ARMY AVIATION

SEPTEMBER ★ 1960

Chinook PROGRES

PROJECT REVIEW

Over a year has been spent on the production design and fabrication of the U.S. Army's Chinook which will fly next spring. Since Vertol is now in the development testing and hardware stage, a project review conference —jointly sponsored by the contractor and the procuring agency—was held at Morton, Pa. on 8-9 September.

57599

SUMMARY

NCE NUMBER ONE

SEPTEMBER, 1960

57597

The conference program included a series of brief presentations on the status of Engineering, Tooling and Manufacturing, Procurement and Subcontracting, Component Testing, Publication and Service Support Program, Fiscal Status, and Status of Contractual Matters.

Conferees were afforded an opportunity to inspect completed major components of the YHC-1B Chinook, and to see the many component test programs that were in progress.

57596

57593

Periodic project review conferences are planned during the development and production cycles of the Army's HC-1B Chinook. These conferences will be useful for the informal interchange of information and discussion of problems between contractor, developing agency and users of the product.

VERTOL DIVISION BOEING

MORTON PENNSYLVANIA

EXPLANATION OF FIGURES

The lead times listed in this Hardware Issue are subject to change on current and new contracts based upon: 1) the volume of orders at the contractor's plant, 2) the modifications requested by the purchaser; 3) the availability of materials and parts; and 4) improved manufacturing techniques.

The performance figures listed for the aircraft in this Hardware Issue are not intended for use in flight planning. These figures will vary with the mission, the gross weight, and/or weather conditions.

ADVERTISERS IN THIS ISSUE

SUBSCRIPTION DATA

"ARMY AVIATION" is published monthly by Army Aviation Publicati 1 Crestwood Road, Westport, Co Phone: CApital 7-8266.
Subscription: U.S., APO, and U.S Possessions, $3.50 per year; all o countries add $0.75 per year for postage. Included as a part of A membership. Display rates are liste in SRDS, Business Publications, Classification 88-A. The Editors res the right to alter or delete copy and specific names from all material. Second Class Postage Paid at Westport, Conn.

1960 HARDWARE ISSUE

VOLUME 8 — NUMBE

SEPTEMBER 15, 1960

ARMY Aviation Magazin

CopterNews from Sikorsky

Marine helicopter test-fires Bullpup missile. As a Marine HUS-1 helicopter hovered at 1,500 feet, a jet of flame streaked from near its starboard side. The Bullpup missile flashed away—out to take a bite of its prey, a target floating in the Chesapeake. The 12½-foot, 570-pound Navy Martin Bullpup missile was the largest and first radio-controlled missile ever fired from a helicopter. Once launched, the pilot guides the missile to target by a switch on his control stick. The two together, Bullpup and helicopter, may turn out to be the perfect combination to provide close ground support for troops. It would implement battlefield firepower with effective punch.

Operation face lift. Thirty U.S. Army H-37's, largest helicopter flying in the free world, are being flown to Sikorsky's Connecticut plant for modification. Major face lifting items include equipment for automatic stabilization and for the standardization of communications. Other improvements will step up operating efficiency... extend the helicopter's range... and cut down operating and maintenance costs. The H-37, ordered from Sikorsky in 1954-55, set a world speed record of 162.7 miles an hour in 1956. Driving the five-bladed, 72-foot diameter main rotor are two 2,100-horsepower engines from Pratt & Whitney Aircraft.

Helicopters do the work of fire extinguishers. A forest fire was raging in Carbon Canyon, south of Los Angeles. Seven Marine HUS crews of HMR 361, carrying special fire fighting kits, bombed with chemicals and water the woodlands ahead of the fires. The blaze was stopped from spreading. Next, the fire itself was drenched and then finally extinguished with the same solution. Runs on the target were made at altitudes of 40 to 100 feet at speeds of 30 to 60 knots.

A New World of Mobility by

SIKORSKY AIRCRAFT

Stratford, Connecticut/A Division of United Aircraft Corporation

McDonnell XHJD-1 (Navy). The world's first twin-engine helicopter. This 5½-ton vehicle, with reciprocating engines driving the rotors through shafts, became a flying helicopter laboratory.

McDonnell XH-20 (Air Force). The world's first ramjet helicopter. A pioneering helicopter development, this flying test-stand had a McDonnell ramjet in each rotor tip. The tip-driven rotor eliminated the need for a torque-compensating tail rotor.

McDonnell XV-1 (Army). The world's first successful convertiplane. This research vehicle was an unloaded-rotor, compound helicopter combining hovering capability with a speed of 200 mph. The rotor was powered by McDonnell-designed blade-tip-mounted pressure jets.

McDonnell Model 120. A "flying crane" of diminutive size but unusual lift capabilities. Powered with McDonnell rotor-tip-mounted pressure-jets, it can carry a useful load exceeding its empty weight. Military evaluation has shown outstanding hover and dynamic longitudinal stability for this experimental craft.

NEW ROLES FOR AMERICA'S NO. 1 JET TARGET

Now ground-launched as well as air-launched, the Ryan Firebee can be used even more effectively as a jet target in all kinds of weather and terrain, and fly new missions for the Armed Forces.

Literally shot into the air from a ground launcher, the Firebee is freed from dependence upon launching planes and airports. And ground-launching increases reliability, cuts launch costs and eliminates time to acquire the target by tracking radar.

Thoroughly proved in over 2000 flights in which high speeds (over 600 mph), altitudes (nearly 60,000 ft.) and range (over 600 miles) have been achieved, the Firebee also has remarkable low-altitude performance. Repeatedly, Firebees have flown missions as low as below 700 feet, 27 miles from ground control, to draw the fire of ground-to-air missiles designed to knock out low-flying enemy planes.

In low-level flights, ground-launching saves time and costs because now the Firebee can be brought to low altitudes faster and more simply than from high air-launch altitudes. All Firebees of the future will have this important capability.

Ryan Offers Challenging Opportunities to Engineers

RYAN BUILDS BETTER

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Ryan Aeronautical Company, San Diego, Calif.

1960 EQUIPMENT ISSUE

ARMY AVIATION

FROM

CUB

TO

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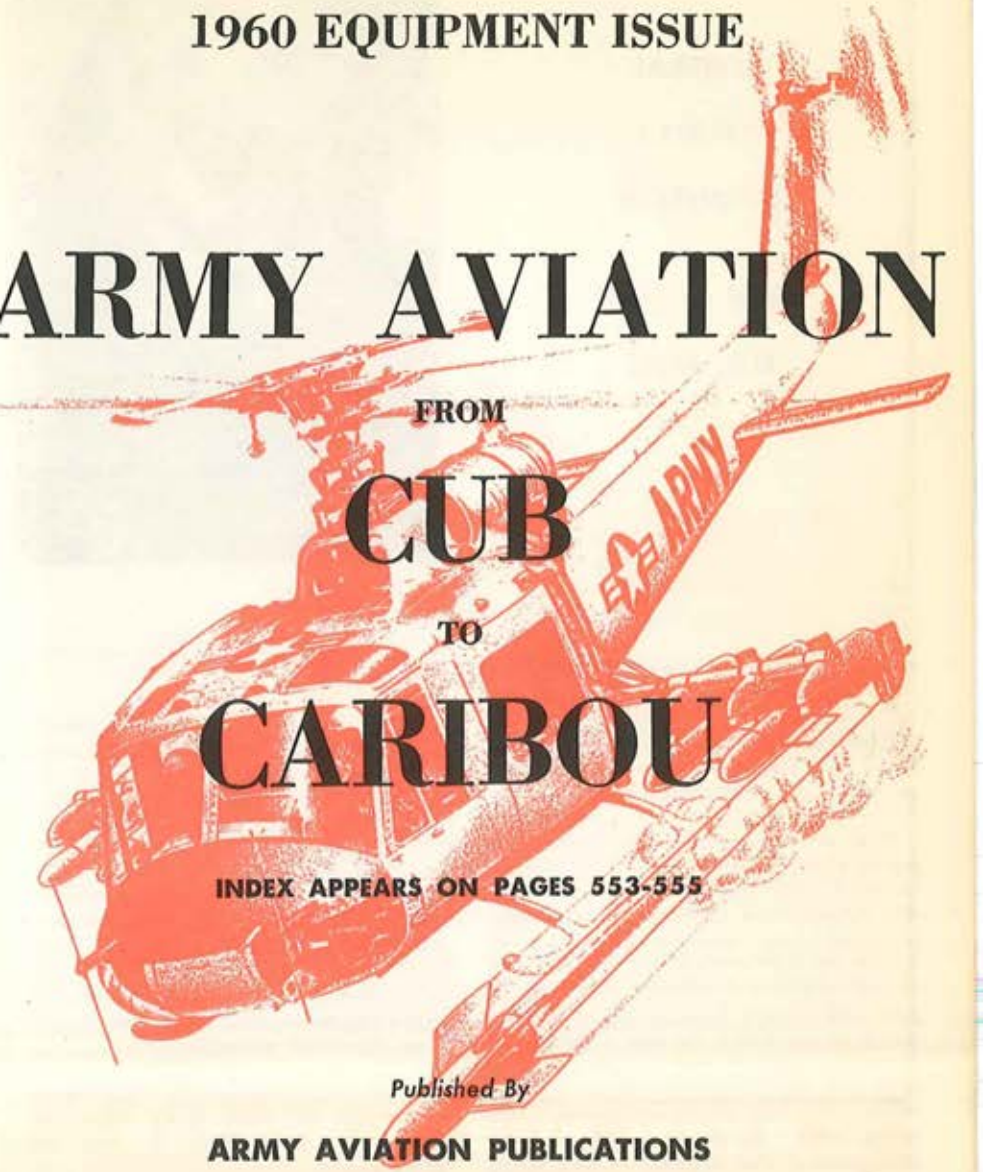

INDEX APPEARS ON PAGES 553-555

Published By

ARMY AVIATION PUBLICATIONS

WESTPORT, CONN.

GENERAL
LYMAN L.
LEMNITZER

Chief of Staff
U.S. Army

The eighteenth anniversary of Army aviation affords me a welcome opportunity to extend congratulations and best wishes to the officers and enlisted men of all the branches of the Army participating in this important activity.

Only a comparatively few years have passed since modern Army aviation was established. Nonetheless, during that time, this function has come to embrace many phases of Army activities, and to include among the individuals performing this type of duty members of virtually all the Army's arms and services. Their record of achievements, in war and peace and in the face of frequently difficult and hazardous conditions, has been impressive. These achievements which have played an important part in the Army's success, are a tribute to the skill, courage, and devotion to duty which you and your predecessors have consistently displayed.

Equally impressive has been the remarkable expansion of functions through which Army aviation contributes to the Army's effectiveness. This expansion clearly reflects the foresight, imagination, and initiative of Army aviation personnel. Your constant search for improved means of performing assigned tasks and for new applications of available potentials has led to extension of Army aviation activities into a host of important fields. The result has been a material increase in the mobility, flexibility, and capabilities of the Army and in the welfare of its individual members.

For all your fellow soldiers, I express our appreciation for your many accomplishments and our confidence in your continued success.

BRIGADIER GENERAL CLIFTON F. VON KANN

Director of Army Aviation, ODCSOPS

The purpose of this issue of *ARMY AVIATION MAGAZINE* is basically to take a look back at our short history and a look forward at our promising future. Having reached our eighteenth anniversary, we feel it is appropriate to re-examine what we have done and what remains to be done.

A primary factor affecting the growth of Army aviation is its utilization by the ground commander. I believe we are reaching a point in time when the entire Army is awakening to the possibilities offered by air mobility. This has been a slow process—painfully slow at times. But now the realization of this potential is recognized by every arm and service as a natural goal if we are to meet the challenge of the future battlefield.

The major task still lies within Army aviation itself. Our challenge is to develop a capability so obviously good that it will be apparent to all who are confronted with it. It is not enough to talk about it; we must demonstrate it! By our own initiative and imagination we must display our capability to the rest of the Army in such a way that utility of aviation will be completely and wholeheartedly accepted.

Therefore, our future lies in the individual—the individual aviator, the individual crewman, the individual aviation specialist. I am convinced that this future is bright with challenge and opportunity.

Just as the 18th birthday of a person signalizes the step from adolescence to maturity, we in aviation have also reached a major turning point.

This issue of *ARMY AVIATION* has been compiled with the specific objective of retracing our footsteps from our humble 1942 beginning to date, and providing a crystal ball view into the future. While this document is largely hardware-oriented, we who have pulled it together hope that in looking at the flying machines, you will consider paramount the spirit of our mission—*the contribution that those who use them and those who serve them can make to the Army as a whole.*

The technical material included in this issue of *ARMY AVIATION* provides the basis for a deeper appreciation of the potential of Army aircraft to provide the Army a major tool of mobility for troops, weapons, special equipment, and supplies, as well as an effective observation platform.

As we look into the demands to be met in the future by our Army, optimizing the balance in firepower and mobility must be a significant factor in tactical thinking. Mobility requires that we be able to apply military power rapidly and effectively at the proper time and place under a wide variety of conditions. The contribution of aviation to the Army's balance of strength has never been more significant.

All aviators owe sincere thanks to Art and Dotty Kesten who conceived and sparked this issue, sweated out the copy, and gave valued editorial comment and assistance and to the following Washingtonians who did all the work as a labor of love:

Colonel Edward L. Burchell, OCofT (Logistics Section)

Colonel John L. Leidenheimer, OCSigO (Avionics Section).

Mr. Don Thompson, OCofT (Research and Development)

Captain John L. Gardner, OCofT (Research and Development)

Major James J. Brockmyer, ODCSOPS (Objectives)

Captain Vernon F. Curd, OCofT (History and Initial Planning)

Captain Morgan H. Mathews, OCofT (Compilation and Initial Editing)

Mr. Paul Culler, OCofT (Photos and Publication Review)

Lucile Durkin, Librarian, Aviation School, Fort Rucker (Basic Research Material)

MAJOR GENERAL RICHARD D. MEYER

Deputy Chief of Transportation for Aviation, OCT

THE Foundational Forties

Begun as an experiment to enhance the fighting capabilities of artillery units, organic Army aviation earns wide acceptance during this significant decade in American history. Observation becomes only one of the many essential roles carried out for combat commanders and a firm groundwork is laid for future exploitation of this new-found capability.

1941 — *Major William W. Ford advocates organic light aviation for Artillery units.*

1942 — *War Department approves the adoption of organic air observation for Artillery.*

1942 — *Light Army aircraft launched into combat from aircraft carrier.*

1947 — *National Security Act of* 1947 *creates separate Air Force.*

1949 — *Joint Army-Air Force agreements prescribe the limits of employment and the size of Army aircraft.*

AN ARMY L-4 LEAVES THE DECK OF THE USS RANGER DURING THE INITIAL PHASES OF THE NORTH AFRICAN CAMPAIGN.

The FOUNDATIONAL FORTIES

The use of aerial devices for observation purposes dates back to the Civil War. A Balloon Company attached to the Union forces under command of *General McClellan* was used to observe Confederate troop movements in the vicinity of Richmond, Va., during the siege of that city. The U.S. Army used similar devices for observation purposes during the Spanish-American War, and by this time most of the world powers had established Balloon Corps in their armies.

Utilization of balloons for observation purposes during World War I became extremely hazardous and ineffective due to their vulnerability to enemy fires. Since then the airplane has been the principal means of aerial observation.

Before World War II, aerial observation was provided by the Air Corps Division and Corps Aviation Squadrons; however, the type of aircraft utilized for this purpose required prepared areas for operations necessitating separation from the supported units.

The inadequacy of the support in this important area became a topic of discussion by Army officers and in 1941, *Major William W. Ford* (now Brigadier General, USA, retired) wrote an article which appeared in the *ARTILLERY JOURNAL*.

In this article, *Major Ford* suggested that aircraft utilized for observation purposes be organic to the units they served. The article interested *Major General Robert M. Danford*, then Chief of Field Artillery. His interest in this approach became more intense after having observed that the British had initiated experiments with organic aircraft in the observation role.

Through the efforts of *General Danford*, War Department permission was obtained to permit the use of civilian aircraft of the Piper and Aeronca design in the Louisiana maneuvers in the fall of 1941. This action became the basis for the initial phase of experimentation with organic fixed-wing aircraft in the air observation role.

General Danford's report in connection with these maneuvers stated " . . . *The only uniformly satisfactory report of air observation during the recent maneuvers came from those artillery units where Cubs . . . were used.*"

In the fall of 1941, *Major Ford* had his "day in court" through an opportunity to plead the case of light organic aircraft directly to *General Danford* during the General's visit to Fort Sill, Okla. In the latter part of 1941 the Commanding General of the Artillery Center, Fort Sill, Okla., was directed to establish a test group for organic aviation for field artillery. This directive included the recommendation that *Lt. Colonel Ford* be placed in charge of the test group.

The nucleus of this test organization was comprised of *Lt. (now Colonel) Robert R. Williams*, and *Lt. (now Colonel) Delbert L. Bristol*, both of whom were "borrowed" from the 18th Field Artillery Regiment. *Major (now Colonel) Gordon J. Wolf*, a reserve officer, was recalled to active duty to assist in the selection of officers and enlisted personnel of the Field Artillery for participation in the forthcoming tests.

A total of twenty-four L-4 aircraft of the standard civilian J-3 Piper *Cub* design were borrowed from the Air Corps. Concurrently, thirty officers and enlisted men, with previous flying experience, were or-

OPERATING FROM A CAPTURED JAPANESE AIRSTRIP ON NEW GUINEA, AN L-4 PREPARES TO FLY AN ARTILLERY RECONNAISSANCE MISSION.

The FOUNDATIONAL FORTIES

dered to report to Fort Sill, Okla., on or about 1 January 1942. Training of the test group began on 15 January 1942 under the supervision of CAA-provided flight and maintenance personnel. The CAA also assisted in enlisting the services of six experienced flight instructors.

Twenty pilots and ten mechanics survived the training program and on 1 March 1942 were split in two groups and ordered to the 2nd Division at Fort Sam Houston, Tex., and the 31st Artillery Brigade, Fort Bragg, N.C. These two groups were to complete the test program for organic aviation for artillery. Upon completion of the tests and submission of the reports in April 1942, these two groups were reassembled in Fort Sill to await the outcome.

As a result of these tests, the War Department approved organic aviation for Field Artillery 6 June 1942 and directed the Artillery School to conduct the training of pilots and mechanics. In compliance with this directive, an Air Training Department was established to conduct the training and the first regularly scheduled class of nineteen pilots entered training 3 August 1942. The initial course length for pilots was five weeks.

During this period special schools were established by the Air Force, at Pittsburg, Kan., and Denton, Tex., to provide primary training for prospective Field Artillery aviators. The advanced training in the skills and techniques required for operation with Artillery units was to be conducted at Fort Sill. Initial distribution of observation aircraft, as organic equipment, was to be on the basis of two per Artillery Battalion.

By War Department Directive, ten qualified aviators were selected 14 September 1942, to be ordered to the European Theater as quickly as possible. This initial group of ten pilots eventually were assigned to the 13th Field Artillery Brigade, then in England, where they ultimately became the nucleus of the II Corps Air Observation Post School.

Late in November of 1942 an advance party of aviators from the II Corps School were moved with the 13th Field Artillery Brigade to establish a flying school in North Africa. The 29th Infantry Division also established a similar school during this period.

