

EQUIPMENT ISSUE

# Army Aviation

JUNE—JULY, 1980

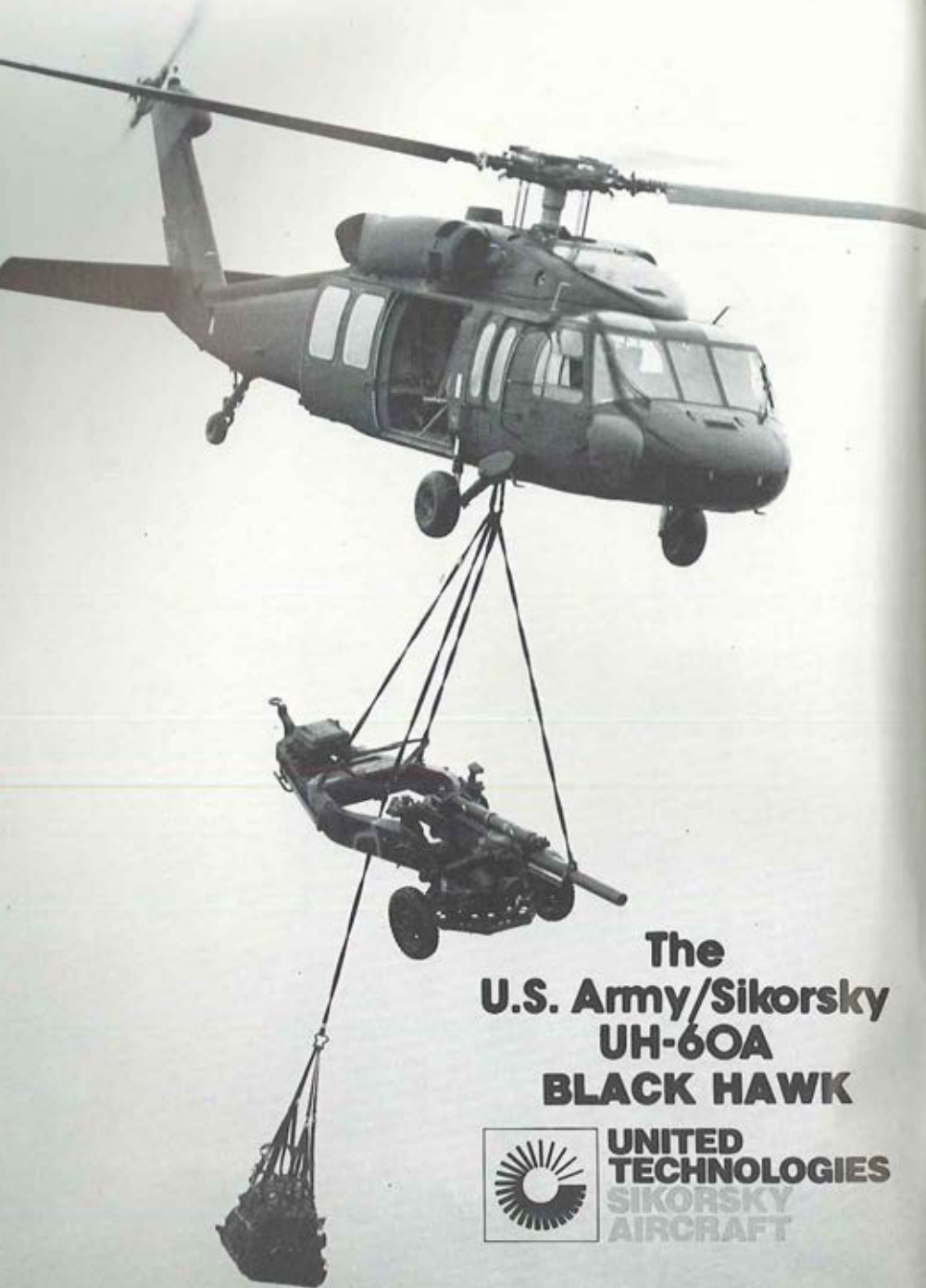


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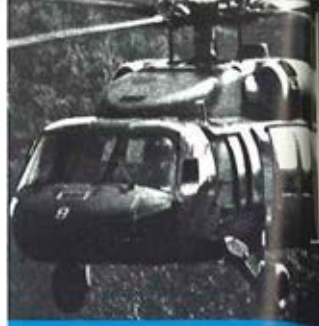
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## FRONT COVER PHOTO

THE U.S. ARMY YAH-64 ADVANCED ATTACK HELICOPTER (AAH) IS SHOWN ON THE FRONT COVER OF THE JUNE-JULY 1980 ISSUE AT THE PALOMAR, CALIFORNIA FACILITY OF HUGHES HELICOPTERS IN JANUARY OF THIS YEAR. BRIGADIER GENERAL (P) EDWARD M. BROWNE, AAH PROGRAM MANAGER, IS IN THE CO-PILOT'S SEAT AND IS FLYING THE HELICOPTER WITH HUGHES TEST PILOT, JACK LUDWIG, IN THE PILOT'S SEAT. GEN BROWNE WAS GETTING A "HANDS ON" FEEL FOR THE YAH-64'S NOE ABILITY DURING THE FLIGHT.



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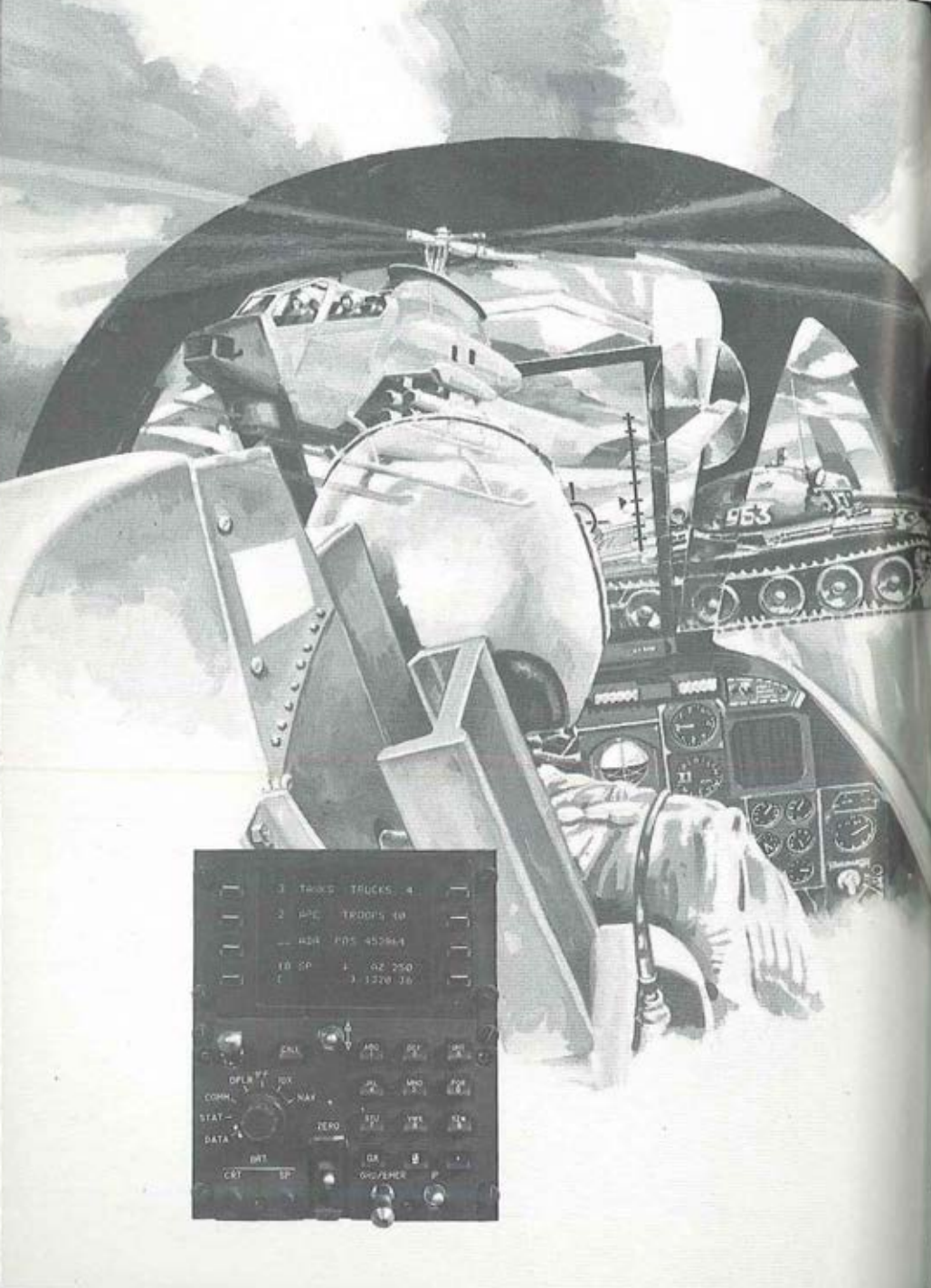
# AAH Power



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operational capability.

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# Hardware: How it evolved, where we are now, and where we are going



By Brig. Gen. Richard D. Kenyon,  
Army Aviation Officer, ODCSOPS,  
Department of the Army

**I**N this issue we examine with nostalgia the Army's aviation hardware program, how it evolved, where we are now, and where we are going. We may have the best pilots and support personnel in the world, but without the most capable equipment, the efforts of our individual soldiers may be for naught.

Using 20/20 hindsight as we enter a new decade, it is clear that accomplishments have been significant; however, some programs have not succeeded. With the expansion of the nation's defense effort during war time and subsequent contraction, we too have been required to expand and contract, and at times with difficulty.

We have stretched or cancelled programs, and some programs have yet to be funded. But I prefer to say a glass is half full rather than half empty; we have come a long way from the L-4 "Grasshopper"<sup>1</sup> days.

## VANDERPOOL'S FOOLS!

A quick review will illustrate my philosophy. Does anyone remember "Vanderpool's Fools"? They were a "crazy" bunch of guys who actually thought a helicopter could be armed and still be useful. Those magnificent men strapped onto OH-13's<sup>2</sup> and other flying machines just about everything they could scrounge. Then came Vietnam with the well-remembered UH-1Bs/C's<sup>3</sup> and later the AH-1G's<sup>4</sup> that flew, fought, and accomplished the mission of putting fire-power where and when it was most needed.

Now as we enter the generation of the 80's, two new participants are knocking at our door. The fully modernized "S" model Cobra<sup>4</sup> is available for even more difficult and challenging missions.

With its up-gunned armament (20mm gun/wing stores management system/universal turret/fire control computer), improved survivability suit (IR suppressor/IR jammer/IFF/secure voice/flat plate canopy), and night/adverse weather capability potential (FLIR augmented Cobra/TOW sight/Projected Map Display/Integrated Avionics Communications), the AH-1S<sup>4</sup> Cobra is indeed a formidable adversary and a capable member of the "combined arms team". And in the future, more improvements can be expected.

<sup>1</sup>Page 28. <sup>2</sup>Page 29. <sup>3</sup>Page 90. <sup>4</sup>Page 52.



The YAH-64 Advanced Attack Helicopter<sup>5</sup>, a great leap forward, is our first attack system designed as such from the ground up and optimized to fight in the frontline with our combat soldiers. This optimization was based on what has been perhaps the most thorough, all encompassing program of tests and studies ever conducted by the U.S. Army on a new weapons system.

## INCREASED SURVIVABILITY

Along with its proven potential for long-range kills of armor at night and during periods of obscured visibility, the eventual AH-64 offers increased survivability on the mid-intensity battlefield; a characteristic it shares with no other alternative at this time and the characteristic that truly sets it apart.

The AH-64 may be the only helicopter that can stay in the fight given the postulated threat. In addition, the Army has recognized that improvements are necessary in the areas of reliability, availability, maintainability, and self-deployability, and as such, has endowed the AH-64 with improved capabilities. However, as good as this AAH<sup>5</sup> is, affordability will preclude filling all attack units with the AH-64. We will continue to operate under the "hi-low" capability mix concept with the AH-64 representing the high side and the AH-1S<sup>4</sup> representing the low side.

The "eyes" of any Army have traditionally been provided by its scouts; this combat requirement is valid now and continues to be in the future. To enable the commander to "see" the battlefield, know where the enemy was and was not, and to assist his maneuvering on that enemy; the scout has been required to be consistently mobile with the passage of time.

First horses, then Jeeps and tracks were required over foot mobility, and now the aero scout helicopter is required over mechanized ground vehicles. Unfortunately, our latest proposed program is urgently needed in the field, but is still pending initiation. Even so, we can see an improvement from the OH-13's<sup>6</sup> and

OH-23's<sup>7</sup> with .30 caliber machine guns strapped on; through the OH-6 Cayuse<sup>8</sup>, which served brilliantly in Vietnam; and, now the upgraded OH-58C<sup>9</sup>.

Now, the Army Helicopter Improvement Program (AHIP) is focused upon taking an existing airframe, providing it with a much better target acquisition capability, and quickly fielding it. Sometime in the future we hope to have a scout designed from the ground up to be a scout, that is, one capable of performing the very demanding yet vital scout mission while functioning in the same environment as the advanced AH-64<sup>10</sup>.

The utility helicopter started with a series of good "birds" which could and did deliver. From the H-21 Shawnee<sup>11</sup> and the H-34 Choctaw<sup>12</sup>, we came to the famous Huey<sup>13</sup> series which was and still is the Army's workhorse. The Huey's missions have spanned roles from VIP transportation to combat assaults under fire, and from a flying mess truck to a turbine-engined Florence Nightingale that saved countless soldiers' lives.

## FASTER, BETTER!

We now have the UH-60A Black Hawk<sup>14</sup> in the field. It is a utility helicopter which can carry more, fly faster, and maneuver better than the Huey. As the UH-60A Black Hawk enters our force, it will assist, but not replace, the Huey in supporting our forces by moving beans, bullets, troops, and spare parts.

In the cargo line, we have also made progress. The CH-21 Shawnee<sup>11</sup> helped here, as did the CH-37 Mojave<sup>15</sup>, and the CH-34 Choctaw<sup>16</sup>. The CH-47 Chinook<sup>17</sup> came on the scene to assist the less numerous CH-54 Flying Cranes<sup>18</sup> lift lighter loads when "Cranes" were not available.

We looked for a real heavyweight in the Heavy Lift Helicopter (HLH)<sup>19</sup>. Unfortunately, this heavyweight has never gotten off the ground and we have had to task the Chinook to take up the load; a mission that the Chinook will have to accomplish through the decade and perhaps the century.

No, we can't forget the wings that don't rotate. I'll let those of you who remember compare the L-1<sup>20</sup> with the present OV-1D<sup>21</sup> for surveillance capabilities. Or how about the L-20 Beaver<sup>22</sup> with the C-12<sup>23</sup> of today? Our fixed (HARDWARE/Continued on Page 118)

<sup>5</sup>Page 98. <sup>6</sup>Page 83. <sup>7</sup>Page 84. <sup>8</sup>Page 82.  
<sup>9</sup>Page 86. <sup>10</sup>Page 98. <sup>11</sup>Page 55. <sup>12</sup>Page 66.  
<sup>13</sup>Page 90. <sup>14</sup>Page 94. <sup>15</sup>Page 66. <sup>16</sup>Page 66.  
<sup>17</sup>Page 55. <sup>18</sup>Page 70. <sup>19</sup>Page 88. <sup>20</sup>Page 26.  
<sup>21</sup>Page 38. <sup>22</sup>Page 42. <sup>23</sup>Page 22.





**T**HE Army's Aviation Research, Development and Acquisition programs executed in the 1970's to achieve the goals of the 1980's have — to a major degree — reached fruition and are ready for exploitation.

It is appropriate on entering the 1980's to provide a status report, and to determine if the 1970's thrusts are still valid.

The status of Army Aviation RDA programs is dynamic and any update must be made in that context. The staff proponent for these programs is the Aviation Systems Division of ODCSRDA.

### Attack Helicopters

In the attack helicopter line, the Army has had the AH-1 *Cobra* for a number of years, but the *Cobra* of the 1980's is a significantly improved aircraft. It is the modernized AH-1S *Cobra*/TOW with increased weapons versatility and accuracy, reduced crew work load, and improved survivability.

Major improvements to the *Cobra* include an upgraded engine and drive train, extended life composite rotor blades, advanced fire control, improved communications and navigation systems, a 20mm turret cannon, and the TOW missile system.

The modernized "S" model *Cobra* is being delivered to the Army now and will soon be

deployed overseas. Current planning calls for the AH-1S *Cobra* to constitute approximately two-thirds of the anti-armor helicopter fleet past the year 1990.

Immediately the question is asked, "What will make up the other one-third of the anti-armor (helicopter) fleet?" The answer is the AH-64 **Advanced Attack Helicopter (AAH)**.

By 16 March 1980, all six development AAH prototypes were delivered and flown with an accumulation of 979 flight hours during Phase II Engineering Development. With the ability to fly and fight at night and in adverse weather added to the improved lethality of the **HELLFIRE** missile and increased survivability, the AH-64 will provide the capability needed to fight outnumbered and win.

The performance of the Target Acquisition Designation System/Pilot Night Vision System (TADS/PNVIS), planned as an integral part of the AH-64, has exceeded performance expectations. A flyoff between competing contractors, Martin Marietta and Northrop, was completed in early March 1980, and Martin Marietta was announced as the winner in early April 1980.

The AH-64 will undergo **Operational Test II (OTII)** in the Summer of 1981 with a production

# UPDATE

## Army Aviation Equipment for the '80's

By Lieutenant Colonel Noble J. Wiley,  
Office, Deputy Chief of Staff for Research, Development  
and Acquisition, Department of the Army

## UPDATE

(Continued from Page 11)

decision scheduled for December 1981. Fielding of the complete system is planned to begin in the mid-1980's, thus adding a new dimension to the U.S. Forces in the anti-armor tank killing role.

As previously mentioned, the **HELLFIRE** missile system is an improved feature of the AH-64, and is approaching the final stages of a highly successful development program.

As of the middle of May, 17 successful guided missile launches were made from the AAH with six designated by ground laser locator designators (GLLD) and 11 by autonomous on-board TADS designation. Targets were tracked and designated using both TV and FLIR, both during day and night conditions.

In addition, 25 successful guided flights have been made in the **HELLFIRE** program and have demonstrated missile performance parameters throughout the operational envelope. Operational tests for **HELLFIRE** were scheduled to begin in April '80 with full production planned for FY82.

In FY81, the Army — as part of the overall DOD projected guided missile program — plans to begin development of a complementary imaging infrared seeker to provide enhanced **HELLFIRE** performance in smoke or poor weather and to achieve a fire-and-forget capability.

## SCOUTS

In November 1979, a special ASARC determined that a new airframe development program for the **Advanced Scout Helicopter (ASH)** was not affordable and development was deferred in favor of an inventory aircraft with a near term mast mounted sight (MMS).

Additionally, the **ASH** program has been renamed by OSD as the **Army Helicopter Improvement Program (AHIP)**. The **AHIP** will incorporate a night capability making it compatible with the **Cobra** carrying the **FLIR Augmented Cobra/TOW Sight (FACTS)**. The **AHIP MMS** evaluation commenced at Redstone Arsenal in March 1980, the goal being to determine the detectability differential.

Following this, the candidate airframes will be evaluated for mission suitability at Fort Rucker. The airframe program plans were presented at an ASARC review in early July. A full scale engineering development contract will be awarded in 1981 with IOC in the mid-1980's.

