase plan worked well. CH-47 aircraft output from cyclic maintenance have virtually all applicable modifications installed. Those MWO's that are 100 percent complied with were rescinded, thereby reducing the overall quantity of applicable CH-47 MWO's. Procurement of additional MWO kits has been substantially reduced since the inception of this program.

A contract was signed with Dynalectron Corporation on 29 June 1973, covering the installation of 16 modification work order kits on CH-47C helicopters. Each individual modification work order was costed out based on a labor hourly rate of \$4.50.

Work on this contract will be accomplished at the Ft. Benning, Georgia Facility. The Government, under terms of this contract, reserves the right to:

- a. Increase or decrease total number of MWO's to be applied.

b. Delete or add aircraft from the delivery schedule.

c. Substitute aircraft.

Delivery schedule varies from 14 work days to 21 work days, depending on the number of MWO's required to be installed.

In order to expedite the MWO update on all CH-47C model aircraft, contracts were negotiated to accomplish this program on helicopters located in Korea and Hawaii. The following chart indicates the status of accomplishments through fiscal year 1975.

Upon completion of the CH-47C update program, action was initiated to continue the same type of program to update the CH-47A aircraft by contract with Dynalectron Corporation at Ft. Benning, Georgia, and by an interservice agreement with the facility at Ft. Lewis, Washington. These two facilities will be involved with the update of CH-47A aircraft throughout FY 1976.

Armed and Armored CH-47 -

In response to military demands for a heavily armed/armored helicopter, COMUSMACV requested that the Department of the Army process the requirement. During the early part of FY 1965, the requirement was established by CINPAC and approved through channels. Action to provide armed/armored CHINOOK's was subsequently initiated by USAMC.

On 30 June 1965, a letter contract was awarded to the Boeing Company, Vertol Division, for the modification of four production CH-47A helicopters to the armed/armored configuration. Only four helicopters were procured due to cost limitations and to the theater desiring only three for evaluation. The first such configured

CHINOOK was delivered to the Army on 30 November 1965.

The first flight test of an armed/armored CHINOOK was conducted in November 1965. Safety release and weapons verification tests were conducted by the US Army Test and Evaluation Command at Aberdeen Proving Ground during January and early February 1966.

A special detachment was formed and began training under the supervision of the 10th Aviation Group. The detachment was designated the 53rd Aviation Detachment, Field Evaluation (Provisional).

Three armed/armored CH-47A's arrived in theater to begin operational evaluation in June 1966. The fourth configured CHINOOK remained in CONUS at Edwards AFB for performance and flying qualities testing.

Upon completion of crew training, the aircraft were assigned missions, i.e., escort, surveillance, security and fire support in the III Corps area in RVN. On 8 August 1966, during this evaluation, one of the aircraft was involved in a taxiing accident and damaged beyond repair. Subsequent to this accident, the aircraft at Edwards AFB was deployed to RVN as a replacement.

After evaluation in the III Corps area, the armed/armored CHINOOK's were sent to the 1st Cavalry Division to complete their evaluation. On 5 May 1967, while on a gunnery run, another armed CHINOOK was lost. After the final evaluation phase, the two remaining aircraft were assigned to the 1st Cavalry Division. The third armed CHINOOK was destroyed by mortar fire in February 1968, and the remaining armed/armored CHINOOK sustained combat hits in January 1968, causing extensive damage.

At this point in time, the Army Concept Team in Vietnam decided not to continue the program since there were other aerial weapons which could also perform this role.

Action was taken in January 1969 to classify the one remaining armored CHINOOK helicopter, serial number 64-13149, as a Category B trainer in RVN.

A review was made of all spare parts peculiar to the armored CHINOOK's, and necessary recoding action was taken to phase all parts out of the supply system.

CH-47C Demonstrations in Europe -

In May 1969, a CH-47C helicopter, with a supply of spare parts, tools and ground support equipment, was airlifted to Sembach AFB, Germany. At Sembach, the aircraft was assembled and flown to the Paris Air Show, held during the period 29 May through 8 June 1969. Upon arrival in Europe, the aircraft and equipment were bailed to Boeing-Vertol under agreement DAAJ01-69-A-0332(2m).

In addition to the Paris Air Show, the contractor was authorized under the bailment agreement, to conduct a tour of Italy for the purpose of performing demonstration flights to stimulate interest in possible future commercial sales. Bailment agreement ended on 16 July 1969 at Sembach, Germany, where the helicopter was lifted to RVN by a C133B aircraft. Support parts and tools were returned to CONUS stock upon completion of the tour.

US Army Contracting Officer's Representative, LTC Harry Chambers, accompanied the aircraft during the European demonstrations, and proceeded to RVN with the aircraft to become the CHINOOK Project

Manager's Liaison Officer in RVN.

The complete tour throughout Europe with the CH-47C helicopter was conducted at no cost to the Government, with all costs being paid by Boeing-Vertol.

CH-47C Demonstration in South America -

In June 1975, a lease agreement was negotiated between Boeing-Vertol and AVSCOM which provided a CH-47C from new production to the Boeing Company for purposes of conducting a demonstration throughout South America. Two US Army personnel accompanied the aircraft as a pilot and a crew chief.

The aircraft was ferried from the contractor's plant in Philadelphia, PA to Jacksonville, Florida through the Bahamas and Puerto Rico to Columbia, South America which was the location of the first demonstration held on 23 June 1975.

The nine week demonstration tour covered five Latin American Countries without incident for 10,000 miles and included several "Firsts" for the Chinook.

The first helicopter to cross the South American continent from coast to coast, over the Amazon jungle region.

Claims an altitude record for water take-off and landing from the 12,507 foot Lake Titicaca in southern Peru. Two other water landings were accomplished, one in the Amazon River and another in Lake Valencia in Maragay, SA.

The Chinook demonstrated to Government officials and military officers in Columbia and Ecuador its ability to transport troops into

confined jungle and mountain areas, and to Peruvian officials and businessmen, its ability to transport heavy oil field equipment and road building machinery into remote areas. The Chinook was constantly subjected to a series of capability tests during the tour.

The return ferry flight included overnight stops in Port Au Prince, Haiti Freeport in the Grand Bahamas, Charleston, South Carolina and ultimately to the Boeing facility at Philadelphia, PA on 28 Aug 75.

During the tour, ferry flights were lengthened from the normal range of 385 miles to 685 miles by using two 600 gallon internal extended range fuel tanks. A Government furnished spare parts kit was carried on board the helicopter but spares consumption, including four periodic inspections, was found to be minimal.

Crew of the CH-47C included a senior US Army Warrant Officer as helicopter Commander, a Military Crew Chief, two Boeing test pilots, four company mechanics, a Boeing Technical Representative, Loadmaster and administrative personnel.

The complete tour through South America was conducted at no cost to the US Government. All spare parts used from the government furnished package are subject to replacement by the contractor at the conclusion of the tour.

The Chinook in Korea -

Early in FY 69, an Activation/Warning Order was received to assemble a Medium Helicopter Company and a supporting Maintenance

Detachment for deployment to Korea. The unit was to be titled Packet 1-19th Aviation Company (Medium Helicopter), and was to be formed under TOE 1-258G. The maintenance unit was Packet 2-19th Aviation Company TC Detachment and was to be organized under TOE 55-510T.

Immediate action was initiated to determine the preferred model of CHINOOK aircraft to be assigned to this unit. Shortly thereafter, it was determined that CH-47A model aircraft could be best supported from the standpoint of aircraft availability and repair parts. Once the type aircraft was selected, all efforts were directed to reviewing the TOE's and determining supply, maintenance and training requirements for Packet 1-19.

The existing TOE was of prime concern to the CHINOOK Project Manager. Past CH-47 experience in USARV had proven that there was a need for some changes. USARPAC, therefore, developed MTOE 1-258G, which combined the Aviation Company and its DS Maintenance Detachment into a single combat element. The quantity of personnel was increased and the skills updated and redistribution to meet the demands dictated by experience. Although MTOE 1-258G was not considered ideal for Packet 1-19 in its original state, it represented a considerable improvement over TOE 1-258G and 55-510T. Therefore, the Project Manager recommended that Packet 1-19 be reorganized under MTOE 1-258G. DA subsequently issued instructions in line with his recommendation. Later, further action was taken to revise MTOE 1-258G to reflect the improvements still required.

An all out effort was implemented to insure that Packet 1-19 would be the best equipped CHINOOK company every deployed. This was of paramount importance because of the fact that this was the first CHINOOK unit to be deployed to Korea.

During 2-10 January 1969, the Project Manager visited Korea to make contact with appropriate personnel, and to lay the groundwork for the receipt of Packet 1-19.

The task of making the unit ready for deployment in the abbreviated timeframe was enormous. All actions were expedited and required constant monitoring. CH-47A model aircraft were reconfigured and processed through cyclic maintenance. The requisition, shipment and receipt of applicable MTOE equipment was closely watched. Unit and supporting DS, GS and Depot support packages were filled. The Project Manager's Office was in daily contact with Packet 1-19 to assist in resolving any and all problems that existed or would occur. For most of the time, a representative from the Project Manager's Office was actually on site, with the unit.

Packet 1-19 was deployed on schedule and arrived in theater during the 4th Qtr, FY 69. It arrived with a 100 percent fill of MTOE equipment. All DS, GS and Depot support packages were airshipped and arrived in Korea before the unit. These support packages had an overall average percent of fill of 96%.

Informal comments received indicate that Packet 1-19 was the best equipped company ever to arrive in Korea.

Change-over to CH-47C Model Aircraft -

During the May 1974 World-Wide Aviation Logistics Conference, emphasis was placed on distribution of CH-47C model helicopters to replace the older CH-47A models, particularly in oversea locations. In this regard, all remaining "A" series in USAEIGHT were scheduled for retrograde during the 1st Quarter FY 75. The "C" series replacements from Project Blackhorse, CONUS new production and depot overhaul provide the primary basis for bringing both Assault Support Helicopter companies to full strength (less maintenance float) by the end of the 3d Qtr FY 75.

A temporary set-back was experienced when the six Blackhorse aircraft arrived in Korea. Inspection of these CH-47C helicopters revealed an excessive amount of maintenance would be required to return these aircraft to a flyable state. After many months of discussion, it was finally agreed to return these six aircraft to CONUS for assignment to Ft. Eustis, VA as maintenance trainers. Replacement aircraft were furnished to Korea from depot overhaul programs.

CH-47C(-) to CH-47C Conversion -

Initially, CH-47C aircraft were delivered to the Army with T55-L-7C engines installed. This was caused by production lead time for the T55-L-11 engines and other major components not being compatible with airframe delivery schedules. As a result, the Army accepted 106 CH-47C(-) aircraft prior to production effectivity of the true CH-47C. Most of these CH-47C(-) aircraft were subsequently deployed to USARV.

Early in FY 1969, planning began for the retrofit of the CH-47C(-) to the CH-47C configuration. Originally, the retrofit program consisted of incorporating 12 Engineering Change Proposals (ECP's) by a Boeing-Vertol contract team in RVN. This program was coordinated with USARV and was scheduled to begin in July 1969.

During the latter part of 1968, however, difficulties were encountered relative to delivery and acceptance of the first true CH-47C aircraft. The production effectivity date of the first true CH-47C, January 1969, was slipped to April 1969 because of these problems. Accordingly, the retrofit schedule for the CH-47C(-) aircraft was also delayed.

The problems encountered with the first true CH-47C caused a reassessment of the modifications required to bring the CH-47C(-) to a true CH-47C. The results of this comprehensive review were that 15 ECP's were added to the original list of modifications required on CH-47C(-) aircraft. The additional modifications cover fixes for the problems with the first true CH-47C and improvements in the areas of airframe structural integrity and overall aircraft reliability and maintainability.

In November 1969, a contract was negotiated through the Air Force with a Vietnam company, Air Vietnam, in Saigon to install 27 Engineering Change Proposals on CH-47C(-) aircraft.

In an attempt to continue reducing the manhour backlog on the CH-47C helicopters within CONUS, a contract was negotiated with Dynallectron Corporation to continue installing Modification Work Order

kits at a facility at Ft. Benning, Georgia. This was the start of Project ZYA or the continuing process of updating CH-47 aircraft through the installation of MWO's.

Beginning in FY 75, Project ZYA concept was expanded to include a facility located on the west coast (Ft. Lewis, Washington). This location for installing MWO's was in addition to the facility at Ft. Benning, Georgia, and Boeing-Vertol and New Cumberland Army Depot. These same four locations will continue this project throughout FY 75 and will be expanded to include the update of CH-47A and CH-47B model aircraft.

History of AVCO Lycoming -

Lycoming began serving industry in 1908 at Williamsport, PA and for more than half a century has held a top position as a producer of automotive engines, aircraft engines, marine engine, industrial engines, precision and volume machine parts, and gray iron and aluminum castings. At the present time, Lycoming-built engines power more than 75 types of fixed-wing and rotary aircraft in commercial and military applications.

Two years after the Williamsport company was founded, it began turning out engines for Velie, Hatfield, Apple and other fore-runners of present-day motorcars. In 1915, the first Lycoming-designed engine was produced for the Dort automobile. Proof of its phenomenal success is found in the fact that thousands of these 4-cylinder, 2-bearing engines saw military service during the First World War when Lycoming smashed all production records to meet the Army's demands.

Lycoming designed one of the nation's first "straight 8" engines and produced it for the 1924 Auburn. From this and other successes came an enviable reputation that resulted in Lycoming's manufacturing 57 different types of engines for such automotive names of the '20's as Dort, Gardner, Auburn, Kissell, Locomobile, Cord, Duesenberg, Graham-Paige, Elcar, and McFarlan, as well as International, Stewart, and Republic trucks.

In the marine-engine field, Lycoming-powered boats won many trophies in important races during the 20s and 30s. Included among the customers were leaders such as Elco, Penn-Yen, Wheeler, and Horace Dodge.

In 1927, Lycoming created its first aircraft engine, the R-680. Powering the Beech-design Travel Air as well as a Stinson tri-motor plane, it became the main powerplant for Ludington Airlines, Boston & Main Airways, and National Airlines, which were among the nation's first scheduled airlines. The reliability of the R-680 made it a mainstay for powering military planes such as Stearman Trainers, Cessna AT-8s, Curtiss AT-9s, Beech AT-10s and L-1s. It became famous in the Air Force as "the old sewing machine that ran and ran and ran." Even as late as the end of World War II, the R-680 was still being produced for use by the military. Its life span covered a period of more than 18 years. Lycoming followed up this initial aircraft achievement with a series of 4-, 6-, and 8-cylinder engines up to 400 horsepower, which have been used by such manufacturers as Piper, Taylorcraft, Beech, and Ryan. For the private and corporate plane

industry, Lycoming has made engines for all leaders. Today these range from single-engine private planes to twin-engine executive aircraft. More than 80 percent of all twin-engine executive-type aircraft being manufactured today are powered by Lycoming engines.

With the outbreak of World War II, Lycoming again turned its production towards the military. Thousands upon thousands of 165-horsepower tank engines were turned out alongside thousands of aircraft powerplants. Toward the end of the war, Lycoming designed and built the world's most powerful reciprocating aircraft engine as an experimental project for the Air Force. It developed in excess of 5000 horsepower.

In 1939, Lycoming became a division of Avco Manufacturing Corporation, an early member of that growing family of famous names. Since then, company growth has accelerated. Lycoming now occupies the former Chance-Vought plant in Stratford, Connecticut, with 1-1/2 million square feet of modern floor space. Lycoming plants in Williamsport, Pennsylvania, and in Stratford, today provide more than two million square feet of floor space and more than 6,000 of the world's finest machine tools to serve both industry and the armed forces.

In 1951, Avco secured the services of Dr. Anselm Franz, one of the world's foremost authorities on jet engines, to initiate the development of gas turbine engines at the Lycoming Division.

As head of the engine development division of the Junkers Company in Germany during the 1940's, Dr. Franz had designed and developed the famous Jumo 004 jet engine.

As head of the Gas Turbine Department, Dr. Franz and his associates envisioned the present Lycoming gas turbine engine design. This design was submitted to the military and in 1952 resulted in the award of an Army contract monitored by the Air Force for the development of the present T53 free power turbine engine.

By 1954, the promise shown by the T53 led the Army and Air Force to sponsor jointly the development of the present T55 free power turbine engine. This engine was to use the same basic design philosophy as the T53, but provide approximately twice the power.

Avco Lycoming continues to play a dominant role in the aircraft propulsion scene, particularly in the area of helicopters. Virtually every rotary wing manufacturer in the nation is using or has used Avco Lycoming-built engines. This list includes Bell, Sikorsky, Kaman, Hiller, Vertol, Hughes, Doman, and Brantly.

History of the Boeing Company -

The history of Boeing is the history of flight in fixed wing, vertical take-off and landing aircraft, missiles, space exploration and product service. In recent years, Boeing has diversified into surface transportation systems with hydrofoils, urban mass transportation systems, and vehicles for the civil market. An extensive baseline of engineering, manufacturing,

and quality technology, backed by advanced technical facilities, has allowed Boeing to offer customers tomorrow's aerospace technology today.

A multitude of military aircraft system development programs have been carried out successfully since the company's original incorporation in 1916. Although the company's initial effort was one of the first successful helicopters in America, it was the only small single-place, single-rotor helicopter ever built by the company, and it soon gave way to the tandem configuration design philosophy which was prevailed since that time. Based on this development in the state-of-the-art, the firm, known as the P-V Engineering Forum, received its initial contract in 1945 from the US Navy for the world's first tandem-rotor transport helicopter, the ten place XHRP-1.