The first force to employ the Air Observation Posts in combat were elements of the Fifth Army. On 8 November 1942, three L-4s took-off from the aircraft carrier *U.S.S. Ranger,* 60 miles off the North African coast; one of these craft, piloted by *Lt. (now Colonel) Ford E. Allcorn,* was shot down by friendly fire, *Allcorn* becoming the first Field Artillery pilot to be shot down in a combat operation in World War II. Improvisation was the key to the success of operations conducted by light aircraft during the succeeding months. Supply and maintenance support was practically non-existent.

Subsequent to the initial use of light aircraft by the Artillery in North Africa, and throughout World War II, they were utilized for almost every conceivable mission. Every major command unit except the anti-aircraft command established a requirement for organic assignment of these craft during this period.

AN ARMY CUB IS LIFTED ABOVE A MAKESHIFT LST "CARRIER" FOR AN INVASION LANDING. STEEL MATTING AND TIMBERS FORM THE TAKEOFF RAMP ON DECK.

The FOUNDATIONAL FORTIES

The period 1942-1947 was characterized by the absence of any clear-cut basic understanding among the agencies concerned regarding the organic assignment of aircraft outside of the Army Air Corps. However, the War Department did approve an agreement between *General Jacob L. Devers,* Commanding General, Army Ground Forces and *General Ira C. Eaker,* Deputy Commanding General, Army Air Corps, on organic assignment of additional aircraft to Ground Force Units.

On the basis of this agreement and combat experiences, by January 1944, a total of 750 Air Observation Post Sections had been activated in the Ground Forces. The total light aircraft inventory had increased to 1,600 suitable units.

Continuous difficulties over organization and control of these aircraft, referred to as liaison aircraft during this period, were further complicated by the questions of what type aircraft were to be used for the observation mission. An additional problem was the shortage of these craft.

The rapid expansion of aviation for the field artillery had generated a projected requirement for an inventory of 2,058 light planes not later than 1943. The capability limitations of the commercial type aircraft being utilized generated a requirement for different types of planes. This issue was pressed continually from the field.

Procurement of different types of aircraft was hampered by the War Department position, which strongly reaffirmed the requirement of artillery observation aircraft but opposed other utilization by ground commanders. The commercial version was considered adequate for the artillery observation mission at this time.

On the basis of combat experience, total quantitative requirements for light aircraft were projected at 100 units per month through 1944 and the training of pilots and maintenance personnel was to be intensified to provide personnel to man these additional craft.

The nearest approach to any degree of accord on the light aviation issue during this period was contained in a set of principles recommended by the Army Air Corps, generally accepted by the Ground Forces, and given due consideration by the War Department in handling decisions on Army aviation.

Salient features of these principles included:

(1) Maximum sustained utilization of aircraft, assigned organically to the Ground Forces, in the exploitation of its capability.

(2) Minimum detachment of individual aircraft from the main body.

(3) Minimized duplication of Army Air Corps units and equipment without a compensating increase in the ability to wage war.

(4) It was generally agreed that separate airdromes, depot maintenance facilities, and training facilities would not be required.

These principles became the general guidelines for planning and programming the future of Army aviation through 1947.

By the end of World War II in August, 1945, a total of 2,630 pilots and 2,252 mechanics had been trained. Cessation of hostilities interrupted the procurement and training programs and subsequently re-

XVIII ABN. CORPS

4TH INF. DIV.

82ND ABN. DIV.

101ST ABN. DIV.

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*The turbine-powered 'Iroquois' offers commanders and field forces bold new tactical advantages. Assault divisions, their missile, medical, and signal-support units have received production-line HU-1A's in quantity.

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PROBLEM: To provide a *Light Observation Aircraft* for military use for:

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...with a speed capability adequate for completion of all mission assignments *without sacrificing:* range, rate of climb, hovering ability, confined area performance or ease of maintenance—*without increasing:* initial cost, operating costs and logistic support requirements.

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HUGHES TOOL COMPANY
CULVER CITY, CALIFORNIA

You are invited to write for full details.

THE ARMY GROWS 'EM TOUGH

How the Hiller 12 E Became First Choice of Commercial Operators

From the day it went into commercial service, the Hiller 12 E had a head start. It had an Army-proved H-23D airframe and an Army-proved H-23D drive system that hadn't begun to exploit its full strength.

The next step rewrote the specs on what light utility helicopters can do. Capitalizing on the H-23D Raven's dynamic components with a 305 hp Lycoming engine's power, light helicopter "firsts" of the kind above were bound to happen. Similar profitable operations are flown every day, wherever there's an E.

That's why the 12 E has become first choice—it's the most economical helicopter purchase today.

Designs are one thing. Deliveries another. Both come from

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Adhesive Engineering Division · San Carlos, Calif.

H-23D 250 hp *12 E 305 hp* *E 4 320 hp* *Super E 340 hp*

L-5 AIRCRAFT OF THE 1ST INFANTRY DIVISION FLY AN AERIAL RECONNAISSANCE MISSION AT THE GRAFENWOHR (GERMANY) TRAINING CENTER DURING '48 MANEUVERS.

duced the aircraft inventory from 1,600 to approximately 200 aircraft by late 1945.

Continued demobilization through this period and disposition of equipment through the Surplus Property Board, and otherwise, reduced the Ground Forces aviation elements to an almost non-existent level.

The FOUNDATIONAL FORTIES

The provisions of the National Security Act of 1947, which created the Department of the Air Force and the U.S. Air Force, involved, among other things, a series of transfer orders issued by the Secretary of Defense.

The first of these transfer orders was dated 26 September 1947, and, in effect, transferred from the Army to the Air Force the greater part of the military personnel, the bases, and equipment of the Army Air Forces. This action constituted the creation of the third military service and placed it on an operating basis.

During the period 26 September 1947-22 July 1949, a total of forty of these transfer orders were issued. On the basis of these orders the Army and Air Force, acting jointly, originated and issued a number of so-called adjustment regulations—one of which was a basic agreement of understanding on the question of organic Army aviation.

On the basis of this agreement and in pursuance of the authority granted in the National Security Act of 1947 and Transfer Order #1, Joint Army and Air Force Regulations 5-10-1 were published 20 May 1949. These regulations set forth the utilization criteria for Army aircraft and imposed weight limitations on both fixed wing and rotary wing aircraft which could be organically assigned to the Army. Maximum weights were established at 2,500 pounds for fixed-wing aircraft, and 3,500 to 4,000 pounds for rotary wing aircraft. Specific functions as outlined in these regulations were very similar to those performed during World War II.

However, under the terms of these regulations, the Army would be responsible for determining quantitative requirements and budgeting for organic aircraft; accessories, and parts; while the Air Force would procure, store, and issue at Depot level.

The Air Force would also assume responsibility for all depot maintenance of Army aircraft and continue to provide field maintenance support in the overseas Commands until 30 June 1950. The Army actively entered the Army aircraft logistical support field on the basis of these regulations in March 1950.

MEMO TO MICHAEL:

Your recent letter to the company has been brought to my attention. I am particularly interested in this paragraph,

I am in the fifth grade at Braun School and am very interested in aviation. When I grow up I want to be a deronautical Engineer if my mother will let me.

Michael, I certainly hope you keep your desire to make a career in aviation. In my opinion it is one of the most challenging opportunities for the young men of America. The helicopter industry, and aviation in general, is helping to keep our country strong and we look forward to the help that boys like you can give when your time comes The backbone of the aircraft industry is the engineer. We will always need good engineers with imagination and vision. You have that vision now. Please keep it. I'm sure that you can count on your mother's support when you are ready to take your place among the other young men who are playing a vital role in a vital industry.

Sincerely,

Charles H Kaman

. . . IN NATIONAL DEFENSE

KAMAN IS PART OF THE PLAN

**Facsimile of a letter to the company

L-1 (A, B, C, D, F)

Observation, Reconnaissance

AIRFRAME
- MANUFACTURER: Vultee-Stinson
- PERSONNEL: Pilot and Observer

ENGINE
- MANUFACTURER: Lycoming
- DESIGNATION: R-680-9
- TAKE-OFF HORSEPOWER: 295
- DESCRIPTION: Radial, 9 cyl., aircooled

PROPELLER/ROTOR
Hamilton-Standard 8'6" constant speed

PROCUREMENT DATA
- Delivered: 1939-42 (384 procured)

PERFORMANCE
- RANGE: 240 nautical miles
- SERVICE CEILING: 14,000 feet
- GROSS WEIGHT: 3,325 pounds
- CRUISING SPEED: 99 knots

REMARKS
Originally designated the O-49. Was the winner of a competition with the Bellanca YO-50 and the Ryan YO-51 Dragonfly. All had extra flaps and slats.

L-2 (A, B, M)

Observation, Reconnaissance

AIRFRAME
- MANUFACTURER: Taylorcraft
- PERSONNEL: Pilot and Observer

ENGINE
- MANUFACTURER: Continental
- MODEL DESIGNATION: O-170-3
- TAKE-OFF HORSEPOWER: 65
- DESCRIPTION: 4 cyl., direct drive, horizontally opposed, aircooled

PROPELLER
Sensenich two-bladed 6', fixed-pitch, wooden propeller

PROCUREMENT DATA
- Delivered: 1941-44 (1,942 procured)

PERFORMANCE
- RANGE: 230 nautical miles
- SERVICE CEILING: 10,050 feet
- GROSS WEIGHT: 1,300 lbs
- CRUISING SPEED: 83 knots

REMARKS
Metal-frame, fabric-covered aircraft.

L-3 (A, B, C)

Observation, Reconnaissance

AIRFRAME
- MANUFACTURER: Aeronca
- PERSONNEL: Pilot and Observer

ENGINE
- MANUFACTURER: Continental
- MODEL DESIGNATION: 0-170-3
- TAKE-OFF HORSEPOWER: 65
- DESCRIPTION: 4 cyl., direct drive, horizontally opposed, aircooled

PROPELLER
L-3A: Freedman-Burnham ground adjustable, two-bladed propeller with aluminum alloy hub. L-3B; C: Sensenich fixed pitch, 6' two-bladed, wooden propeller.

PROCUREMENT DATA
- Delivered: 1942-43 (1,464 procured)

PERFORMANCE
- RANGE: 165 nautical miles
- SERVICE CEILING: 7,750 feet
- GROSS WEIGHT: 1,300 lbs
- CRUISING SPEED: 76 knots

REMARKS
Metal-frame, fabric-covered aircraft. Originally designated the 0-58. Ten versions were purchased, a few of which were side-by-side.

L-4 (A, B, H, J)

Observation, Reconnaissance

AIRFRAME
- MANUFACTURER: Piper
- PERSONNEL: Pilot and Observer

ENGINE
- MANUFACTURER: Continental
- MODEL DESIGNATION: 0-170-3
- TAKE-OFF HORSEPOWER: 65
- DESCRIPTION: 4 cyl., direct drive, horizontally opposed, aircooled

PROPELLER
Sensenich fixed pitch, 6' two-bladed, wooden propeller.

PROCUREMENT DATA
- Delivered: 1942-45 (9,404 procured)

PERFORMANCE
- RANGE: 165 nautical miles
- SERVICE CEILING: 9,300 feet
- GROSS WEIGHT: 1,220 lbs
- CRUISING SPEED: 66 knots

REMARKS
Metal-frame, fabric-covered aircraft. Purchased in 10 versions. Originally designated the 0-59. The L-2, L-3, and L-4 were all unofficially called "Grasshoppers."

L-5 (A, B, C, E)

Observation, Reconnaissance

AIRFRAME
- MANUFACTURER: Vultee-Stinson
- PERSONNEL: Pilot and Observer, or Litter

ENGINE
- MANUFACTURER: Lycoming
- MODEL DESIGNATION: 0-435-1
- TAKE-OFF HORSEPOWER: 185
- DESCRIPTION: 6 cyl., direct drive, horizontally opposed, aircooled

PROPELLER
Sensenich, fixed pitch, 7'1" two-bladed, wooden propeller

PROCUREMENT DATA
- Delivered: 1942-45 (3,975 procured)

PERFORMANCE
- RANGE: 365 nautical miles
- SERVICE CEILING: 15,800 feet
- GROSS WEIGHT: 2,020 lbs
- CRUISING SPEED: 87 knots

REMARKS
Metal-frame fuselage, wood and metal airfoil structure, fabric-covered aircraft. Originally used exclusively by the Army Air Corps and designated the 0-62. Army Liaison pilots operated these from 1945 and during the first months of the Korean hostilities.

L-6

Observation, Reconnaissance

AIRFRAME
- MANUFACTURER: Interstate
- PERSONNEL: Pilot and Observer

ENGINE
- MANUFACTURER: Aircooled
- MODEL DESIGNATION: 0-200-5
- TAKE-OFF HORSEPOWER: 102
- DESCRIPTION: 4 cyl., horizontally opposed, direct drive, aircooled.

PROPELLER
U.S. Propeller, 6'4" fixed pitch, two-bladed propeller

PROCUREMENT DATA
- Delivered: 1942-43 (250 procured)

PERFORMANCE
- RANGE: 515 nautical miles
- SERVICE CEILING: 12,100 feet
- GROSS WEIGHT: 1,650 lbs
- CRUISING SPEED: 76 knots

REMARKS
Fabric-covered aircraft known commercially as the S-1B Cadet. Original military designation was 0-63.

FOUNDATIONAL FORTIES

H-13B
Training, Observation, Recon.

AIRFRAME
- MANUFACTURER: Bell
- PERSONNEL: Pilot and Observer

ENGINE
- MANUFACTURER: Franklin
- MODEL DESIGNATION: 1E-0-335
- TAKE-OFF HORSEPOWER: 178
- DESCRIPTION: 6 cyl., horizontally opposed, aircooled.

PROCUREMENT DATA
- Delivered: 1948-49 (65 purchased)

PERFORMANCE
- RANGE: 122 nautical miles
- GROSS WEIGHT: 2,102 lbs
- CRUISING SPEED: 57 knots

REMARKS

Forerunner to current H-13 Helicopter. These machines were used during early Korean hostilities.

H-23 (A, B)
Trng., Obsn., Recon., Evac.

MANUFACTURER: Hiller

PERSONNEL
Pilot—2 passengers, or two litters

ENGINE
- MANUFACTURER: Franklin
- MODEL DESIGNATION: 0-335-4
- TAKE-OFF HORSEPOWER: 178

DESCRIPTION
6 cyl., horizontally opposed, aircooled

PROCUREMENT DATA
- Delivered: 1950 (323 procured)

PERFORMANCE
- RANGE: 95 nautical miles
- GROSS WEIGHT (Maximum): 2,400 lbs
- CRUISING SPEED (Medium): 42 knots

REMARKS

The Navy gave the Army 50 HTL's in 1950 which were redesignated H23A's. Seven of these went to Korea. The Army then purchased 50 H-23A's and 273 H-23B's in 1950. (FY 1951 funding). The early model H-23's had "mast bumping" trouble which was later corrected by increasing the hub clearances.

L-16

Observation, Reconnaissance

AIRFRAME
- MANUFACTURER: Aeronca
- PERSONNEL: Pilot and Observer

ENGINE
- MANUFACTURER: Continental
- MODEL DESIGNATION: 0-190-1
- TAKE-OFF HORSEPOWER: 95
- DESCRIPTION: 4 cyl., horizontally opposed, direct drive, aircooled.

PROPELLER
McCauley 6'1" fixed pitch, metal blade

PROCUREMENT DATA
- Delivered: 1948 (609 procured)

PERFORMANCE
- RANGE: 219 nautical miles
- SERVICE CEILING: 14,500 feet
- GROSS WEIGHT: 1,300 lbs
- CRUISING SPEED: 70 knots

REMARKS
Fabric-covered, metal-frame. Standard commercial Aeronca "Champion." The most inexpensive aircraft ever purchased by the military. Used in early part of Korean War.

FOUNDATIONAL FORTIES

L-17

Utility

AIRFRAME
- MANUFACTURER: Ryan (North American)
- PERSONNEL: Pilot—3 Passengers

ENGINE
- MANUFACTURER: Continental
- MODEL DESIGNATION: 0-470-7
- TAKE-OFF HORSEPOWER: 205
- DESCRIPTION: 6 cyl., horizontally opposed, direct drive, aircooled.

PROPELLER
Hartzell 7' controllable pitch, metal or plastic two-bladed propeller

PROCUREMENT DATA
- Delivered: 1948-49 (657 procured)

PERFORMANCE
- RANGE: 516 nautical miles
- SERVICE CEILING: 10,900 feet
- GROSS WEIGHT: 3,050 lbs
- CRUISING SPEED: 105 knots

REMARKS
Three versions of the L-17 were purchased.

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AIR EVACUATION IN KOREA

THE

Controversial Fifties

Certain logistical support functions are taken over from the Air Force. The outbreak of hostilities in Korea leads to further clarification of roles and missions and the helicopter is introduced and performs magnificently in the difficult mountain campaigns.

1950 — *Army assumes Army aviation logistical support.*

1950 — *Army plans for cargo helicopter companies.*

1951 — *Helicopter proves its worth in Korea.*

1955 — *Army takes over the depot support mission of Army aircraft.*

1956 — *Secretary of Defense issues policy decision and detailed role of Army aviation, to include new weight policies on Army aircraft.*

1955-1960 — *Army builds its aviation capability as warfare requirements increase.*

1955-1960 — *Army initiates procurement of larger and more sophisticated aircraft with Secretary of Defense approval.*

AN L-16 OF THE 3D INFANTRY DIVISION UTILIZES A BUMPY KOREAN ROAD AS AN EMERGENCY LANDING STRIP.

The CONTROVERSIAL FIFTIES

Publication of two identical documents, AR 700-50 and AFR 65-7, 23 March 1950, confirmed the basic understanding and officially assigned the major responsibility for logistical support of organic aircraft to the Ordnance Corps.

The procedures and responsibilities contained in the Joint Army and Air Force Regulations were the subject of continual discussion on all sides from the date of publication and especially after the outbreak of hostilities in Korea. The basic problem was bound inextricably with the divergent views on the nature and extent of aotivities expected of the Air Force in support of Army field forces. These stemmed primarily from the various interpretations as applied to the stated functions and missions of the Air Force as set forth in the *"Function Papers."*

By 1951, and as the direct result of experiences in Korea, and the continuing disagreements over Army aviation, discussions of the functions and roles of Army aircraft, particularly the helicopter, had reached the highest administrative level of the two service departments concerned.

As a result of these discussions, *Secretaries Pace* (Army) and *Finletter* (Air Force) signed a special *Memorandum of Understanding* dated 2 October 1951. This document eliminated the aircraft weight limitation, previously imposed, and substituted a definition for organic Army aircraft in terms of the functions to be performed.

Under the terms of this document organic Army aircraft would be used by the Army *"as an integral part of its components for the purpose of expediting and improving ground combat and logistical procedures within the Combat Zone."* Detailed functions, under the exclusive control of the ground force commander, which might be performed by Army organic aircraft, were spelled out in this Magna Carta of Army aviation.

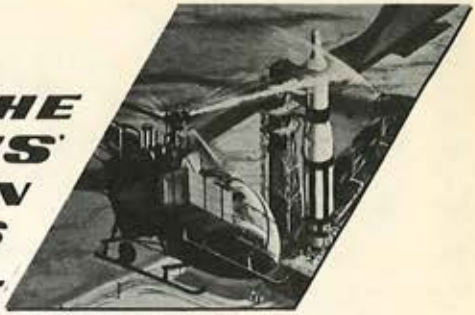
The need for further clarification of Army and Air Force viewpoints on the Army aviation issue, particularly helicopter implications, again required consideration and discussion of the subject at the Department level. These discussions, initiated 10 November 1951 and continuing through the fall of 1952, included those problems, general and specific, encountered during the Korean conflict. On 4 November 1952, the Army and Air Force concluded a *second Memorandum of Understanding*, which superseded the special agreement of 1951.