## UTILITY

The new **UH-60A Black Hawk** is replacing the **UH-1** in air cavalry, aeromedical, and air assault missions. **Black Hawk** can carry more than twice the payload of the **UH-1** and can move a fully equipped, 11-man squad under adverse weather conditions at a significantly faster speed than the **UH-1**.

The first **Black Hawk** Company achieved IOC in 1979 and by the end of May 1980, the Army will have three **Combat Support Aviation Companies** fully operational with the **UH-60A**. Since initial fielding, the **UH-60** fleet has accumulated over 7,200 flight hours with one aircraft over the 700 hour mark.

The **Black Hawk** has already participated in two deployment exercises. The first was a 15 aircraft deployment from Fort Campbell to Fort Hood for a 24-hour operation involving 164 flight hours. The second deployment was to the Panama Canal Zone where 12 **UH-60's** participated in Operation **BLACK FURY III**, accumulating 244 flight hours in the process.

During both exercises, the **Black Hawk** met or exceeded design specifications under adverse weather conditions of high humidity and high density altitude. Clearly, the **UH-60A Black Hawk**, as a tactical transport, is achieving our 1980 expectations. **CONTINUED▶**



**HUNTER-KILLER** — A one-of-a-kind aircraft, a Hughes Helicopters 500MD sports a Mast Mounted Sight made by Martin Marietta. A company-funded project, the ship visited USAAVNC.

## CARGO

In 1975, the Army determined it had a valid medium lift helicopter requirement through the year 2000 and initiated the CH-47 modernization program, and opted to fill this requirement with a CH-47D. The CH-47D is a modernized version of the current CH-47A, B, and C model Chinook medium lift helicopters.

The Modernized CH-47D provides an adverse weather, day/night capability for transporting internal and external cargo such as artillery, missiles, personnel, disabled aircraft, medical evacuees, and liquid and dry bulk cargo.

It is designed to greatly improve aircraft productivity, safety, reliability, availability, maintainability, and survivability while reducing vulnerability. By achieving the goal of having one standard configuration aircraft, the CH-47D Chinook facilitates logistical support and simplifies maintenance support.

The first flight of the "D" model prototype was on 11 May 1979. Development Test II (DT II) was conducted from November 1979 through March 1980 at Fort Rucker, AL, and OT II began on 31 March and ran through mid-May 1980. Production contract award is planned for October 1980 with first aircraft delivery scheduled for May 1982 and the IOC unit equipped by early 1984.

## SEMA PROGRAMS

The wide ranging Special Electronic Mission Aircraft (SEMA) programs include both fixed and rotary wing aircraft. GUARDRAIL is a combined airborne and ground communications intelligence system designed to intercept and locate enemy communications emitters.

GUARDRAIL IV is currently in operation and is programmed to begin product improvement in 1981 to include conversion to the RC-12D aircraft, an integrated inertial navigation system, data link, and system automation.

The RV-1D, which provides a Corps fixed wing capability to monitor and locate opposing radar emitters, is in the final stages of procurement. Conversion of OV-1 aircraft to the OV-1D will be completed in 1984 and will provide near realtime radar imagery of both fixed and moving targets through the new AN/APS-94F radar.

There is a great deal of activity on the rotary wing side of SEMA with many programs underway. QUICKFIX (QF), which provides a



**SEMA — The many Special Electronic Mission Aircraft (SEMA) programs, such as typified by the Army's RC-12D pictured above, provide an airborne and ground communications intelligence system to intercept and locate enemy communication emitters.**

Division level rotary wing aircraft that can intercept, locate, and take countermeasures against hostile force communications, will enter QUICKFIX 1B Operational Test III in the Fall of 1980 with the EH-1H aircraft. QUICKFIX II is currently under contract for the EH-1X and will enter advanced procurement of the EH-60A helicopter in 1982.

## ASE

The Aircraft Survivability Equipment (ASE) program is well on its way to providing appropriate countermeasure equipment against all air defense threats. Systems have been developed and are now being fielded to counter the threat of infrared (IR), radar, laser, and optically controlled guns and missiles.

Since there are a variety of combat mission profiles for Army aircraft, various ASE suits have been designed to provide the optimum survivability protection for each mission role. System installation is integrated into airframe modernization and new production where possible. Field installation is conducted for the existing fleet on a priority basis.

Growth potential has been designed into the "black box" countermeasures systems and the ASE program will continue to address the evolving 1980 threats.

## AVIONICS

Avionics in the 1980's will provide the eyes, ears, and nerves for Army aircraft to operate beyond the range of human senses. Night operations will become increasingly more effective with the introduction of the Aviator's Night (UPDATE/Continued on Page 16)



# When the enemy's and coming




Engage him at maximum  
effective range with  
**AQUILA.**



## A breakthrough in Target Acquisition.

Thanks to state-of-the-art miniaturized solid state electronics, the Aquila mini-Remotely Piloted Vehicle (RPV) system can determine the target's location with precise accuracy and send back real-time TV pictures of the target area, thus supporting conventional artillery and the Multiple Launcher Rocket



System (MLRS). Or the RPV can use its laser to illuminate the targets for pinpoint terminal guidance when laser-guided munitions are used. The RPV provides immediate battle damage assessment.

The Aquila Technology Demonstrator System has proven the operational concept with 218 data packed missions.

## Survivability: Think Small.

The RPV's low radar cross-section presents a flyspeck of a target to enemy air defense. Small size and maneuverability enabled the Aquila Technology Demonstrator to survive

# been detected fast....



many rounds from several types of weapons. After repeated attempts—no hits, even at representative combat ranges, IR is no different—not sufficient heat for homing.

## **When: Think Soon.**

Developed by Lockheed and managed by AVRADCOM, this breakthrough in target acquisition will be operational in the early 1980s. Growth is available as technology expands! Other sensors and missions will come as tactical effectiveness is proven.

When the other side has more men, more guns, more tanks you



need force multipliers. That's exactly what this RPV is... a force multiplier that will get more steel on target, faster, provide immediate battle damage assessment, and, at the same time, conserve the artilleryman's vital munitions.

# Lockheed

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## UPDATE

(Continued from Page 13)

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Vision Imaging System (ANVIS) and the TADS/PNVIS previously mentioned with the AH-64. ANVIS — a third generation, lightweight set of night vision goggles which operate with no emitted radiation — is scheduled for a first year buy in FY82.

Weather operations in the late 1980's will be possible from forward, unimproved clearings in fog and smoke conditions through use of the Joint Tactical Microwave Landing System (JTMLS). The JTMLS, coupled with advanced displays in the cockpit, may allow helicopters to make steep, decelerating approaches to a hover without seeing the ground.

Since both night and weather tactical operations are expected to be conducted at NOE altitudes, conventional line-of-sight radios must be replaced with improved, higher power VHF radios and HF radios able to transmit over hills. Off-the-shelf procurement of such radios will begin in FY80 with an IOC in FY83.

Shortened reaction time and increased pilot workload in the NOE environment will require assistance for aviators. Some such systems under development that could be available in the 1980's are:

- A Wire and Wire-like Object Detection System (WWLODS) which warns pilots of cables/wires in their path.
- An Advanced Map Display System which automatically ties into the aircraft navigation equipment and presents a moving map display showing aircraft position.
- An Integrated Avionics Control System (IACS) which will eliminate cockpit crowding by replacing all current navigation and communication radio control boxes with one primary and one backup integrated control.
- An Airborne Target Handoff System to rapidly and efficiently transfer full attack data from a scout to an attack aircraft.

## FLIGHT SIMULATORS

In support of the various aircraft programs and in order to meet the increasing challenges of rigorous aviation qualification and combat readiness training standards, the Army plans exploitation of the many advantages provided by the new "third generation" simulators. Army

flight simulators of the 1980's will include NOE visual displays and attack helicopter weapon systems which will provide flight crew mission training under simulated enemy air defense environments.

Additionally, the "third generation" flight simulators will train aircrews to overcome adverse conditions of weather and day/night operations. The attack helicopter simulators, through incorporation of aerial weapons simulation, will improve aircrew gunnery skills while avoiding the normally inherent costs of training ammunition and the necessity for additional aerial weapon ranges.

Currently, the Army is fielding three CH-47 and two AH-1 flight simulators in FY82. Plans include procurement of simulators for the UH-60 and AH-64.

## AIRDROP

A new High Altitude Airdrop Resupply System was recently type classified and is scheduled for fielding in mid-1981. This resupply system will provide a new capability to airdrop supplies accurately from altitudes up to 10,000 feet. In development is another high altitude resupply system capable of airdropping supplies from higher altitudes.

To reduce dispersion of heavy drop platform loads, an Aircraft Controlled Exit System is being developed which will allow airdrop of linked platforms. Operationally, this means that functionally related equipment such as missile/launcher and trailer/prime mover will be airdropped together.

Entering the final stage of development is a new Maneuverable Reserve Parachute for the Standard Army MC-3 Free-Fall Parachute Assembly which will enhance mission accomplishment in case of failure of the main canopy.

The development of a new system for airdropping personnel and accompanying supplies from a single C-130 aircraft during the initial pass over the drop zone has just been completed and when fielded, will considerably speed the assembly of personnel and their accompanying loads.

The use of guidance and control with gliding decelerators is being explored to provide extreme accuracy of airdrop of supplies during extreme conditions of high winds, high altitudes, and low visibility. (CONT. ON P. 118)▶





1950'S – O-1



1960'S – UH-1



1970'S – AH-1G

# 1980 EQUIPMENT ISSUE

ARMY AVIATION – 1942-1980

# ARMY AVIATION EQUIPMENT ISSUE

JULY 15, 1980

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## QUIK QUIZ #1

We present 19 aircraft photos for you to identify... if you can! Turn to page 50 for the correct answers after you've made your guesses..... 48

## QUIK QUIZ #2

Perhaps it's easier for you to identify aircraft by their line drawings. If so, here are 21 more aircraft with which to test yourself..... 112

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## ACKNOWLEDGMENT

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## PLEASE NOTE

The eight-page centerfold section is a special AAAA "1980 Sweepstakes" insert which may be removed as a simple pullout.

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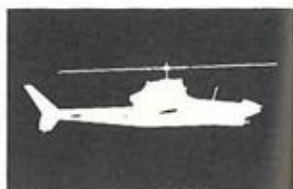
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## MAGAZINE DETAILS

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# A ONCE-IN-A-DECADE ISSUE!

The June-July 1980 "Equipment Issue" of ARMY AVIATION MAGAZINE attempts to capture, in one magazine issue, some 38-40 years of Army Aviation history as pictured by the aviation "hardware" used in the four decade period. The "Equipment Issue" was last published in August 1969.

While more than 260 aircraft of all types are shown photographically or pictorially within the magazine's 120 editorial and advertising pages, the issue does NOT claim that the aircraft presented herein represent the Army's "full aeronautical stable" during 1942-1980.

We know we've covered the major systems that received Army funding, and probably did not miss very many R&D proposals, but miss some we did, and we turn to you to

fill us in on just which aircraft should be added to our next update, the "1982 Equipment Issue."

One consistent and major (slipstick) editorial goof, except for page 112: The issue's "Maximum and cruising speeds" appear in "knots" and should be interpreted as "kilometers per hour". "Ranges" appear as "nautical miles" or "n.m." and should be interpreted as kilometers. The issue went off to the printer before we were aware of this error.

How many aircraft, GEMS, etc. are pictured in this issue by photo or drawing? We'll send a 1979 bound volume to the first three persons sending in the correct answer. So get out your pencil, tick them off, and send in your total on a 10-penny postcard.

—Art Kesten

## FROM THE BEGINNING LITTON PRECISION GEARS HAVE KEPT THE CHINOOK FLYING WITH THE BEST.



MODELS  
A-B-C-D

One piece transmission gear shaft clusters combine latest state-of-the-art design and new manufacturing technology.



**Litton Precision Gear**  
Chicago, Illinois



1950'S - U-1



1960'S - OV-1



1970'S - C-12

# FIXED WING AIRCRAFT

1980 EQUIPMENT ISSUE

# C-12A HURON



BELOW: 52 inch wide by 52½ inch high cargo door is C-12A feature



**DESCRIPTION:** Ten-place pressurized command transport, liaison, and cargo aircraft now utilized by all three Services.

**MANUFACTURER:** Beech Aircraft Corporation, Wichita, Kansas.

**POWER PLANT:** Two Pratt & Whitney PTA6A-38 turbine engines of 750 shaft horsepower each.

**PROPELLERS:** Three-bladed Hartzell full-feathering, reversible propellers.

**SPECIFICATIONS:** Span: 54 ft, 6 in. Length: 43 ft, 10 in. Height: 15 ft, 5 in. Gross weight: 12,500 lbs. Empty weight: 7,821 lbs. Useful load: 4,764 lbs. Fuel: 386 gal.

**PERFORMANCE:** Cruising speed (25,000 ft): 241 knots. Cruising speed (31,000 ft): 222 knots. Stall speed: 80 knots. Service ceiling: 30,400 feet. Max range: 1,177 nautical miles. Rate of climb: 2,130 feet per minute.

**REMARKS:** A member of Beechcraft's King Air family, the T-tail C-12A is truly a well-tested off-the-shelf "buy." Fully-instrumen-

ted and having a quick-change interior, wide cargo door, and high-flotation landing gear, the Huron provides rapid and secure movement of vital people and critically needed materiel from short-grass runways while still being able to operate at 31,000 feet in pressurized comfort. First accepted in July 1975, a total of 70 C-12A's are currently on contract with four one-year options of 20 aircraft each year remaining. Most are assigned to flight detachments, embassies, and missions.





## This top-ranking military jetprop is volunteering for more special missions.

Beechcraft's rugged C-12 jetprop has earned its military stripes as a hardworking military transport. Its turboprop economy has been saving money for the Army, Air Force and Navy and Marines all over the world. In addition, the C-12 has gained an enviable reputation for reliability.

Now it's ready for more special assignments.

With available installations for aerial surveillance, tactical field support, ECM, photography, Infra-Red,

Side Looking Radar (SLAR), remote sensing, and many others, this versatile aircraft offers a broad range of mission capabilities.

And because many of these special equipment packages can be quickly removed or converted, one C-12 airframe can be used to fill the roles of several special missions aircraft.

In addition, the comprehensive Beech logistics support program now assumes total responsibility for all

on-site maintenance, crew training, parts inventory, and worldwide technical service. As a result, the C-12 continues to deliver operational readiness rates well in excess of 90%.

If your command could use a special mission support system with this kind of multi-role capability, write Beech Aircraft Corporation, Aerospace Programs, Wichita, Kansas 67201.



# CV-2 CARIBOU



**DESCRIPTION:** Medium Tactical Transport (MTT) STOL aircraft with wheel or wheel-skis.  
**MANUFACTURER:** DeHavilland Aircraft of Canada, Limited, Downsview, Ontario.  
**POWER PLANT:** Two Pratt & Whitney

R2000-7M2 engines of 1,450 hp each..

**PROPELLERS:** Hamilton Standard three-bladed, variable pitch metal propellers.

**SPECIFICATIONS:** Span: 95 ft, 8 in. Length: 72 ft, 7 in. Ht: 31 ft, 9 in. Empty wt: 16,920 lbs. Gross wt: 28,500 lbs. Places: Crew of two and 32 pass., 24 combat-equipped troops, or 14 litters and 8 troops.

**PERFORMANCE:** Max speed (SL): 346 knots. Cruise speed (SL): 272 knots. Service ceiling: 27,500 ft. Max range: 2,240 n.m. Rate of climb: 1,575 fpm.

**REMARKS:** Since initial procurement (Nov 1959) and first delivery (Jan 1961), the Army purchased 173 Caribou before releasing them to the USAF in April 1966 under a Army-Air Force agreement. The CV-2's were ferried to Vietnam in 1962 where their excellent short-field performance and three-ton payload served well. DOD later approved ('66) a twin-turbine, wide fuselage program.

# CV-7 BUFFALO

**DESCRIPTION:** Medium Tactical Transport (MTT) STOL aircraft.  
**MANUFACTURER:** DeHavilland Aircraft of Canada, Limited, Downsview, Ontario.  
**POWER PLANT:** Two General Electric T64-10

turbo-prop engines of 2,850 horsepower each

**PROPELLERS:** Hamilton Standard three-bladed, reversible pitch metal propellers, 13 feet, 9 inches diameter.

**SPECIFICATIONS:** Span: 96 feet. Length: 77 feet, 3 inches. Height: 28 feet, 7 inches. Empty weight: 22,864 pounds. Gross weight: 41,000 pounds. Places: Crew of two and 41 passengers (or 35 paratroopers) or 24 litters and 6 troops.

**PERFORMANCE:** Maximum speed (Sea level): 347 knots. Cruising speed (Sea level): 451 knots. (5,000 feet): 443 knots. Service ceiling: 31,000 feet. Maximum range: 846 nautical miles. Rate of climb: 2,050 feet per minute.

**REMARKS:** The Buffalo is a larger turbo-prop version of the CV-2 Caribou. Since April, 1965, four prototypes of the CV-7 Buffalo were built under a U.S.-Canadian production-sharing agreement.



# Tracor M-130

MISSIONIZED SURVIVABILITY EQUIPMENT



## TRACOR'S M-130 — STANDARD EQUIPMENT ON UH-60

Mission completion on the modern battlefield demands protection from air-defense weapons. The lightweight M-130 provides the needed protection against radar and IR threats using the test-proven M-1 chaff and M-206 flare units. The M-130 can be used on a missionized basis to provide protection when needed in a 30 lb. package. The M-130 is in production at Tracor for the U.S. Army and for an international customer. The M-130 has been successfully test flown on the AH-1, UH-1, OH-58, CH-47, OV-1,

RU-21, and the UH-60 Black Hawk. Flight tests will soon be conducted on the AH-64 Advanced Attack Helicopter. Similarity to the USAF AN/ALE-40 standard tactical dispenser allows reduced logistic burden through commonality of expendables and many assemblies and spare parts.

For information contact David Wallace, Countermeasures Marketing, Tracor, Inc. 6500 Tracor Lane, Austin, Texas 78721. Telephone 512/326-2800. TLX Number 776410, or TWX Number 910/874-1372.

## Tracor Aerospace

Tracor, Inc. 6500 Tracor Lane Austin, Texas 78721 TWX-874-1372 Telex 77-6414

"THE LEADING EDGE IN ELECTRONIC SYSTEMS TECHNOLOGY"



# L-1 VIGILANT



**DESCRIPTION:** Two-place metal frame, fabric covered high wing observation and reconnaissance aircraft employed in medical evacuation missions in its litter configuration.

**MANUFACTURER:** Stinson Division of Con-

solidated Vultee Aircraft Corporation.

**POWER PLANT:** One Lycoming R-680-9 radial, 9 cylinder, aircooled engine of 295 horsepower.

**PROPELLERS:** Hamilton-Standard constant speed, 8 foot, 6 inch diameter.

**SPECIFICATIONS:** Gross Weight: 3,325 lbs.

**PERFORMANCE:** Cruise speed (Sea level): 99 knots. Service ceiling: 14,000 feet. Maximum range: 240 nautical miles.

**REMARKS:** This aircraft was originally designated as the O-49 with its procurement being handled by the Army Air Corps. The Vultee-Stinson entry was the winner of a competition with the Bellanca YO-50 and the Ryan YO-51 Dragonfly. All models (A through F) had flaps and slots. 327 Vigilants were purchased in 1942 to include 142 L-1's, 182 L-1A's, and 3 L-1B ambulance aircraft. An additional 25 were bought in 1943 with 21 L-1D's being converted A's for familiarization in glider training.

# L-2 GRASSHOPPER

**DESCRIPTION:** Two-place metal frame, fabric covered, high wing observation and reconnaissance aircraft.

**MANUFACTURER:** Taylorcraft.

**POWER PLANT:** One Continental O-170-3 4

cylinder, direct drive, horizontally opposed, aircooled engine of 65 horsepower.