The year 1946 brought a name change from P-V Engineering Forum to the Piasecki Helicopter Corporation, plus a navy contract for a fleet utility helicopter, the HUP, and a US Air Force contract for a helicopter capable of accomplishing long-range rescue missions. The company expanded rapidly and built a facility which is now the Division's Fabrication Center.

During the following decade, the company designed, developed and produced the six-place HUP, later designed the UH-25 for the Navy, the 14 to 22 place H-21 work horse, later designated the CH-21 for the Air Force, as well as the 40-passenger YH-16, the then largest helicopter in the world, which was not placed

in production. The HUP's were delivered to the United States, Canadian and export military services. The H-21 joined the military forces of the United States, Canada, West Germany, France, Sweden, Japan and the Union of Burma. From the highly successful H-21 evolved the tandem rotor Vertol 42, 43 and 44, which saw service on the mid-Canada line, the arctic, in Europe and Asia, as well as in the petroleum and construction industries.

In March 1956, the company name was again changed to the Vertol Aircraft Corporation to reflect the broader interest in the field of vertical take-off and landing aircraft. After producing more than 1,000 tandem-rotor helicopters, Vertol initiated, in 1956, an eighteen month program of research and design for a twin-turbine transport helicopter to meet military and civilian requirements. This program first led to the 107 prototype and eventually to the US Army CH-47A Chinook.

The US Navy and US Marine Corps versions of the model 107 were designated the UH-46A and CH-46A respectively and placed in production. The UH-46A was deployed aboard fast combat supply ships of the Atlantic and Pacific fleets as a major part of the Navy's vertical replenishment program. The CH-46A was operational with squadrons of the fleet marine forces, Atlantic and Pacific fleets. The US Army CH-47 Chinook became the Army's standard medium lift helicopter and was assigned world-wide, having a primary mission for rapid troop deployment.

In 1957, the company embarked on a pioneering venture in tilt-wing technology. The result of this venture was the Vertol 76 (VZ-2). In July 1958, the Vertol 76 was the first tilt-wing to successfully convert from vertical to horizontal flight and back. This research and development led to state-of-the-art breakthroughs in tilt-wing control systems and lifting devices.

In March 1960, the Vertol Aircraft Corporation became the Vertol Division of the Boeing Company. Since then, the Boeing Company expanded the Vertol Division Facilities over 400 percent to meet the then increased production needs. The Division's employment level has grown in this period from about 2,000 to over 12,000 persons.

In 1962, the first phase of a complex was constructed and occupied on 290 acres of land located in Ridley Township. This facility, the Engineering and Dynamics Center, includes a blade plant and a transmission assembly building.

In September 1970, Deputy Secretary of Defense David Packard approved a joint Army/Navy program to exploit technology and develop the critical components for a 22.5 ton heavy lift helicopter. After reviewing the recommendations of a source selection board, Secretary Packard directed that a three year advanced technology component development contract be awarded to the Boeing-Vertol Company, which was awarded on 25 June 1971. The heavy lift helicopter design envisioned in the Boeing-Vertol proposal is a

shaft-driven, tandem rotor helicopter. In December 1971, DA approved, in concept, a program to build and conduct a flight evaluation of a prototype HLH aircraft. A contract for this prototype was signed with Boeing-Vertol in January 1973.

In accordance with the ASARC decision of September 1974, the requirement for an HLH system was validated; however, DA directed the component development phase continued and for the Army to make no commitment for continuing the engineering development phase or for production.

Vertol Division, as a pioneer in the field of vertical flight, with access to the vast resources of the Boeing Company, continues to be a fully integrated aircraft manufacturing facility, with the experience and engineering talent required to meet the problems and challenges in the broad field of VTOL-STOL mechanical and aeronautical technology.

Safety First -

The US Army Agency for Aviation Safety reported in June that the CH-47 cumulative accident rate for the four year period (FY 1971 through FY 1974) was 7.77 per 100,000 flying hours, compared to the total rotary wing cumulative accident rate of 11.75 per 100,000 hours for this period.

The agency concluded that the CH-47 accident rate, the lowest of all rotary wing aircraft, has decreased at a greater rate than the overall rotary wing rate for the past four years.



PROGRESS

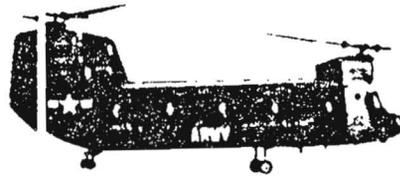
SUMMARY

February, 1963

Fort Rucker

User Test and Pilot Training Activity

During January 1963, the number of CH-47A Chinooks assigned to units at the United States Army Aviation Center, Fort Rucker, Alabama, was increased to five. Three Chinooks are now assigned to the U. S. Army Aviation Test and Evaluation Command and two to the U. S. Army Aviation School. As of the end of January, these helicopters had accumulated a total of approximately 120 flight hours since their arrival at Fort Rucker. High time for one aircraft in a single day was 5 hours 55 minutes. The Army Aviation School and the Transportation School are scheduled to receive the balance of their Chinooks in February and March, and deliveries starting in April are allocated to TOE units.



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VERMILION
BOEING



PROGRESS

SUMMARY

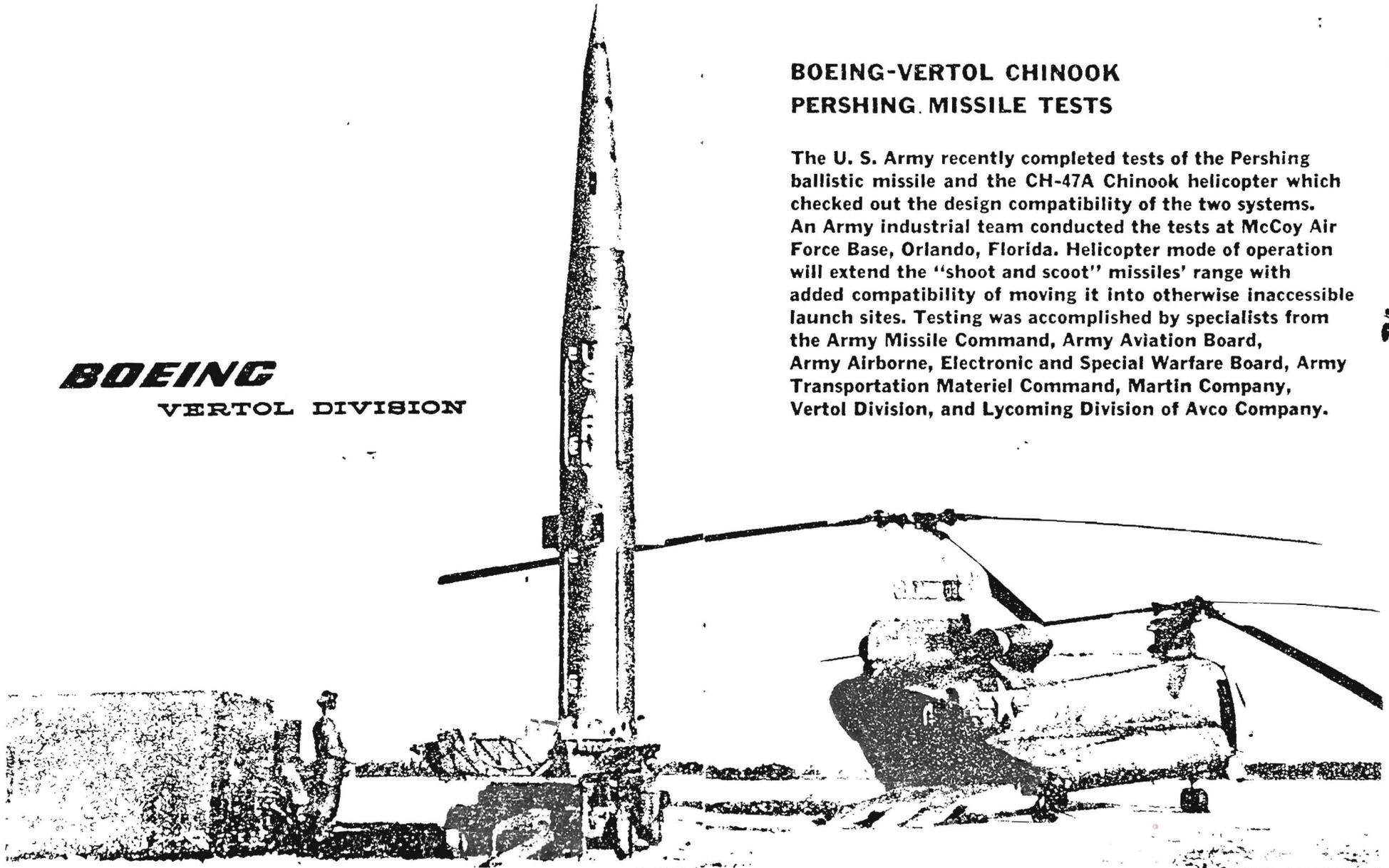
March, 1963

**BOEING-VERTOL CHINOOK
PERSHING MISSILE TESTS**

The U. S. Army recently completed tests of the Pershing ballistic missile and the CH-47A Chinook helicopter which checked out the design compatibility of the two systems. An Army industrial team conducted the tests at McCoy Air Force Base, Orlando, Florida. Helicopter mode of operation will extend the "shoot and scoot" missiles' range with added compatibility of moving it into otherwise inaccessible launch sites. Testing was accomplished by specialists from the Army Missile Command, Army Aviation Board, Army Airborne, Electronic and Special Warfare Board, Army Transportation Materiel Command, Martin Company, Vertol Division, and Lycoming Division of Avco Company.

BOEING

VERTOL DIVISION



Chinook

PROGRESS

SUMMARY

April, 1963

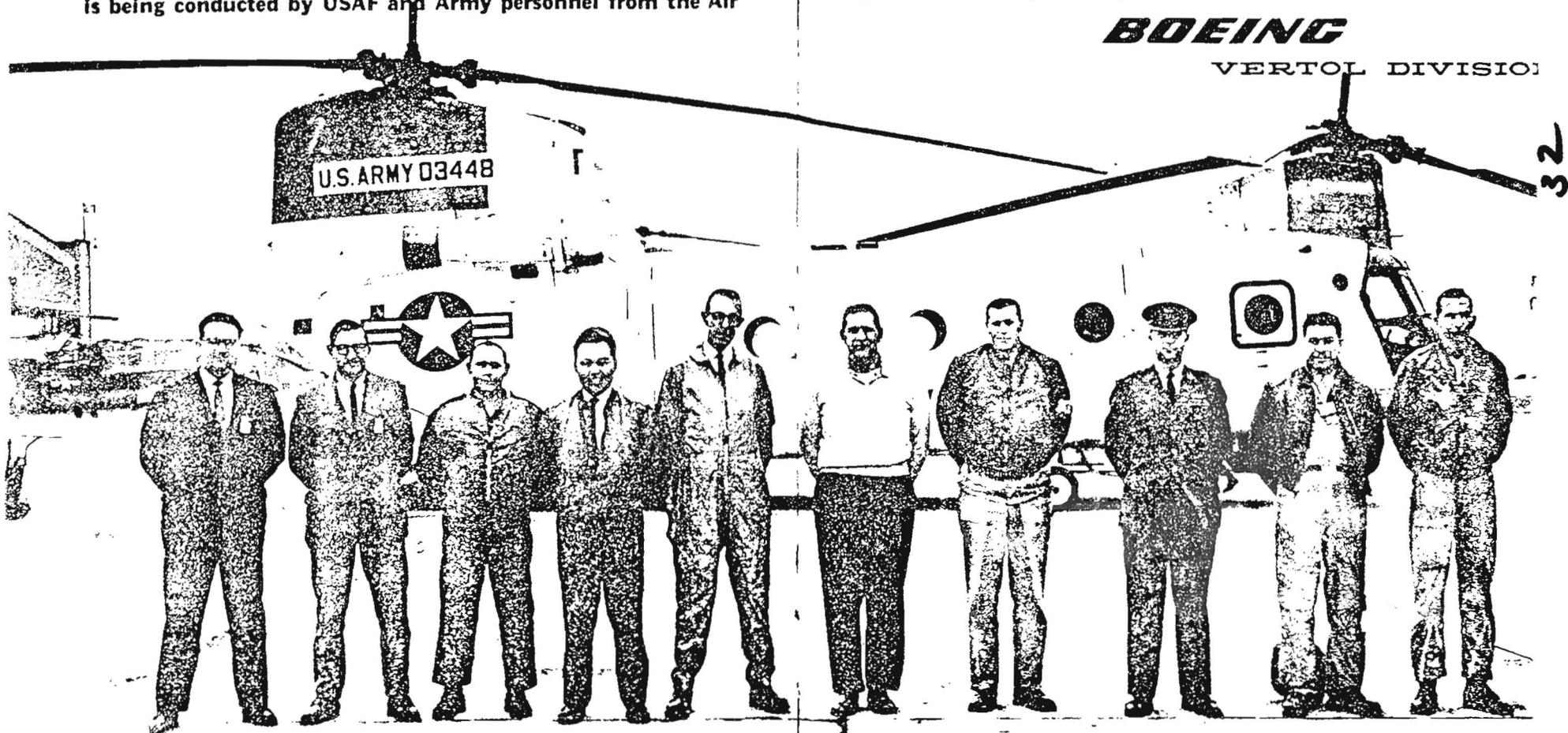
CHINOOK CATEGORY II TEST PROGRAM

The Category II engineering flight test program on the U.S. Army's CH-47A Chinook medium transport helicopter began on 22 February 1963 at Vertol Division's flight test center, Philadelphia International Airport. The Category II test program is being conducted by USAF and Army personnel from the Air

Force Flight Test Center, Edwards Air Force Base, California, and is being supported by the contractor. The sixth CH-47A is being utilized at present, and will be augmented by the seventh Chinook in June. The Category II test program includes engineering evaluation of flying qualities and verification of performance to provide pilot handbook data.

BOEING

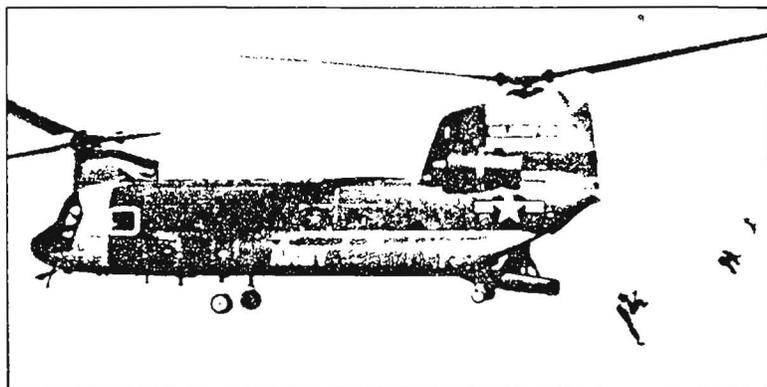
VERTOL DIVISION



Chinook

PROGRESS SUMMARY

June, 1963



CHINOOK DROPS PARATROOPS AT FORT BRAGG

During the week of June 10, the U.S. Army's Aviation Electronics and Special Warfare Board at Ft. Bragg, North Carolina, conducted a series of tests using a CH-47A Chinook helicopter to drop paratroopers. A total of 500 jumps was made by paratroopers from the 18th Airborne Corps of STRAC.

The initial jumps were made by six fully equipped paratroopers. The number was then graduated upward to twenty-eight paratroopers, the normal troop capacity for the Chinook on a paratroop drop mission.

The drops were made at various speeds during the tests which are part of the Army's User Test Program.

BOEING

VERTOL DIVISION

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CHINOOK AIRLIFTS JET TRAINER

A U.S. Army CH-47A Chinook helicopter recently airlifted a U.S. Air Force T-33 jet aircraft from Maxwell Air Force Base, Alabama, to Tuscaloosa, Alabama.

The jet, an obsolete trainer, was presented to the Mayor of Tuscaloosa for permanent display in the Junior Chamber of Commerce Park.

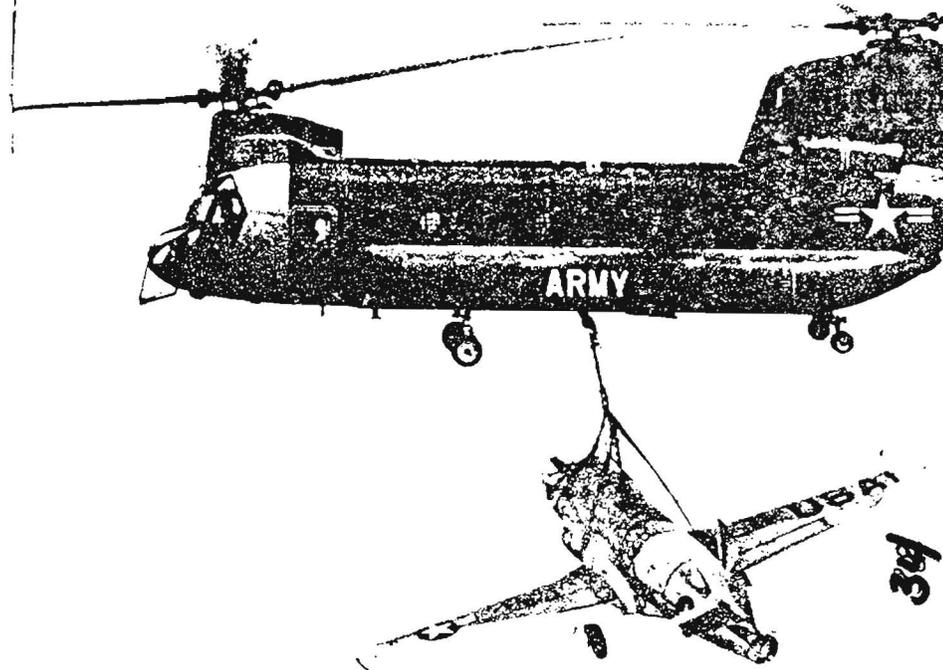
This Chinook, one of 11 CH-47A aircraft currently assigned to Ft. Rucker, made the 85 mile ferry flight as part of the U.S. Army Aviation Test Boards User Test Program.