This second document favored the Army point-of-view on Army aviation; however, it re-established a maximum weight limitation of 5,000 pounds on organic Army fixed-wing aircraft. The document stipulated that this provision would be subject to review by the Secretary of Defense upon the request of either Service Secretary. The weight of helicopters organic to the Army was not restricted by this document.

A most significant feature of this second memorandum was the clear-cut delineation made between the primary function to be performed by organic Army aircraft and those operated by the Air Force.

Continued growth predicated on the responsibilities and functions established by these *Memoranda of Understanding* resulted in transfer of logistical support respon-

THE ALOUETTE'S PROVEN CAPABILITIES ASSURE...



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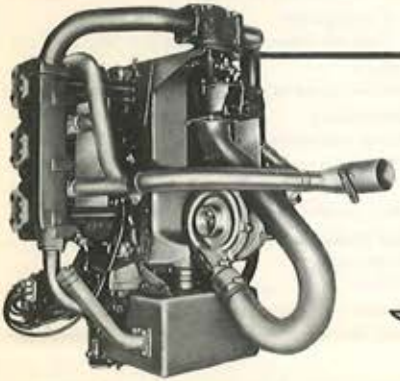

Franklin 6VS-335
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At 15,000 feet, the Franklin turbosupercharged engine in the Bell 47G-3 produces the same solid 225 h.p. as it does at sea level. With this helicopter and this engine, you can forget the old problem of how much you can lift at a given altitude. You can lift the rated payload of 1,111 lbs. right over the top of any ordinary mountain! Ask your Bell Helicopter or Franklin Engine representative for full details.

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AN ARMY H-37 MOJAVE FROM THE US ARMY AVIATION TEST BOARD LANDS ATOP PIKES PEAK DURING ALTITUDE TESTING.

sibility from the Ordnance Corps to the Transportation Corps. Authority for this action was contained in DA General Order 76, dated 11 August 1952. Approval of the necessary funds for 5 helicopter companies included authority for the Army Field Forces to activate and train 4 of them. The Air Force would be responsible for the 5th.

These companies subsequently were designated as Transportation Corps units. The responsibility for activation and training of additional companies was assigned to the Commanding General, Army Field Forces and was discharged through two Army Aviation Unit Training Commands. Unit activation and training for single rotor cargo helicopters were conducted at Ft. Sill, Okla., by the 45th Transportation Battalion. Tandem Rotor Cargo Helicopter Unit activation and training were conducted at Ft. Riley, Kan., by the 71st Transportation Battalion.

Coincident with these transfers and designations of responsibility, discussions related to the duplication of capabilities, between the Army and Air Force, with regard to helicopters, had reached the Departmental level once again. As a result of these discussions on 21 August 1952, the Army Chief of Staff approved a program to provide the Army with 12 helicopter Battalions by 1956.

The recognized potential of organic Army aviation, helicopters and airplanes, as a direct result of operation in Korea sustained its continued growth. Its importance was officially substantiated in January 1955 by the Army Chief of Staff's approval of an Aviation Division in G-3 for overall staff supervision; centralization, in G-1, of Army Aviator assignment authority; the establishment of an aviation center at Ft. Rucker, Alabama, to include an aviation test board; assumptions by the Army of depot maintenance and supply responsibilities; and certain changes in procurement control procedures.

During the foregoing period 1942-1955, the Air Force had continued to train pilots and mechanics for the Army. Army pilot training by the Air Force was limited to the primary phase, that of teaching prospective aviators to fly. The tactical phase of training was conducted by the Army at Ft. Sill, Okla., and later at Ft. Rucker, Ala. The main training facility utilized by the Air Force for Army pilot and mechanic training was Gary Air Force Base, located at San Marcos, Tex.

The divided responsibility for the training of Army aviators was unsatisfactory and the Army took steps to resolve this issue. In July 1956, the Army was directed to assume responsibility for the training of Army aviators and aviation mechanics. Thus, for the first time, the Army had full responsibility for the Army Aviation Program except for certain logistic and developmental functions.

Although the Air Force Army Pilot Training Organization was phased-out, the base at San Marcos, Tex., was utilized to continue the primary pilot training phase by civilian contract under Army supervision. Army aircraft organizational mechanics training, which had been conducted at the Gary facility, was transferred to Fort

AN ARMY YH-41 PILOTED BY CAPT. JAMES BOWMAN SET A CLASS ALTITUDE RECORD OF 30,335 FEET IN LATE DECEMBER, 1957.

The CONTROVERSIAL FIFTIES

Rucker, Ala. Field maintenance training of mechanics which has been conducted by the Transportation School since 1 July 1954 was not affected by this change.

Such was the status of Army aviation until 26 November 1956. On this date, the Secretary of Defense issued a policy decision, which spelled out in detail the role of Army aviation. Specific Army aviation functions were defined in terms of requirements envisioned within the combat zone.

Included in these limits were maximum empty weights for Army organic airplanes and helicopters. Fixed-wing aircraft were not to exceed 5,000 pounds; and rotary wing aircraft were not to exceed 20,000 pounds empty. At the same time, the Secretary of Defense provided that on an appropriate showing of need, the Army would be permitted by exception to procure larger aircraft. It was under this exceptional authority that the Army shortly thereafter was authorized to initiate the *Mohawk* and *Caribou* programs.

General acceptance of Army aviation during and subsequent to the Korean conflict has greatly increased aviation requirements. Consequently, the major effort during the recent past has been devoted to expanding the Army aviation capability, through improved equipment and organizations, designated specifically to meet the requirements envisioned in future military operations and to proceed to mature the Technical Service research, development, and logistic support capability.

The foregoing brief history of Army aviation, from inception to date, includes decisions and actions, which are considered major instruments in shaping its course.

As indicated by the foregoing, the development of an adequate organic aviation capability, immediately responsive to the desires of the Army Combat Commander, for the performance of a wide variety of Army functions, has been continuous. The final acceptance of aviation as an important and integral element of Army military power is the result of the efforts of its proponents and the urgent mobility requirements of the modern Army.

L-19 (B, D, E) Bird Dog

Observation, Reconnaissance

AIRFRAME
MANUFACTURER — Cessna
PERSONNEL — Pilot and Observer

ENGINE
MANUFACTURER — Continental
MODEL DESIGNATION — O-470-11
TAKE-OFF HORSEPOWER — 213
DESCRIPTION
cyl., horizontally opposed, aircooled, direct drive.

PROPELLER
McCauley fixed pitch, two-bladed, metal propeller

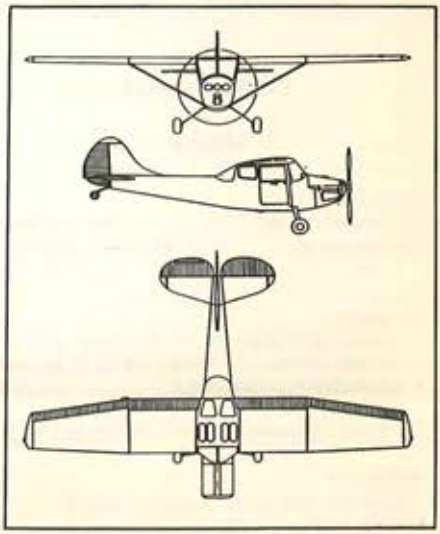
PROCUREMENT DATA
Delivered — 1951-59 (1,871 in system)
Procurement Status — Out of Production
Manufacturer's Lead Time — 12 Months

PERFORMANCE
RANGE — 515 nautical miles
SERVICE CEILING — 20,000 feet
GROSS WEIGHT
L-19A: 2,100 lbs., L-19E: 2,400 lbs.
CRUISING SPEED — 87 knots

REMARKS
The TL-19D is an instrument trainer with similar configuration and is stronger structurally than the L-19. It has a rear instrument panel which may be enclosed for hooded flight, and a constant speed propeller.

The L-19E incorporates the resdesigned structural changes in the TL-19D instrument trainer aircraft (excluding constant speed propeller and rear instrument panel).

The basic L-19 configuration had a Boeing Turbine XT-50-BO-1 mounted and was known as the XL-19B. An Artouste 1 Turbine XT-51-T-1 was similarly mounted in the L-19 and was known as the XL-19C. Both ships were flown successfully, but were purely for research. Both ships have since been returned to the normal L-19 configuration.



L-20A Beaver

Utility

AIRFRAME
- MANUFACTURER: De Havilland
- PERSONNEL: Pilot—5 passengers
- CARGO: 1,000 lbs

ENGINE
- MANUFACTURER: Pratt and Whitney
- MODEL DESIG.: R-985 AN-1, 3, 39, 39A
- TAKE-OFF HORSEPOWER: 450
- DESCRIPTION: 9 cyl., aircooled, radial, with supercharger

PROPELLER
Hamilton-Standard contant-speed, two-bladed metal propeller

ELECTRONIC & COMMUNICATIONS EQUIP.
UHF, FM, Marker Beacon, VHF Omni, ADF

PROCUREMENT DATA
- Delivered: 1951-59 (654 in system)
- Procurement Status: Last procurement—FY58
- Manufacturer's Lead Time: 12 Months

PERFORMANCE
- RANGE: 396 nautical miles (240 BHP @ 5000 feet)
- SERVICE CEILING: 18,000 feet
- GROSS WEIGHT: 4,820 lbs
- CRUISING SPEED: 113 knots (240 BHP @ 5,000 Feet)

REMARKS
A rugged all purpose aircraft; its versatility proven by bush pilots in hazardous year round operations in Alaska and Canada.

L-21A

Observation, Reconnaissance

AIRFRAME
- MANUFACTURER: Piper
- PERSONNEL: Pilot and Observer

ENGINE
- MANUFACTURER: Lycoming
- MODEL DESIGNATION: 0-290-D
- TAKE-OFF HORSEPOWER: 125
- DESCRIPTION: 4 cyl., horizontally opposed, direct drive

PROPELLER
Sensenich 6'2" fixed pitch, metal propeller

PROCUREMENT DATA
- Delivered: 1951 (150 procured)
- Procurement Status: No Army procurement
- Manufacturer's Lead Time: 9 Months

PERFORMANCE
- RANGE: 260 nautical miles
- SERVICE CEILING: 16,000 feet
- GROSS WEIGHT: 1,500 lbs
- CRUISING SPEED: 95 knots

REMARKS
All metal-frame, fabric-covered aircraft. The L-18C purchased for MDAP was the same airframe as the L-21A. The engine, however, was a 90 H.P. Continental. This aircraft is now used in many Army Flying Clubs.

LC-126

Utility

AIRFRAME
- MANUFACTURER: Cessna
- PERSONNEL: Pilot—3 passengers

ENGINE
- MANUFACTURER: Jacobs
- MODEL DESIGNATION: R-755-11
- TAKE-OFF HORSEPOWER: 300
- DESCRIPTION: 7 cyl., radial, direct drive

PROPELLER
Hamilton-Standard 7'9" constant-speed, metal propeller.

PROCUREMENT DATA
- Delivered: 1951-52 (60 procured)

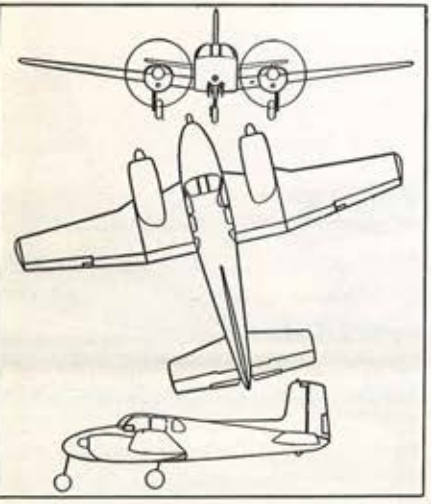
PERFORMANCE
- RANGE: 782 nautical miles
- SERVICE CEILING: 19,800 feet
- GROSS WEIGHT: 3,350 lbs
- CRUISING SPEED: 117 knots

REMARKS
Originally purchased by Air Force, then turned over to the Army.. Were used as instrument trainers by the Army for several years but have been dropped from the Army system.

L-23D Seminole

Utility, Transport

AIRFRAME
- MANUFACTURER: Beech
- PERSONNEL: Pilot—4 to 5 passengers
- CARGO: 300 lbs aft compartment; 393 lbs rear compartment



ENGINE
- MANUFACTURER: Lycoming
- MODEL DESIGNATION: GSO-480-1 (two)
- TAKE-OFF HORSEPOWER: 340 each
- DESCRIPTION: 6 cyl., horizontally opposed, air-cooled, with geared supercharger

PROPELLER
Hartzell 3-bladed, contant-speed propeller.

ELECTRONIC & COMMUNICATIONS EQUIP.
UHF, VHF, ADF, Marker Beacon, Glideslope Receiver.

PROCUREMENT DATA
- Delivered: 1953 (A), 1954 (B), and 1956-59 (D) (194 in system)
- Procurement Data: Last procurement—FY58

PERFORMANCE
- RANGE: 1,177 nautical miles (65% pwr @ 10,000 feet)
- SERVICE CEILING: 26,300 feet
- GROSS WEIGHT: 7,000 lbs
- CRUISING SPEED: 176 knots (65% pwr @ 10,000 feet)

REMARKS
This model is installed with deicing equipment and an oxygen system. 16 RL-23 aircraft in system.

L-26B

Utility

AIRFRAME
MANUFACTURER — Aero Design
PERSONNEL — Pilot—5 passengers

ENGINE
MANUFACTURER — Lycoming
MODEL DESIGNATION — GO-480-1 (two)
TAKE-OFF HORSEPOWER — 275 (each)
DESCRIPTION
6 cyl., horizontally opposed, gear drive

PROPELLER
Hartzell controllable-pitch, metal propeller.

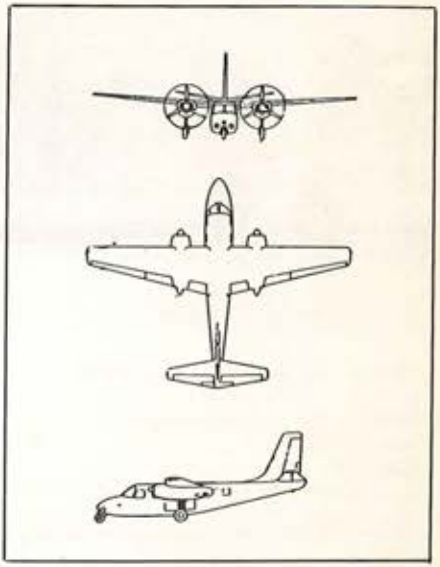
ELECTRONIC & COMMUNICATIONS EQUIP.
Radio Rec., Glide Slope, ADF, Marker Beacon, Omni, UHF.

PROCUREMENT DATA
Delivered — (15 procured; 10 in system)
Procurement Status — None

PERFORMANCE
RANGE — 1,000 nautical miles
SERVICE CEILING — 22,900 feet
GROSS WEIGHT — 5,500 lbs

CRUISING SPEED — 170 knots

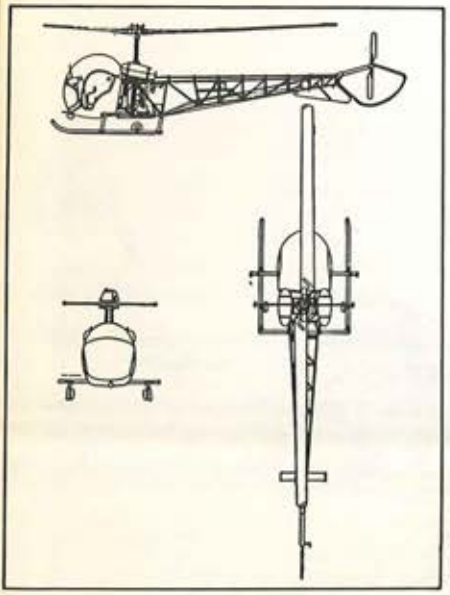
REMARKS
5 are RL-26 configuration with special electronic gear.



H-13H Sioux

Trng., Obsn., Recon., Evac.

AIRFRAME
MANUFACTURER — Bell
PERSONNEL
Pilot—two passengers, or two litters



ENGINE
MANUFACTURER — Lycoming
MODEL DESIGNATION — C-435-23
TAKE-OFF H.P. — 250 (Derated to 200)
DESCRIPTION
6 cyl., horizontally opposed, aircooled.

ROTOR
Bell rotor, two-bladed teetering with Bell metal blades.

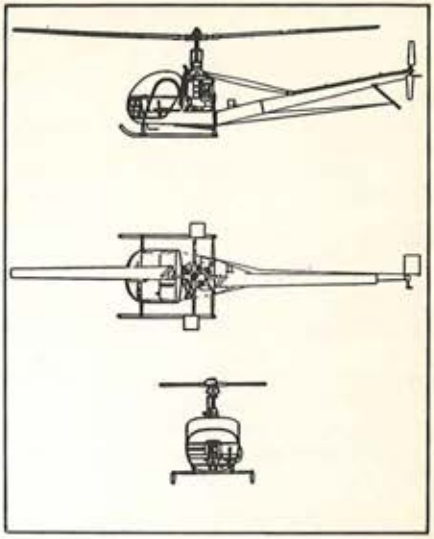
PROCUREMENT DATA
Delivered — 1956-60 (831 in system)
Procurement Status
Commercial production only
Manufacturer's Lead Time — 11 Months

PERFORMANCE
RANGE — 166 nautical miles
SERVICE CEILING — 13,400 feet
GROSS WEIGHT — 2,450 lbs
CRUISING SPEED — 70 knots

REMARKS
The H-13H is the latest of the H-13 series. The H-13A, B, C, D, E, and G were powered by conventional engines and were the results of improvement of the basic aircraft. One "E" model was converted to an XH-13F model with an Artouste 1 turbine engine installed for tests. This has been returned to the "G" configuration.

H-23D Raven

Trng., Obsn., Recon., Evac.



AIRFRAME
- MANUFACTURER: Hiller
- PERSONNEL: Pilot—Two passengers

ENGINE
- MANUFACTURER: Lycoming
- MODEL DESIGNATION: 0-435-23
- TAKE-OFF HORSEPOWER: 250
- DESCRIPTION: 6 cyl., horizontally opposed, aircooled

ROTOR

Hiller rotor, two-bladed with Parsons metal blades, 35' diameter; single metal tail.

PROCUREMENT DATA
- Delivered: 1957-60 (574 in system)
- Procurement Status: Current production
- Manufacturer's Lead Time: 12 Months

PERFORMANCE
- RANGE: 162 nautical miles
- SERVICE CEILING: 12,900 feet
- GROSS WEIGHT: 2,700 lbs
- CRUISING SPEED: 70 knots

REMARKS

The Army purchased its first H-23 model helicopters in FY 1951.