**PROPELLERS:** Sensenich two-bladed fixed pitch wooden propeller, 6 foot diameter.

**SPECIFICATIONS:** Gross Weight: 1,300 lbs.

**PERFORMANCE:** Cruise speed (Sea level): 83 knots. Service ceiling: 10,050 feet. Maximum range: 230 nautical miles.

**REMARKS:** Originally designated within the Army Air Forces as the O-57, the aircraft was used by both the AAF and the Army Ground Forces. All models, A through M and excluding "I", had 65 horsepower engines, except the L with its 50 horsepower engine. Procurement included 559 in 1942 (74 L-2's, 476 L-2A's, and one each of the C, D, E, F, G, H, J, K, and L models). 1943 procurement totaled 1,390 aircraft (490 L-2B's and 900 L-2M's). The H, J, K, and L's had side-by-side seating; all other models featured tandem seating.



# L-3 GRASSHOPPER

**DESCRIPTION:** Two-place metal frame, fabric-covered observation and reconnaissance aircraft. Military version of commercial "Challenger." Models ranged from "A" through "J", excluding "I".

**MANUFACTURER:** Aeronca Mfg. Company.

**POWER PLANT:** One Continental O-170-3 4 cylinder, direct drive, horizontally opposed, aircooled engine of 65 horsepower.

**PROPELLERS:** "A" model: Freedman-Burnham ground adjustable, two-bladed propeller with aluminum hub. The "B" & "C" models had a Sensenich fixed pitch wooden propeller.

**SPECIFICATIONS:** Gross Weight: 1,300 lbs.

**PERFORMANCE:** Cruise speed (SL): 76 knots. Service ceiling: 7,750 feet. Maximum range: 165 nautical miles.

**REMARKS:** Used by both AGF and AAF. Originally the O-58, the L-3 was dubbed "Grasshopper" by the Army. All models had



65 horsepower engines; all but the "F" and "G" with side-by-side seating, had tandem seats. 875 "B's" and 490 "C's" were purchased during 1942-1943 with total procurement being 1,465 aircraft.

## ADD'L "L" AIRCRAFT

**L-7 Monocoupe** . . Manufactured by Universal; powered by a 90 hp O-200-1 Franklin engine. All 19 two-place "A's" purchased in FY 1943 were sent to the ETO.

**L-8 Cadet** . . Manufactured by Interstate; powered by a 65 hp O-170-3 Continental engine. Two-place commercial **S-1A Cadet** not used by the AGF; Bolivia bought 8.

**L-9 Voyager** . . Manufactured by Stinson; powered by a 90 hp O-200-1 Franklin engine. The British Navy bought eight three-place L-9A's in FY 42 and also used 12 L-9B's with 4AC-199-E3 engines.

**L-10** . . Manufactured by Ryan Aeronautical; powered by a 145 hp 50-499 Warner engine. Designated as the Ryan **SCW** in 1937, one three-place L-10 was leased in FY 42.

**L-11** . . Manufactured by Bellanca as the six-place 31-50. Powered by a 600 hp R-1340-41 Pratt & Whitney engine. One leased.

**L-12 Reliant** . . Manufactured by Stinson as

the **SR-5A** ("A" model) and the **SM-7B** ("B" model). Two L-12's with a 300 hp R-680-9 Lycoming engine and two L-12A's with 300 hp R-985-A P&W engines were purchased by the AFF in FY 44 as four-place trainers.

**L-18** . . Manufactured by Piper as **Cub 95**; powered by a 90 hp O-205-1 Continental engine. First purchased in FY 49 with the bulk of a 1,043 buy (105 "B's" and 938 "C's") being obtained by Turkey and a small number utilized by Army flying clubs.

**L-22 Super Navion** . . Manufactured by Ryan Aeronautical; Only three aircraft carried this designation. Redesignated as **XL-17D's**.

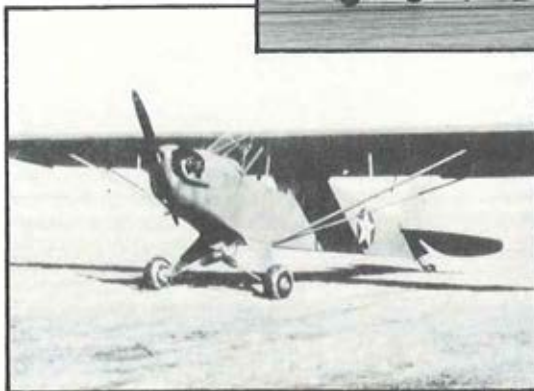
**L-25** . . . Manufactured by McDonnell Aircraft; only aircraft to carry three designations; also known as the **XV-1** and **XH-35**.

**L-27** . . . Manufactured by Cessna Aircraft as its commercial **Model 310** twin-engine aircraft and used within the USAF. No Army procurement of this model.

# L-4 CUB



BELOW: An L-4 on the deck



LEFT: The L-4 is hand propped



**DESCRIPTION:** Two-place metal frame, fabric-covered, high wing observation/liaison aircraft.

**MANUFACTURER:** Piper Aircraft Corporation, Lock Haven, Pennsylvania.

**POWER PLANT:** One Continental O-170-3 piston engine of 65 horsepower.

**PROPELLERS:** Sensenich fixed pitch, two bladed wooden propeller.

**SPECIFICATIONS:** Span: 35 feet, 4 inches. Length: 22 feet, 4 inches. Height: 6 feet, 7 inches. Empty weight: 658 pounds. Gross weight: 1,220 pounds.

**PERFORMANCE:** Maximum speed (Sea level): 139 knots. Cruising speed (Sea level): 120 knots. Stalling speed: 60 knots. Service ceiling: 9,300 ft. Maximum range: 204 n.m.

**REMARKS:** From initial '42 procurement until '45, the Army rec'd 5,671 L-4's. Ten models were purchased, ranging from the "A" (948 purchased) through the "J" (1,680 units). 981 "B's" and 1,801 "H's" were other major

buys. All had tandem seating, except the E and F. They also had a 75 hp Continental engine; three-places, one in front, two in back; and were used for pre-glider training. "G" had a 100 hp Lycoming engine. "H" was a "B" with a fixed pitch prop and a 65 hp Lycoming engine; the "J" was an "H" with a controllable pitch propeller. While the L-2, L-3, and L-4 were all called "Grasshoppers", the name "Cub" stuck to the L-4. It was also called the "Maytag Messerschmidt."



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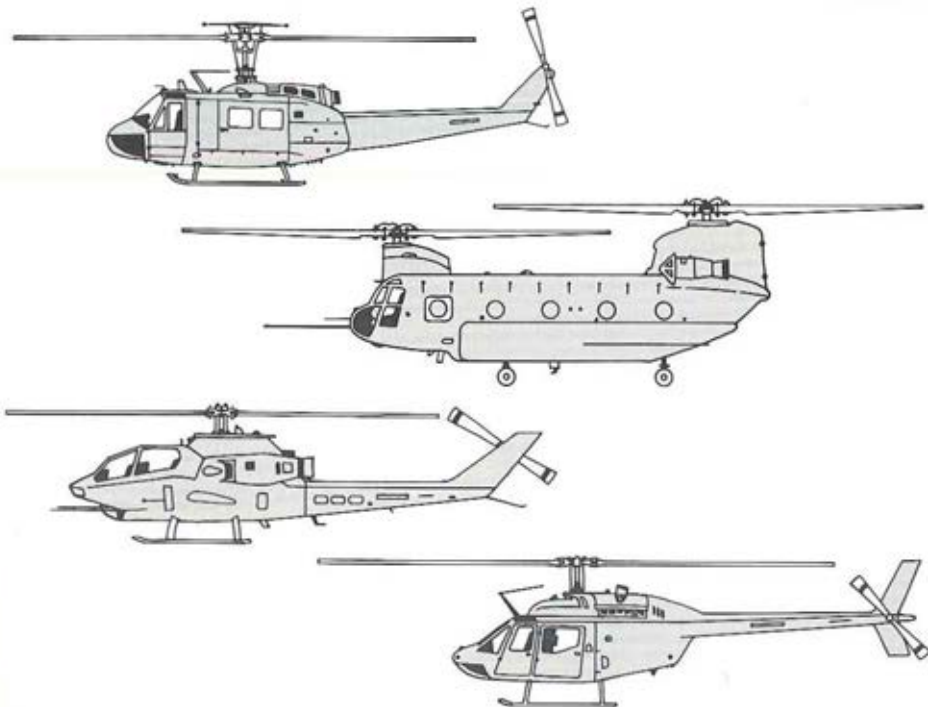
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# L-5 SENTINEL



**DESCRIPTION:** Two-place metal frame, fabric covered high wing observation-reconnaissance and medical evacuation aircraft used by the AAF, AGF, and the Navy. Originally the O-62, the models ranged from

"A" to "G", excluding "D."

**MANUFACTURER:** Stinson Division of the Consolidated Vultee Aircraft Corporation.

**POWER PLANT:** One Lycoming O-435-I engine of 185 horsepower.

**PROPELLERS:** Sensenich fixed pitch, two-bladed wooden propeller, 7 feet, 1 inch diameter.

**SPECIFICATIONS:** Aircraft Gross weight: 2,020 pounds.

**PERFORMANCE:** Cruising speed (Sea level): 160 knots. Service ceiling: 15,800 feet. Maximum range: 672 nautical miles.

**REMARKS:** Army L- Pilots operated the L-5 from 1945 through the first months of the Korean hostilities. The "drop" rear seat permitted cargo or litter carrying. A total of 2,272 L-5's were purchased between 1942-1945 (2,419 L-5 and L-5A's in 1942) (679 "B's" in 1943) (300 "C's", 558 "E's", and one "F" in 1944) (115 "G's" in 1945.)

# L-6

**DESCRIPTION:** Two-place metal frame, high wing observation and reconnaissance aircraft.

**MANUFACTURER:** Interstate.

**POWER PLANT:** One air-cooled Franklin

O-200-5 engine of 102 horsepower.

**PROPELLERS:** U.S. Propeller fixed pitch, two-bladed propeller of 6 feet, 4 inches diameter.

**SPECIFICATIONS:** The aircraft's gross weight totaled 1,650 pounds.

**PERFORMANCE:** Cruising speed (Sea level): 139 knots. Service ceiling: 12,100 feet. Maximum range: 1,107 nautical miles.

**REMARKS:** This fabric-covered aircraft was sold commercially as the Interstate S-1B Cadet. Its original Army Air Corps military designation was the O-63. One XL-6 Interstate Cadet was procured in 1942 with an additional 250 of the aircraft being purchased by the government in 1943.



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# L-13



**DESCRIPTION:** Three-place, all-metal, high wing observation and reconnaissance aircraft capable of fulfilling the medical evacuation mission.

**MANUFACTURER:** Stinson Division of the

Consolidated Vultee Aircraft Corporation.

**POWER PLANT:** One air-cooled Franklin XO-425-5 engine of 245 horsepower.

**PROPELLERS:** Two-bladed, variable pitch propeller of 8 feet, 6 inch diameter.

**SPECIFICATIONS:** The aircraft had a gross weight of 2,900 pounds.

**PERFORMANCE:** Cruising speed (Sea level): 169 knots. Service ceiling: 15,000 feet. Maximum range: 781 nautical miles.

**REMARKS:** Although the Army Ground Forces tested two of these aircraft in 1945, the L-13 was not accepted at that time. Later, the Army Ground Forces procured the L-13 model and by June, 1951, there were 43 of this aircraft in the Army inventory. The L-13 could carry two litters in place of the rear passenger seats. The production prototypes of the L-13 aircraft had folding wings, but this particular model was not procured for use by the Army.

# L-14

**DESCRIPTION:** Three-place, metal frame, fabric-covered observation and reconnaissance aircraft capable of fulfilling medical evacuation missions.

**MANUFACTURER:** Piper Aircraft Corpora-



tion of Lock Haven, Pennsylvania.

**POWER PLANT:** One Lycoming O-290-3 piston engine of 130 horsepower.

**PROPELLERS:** Sensenich two-bladed model 76 JB 44 propeller.

**SPECIFICATIONS:** Span: 35 feet, 10 inches. Length: 23 feet, 3 inches. Height: 7 feet. Empty weight: 1,100 pounds. Gross weight: 1,800 pounds.

**PERFORMANCE:** Maximum speed (Sea level): 187 knots. Cruising speed (Sea level): 166 knots. Service ceiling: 14,500 feet. Maximum range: 552 n.m. Endurance: 3.5 hours.

**REMARKS:** The Army Ground Forces procured five L-14's and cancelled an order for 845 more on VJ Day. The airplane had long landing gear, a litter-carrying configuration (over the rear seat and into the rear fuselage), and exceptional all-around visibility through the plexiglass 'birdhouse' in which the pilot sat.

# L-15 SCOUT

**DESCRIPTION:** Two-place all-metal, high wing observation and reconnaissance aircraft with tricycle landing gear.

**MANUFACTURER:** The Boeing Airplane Co.

**POWER PLANT:** One Lycoming O-290-7 engine of 125 horsepower.

**PROPELLERS:** Two-bladed, variable pitch propeller.

**SPECIFICATIONS:** The aircraft had a gross weight of 2,216 lbs.

**PERFORMANCE:** Cruising speed (Sea level): 138 knots. Service ceiling: 12,500 feet. Maximum range: 347 nautical miles.

**REMARKS:** This was a production prototype that was never produced in quantity. Twelve YL-15 aircraft were procured by the Army Ground Forces between 1947 and 1949 for service and evaluation tests only. The YL-15's were later utilized in Alaska by the Forestry Service. The Boeing-built L-15 Scout used spoilers instead of ailerons and



full flaps. With its high wing and elevated tail boom, the L-15's observer was seated backwards and had a full panoramic downward view unobstructed by the normal tail structure of most observation aircraft.

# L-16

**DESCRIPTION:** Two-place, metal frame, fabric-covered observation and reconnaissance aircraft.

**MANUFACTURER:** Aeronca Manufacturing Company.

**POWER PLANT:** One Continental O-190-1 engine of 95 horsepower.

**PROPELLERS:** McCauley fixed pitch, two-bladed metal propeller of 6 feet, 1 inch diameter.

**SPECIFICATIONS:** The aircraft had a gross weight of 1,300 lbs.

**PERFORMANCE:** Cruising speed (Sea level): 130 knots. Service ceiling: 14,500 feet. Maximum range: 328 nautical miles.

**REMARKS:** This tandem-seating L-16 aircraft was the military version of the Aeronca "Champion", and was the most inexpensive aircraft ever purchased by the military. The initial date of Army procurement was in 1948, with a total of 742 L-16A's eventually

being delivered. There were 61 "B" Models through June 1948. The L-16 was used extensively in the early part of the Korean conflict in 1950, and a large number were also used in the Civil Air Patrol in the mid-'50's.



# L-17 NAVION



**DESCRIPTION:** Four-place all-metal, low wing utility and liaison aircraft with fully-retractable landing gear.

**MANUFACTURER:** Ryan Aeronautical Company (L-17A). North American Aviation manu-

factured the "B" and "C" models of the L-17. **POWER PLANT:** One Continental O-470-7 engine of 185 horsepower ("A" Model); 205 horsepower ("B" and "C" Models).

**PROPELLERS:** Hartzell two-bladed, variable pitch metal or plastic propeller, of 7 foot diameter.

**SPECIFICATIONS:** Gross weight: 3,050 lbs. **PERFORMANCE:** Cruising speed (Sea level): 194 knots. Service ceiling: 10,900 feet. Maximum range: 899 nautical miles.

**REMARKS:** Three models of the L-17 were procured by the Army. The "A" models were first purchased in FY 1947 with the inventory high point of 42 being reached by 1951. The "B" and "C" models had 205 horsepower engines and were purchased in FY 1949 with 196 "B's" and 35 "C's" being inventory highs in June 1949. The L-17 Navions were turned over to Army flying clubs on being phased out of service.

# L-21 SUPER CUB

**DESCRIPTION:** Two-place observation and liaison aircraft.

**MANUFACTURER:** Piper Aircraft Corporation, Lock Haven, Pennsylvania.

**POWER PLANT:** One Lycoming O-290-D

piston engine of 125 horsepower.

**PROPELLERS:** Sensenich fixed pitch, two-bladed metal propeller.

**SPECIFICATIONS:** Span: 35 feet, 4 inches. Length: 22 feet, 3 inches. Height: 6 feet, 8 inches. Empty weight: 935 pounds. Gross weight: 1,500 pounds.

**PERFORMANCE:** Maximum speed (Sea level): 192 knots. Cruising speed (Sea level): 176 knots. Service ceiling: 16,000 feet. Maximum range: 480 nautical miles. Rate of climb: 1,000 feet per minute.

**REMARKS:** Since its initial delivery date in 1951, the Army procured 150 "A" models and 69 "B" models. This metal-frame, fabric-covered airplane was used mainly as a trainer. The "B" model saw extensive use in the Far East with leased aircraft being used in SFT by Reservists. The L-18C, used in MDAP, was the same as the L-21 except that it had a 90 horsepower Continental engine.





# L-25 (XV-1, H-35)

**DESCRIPTION:** Four-place experimental convertiplane.

**MANUFACTURER:** McDonnell Aircraft Corporation, St. Louis, Missouri.

**POWER PLANT:** One Continental R-975-19 engine of 550 horsepower.

**ROTOR SYSTEM:** Single three-bladed rotor and two-bladed pusher propeller.

**SPECIFICATIONS:** Empty weight: 4,277 pounds. Gross weight: 5,505 pounds.

**PERFORMANCE:** Maximum speed (Sea level): 312 knots. Service ceiling: 11,800 feet. Maximum range: 589 nautical miles.

**REMARKS:** The Army procured two L-25 aircraft in FY 1954 from McDonnell Aircraft for state-of-the-art research and evaluation. This was the only aircraft ever given three separate designations. The Army originally called this aircraft the XH-35 while the USAF referred to the convertiplane as the XL-25 with the XV-1 being the compromise design.



nation. The twin boom aircraft had a greenhouse-type cockpit and stressed skids. The XV-1 was followed by the XV-2 (Sikorsky) convertiplane (design study only) and the XV-3 (Bell) which achieved in-flight conversion.

# LC-126

**DESCRIPTION:** Four-place utility airplane.

**MANUFACTURER:** Cessna Aircraft Company, Wichita, Kansas.

**POWER PLANT:** One Jacobs R-755-11 direct drive engine of 300 horsepower.

**PROPELLERS:** Hamilton Standard constant speed metal propeller, 7 ft, 9 in diameter.

**SPECIFICATIONS:** Span: 36 feet, 2 inches. Length: 27 feet, 4 inches. Height: 8 feet, 3.5 inches. Empty weight: 2,250 pounds. Gross weight: 3,350 pounds.

**PERFORMANCE:** Maximum speed (Sea level): 288 knots. Cruising speed (Sea level): 216 knots. (10,000 feet): 254 knots. Service ceiling: 19,800 feet. Maximum range: 1,536 nautical miles. Endurance: 4 hours. Rate of climb: 1,200 feet per minute.

**REMARKS:** In 1950, five LC-126B's were purchased by the USAF for the Army National Guard. The Army issued a contract in 1952 for 63 LC-126C's for use in such varied mis-

sions as search and rescue, light cargo transport, and instrument training. The maximum inventory totals for the aircraft were eight "A's", five "B's", and 64 "C's", dropping to nine aircraft by January 1962.



# O-1 BIRD DOG

BELOW: A float-equipped O-1 on a Panama mission.