FIRST CHINOOK HELICOPTER ASSIGNED TO U. S. ARMY TACTICAL UNIT

The first CH-47A Chinook helicopter to be assigned to a tactical unit of the United States Army was formally accepted at Boeing's Vertel Division.

This Chinook aircraft will be assigned to Company A of the 228th Assault Support Battalion at Ft. Benning, Ga. Pictured below is Colonel Myers turning the helicopter over to Major A. C. Hawkins, Commanding Officer of Company A. Looking on is R. W. Tharrington, Vice President and General Manager of the Vertel Division.

The 228th Assault Support Battalion is part of the Army's newly activated 11th Air Assault Division at Ft. Benning, Ga.



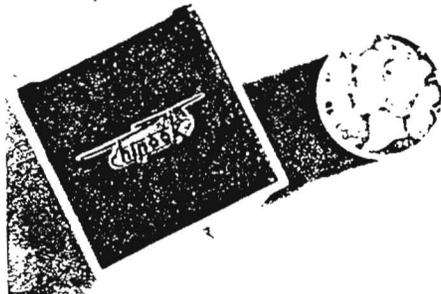
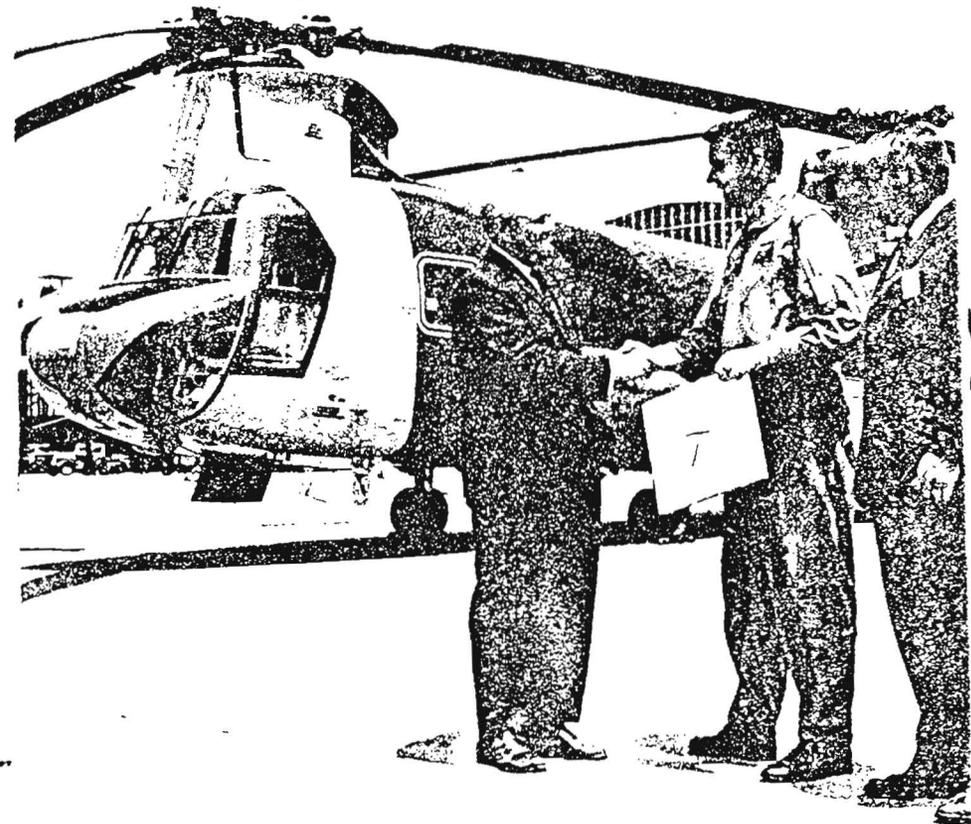


PROGRESS SUMMARY

August, 1963

AMC PROGRAM MANAGER CHECKS OUT IN CHINOOK

Lt Col Fred Myers, U. S. Army CH-47A Chinook Program Manager, receives congratulatory handshake and certificate of achievement from Robert W. Tharrington Vice President and General Manager of Boeing's Vertol Division. Looking on is Thomas P. Pepler Vertol Division Chinook Program Manager. The ceremony took place at the division's Flight Center following Colonel Myers' pilot qualification in the Chinook. Shown below are the pin and certificate that are available to all pilots that have successfully completed pilot training in the Chinook.



BOEING
VERTOL DIVISION

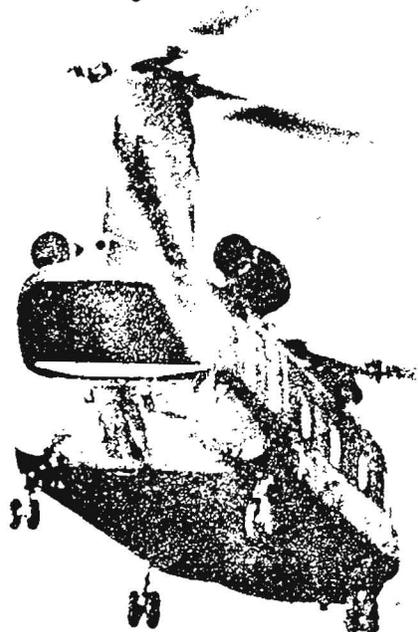
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Chinook

PROGRESS

SUMMARY

August, 1963



CHINOOK LANDS ATOP PIKES PEAK

A United States Army CH-47A Chinook helicopter made a landing, August 10, on top of Pikes Peak in Colorado. The Army's tactical transport helicopter set down on the 14,110 foot mountain at 5:55 in the morning.

The Chinook was flown from Butts Army Airfield, Ft. Carson, Colorado. Prior to landing on Pikes Peak, the aircraft participated in the Army Aviation Board's high altitude user tests. The CH-47A Chinook was tested at different elevations in the high mountains near Colorado Springs. Gross weight was also varied during the testing (25,500 pounds and 27,500 pounds). Testing of the Chinook at high altitudes was done to investigate the controllability and hovering performance and to confirm flight handbook data.

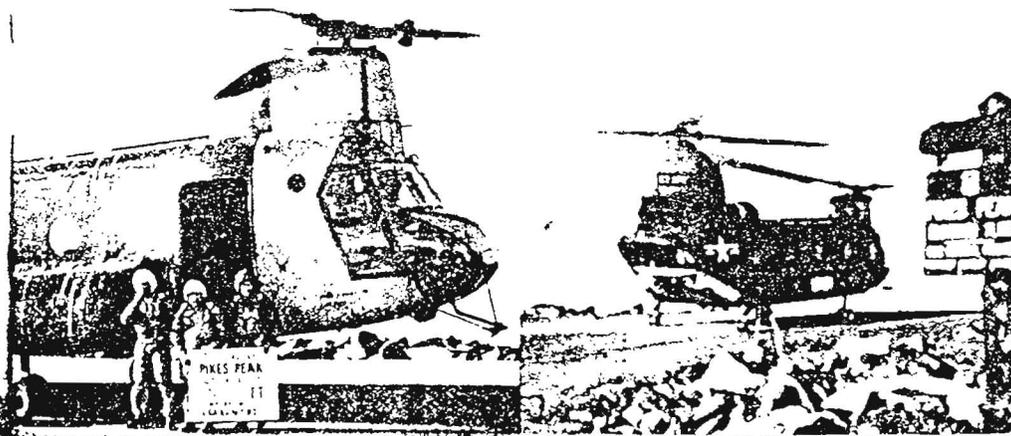
Joseph Givens, Army Aviation Board civilian pilot, and Major J. E. Holstad, Army Aviation Board Pilot, were at the controls of the Chinook when it landed on Pikes Peak.

Other Army Aviation Test Board personnel aboard the Chinook were Major Claude E. Hargett, Pilot and Project Officer, and Major Donald G. Forchette, Pilot and Maintenance Officer.

After the CH-47A Chinook returned to Ft. Carson from Pikes Peak it was flown back to its home base, Ft. Rucker, Alabama, where it will continue the Army Aviation Board's User Test Program.

Prior to the high altitude tests the Chinook was at Yuma Test Station in Arizona for desert testing. This included hovering in a dust cloud for four hours at temperatures up to 116° F.

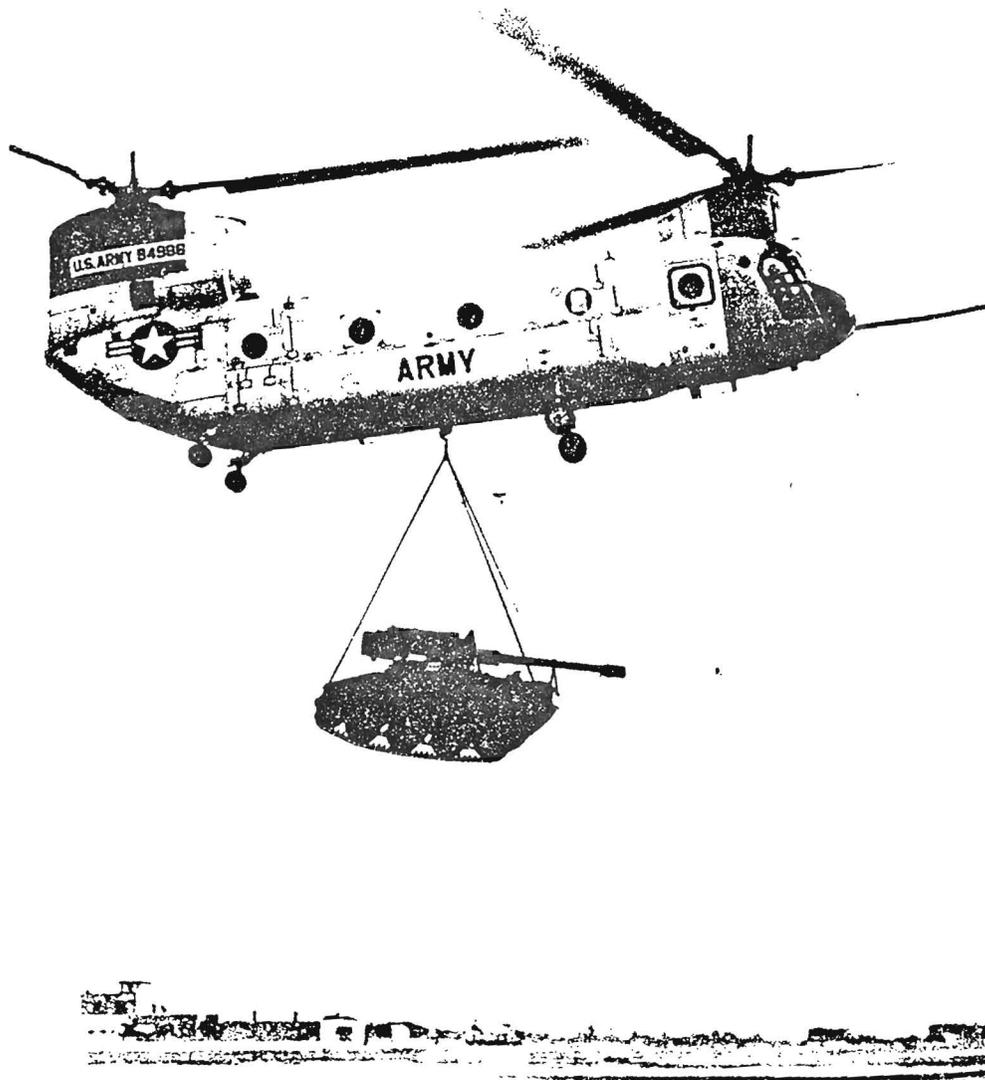
BOEING
VERTOL DIVISION



Chinook

PROGRESS SUMMARY

February, 1964



CHINOOK LIFTS 10.5 TONS

A U. S. Army CH-47A Chinook helicopter successfully lifted a useful load of approximately 10.5 tons. This figure considerably exceeds the 17,700-pound (8.85 tons) empty weight of the aircraft.

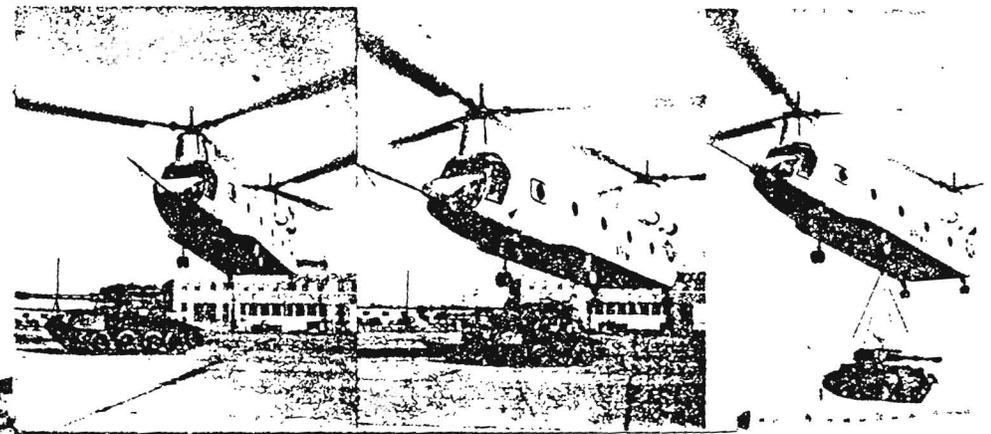
The Army's twin-turbine transport helicopter lifted a 14,100-pound M-56 Scorpion self-propelled anti-tank gun during the test which was held at Boeing's Vertol Division Flight Center.

Internal weight, consisting of instrumentation, fuel, crew, and additional cargo, totalled 6,700 pounds. This combined load brought the total useful load to 20,800 pounds and the total gross weight of the aircraft to 38,500 pounds.

The Chinook is powered by two Lycoming T55-L-7 turbine engines, each rated at 2,650 shaft horsepower.

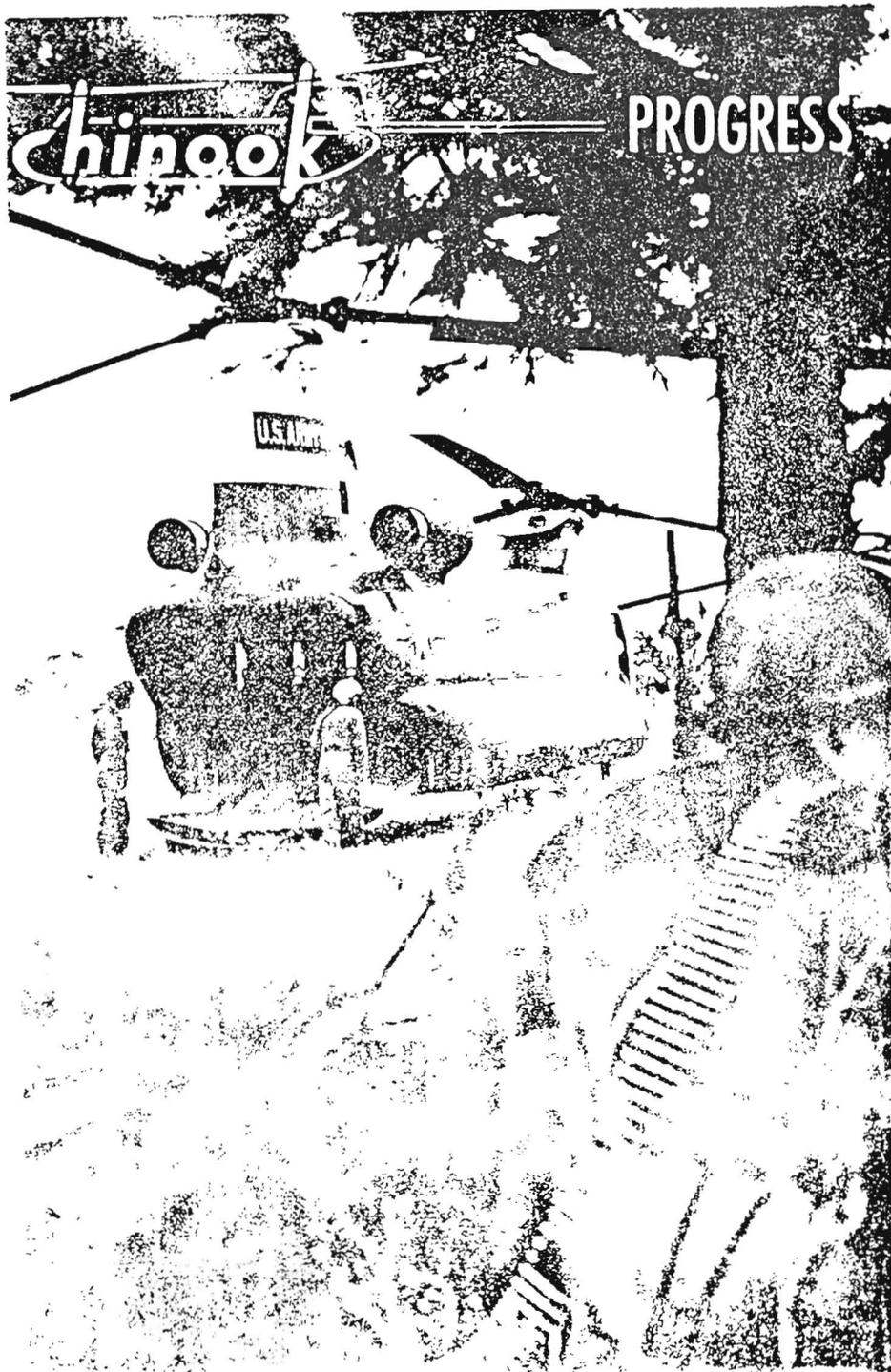
BOEING

VERTOL DIVISION



Chinook

PROGRESS



SUMMARY

October, 1963

CHINOOK IN OPERATION "EAGLE CLAW"

U. S. Army CH-47A Chinook helicopters participated in Operation "Eagle Claws" held recently at Fort Benning, Georgia. The exercise involved all elements of the Battalion Task Force of the 11th Air Assault Division. The Chinooks are assigned to Company "A", 228th Assault Support Helicopter Battalion.