H-19 (A, B, C, D) Chickasaw

Utility

AIRFRAME

MANUFACTURER	Sikorsky
PERSONNEL	Crew of 2, plus 10 passengers, or 6 litter patients
CARGO	1,028 lbs

ENGINE

MANUFACTURER	Curtiss-Wright (Lycoming)
MODEL DESIGNATION	R-1300-3
TAKE-OFF H.P.	800 (de-rated 700)
DESCRIPTION	9 cylinder, radial

ROTOR

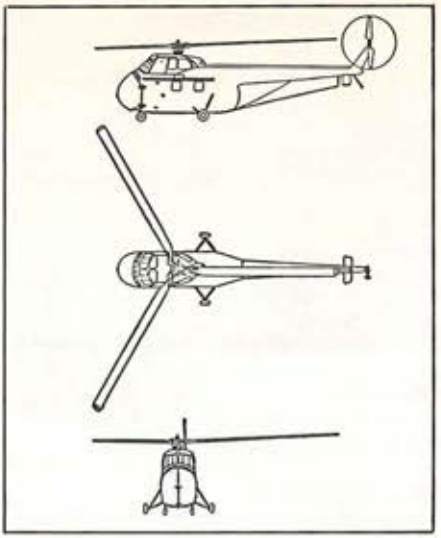
3 Blade, 53' Diameter, Sikorsky Interchangeable Metal Blades (Main); 2 Blade, 8' Diameter, Sikorsky Interchangeable Metal Blades (Tail Rotor).

PROCUREMENT DATA

Delivered	1953-56 (292 in system)
Manufacturer's Lead Time	12 Months

PERFORMANCE

RANGE	220 nautical miles
SERVICE CEILING	12,000 feet
GROSS WEIGHT	7,522 lbs (H-19D) 6,767 lbs (H-19C)
CRUISING SPEED	81 knots



REMARKS

The H-19C, an earlier model, was powered with a 600 hp, Pratt & Whitney R-1340-57 engine. The Air Force designation of this hcptr is the H-19A and B. Navy is HRS, Marine is HO4S. This aircraft was the first Army cargo aircraft used in combat. Two companies arrived in Korea in January, 1953.

H-21C Shawnee

Cargo, Personnel

GROSS WEIGHT	13,300 lbs (Max. T.O. 15,060 lbs)
CRUISING SPEED	85 knots

AIRFRAME

MANUFACTURER	Vertol
PERSONNEL	Crew of 2, plus 20 troops or crew of 3 and 12 litters
CARGO	Approximate 3,200 lbs

ENGINE

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

ELECTRONIC & COMMUNICATIONS EQUIP.

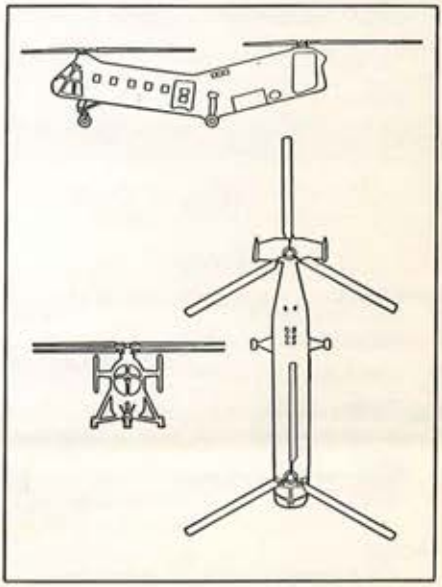
FM, Marker Beacon, VHF, ADF

PROCUREMENT DATA

Delivered	1954-59 (294 in system)
Procurement Status	No Army procurement
Manufacturer's Lead Time	20 Months

PERFORMANCE

RANGE	220 nautical miles
SERVICE CEILING	18,600 feet



H-25

Utility

AIRFRAME
- MANUFACTURER: Piasecki
- PERSONNEL: Crew of 2, plus 3 to 6 passengers

ENGINE
- MANUFACTURER: Continental
- MODEL DESIGNATION: R-975-46
- TAKE-OFF HORSEPOWER: 475
- DESCRIPTION: 9 cylinder radial engine

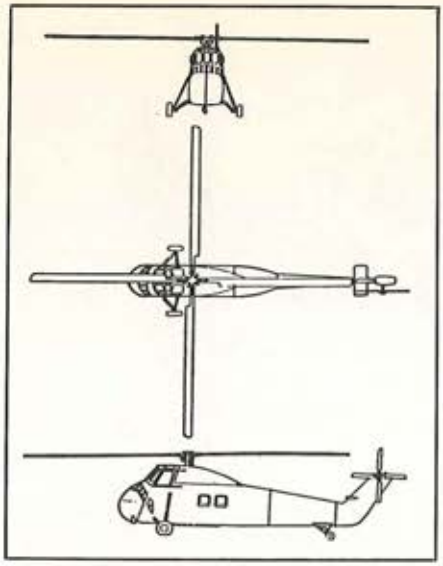
ROTOR
2 three-bladed rotors, 35' in diameter.

PROCUREMENT DATA (See Remarks)

PERFORMANCE
- RANGE: 216 nautical miles
- SERVICE CEILING: 11,500 feet
- GROSS WEIGHT: 5,500 lbs
- CRUISING SPEED: 80 knots

REMARKS

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. 70 were procured for Army use but have since been turned over to the Navy.



H-34A Choctaw

Light Cargo

AIRFRAME
- MANUFACTURER: Sikorsky
- PERSONNEL: Crew of 2, plus 18 troops, or 8 litters
- CARGO: Approximately 3,200 lbs

ENGINE
- MANUFACTURER: Curtiss-Wright (Lycoming)
- MODEL DESIGNATION: R-1820-84
- TAKE-OFF HORSEPOWER: 1,425
- DESCRIPTION: 9 cylinder, radial

PROPELLER

4 Blade 56' Diameter, Sikorsky Metal Interchangeable Blades (Main); 4 Blade, 9'4" Diameter, Sikorsky Metal Interchangeable Blades (Tail)

ELECTRONIC & COMMUNICATION EQUIP.

VHF, FM, Marker Beacon, ADF, UHF

PROCUREMENT DATA
- Delivered: 1955-59 (407 in system)
- Production Status: No Army procurement
- Manufacturer's Lead Time: 18 Months

PERFORMANCE
- RANGE: 238 nautical miles
- SERVICE CEILING: 10,400 feet
- GROSS WEIGHT: Design: 12,068 lbs; Max. T.O.: 13,000
- CRUISING SPEED: 94 knots

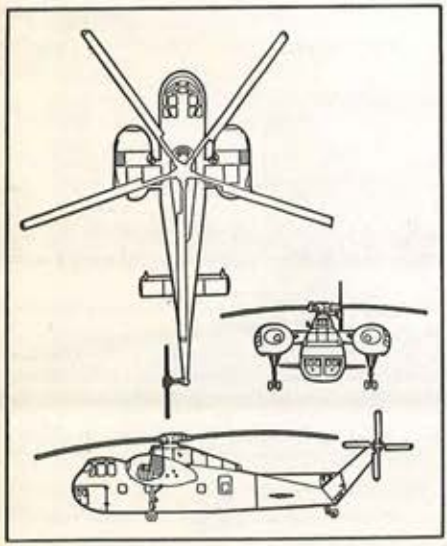
REMARKS

The Navy Designation is HSS-1, Marine HUS-1. The Air Force does not use this helicopter. H-34A is equipped to carry external sling loads, and selected helicopters are equipped for rescue missions.

H-37A Mojave

Medium Cargo

AIRFRAME
- MANUFACTURER: Sikorsky
- PERSONNEL: Crew of 3, 23 troops, or 24 litters
- CARGO: 6,000 lbs



ENGINE
- MANUFACTURER: Pratt and Whitney
- MODEL DESIGNATION: R-2800-54 (two)
- TAKE-OFF HORSEPOWER: 2,100 each
- DESCRIPTION: 18 cyl., twin row, radial

ROTOR

5 Blade, 72' Diameter, 21.5" Chord, Sikorsky Metal Interchangeable Blades (Main); 4 Blade, 15' Diameter, Sikorsky Metal Interchangeable Blades (Tail)

ELECTRONIC & COMMUNICATION EQUIPMENT

VHF, FM, Marker Beacon, ADF

PROCUREMENT DATA
- Delivered: 1956-60 (91 in system)
- Manufacturer's Lead Time: 18 Months

PERFORMANCE
- RANGE: 125 nautical miles
- SERVICE CEILING: 9,650 feet
- WEIGHT: Design 30,342 lbs, Max. T.O. 31,000 lbs
- CRUISING SPEED: 100 knots

REMARKS

This is the largest standard helicopter in current Army use. The AF does not use this helicopter. The Navy and Marine designation of this helicopter is HR2S-1.

U-1A Otter

Cargo, Personnel, Evac, Air Supply

AIRFRAME
- MANUFACTURER: De Havilland
- PERSONNEL: Pilot—10 troops
- CARGO: Pilot plus 2,000 lbs

ENGINE
- MANUFACTURER: Pratt and Whitney
- MODEL DESIGNATION: R-1340-59
- TAKE-OFF HORSEPOWER: 600
- DESCRIPTION

9 cyl., aircooled, radial, gear drive, with supercharger

PROPELLER

Hamilton-Standard three-bladed, constant speed, hydromatic propeller

ELECTRONIC & COMMUNICATIONS EQUIP.

FM Trans Rec, LF Radio Receiver, UHF Trans-Rec Radio Set, ADF, Marker Beacon, Gyromagnetic Compass, VHF Omni.

PROCUREMENT DATA
- Delivered: 1955-60 (170 in system)
- Procurement Status: No Army procurement
- Manufacturer's Lead Time: 12 Months

PERFORMANCE
- RANGE (Combat 1 ton payload): 505 nautical miles
- SERVICE CEILING: 17,400 feet
- GROSS WEIGHT: 8,000 lbs
- CRUISING SPEED: 104 knots

REMARKS

To be replaced by the AC-1 Caribou.

CONTROVERSIAL FIFTIES

XH-26

Observation, Reconnaissance

AIRFRAME
- MANUFACTURER: American Helicopter
- PERSONNEL: Pilot

ENGINE
- MANUFACTURER: American Helicopter
- MODEL DESIGNATION: XPJ49-AH-3 (two)
- TAKE-OFF HORSEPOWER: 36 lbs thrust each
- DESCRIPTION: Tip-mounted, Pulse Jet

PROPELLER
- 2 bladed, teetering, with Prewitt blades

PROCUREMENT DATA
- Delivered: 1952-1954 (5 procured)

PERFORMANCE
- RANGE: 100 nautical miles
- SERVICE CEILING: 7,000 feet
- GROSS WEIGHT: 810 lbs
- CRUISING SPEED: 65 knots

REMARKS

Procured for engineering and operational evaluation.

YL-15

Observation

AIRFRAME
- MANUFACTURER: Boeing
- PERSONNEL: Pilot and Observer

ENGINE
- MANUFACTURER: Lycoming
- MODEL DESIGNATION: 0-290-7
- TAKE-OFF HORSEPOWER: 125
- DESCRIPTION: 4 cyl., horizontally opposed, direct drive, aircooled

PROPELLER
- Controllable pitch propeller

PROCUREMENT DATA
- Delivered: 1947-49 (12 procured)

PERFORMANCE
- RANGE: 189 nautical miles
- SERVICE CEILING: 12,500 feet
- GROSS WEIGHT: 2,216 lbs
- CRUISING SPEED: 75 knots

REMARKS

Production prototype, never produced. The aircraft used spoilers instead of ailerons and full flaps. Observer was seated backwards.

XL-13

Observation

AIRFRAME
- MANUFACTURER: Consolidated-Vultee
- PERSONNEL: Pilot—2 passengers

ENGINE
- MANUFACTURER: Aircooled
- MODEL DESIGNATION: XO-425-5
- TAKE-OFF HORSEPOWER: 245
- DESCRIPTION: 6 cyl., horizontally opopsed, direct drive

PROPELLER
8'6" Controllable pitch propeller

PROCUREMENT DATA: See Remarks

PERFORMANCE
- RANGE: 425 nautical miles
- SERVICE CEILING: 15,000 feet
- GROSS WEIGHT: 2,900 lbs
- CRUISING SPEED: 92 knots

REMARKS
Two procured. Production prototype with folding wings and tail. Never produced for Army aviation.

CONTROVERSIAL FIFTIES

XH-15

Reconnaissance, Utility

AIRFRAME
- MANUFACTURER: Bell
- PERSONNEL: Pilot—1 passenger

ENGINE
- MANUFACTURER: Continental
- MODEL DESIGNATION: XO-470-5
- TAKE-OFF HORSEPOWER: 280
- DESCRIPTION: 6 cylinder, horizontally opposed, aircooled

XH-20

Reconnaissance

AIRFRAME
- MANUFACTURER: McDonnell
- PERSONNEL: Pilot

ENGINE
- MANUFACTURER: McDonnell
- TAKE-OFF HORSEPOWER: 30 lbs thrust
- DESCRIPTION: Ram jet

REMARKS
Army followed operational and engineering evaluation progress report of Air Force.

CONTROVERSIAL FIFTIES

YL- 24

Observation, Reconnaissance

AIRFRAME
- MANUFACTURER: Helio
- PERSONNEL: Pilot—3 passengers

ENGINE
- MANUFACTURER: Lycoming
- MODEL DESIGNATION: 0-435-17
- TAKE-OFF HORSEPOWER: 255
- DESCRIPTION: Horizontally opposed

PROCUREMENT DATA
- Delivered: 1952 (1 procured)

PERFORMANCE
- RANGE: 600 nautical miles
- CRUISING SPEED: 130 knots

REMARKS

This is a commercial machine and was procured for operational and engineering evaluation.

T-37A

Observation

AIRFRAME
- MANUFACTURER: Cessna

- PERSONNEL: Pilot and Observer

ENGINE
- MANUFACTURER: Continental
- MODEL DESIGNATION: XJ-69-T-15 (two)
- TAKE-OFF H.P.: 920 lbs thrust (each)
- DESCRIPTION

Turbo jet engine utilizing a steel axial inducer and an aluminum centrifugal compressor.

ELECTRONIC & COMMUNICATIONS EQUIP.: VHF, UHF, VHF, Omni Receiver

PROCUREMENT DATA: See Remarks

PERFORMANCE
- RANGE: 550 nautical miles
- SERVICE CEILING: 36,500 feet
- GROSS WEIGHT: 6,250 lbs
- CRUISING SPEED: 257 knots

REMARKS

This aircraft is a jet trainer procured by the Air Force. Three were loaned to the Army for evaluation as a long range artillery adjuster and for evaluation of low altitude high speed flight. Utilizes side by side seating with ejection canopy and seat features.

XH-17
Heavy Lift

AIRFRAME
MANUFACTURER — Hughes
PERSONNEL — Crew of 2, 1 engineer (test)

ENGINE
MANUFACTURER — General Electric
MODEL DESIGNATION — TG-180, (J-35) modified (two)
TAKE-OFF HORSEPOWER — 3,480
DESCRIPTION — Gas turbine, fixed shaft, gas producers for pressure jet (blade tip) operation

ROTOR
2 blade, 130' diameter, 68" chord, metal (main)

PROCUREMENT DATA — See Remarks

PERFORMANCE
GROSS WEIGHT — 46,000 lbs

REMARKS
The XH-17 was utilized as a test vehicle only. Army followed progress reports on this machine, the first attempt to produce a flying crane.

XH-39
Utility

AIRFRAME
MANUFACTURER — Sikorsky

PERSONNEL — Pilot—3 passengers
CARGO — 464 lbs

ENGINE
MANUFACTURER — Turbo Meca
MODEL DESIG. — Artouste 11-XT-51-T-3
TAKE-OFF HORSEPOWER — 425
DESCRIPTION — Gas turbine

ROTOR
4 Bladed, all-metal, articulated rotor 35' Diameter Main; 3 Bladed all-metal 6'4" Rotor Tail.

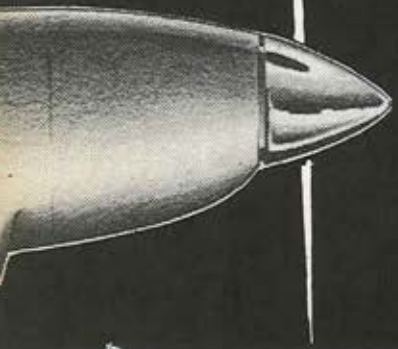
PROCUREMENT DATA — See Remarks

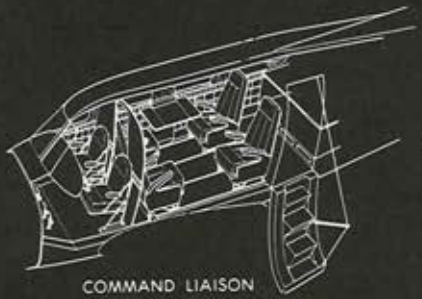
PERFORMANCE
RANGE — 230 nautical miles
SERVICE CEILING — 16,500 feet
GROSS WEIGHT — 3,361 lbs
CRUISING SPEED — 120 knots

REMARKS
The XH-39 is a modified Sikorsky YH-18 with the Artouste 11 engine installed. Used for engineering and high speed operational evaluation.

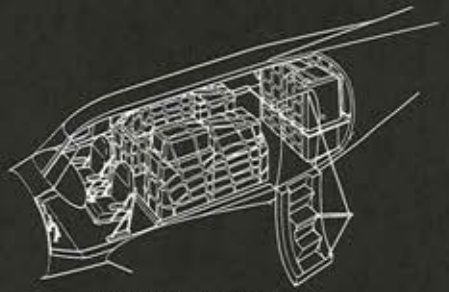
BEECH "IMAGINUITY" IN *Air Mobility*

POTENTIAL FOR
FUTURE DEVELOPMENT
ALREADY DESIGNED IN





COMMAND LIAISON
TRANSPORT



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ON TOUR WITH CESSNA'S NEW MINIMUM-MAINTENANCE HELICOPTER: CH-IC

Time: Midway in CH-IC cross-country demonstration tour. Place: High above military air base in Southwest. The pilot, demonstrating and explaining the CH-IC's high stability, was suddenly interrupted. "Did you say *all-mechanical?*" He did, and that is the wonder of this uncommon new aircraft: Free from the complexities and uncertainties that characterize traditional electronic stabilization systems, the CH-IC delivers stability with economy-of-maintenance and dependability until now unknown in hellicopter history.

CESSNA

Military Division

CESSNA MILITARY FLEET

YH-24

Reconnaissance, Evacuation

AIRFRAME
- MANUFACTURER: Seibel Helicopter
- PERSONNEL: Pilot—1 passenger

CONTROVERSIAL FIFTIES

ENGINE
- MANUFACTURER: Lycoming
- MODEL DESIGNATION: 0-290-D1
- TAKE-OFF HORSEPOWER: 130
- DESCRIPTION: 4 cyl., horizontally opposed, aircooled.

ROTOR
29' Diameter blade wood (Main); 74" 2 blade (tail)

PROCUREMENT DATA: See Remarks

PERFORMANCE
- RANGE: 85 nautical miles
- SERVICE CEILING: 4,300 feet
- GROSS WEIGHT: 1,540 lbs
- CRUISING SPEED: 50 knots

REMARKS
Two procured for operational and engineering evaluation.

YH-41 Seneca

Observation

AIRFRAME
- MANUFACTURER: Cessna
- PERSONNEL: Pilot—3 passengers

ENGINE
- MANUFACTURER: Continental
- MODEL DESIGNATION: FSO-526
- TAKE-OFF HORSEPOWER: 260
- DESCRIPTION: 6 cyl., engine, horizontally opopsed, mounted horizontal

ROTOR
2-Bladed, 35' Diameter Metal (Main); 2-Bladed, 7' Diameter Metal (Tail)

PROCUREMENT DATA
- Delivered: 1957 (10 procured)
- Manufacturer's Lead Time: 15 Months

PERFORMANCE
- RANGE: 270 nautical miles
- SERVICE CEILING: 12,200 feet
- GROSS WEIGHT: 3,000 lbs
- CRUISING SPEED: 82 knots

REMARKS
Procured for high altitude operation and engineering evaluation.