LEFT: A specially-rigged O-1 Bird Dog is ready to drop two 82d Abn troopers.



**DESCRIPTION:** Two-place all-metal, high wing observation, reconnaissance, and liaison aircraft with tandem seating.

**MANUFACTURER:** Cessna Aircraft Company, Wichita, Kansas.

**POWER PLANT:** One Continental O-470-11 piston engine rated at 213 horsepower.

**PROPELLERS:** McCauley fixed pitch, two-bladed metal propeller.

**SPECIFICATIONS:** Span: 36 ft. Length: 25 ft, 10 in. Height: 7 ft, 4 in. Empty wt: 1,614 lbs. Gross wt: 2,430 lbs. Fuel: 40 gal. Flaps, fixed landing gear.

**PERFORMANCE:** Max speed (SL): 184 knots. Cruising speed (SL): 160 knots. (10,000 ft): 170 knots. Stalling speed: 86 knots. Service ceiling: 18,500 ft. Max range: 947 n.m. Endurance: 4.67 hours. Rate of climb: 1,040 fpm.

**REMARKS:** Developed for the Army after WW II, the Bird Dog (originally designated by the Army as the L-19) was Cessna's winning design competition entry in April 1950. The

Army accepted some 3,430 O-1A's and E's by March 1964 with the USMC using O-1B's and O-1C's. Later, the USAF utilized F's and G's in Vietnam for forward air controller missions. Nineteen other countries also purchased this versatile aircraft. The structurally stronger TO-1D served as the Army's instrument trainer version in having a variable pitch propeller and an instrument panel in the rear. The latter could be enclosed for hooded flight.

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# OV-1 MOHAWK



LEFT: OV-1 Mohawk equipped with SLAR



**DESCRIPTION:** Two-place observation and reconnaissance aircraft.

**MANUFACTURER:** Grumman Aerospace.

**POWER PLANT:** Two Lycoming T53-L-701 turboprop engines of 1,400 shp each.

**PROPELLERS:** Hamilton-Standard three-bladed reversing & feathering, 10 ft. diam.

**SPECIFICATIONS:** Span: 48 ft. Length: 41 ft. Length (with SLAR antenna): 43 ft. Height: 13 ft. Empty wt: 11,800 lbs. Fuel: 1,930 lbs; Two 150-gallon drop tanks: 2,368 lbs.

**PERFORMANCE:** Max speed (Sea level): 265 knots (IR/photo). Cruise (Sea level): 210 knots. Service ceiling (80% fuel): 25,000 ft. Range (w/drop tanks): 878 nm (IR/photo).

**REMARKS:** The OV-1 was first purchased as the AO-1 in Sept., 1960. The "A" utilized two 960 hp Lycoming T-53-L3 turboprop engines; a 1,100 hp T-53-L7 was installed in the "B" model in 1963. Designed to operate from small, unimproved fields in the forward battle area, the "D" is deceptively similar to ear-

lier versions but rapid configuration procedures enable a single OV-1D to perform the surveillance functions of any previous Mohawk. Capable of daylight, darkness, and inclement weather operations, the "D" has a more accurate inertial navigation system, improved infrared and radar performance, a vertical panoramic camera system that photographs terrain horizon to horizon, a radiological monitoring system, and ECM equipment to assure mission success.

# T-37



**DESCRIPTION:** Two-place, side-by-side off-the-shelf jet trainer.

**MANUFACTURER:** Cessna Aircraft Company, Wichita, Kansas.

**POWER PLANT:** Two Continental J-69-T-9

turbojets developing 1,840 pounds thrust.

**SPECIFICATIONS:** Span: 33 feet, 8 inches. Length: 29 feet, 2 inches. Height: 9 feet, 1 inch. Gross weight: 6,600 pounds. Empty weight: 4,076 pounds.

**PERFORMANCE:** Maximum speed (35,000 feet): 653 knots at military power, 21,730 rpm. Cruising speed (35,000): 589 knots at normal rated power, 20,700 rpm. Service ceiling: 35,000 feet. Maximum range: 1,274 nautical miles. Endurance: 2.8 hours. Rate of climb (Sea level): 3,200 feet per minute.

**REMARKS:** This aircraft was procured by the USAF as a primary jet trainer. Three T-37's were loaned to the Army in 1958 for Project LONG ARM for the purpose of evaluating the use of high speed, high performance aircraft for long range artillery adjustment and observation as well as low altitude, high speed flight. More than 900 were built for the USAF and other nations.

# G-91

**DESCRIPTION:** One-place high performance tactical reconnaissance jet fighter evaluated for use by the USA Aviation Test Board as an observation aircraft.

**MANUFACTURER:** Built for the NATO For-

ces by the Fiat Aviation Division of Turin, Italy.

**POWER PLANT:** Bristol-Siddeley Orpheus MK 803 axial flow turbojet engine of 4,078 pounds thrust each with after-burner. 5,000 pounds of rated sea level static thrust.

**SPECIFICATIONS:** Span: 29 feet. Length: 39 feet, 3 inches. Height: 14 feet, 5 inches. Empty weight: 8,380 pounds. Gross weight: 19,070 pounds.

**PERFORMANCE:** Maximum speed (Sea level): 1,144 knots. Operational ceiling: 27,600 feet.

**REMARKS:** In 1961, the Army received the loan of three of these NATO fighters to be used for test and evaluation as a high speed, high performance observation aircraft. Testing was discontinued after two of these jets were lost in separate accidents. The G-91T was a two-place tandem-seating trainer version.





# T-41B MESCALERO

**DESCRIPTION:** Four-place, all-metal, high wing single engine primary trainer.

**MANUFACTURER:** Cessna Aircraft Company, Wichita, Kansas.

**POWER PLANT:** One Continental IO-360-D piston engine of 210 horsepower.

**PROPELLERS:** One McCauley two-bladed, constant speed propeller. 6 ft., 4 in. dia.

**SPECIFICATIONS:** 35 feet, 10 inches. Length: 26 feet, 11 inches. Height: 8 feet, 11 inches. Gross weight: 2,300 pounds. Empty weight: 1,255 pounds.

**PERFORMANCE:** Maximum speed (Sea level): 246 knots. Cruising speed (5,500 feet): 248 knots per hour. Service ceiling: 17,500 feet. Normal range (5,500 feet): 950 nautical miles. Maximum range (10,000 feet): 1,288 nautical miles. Takeoff, sod runway: 635 feet. Landing, sod: 400 feet. Fuel: 52 U.S. gallons. Rate of climb: 910 feet per minute.

**REMARKS:** An off-the-shelf Cessna Model 172, 255 T-41B's were delivered through



March, 1967 under a \$4 million contract. With extensive nav-com equipment for student-instructor usage, the T-41 replaced the O-1 Bird Dog, then the Army's primary trainer, for other support missions.

# T-42A

**DESCRIPTION:** Four-place off-the-shelf dual instrumented, all-weather instrument and transition trainer.

**MANUFACTURER:** Beech Aircraft Corporation, Wichita, Kansas.

**POWER PLANT:** Two Continental IO-470-L fuel injection engines rated at 260 horsepower each.

**PROPELLERS:** McCauley constant speed, full-feathering two-bladed metal propellers, 6 feet, 6 inches diameter.

**SPECIFICATIONS:** Span: 37.9 feet. Length: 27.3 feet. Height: 9.6 feet. Empty weight: 3,423 pounds. Gross weight: 5,100 pounds.

**PERFORMANCE:** Maximum speed (Sea level): 205 knots. Cruising speed, 65 percent (Sea level): 191 knots. Service ceiling: 19,700 feet. Absolute ceiling: 21,000 feet. Maximum range: 1,065 nautical miles (with 45 minute reserve). Endurance: 7.5 hours. Rate of climb: 1,670 feet per minute.

**REMARKS:** Commercially known as the

Beechcraft B55 Baron, the T-42A was first purchased in '65 becoming one of the Army's most active trainers. Additional T-42's were flown to Turkey by US Army pilots under a Military Assistance Program.



# U-1A OTTER



**DESCRIPTION:** Eleven-place all-metal, high wing utility STOL aircraft.

**MANUFACTURER:** DeHavilland Aircraft of Canada, Ltd., Downsview, Ontario, Canada.

**POWER PLANT:** One Pratt & Whitney R-1340-

59 piston engine of developing 600 horsepower.

**PROPELLERS:** Hamilton Standard three-bladed, variable pitch metal propeller.

**SPECIFICATIONS:** Span: 58 feet. Length: 41 feet, 10 inches. Height: 12 feet, 7 inches. Empty weight: 4,431 pounds. Gross weight: 8,000 pounds. Fuel: 216 gallons.

**PERFORMANCE:** Maximum speed (Sea level): 245 knots. Cruising speed (Sea level): 193 knots. (5,000 feet): 221 knots. Service ceiling: 17,400 feet. Absolute ceiling: 20,500 feet. Cruising range: 1,400 nautical miles. Rate of climb: 735 feet per minute. Endurance at cruise power: 6.9 hours.

**REMARKS:** Since the initial procurement in March, 1955, the Army has purchased 205 Otters. Described as an "airborne one ton truck," the U-1A is one of the few service aircraft to retain its original designation. It employs wheels, skis, wheel-skis, and floats in filling Arctic, tropic, and normal missions.

# U-6 BEAVER

**DESCRIPTION:** Six-place, all-metal, high wing general utility aircraft with non-retractable gear. Originally the Army L-20; Off-the-shelf commercial DHC-2.

**MANUFACTURER:** DeHavilland Aircraft of

Canada, Limited, Downsview, Ontario.

**POWER PLANT:** One Pratt & Whitney R-985 AN-1 engine of 450 horsepower.

**PROPELLERS:** Hamilton Standard two-bladed, variable pitch metal propeller.

**SPECIFICATIONS:** Span: 48 ft. Length: 30 ft, 4 in. Height: 9 ft. Empty wt: 3,000 lbs. Gross wt: 5,100 lbs.

**PERFORMANCE:** Max speed (SL): 257 knots. Cruise speed (SL): 209 knots. Service ceiling: 18,000 ft. Max range (5,000 ft): 1,047 n.m. Endurance: 8 hours. Rate of climb: 850 fpm.

**REMARKS:** Operable on wheels, floats, skis, or with a wheel-ski combination, the L-20 was designed for Canada's "bush" country, its high wing allowing easy mooring at lakeside docks. Its Army missions included transporting and air-dropping personnel and supplies, wire laying, courier services, med evacuation, and command transport. 968 U-6s in all were delivered to the Army.



# U-8D/F SEMINOLE

BELOW: RU-8D Wine-bottle Configuration



LEFT: RU-8D with APS-85 Radar



**DESCRIPTION:** Six-place all-metal, low-wing high performance, all-weather courier and personnel transport with retractable tricycle landing gear. Convertible to a medevac ambulance, pilot trainer, or cargo hauler.

**MANUFACTURER:** Beech Aircraft Corporation, Wichita, Kansas.

**POWER PLANT:** Two Lycoming GSO-480-I engines rated at 340 horsepower each, supercharged for high altitude flight.

**PROPELLERS:** Hartzell three-bladed, all-metal featherable propellers.

**SPECIFICATIONS ("F"):** Span: 45 ft, 10.4 in. Length: 33 ft, 4 in. Height: 11 ft, 6½ in. Empty wt: 5,112 lbs; gross wt: 7,700 lbs.

**PERFORMANCE:** Max speed (SL): 290 knots. Cruise speed (10,000 ft): 314 knots. Service ceiling: 27,000 ft. Max range: 2,035 n.m. Endurance: 8.36 hrs. Rate of climb: 1,300 feet per minute.

**REMARKS:** The U-8D (originally the L-23) is the military version of the Beechcraft Model



50 Twin-Bonanza with the "F" being a Beechcraft 65 Queen Air. 358 Seminoles were purchased during 1952-1962. Three production and 68 production U-8Fs were delivered starting in January 1962. The NU-8F, a turbine-powered, unpressurized U-8F (two Pratt & Whitney PT6A-6 turbine engines rated at 550 shaft horsepower each) was procured by the Army in 1964. Its increased speed, higher useful load, and greater range made it a welcome addition to the Army fleet.



# U-9 AEROCOMMANDER



**DESCRIPTION:** Five-place all-metal, high-wing, utility, command, and liaison aircraft. Originally designated as the Army L-26 (Models B through D, excluding A). Off-the-shelf-version of the commercial Model 520.

**MANUFACTURER:** Aero Design and Engineering Co., Bethany, Oklahoma (Later North American Rockwell Corporation).

**POWER PLANT:** Two Lycoming GO-480-1 piston engines of 260 hp (YL-26); 270 hp (L-26B); 320 horsepower (C, D, and E models).

**PROPELLERS:** Hartzell three-bladed variable pitch, metal propellers.

**SPECIFICATIONS:** Span: 49 ft, 6 in. Length: 35 ft, 1 1/4 in. Height: 14 ft, 9 1/2 in. Empty wt: 4,475 lbs. Gross wt: 6,750 lbs. Fuel: 156 gal.

**PERFORMANCE:** Max speed (SL): 408 knots. Cruise speed (SL): 317 knots. Service ceiling 21,000 ft. Max range: 2,088 n.m. Rate of climb: 1,525 fpm.

**REMARKS:** The first U-9 (YL-26) was obtained by the Army in 1953. Some seven 260 hp U-9's, one 270 hp "B", four 320 hp "C's", 3 "D's" similar to the "C", and five RL-26's (SLAR-carriers) were purchased in '53-'59 with only nine remaining by January 1962.

# U-10 HELIO COURIER

**DESCRIPTION:** Six-place all-metal, high wing short takeoff and landing utility aircraft.

**MANUFACTURER:** Helio Aircraft Corporation, Bedford, Massachusetts.

**POWER PLANT:** One Lycoming GO-480-G1D6 engine developing 295 horsepower.

**PROPELLERS:** Hartzell three-bladed, constant-speed propeller, 8 feet diameter.

**SPECIFICATIONS:** Span: 39 feet. Length: 31 feet. Height: 8 feet, 10 inches. Empty weight: 2,037 pounds. Gross weight: 3,600 pounds.

**PERFORMANCE:** Maximum speed (Sea level): 272 knots. Cruising speed (Sea level): 240 knots. (10,000 feet): 262 knots. Service ceiling: 16,500 feet. Maximum range: 1,760 nautical miles. Endurance: 14 hours. Rate of climb: 1,125 feet per minute.

**REMARKS:** Originally designated the L-24, the commercial Helio-Courier H-395 was purchased "off-the-shelf" in 1963 by the U.S. Army for operational testing and evaluation. Twenty U-10's were procured through Fiscal Year 1965 for use by the Army's Special Forces Groups. The L-28 was the USAF version of the Helio Courier.



# U-21 UTE



BELOW: An RU-21D with SEMA antenna array similar to that on an RU-21E reconnaissance aircraft.



**DESCRIPTION:** Twelve place unpressurized, high performance, all-weather utility and tactical troop transport with a three-chair, three-litter air ambulance configuration.

**MANUFACTURER:** Beech Aircraft Corporation, Wichita, Kansas.

**POWER PLANT:** Two United Aircraft of Canada PT 6A-20 free shaft turbine engines of 520 horsepower each.

**PROPELLERS:** Beech full-feathering, reversible propellers, 7 ft, 9 in diameter.

**SPECIFICATIONS:** Span: 50 ft, 3 in. Length: 35 ft, 6 in. Height: 14 ft, 2 in. Empty weight: 6,065 lbs. Gross weight: 7,700 lbs. Retractable tricycle landing gear with single wheels.

**PERFORMANCE:** Max speed (10,000 ft): 225 knots. Cruising speed (10,000 ft): 210 knots. Service ceiling (at max gross wt): 27,000 ft. Max cruise range: 1,536 n.m. Rate of climb: 1,500 fpm.

**REMARKS:** A military combination of the Beechcraft corporate turbine-powered King

Air 90 and Queen Air, the U-21A is capable of carrying 3,000 lbs. of air cargo and features a spacious cabin with a large cargo door (53.5 in. x 51.5 in.). As a troop transport, the Ute can carry 10 field-equipped men with combat gear stowed under bench-type seats. Initial U-21A acceptance took place in April 1967. Modified version of the Army's NU-8F, which underwent initial user evaluation in March 1964. The RU-21D version was a SEMA configuration.

**RU-21H Guardrail**



**EH-1X Quick Fix II**



**EH-60 Blackhawk**







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# WOTIZZ?

## IT'S QUIK QUIZ #1.

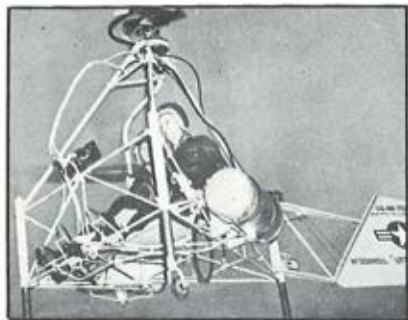
Are you sharp in recognizing the not-so-well-known aircraft proposals that have graced our magazine pages over the years? If you can name either the model number or the year in which ten of the 19 models pictured were produced, consider yourself an aviation intellectual. The answers appear on the next page.



● 4. KAMAN.....



● 8. FAIRCHILD.....



● 1. McDONNELL.....



● 5. DEL MAR.....



● 9. BELL AIR.....



● 2. BELL.....



● 6. BELL AEROSYSTEMS.....



● 10. GOODY.....



● 3. BELL.....



● 7. DEL MAR.....



● 11. AGUSTA.....



LER.....



● 12. VERTOL.....



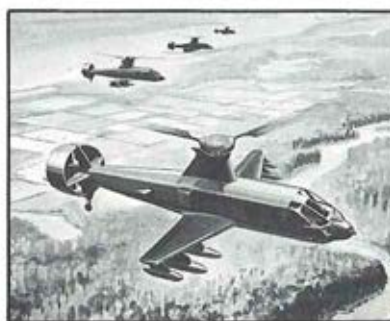
● 16. BELL.....



STEMS.....



● 13. RYAN AERONAUTICAL.....



● 17. PIASECKI.....



● 14. CANADAIR.....



● 18. SIKORSKY.....



● 15. BOEING VERTOL.....



● 19. BEECH.....





# UV-18 TWIN OTTER



**DESCRIPTION:** 21-place high-wing "command administrative, logistical, and personnel" STOL aircraft capable of operating on wheels, wheel-skis, floats, or high-flotation tires.

**MANUFACTURER:** De Havilland Aircraft, Limited, Downsview, Ontario, Canada.

**POWER PLANT:** Pratt & Whitney of Canada PT6A-20 turboprop of 579 shp.

**SPECIFICATIONS:** Span: 65 ft. Length: 51 ft, 9 in. Gross wt: 12,500 lbs.

**PERFORMANCE:** Cruising speed (SL): 296 knots. Stall speed (with flaps): 106 knots. Service ceiling: 26,700 feet. Range: 1,202 n.m. Max T.O wt: 12,500 lbs. Rate of climb: 1,600 fpm. T.O. run: 860 ft. Landing run: 950 ft.

**REMARKS:** Joining the Alaska Army National Guard in 1970, the highly successful DHC-6 Twin Otter provided ARNG forces with a multi-mission capability. On observation or search and rescue missions, the UV-18A can fly for more than six hours. Easily handled at only 129 knots, the aircraft can drop men and supplies by parachute with great precision. Its double-slotted flaps and ailerons provide safe, steep, visible descents.