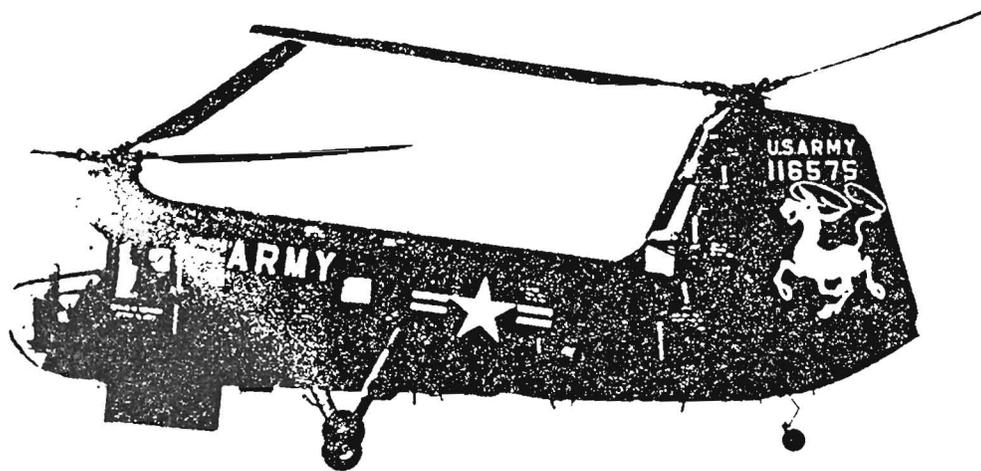


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Operation "Eagle Claws" permitted the Chinooks to perform a wide range of missions during their first tactical exercise with troops. These missions included: Tactical lift of an Infantry Rifle Company in attack and retrograde employments; Tactical lift of an Infantry Combat Support (Weapons) Company in the attack; Transport of hot foods to troops in the objective areas; Medical evacuation of casualties, and evacuation of prisoners of war. Three CH-47A Chinooks transported approximately 470 fully equipped troops and their support weapons to a designated field area. Support weapons included mortars and 1/2 ton infantry weapons carriers.

BOEING

VERTOL DIVISION



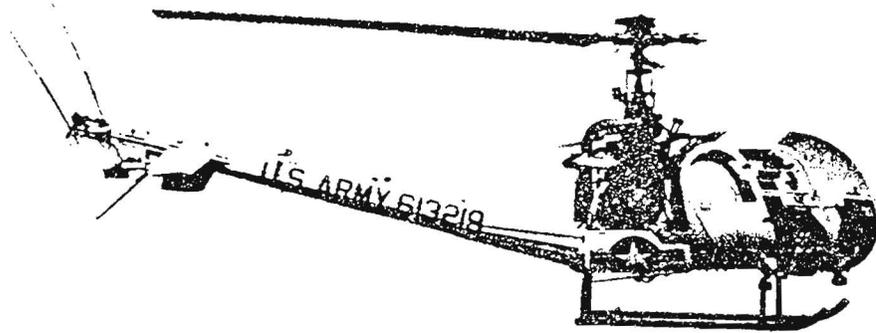
H-25

PURPOSE	Utility	PERFORMANCE
COMMON NAME	Army Mule	Range 310 nautical miles
AIRFRAME		Service Ceiling 12,700 feet
Manufacturer	Piasecki	Gross Weight 5,750 lbs
Personnel	Crew of 2, plus 3 to 6 passengers	Cruising Speed 80 knots
ROTOR		REMARKS
	3 Bladed Rotors, 35' in diameter	The H-25 helicopter was developed for the Navy for rescue operations. With minor modifications, it met U.S. Army operational needs in land-cargo and rescue utility type missions. Fifty of the Piasecki H-25 aircraft were procured by the Army, but were later turned over to the Navy for use.
ENGINE		
Manufacturer	Continental	
Model Designation	R-975-42	
Take-Off Horsepower	475	
Description	9 cylinder radial	

CH-21

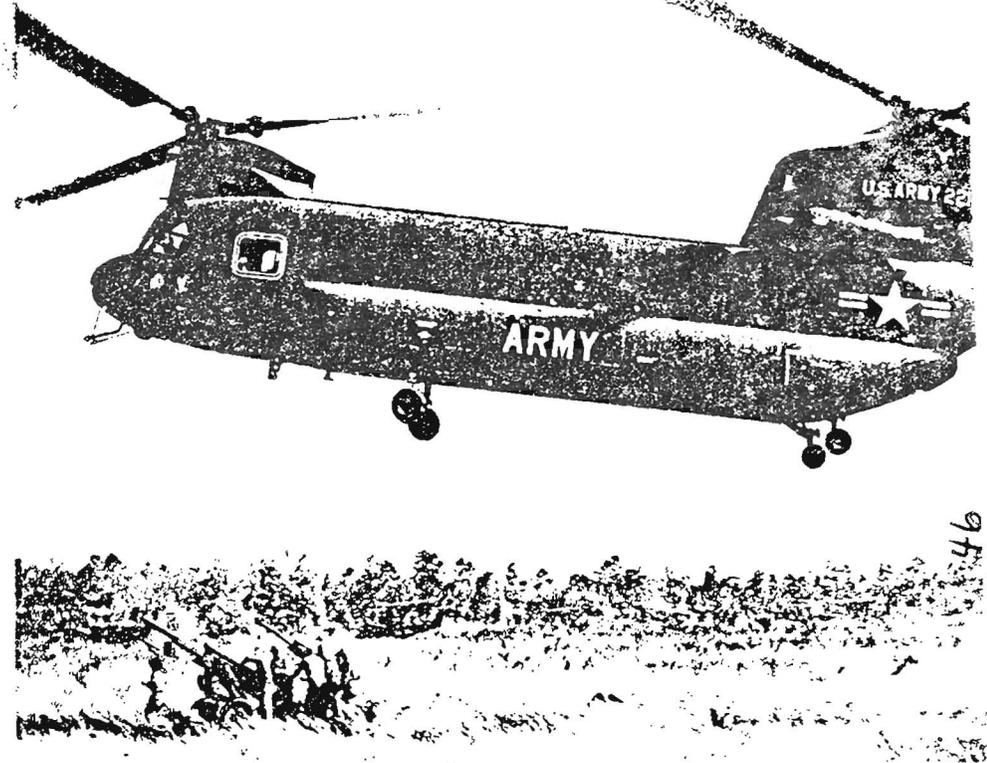
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PURPOSE	Cargo, Personnel	PERFORMANCE
COMMON NAME	Shawnee	Range 220 nautical miles
AIRFRAME		Service Ceiling 18,600 feet
Manufacturer	Vertol	Gross Weight 13,300 lbs (Max. T.O. 15,060 lbs)
Personnel	Crew of 2, plus 20 troops or crew of 3 and 12 litters	Cruising Speed 55 knots
Cargo	Approx. 3,200 lbs	REMARKS
ENGINE		The initial order of H-21s were delivered to the Army in August 1954. In December of 1958, the Army inventory of H-21s reached a peak of 308. In addition, the Army acquired sixteen H-21Bs from the Air Force. Early in 1962 the Army inventory listed sixteen H-21Bs and 283 H-21 C models. The H-21 Shawnee model has been employed extensively in troop transport in Vietnam.
Manufacturer	Curtiss-Wright	
Model Designation	R-1820-103	
Take-Off Horsepower	1,425	
Description	9 cylinder, radial	
ROTOR		
	3-Blade, 44' Diameter, 16.5" Chord Tandem Rotors	



OH-23F

PURPOSE COMMON NAME	Light Utility Raven	PROCUREMENT DATA Initial quantity of 17 delivered
AIRFRAME Manufacturer Personnel	Hiller Pilot-3 passengers	PERFORMANCE Range 195 nautical miles Service Ceiling 15,200 feet Gross Weight 2,800 lbs Cruising Speed 79 knots
ENGINE Manufacturer Model Designation Take-Off Horsepower Description	Lycoming VO-540 305 6 cylinder, horizontally opposed, aircooled	REMARKS Purchased by the Army as a specialized high performance vehicle to support the Army Engineers' Inter-American Geodetic Survey operation in Latin America, history's largest mapping operation. In commercial use since 1960, this helicopter entered Army inventory in 1962.
ROTOR	Hiller Rotomatic, 2-bladed with Parsons metal blades, 35' diameter; single metal tail	



CH-47A

PURPOSE COMMON NAME	Transport Chinook	PERFORMANCE Range 100 nautical miles Service Ceiling 19,400 feet Gross Weight 27,921 lbs Cruising Speed 150 mph Top Speed 155 mph
AIRFRAME Manufacturer Personnel Cargo	Boeing/Vertol Crew of 3 and 33 troops, or 24 litters More than 14,000 lbs	REMARKS In October 1963, CH-47A was type classified "Standard A," making it the official Army medium transport helicopter. Chinook has been designed to be compatible with any component of the Pershing Missile System. Aircraft has been in the Army system since October 1961.
ENGINE Manufacturer Model Designation Take-Off Horsepower	Lycoming T-55-L-7 2,650 SHP	
ROTOR	Two 3 blade rotors, 59' diameter	

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PROGRESS SUMMARY

CH-47A CHINOOK PERFORMS RESCUE MISSIONS IN ALASKA

Shown at left is a U.S. Army CH-47A Chinook medium assault transport helicopter airlifting a 6,000-pound communications van in an external sling during emergency operations following the Alaska earthquake disaster. The much-needed communications was ferried from Fort Richardson, Alaska to Seward, one of the Alaskan cities that was heavily damaged by the earthquake and resulting tidal waves. The Chinook carried the van 120 miles through tricky windswept mountain passes.

Other missions performed by the Chinook, undergoing cold weather capability tests at the U.S. Army Arctic Test Board at Fort Greely, included carrying 8,000 pounds of aviation gas and jet fuel plus 2,000 pounds of equipment. The Chinook subsequently transported 26 troops and several thousand pounds of equipment for guard duty in the stricken city of Valdez. In addition, the Chinook, piloted by Major Stebbins and Major Murphy of the Arctic Test Board, evacuated women and children from the disaster area.

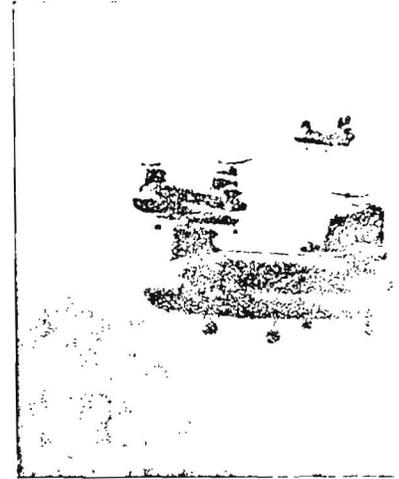
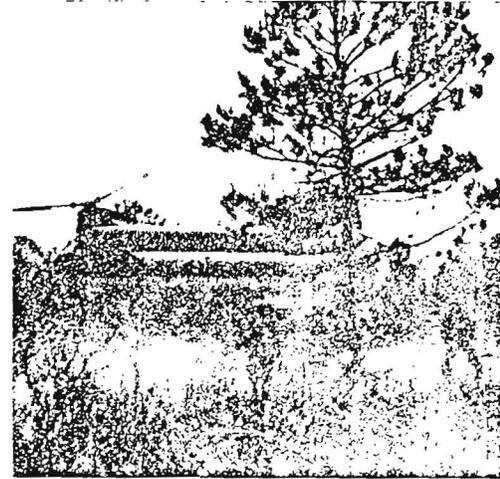
CH-47A CHINOOKS PARTICIPATE IN HAWK THRUST II

The 228th Assault Support Battalion of the 11th Air Assault Division continued field testing of the U. S. Army's air assault concepts at the Fort Stewart, Georgia maneuver area. CH-47A-equipped units supported other elements of the Division by providing heavy airlift capability.

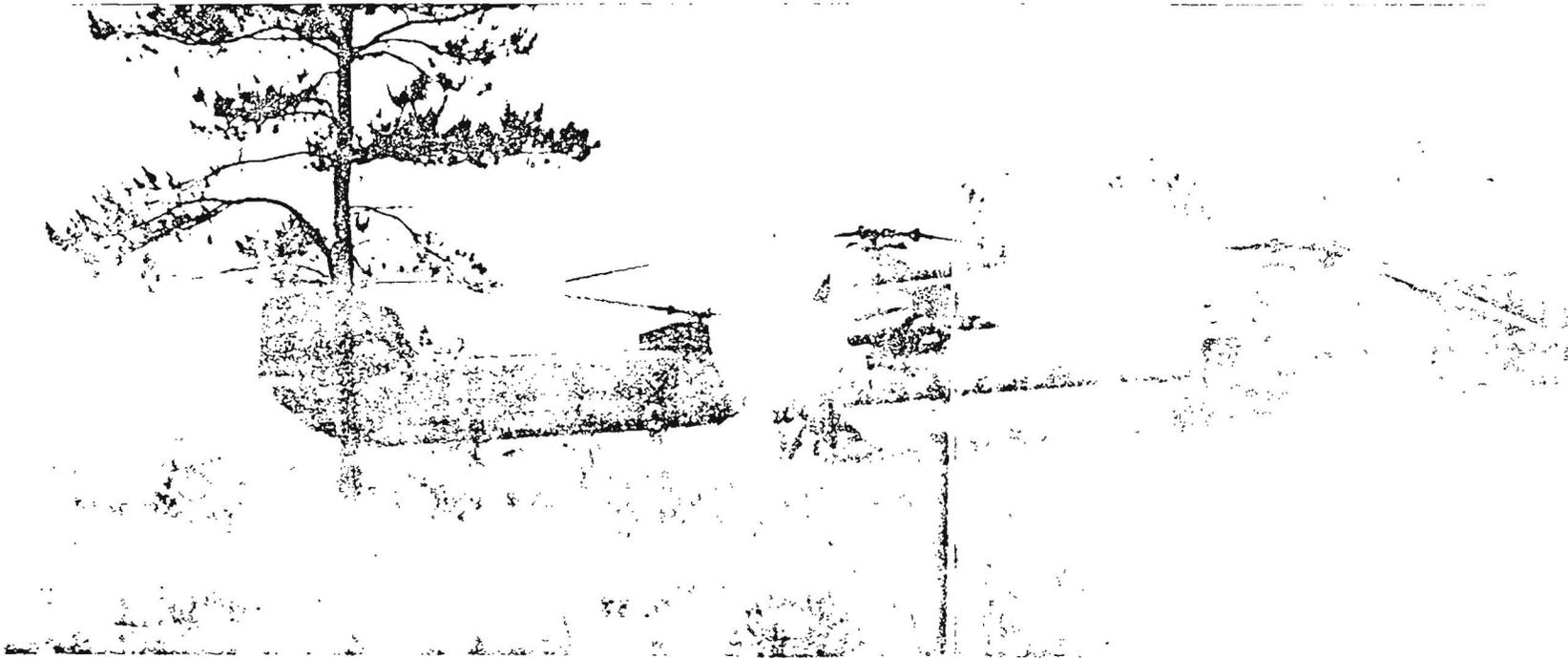
During this exercise known as "Hawk Thrust II," the 228th Battalion Chinooks demonstrated their versatility by flying sorties in support of infantry units, artillery units, and transporting fuel in general support of the Division.

BOEING

VERTOL DIVISION



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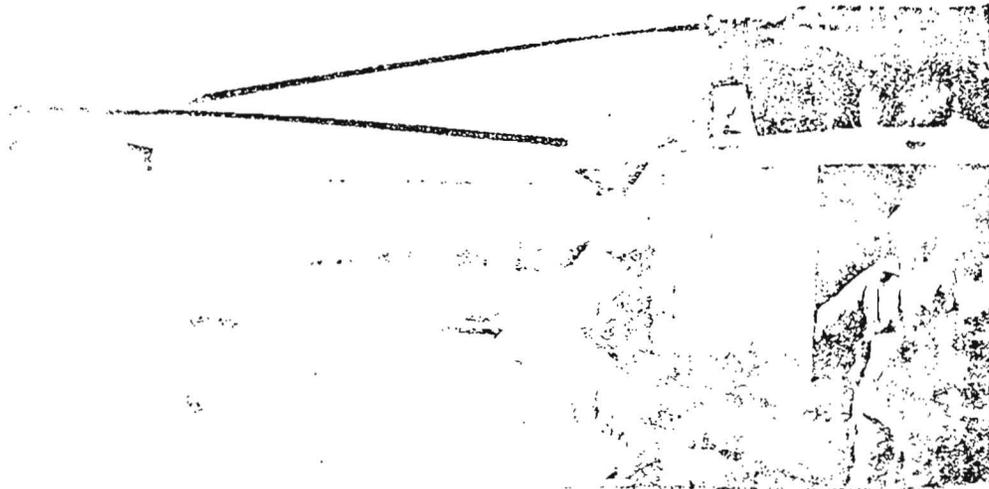
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CHINOOK

REQUIREMENTS

SUMMARY

B



CHINOOK: THE FLYING GASOLINE STATION

The CH-47A Chinook is a key element in complementing tactical mobility with logistic mobility. CH-47A Chinooks, assigned to the 44th Air Transport Battalion of the 10th Air Transport Brigade and the 228th Assault Support Battalion, can supply thousands of gallons of fuel in collapsible cells, thereby keeping aircraft supplied with fuel without dependence on trucks and fixed-wing aircraft tankers. This gives the Air Assault Division the capability of unrestrained mobility under the most severe conditions. A single Chinook with 2000 gallons of fuel can refuel ten HU-1D Iroquois helicopters in an assault area. Three HU-1Ds can be refueled simultaneously.