U.S.ARMY
25837


ARMY

YH-18

Utility

AIRFRAME

MANUFACTURER	Sikorsky
PERSONNEL	Pilot—3 passengers
CARGO	800 lbs

ENGINE

MANUFACTURER	Franklin
MODEL DESIGNATION	0-425-1
TAKE-OFF HORSEPOWER	245
DESCRIPTION	6 cylinder, opposed

ROTOR

3 Bladed, all-metal main rotor 39' diameter with 2 bladed, all-metal tail rotor 5'5" diameter

PROCUREMENT DATA — See Remarks

PERFORMANCE

RANGE	400 nautical miles
SERVICE CEILING	12,800 feet
GROSS WEIGHT	2,400 lbs
CRUISING SPEED	90 knots

REMARKS

The YH-18 was utilized by the Army for operational and engineering evaluation.

YH-30

Training, Obsn, Evacuation, Cargo

AIRFRAME

MANUFACTURER	McCulloch Motors
PERSONNEL	Pilot—1 passenger
CARGO	630 lbs

ENGINE

MANUFACTURER	Franklin
MODEL DESIGNATION	6A4-200-C6
TAKE-OFF HORSEPOWER	200
DESCRIPTION	6 cyl., horizontally opposed, aircooled

ROTOR

2 rotors same diameter, 3 blade, 22'

PROCUREMENT DATA — See Remarks

PERFORMANCE

RANGE	172 nautical miles
SERVICE CEILING	12,000 feet
GROSS WEIGHT	2,000 lbs
CRUISING SPEED	78 knots

REMARKS

Two procured for engineering and operational evaluation. Rotor hub now used on Hughes YHO-2. Side by side seating.

YH-31

Utility

AIRFRAME

MANUFACTURER	Doman
PERSONNEL	Pilot—3 to 7 passengers

ENGINE

MANUFACTURER	Lycoming
MODEL DESIGNATION	SO-580-D
TAKE-OFF HORSEPOWER	400
DESCRIPTION	8 cylinder

ROTOR

4 wooden blades (Main); 3 wooden blades (Tail)

PROCUREMENT DATA — See Remarks

PERFORMANCE

RANGE	390 nautical miles
SERVICE CEILING	5,700 feet
GROSS WEIGHT	5,200 lbs (8 places)
CRUISING SPEED	68 knots

REMARKS

Two procured for operational and engineering evaluation. Commercial designation is LZ-5.

CONTROVERSIAL FIFTIES

YH-32

Reconnaissance

AIRFRAME
- MANUFACTURER: Hiller
- PERSONNEL: Pilot—1 passenger

ENGINE
- MANUFACTURER: Hiller
- MODEL DESIG.: HR J2B Ram Jet (two)
- TAKE-OFF HORSEPOWER: 30 lbs thrust each
- DESCRIPTION: Ram jet, tip mounted

ROTOR
2 blade metal 23' diameter main rotor; Single blade-counter balance wooden tail rotor 32" diameter

PROCUREMENT DATA: See Remarks

PERFORMANCE
- RANGE: 24 nautical miles
- SERVICE CEILING: 11,500 feet
- GROSS WEIGHT: 1,080 lbs
- CRUISING SPEED: 61 knots

REMARKS
6 procured for operational and engineering evaluation.

YHO-1DJ

Reconnaissance

AIRFRAME
- MANUFACTURER: Djinn
- PERSONNEL: Pilot—1 passenger

ENGINE
- MANUFACTURER: Palouste
- MODEL DESIGNATION: Palouste Air Generator Model 4
- DESCRIPTION: Compressed air generator consisting of a turbine compressor unit.

ROTOR
Three all metal blades 35'5" in diameter

PROCUREMENT DATA: See Remarks

PERFORMANCE
- RANGE: 109 nautical miles
- GROSS WEIGHT: 1,671 lbs
- CRUISING SPEED: 46 knots

REMARKS
Procured for engineering and operational evaluation. First helicopter to receive new Army observation designation.

YHO-2HU (YH-42)

Observation, Training, Recon.

AIRFRAME
- MANUFACTURER: Hughes
- PERSONNEL: Pilot—1 passenger

ENGINE
- MANUFACTURER: Lycoming
- MODEL DESIGNATION: 0-360
- TAKE-OFF HORSEPOWER: Derated to 160
- DESCRIPTION: 4 cylinder, aircooled

ROTOR
3 blades, 25' diameter (main); 2 blades, 39.8" diameter (tail)

PROCUREMENT DATA: See Remarks

PERFORMANCE
- RANGE: 130 nautical miles
- SERVICE CEILING: 11,000 feet
- GROSS WEIGHT: 1,550 lbs
- CRUISING SPEED: 65 knots

REMARKS
Off-the-shelf procurement for engineering & operational evaluation.

CONTROVERSIAL FIFTIES

YHO-3BR

Observation

AIRFRAME
- MANUFACTURER: Brantley
- PERSONNEL: Pilot—1 passenger

ENGINE
- MANUFACTURER: Lycoming
- MODEL DESIGNATION: VO-360
- TAKE-OFF HORSEPOWER: 162
- DESCRIPTION: 4 cyl., vertically mounted, opposed type, air cooled.

PROPELLER
Brantley-designed two section, three bladed.

PROCUREMENT DATA: See Remarks

PERFORMANCE
- RANGE: 217 nautical miles
- SERVICE CEILING: 9,000 feet
- GROSS WEIGHT: 1,600 lbs
- CRUISING SPEED: 87 knots

REMARKS
5 procured for engineering and operational evaluation. The aircraft tested by the Army had skid gear in place of wheels.

CONTROVERSIAL FIFTIES

YHC-1A

Medium Cargo

AIRFRAME
- MANUFACTURER: Vertol
- PERSONELL: Crew of 3, 20 troops, or 15 litters
- PAYLOAD: 3,778 lbs

ENGINE
- MANUFACTURER: General Electric
- MODEL DESIGNATION: T-58-GE-6 (two)
- MIL POWER (ea.): 1,050 SHP
- NR POWER (ea.): 900 SHP

ROTOR
Two each tandem configuration. 3 Blade, 48'4" diameter, fully articulated, all metal construction.

PROCUREMENT DATA: See Remarks

PERFORMANCE
- RANGE: 100 nautical mile radius

- SERVICE CEILING: 13,000 feet
- GROSS WEIGHT: 15,550 lbs
- CRUISING SPEED: 135 knots

REMARKS
This is a scaled-down version of the HC-1B. Valuable engineering and operational data derived from this aircraft is being incorporated in the HC-1B. 3 procured for test.

YH-16B

Heavy Cargo

AIRFRAME
- MANUFACTURER: Piasecki

- PERSONNEL: Crew of 3, and 47 troops
- CAFGO: 8,500 lbs

ENGINE
- MANUFACTURER: Allison
- MODEL DESIGNATION: T-56-A-5 (two)
- TAKE-OFF HORSEPOWER: 2,100
- DESCRIPTION: Gas turbine

ROTOR
4 Bladed Metal, Fully Articulated Tandem Rotor, 82' diameter, 22" chord

PROCUREMENT DATA: See Remarks

PERFORMANCE
- RANGE: 175 nautical miles
- SERVICE CEILING: 15,600 feet
- GROSS WEIGHT: 46,700 lbs
- CRUISING SPEED: 124 knots

REMARKS
The YH-16A employed the T-38 engine, manufactured by Allison. This project was terminated in 1956.

THE OPTIMISTIC SIXTIES

Army aviation stands upon a solid foundation of acceptance and looks to the future with confidence. The state-of-the-art in aircraft design and production forecasts a significant future in which new and perhaps revolutionary concepts for the employment of organic aircraft will become quite commonplace. Future utilization plans are discussed along with research and development efforts and goals and logistics activities.

1960

Army Secretarial level backs Army request to Secretary of Defense for final assumption by Army of complete logistic responsibility. Secretary of Defense reviews plan for Army assumption of complete reasearch and development responsibility.

Army aircraft development and production systems management initiated by Chief of Transportation.

First HU-1 delivered to troops.

Mohawk AO-1 enters final engineering test stage.

First Caribou accepted by Army for extensive service test.

Army Aviation Requirements Review Board develops blueprint for future Army aircraft. Approved as planning guidance for 1960-1970 by the Chief of Staff and the Secretary of the Army.

Firm long range suppressive fire development program initiated with strong financial support.

Concurrent avionics programs developed to return coordinated weapons systems.

Military

OBJECTIVES IN THE SIXTIES

Looking at Army aviation in three phases: the "40's" when an infant was born out of wedlock and battled against the stigma of illegitimacy during and after World War II; the "50's" when the stimulus of Korea pushed the adolescent toward rapid maturity, with a growing recognition of latent capabilities of the helicopter; the "60's", in retrospect, may well be looked upon as the decade when Army aviation changed the very organization and tactics of the basic ground elements.

Army aviation starts this decade upon a firm foundation which makes it possible to look to the future with increased confidence. Today, more than 5,000 aircraft are operated by the Army. Each of the major combat units in the type field Army (division, corps, or Army headquarters) has an organic Army aviation element. Smaller aviation sections are found, as well, in certain of the combat support organizations.

In addition to these organic aviation elements, large numbers of aircraft are found in the Transport Aircraft Group which may be attached as required to any combat unit at field Army level, or for the conduct of a specific operation, to any combat unit below field Army level.

A requirement for Army aviation to support the Logistical Command has been recognized and proposed staffs and units have been established and are now awaiting approval.

It has not been difficult to find multiple uses for aviation. Rather, the problem has been to concentrate the limited means to accomplish priority tasks. In short, the Army has had to limit itself to goals attainable by realistic priorities.

While ground transportation will remain basic through this period, units, such as "air cavalry," will inevitably generate experience leading to other air-mobile organizations within the field Army. Rather than a large move involving say, a battle group, it is much more likely that the Army will be employing the smaller platoon and company-size air-mobile forces. The importance of a force that has this mobility may be all out of proportion to its size. Only by planning to use this type of force on every possible occasion will the Army realize its potential.

Concept under Test

At present, the Army is testing this concept. It effectively integrates reconnaissance units and Army aviation. Using armed aircraft, such units will be able to probe the gaps of the atomic battlefield by fire and movement. With their machine guns, rockets, and missiles, they can execute the battle tested device of reconnaissance by fire.

Unlike the fighter bomber, these units will operate habitually at or below tree top level, shooting generally from hovering positions close to cover, and delivering heavy concentrations of fire for short periods of

SEVEN SPEED AND TIME-TO-CLIMB SEVEN WORLD SPEED AND TIME-TO-CLIMB RECORDS WERE SET BY AN ARMY HU-1 IROQUOIS IN LATE MAY, 1960.

time. Aerial combat reconnaissance proposes a completely air-mobile combined-arms unit capable of performing all the conventional missions of cavalry with an air-to-ground and a ground-to-ground fighting capability.

So successful has been the armed helicopter concept that the Army has established a firm program for the development of the weapons and allied equipment. Instead of being weapon oriented as in the past, the program is now system oriented, the eventual goal being to design the weapon for the helicopter at its inception. CONARC has now approved increased participation by the Transportation Corps jointly with the Ordnance Corps in procurement, development, and test activities with the Transportation Corps monitoring.

The Army is fortunate to begin this decade with a logical blueprint for the future. The results of the *Army Aviation Requirements Review Board* and the follow-up actions on its recommendations are a guide to future procurement, organizational requirements, and personnel funding implications.

A ten-year plan such as this cannot possibly forecast all the imponderables that may affect it through the years. State-of-the-art advancements may well indicate a new aircraft which may offer significant advantages which cannot be ignored. Any radical change in the Army's personnel ceiling or budget will undoubtedly be reflected in changes in its aviation program.

The Army ten-year plan was based on a "status quo" assumption of personnel, funds, and political atmosphere. Within these parameters, the Army is convinced it has a sound and valid program—a program which establishes goals that year by year give an index of whether it is progressing or retrogressing from its air mobility aims.

The OPTIMISTIC SIXTIES

As new hardware of greater reliability and reduced maintenance requirements comes into the system, we will see greater acceptance of air mobility as a *standard* means of movement. This change in the state-of-the-mind is as important as the new hardware itself. The technical advancements in the state-of-the-art must be matched by similar advances in air-minded concepts if the Army is going to exploit its real potential.

Organization Objectives

Organizationally, the Army hopes to move toward these basic objectives:

1. Each Division to have the capability of moving at least a Company of Infantry by its organic airlift.
2. Each Division and each Cavalry Squadron to have an organic Aerial and Reconnaissance Troop.
3. Aerial Surveillance to match its firepower, at each echelon.
4. Rapid purification of inventory to reduce the type of aircraft to the essential family.
5. Acquisition of a limited number of flying cranes.
6. Increased logistic capabilities as represented by the *Caribou/Chinook* team and any possible successor.

If this forecast of the future appears overly optimistic, one only has to look back at 1950 to recognize that such growth is realistic and feasible.

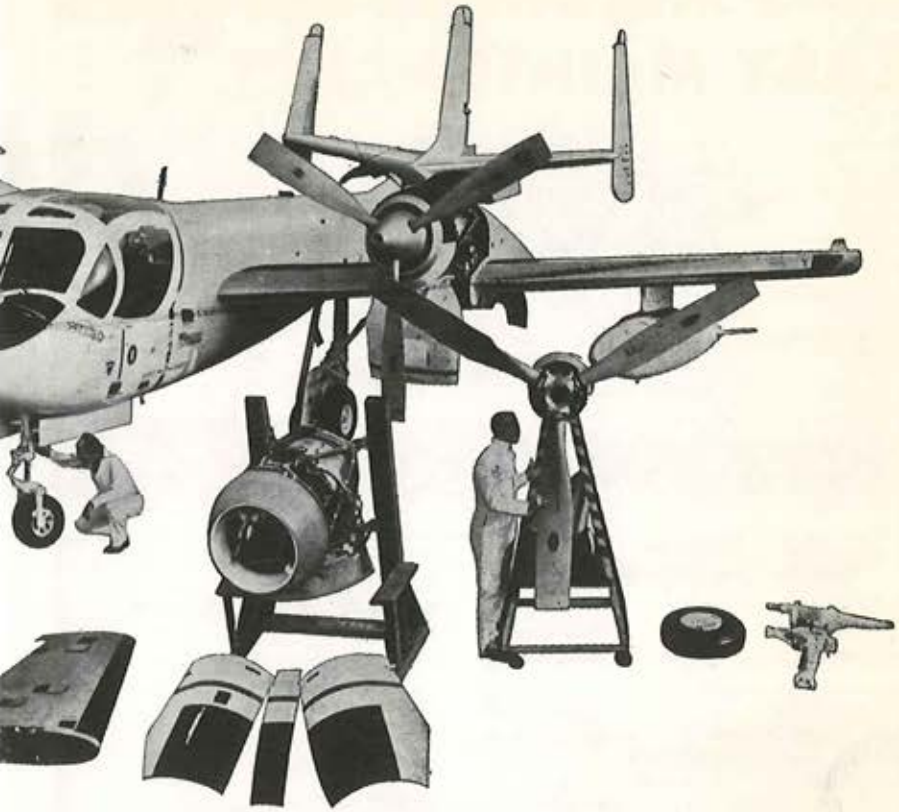
AO-1 MOHAWK FEATURES EASY MAINTENANCE

Grumman's AO-1 Mohawk, new Army observation plane, was designed for short take-off and landing, operation from rough fields, high maneuverability, and maximum visibility for the two-man crew. Since it will live in the field with today's pentomic Army, ease of maintenance is essential . . . and here's how the Mohawk meets maintenance requirements:

1. **INTERCHANGEABILITY**—Left- and right-hand components on the Mohawk are interchangeable, including tail surfaces, engine power plant packages, landing gear.

2. **SERVICEABILITY**—Engines on the Mohawk, including accessories, can be changed with standard tools—a minimum of special tools is required. That's what you call easy serviceability!

3. **ACCESSIBILITY**—75% of the Mohawk opens up for maintenance in a matter of seconds, and this is done entirely by hand. And this is accomplished at ground level, thus eliminating aircraft stands, ladders, and other paraphernalia often unavailable in the field. That's what you call easy maintenance!



GRUMMAN MOHAWK

Grumman Aircraft Engineering Corporation, Bethpage, L. I., N. Y.

AO-1 Mohawk
Combat Surveillance

AIRFRAME

MANUFACTURER	Grumman
PERSONNEL	Pilot—1 passenger

ENGINE

MANUFACTURER	Lycoming
MODEL DESIGNATION	T-53-L3 (two)
TAKE-OFF SHAFT HORSEPOWER	960
DESCRIPTION	Free-shaft, turbo prop, gas turbine

PROPELLER

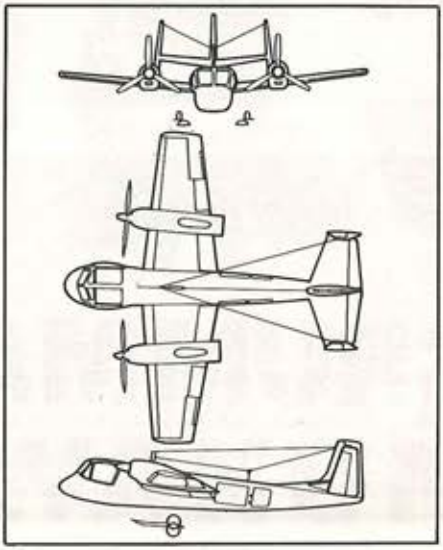
Hamilton-Standard, reversible pitch, three-bladed hydromatic propellers

PERFORMANCE

RANGE	400 nautical miles
SERVICE CEILING	25,000 feet
GROSS WEIGHT	11,860 lbs
CRUISING SPEED	200 knots

REMARKS

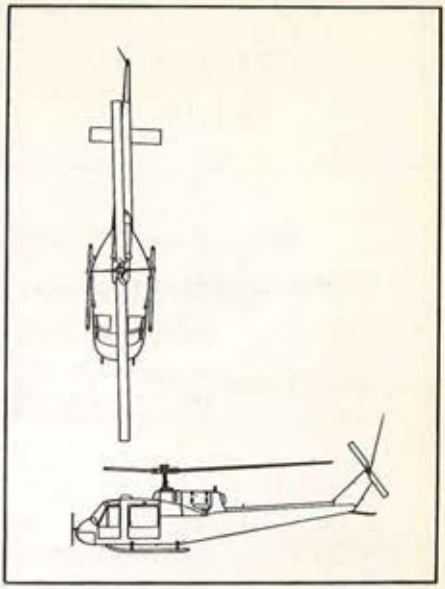
The electronic equipment varies with each configuration resulting in a change in gross weight, performance, and cost. The AO-1A is the visual and photographic aircraft and the AO-1B has the AO-1A equipment plus a side looking radar, and the AO-1C has the AO-1A equipment plus infrared detection equipment.



The first two production aircraft are scheduled for delivery to the field for operational use in April 1961.