## ANSWERS TO QUIK QUIZ #1

- 1. McDONNELL AIRCRAFT...XH-20 AAF PURCHASE..... 1952
- 2. BELL HELICOPTER.....H-12 AAF PURCHASE..... 1947
- 3. BELL.....TWIN-ENGINE UH-1D..... 1966
- 4. KAMAN AIRCRAFT.....HOK-1 PROPOSAL..... 1957
- 5. DEL MAR.....DH-2C TARGET DRONE..... 1966
- 6. BELL AEROSYSTEMS.....X-14 TWIN DUCT..... 1959
- 7. DEL MAR.....WHIRLYMITE R/W TRAINER..... 1966
- 8. FAIRCHILD-HILLER.....TURBO-PORTER (PILATUS)..... 1964
- 9. BELL AEROSYSTEMS. CARABAO GEM..... 1963
- 10. GOODYEAR.....INFLATO-PLANE..... 1959
- 11. AGUSTA..... 109 ASH PROPOSAL..... 1979
- 12. VERTOL.....SIX-ENGINE V/STOL AIRCRAFT..... 1959

- 13. RYAN AERONAUTICAL...DISC-ROTOR..... 1966
  - 14. CANADAIR.....CL-84 TILT-WING..... 1965
  - 15. BOEING VERTOL.....YUH-61A UTTAS PROPOSAL..... 1976
  - 16. BELL.....WINGED HELICOPTER..... 1963
  - 17. PIASECKI.....16H-1B PATHFINDER..... 1964
  - 18. SIKORSKY.....VH-3A WHITE HOUSE AIRCRAFT..... 1962
  - 19. BEECH.....L-23 WITH FUEL TANK OUTRIGGERS..... 1962
- HOW DID YOU DO? IDENTIFYING TEN OR MORE OF THE 19 PICTURED AIRCRAFT MODELS OR KNOWING THEIR MAIDEN YEAR PLACES YOU IN THE "AVIATION INTELLECTUAL" CATEGORY. IF YOU IDENTIFIED FIVE TO NINE PHOTOS, YOU'RE SHARP! IF YOU COULD ONLY LABEL FOUR OR LESS, AVIATION AIN'T YOUR THING!



1950'S - OH-13



1960'S - CH-54



1970'S - CH-47D

# ROTARY WING AIRCRAFT

1980 EQUIPMENT ISSUE



LEFT: An "S" Cobra  
NOE below the trees





# AH-1 COBRA

BELOW: AH-1G with stabilized night sight



LEFT & BELOW: An AH-1S is shown on the deck.



LEFT: Snow setting during a recent REFORGER



**DESCRIPTION ("S"):** Two-place attack helicopter.

**MANUFACTURER:** Bell Helicopter Textron, Fort Worth, Texas

**POWER PLANT:** Avco Lycoming T-53-L-703 turbine, 1,800 shaft horsepower.

**ROTOR SYSTEM:** Single composite two-bladed semi-rigid fiberglass 44 ft. dia. main rotor; flapping hinge, 8 ft., 6 in. dia. tail rotor.

**SPECIFICATIONS:** Gross wt: 10,000 lbs. Empty wt: 6,598 pounds. Length: 44 ft., 7 in. Height: 12 ft. Fuel: 259 gal.

**PERFORMANCE:** Max speed (SL): 125 to 135 knots, depending upon stores. Max range: 280 n.m. Rate of climb: 1,580 fpm.

**REMARKS:** The AH-1 series, in replacing the UH-1 armed helicopter, started in April 1966 with a development and production contract for 110 AH-1G's. First delivery followed just 13 months later with combat introduction to Vietnam in August 1967. During 1967-1972, 1,126 G's were produced at the rate of 35 per

month, logging over one million combat hours. In 1975, 91 G's were equipped with TOW systems as Q's. Later, all Q's and 198 G's received a new power train becoming the AH-1S (modified). In a three-step program beginning in March 1977, Bell was to produce 297 new S's by February 1981. In companion steps, the remaining G's were to be re-modified in the Modernized "S" configuration and all earlier production "S's" were to receive Modernized Cobra features.

# AH-56A CHEYENNE

BELOW: A pusher-prop speeds the AH-56 along.



BELOW: Gear up and doing about 380 knots!



**DESCRIPTION:** Two-place high-speed compound aircraft.

**MANUFACTURER:** Lockheed-California Company, Burbank, California

**POWER PLANT:** One General Electric T64-GE-16 turbine of 3,435 shp.

**ROTOR SYSTEM:** Single rigid rotor, 50.4 ft dia.; tall rotor 10.0 ft dia.; 10 ft dia. pusher propeller for horizontal propulsion.

**SPECIFICATIONS:** Wing span: 28.7 ft. Gross wt: 16,995 lbs. Empty wt: 11,700 lbs. Length: 55 ft. Height: 13 ft, 7 in. Tandem-seating.

**PERFORMANCE:** Max speed (SL): 220 kt. Cruise speed (SL): 210 kt. Service ceiling: 26,000 ft. Hover ceiling (OGE): 10,600 feet (std). Maximum range: 760 n.m. Endurance: 5.4 hrs. Rate of climb: 3,420 fpm.

**REMARKS:** The No. 1 prototype of the Army's AAFSS (Advanced Aerial Fire Support System) was rolled out on May 3, 1967, 13 months after the initial contract was let, with the 10th and final prototype being ac-

cepted in August, 1968. FAA certification took place in October '68 with Lockheed and its 813 suppliers to build 375 of the advanced attack helicopters for the U.S. Army. OSA terminated the Cheyenne contract in Aug '72 due to delayed development, rising costs, and the appearance of two competitive company-funded AAH candidates. In a July '72 report, a task force called for a more agile, smaller, and somewhat slower AAH with less sophisticated fire control and navigation equipment.

# CH-21 SHAWNEE

BELOW: An H-21 with floats is tested at the Boeing Vertol facility.



LEFT: A hook-up in South Vietnam.



LEFT: An Alaska ski landing.

**DESCRIPTION:** Twenty-two place single engine, twin rotor personnel and cargo helicopter.

**MANUFACTURER:** Piasecki Helicopter Corporation (later the Vertol Aircraft Corporation), Morton, Pennsylvania.

**POWER PLANT:** One Curtiss-Wright supercharged R-1820-103 engine developing 1,425 horsepower.

**ROTOR SYSTEM:** Tandem fully-articulated three-bladed counter-rotating rotors, each 44 feet in diameter.

**SPECIFICATIONS:** Gross weight: 15,200 pounds. Empty weight: 8,950 pounds. Length: 52 feet, 6 inches. Height: 15 feet, 9 inches.

**PERFORMANCE:** Maximum speed (Sea level): 203 knots. Cruise speed (Sea level): 127 knots. Service ceiling: 18,600 feet. Maximum range: 319 nautical miles. Endurance: 2 hours, 41 minutes.

**REMARKS:** Since the initial date of procure-

ment in June 1950, the Army purchased 334 CH-21s of all models. It also obtained 16 B's from the USAF. In its litter configuration, the CH-21 could carry 12 litters plus seats for two medical attendants. A multi-mission helicopter, the Shawnee utilized wheels, skis, or floats. The Shawnee was, until late 1963, the workhorse of Vietnam, when it was replaced by the UH-1. Widely used by other nations, the French employed the "Flying Banana" in Algeria combat operations.



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Team  
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COL RONALD  
K. ANDRESON  
Chief of the  
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Division  
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LTC MICHAEL  
H. SUMMERS  
DASC for Ad-  
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Helicopter  
(AAH)  
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MAJ KENNY  
J. KUNSTEL  
DASC  
for the  
HELLFIRE  
Program  
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MR. JAMES  
YAMASHITA  
Chief  
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LTC EDWARD  
A. ROBINSON  
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UH-60A BLACK  
HAWK and  
UH-1 Iriquois  
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DASC  
for the  
AH-1S COBRA/  
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# Army Aviation Association

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18 July 1980

## WORLD HELICOPTER CHAMPIONSHIPS

In response to my letter and one from the **Helicopter Club of America (HCA)** requesting D/A "support for participation by Army personnel and equipment in the **World Helicopter Championship (WHC)** to take place in Poland in 1981", the Army has completed a review and "has decided that given the current international situation, the Army should plan on participating." The commanders of USA TRADOC and FORSCOM have been requested to initiate planning and training for the 1981 WHC utilizing the published competition rules and current resources. National Board member **BG Richard D. Kenyon** is monitoring the program for AAAA.

## UNIQUE CHAPTER ACTIVITIES

Not ones to wring their hands, officers of six of AAAA's Chapters demonstrated considerable ingenuity in their recent and future membership gatherings. The **Suncoast (Tampa) Chapter** had a major on-base static display for families before adjoining to a nearby restaurant for cocktails and dinner. The **Franconia-Marne Chapter** held a 6+ mile run for three categories of its members: Males 17—30, males 30 + , and females, all ages. Prizes? Of course!! At a Mexican Buffet luncheon, **Corpus Christi Chapter** members "roasted" their first CCAD Director with six of his member-friends being the "roasters." At the **Fulda Chapter**, members' families held a traditional late afternoon Bar-B-Que that was enlivened by a (Keg-a-base?) softball game. You might figure the **Aloha Chapter** to have a "Beach Call" with coolers and picnic baskets, but would you believe that 53 aviators/members participated in the 26.2 mile Honolulu Marathon? (Photo next month). Later, the same Chapter invited its membership to a **Helicopter Ditching and Water Survival Class,** certainly a most unique professional meeting in Quad-A annals. Lastly, the newly-reactivated **Metro-Atlanta Chapter** has a September Chapter Air Show planned. Shades of Farnborough! . . . Join our **Membership Sweepstakes!**

GEORGE S. BEATTY, JR.  
Major General, USA (Retired)  
President, AAAA

# MAY-AUGUST, 1980 AAAA CHAPTER MEETINGS



■ ■ MAY 23. Fort Sill Chapter. Professional Luncheon Meeting. Major Robert Stewart, "The Army's First Astronaut", guest speaker. Fort Sill Officers' Club.

■ ■ MAY 23. David E. Condon Chapter. Professional Luncheon Meeting. BG Richard D. Kenyon, Army Aviation Officer—DA, guest speaker. Fort Eustis Main NCO Club.

■ ■ MAY 24. Suncoast Chapter. "Spring Function". Static display. Nat'l Convention Report. MacDill AFB Base Hangar. Cocktails and Buffet Dinner at Sweden House.

■ ■ MAY 30. Fort Hood Chapter. General Business & Family Social Meeting. Turkey Shoot—Chicken Shoot—Quail Walk. Election of Chapter Officers. Bar-B-Q—Prizes. Free beer. Roof and Gun Club, Fort Hood.

■ ■ MAY 30. Corpus Christi Chapter. Late afternoon general membership meeting. Nominations for Chapter Offices. Tides Club, NAS.

■ ■ MAY 30. Metro-Atlanta Chapter. Late afternoon professional meeting. Ray Swindell, Bell Helicopter Textron, as guest speaker. Dobbins AFB NCO Club.

■ ■ JUNE 7. Army Aviation Center Chapter. 38th Army Aviation Birthday Party. Antique Aircraft, Flea Market, Band Music, Cake Cutting, etc. Guthrie Field.

■ ■ JUNE 7. Morning Calm Chapter. Professional dinner meeting. BG Elmer Pendleton, guest speaker. Frontier Club, Yongsan.

■ ■ JUNE 13. Fulda Chapter. Family Bar-B-Que and Softball game. Free food, beer, & beverages. Downs Barracks.

■ ■ JUNE 13. Coastal Empire Chapter. Late afternoon general membership meeting. Chapter officer election. Hunter AAF O-Club.

■ ■ JUNE 14. Checkpoint Charlie Chapter. Family Picnic. Sports, entertainment, barbecue, and suds. Tempelhof Central Airport (TCA) Picnic Grounds (Area 1 & 2).

■ ■ JUNE 18. S. California Chapter. Professional Dinner Meeting. Carl D. Perry, Exec. VP, Hughes Helicopters, guest speaker. Ramada Inn, Culver City.

■ ■ JUNE 20. Monmouth Chapter's Annual Dinner and Birthday Ball. Installation of officers, cocktails, dinner. Entertainment by the "MODS". Sheraton Gardens, Freehold, New Jersey.

■ ■ JUNE 21. Air Assault Chapter. Annual AAAA Family Picnic. Unit competitions. Static displays. Special Skydiving Demonstration. Clarksville Base Picnic Area.

■ ■ JUNE 23. Stuttgart Chapter. Late afternoon professional meeting. COL Arthur D. Bills and COL George A. Morgan, MILPER-CEN, guest speakers. Nelligen O-Club.

■ ■ JUNE 25. Franconia-Marne Chapter. First Annual "Afternoon Delight" (Cross-Country Run of 6+ miles.) Prizes! Three competitive categories.

■ ■ JUNE 26. Corpus Christi Chapter. "Directors' Roast—Mexican Buffet" (Membership Luncheon.) NAS Officers' Club.

■ ■ JULY 12. Birmingham Area Chapter. Late afternoon general business meeting. Officer nominations. Fort Henry V. Graham Armory.

■ ■ JULY 23. David E. Condon Chapter. Late afternoon professional meeting. Update by Maintenance Management Division. Refreshments. Bldg 2411-B, Felker Field.

■ ■ JULY 23. Suncoast Chapter. AAAA Membership Luncheon. Election of Officers. MacDill AFB O-Club.

■ ■ AUG. 27. Franconia-Marne Chapter. Luncheon and membership meeting. Guided tour of the Giebelstadt facilities. Lunch at the Giebel-People Inn.



**ADDITIONS**—MG James H. Merryman, r., CG, USAAVNC, and COL Robert A. Bonifacio, I, President, USA Aviation Board, as members of AAAA's Nat'l Board, present plaques for the "Aviation Soldier of the Year Award" and the "Army Aviator of the Year Award" to LTC Thomas J. Sabiston, center, Army Aviation Museum curator, at early 1980 ceremonies.



**EIGHT DRAWINGS! NO PURCHASE NECESSARY!  
ENROLL ONE NEW AAAA MEMBER TO COMPETE!**



# 1980 AAAA SWEEPSTAKES



**AIRCRAFT MODELS, TRIPS, MANY OTHER PRIZES!  
HELP AAAA REACH ITS 1980 GOAL OF 10,000!**

#### PRIZES!

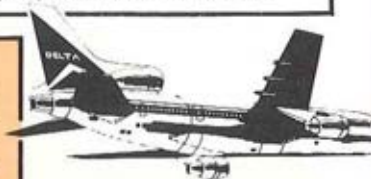
The "starter" list of Sweepstakes' Prizes includes many hard-to-get models of the aircraft employed in Army Aviation, an expense-paid trip to AAAA's 1981 National Convention site, AA rings, 19" aluminum wings, an aviation "library", and other prizes to be announced in subsequent months. Help AAAA reach its Dec. 31, 1980 membership goal of 10,000 members by participating in the 1980 National Sweepstakes!

#### GRAND SWEEPSTAKES' FIRST PRIZE

As Grand Sweepstakes' winner, fly round-trip accommodations for two between any two points served by Delta Air Lines in the Continental U.S. on or before Dec. 31, 1981. The new members you enroll may also win **substantial prizes!** Their coupons will be entered in a separate **End-of-Sweepstakes' Drawing** for new members only. It's easy to enter! Just complete one or more of the coupons that follow, and have your new members complete the opposite side, and remit them with the appropriate AAAA Dues.

#### NINE CHANCES TO WIN!

Sign up **ONE** new AAAA member using the application form provided, and your coupon will be entered in **NINE** separate Sweepstakes' drawings . . . You'll be competing for prizes in six **Bi-Monthly Drawings** during the 1980 calendar year, the **Mid-Year Sweepstakes' Drawing** on July 15, and the **Grand Sweepstakes' Drawing** on January 15, 1981. That's **eight** drawings, and if you want to enter the **"Top Gun Drawing"** for AAAA's **Top Recruiter**, that's a **NINTH** opportunity to win!



#### GENERAL RULES

No purchase is required. An AAAA member may submit as many entries as he wishes, and is not limited in the number of prizes he or she wins. All Federal, State, and Local Regulations apply, and an entry is void where prohibited by law.



## The Sweepstakes' "Top Gun"

CAPTAIN WILLIAM S. BROPHY of the 101st Airborne Division (Air Assault), Fort Campbell, Kentucky, is the current "Top Gun" in the 1980 AAAA National Membership Sweepstakes having enrolled 140 new members during the period 1 January-30 June 1980.



## Sweepstakes' Model Winners to Date

### WINNER OF JAN-FEB. 1980 AAAA SWEEPSTAKES DRAWING

Drawing held in Atlanta, Ga. during the 1980 AAAA National Convention. Sweepstakes coupon was drawn by Mr. Gerald J. Tobias, President of the Sikorsky Aircraft Division, United Technologies Corp. The prize is a fully-assembled model of the U.S. Army UH-60A Black Hawk Helicopter.

WINNER: 1SG James Neale, 101st Airborne Div (AASLT), Ft Campbell, KY

### WINNER OF MARCH-APRIL 1980 SWEEPSTAKES DRAWING

Drawing held in Culver City, California, with the winning AAAA Sweepstakes coupon being drawn by Mr. Jack G. Real, President of Hughes Helicopters, a Division of the Summa Corporation. The prize is a fully-assembled model of the Army's YAH-64 Advanced Attack Helicopter.

WINNER: Major Ace A. Cozzalio, 501st Aviation Bn (Cbt) APO N.Y. 09326.

### WINNER OF MAY-JUNE AAAA SWEEPSTAKES DRAWING

Drawing held in Bethpage, N.Y., with the winning Sweepstakes coupon being drawn by Mr. George M. Skurla, Chairman of the Board, President, and Chief Executive Officer, Grumman Aerospace Corp. The prize is a fully-assembled model of the U.S. Army's OV-1D Mohawk.

WINNER: Captain Jose F. Campos, Bde Avn Sect, 92nd Inf Bde, PRARNG

## "Top" Chapters through June 1980

CATEGORY I: LARGEST MEMBERSHIP GAIN (MEMB. DIFF. BETWEEN 1 JAN—31 DEC 1980

Chapter Prize: AAAA Walnut Plaque and an All-Expense Paid Chapter Hospitality Suite for One Night at the 1981 AAAA National Convention in Washington, D.C.

LEADER: Air Assault Chapter, Fort Campbell, Kentucky — Gain of +422 Members

CATEGORY II: LARGEST PERCENTAGE GAIN (% GAIN AT 31 DEC 1980 OVER 1 JAN 1980

Chapter Prize: AAAA Walnut Plaque and \$100 Cash Award Payable at the 1981 AAAA National Convention in Washington, D.C.

LEADER: Old Ironside Chapter (Illesheim) — 73.9% Membership Gain over 1 January 1980



## January-June Drawings for Models

ATLANTA, GEORGIA—Sikorsky President Gerald J. Tobias, r., is about to draw the slip of 1SG James Neale from the AAAAA bowl containing the January-February "Sweepstakes Recruiter" slips. A.W. "Bill" Pollard, Jr., center, of Sikorsky, holds the bowl aloft as AAAA National President Major General George S. Beatty, Jr., Ret., holds the UH-60A Black Hawk model that was later forwarded to the Ft Campbell winner. The drawing took place at the Sikorsky display booth during the 1980 AAAA National Convention.



CULVER CITY, CA—Brig. Gen (P) Edward M. Browne, cen., moves to verify the winning slip of Maj. Ace A. Cozzalio, 501st CAB, just after it was drawn from the bowl containing the January-April "1980 Sweepstakes' Recruiter" slips by Jack G. Real, right, President of Hughes Helicopters. Looking on from the left and holding onto Maj. Cozzalio's model of the Army's YAH-64 Advanced Attack Helicopter is Carl D. Perry, Hughes Executive Vice Pres. Gen. Browne, the AAH Program Manager, was visiting Hughes at the time.