BOEING

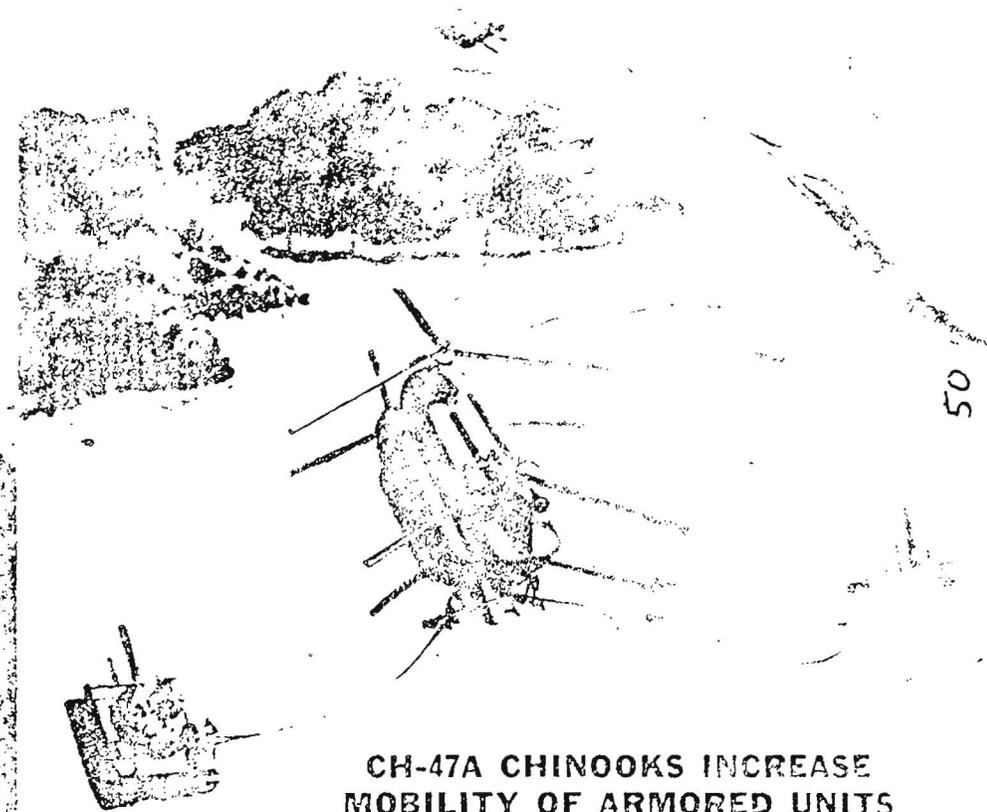
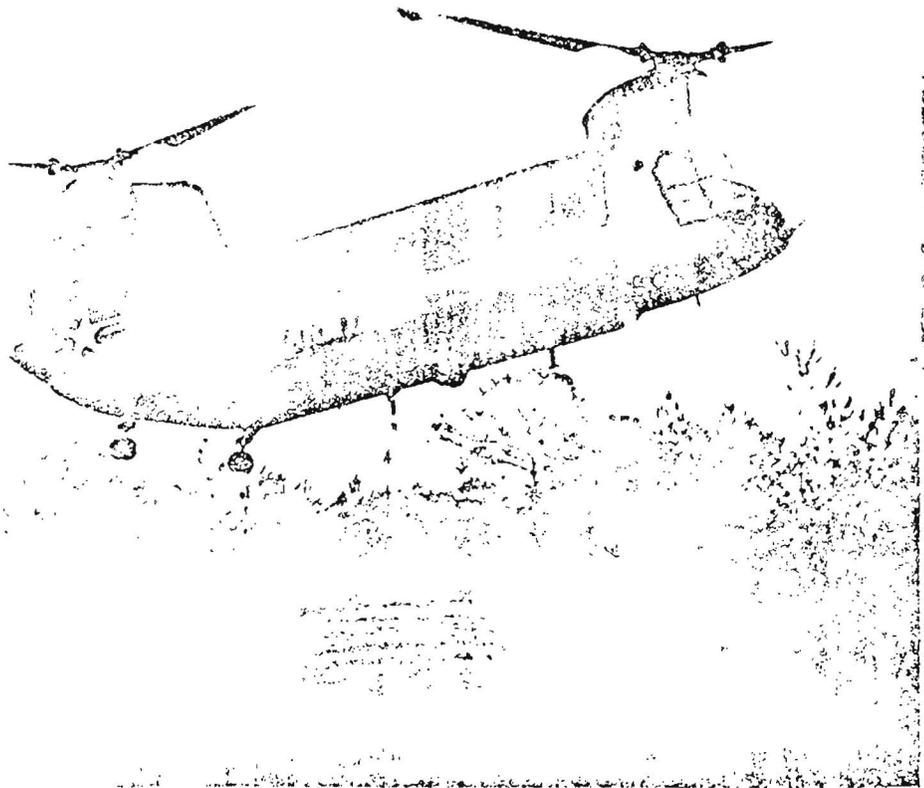
VERTOL DIVISION

Chinook

PROGRESS SUMMARY

August, 1964

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CH-47A CHINOOKS INCREASE MOBILITY OF ARMORED UNITS

In future breakthroughs of U.S. Army armored units, exploitation need not be limited by dependence on land lines of communication. A single company of CH-47A Chinook medium transport helicopters can supply the daily food, fuel, and ammunition requirements of the combat elements of a full tank battalion. The utilization of the Chinook in the resupply role will give armored units a degree of flexibility heretofore not available.

BOEING
VERTOL DIVISION





Chinook

PROGRESS

SUMMARY

NOVEMBER, 1964



U.S. ARMY CH-47A CHINOOK HELICOPTERS

PARTICIPATE IN AIR ASSAULT II MANEUVERS

United States Army CH-47A Chinook helicopters played an important role in the Army's air mobility test exercise, Air Assault II, that took place in North and South Carolina.

Designed and produced by The Boeing Company's Vertol Division, the Chinook carried out such vital missions as resupply of front line troops, transport of fuel for air and ground vehicles in the forward areas and transport

of troops and artillery with crews and ammunition.

Shown above is a formation of 22 Chinooks during the Air Assault II operation. This helicopter armada is capable of transporting on a single mission over 308,000 pounds of cargo or almost 1,000 troops.

Taking part in Air Assault II, a maneuver to evaluate air mobile techniques with a division size unit, were the 11th Air Assault Division and the 82nd Airborne Division. The

82nd Airborne were the "aggressors" and the 11th Air Assault Division mission was to repel their attack and take offensive action using newly devised air mobile tactics.

Units of the 11th Air Assault Division using the CH-47A Chinook include the 228th Assault Support Battalion and the Provisional Helicopter Company of the 10th Air Transport Brigade.

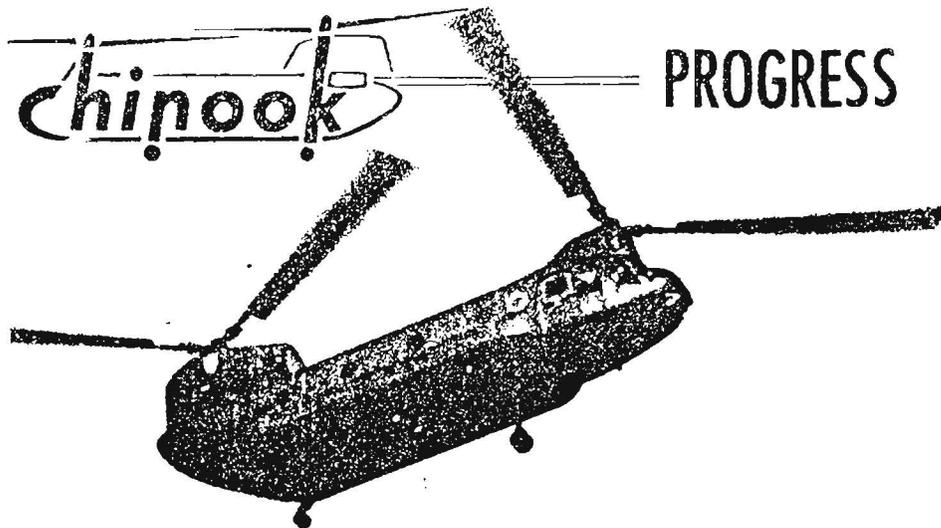
BOEING
VERTOL DIVISION

Chinook

PROGRESS

SUMMARY

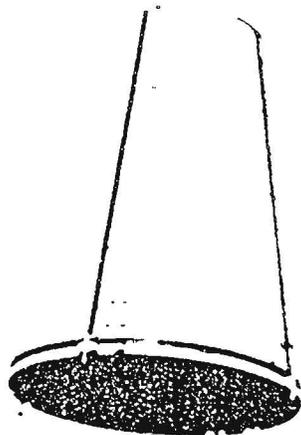
DECEMBER, 196



CH-47A TRANSPORTS APOLLO LEM ADAPTER

A CH-47A Chinook from the 11th Air Assault Division, Fort Benning, Georgia, is shown transporting a 4,800 pound, 49 foot high lunar excursion module (LEM) adapter as part of a joint operation between NASA and the United States Army. After extensive investigation by NASA and the North American Aviation Company who builds this adapter, it was determined that transport of this adapter by helicopter from Tulsa, Oklahoma to Cape Kennedy, Florida would be the most economical means of transport from the manufacturing site to the missile assembly point at Cape Kennedy. The actual missile adapter measures 154 inches in diameter at the top, 360 inches in diameter at the base and is 28 feet high. The tripod which is mounted on top of the adapter is to facilitate the sling loading and provide better flight characteristics of the adapter when it is transported beneath the helicopter.

The component shown at the left is a dummy adapter built by North American at its Tulsa, Oklahoma facility for use by NASA for dimensional checks with other components of the Apollo vehicle.



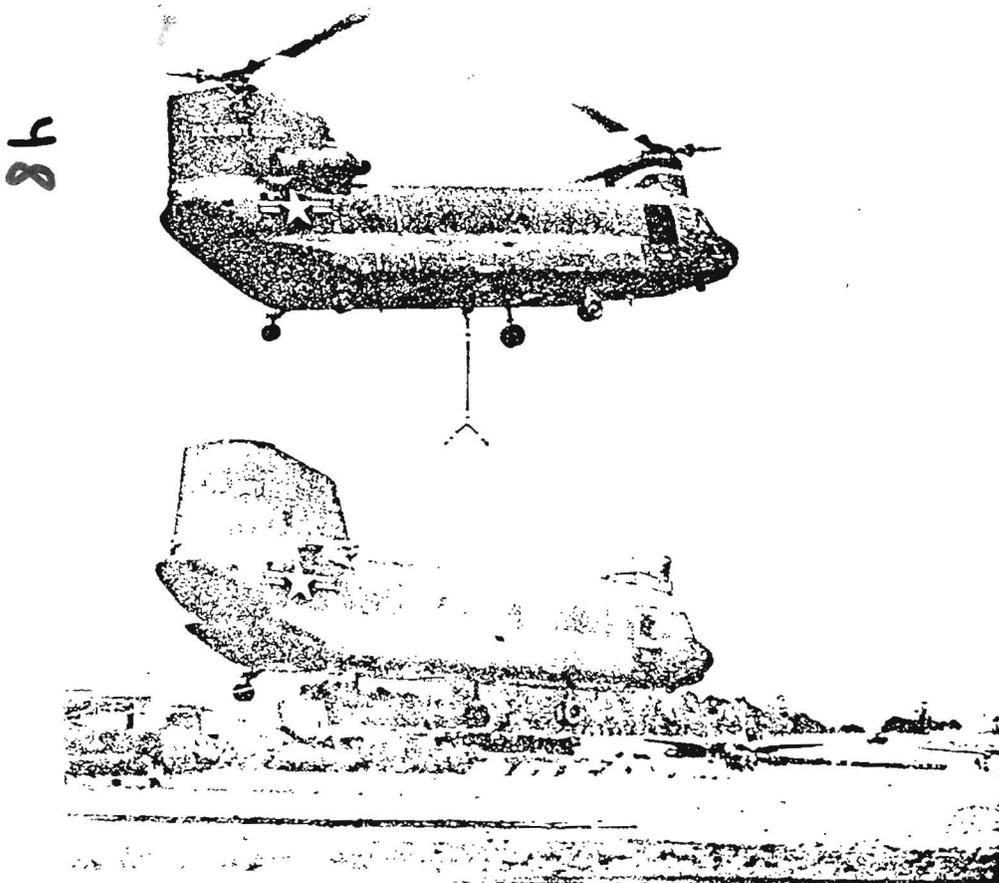
BOEING

VERTOL DIVISION

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CH-47A CHINOOK LIFTS "ITSELF"

The Chinook can not only airlift other grounded aircraft that can not be retrieved by any other means from inaccessible areas—but it can also retrieve another Chinook. This capability permits a Chinook unit to carry out retrieval of its own aircraft if the need arises. The photo at left shows a Chinook carrying out such a retrieval operation. The ability to return to combat costly aircraft which might otherwise be lost, permits the maintenance of a high state of combat readiness.



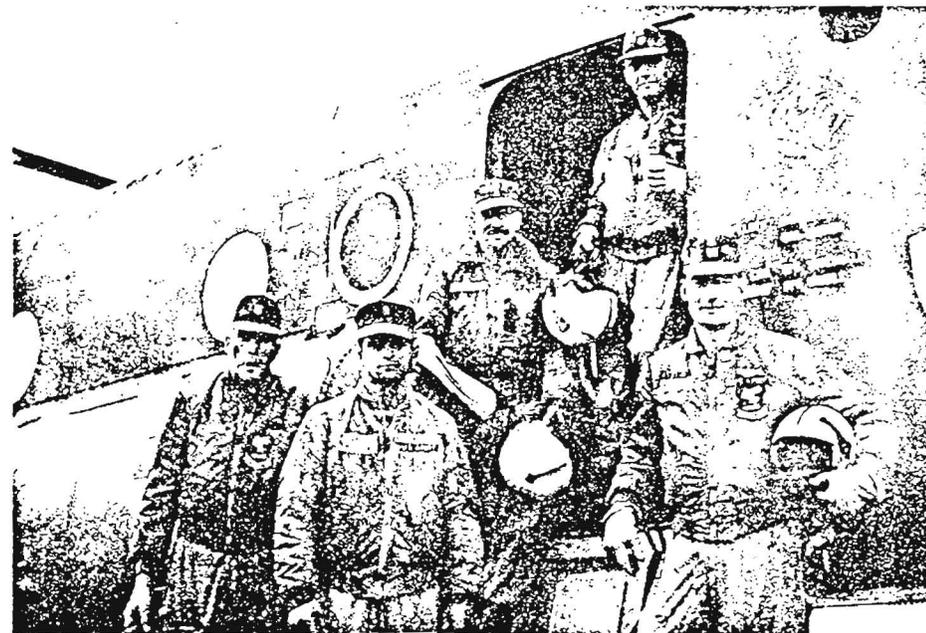
CHINOOK MAKES ENDURANCE FLIGHT

On 8 November, the CH-47A helicopter was flown for a continuous period of 6 hours and 40 minutes to determine the feasibility of CH-47A ferry flight.

Crew members of this endurance flight were Major Dwight Lorenz, Captain Otto J. Hierholzer, CWO Willy Huff, SP5 Larry Truesdale, Flight Engineer and SP5 Ralph Moseley, Crew Chief.

The CH-47A, as presently delivered, is capable of self-deployment of 850 nautical miles nonstop by use of the 2,000 gallon pillow tank installed in the aircraft and adapted for fuel transfer into the integral fuel tanks.

The total distance of this endurance flight was 812 nautical miles. The average ground speed over the route was 122 knots and the fuel remaining at the end of the flight was 1,000 pounds.