HU-1A Iroquois

Utility Tactical Transport



AIRFRAME

MANUFACTURER	Bell
PERSONNEL	
Pilot—5 passengers, or crew of 3 & 2 litters	
CARGO	800 lbs (@ 5,908 GW)

ENGINE

MANUFACTURER	Lycoming
TAKE-OFF HORSEPOWER	860
DESCRIPTION	Gas turbine, free shaft

ROTOR

2-Blade, 43'9" Diameter, Bell metal interchangeable (Main); 2-Blade, 8'5" Diameter, Bell metal interchangeable (Tail)

PERFORMANCE

RANGE	200 nautical miles
SERVICE CEILING	14,800 feet
GROSS WEIGHT	5,950 lbs
CRUISING SPEED	100 knots

REMARKS

This helicopter is the first helicopter to be designed specifically to meet DA requirements. Many ease-of-maintenance features have been incorporated, such as: quick disconnects on all major components, winged dzus fasteners on engine cowling, one-half hour engine change capability, no requirement for special tools, built-in work platforms, and provisions for mounting of engine, rotor, and transmission hoist.

First production aircraft went to 101st Airborne on September 11, 1959.

OPTIMISTIC SIXTIES

HU-1B Iroquois

Utility Tactical Transport

AIRFRAME
- MANUFACTURER: Bell
- PERSONNEL: Pilot—5 passengers, or crew of 3 & 2 litters
- CARGO: 800 lbs (@ 6,532 GW)

ENGINE
- MANUFACTURER: Lycoming
- MODEL DESIGNATION: T-53-L5
- TAKE-OFF HORSEPOWER: 960
- DESCRIPTION: Gas turbine, free shaft

ROTOR
2-Blade, 44' Diameter Bell Metal Interchangeable (Main); 2-Blade, 8'5" Diameter Bell Metal Interchangeable (Tail)

ELECTRONIC & COMMUNICATIONS EQUIP.
UHF, FM set, Interphone, Emergency Radio, VOR, ADF, FM Homer, IFR, Gyro Compass, Marker Beacon.

PERFORMANCE

RANGE	200 nautical miles
SERVICE CEILING	13,700 feet
GROSS WEIGHT (Design)	6,600 lbs
CRUISING SPEED	100 knots

REMARKS

The fuselage configuration of the HU-1B is essentially the same as the HU-1A. The prime difference between the "A" and the "B" lies in the improved dynamic components which give the HU-1B improved "hot day" performance.

First HU-1B production aircraft scheduled for operational use in April 1961.

HU-1D Iroquois
Utility Tactical Transport

AIRFRAME
MANUFACTURER — Bell
PERSONNEL — Pilot, co-pilot, 11 troops, or 6 litters

ENGINE
MANUFACTURER — Lycoming
MODEL DESIGNATION — T-53-L9
TAKE-OFF HORSEPOWER — 1,100
DESCRIPTION — Gas turbine, free shaft

ROTOR
2 blade, 44' diameter Bell Metal Interchangeable (Main); 2-Blade, 8'5" diameter Bell Metal Interchangeable (Tail)

PERFORMANCE
RANGE — 250 nautical miles
SERVICE CEILING — 13, 700 feet
GROSS WEIGHT (Design) — 6,600 lbs
CRUISING SPEED — 105 knots

REMARKS
A development program for the HU-1D was initiated during FY 1960. The HU-1D will have the same dynamic components as the HU-1B but will have a slightly different fuselage configuration. In addition to the pilot and co-pilot, this aircraft will be capble of carrying 11 troops.

OPTIMISTIC
SIXTIES

L-23F
Utility Transport

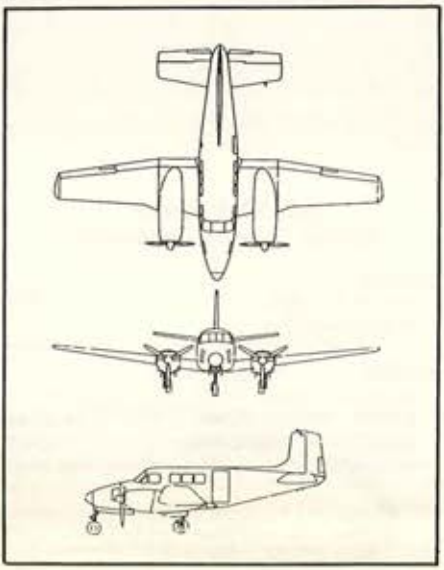
AIRFRAME
MANUFACTURER — Beech
PERSONNEL — Pilot, co-pilot,—4 passengers

ENGINE
MANUFACTURER — Lycoming
MODEL DESIGNATION — IGSO-480-A1A6
TAKE-OFF HORSEPOWER — 340
DESCRIPTION
6 cyl., horizontally opposed, aircooled, supercharged with fuel injection.

PROPELLER
Hartzell 3-bladed, constant speed, hydraulically-controlled, full feathering propellers

PERFORMANCE
RANGE — 1,180 nautical miles (65% pwr @ 10,000)
SERVICE CEILING — 25,000 feet
GROSS WEIGHT — 7,368 lbs
CRUISING SPEED — 177 knots (65% pwr @ 10,000)

REMARKS
Basically, this is an L-23D with a redesigned fuselage with ground level loading and airliner type seats.



AC-1 Caribou

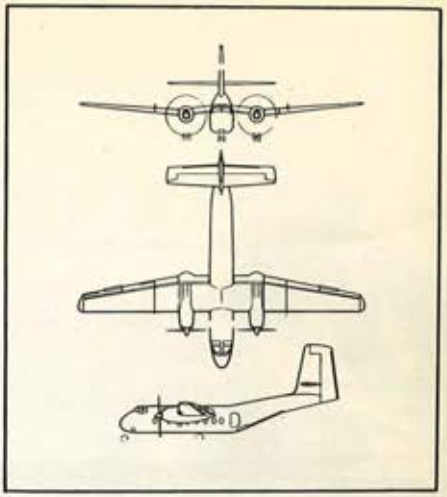
Transport

AIRFRAME
- MANUFACTURER: De Havilland
- PERSONNEL: Pilot, Co-pilot, or Crew member, 32 Passengers, or 24 Troops or 14 litters and 8 troops
- CARGO: 6,000 lbs

ENGINE
- MANUFACTURER: Pratt and Whitney
- MODEL DESIGNATION: R-2000-13
- TAKE-OFF HORSEPOWER: 1,450
- DESCRIPTION: 14 cyl., radial engine

PROPELLER
Hamilton-Standard constant speed, hydromatic propellers

PERFORMANCE
- RANGE, Combat (1½ ton + payload): 1,145 nautical miles
- SERVICE CEILING: 27,500 feet
- GROSS WEIGHT: 26,000 lbs
- CRUISING SPEED: 131 knots



REMARKS

Five of this type aircraft are undergoing service tests. 1st aircraft scheduled for delivery to operational units, May 1961.

HC-1B Chinook

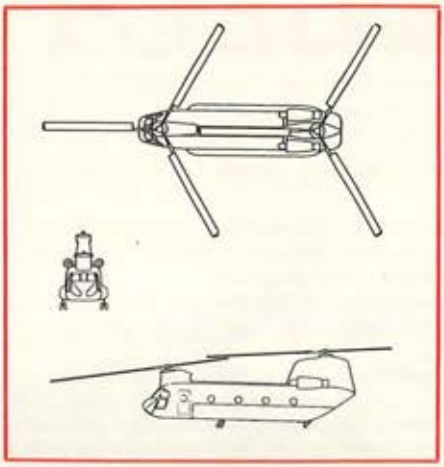
Transport

AIRFRAME
- MANUFACTURER: Vertol
- PERSONNEL: Pilot, Co-pilot, Crew Chief & 33 troops or 24 litters
- CARGO: Pilot, Co-pilot, Crew Chief and 2-3 tons, depending on conditions and mission

ENGINE
- MANUFACTURER: Lycoming
- MODEL DESIGNATION: T-55-L-5 (two)
- TAKE-OFF H.P.: 2,200 SHP (Mil Power) 1,850 SHP (NRP)

ROTOR
2 Rotors—Tandem; Blades—3/Rotor Diameter 59'

PERFORMANCE
- RANGE: 100 nautical miles radius
- SERVICE CEILING: 18,900 feet
- GROSS WEIGHT: 26,600 lbs
- CRUISING SPEED: 130 knots



REMARKS

Will carry Pershing Missile System Components. 1st Troop issue scheduled for 3rd Quarter FY 62. Replacement aircraft for the medium transport helicopter (H-37A).

a review of army aviation

ELECTRONICS

While reporting on electronic equipments utilized in the 40s and the 50s, the Signal Aviation Program Manager, Colonel John L. Leidenheimer, of the Office of the Chief Signal Officer, casts an eye toward the 1960 decade and predicts the ultimate in the provision of Signal support

EARLY ARMY AVIATION

One of the weapons of a modern Army is aviation—aviation to provide mobility, to obtain intelligence, to direct the Army's firepower. But aircraft are like eyes, which have worth only when they can communicate with the brain and thus aid in actions accomplished by the body.

Army aviation at its birth had the problem of communication. Utilized primarily for artillery fire direction during World War II, the umbilical cord to the fire direction center consisted of the battery operated ground radios. The radio was not a part of the aircraft and was often simply bolted to it. Although this equipment lacked flexibility, range, and other essentials of dependable communication, a remarkable task was accomplished. Indeed, enemy supply lines often ground to a halt due merely to the presence of the yellow Cub in the sky.

The L-4 and L-5 were used exclusively during contact flight conditions, as they lacked the essential instruments for blind flight. Hence, they required no sophisticated navigation capability nor air traffic control communications. They usually operated within sight of the parent unit, so identification did not become a major difficulty. Thus remained the Army liaison plane and its mission, until the advent of the Korean War. Even though during the interval between 1945 and 1950 new aircraft were being procured, these craft maintained many of the features of the first liaison plane and

New BLC-130 takes off or lands in five times its own length

the population of Army aircraft remained small. The Army Commanders, however, were finding new uses for their aircraft. New weapons were being developed—weapons less dependent on weather, on the light of day, and even on the exact knowledge of an enemy's location—and the Army found new dimensions in the mobility of its aircraft. New aircraft were purchased to meet new needs. They were commercial types, but they began to bear less resemblance to the J-3 Cub. And with new concepts came new requirements for electronics—communication, navigation, automatic stabilization, instrumentation, identification, air traffic regulation!

With the demand for more comprehensive aircraft utilization, new policy had to be established. In 1952 a joint Memorandum of Understanding established Army aviation's role in the nation's defense. This brings the history of Army aviation electronics to the Korean period.

KOREA

During the early period of Army aviation there was one effort in the R & D field, initiated by the U.S. Air Force, to develop a light-weight grouping of equipment to meet the requirements of small aircraft. Although considerable Air Force time and money went into this research effort, the outbreak of the Korean War found the Army in very nearly the same situation as existed at the close of World War II. Only a few Army aircraft in service at the time had radios, and the field expedient of installing ground sets to meet the requirements of the observation role was again necessary.

There had been some advances in the family of ground FM radios, which made the task of supplying supporting communications in the observation aircraft somewhat less difficult than that experienced during World War II. Still no overall ser-

vice effort was orientated to the specific problem of Army aviation electronics. The L-17 had only recently been delivered with installed radios, but the electronic package consisted of commercial equipment. No standardization and little maintainence back-up were considered at the time of procurement. This further complicated the problems of Army aviation.

ARMY "AVIONICS"

November 4, 1952 marked the beginning of a concentrated effort to provide the electronics required in support of the ever increasing Army aviation roles. The Memorandum of Understanding of that date between the Secretary of the Army and the Secretary of the Air Force relating to the Army's organic aviation clarified the purpose of Army aviation and provided the impetus necessary to establish a true Aviation electronic (avionics) program.

The Signal Corps inherited the research and development of the light-weight Avionics package (AN/ARC-22) of the Air Force. This system incorporated these components: FM tactical communication and homing equipment, a VOR set, a marker beacon receiver, and VHF-UHF communications sets. The development of the FM tactical set (AN/ARC-44) and the homing unit (AN/ARA-31) were sufficiently advanced during the Korean conflict that a production contract was awarded, resulting in a user test model in 1954. By 1956 the first production line installation had been made of a service developed equipment designed to meet Army requirements. However, the rest of the AN/ARC-22 was not adopted by the Army.

Within the Army Signal Research and Development Laboratory at Ft. Monmouth, N.J. and the Army Electronic Proving Grounds at Ft. Huachuca, Arizona, R & D and evaluation work in support of the

Army Aviation Program was initiated with the aim of developing equipments to replace the existing commercial electronics then in use. The Korean action and the delayed availability of the Air Force-Signal Corps developed AN/ARC-22 had forced dependence on commercial gear. One was unlikely to find any two aircraft with the same electronic packages. The Aircraft Radio Corporation (ARC) Type 12 VHF set had found its way into the L-17, L-19, H-13, and H-19 aircraft but here the electronic configuration standardization ended.

By the end of hostilities the Army aircraft had installed equipments to meet the FM tactical Communications role (The SCR-619 and AN/PRC-8, 9, and 10 ground FM sets), VHF communications, Low Frequency Navigation (Manual loop and ADF in some aircraft), and VOR navigation equipments.

POST KOREA GROWTH

The impact of Army aviation on the conduct of war in Korea clearly highlighted the need to expedite development of Avionics equipment, to provide the 3rd dimension of battle with military equipment capable of enhancing its goals.

The post-Korea period also ushered in the DOD requirement for all military aircraft to convert from VHF to UHF. Had it been possible to apply UHF universally in Army aircraft the problems encountered would have been considerably lessened. Though today the conversion is almost completed for CONUS aircraft, operational necessity requires the use of VHF and HF radios in many parts of the world.

A major retrofit program has resulted in a complete electronic configuration change since the end of the Korean War. All Army aircraft are now equipped with UHF, VHF, or HF operational communication sets and many have emergency standby sets. All tactical in-service aircraft and all new aircraft have FM tactical communications as an integral part of the aircraft. For navigation both low-medium frequency, ADF, and VOR equipments and improved instrumentation have been installed. Many aircraft, both fixed wing and helicopter, now have electronic augmented stability. Retrofit of IFF is also well underway.

COLONEL
JOHN L. LEIDENHEIMER

The demand for all-weather operation of Army aircraft has resulted in varied and complex electronic systems to insure Army aircraft operation in the tactical environment while retaining a suitability for operations in the common systems. The Signal Corps has now established interim configurations to provide tactical and common system compatibility for all areas in which the U.S. Army is operating. The varied equipments required and the limited standardization have resulted in major logistic, training, and maintenance problems. To relieve the situation the Signal Corps and the Transportation Corps have established a Configuration Standardization Group with the aim of reducing the number of different configurations. Progress has been made in this area and future aims are a reduction of the number of configurations by 50%.

Model T-22-RA High Frequency Transceiver by SunAir – for long range communications.

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$2,395* COMPLETE with shock-mount, remote control head, full 44-crystal complement and power supply.

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- Powered by exclusive SunAir solid-state transistorized unit
- Improved etched circuit and hermetically sealed relays
- WEIGHS ONLY 15 POUNDS
- 22 Crystal-controlled channels —simplex or duplex operation
- 2,000-15,000 kcs.
- Ranges over 2,500 miles are common
- Size: ½ ATR

*Subject to Change. F.O.B. Ft. Lauderdale, Florida, U.S.A.

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FUTURE ELECTRONICS

As wars are fought with "the tools at hand," continued research and development is of utmost importance. Especially so in this day of rapid advancement in the state-of-the-art. As long as potential enemies exist, not only must research be continued to meet their best with better, but our Army must be equipped with the fruits of our developments, and production facilities capable of rapid expansion must be maintained. To this end the Signal Corps, based on the experiences of World War II and Korea, is maintaining a program of avionics research, development, and aircraft modernization.

Many results of the Signal Corps programs of recent years will become apparent to using units in the near future. Some illustrations of developments nearing completion are:

R-737/ARN
Marker Beacon Receiver
Weighs a fraction of previous receivers and consumes much less power and space.

AN/ASW-12 (V)
Automatic Flight Control System
A single series of equipment that will be tailored into all Army aircraft requiring stability augmentation, it is lighter and more efficient than its predecessors.

AN/ARC-54
VHF FM Transceiver
Lighter and more powerful than the AN/ARC-44, it provides frequency coverage and channelization compatible with new tactical radios and furnishes improved homing capabilities.

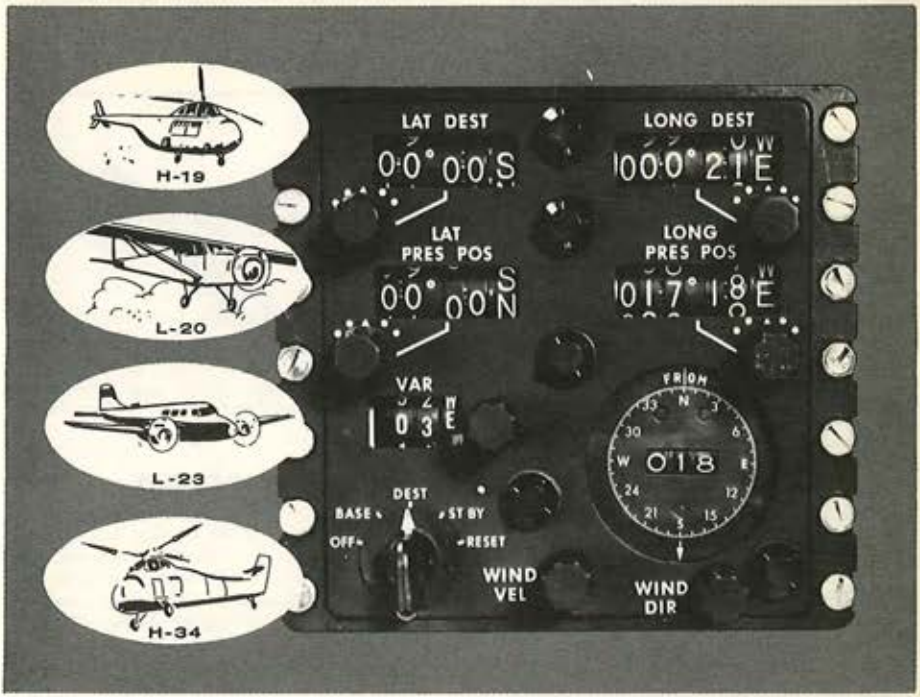
In addition to these electronic systems the Signal Corps is developing many other systems ranging from self contained doppler navigators to flight operations centers. Also, continuing research programs are being conducted to provide lighter, more compact, more reliable avionics in all areas, ground as well as airborne. Improved tactical airspace utilization is being studied; simplified means of maintenance and aero-mobile maintenance systems are being investigated and improved means of logistic support are being developed. Aircraft installations are being studied with a view to simplification, reduction of retrofit difficulties and standardization.

The U.S. Army Signal Corps in keeping with its policy of providing the field commander with the best possible communication, surveillance, and other electronic devices will continue to stay abreast of the requirement to improve Army aviation's capabilities.

Typical Flight Operations Center

cppc SYSTEMS DIVISION

IS IN THE ARMY TOO!



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CPPC Navigational Computers with Doppler tie-in provide:

- Continuous Latitude Longitude Present Position
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- Automatic Display of Wind Velocity and Direction
- Steering Information
- True Ground Track

cppc SYSTEMS DIVISION

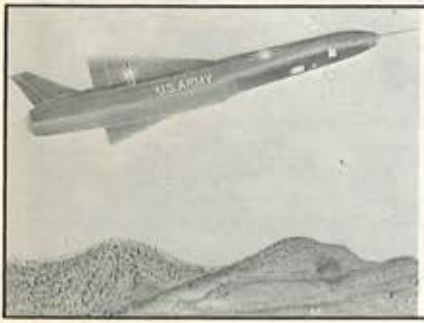
CLIFTON PRECISION PRODUCTS CO., INC., CLIFTON HEIGHTS, PA.