BETHPAGE, NEW YORK—Grumman Aerospace Vice President and Director of Business Development Thomas J. Kane, center, is shown reaching for slip bearing the name of Captain Jose F. Campos of the Puerto Rico Army National Guard, winner of the Grumman OV-1D Mohawk model held by Joel DiMaggio, right, of Grumman Army Marketing. Observing the early July National Sweepstakes' drawing covering all January-June entries is John A. Kendrick, I., Grumman's Deputy Director of Army Marketing.





# Chapter Sweepstakes' Standings

## 1980 CHAPTER TROPHY % MEMBERSHIP GAIN

Membership Gain of 12.5%  
or More Since 1 January

Old Ironside Chapter (Illesheim) . . . . .	73.9%
Air Assault Chapter (Ft Campbell) . . . . .	59.8%
Morning Calm Chapter (Seoul) . . . . .	46.7%
Stuttgart Chapter . . . . .	38.3%
David E. Condon (Ft. Eustis) . . . . .	32.3%
Franconia-Marne Chapter . . . . .	28.4%
Fort Benning Chapter . . . . .	28.3%
Taunus Chapter (Frankfurt) . . . . .	24.8%
Fulda Chapter . . . . .	24.7%
Aloha Chapter (Hawaii) . . . . .	19.2%
Coastal Empire Chapter . . . . .	18.8%
Hanau Chapter (Hanau) . . . . .	15.5%
San Francisco Area . . . . .	14.8%
S. California Chapter . . . . .	14.0%
Fort Riley Area . . . . .	13.8%
Tarheel Chapter . . . . .	12.7%

## 1980 CHAPTER TROPHY NET MEMBERSHIP GAIN

Gain of 10 Members or  
More Since 1 January

Air Assault Chapter (Ft Campbell) . . . . .	+ 422
David E. Condon Chapter . . . . .	+ 50
Morning Calm Chapter (Seoul) . . . . .	+ 35
Old Ironside Chapter (Illesheim) . . . . .	+ 34
Stuttgart Chapter . . . . .	+ 31
Southern California Chapter . . . . .	+ 28
Taunus Chapter Chapter (Frankfurt) . . . . .	+ 28
Franconia-Marne Chapter . . . . .	+ 21
Monmouth Chapter . . . . .	+ 21
Washington, D.C. Chapter . . . . .	+ 20
Aloha Chapter (Hawaii) . . . . .	+ 19
Fulda Chapter . . . . .	+ 19
Coastal Empire Chapter . . . . .	+ 16
Fort Benning Chapter . . . . .	+ 15
Lindbergh Chapter . . . . .	+ 15
Corpus Christi Chapter . . . . .	+ 14

## Individual "Aces" — 6 or More

CPT William S. Brophy, Ft Campbell . . . . .	140
1SG James Neale, Ft Campbell . . . . .	79
CPT Paul O'Sullivan, Ft Campbell . . . . .	44
MAJ Dieter W. Krause, APO NY 09031 . . . . .	27
CW4 Donald R. Joyce, Newport News . . . . .	22
CPT Henry A. Parham, Jr., Ft Campbell . . . . .	22
MAJ Ace A. Cozzalio, APO NY 09326 . . . . .	21
MAJ Wm. E. Coleman, Ft Rucker . . . . .	20
MAJ Roger D. Hill, APO NY 09061 . . . . .	19
CW2 Robert Whatley, APO NY 09146 . . . . .	19
WO1 Ross Palmer, Ft Campbell . . . . .	18
Ms Sandra Strub, Corpus Christi . . . . .	17
CW3 Junius H. Julien, Ft Campbell . . . . .	16
Mr William Y. Edgar, Corpus Christi . . . . .	16
MAJ Robert H. Bryant . . . . .	16
CPT Randall Cochran, Ft Campbell . . . . .	13
LTC Jack E. Easton, APO NY 09039 . . . . .	13
MAJ Paul C. Hollowell, II, APO NY 09611 . . . . .	13
SGT Ernest D. Anderson, APO NY 09039 . . . . .	12
CPT Jose F. Campos, Guaynabo, PR . . . . .	11
E5 John Heiserman, Ft Campbell . . . . .	11
MAJ James H. March, APO NY 09025 . . . . .	11
CW2 Richard M. Mazur, Ft Benning . . . . .	11
MAJ John L. Ross, Jr., APO SF 96301 . . . . .	11

MAJ Donald B. Skipper, Ft McPherson . . . . .	11
CW4 James E. Bias, Ft Rucker . . . . .	10
SFC Jerry Burns, Ft Campbell . . . . .	10
CPT Steven Edwards, Ft Campbell . . . . .	10
MAJ Paul W. Sines, Ft Campbell . . . . .	10
LTC Joel L. Terry, Jr., Williamsburg . . . . .	10
SFC Robert L. Conley, Ft Campbell . . . . .	9
SP4 Terry Prybal, Ft Campbell . . . . .	9
CW3 Dennis A. Ryan, APO NY 09185 . . . . .	9
CPT Robert L. Johnson, Ft Campbell . . . . .	8
CW2 Daniel T. Lorimor, Hunter AAF . . . . .	8
MAJ Gary Brink, APO NY 09061 . . . . .	7
MAJ Thomas E. Bruns, Ft Eustis . . . . .	7
CPT Gregory K. Gandy, Ft Campbell . . . . .	7
CPT Campbell M. Motley, Newport News . . . . .	7
CPT John E. Rieder, Newport News . . . . .	7
LTC Thomas C. Scofield, APO NY 09061 . . . . .	7
SFC Lawrence W. Sconvers, Ft Campbell . . . . .	7
SFC Donald J. Gorski, APO NY 09185 . . . . .	6
CPT Gary L. Grogorie, APO NY 09039 . . . . .	6
CW3 Terry J. Overton, APO NY 09326 . . . . .	6
LTC William C. Page, APO SF 96301 . . . . .	6
CPT William Smith, Ft Campbell . . . . .	6
1SG Thomas Treece, Ft Campbell . . . . .	6
CW4 Norris M. Woodruff, APO NY 09146 . . . . .	6



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Washington, DC 20310  
5 digit ext.  
+ 5 digit ext.

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Pentagon Building  
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THE 16-PAGE CENTER-  
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# CH-34 CHOCTAW



**DESCRIPTION:** 16-place cargo and light tactical transport helicopter.

**MANUFACTURER:** Sikorsky Aircraft Division, Stratford, Connecticut.

**POWER PLANT:** One Curtiss-Wright R-1820-

84 piston engine of 1,425 horsepower.

**ROTOR SYSTEM:** Single four-bladed main rotor, 56 foot diameter. Four-bladed metal anti-torque rotor, 9 feet, 4 inch diameter.

**SPECIFICATIONS:** Gross Weight: 13,000 pounds. Empty Weight: 7,675 pounds. Length: 65 ft. 8 inches. Height: 15 feet, 10 inches.

**PERFORMANCE:** Maximum speed (Sea level): 195 knots. Cruise speed (SL): 173 knots. Service ceiling: 9,500 feet. Hover ceiling (OGE): 2,400 feet. Maximum range: 437 nautical miles. Rate of climb: 1,100 feet per minute.

**REMARKS:** Beginning in FY 1955, the Army procured a total of 437 Choctaws of A and C models through FY 65. The VH-34 was used for VIP transport, notably as the first helicopters used by the Presidential Flight Detachment. It had an eight-litter med evac capability.

# CH-37 MOJAVE

**DESCRIPTION:** 26-place medium cargo helicopter

**MANUFACTURER:** Sikorsky Aircraft Division, Stratford, Connecticut.

**POWER PLANT:** Two Pratt & Whitney R-2800-



54 piston engines of 2,100 hp each.

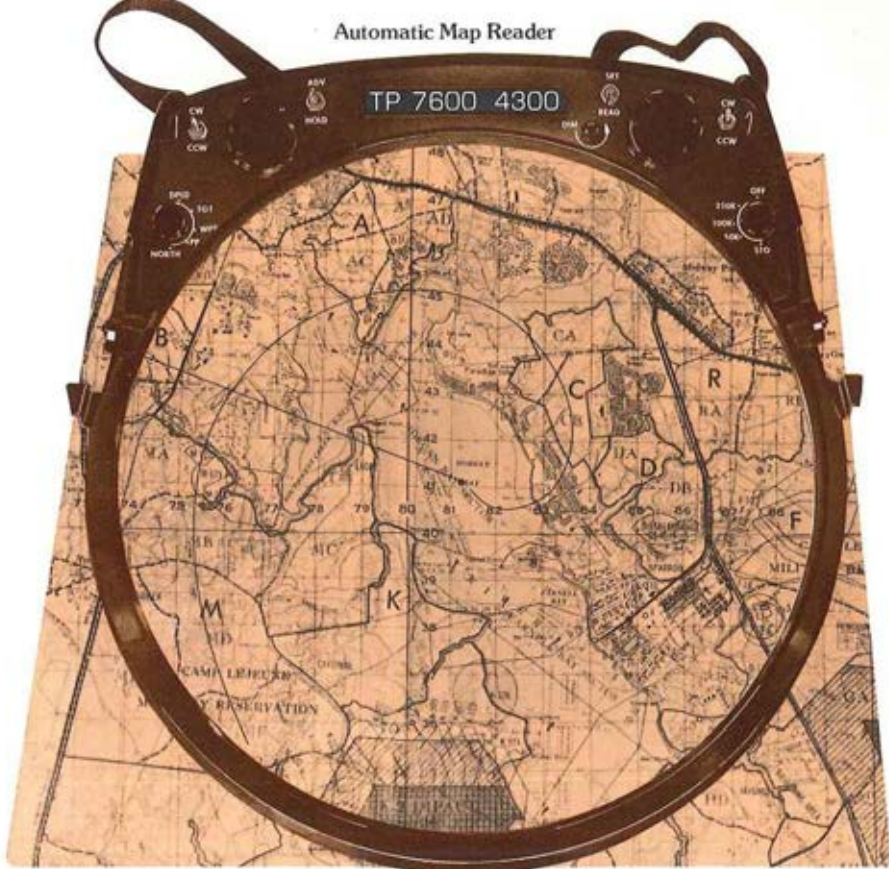
**ROTOR SYSTEM:** Single five-bladed main rotor, 72 ft. diameter. Four-bladed metal anti-torque tail rotor, 15 ft. diameter.

**SPECIFICATIONS:** Gross Weight: 31,000 pounds. Empty Weight: 20,690 pounds. Length: 88 ft. Height: 22 feet. Rotor Diameter: 72 feet. Tail Rotor Dia.: 15 feet.

**PERFORMANCE:** Maximum speed (Sea Level): 208 knots. Cruise speed (SL): 184 knots. Service ceiling: 8,700 feet. Hover ceiling (OGE): 1,100 feet. Maximum range: 232 nautical miles. Rate of climb: 910 feet per minute.

**REMARKS:** Since initial procurement in 1956, the Army purchased 91 similarly powered CH-37 "A" and "B" models through FY 65. The Mojave is loaded through clamshell doors in the nose portion of the aircraft. It also had a 24-litter med evac capability, or could carry three tons of cargo.

## Automatic Map Reader



The Automatic Map Reader (AMR) receives data from the navigational source.

The aircraft position is displayed by the intersection of ruled lines on two rotating discs. One is a spiral line, the other a radial line. Simultaneously the geographical coordinates appear on a LED alphanumeric display.

The Automatic Map Reader offers the following capabilities: (1) An instantaneous display of present aircraft position over a standard military map. (2) A means of auto-

# MAKING THINGS HAPPEN

atically computing the coordinates of any designated point within the map display. This can be a visual fix to update the present position or the coordinates of a target or waypoint. (3) An output of present position or any designated point. This may be used to update the navigational system or transfer target information. (4) Data storage capability to permit use in or out of the cockpit. (5) A very lightweight compact, low cost, highly reliable solution to the topographic navigational display problem.

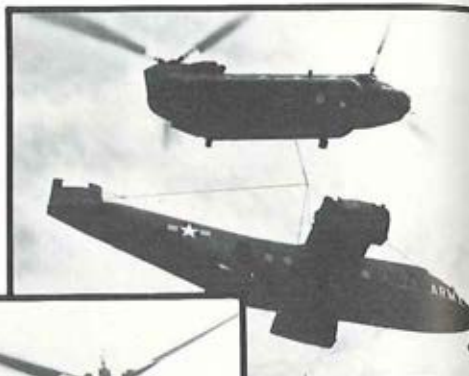
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In England: Marconi Avionics Limited Rochester, Basildon, Borehamwood.





ABOVE: A CH-47 lifts a CV-2 Caribou.



ABOVE: The fly-by-wire, triple hook CH-47 with the craft operated from the retractable load controller crewmember's (LCC) station. CIRCLE ABOVE: The Boeing Model 347 — the world's largest tandem rotor 'copter with a controllable tilt-wing.



# CH-47 CHINOOK

RIGHT: The CH-47 demonstrates its flotation ability.



BELOW: A Chinook with three separate fuel bladders as an underslung load.



BELOW: Up to five 105mm howitzers can be carried by the CH-47. Shown is a four-howitzer airlift.



**DESCRIPTION ("D"):** 47-place twin-turbine, deployable tandem-rotor medium transport helicopter.

**MANUFACTURER:** Boeing Vertol Division, Philadelphia, Pennsylvania.

**POWER PLANT:** Two Lycoming T55-L-712 turboshaft engines of 4,600 shaft horsepower each.

**ROTOR SYSTEM:** Tandem three-bladed, counterrotating fiberglass rotors, 60 ft. dia.

**SPECIFICATIONS:** Gross wt: 33,000 lbs. Empty wt: 22,756 lbs. Length: 51 ft. Height: 18 ft, 7.8 in. Fuel: 1,047 US gal.

**PERFORMANCE (at gross wt):** Max speed (SL): 262 knots. Service ceiling: 19,800 ft. Hover ceiling (OGE): 13,850 ft. Max range: 275 n.m. Rate of climb: 3,000 fpm.

**REMARKS:** Selected to produce a new medium transport helicopter in September 1958, the Vertol Division delivered its first Chinook to the Army four years later. Some 699 were delivered, the Chinook being a



combat-tested performer throughout Vietnam. The B and C models utilize the same airframe as the A, the B using T55-L-7C turbines and the C using the T55-L-11 engine. The rollout of the D prototype took place in March 1979 with the first flight occurring two months later. Army plans call for 361 earlier Chinooks to be remodified over a 10-12 year timespan with additional new production CH-47D's being ordered to meet the Army's MLH continuing needs.

# CH-54 TARHE



**DESCRIPTION:** 48-place twin-turbine heavy lift helicopter.

**MANUFACTURER:** Sikorsky Aircraft Division, Stratford, Connecticut.

**POWER PLANT:** Two Pratt & Whitney JFTD-12A-5A turbines of 4,800 hp each.

**ROTOR SYSTEM:** Single six-bladed main rotor; four-bladed metal anti-torque tail rotor.

**SPECIFICATIONS:** Gross wt: 42,000 lbs. Useful load: 19,031 lbs. Length: 88 ft, 6 in. (Blades extended). Height: 25 ft, 4 in. Rotor Dia: 72 ft. Tail Rotor Dia: 15 ft, 4 in. Pod (28' 1" x 9', 6"): 24 litters + 15 seats; 45 troops.

**PERFORMANCE:** Max speed (SL/GW): 95 kts. Cruise (SL/GW): 80 kts. Without load: 115 kts. Service ceiling: 13,000 feet. Hover ceiling (OGE): 4,000 feet. Best rate of climb: 1,700 fpm. Endurance: 2 hrs, 15 min.

**REMARKS:** Since first flight (1962) and initial procurement of six Sikorsky S-64 Skycranes (1964), the Army had purchased 28 CH-54's

through FY 68. Designed to carry loads externally, it has a rear-facing pilot's seat to provide a clear view of the cargo during pickups and deliveries. By means of a hoist it can pick up or deposit loads without landing. A lightweight van (universal pod) can be attached to the fuselage as used as a CP, MASH, or repair shop. Particularly suited for recovering downed aircraft and offloading in ship-to-shore missions, the CH-54 did yeoman service in Vietnam.





DOPPLER



HELMET SIGHT



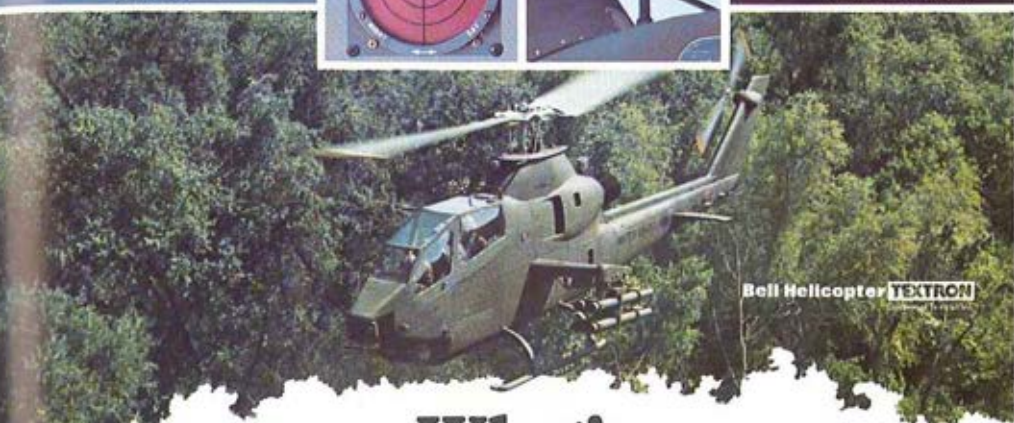
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With a helmet-mounted sight, the crew quickly aims cannon to TOW missile sight.

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Weapon systems, fire control, cockpit, active/passive defense systems, dynamics: These devices are found in the new Cobra... today!

**Bell's AH-1S Cobra: Everything's new but the name.**

# H-24



**DESCRIPTION:** Two-place (pilot and passenger) observation and medical evacuation helicopter.

**MANUFACTURER:** Seibel Helicopter.

**POWER PLANT:** One Avco Lycoming

4-cylinder, horizontally opposed, aircooled O-290-D1 piston engine of 130 horsepower.

**ROTOR SYSTEM:** One wooden main rotor blade of 29 foot diameter; a two-bladed 74 inch tail rotor.

**SPECIFICATIONS:** Gross weight: 1,540 pounds. Places: Two, or pilot and one litter.

**PERFORMANCE:** Cruising speed (Sea level): 50 knots. Service ceiling: 4,300 feet. Maximum range: 85 statute miles.

**REMARKS:** Two H-24 Seibel helicopters were procured in Fiscal Year 1951 for test and evaluation.

## TEST YOURSELF!

More than 200 Army fixed and rotary wing aircraft are pictured on the 120 editorial and advertising pages of this combined June-July 1980 "Equipment Issue." **Do you pride yourself on your aircraft recognition capability?** If so, turn to page 112 and take the **QUIK QUIZ** that appears on that page. ★

# H-25 ARMY MULE

**DESCRIPTION:** Eight-place tandem rotor cargo and utility helicopter.

**MANUFACTURER:** Piasecki Aircraft Corporation, Philadelphia, Pennsylvania.

**POWER PLANT:** One Continental Motors 9-

cylinder radial R-975-46 engine of 475 horsepower.

**ROTOR SYSTEM:** Two three-bladed counter-rotating rotors. 35 foot diameter.

**SPECIFICATIONS:** Gross Weight: 5,500 pounds. Rotor Diameter: 35 feet. Fixed landing gear. The H-25 crew numbered two persons, with an optional load of three to six passengers.