Chinook

PROGRESS

SUMMARY

CHINOOK AIRLIFTS MERCY CARGO IN FLOOD AREA

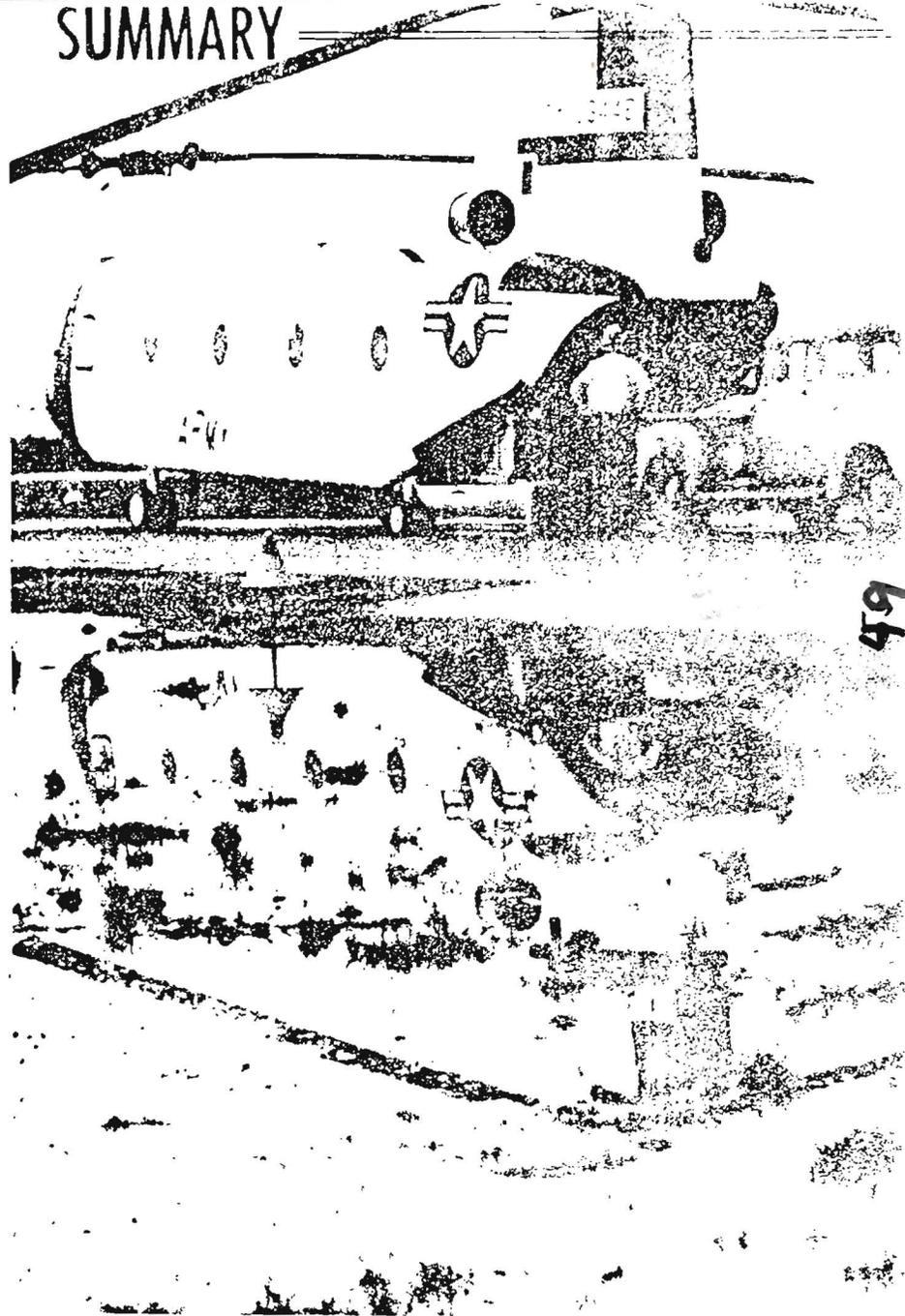
A United States Army CH-47A Chinook helicopter stationed at Edwards Air Force Base, for high altitude testing, has taken part in the massive rescue and resupply effort now underway in flood-stricken Northern California.

To date the Chinook has carried over 100,000 pounds of cargo into the devastated lumber towns of this region. Operating out of Murray Air Field, Eureka, California, the Chinook has been called on to transport heavy loads of foodstuffs, fuel, medicine and construction equipment.

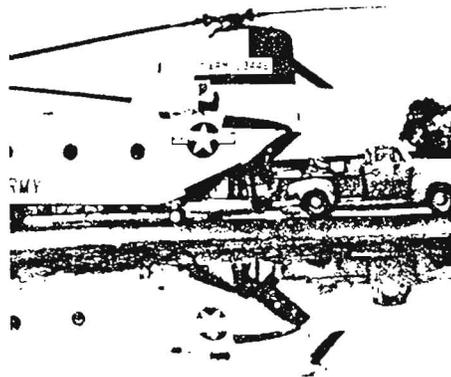
The Chinook has hauled cargo ranging from a 3,000 pound air compressor and 1,800 pound propane tanks to 10,500 pounds of food. In four days of operations, from January 6 to 10, the Chinook transported a total of 77,500 pounds. This represents 47 per cent of all the cargo transported by all the helicopters stationed at Murray Air field during the emergency.

BOEING

VERTOL DIVISION



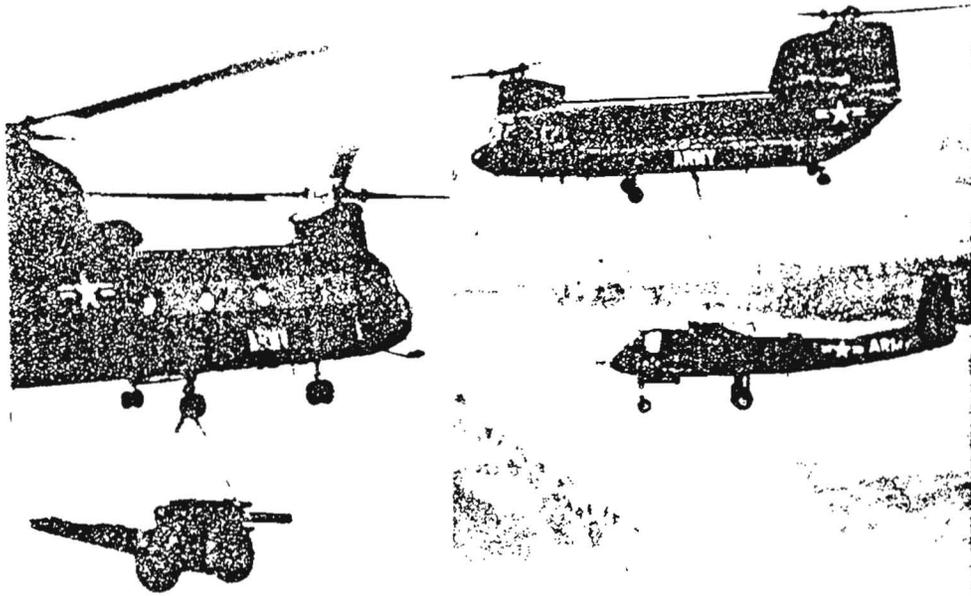
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Chinook

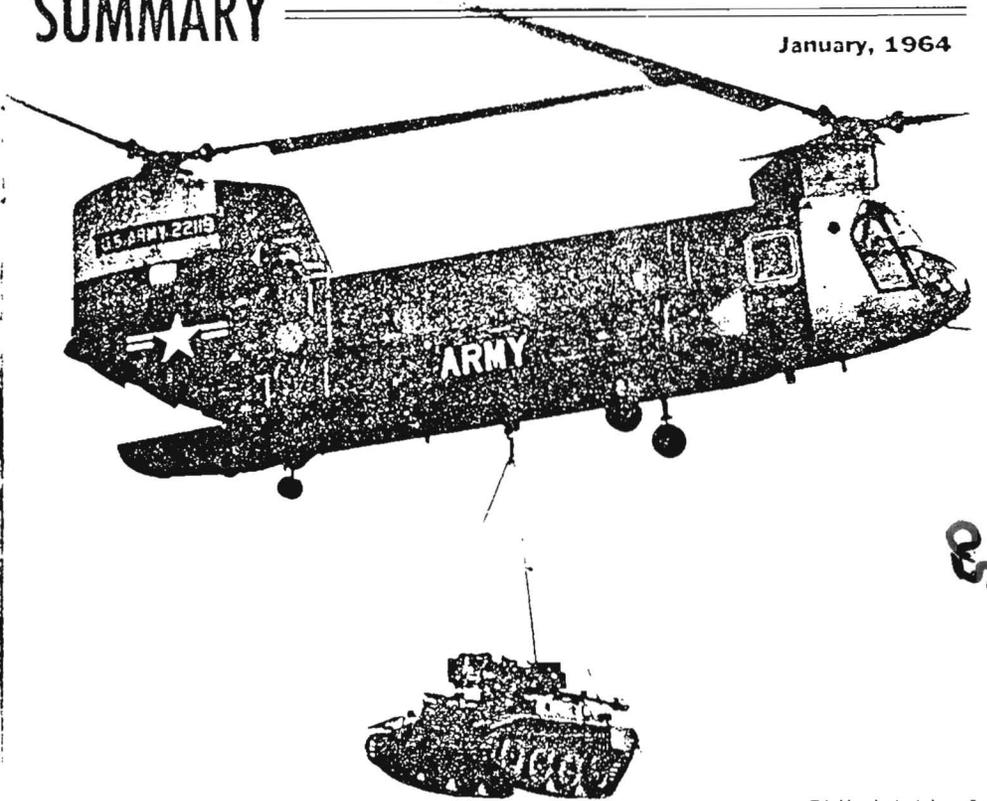
PROGRESS SUMMARY

January, 1964



Ft Bragg, N.C.

Ft. Stewart, Ga.



Philadelphia, Pa.

CHINOOK DEMONSTRATES ITS AIRLIFT CAPABILITY

The U.S. Army CH-47A Chinook has been a busy aircraft.

At Ft. Bragg, North Carolina it transported a 155mm howitzer as part of the Aviation Board's Test and Evaluation Command user testing program. 155mm howitzer gross weight: approximately 12,500 pounds.

At Ft. Stewart, Georgia, a Chinook assigned to the 228th Assault Support Battalion, 11th Air Assault Division, ferried a U.S. Army

OV-1 Mohawk to the Army Depot at Atlanta, Georgia. Mohawk Gross Weight: 10,500 pounds.

At Philadelphia International Airport, site of Vertol Division's Flight Center, the Chinook flew with a 90mm M56 Scorpion self-propelled gun as an external load.

Scorpion Gross Weight: 14,100 pounds.

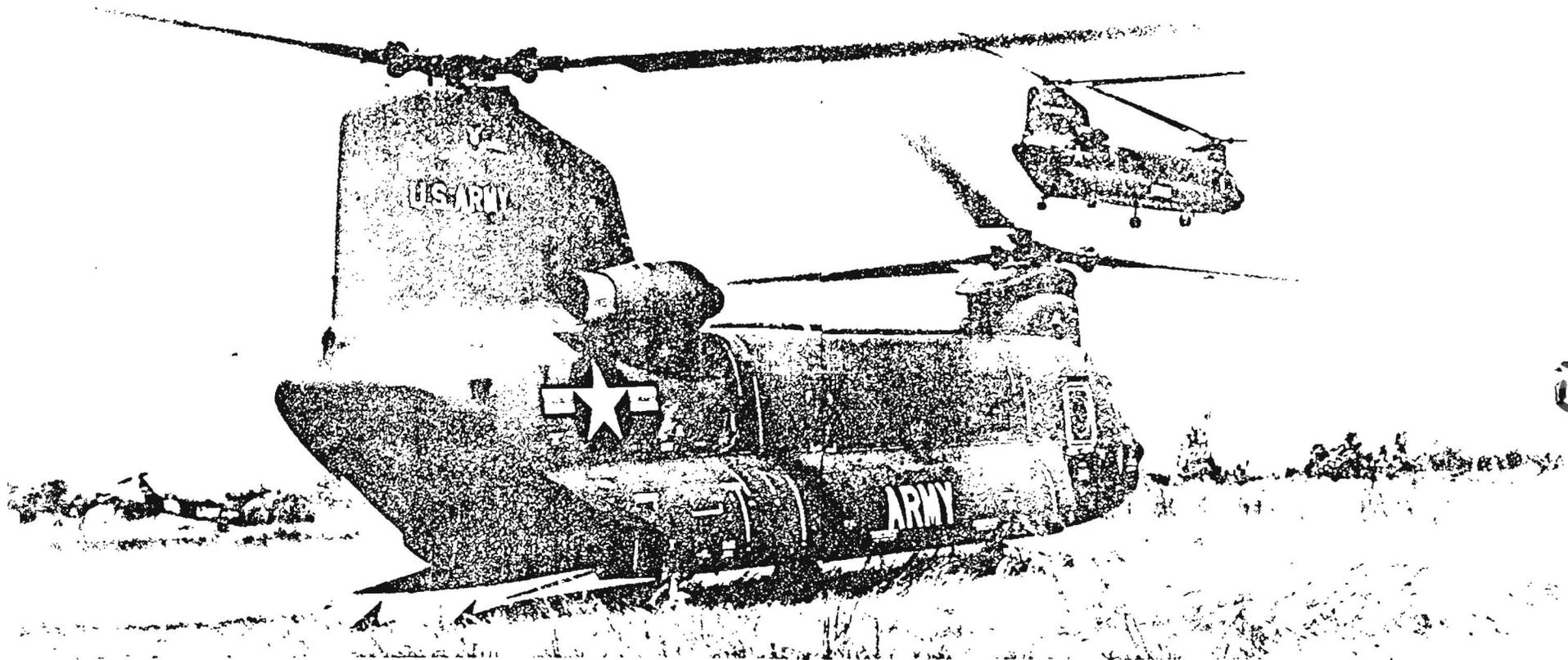
Total Gross Weight of aircraft and cargo—38,500 pounds.

BOEING

VERTOL DIVISION

chipook

PROGRESS SUMMARY



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TWO CHINOOKS DEPLOYED TO FLOOD AREA

On 25 January two U. S. Army CH-47A Chinooks from the 11th Air Assault Division at Fort Benning were deployed to flood-stricken northern California. Their mission is to assist in the resupply of food and materials now underway, and to standby in the event of future flooding.

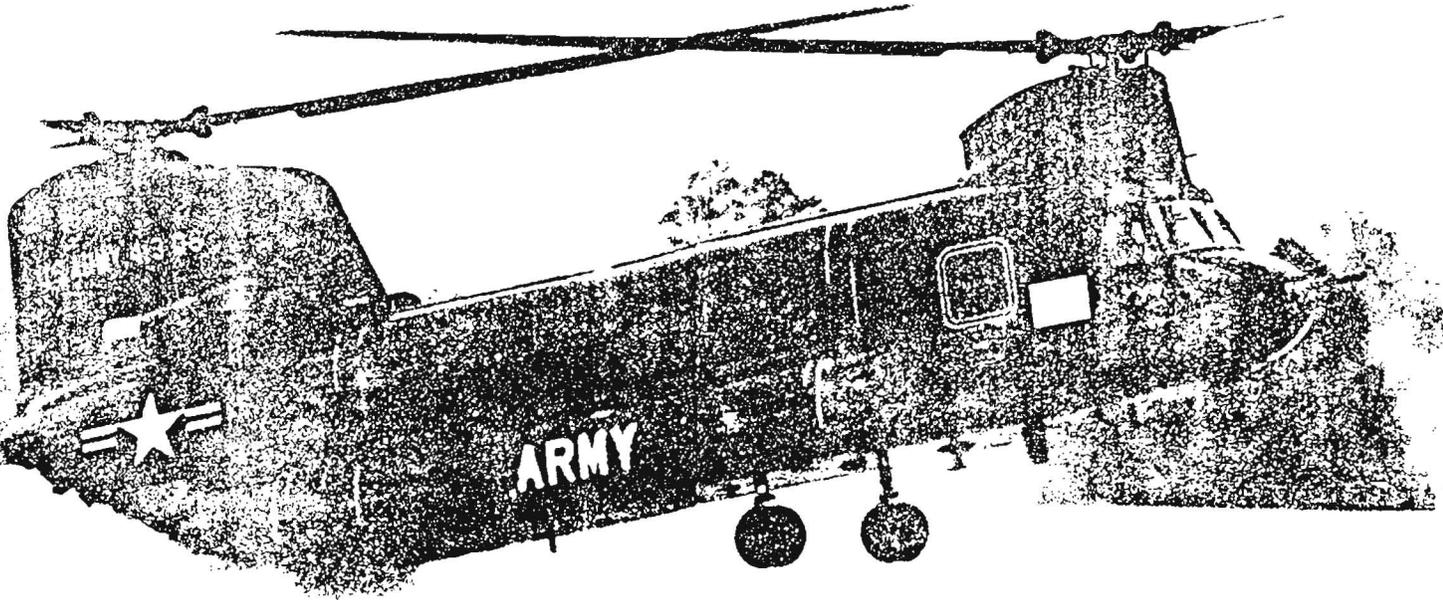
These aircraft replace a Chinook that has been operating in the flood area since 29 December. At the time this CH-47A returned to its base at Edwards Air Force Base, for continuation of high altitude testing, it had transported a total of 275,885 pounds of cargo and 162 persons, including medical evacuees, during 68 sorties.

BOEING

VERTOL DIVISION

chipook

PROGRESS SUMMARY



CH-47A CHINOOK CONTINUES WATER LANDING OPERATIONS AT FORT BENNING.....

On 22 January, the 228th Assault Support Battalion of the 11th Air Assault Division began water operations with their CH-47A Chinook assault transport helicopters. These water landings, which were the first to be executed by an operational Chinook battalion, were repeated to allow pilots to gain maximum information. The photo above was taken during similar water landing tests at the Army Aviation Test and Evaluation Board at Fort Rucker. The Chinook on the left is the 11th Air Assault Division aircraft piloted by Lt. Col. Benjamin S. Silver, commanding officer of the 228th, and CW0 Denver Kidd.

BOEING

VERTOL DIVISION



ARMY AVIATION TEST BOARD CONDUCTS

1002-MILE CHINOOK ENDURANCE FLIGHT

An endurance record for one of the U.S. Army's standard medium assault transport helicopters, the CH-47A Chinook, was set 13 February by a five-man crew from the Army Aviation Test Board.