AN/USD-1 DRONE

The AN/USD-1 airborne combat surveillance drone presently issued to the Divisions to give them an interim unmanned surveillance capability. Manufactured by Radioplane, the SD-1 can carry a camera and is capable of being launched from a zero length rail.

AN/USD-2 DRONE

Manufactured by the Aerojet-General Corporation, the AN/USD-2 drone is being developed to perform the Division drone mission. This model will be able to carry a variety of airborne sensors and will eventually replace the SD-1 drones.



AN/USD-4 DRONE

An artist's conception of the medium endurance drone, the AN/USD-4, to be manufactured by the Republic Aviation Corporation. Expected to be an optimum all-weather endurance surveillance system, this high speed drone will be used at Corps and higher headquarters.

AN/USD-5 DRONE

The AN/USD-5 long endurance drone now under development to fulfill the surveillance requirements of the field Army. Manufactured by Fairchild, the USD-5 will have a zero launch capability, and contain a variety of cameras, radar, and infrared equipment.

LOGISTICS

Less glamorous but most vital is the work-a-day role of aviation logistics. The difficulties, successes, and future plans for improving this aspect of the program should be of vital interest to all concerned with the future success of Army aviation.

The Transportation Corps has been assigned the basic responsibility for supply and maintenance of Army aircraft. Other Technical Services have a vital part to play in the overall logistic support of Army aviation. The Signal Corps furnishes electronic support; the Quartermaster General provides fuel; Ordnance the weapons; and the Corps of Engineers designs, constructs, and maintains the airfields.

The Army aircraft supply and maintenance support was extremely difficult to carry out under the original split of responsibilities between the Army and the Air Force. The Army was charged with requirements, computation, funding, storage, and issue of supplies, and maintenance at the field level, but the Air Force retained procurement, development, storage, issue, and maintenance at Depot level.

The deficiencies in this division of effort were finally recognized by Department of Defense and in 1956 the Army was given complete responsibility for all levels of budgeting, storage, and issue of supplies, and maintenance of Army aircraft. The period of transition of these functions from Air Force to the Army was characterized by a series of problems caused primarily by the assumption of practices common to the Air Force but strange to the Army, and by the hiring of technicians who had been trained in the Air Force's way of doing business.

Today, the aviation supply system in the Army generally conforms to the same practices and is amendable to the same regulations as all other supplies within the Army. The structure of the maintenance of aviation equipment also largely conforms to the standard maintenance patterns for other types of Army equipment, with the possible exception of the extensive use of commercial contractors both in depot overhaul and, to a lesser degree, in the field maintenance. This use of contractors at depot level has pointed out one deficiency in our present system.

The Department of Defense and the Army are both cognizant of a need for an in-house capability for depot maintenance in Army aviation. They have decided that a plan be developed for phasing this capability into the system to give the Army an emergency ability to overhaul critical components and to provide a practical training ground for cadres of depot military personnel when they are required in theaters of operation. While no final steps have been completed, the Army has developed and completed its plans and is prepared to move.

AN ELECTRONIC DATA PROCESSING SYSTEM INSTALLED AT TMC, ST. LOUIS, SPEEDS REQUISITIONS FOR PARTS AND SUPPLIES TO USERS.

The OPTIMISTIC SIXTIES

The concept of maintenance of Army aircraft is based on the principle of getting the maintenance support forward to the using unit in order to return any aircraft to the using unit as rapidly as possible.

Transportation Corps units are organized to perform all field and depot maintenance in the theater, from the detachment which is organic to the combat division to the Depot Maintenance and Supply Battation which is normally under the Communications Zone or rear area commander. Present maintenance in the overseas theaters operates with these troop organizations, but the depot maintenance is reinforced by local hire of civilians and by overhaul contracts with industry.

There is some notable difference in the management of maintenance within the continental United States. The major Army commanders have responsibility for the organizational and field maintenance which is exercised through command channels to units and to posts, camps, and stations.

Organizational maintenance is performed by military personnel within the units operating the aircraft, but third echelon maintenance shops are normally non-TOE facilities operated with tools and equipment and personnel organized under a table of distribution and tables of allowances. The personnel are generally civilians hired under Civil Service regulations.

The responsibility for fourth echelon aircraft maintenance within the United States was assumed by the Transportation Corps effective 1 July 1958 and is accomplished at maintenance shops located at General Depots.

The aircraft supply system overseas operates under the concept that a small stock of fast moving parts plus "insurance" items will be maintained at the using level, with each echelon above carrying replenishment stocks and items not stocked in theaters being forwarded by electronic transmission through the Overseas Supply Agency in the United States to the responsible Inventory Control Point.

This system, the *Army Field Stock Control System,* was developed in order to improve the economical distribution of secondary items, with particular emphasis on repair parts and the objective of assuring an adequate amount of supplies in the proper place and at the proper time without overstocking at any point of supply.

The system, employing a selective stockage plan at all echelons of supply, is based upon true consumption demand experience. Stocks are maintained in direct relationship to the demands of the consumer. The same basic system is followed in the United States, with requisitions being forwarded through the maintenance channels to the National Inventory Control Point.

The basic problem of computing requirements for procurement of parts to fill future demands for new aircraft entering the system cannot be met through the normal use of demand data. Here, a system of provisioning is required which permits Army representatives to work with a contractor to make an engineering determination of what parts will be reparable, at what maintenance level it will be repaired, and how many flying hours it will last. With this information, determination can

THE

TEST

OF TIME

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LIVERED IN 1948 – IS STILL PER-
FORMING DEPENDABLE DAILY SER-
VICE OVER THE ROUTES SERVED BY
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CF-FHB, the original Beaver pro
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Much of the service performed by
this venerable Eager Beaver has beer
along the mountainous Pacific Coast, op
erating from salt water – as a seaplan
landing on glacial ice – and from moun
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16 seconds).

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1,500 BEAVERS HAVE ROLLED OF
D.H. CANADA'S ASSEMBLY LINES

Today's Beaver is virtually identi
cal to CF-FHB. No major modification
have been necessary since the first pro
totype was originally built.

DE HAVILLAND AIRCRAFT OF CANAD
DOWNSVIEW ONTARI

operational theatre: the world

The Iranian government, the Colombian airforce, the kingdom of Yemen, a police force in Indonesia are remotely situated on the global map. Yet these entities, as well as the governments of Vietnam, Argentina, Pakistan and many others, have at least one interest in common with the United States Army, the U.S.A.F. and the N.A.S.A. All depend on Aero Commander for safe, fast transportation.

Whatever, wherever its assignment, Aero Commander accomplishes each mission with maximum flight safety. Aero Commander provides versatile adaptability as V.I.P. transport or for high priority cargo. Or as a twin engine transition, instrument and navigational trainer. Aero Commander is equally adaptable to ambulance duty, search and patrol, supply drop, radar and photo reconnaissance and aerial survey. Its stability and performance are unparalleled by any twin in its class.

Pictured above is the all-new 8,000 lb. Aero Commander 680F with Lycoming IGSO-540 380 hp fuel injection engines, over-the-wing exhausts, and super-quiet interior. Write Military Relations Department for details on all models.

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MOBILE MAINTENANCE VANS KEYED TO MISSION REQUIREMENTS PROVIDE IMPROVED COMBAT ZONE FIELD MAINTENANCE SUPPORT.

be made as to what and how much to buy for maintenance support before the first aircraft comes off the production line.

The range and quantity of parts selected during provisioning and the maintenance and allowance factors initially established to support a new aircraft are recognized as estimates at best. It is highly desirable that these estimates be confirmed at the earliest practical date, or that they be revised promptly, based upon experience with the new aircraft.

For this purpose, the *Transportation Aircraft Test and Support Activity* operates at Fort Rucker, Ala. This organization conducts logistical and related test programs for new end items and components of aviation equipment. Testing consists of both accelerated and nonaccelerated flying hour programs on new and in-service aircraft as well as of evaluation of support equipment and tools. The tests are performed to obtain data on parts usage and adequacy of the initial parts procurement, but are also used to determine overall costs of operating the craft to include fuel, oil, and lubrication, inspection requirements, and many other items.

Among the tools of management in the supply and maintenance field is one that is also used by top level operational managers. That is the *Flying Hour Program*. This program, which establishes the number of hours each type of aircraft will be flown during the year, is one of the most important tools we have today for management and programming of logistical support of Army aviation. It provides one of the bases for computation of the initial requirements at the time of provisioning, for replenishment procurement, for preparation of repair schedules, and the establishment of overhaul contracts and for budget justification.

The OPTIMISTIC SIXTIES

All the tools of management still leave some problems to be faced by the logistician:

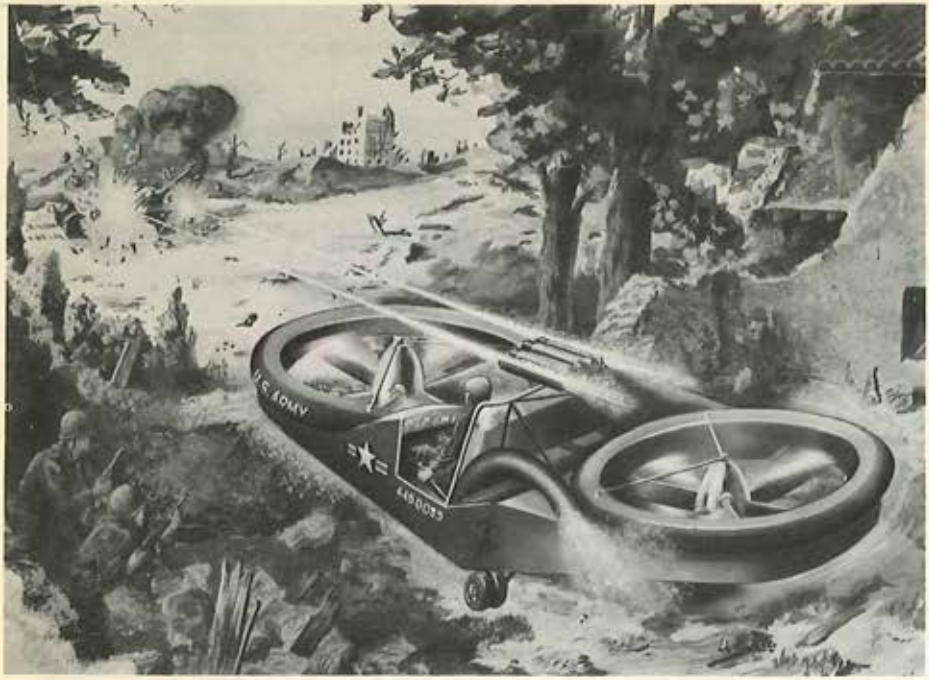
a. The Army still depends on the Air Force for procurement and engineering of end items. The Army Secretarial level is backing a request to the Secretary of Defense for final assumption by the Army of complete logistical responsibility, including these elements.

b. The Army still needs an in-house capability for depot overhaul to facilitate training. Effective steps to eliminate this weakness are being taken.

c. The Army must improve its identification of individual parts, its control of reparables, and even its selection of end items for overhaul, Positive actions are under way on all of these.

d. The Army has initiated a plan for expanding its systems management to encompass Army aircraft production and development.

The trend toward fewer models and types of aircraft and the standardization of repair parts between aircraft are each aids in solving logistics problems. Our logisticians and materiel managers are rapidly gaining experience. The expanding program is attracting more highly skilled technicians. Changes are required, and changes will be made, to assure that the Army aviation fleet of the 1960's will be receiving even better logistical support than today.



have airjeep with gun . . . will travel!

- **minimum silhouette**
  Lower than a doughboy, shorter than an Army truck, the Piasecki airjeep finds easy concealment behind ground-hugging hedges and brush.

- **weapon capability**
  Ideal firing platform for rockets, recoilless rifles, guided SS missiles and Davy Crocketts.

- **maximum mobility**
  Flies easily over, around or under any natural or man-made obstacles. Drives on the ground.

- **immediate transportability**
  Flies in a C-130, stows on decks, piggybacks on flatcars or trailers.

PIASECKI AIRCRAFT **corporation**

pioneers in vertical flight · International Airport, Philadelphia, Pa.

TECHNICAL FORECAST . . .

. . . For the next ten years in Army aviation

The shape of Army air vehicles which will be seen coming into the inventory during the next ten years will depend upon the resources which are made available to the Army to implement the recommendations of the *Army Aviation Requirements Review Board,* commonly referred to as the "Rogers Board."

This now popular term "Rogers Board" refers to the group of officers headed by *Lt. General Gordon B. Rogers,* of CONARC, who have written the latest chapter in the long history of cooperation between the U.S. Army and American industry.

This latest chapter started last fall when the U.S. Army invited industry to participate in studies of the types of air vehicles which should be developed to meet the requirements for the modern Army of the future. In a meeting held at CONARC, the Army outlined the present and future missions to be accomplished by Army aviation. These were divided into three separate areas:

The first area, from the standpoint of payload, was *the observation mission,* which is now performed by the familiar Bell H-13 and Hiller H-23 type helicopters and Cessna L-19. The second area was an extension of the range and penetration of the *surveillance mission* capable of being performed by the Grumman AO-1 *Mohawk.* The third area was the *transport area,* for which the Army sought to determine whether it was timely to plan for a single V/STOL aircraft as a replacement for the De Havilland AC-1 *Caribou* airplane and the Vertol HC-1 *Chinook* helicopter team.

For each of the missions, the Army prepared descriptive material which outlined the mission, including payload, types of terrain and weather, and any specific design features required. This material became known as the *Army Study Requirements,* (ASRs).

ASR 60-1 described the observation mission, ASR 60-2 the surveillance mission, and ASR 60-3 described the transport mission. These ASRs were not military characteristics, but a summary of current capabilities and missions to be performed now and in the future. They gave industry a complete picture of the job to be done, not the type of equipment desired.

Based upon the Army statement of the job to be done, industry studied all types of vehicles which might, within the 1960-1970 time period, be available to meet the Army requirements. These studies included all of the aspects of the vehicle and supporting equipment.

Typical operational missions were shown; design features described in detail; and production and maintenance costs were estimated. The types of air vehicles shown included autogyros, helicopters, compound helicopters, all types of Vertical Take-off and Landing (VTOL) air vehicles, and Short Take-off and Landing (STOL) airplanes.

The ideas submitted covered the complete spectrum of technical possibilities as it is known today. From this complete spectrum of technical possibilities the Army selected the area, and within the area, the general type of vehicle for which military characteristics would be prepared for a design competition to be initiated with Fiscal Year 1961 funds.

The Army selection of mission and type was a three step process. First, all of the information was submitted to a technical review to verify and correlate the data. Aeronautical engineers from the Langley Laboratory of the National Aeronautics and Space Administration assisted the personnel from the U.S. Army Transportation Research Command at Ft. Eustis in this verification and correlation of data.

The next step was to submit the verified technical analysis to working groups of U.S. Army officers who considered the operational desirability of the ideas submitted. Members of these "working groups," as they were called, were drawn from Army aviation personnel all over the world and represented a tremendous background of aviation experience. Each working group was responsible for a particular area (observation, surveillance, or transport), and specifically charged with making a recommendation as to the type of air vehicle which should be developed to meet the U.S. Army requirements in the particular area.

The final step in the selection of mission and type was to evaluate the recommendations of the three working groups. Because of the importance of the final decision to aviation and the U.S. Army, a board of general officers was established. As previously mentioned, the chairman of this board was *Lt. General Gordon B. Rogers* of CONARC, who, for the purpose of this board action, reported directly to the Chief of Staff of the Army. Membership of the Board consisted of five rated and five nonrated general officers from all parts of the Army (see box below).

The "Rogers Board," considered the recommendations of each of the working groups. The group on observation recommended immediate development of a new helicopter to replace the H-13 and H-23 helicopters and the L-19 now in Army inventory. *Figure 1* presents an artist's conception of what this new helicopter might look like. It should have space for four persons and be capable of cruise speeds in excess of 100 knots.

ARMY REQUIREMENTS REVIEW BOARD

Lt. Gen. Gordon B. Rogers—Chairman
Deputy Commanding General, U.S. CONARC

Maj. Gen. Robert J. Wood
Deputy Chief, Research and Development

Maj. Gen. Hamilton H. Howze
Chief of U.S. Military Assistance Advisory Group—Seoul, Korea

Maj. Gen. Thomas F. Van Natta
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Maj. Gen. Alva R. Fitch
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Maj. Gen. Richard D. Meyer
Deputy Chief of Transportation for Aviation, Office, Chief of Transportation

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Brig. Gen. Lawrence J. Lincoln
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Brig. Gen. William M. Thames, Jr.
Commanding General, Army Combat Surveillance Agency, Office of the Chief Signal Officer

Brig. Gen. Clifton F. von Kann
Director of Army Aviation, Office, Deputy Chief of Staff for Operations

Col. Robert R. Williams—Exec. Sec'y
Chief of Air Mobility Division, Office, Chief of Research and Development

WITH ELECTRONIC EQUIPMENTS PROVIDING A STRONG ASSIST, TOMORROW'S ARMY AVIATORS ANTICIPATE AN ALL-WEATHER, AROUND-THE-CLOCK CAPABILITY.

The OPTIMISTIC SIXTIES

The working group on surveillance recommended a new STOL airplane of significantly increased capabilities. An artist's conception of this aircraft is shown in *Figure 2*.

The transport working group recommended a VTOL air vehicle. This might be an unloaded rotor convertiplane or compound helicopter as shown in *Figure 3*, a tilt-wing as shown in *Figure 4*, or a vehicle resulting from the current "test bed" program which has demonstrated technical feasibility of the ducted fan, tilt-wing, and deflected slip stream VTOL concepts.

After study of the recommendations made by the working groups, the current Army air vehicle inventory situation, and the probable availability of funds not only for development but for production as well, the "Rogers Board" presented essentially a two-fold recommendation.

The Board recommended an immediate design competition, to be supported with FY 61 funds, for a new observation helicopter to replace the L-19 and H-13 and H-23 helicopters now in Army inventory.

The board also recommended continued operational and technical research in the surveillance and transport areas in advance of design competitions for vehicles in these areas. *Figure 5* depicts a possible forthcoming STOL research vehicle.

This latter recommendation and the outcome of the studies now progressing, not to mention availability of funds, will govern the shape of Army air vehicles which will begin to enter the inventory toward the end of the decade. The first development will be a new helicopter to replace the L-19, H-13, and H-23.

When, whether, and with what this will be followed by a surveillance air vehicle to provide greater capabilities in this important area, or a VTOL transport of some type to augment the capabilities of the *Caribou* and *Chinook* systems, will develop as time goes on. Once a decision is made on the next area for development, the type of air vehicles will still have to be decided. The artist's sketches shown herein are only possibilities.

The final decision will be made after establishment of clear-cut requirements and operational missions, approval of military characteristics, and a design competition. Of the future, only one thing is certain. Army aviation will continue to grow. New vehicles will continue in research and development to meet the timeless requirements for mobility.

The shape of things to come in achieving mobility may be unlike anything envisioned during the earlier part of the past decade. A case in point is the *Ground Effects Machine (GEM)*. The concept of a *GEM* machine is that of a vehicle which would ride on a cushion of air between the machine and the ground.