**PERFORMANCE:** Cruising speed (Sea level): 80 knots. Service ceiling: 11,500 feet. Maximum range: 216 nautical miles.

**REMARKS:** The Piasecki H-25 was developed for the U.S. Navy for rescue operations, but with minor modification, it met Army operational needs in cargo and utility missions. The first H-25A Army Mules were purchased in FY 1953 with the highest full-year inventory count reaching 63 in FY 1955. All inventory aircraft were later turned over to the Navy for use.







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In the Multipurpose Lightweight Missile System, General Dynamics is adapting Stinger's high-velocity, fire-and-forget system to provide a lethal self-protect capability for the attack helicopter team. Stinger is in production for multi-service use and is readily adaptable to the air-to-air and air-to-ground requirements of the self-protect mission.

**GENERAL DYNAMICS**

*Pomona Division*



# H-26



**DESCRIPTION:** One-place observation and reconnaissance research helicopter.

**MANUFACTURER:** American Helicopter Company.

**POWER PLANT:** Two American Helicopter

48 horsepower XPJ49-AH-3 tip-mounted pulse jet engines of 36 pounds thrust each.

**ROTOR SYSTEM:** Single two-bladed teetering rotor system, with rotor blades by Prewitt.

**SPECIFICATIONS:** Gross Weight: 810 pounds.

**PERFORMANCE:** Cruising speed (Sea level): 65 knots. Service ceiling: 7,000 feet. Maximum range: 160 nautical miles.

**REMARKS:** The Army procured five American Helicopter XH-26's during the period 1952-1954 for engineering and operational evaluation. The aircraft shown in the photograph is on permanent display at the U.S. Army Aviation Museum at Fort Rucker, Alabama.

# H-30

**DESCRIPTION:** Two-place (pilot and passenger) observation, medical evacuation, and utility helicopter.

**MANUFACTURER:** McCulloch Motors Corporation.



**POWER PLANT:** One Franklin Motors 6A4-200-C6 6-cylinder, horizontally opposed, aircooled engine of 200 horsepower.

**ROTOR SYSTEM:** Tandem three-bladed rotor system with each blade being 22 feet in diameter.

**SPECIFICATIONS:** Gross Weight: 2,000 pounds. Rotor Diameter: 22 feet.

**PERFORMANCE:** Cruising speed (Sea level): 144 knots. Service ceiling: 12,000 feet. Maximum range: 198 nautical miles. Side-by-side crew seating.

**REMARKS:** Two McCulloch Motors H-30 helicopters were procured by the Army in 1952 for operational and engineering evaluation. The rotor hub of the H-30 was later used on the Hughes YHO-2 which eventually became the Army's TH-55. The H-30 had tricycle landing gear and a full "greenhouse" that afforded the pilot and passenger maximum all-around visibility.



# BLACK HAWK

## SYNTHETIC FLIGHT TRAINING SYSTEM

Now that the Army's most advanced utility helicopter, the Black Hawk, is in service, its extended survivability in a hostile environment will also depend on the best trained crews. Today at Fort Rucker Link simulation technology through the Army's Synthetic Flight Training System (SFTS) is making that prerequisite a reality.

**Link**

A DIVISION OF THE SINGER COMPANY  
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# H-31



**DESCRIPTION:** Eight-place (pilot and three to seven passengers) medical evacuation and utility helicopter.

**MANUFACTURER:** Doman Helicopters Inc, Danbury, Connecticut.

**POWER PLANT:** One Avco Lycoming SO-580-D 8-cylinder piston engine of 400 horsepower.

**ROTOR SYSTEM:** Single four-bladed main rotor system utilizing wooden blades. Three-bladed tail rotor (wooden blades).

**SPECIFICATIONS:** Gross Weight: 5,200 pounds (with eight persons aboard).

**PERFORMANCE:** Cruising speed (SL): 109 knots. Service ceiling: 5,700 feet. Maximum range: 576 nautical miles.

**REMARKS:** The Army procured two Doman Helicopters H-31's in 1952 for test and evaluation by the US Army Aviation Test Board at Fort Rucker, Alabama. The aircraft had a completely sealed, non-articulated rotor system (the first "rigid rotor" system in use), and featured four-wheel fixed landing gear and an oversize cargo door. The Doman commercial designation for the H-31 was LZ-5.

# H-32 HORNET

**DESCRIPTION:** Two-place (pilot and passenger) observation helicopter.

**MANUFACTURER:** Hiller Aircraft Company, Palo Alto, California.

**POWER PLANT:** Two Hiller HR J2B Ram Jet

tip-mounted engines of 30 pounds thrust each.

**ROTOR SYSTEM:** Single two-bladed metal-main rotor and single two-bladed wooden tail rotor.

**SPECIFICATIONS:** Gross Weight: 1,080 pounds. Main Rotor Diameter: 23 feet. Tail Rotor Diameter: 32 inches.

**PERFORMANCE:** Cruising speed (Sea level): 122 knots. Service ceiling: 11,500 feet. Maximum range: 45 nautical miles.

**REMARKS:** The ram jet Hiller Hornet first flew in 1950, although the Army did not take delivery of this type of aircraft until 1956, at which time it purchased six. The H-32 featured extremely high maneuverability and agility, an exceptional rate of climb, side-by-side seating for the pilot and the observer-passenger, and a sturdy landing skid in lieu of wheels. The Hornet was the first practical micro-copter in an era of large machines.





# H-33 (XV-3)

**DESCRIPTION:** Two-place tilt-rotor research aircraft.

**MANUFACTURER:** Bell Helicopter Textron, Fort Worth, Texas.

**POWER PLANT:** One Pratt & Whitney R-985-AN-3 engine of 450 horsepower.

**ROTOR SYSTEM:** Two two-bladed semi-rigid tilting prop-rotors of 23 feet diameter.

**SPECIFICATIONS:** Gross Weight: 4,850 pounds. Empty Weight: 4,200 pounds. Length: 30 feet, 4 inches. Height: 13 feet, 7 inches.

**PERFORMANCE:** Max speed (SL) : 240 knots. Cruising speed (SL) : 208 knots. Service ceiling: 12,000 ft. Max range: 224 nautical miles.

**REMARKS:** Two aircraft were procured in '51 under a joint Army-USAF contract, No. 4147 being first flown in Aug '55. The prop-rotor H-33 was then destroyed in an accident, two-bladed semi-rigid rotors being added to the



No. 4148. The latter achieved full in-flight conversion of its tilting rotors in Dec '58, a 10-second operation, the world's first such performance by this type of aircraft. The convertiplane was also designated as the XV-3.

# H-39

**DESCRIPTION:** Four-place (pilot and three passengers) utility helicopter.

**MANUFACTURER:** Sikorsky Aircraft Division, Stratford, Connecticut.

**POWER PLANT:** One Turbomeca Artouste II-XT-51-T3 turbine engine of 400 horsepower.

**ROTOR SYSTEM:** Single four-bladed articulated main rotor of 35 foot diameter and metal three-bladed anti-torque tail rotor of 6 foot, 4 inch diameter.

**SPECIFICATIONS:** Gross Weight: 3,361 pounds. Empty Weight: 2,105 pounds. Length: 41 ft, 9 in. Height: 9 ft, 7 in.

**PERFORMANCE:** Maximum speed (Sea level): 250 knots. Cruise speed (SL): 221 knots. Service ceiling: 17,900 feet. Hover ceiling (OGE): 15,100 feet. Maximum range: 424 nautical miles. Endurance: 2 hours. Rate of climb: 1,680 feet per minute.

**REMARKS:** The H-39 was basically a modified H-18 with an Artouste II gas turbine

engine installed. In 1954 the Army obtained one Sikorsky YH-18A to be used for operational and engineering evaluation. The H-39 set World Records in 1954 for its class for speed (250 knots) and altitude (24,220 feet.)



# HO-1 DJINN



**DESCRIPTION:** Two-place (pilot and passenger) observation and reconnaissance helicopter.

**MANUFACTURER:** Sud Aviation of Paris, France.

**POWER PLANT:** Single Turbomeca compressed air Palouste 4 turbo-generator of 240 horsepower.

**ROTOR SYSTEM:** Single two-bladed main rotor, 35 feet, 5 inches in diameter. Air bled from the compressor was fed to the Djinn's blade-tip ejectors providing thrust for their rotational power.

**SPECIFICATIONS:** Gross Weight: 1,676 pounds. Empty Weight: 794 pounds. Length: 17 ft. 5 inches. Height: 8 feet, 7 inches.

**PERFORMANCE:** Max speed (SL): 125 knots. Cruise speed (SL): 99 knots. Hover ceiling (OGE): 4,000 ft. Hover ceiling (IGE): 2,500 ft. Max range: 200 nm. Endurance: 2 hrs, 15 min.

**REMARKS:** The Sud Djinn was the first aircraft to receive the Army's new "Helicopter Observation — HO" designation. Three YHO-1's were purchased by the Army for engineering and operational evaluation at its U.S. Army Aviation Test Board.

# HO-3

**DESCRIPTION:** Two-place (pilot and passenger) observation and reconnaissance helicopter

**MANUFACTURER:** Brantley Helicopter Corporation, Frederick, Oklahoma.



**POWER PLANT:** One Lycoming VO-360 engine of 180 horsepower.

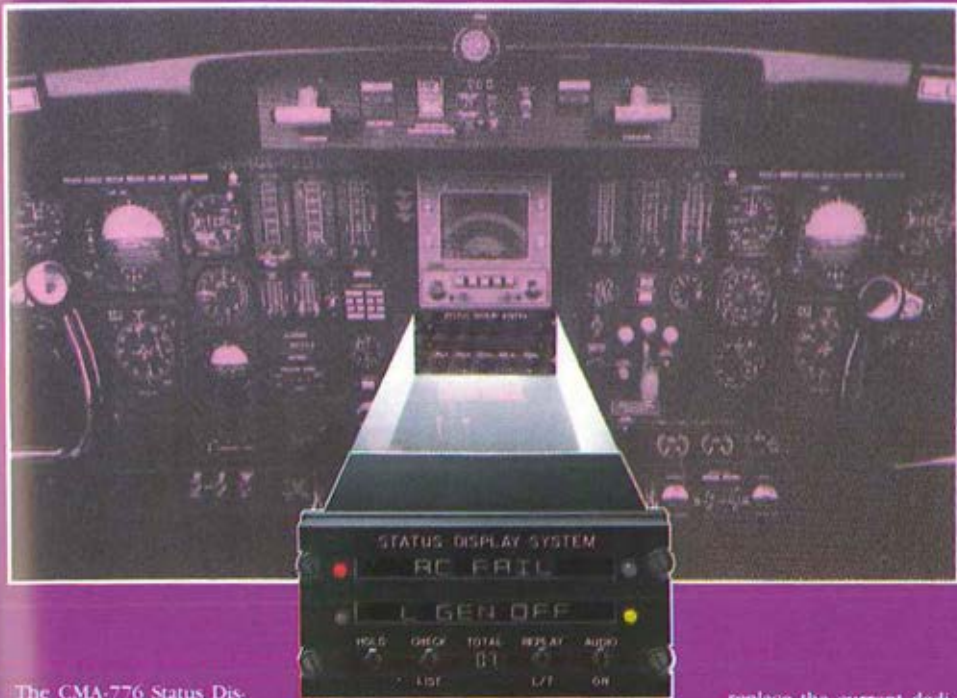
**ROTOR SYSTEM:** Single three-bladed main rotor of 28 feet, 3 inches diameter; Brantley-designed two-section blades.

**SPECIFICATIONS:** Gross Weight: 1,670 pounds. Empty Weight: 1,020 pounds. Length: 21 feet, 9 inches. Height: 6 feet, 9 inches.

**PERFORMANCE:** Maximum speed (Sea level): 160 knots. Cruising speed (Sea level): 144 knots. Service ceiling: 9,000 feet. Hover ceiling (OGE): 4,000 feet. Normal range: 400 nautical miles. Rate of climb: 1,400 fpm.

**REMARKS:** The Army purchased five YHO-3's (Commercial off-the-shelf Brantley B-2's) for engineering and operational evaluation. The Army test aircraft had skid gear instead of wheels as shown. The YHO-3 was referred to affectionately as an "ice cream cone" by all flight test personnel.

*Look at this*



The CMA-776 Status Display System *knows* when things go wrong and spells it out for you. It also sorts it out. The system is programmed from the experience of the airframe manufacturer, the systems designers, and the test pilots to display the faults in the order in which you should deal with them. The display uses CMC's proven fiber-optic solid state alpha-numeric segments currently flying in military and commercial aircraft. The microprocessor based system is designed to

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# OH-4A



**DESCRIPTION:** Four-place light observation helicopter.

**MANUFACTURER:** Bell Helicopter Textron, Fort Worth, Texas.

**POWER PLANT:** One Allison T63 turbine

engine of 250 horsepower.

**ROTOR SYSTEM:** Single two-bladed main rotor system, 33.3 foot diameter; metal two-bladed tail rotor, 5 feet, 2 inch diameter.

**SPECIFICATIONS:** Gross Weight: 2,573 pounds. Empty Weight: 1,536 pounds. Length: 38 feet, 8 inches. Height: 8 feet, 10 inches.

**PERFORMANCE:** Maximum speed (Sea level): 216 knots. Cruising speed (SL): 178 knots. Service ceiling: 20,000 feet. Hover ceiling (OGE): 8,000 feet. Maximum range: 463 n.m. Endurance: 2 hours, 35 minutes. Rate of climb: 1,100 feet per minute.

**REMARKS:** Designated as the Bell D-250, the OH-4A (HO-4) was the first of the three competing Light Observation Helicopters (LOH) to fly, taking to the air in December 1962. Five OH-4's were delivered to the U.S. Army Aviation Test Board for test and evaluation in January 1964.

# OH-5A

**DESCRIPTION:** Four-place light observation helicopter (LOH).

**MANUFACTURER:** Hiller Aircraft Company, Palo Alto, California.

**POWER PLANT:** One Allison Division T63-

A-5 turbine engine of 250 shaft horsepower.

**ROTOR SYSTEM:** Single two-bladed Hiller "L" rotor by Parsons, 35 ft. 5 in. diameter. Two-bladed metal tail rotor, 6 ft. diameter.

**SPECIFICATIONS:** Length: 41 ft. 4 in. Height: 9 ft. 2 in. Gross Weight: 2,530 pounds. Empty Weight: 1,395 pounds.

**PERFORMANCE:** Max speed (SL): 205 knots. Cruise speed: 205 knots. Service ceiling: 16,400 feet. Hover ceiling (OGE): 12,000 feet. (IGE): 15,950 feet. Normal range: 656 n.m. Endurance: 8.1 hours. Rate of climb: 1,830 feet per minute.

**REMARKS:** Five OH-5As were built for the Army to test and compare with two other versions of the proposed LOH. The first flying model was turned over to the Army in December 1963. The Hiller OH-5A was the first of the three LOH's to be eliminated from the LOH competition. A modified version of the Hiller LOH is marketed as the FH-1100.



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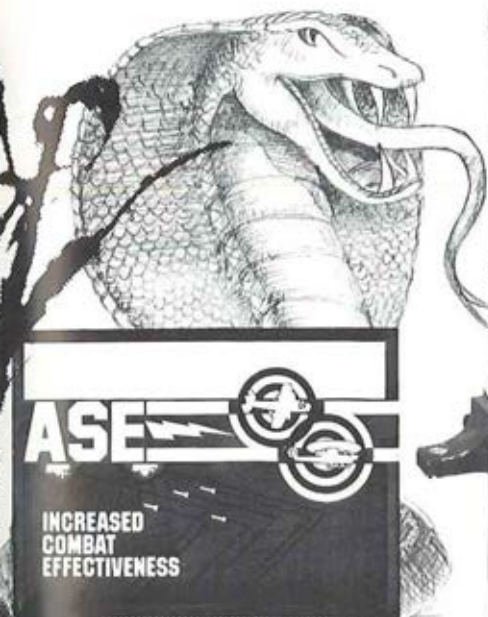
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# OH-6A CAYUSE



LEFT: A Cayuse pilot checks his gun mountings.

**DESCRIPTION:** Four-place light observation helicopter (LOH).

**MANUFACTURER:** Hughes Helicopters Division, Culver City, California.

**POWER PLANT:** One Allison T63-A-5A turbine of 252 horsepower (derated).

**ROTOR SYSTEM:** Single four-bladed main rotor, 26 ft. 4 in. Two-bladed metal tail rotor, 4 ft. 3 in.

**SPECIFICATIONS:** Mission gross wt: 2,163 lbs. Overload gross wt: 2,700 lbs. Empty Weight: 1,030 lbs. Overall length: 30 ft. 4 in. Fuselage length: 23 ft. Height: 8 ft, 6 in.

**PERFORMANCE (at 2,400 lb.):** Cruising speed (SL): 229 knots. Service ceiling: 15,800 ft. Hover ceiling (OGE): 7,200 ft. (IGE): 12,100 ft. Normal range: 661 n.m. at 5,000 feet. Rate of climb: 1,550 fpm. Fuel: 400 lb.

**REMARKS:** Commercially marketed as the Hughes 500, the OH-6A was the winning LOH design tested and evaluated by the USA Aviation Test Board. The initial date of

procurement for the Hughes OH-6A Cayuse was May 26, 1965 with first deliveries to U.S. Army, Vietnam commencing in early 1968. Organic to division, brigade, and battalion or equivalent units, the OH-6A was employed in performing command and control, visual observation, target acquisition, and reconnaissance missions. Highly popular with aviators in USARV, the "Loach" proved to be veritably indestructible, taking major hits from ground fire and still coming home.



# OH-13 SIOUX

RIGHT: An OH-13B in flight at the Bell plant.  
BELOW: A turbo-supercharged OH-13S helicopter on the ramp.



BELOW: Sioux Scout, a 2-place experimental armed helicopter that led to the HueyCobra.



**DESCRIPTION:** Three-place observation, recon, and medical evacuation helicopter.

**MANUFACTURER:** Bell Helicopter Company, Fort Worth, Texas.

**POWER PLANT:** One Lycoming VO-435-25 6-cylinder, horizontally opposed, aircooled, turbo-supercharged engine of 260 hp.

**ROTOR SYSTEM:** Single two-bladed metal main rotor, 37 ft. diameter; two-bladed metal tail rotor, 5 ft, 10 in. diameter.

**SPECIFICATIONS:** Gross Weight: 2,950 pounds. Empty Weight: 1,936 pounds. Length: 43 ft., 4 in. Height: 9 ft., 3 in.

**PERFORMANCE:** Max speed (Sea level): 168 knots. Cruise speed (SL): 149 knots. Service ceiling: 20,000 feet. Hover ceiling (OGE): 18,600 feet. Maximum range: 518 nautical miles. Endurance: 2 hours. Rate of climb: 880 feet per minute.

**REMARKS:** The Army procured its first YR-13 in Dec 1946. Since that date, it has



purchased 2,197 OH-13's of all models ranging from A's through T's. An E model drone demonstrated a remote control capability more than six miles away from its ground control unit. Many OH-13's performed admirably in the Korean War as scouts and med evac aircraft. The T served as a basic instrument trainer. Very agile, OH-13's were crowd pleasers for many years as Bozo, the clown, or in their numerous Square Dance demonstrations or lifting a 70 lb. Yo-Yo.