The Chinook flew 1,002 miles nonstop, from Fort Rucker, Alabama to Shreveport, Louisiana and return. The long-distance flight began at 7:30 a. m. Saturday, and ended at the helipad in front of Test Board headquarters at 4:29 p. m., eight hours and 59 minutes later.

Aircraft commander for the flight was 1st Lt. John Dixon. Frank Brand and Charles Arnold were pilot and co-pilot respectively. Crew chiefs on the aircraft were Sp6 C. M. Elliott and Sp5 Thomas Dembrowski.

Extra fuel tanks were placed in the cargo compartment of the aircraft. A U. S. Army spokesman said this test "provided the technical data that demonstrates the self-deployment capability of the largest troop carrying assault helicopter in the U. S. Army inventory, and improved the combat status of the U.S. Army."

The aviators were greeted at the end of their record flight by a group of Test Board officials headed by the Deputy President, Colonel Raymond E. Johnson.

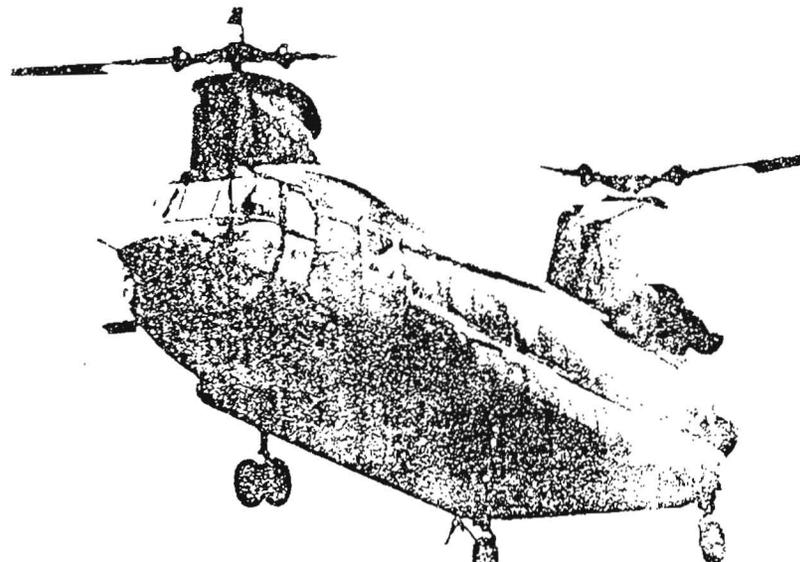
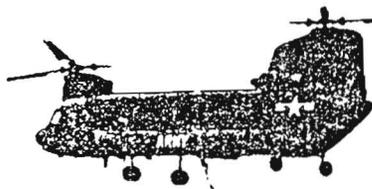
BOEING
VERTOL DIVISION

CH-47A CHINOOK PROVES COMPATIBILITY WITH MUST

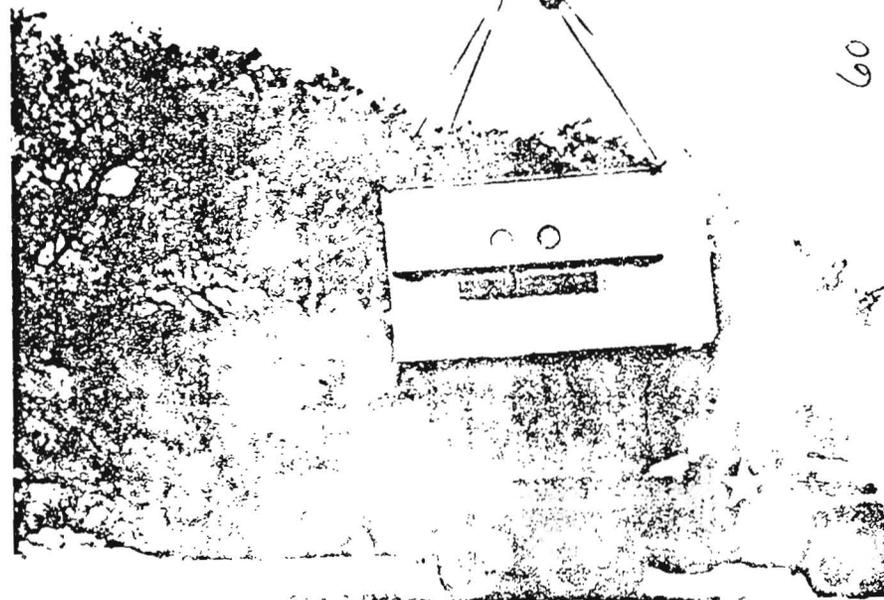
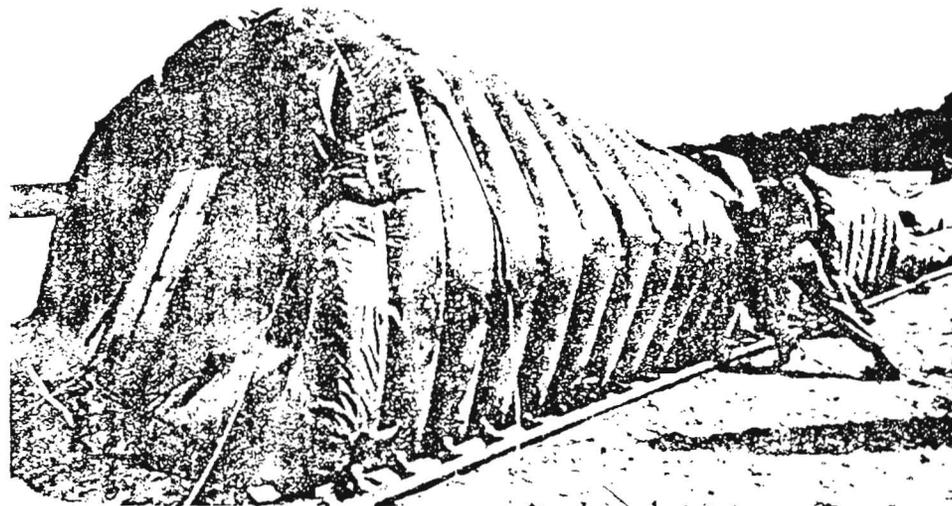
On 20 February, at Camp Bullis, Texas, a CH-47A Chinook assigned to the 10th Air Transport Brigade at Fort Benning proved its compatibility with the new MUST (Medical Unit Self-Contained Transportable) field hospital.

The MUST, a new concept in field hospitals, is an inflatable unit that can be easily transported from place to place by the Chinook. Weights of MUST loads range from 4000 to 7000 pounds.

The Chinook is the only aircraft in the U. S. Army inventory capable of lifting and transporting the unit up to distances of 100 nautical miles. In addition to carrying all the units of the field hospital externally, the Chinook, on an alternate mission, has the capability of transporting twenty-four litter patients and two medical attendants.



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BOEING
VERTOL DIVISION

CHINOOK COMPLETES PERSHING MISSILE TESTS

Battlefield mobility of the Army's Pershing Weapon System was demonstrated recently through tests of the ability of the U.S. Army's standard CH-47A Chinook helicopter to transport the "shoot and scoot" missile.

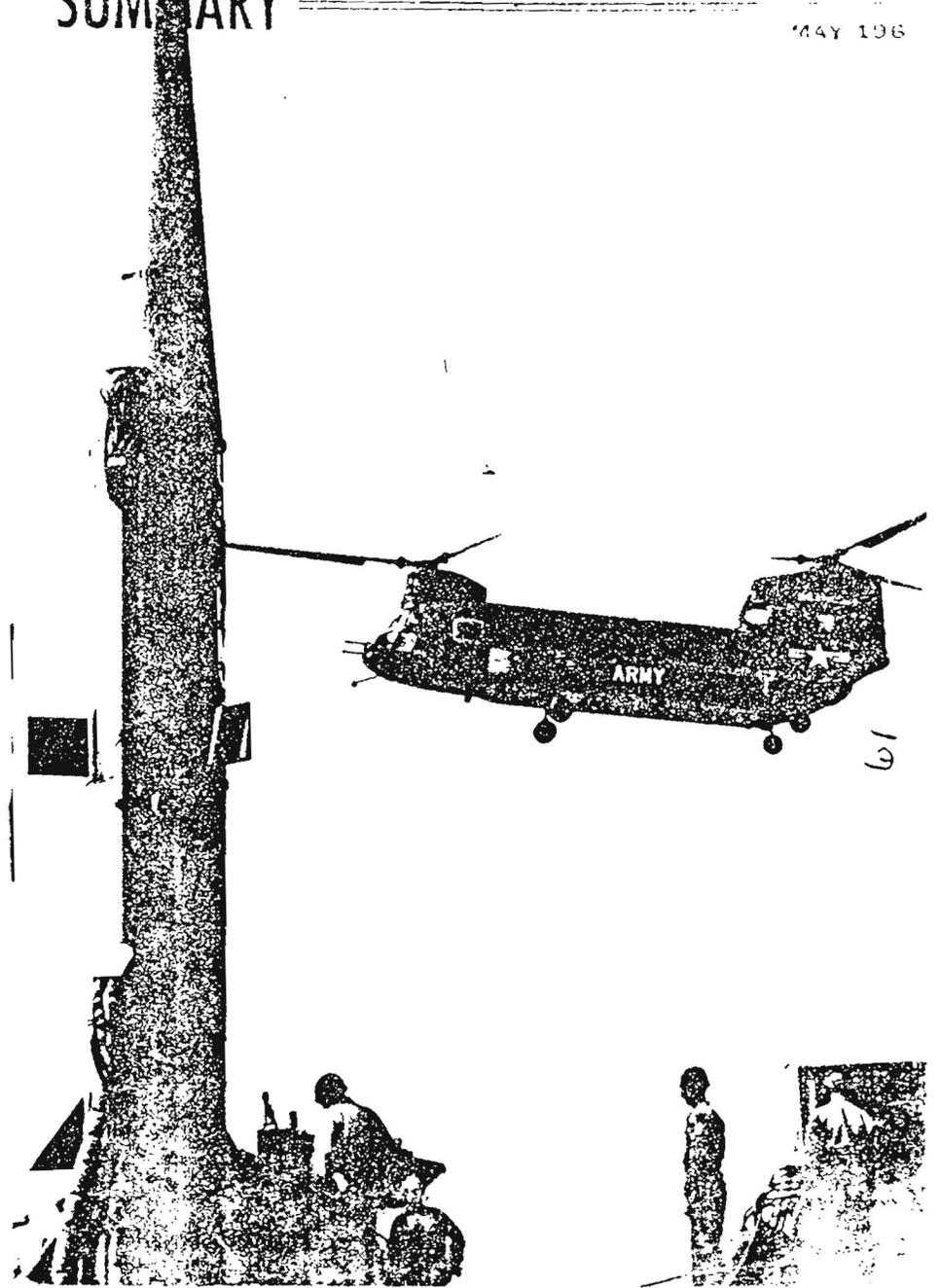
Three weeks of trials with the Army's longest-range tactical missile and the latest model of the largest helicopter in Army inventory ended March 19 at McCoy Air Base near Orlando, Florida.

Army officials said the mobility tests confirm that the Chinook can transport all Pershing system components, and that the Pershing can stand up under environmental conditions it would meet while being transported by helicopter.



BOEING

VERTOL DIVISION



Chinook

PROGRESS

SUMMARY

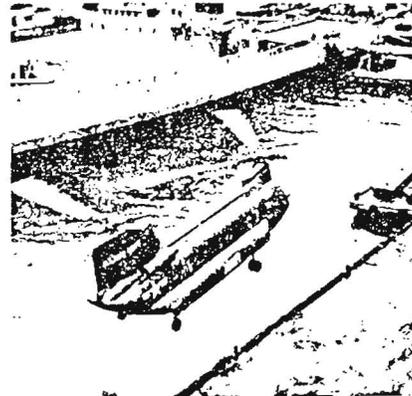
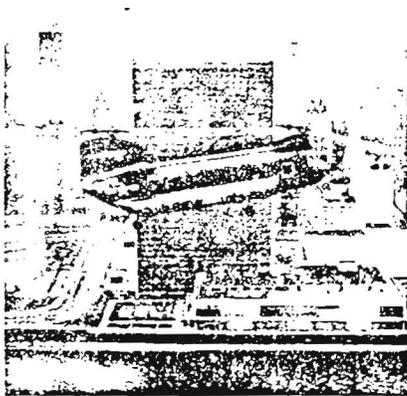
JUNE, 1965

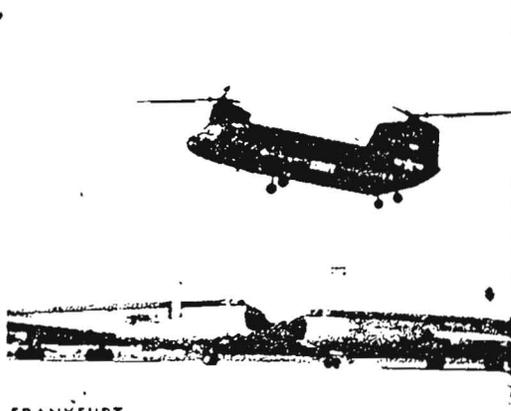
CHINOOK BEGINS TOUR OF EUROPEAN AIR SHOWS...

On 18 May a U. S. Army CH-47A Chinook arrived in Bremmerhaven, Germany aboard the SS Pioneer Glen to begin a series of demonstrations in Europe. Making its first overseas visit, the Chinook will take part in the German Army Helicopter Forum in Buckeburg, Germany, the Paris Air Show and demonstrations at U. S. and German military bases in Germany.

During this tour the Chinook will demonstrate its proven flight and lift capabilities including the transport of troops, vehicles, artillery systems and cargo. A static display will show the Chinook's versatility as a fueler for other aircraft and vehicles.

BOEING
VERTOL DIVISION





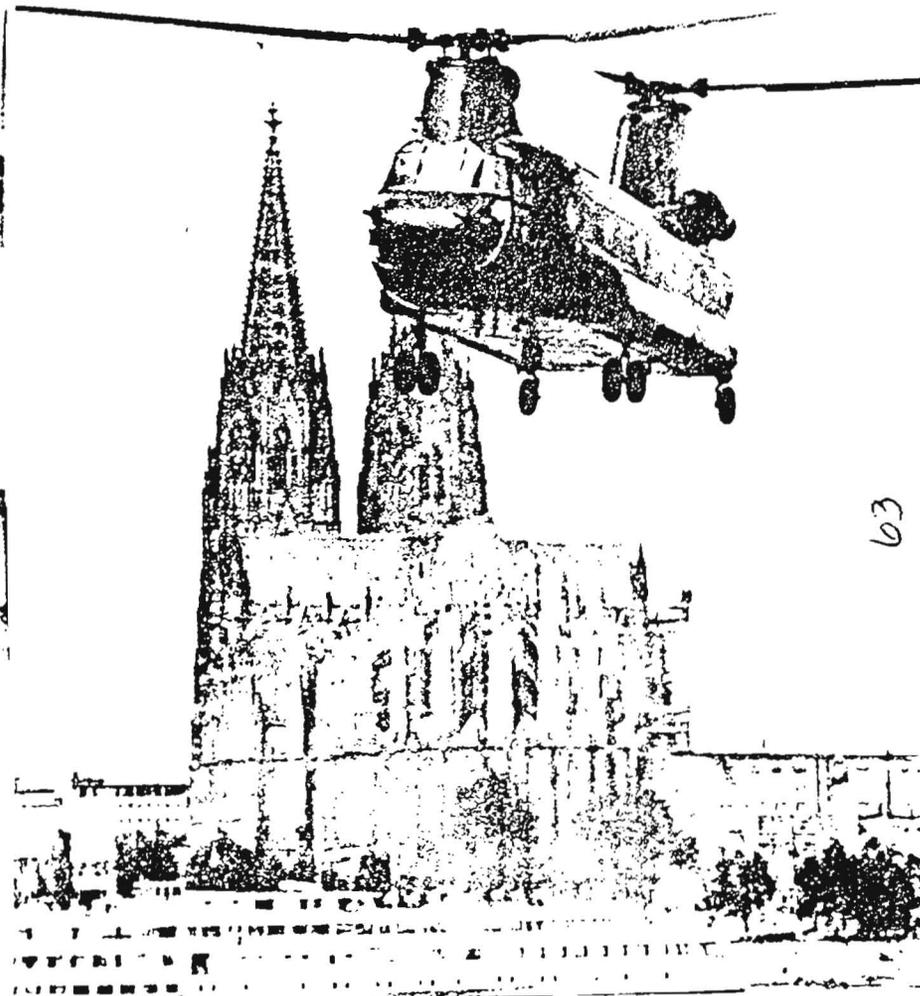
FRANKFURT



HEIDELBERG

CHINOOK COMPLETES EUROPEAN TOUR . . .

During late May and June the U.S. Army's CH-47A CHINOOK participated in the German Army's Helicopter Forum in Buckeburg, Germany and the Paris Air Show. Prior to and after these events the CHINOOK demonstrated its flight characteristics and payload capabilities to high ranking military officers at U.S. Army and German Army installations throughout Germany.