Ground effects machines are not flying machines. They are discussed here only because they may provide the Army additional surface mobility to complement that now only available through aircraft. Although the concept is not exactly new, this phenomenon has had very recently advanced from the conceptual stage to actual "flying" research hardware as illustrated in *Figures 6* and *7*.

The Army is currently establishing a research program to exploit this potential to the fullest, to develop operational concepts, and to establish clear-cut objectives.

The Convair F-106 sets record as world's fastest jet aircraft...

powered by a Pratt & Whitney Aircraft J-75 jet engine

At Edwards Air Force Base on December 15, 1959, the F-106 all-weather interceptor roared to a new world speed record of 1,525.95 miles per hour. Flying a straightaway course at an altitude of 40,000 feet, it bettered the previous official world mark by 122 miles per hour.

The Air Force F-106 has also demonstrated that it has low-level striking power. At elevations of 50 to 300 feet, under most adverse conditions, the F-106 averaged 700 miles an hour in a 300-mile flight from Edwards Air Force Base.

Pratt & Whitney Aircraft's J-75 jet engine powers the F-106. With this same engine, Republic's F-105D fighter-bomber recently set a new speed record for closed-course flight. Over the years, Pratt & Whitney Aircraft J-57 and J-75 jet engines have held virtually every major flight record.

PRATT & WHITNEY AIRCRAFT

East Hartford, Connecticut
A DIVISION OF UNITED AIRCRAFT CORPORATION

FIGURE 1

Artist's Concept
Light Observation Aircraft
Successor to
H-13, H-23, and L-19

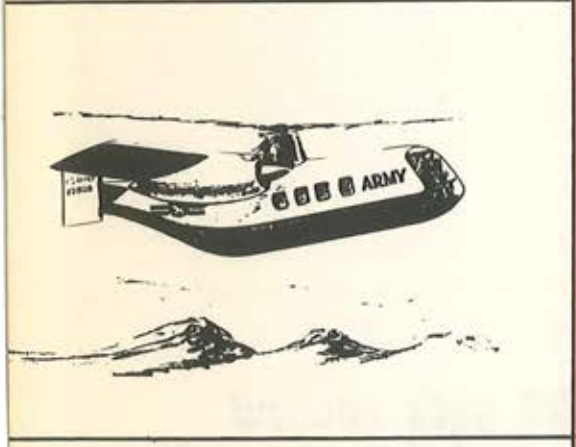


FIGURE 3

V-STOL

Artist's concept of a possible V-STOL configuration which may enter the Army inventory in the late 60's. See Figure 4 (adjoining) for another possible V-STOL configuration.

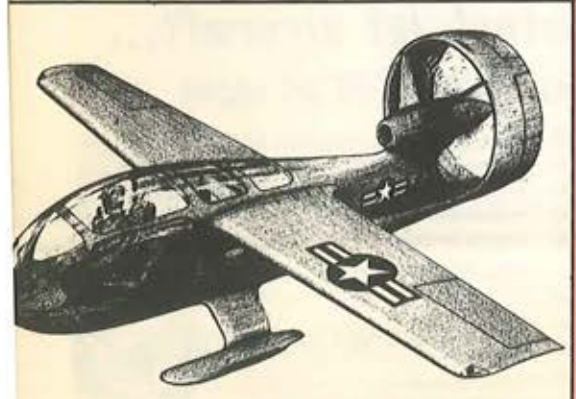


FIGURE 5

STOL

An artist's concept of a possible forthcoming STOL research vehicle.

FIGURE 2

Combat Surveillance Airplane
Artist's concept of a potential low altitude, deep penetration aircraft. Detailed studies are to begin this year on the technical problems associated with this type of aircraft.

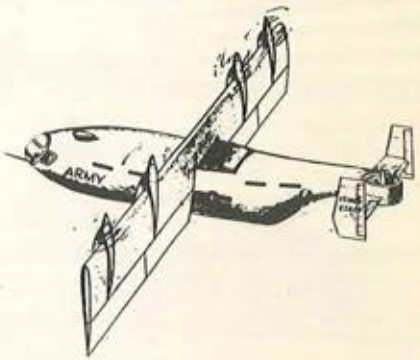


FIGURE 4

V-STOL

A second artist's concept of a possible V-STOL configuration which may enter the Army inventory in the late 60's. Figure 3 (opposite) presents another concept.

FIGURE 6

Air Car

This 4-place Ground Effects Machine (GEM), a Curtiss-Wright Air Car, is designed to skim 6 to 12 inches off the ground at speeds up to 35 miles per hour. Two of these machines were bought "off-the-shelf" from Curtiss-Wright to obtain research information on basic operating principles. Both machines are undergoing testing at Ft. Eustis, Va.

FIGURE 7

Princeton GEM

This Ground Effects Machine (GEM) was designed and built by Princeton University under Army contract to study the GEM phenomenon and particularly the problems of stability and control.

McDonnell XV-1

GROSS WT	4,800 lbs
EMPTY WT	3,651 lbs
ENGINE	Continental R-975-42
SERVICE CEILING	11,800 ft
CREW	1
SPEED	120 knots
MAXIMUM RANGE	318 nm
MAX RANGE PAYLOAD	410 lbs

REMARKS
This aircraft was a "State-of-the-Art" development. The Army does not plan to acquire additional models.

Bell XV-3

GROSS WT	4,744 lbs
EMPTY WT	3,412 lbs
ENGINE	P & W R-985-AN-1
SERVICE CEILING	15,600 ft
CREW	1
SPEED	136 knots
MAXIMUM RANGE	380 nm
MAX RANGE PAYLOAD	467 lbs

REMARKS
This aircraft is currently undergoing flight testing by NASA. The project will be terminated at the conclusion of these tests.

DeLackner HZ-1DE

An alternate approach to the flying platform, this research vehicle (top) provided data on the un-ducted propeller concept for an individual lift device. A later version used metal skids as landing gear, instead of the outriggers and inflated rubber bags. This project has been completed.

Hiller VZ-1E

The individual lift concept (center) seeks to provide mobility for the individual soldier on missions such as scouting, reconnaissance, etc. This research vehicle is an experimental flying platform, kinesthetically controlled, employing a ducted fan for propulsion and lift. The flying platform is powered by three 40 hp Nelson H-59 engines, and weighs approximately 465 pounds. The Army investigations of this vehicle have been completed and the program terminated.

Vertol VZ-2PH

A research tilt-wing aircraft (bottom) that operates both as a vertical take-off and landing (VTOL) aircraft and as a conventional airplane. In flight, the wing rotates through 90 degrees to convert the aircraft from vertical take-off and hovering to normal flight. To land, the wing again is rotated to the vertical. The propellers are interconnected and powered by one T-53 turbine engine. The aircraft completed full transition from vertical take-off to cruise and back to vertical landing on 15 July 1958. NASA research flight tests are nearing completion.

Ryan VZ-3RY

A research aircraft employing two propeller deflected slipstream. Vertical flight is achieved by deflecting the slipstream downward by means of a highly flapped wing. The propellers are interconnected and powered by a single T-53 turbine engine, mounted in the fuselage. This aircraft (top) crashed in February 1960 while undergoing test by NASA. The aircraft is being rebuilt by NASA and testing will continue.

Doak VZ-4DA

This research aircraft (center) operates both as a vertical take-off and landing (VTOL) aircraft and as a conventional airplane. Ducted propellers on the wing tips rotate through 90 degrees to convert the plane in flight. To land, the propellers again are turned to the vertical. The entire airplane remains in the conventional horizontal attitude at all times. The ducted propellers are interconnected and powered by one YT-53 turbine engine. Full conversion was successfully completed in May 1959. Contractor testing is continuing. NASA flight testing is planned.

Fairchild VZ-5FA

A research aircraft (bottom) that achieves its VTOL capability by deflecting the slipstream downward by means of a highly flapped wing. The four propellers are interconnected and powered by a single T-58 turbine engine. The aircraft is currently undergoing tethered flight testing by the contractor. NASA wind tunnel and flight testing is planned at an early date.

Chrysler VZ-6CH

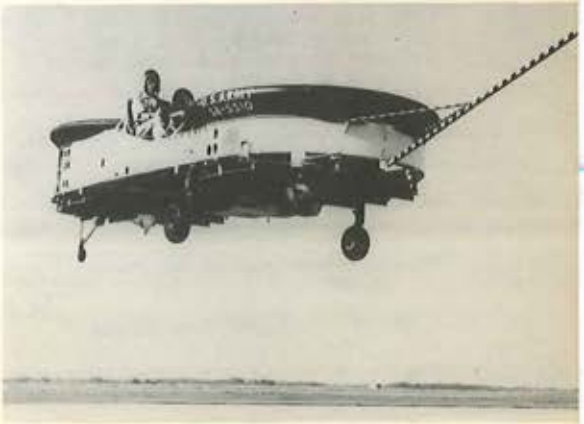
A single place research aircraft (top) designed to explore the aerial jeep concept and obtain research data. Shafting from one 380 hp reciprocating engine transmits power to the two ducted propellers. Propulsion is obtained from a combination of vehicle nose down attitude and rearward propeller slipstream deflection accomplished by duct exit vanes. This aircraft crashed in June 1959 during free flight testing. This vehicle has since been dropped from the aerial jeep program.

Curtis-Wright VZ-7AP

The aerial jeep research vehicle (center) was originally designed and constructed utilizing four ducted fans. As shown, the ducts were later removed. The vehicle is powered with a single Artouste II turbine engine. Tests have been completed and the project terminated.

Piasecki VZ-8P

This aerial jeep research vehicle (bottom) made its first successful hovering flight in August 1958. This model is powered by a single Artouste II turbine engine. A later version is powered by two of the same engines. Wind tunnel test and a flight research program have been planned with NASA.



Flying Crane Helicopters

The Army has a definite interest in heavy lift aerial vehicles that will lift about 20 tons of cargo. These flying cranes by lifting heavy loads over the beach without a break at the shore line would save critical manpower. Such craft would be able to repair breaks in surface lines of supply, expedite movement of large equipment over difficult terrain, carry structural materiel for bridges, and transport fuel to the forward combat areas. Several years ago the Army awarded a design study contract for a flying crane helicopter and more recently leased 25 hours on the Sikorsky built S-60 "Crane" for familiarization purposes. Pictured at the right, the S-60 is essentially the Sikorsky H-37 with a load-free boom in place of the fuselage and a glass-enclosed cab at the front. The pilot's seat is mounted on a swivel so that it can be rotated during loading for greater visibility. The load is attached to an electro-mechanical hoist suspended beneath the rotor centerline for maximum stability. Designed to lift 12,000 pounds, the S-60 has a current range of about 100 miles.

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NUMERICAL LISTING OF AIRCRAFT

ROTARY WING AIRCRAFT

MODEL (MANUFACTURER) REMARKS

R-1 (Platt-LePage) ..... Pratt and Whitney R-985-21, 410 hp engine. Twin rotors, side by side. Only two models built.

R-2 (Kellett) ..... Jacobs R-915-1, 300 hp engine. YG-1C autogyro. Only one R-2 procured.

R-3 (Kellett) ..... Jacobs R-755-3, 225 hp engine. A converted YG-1B autogyro with a feathering rotor. Only one procured. R-2 and R-3 are the only true autogyros with a military designation.

R-4 (Sikorsky) ..... Warner R-550-3, 200 hp engine. First helicopter procured by the military in quantity (131). Navy designation was HNS-1.

R-5 (Sikorsky) ..... Pratt and Whitney R-985-AN-5, 450 hp engine. First XR-5 (VS-372) was a tandem rotor model; all other were single rotor. 132 procured in eleven models. Later redesignated the H-5. Navy designation was HO3S-1.

R-6 (Sikorsky, Nash-Kelvinator) ..... Franklin O-405-9, 240 hp engine. Sikorsky design produced in quantity by Nash-Kelvinator as R-6A and R-6B. 225 procured.

R-7 (Sikorsky) ..... This aircraft was a redesignation of the XR-6A. The redesignation was later cancelled.

R-8 (Kellett) ..... Franklin O-405-9, 240 hp engine. Twin side by side rotors. Two procured.

R-9 (G & A Aircraft, Firestone) ..... Lycoming O-290-7, 135 hp engine. One procured. One two-bladed rotor.

R-10 (Kellett) ..... Two Pratt and Whitney R-985-AN-5, 450 hp engines. Two intermeshing rotors. Crew of two, six litters. Two procured. Later redesignated the H-10A. Ten cancelled.

R-11 (Rotor-Craft, Magill) ..... Continental A-100, 100 hp engine. Two contra-rotating, three-bladed rotors. One procured.

R-12 (Bell) ..... Pratt and Whitney R-1340-55, 600 hp engine. Bell Model 48. Five passenger. 13 procured. Later redesignated as the H-12.

H-13 (Bell) ..... See pages 478 and 492. Navy designation is HTL.

R-14 (G & A Aircraft, Firestone) ..... Light observation proposal. Three cancelled in 1946.

H-15 (Bell) ..... See page 501.

H-16 (Piasecki) ..... See page 512.

H-17 (Hughes) ..... See page 503.

H-18 (Sikorsky) ..... See page 509.

H-19 (Sikorsky) ..... See page 494.

H-20 (McDonnell) ..... See page 501.

H-21 (Piasecki, Vertol) ..... See page 495.

H-22 (Kaman) ..... Lycoming O-435-C engine, 200 hp. One Kaman K-225 procured for Navy test.

H-26 (American Helicopter) ..... See page 500.

H-27 (Piasecki) ..... This was the original designation of the second YH-16 with T-38 turbine engines installed. Later redesignated the YH-16A.

H-28 (Hughes) ..... This designation was assigned to the improved H-17 Model M-190-4A. No actual aircraft ever built.

H-29 (McDonnell) ..... This designation assigned to the two-seat version of the "Little Henry" ram jet, See H-20, page 501. Project cancelled.

H-30 (McCulloch) ..... See page 509.

H-31 (Doman) ..... See page 509.

H-32 (Hiller) ..... See page 510. Navy designation is HJ-1.

H-33 (Bell) ..... Original Army designation given to the XV-3 Convertiplane. See page 546.

H-34 (Sikorsky) ..... See page 497. Navy designation is HSS-1.

H-35 (McCulloch) ..... This was the Army designation of the XV-1. Also desginated the XL-25. See page 546.

H-36 ..... Reserved for Navy use, then cancelled. Designation number never used.

H-37 (Sikorsky) ..... See page 498. Navy designation is HR2S-1.

H-38 ..... Originally reserved for Navy use, then cancelled. Number was later assigned to a classified project.

H-39 (Sikorsky) ..... See page 503.

H-40 (Bell) ..... Production models designated HU-1A. Only the "X" and "Y" models carried the H-40 designation. See page 519.

H-41 (Cessna) ..... Ten models procured for test. Four-place. Supercharged. See page 507.

H-42 (Hughes) ..... Original Air Force designation of the YHO-2HU. See page 511.

H-43 (Kaman) ..... Pratt and Whitney R-1340 engine. H-43B has a Lycoming T-51-L-1 turbine engine. Procured by USAF for crash and rescue missions.

HU-1 (Bell) ..... Production desgination of YH-40. Actual production is HU-1A. See page 519.

Pawnee (Hiller) ..... Indian code name given to the Hiller Flying Platform. See page 547.

YHC-1B (Vertol) ..... See page 524.

YHO-1DJ (SUD) ..... See page 510. First helicopter to receive new Army observation designation.

YHO-2HU (Hughes) ..... Lycoming 180 hp engine. Commercial Model 269 ultralight. Five procured for test. Rotor hub is the same as the H-30. See page 511.

YHO-3BR (Brantley) ..... Model B-2 ultralight Five procured for test. Lycoming 180 hp engine. See page 511.

FIXED WING AIRCRAFT

MODEL (MANUFACTURER) REMARKS

L-1 (Stinson) ..... See page 475.

L-2 (Taylorcraft) ..... See page 475.

L-3 (Aeronca) ..... See page 476.

L-4 (Piper) ..... See page 476.

L-5 (Vultee, Stinson) ..... See page 477.

L-6 (Interstate) ..... See page 477.

L-7 (Universal) ..... Franklin O-200-5, 90 hp engine. Commercial 90-AF Monocoupe. 19 purchased and sent to France.

L-8 (Interstate) ..... Continental O-170-3, 65 hp engine. Commercial S-1A Cadet. 8 purchased for Bolivia.

L-9 (Stinson) ..... Franklin O-200-1, 90 hp engine. Commercial Stinson Voyager. 20 were purchased as trainers for the Royal Navy.

L-10 (Ryan) ..... Warner 50-499, 145 hp engine. Only one aircraft carried this designation. This was an SCW (1937) leased by the military.

L-11 (Bellanca) ..... Pratt and Whitney R-1340-41, 600 hp engine. Like the L-10, only one leased aircraft carried this designation. Built in 1934 as the Bellanca 31-50.

L-12 (Stinson) ..... Pratt and Whitney R-60-9, 300 hp engine. 4 Stinson Reliants built between 1930 and 1935 as the SR-5A and SM-7B. Used in Air Corps training.

L-13 (Convair, Vultee) ..... See page 501.

L-14 (Piper) ..... (Photo, this page). Lycoming O-290-3, 130 hp engine. Large Piper aircraft with long landing gear, litter configuration. 5 were procured. 845 were cancelled on VJ Day.

L-15 (Boeing) ..... See page 500.

L-16 (Aeronca) ..... See page 479.

L-17 (North American, Ryan) ..... See page 479.

L-18 (Piper) ..... Continental O-205-1, 90 hp engine. Standard "Piper Cub 95's" purchased for Turkey. 105 new aircraft and 400 L-4J's that were overhauled. Some were never shipped and were later used in Army flying clubs.

L-19 (Cessna) ..... See page 487.

L-20 (de Havilland) ..... See page 488.

L-21 (Piper) ..... See page 489.

L-22 (Ryan) ..... 3 "Super Navions" were the only aircraft to carry this designation. Later they were redesignated XL-17D's.

L-23 (Beech) ..... See page 490.

L-24 (Helio) ..... See page 502.

L-25 (McDonnell) ..... Air Force originally designated the XV-1 as the XL-25. See page 546. The Army originally designated it as the XH-35. This is the only aircraft that has three official "class" designations.

L-26 (Aero Design) ..... See page 491.

L-27 (Cessna) ..... Standard Cessna commercial Model 310 twin-engine aircraft purchased by the Air Force as CONUS command aircraft. No Army procurement.

LC-126 (Cessna) ..... See page 489.

U-1A (de Havilland) ..... See page 499.

*XV-1 (McDonnell) ..... See page 546. Also known as the XL-25 (Air Force) and XH-35 (Army).

*XV-2 (Sikorsky) ..... S-57 convertiplane using a retracting motor. Design study only. Never built.

*XV-3 (Bell) ..... See page 546. Originally designated the XH-33 by Army.

YAC-1 (de Havilland) ..... See page 523.

YAO-1 (Grumman) ..... See page 518.

*XV stands for experimental vehicle. This designation was a compromise between the Air Force and the Army. Only three aircraft received XV designations.

L-14 AIRCRAFT

INDEX

FOREWARDS

FOUNDATIONAL FORTIES

1942-1949 Production Aircraft

CONTROVERSIAL FIFTIES

1950-1959 Production Aircraft

1950-1959 Test and Development Aircraft

OPTIMISTIC SIXTIES

DRONE AIRCRAFT

1960-1969 Production Aircraft

THE FUTURE

Possible Concepts for the Future

NUMERICAL LISTING OF AIRCRAFT

LIST OF ADVERTISERS AND PRODUCT PAGES

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