COLOGNE

BOEING VERTOL DIVISION

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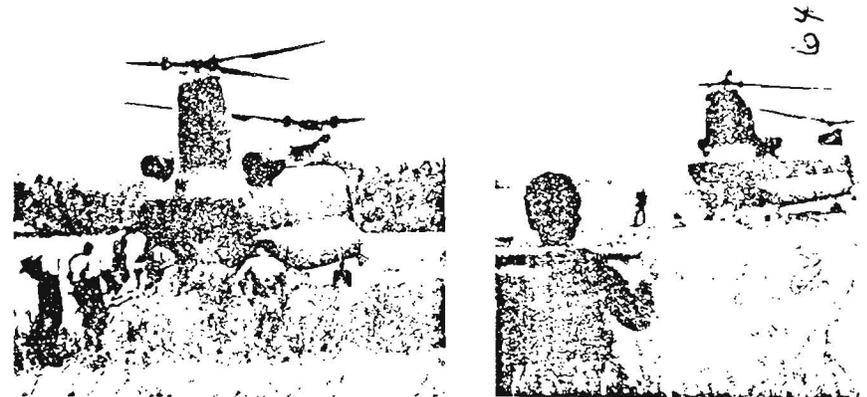
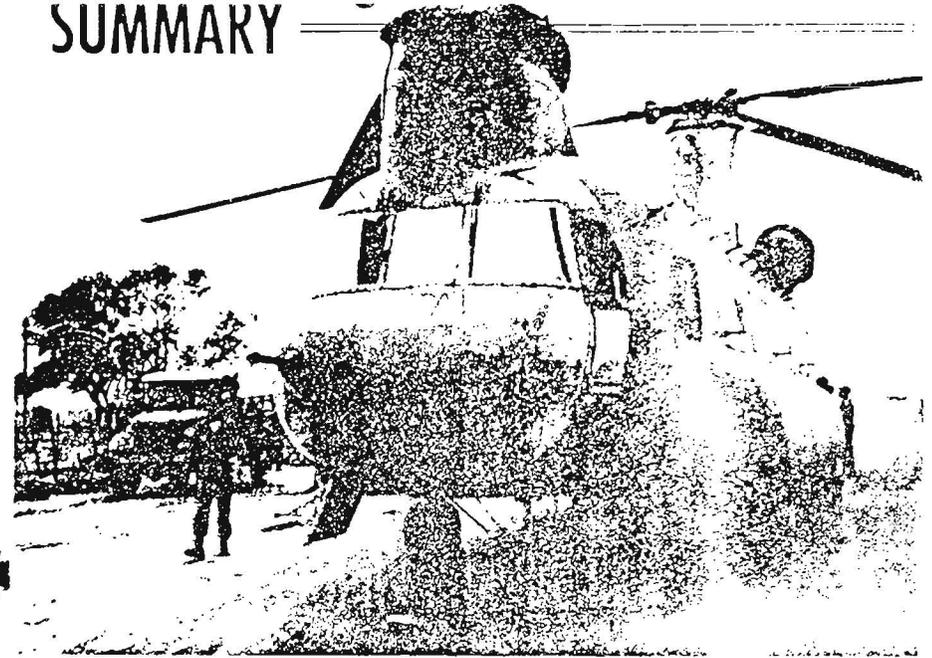
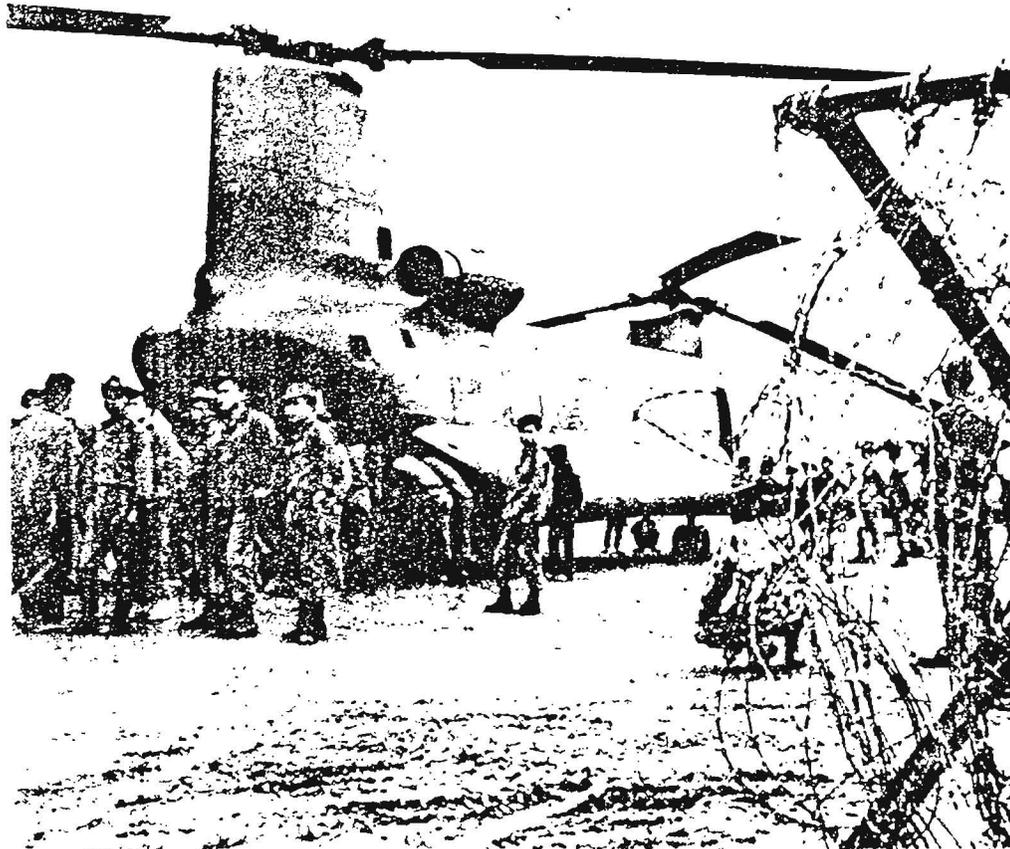
Chinook

PROGRESS

SUMMARY

October, 1965

CHINOOK ENTERS COMBAT WITH THE FIRST TEAM...
CH-47A Chinooks of the First Team — the 1st Cavalry Division (Air Mobile) have entered combat in South Vietnam. Based at An Khe, Chinooks have transported troops, supplies and have already utilized their lifting capability to retrieve downed aircraft.



BOEING Helicopters
VERTOL DIVISION



CHINOOK FLEET PASSES 50,000-HOUR SERVICE MARK

The 50,000th hour flown by the U. S. Army CH-47A Chinook transport helicopter was chalked up somewhere in the world this month. Chances are, it was in Vietnam where the 1st Cavalry Division (Air Mobile), has logged over 10,000 hours of combat flying time.

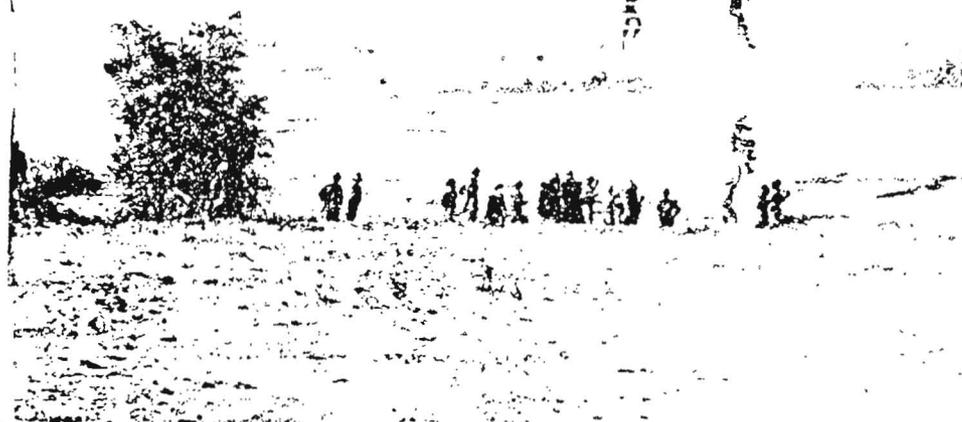
The 50,000th hour was reached by the Chinook less than five years after its first flight in 1961. Dramatic evidence of the accelerated use of the Chinook is that the next 50,000 hours are expected to be flown by December of this year . . . in just 9 months!

BOEING Helicopters

VERTOL DIVISION / MORTON PENNSYLVANIA, U.S.A.



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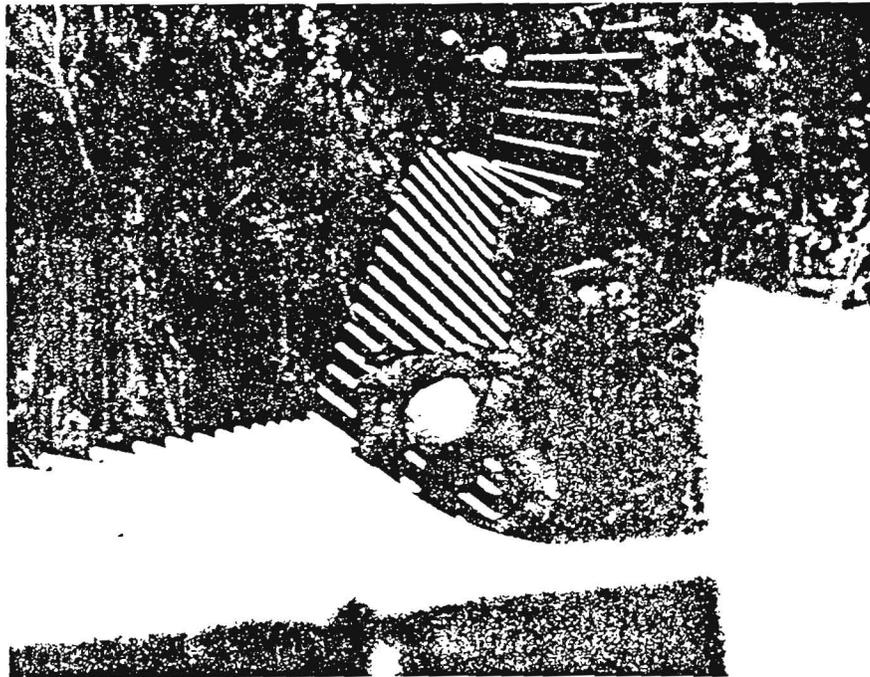
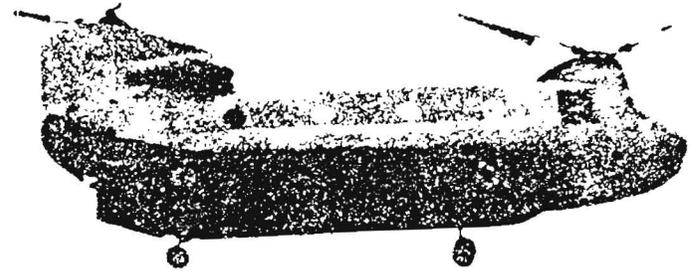


Chinook

PROGRESS SUMMARY

CHINOOK USED AS SKY PLATFORM

For the first time in combat, Chinooks delivered troops by ladder into Vietcong infested territory. The mission was a blocking force to intercept a possible Vietcong movement. Because dense jungle made it impossible to land any aircraft, the Chinook unit delivered 140 men by the ladder technique. Lieutenant Colonel Max A. Clark piloted the lead Chinook. First Cavalry Division officers observing the maneuver were impressed by the effectiveness of the new concept and ladders may be used frequently to deliver troops in future operations.



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BOEING Helicopters

VERTOL DIVISION / MORTON, PENNSYLVANIA, U.S.A.

Chinook

PROGRESS

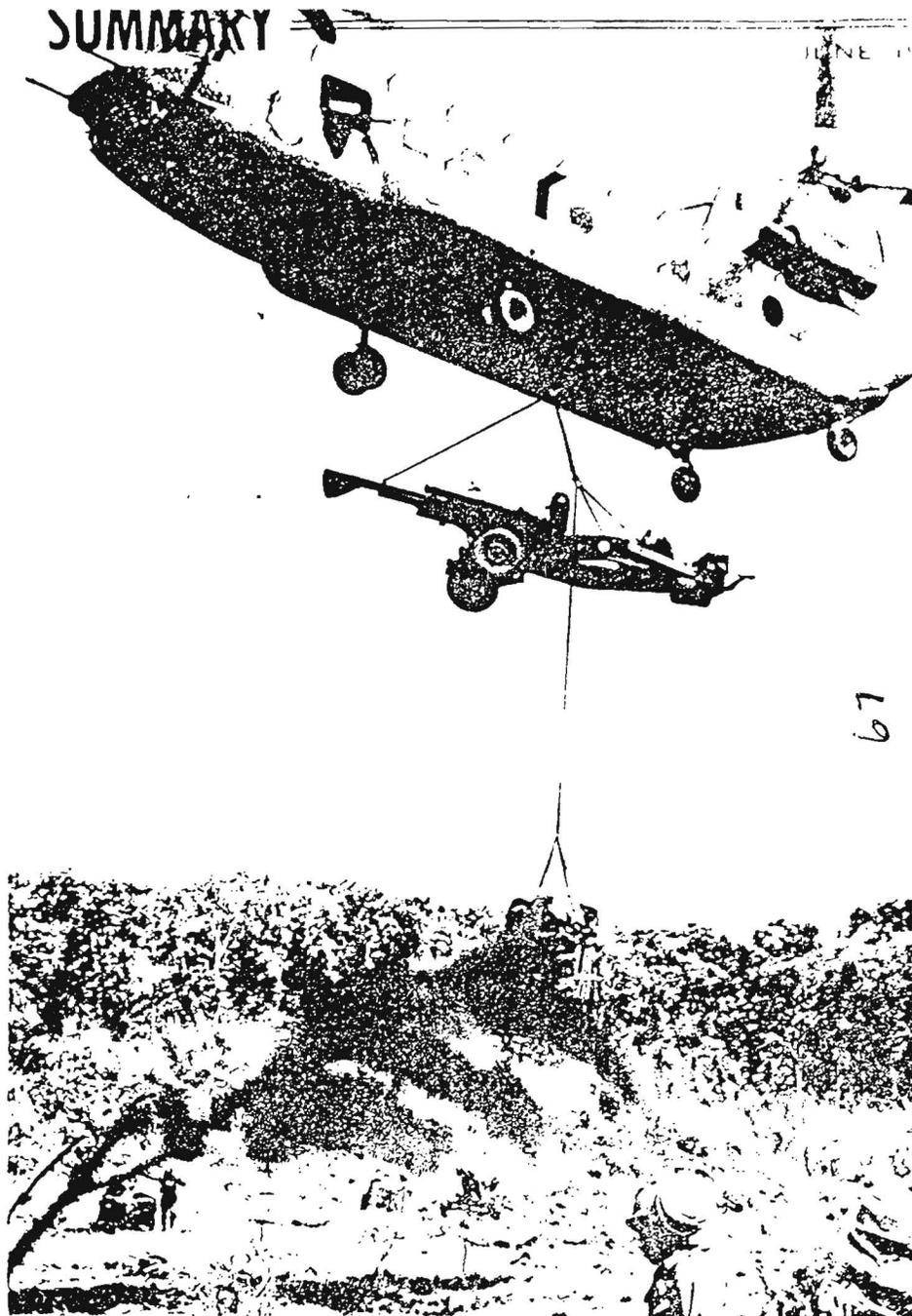
SUMMARY

CHINOOKS "PIGGYBACK" ARTILLERY IN VIETNAM

The U.S. Army CH-47A Chinook is adding a "third dimension" to infantry warfare in Vietnam. Here, Chinooks of the 228th Assault Helicopter Battalion "piggyback" a 105mm howitzer and its ammunition over Viet Cong territory to a vantage point near the Cambodian border.

A short time later this entire operation was swiftly airlifted to another strategic location by the Chinooks.

Finding and fixing the enemy is made surer with the mobility provided by the Chinook medium transport helicopter.



BOEING Helicopters

VERTOL DIVISION / MORTON, PENNSYLVANIA, U.S.A.

Chinook

PROGRESS SUMMARY

CHINOOK HELICOPTERS CONTINUE TO BE ANGELS OF MERCY IN VIETNAM

The U. S. Army CH-47A Chinook helicopters operating in Vietnam are called upon daily to perform a variety of missions. They transport artillery, lift downed aircraft and move supplies and troops.

But to the men and officers who operate Chinooks the most gratifying missions are those involved with the rescue of Vietnamese refugees.

Chinooks are used extensively to transport refugees and evacuate their belongings when they become endangered by the Viet Cong. Thousands of women and children have been lifted out of the danger zones into safe areas by the Boeing-built "Angels of Mercy."

The photograph on the right is typical of a refugee evacuation. The Chinook helicopter has lifted the refugees to safety and the American soldier adds his personal touch of "tender loving care" that is so necessary in winning the hearts of the Vietnamese people.



BOEING Helicopters

VERTOL DIVISION / MORTON PENNSYLVANIA, U.S.A.

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PROGRESS SUMMARY

November, 1966

U.S. ARMY'S CH-47A CHINOOK HELICOPTERS PARTICIPATE IN FEDERAL AVIATION AGENCY'S METRO AIR SUPPORT '66

U.S. Army CH-47A Chinook helicopters participated this month in a simulated emergency situation in New York City. The program, Metro Air Support '66, was sponsored by the Federal Aviation Agency and was designed to show the valuable use of helicopters and STOL aircraft in supporting New York City in the event of an actual emergency.

The Chinook helicopters, from the 154th Aviation Company, Fort Sill, Oklahoma, landed on city piers and in public parks during the two-day demonstration. Chinook missions included the transport of food, blankets, medicine and plasma. In addition 250 Civil Air Patrol cadets, in the role of doctors, policemen and firemen, were transported to strategic points throughout the city.

In the event of an actual emergency the Chinook helicopters would have landed in the city streets to deliver the needed medical supplies and personnel right at the disaster site.