# OH-23 RAVEN



BELOW: A familiar sight in Korea: the two-litter OH-23 descending to the pad



**DESCRIPTION ("G"):** Four-place observation, utility, and med evac helicopter.

**MANUFACTURER:** Hiller Aircraft Company, Palo Alto, California.

**POWER PLANT ("G"):** One Lycoming VO-540 6 cylinder, horizontally opposed, aircooled engine of 305 hp.

**ROTOR SYSTEM:** Single two-bladed metal main rotor, 35 ft, 5 in. dia.; two-bladed tail rotor, 5 ft., 6 in. dia.

**SPECIFICATIONS:** Gross wt: 2,800 lbs. Empty wt: 1,759 lbs. Length: 40 ft., 8 in. Height: 10 ft., 2 in.

**PERFORMANCE:** Max speed (SL): 154 knots. Cruise speed (SL): 144 knots. Service ceiling: 15,200 ft. Hover ceiling (OGE): 5,800 ft. Max-range: 365 n.m. Endurance: 3 hrs, 12 min. Rate of climb: 1,290 fpm.

**REMARKS:** With procurement starting in FY 1950, the Army ordered A through G models, excluding E. Used in the Korean War with two external litters, the A's and B's had

178-200 hp Aircooled Motors. The "D" model Raven was used mainly as the primary helicopter trainer until late 1965 when it was replaced by the TH-55A. The four-place F was used throughout Latin America for Coast & Geodetic Survey missions. The F and G models were very similar in capabilities, the F being slightly larger and heavier and being sold commercially as the E4. By January 1962 the Army had 656 OH-13 Ravens in its inventory.

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# OH-58 KIOWA



LEFT: Kiowa using a mast mounted sight.



ABOVE: Kiowa with inflatable floats.

**DESCRIPTION:** Two-place, single engine light observation helicopter being used as an interim scout.

**MANUFACTURER:** Bell Helicopter Textron, Fort Worth, Texas.

**POWER PLANT:** Allison T63-A-700 turbine engine with 317 horsepower at takeoff and 270 continuous horsepower.

**ROTOR SYSTEM:** Two-bladed semi-rigid main rotor of 35'-4" diameter; two-bladed tail rotor of 5'-2" diameter.

**SPECIFICATIONS:** Fuselage length: 32'-3.5". Height: 9'-6.5". Maximum gross weight ("C"): 3,200 lb. Empty weight: 1,930 lb. Armor: 112 lb. Cargo volume: 40 cubic feet. Fuel: 73 gallons.

**PERFORMANCE (Observation mission):** Maximum allowable airspeed: 120 knots. Maximum cruise speed (Sea level to 4,000 feet): 100 knots. Cruising range: 279 to 303 nautical miles. Hover ceiling: OGE, 5,400 feet and IGE, 10,500 feet. Endurance: 3.5 hours.



Rate of climb: 1,200+ feet per minute.

**REMARKS:** As an interim scout, 585 OH-58A's are being modified to the "C" configuration, and will have new T63-A-720 turbine engines, flat plate windshields, IR suppression, redundant tail rotor controls, and improved transmission and driveshaft covers to protect hangar bearings and tail rotor driveshafts. In performing its roles, the Kiowa will operate in air cavalry, attack helicopter, and field artillery units.

**R-4  
(1942)**



Sikorsky Aircraft. First 'copter to be procured in quantity. First obtained in FY 1942. 134 purchased ranging through "C". Two-place, side-by-side. 165, 180, 200 hp. Used for observation, recon, and med evacuation.

**R-5 (H-5)  
(1944)**



Sikorsky Aircraft. The first XR-5 in 1944 was a tandem rotor model, the VS-272; all others were single rotor. 132 procured in 11 models; later redesignated as the H-5. Powered by a P&W R-985-AN-5 540 horsepower engine.

**R-6  
(1945)**



Sikorsky Aircraft/Nash Kelvinator. 225 of the Sikorsky design produced by N/K in 1944. All except D had 450 hp P&W R-985-AN-5 engines; D had a 600 hp P&W R-1340 engine. Used primarily by US Navy and Coast Guard.

**XCH-62  
HLH**



Boeing Vertol. 1974 R&D heavy lift project. Loads of 35-tons + lifted at 150 knots. First aircraft designed for "fly-by-wire." Powered by three Allison T701 turboshaft engines of 24,000 total shp. Program cancelled in 1976.



# TH-55 OSAGE

**DESCRIPTION:** Two-place side-by-side, dual control primary trainer helicopter.

**MANUFACTURER:** Hughes Tool Company, Aircraft Division, Culver City, California.

**POWER PLANT:** One Lycoming HIO-360-B1A engine of 180 horsepower.

**ROTOR SYSTEM:** Single three-bladed main rotor, 25' 4" dia.; two-bladed metal anti-torque rotor, 3' 4".

**SPECIFICATIONS:** Gross Wt: 1,600 lb. Empty Wt: 1,010 lb. Useful load: 590 lb. Length: 28' 5". Height: 8' 3". **PERFORMANCE:** Max speed (SL): 138 knots. Cruising speed (SL): 130 knots. Hover (OGE): 4,000 ft. (IGE): 6,400 ft. Max range: 299 n.m.. Endurance: 2.5 hrs. Rate of climb: 1,350 fpm.

**REMARKS:** The TH-55A (formerly designated as the HO-2) was purchased off-the-shelf after Army tests and evaluation by the Army. Commercially known as the Hughes 200, the Osage was initially procured in Nov



'64 with some 860 TH-55A's eventually being purchased. Features: 360-degree visibility, 8-foot ground-to-rotor clearance; low vibration and noise; and well-designed skids to absorb hard student landings.

# 16H-1C

**DESCRIPTION:** Eight-place developmental shaft compound, ring-tail helicopter.

**MANUFACTURER:** Piasecki Aircraft Corporation, Philadelphia, Pennsylvania 19153.

**POWER PLANT:** One General Electric Company T-58-5 turbine engine of 1,500 shaft horsepower.

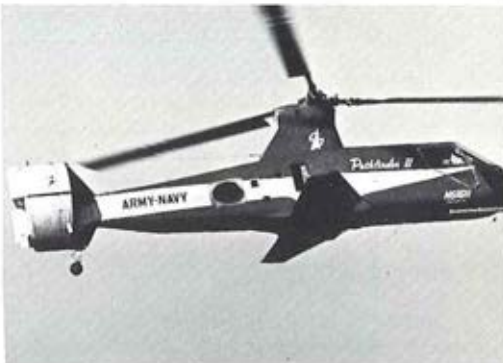
**ROTOR SYSTEM:** Fully-articulated 3-bladed main rotor, 44' dia.; 3-bladed controllable pitch ducted tail-prop for forward propulsion and anti-torque directional control.

**SPECIFICATIONS:** Empty wt: 4,800 lb. STOL Gross wt: 8,150 lb. Disc loading: 5.36 lb/sq ft. STOL Gross wt: 10,800 lb.

**PERFORMANCE:** Max speed (SL): 331 knots. Cruising speed (SL): 299 knots at 80% Takeoff power. Service ceiling: 18,700 ft. Hover ceiling (OGE): 7,800 ft. Maximum range: 720 n.m.

**REMARKS:** Developed initially by the Piasecki Aircraft Corporation as a private

company-funded project using the 16H-1 Pathfinder project name, this compound aircraft was later modified to the Pathfinder II under a joint Army-Navy contract to explore high speeds in rotary wing aircraft..





ABOVE: A Huey prepares to splashdown.



RIGHT: Three Hueys in a tight formation.



BELOW: A stick of six goes out the doors.



# UH-1 IROQUOIS

BELOW: An Aerial Rocket Artillery (ARA) Huey in action



**DESCRIPTION ("H"):** 13-place tactical transport helicopter.

**MANUFACTURER:** Bell Helicopter Textron, Fort Worth, Texas.

**POWER PLANT:** One Lycoming T53-L-13 turbine engine rated at 1,400 shp.

**ROTOR SYSTEM:** Two-bladed semi-rigid metal main rotor, 48' dia.; two-bladed semi-rigid metal tail rotor, 8' 6" dia.

**SPECIFICATIONS ("H"):** Gross Weight: 9,500 lbs. Empty Weight: 5,210 lbs. Length: 41' 11". Height: 11' 9". Fuel: 211 gal. External cargo: 4,000 lbs. Internal cargo: 220 cu. ft.

**PERFORMANCE:** Max cruise speed (SL): 120 knots. Max endurance: 3.4 hours.

**REMARKS:** A major Army helicopter asset since its initial procurement in 1959, the UH-1 series has evolved through 13 models (A through V). Starting its career as a med evac aircraft, the Huey has flown more than 20,000,000 flight hours in supporting a wide variety of Army missions. From the 7-place

UH-1A of 1959-1961 (173 purchased), the Army procured 1,033 nine-place B's during 1961-1965 and 749 C's/M's during 1965-1967. More than 7,534 D's/H's have been bought since 1963. The Army's utility fleet of today is composed of 90% H's and 10% B's, C's, and M's with 82% operating from Division Forward. The "Slick" was the backbone of all airmobile combat operations in Vietnam. The last production H was delivered in Dec '76 with average fleet age at nine years now.



# UH-2



**DESCRIPTION:** A compound version of the six- to thirteen-place UH-2 general utility helicopter.

**MANUFACTURER:** Kaman Aircraft Corporation, Bloomfield, Connecticut.

**POWER PLANT:** One General Electric T58-B turbine engine of 1,250 shaft horsepower, and one GE J-85 turbojet of 2,500 lb/thrust for auxiliary propulsion.

**ROTOR SYSTEM:** Single four-bladed main rotor of 44 feet diameter; and a three-bladed tail rotor of 9 feet, 4 inches diameter.

**SPECIFICATIONS:** Gross Weight: 8,637 pounds. Empty Weight: 6,100 pounds. Length: 52 feet, 6 inches. Height: 13 feet, 7 inches.

**PERFORMANCE:** Maximum speed (Sea level): In excess of 360 knots. No other performance figures are available.

**REMARKS:** The UH-2 compound Seasprite helicopter was flown in 1965 under a joint Army-Navy test program to investigate the high speed potential of the Seasprite rotor system. The UH-2 compound is basically a UH-2 with stub wings and auxiliary jet engine added.

# UH-19 CHICKASAW

**DESCRIPTION:** Twelve-place utility and light tactical helicopter.

**MANUFACTURER:** Sikorsky Aircraft, Stratford, Connecticut.

**POWER PLANT ("D"):** One Curtiss-Wright

R-1300-3 piston engine of 700 horsepower; the A and C models used a 550 horsepower Pratt & Whitney R-1340-57 engine.

**ROTOR SYSTEM:** Single three-bladed main rotor of 53 foot diameter; metal two-bladed tail rotor of 8 foot diameter.

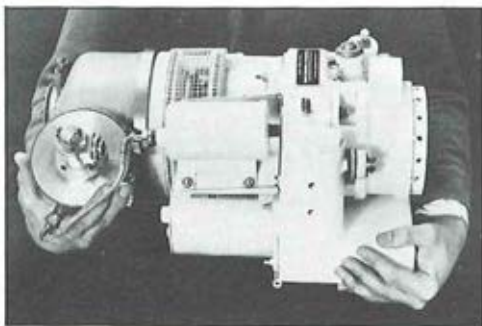
**SPECIFICATIONS:** Fuselage length: 41 feet, 2 inches. Height: 15 feet, 6 inches. Empty weight: 5,250 lb. Gross weight: 7,500 lb.

**PERFORMANCE:** Max speed (SL): 179 knots. Cruising speed (SL): 146 knots. Service ceiling: 10,600 ft. Hover ceiling (OGE): 2,300 ft. Max range: 576 n.m. Endurance: 4.3 hrs. Rate of climb: 1,020 fpm.

**REMARKS:** The world's first transport helicopter and the first to be used for commercial scheduled service. Crew of two plus six litters and one medical orderly, or ten passengers. Since its initial procurement in Nov 1949, 355 Chickasaws were brought into the Army inventory through FY 1965.



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BELOW: Slope landing test





# UH-60A BLACK HAWK

BELOW: Hooking up at Fort Campbell



LEFT: 105mm howitzer in tow



**DESCRIPTION:** 14-place combat assault helicopter. Crew of three and 11 fully equipped troops, four stretcher patients, internal cargo, or 8,000 pounds of slung cargo.

**MANUFACTURER:** Sikorsky Aircraft, Stratford, Connecticut.

**POWER PLANT:** Two General Electric T-700 turboshaft engines of 1,543 shaft horsepower each.

**ROTOR SYSTEM:** Composite (titanium and fiber glass) four-bladed main rotor, 53' 8" diameter.

**SPECIFICATIONS:** Length: 50' ¾". Mission gross weight: 16,450 pounds. Gross weight: 20,250 pounds.

**PERFORMANCE:** Maximum speed: 296 knots. Hover ceiling (OGE): 10,400 feet; (IGE): 14,700 feet; service ceiling: 17,690 feet. Range: 600 nautical miles. Required endurance: 2.3 hours. Rate of climb: 450 feet per minute.

**REMARKS:** Following an extensive, ex-

haustive, and highly competitive test and evaluation, the Sikorsky UTTAS (Utility Tactical Transport Aircraft System) was selected by the Army from a field of five companies on December 23, 1976 with eventual production to exceed 1,100 aircraft. Still undergoing field evaluation in July 1980, the UH-60 has accumulated more than 13,000 flight hours. More than 60 had been delivered to field units, primarily three aviation companies of the 101st Abn Div (Air Assault).

# XH-15



**DESCRIPTION:** Four-place (pilot and three passengers) experimental observation-utility helicopter.

**MANUFACTURER:** Bell Helicopter Textron, Fort Worth, Texas.

**POWER PLANT:** One Continental XO-470-5 turbo-supercharged engine of 275 horsepower.

**ROTOR SYSTEM:** Single two-bladed rotor system, wooden blades, 36 feet, 10 inch diameter.

**SPECIFICATIONS:** Length: 43 feet. Gross weight: 2,700 pounds.

**PERFORMANCE:** Maximum speed (Sea level): 160 knots. Service ceiling: 20,000 feet. No other mission data is available in that only experimental work was completed.

**REMARKS:** In FY 1950, the Army Air Forces procured three Bell XH-15 helicopters for service test and evaluation. Because the aircraft never became a production article, many of the operational parameters were never firmly established. The XH-15 was designed as a high altitude helicopter for the USAF and was the first helicopter to incorporate a turbo-supercharged engine.

# XH-17

**DESCRIPTION:** Three-place heavy lift research helicopter.

**MANUFACTURER:** Hughes Helicopters, Division of Summa Corporation, Culver City, California.



**POWER PLANT:** One TG-80 (J-36) modified gas turbine engine of 3,480 horsepower.

**ROTOR SYSTEM:** Single two-bladed metal main rotor of 168 foot diameter and 68-inch chord.

**SPECIFICATIONS:** Gross Weight: 47,500 pounds.

**PERFORMANCE:** This was a test aircraft and no performance data is available.

**REMARKS:** This was the first effort to prove to prove the feasibility and the advantages of jet power for rotary wing aircraft. Built and demonstrated by Hughes, the XH-17 was procured by the USAF in 1952 and flew numerous tests through 1955. All evaluation data was supplied to the Army with invaluable knowledge of jet engine installation, complex ducting, and pressurized structures being "fallout." The project was initially launched by Kellett Aircraft and later taken over by Hughes Helicopters.

# XH-51A

**DESCRIPTION:** Two-place developmental rigid-rotor compound research helicopter.

**MANUFACTURER:** Lockheed-California Company, Burbank, California.

**POWER PLANT:** One UA of Canada PT-6B-6 550 shp turbine engine; P&W J60-P2 turbojet of 2,900 lb/thrust for auxiliary propulsion.

**ROTOR SYSTEM:** Single four-bladed Lockheed rigid-rotor, 35' dia; 6' tall rotor.

**SPECIFICATIONS:** Fuselage length: 32 ft, 10 in. Height: 8 ft, 2 in. Empty wt: 4,000 lb. Gross wt: 4,500 lb. Retractable landing gear.

**PERFORMANCE:** Max speed (SL): 435 knots. Cruising speed (SL): 376 knots. Hover ceiling (OGE): 7,000 ft. Max range: 459 n.m. Endurance: 2.7 hrs. Rate of climb: 1,850 fpm.

**REMARKS:** The XH-51A compound helicopter was developed under a joint Army-Navy contract as a research vehicle for high performance rotary wing aircraft, completing its first flight in November 1962. The XH-51N



has PT6B-9 550 shp engine, three-bladed rigid rotor, gross weight of 3,500 lbs, and 2,650 lb. empty weight. Lockheed also developed a commercial model of the XH-51 designated as its Model 286.

# YH-16

**DESCRIPTION ("B"):** 50-place tandem rotor, heavy cargo helicopter. "A" was 44-place aircraft first designated as the H-27.

**MANUFACTURER:** Piasecki Aircraft Corporation, Philadelphia, Pennsylvania.

**POWER PLANT:** Two T-56-A5 Allison turbine engines of 2,100 hp. Initial YH-16A (H-27) had two Allison T-38-A3 engines.

**ROTOR SYSTEM:** Tandem four-bladed metal fully-articulated rotor system. Diameter: 82 feet.

**SPECIFICATIONS:** Gross weight: 46,700 pounds.

**PERFORMANCE:** Cruise speed (Sea level): 229 knots. Service ceiling: 15,600 feet. Maximum range: 320 nautical miles.

**REMARKS:** The Army procured two Piasecki YH-16 cargo helicopters for test and evaluation purposes, the second H-16 being an "A" model employing the Allison T38 turbine engine. The project was terminated in 1956.

## TEST YOURSELF!

More than 200 aircraft are pictured on the "Equipment Issue's" 120 pages. **Do you pride yourself on your aircraft recognition ability?** If so, turn to page 112 for **Quik Quiz #2.**





# YAH-64



BELOW: The YAH-64 as it appears head on!



**DESCRIPTION:** Two-place, twin engine advanced attack helicopter.

**MANUFACTURER:** Hughes Helicopters, Culver City, California.

**POWER PLANT:** Two General Electric T-700 turboshaft engines of 1,543 shaft horsepower each.

**ROTOR SYSTEM:** Four-bladed articulated main rotor, 48 feet diameter, with static mast; four-bladed tail rotor.

**SPECIFICATIONS:** Gross weight: 18,500 lb. Length: 49'-5".

**PERFORMANCE (Primary Mission):** Maximum forward speed (SL): 196 knots; side-ward-rearward: 45 knots. Service ceiling: 20,500 feet. Hover ceiling: OGE, 11,800 feet; IGE, 14,600 feet. Maximum range: 574 nautical miles. Endurance: 1.8 hours. Rate of climb: 3,000 feet per minute.

**REMARKS:** Selected after a competitive fly-off in June 1973, the AAH is expected to be deployed within Army Aviation in the '80's. A



possible anti-helicopter helicopter, the YAH-64 — with its on-board TADS/PNVIS acquisition and HELLFIRE laser-guided missile systems — is regarded by the Army as a "highly mobile piece of ground equipment," rather than as a pure aviation item. With its built-in survivability, the latest in countermeasures systems, withering firepower, and an around-the-clock capability, the Advanced Attack Helicopter is a formidable anti-tank weapon.

# YH-18A

**DESCRIPTION:** Four-place (pilot and three passengers) utility helicopter.

**MANUFACTURER:** Sikorsky Aircraft Division, Stratford, Connecticut.

**POWER PLANT:** One Franklin 0-425-1 piston engine of 245 horsepower.

**ROTOR SYSTEM:** Single three-bladed metal main rotor, 33 feet in diameter; two-bladed metal tail rotor of 5 feet, 5 inch diameter.

**SPECIFICATIONS:** Length: 35 feet. Height: 8 feet, 6 inches. Gross weight: 2,700 pounds. Four-wheel landing gear.

**PERFORMANCE:** Maximum speed (Sea level): 176 knots. Cruising speed (Sea level): 147 knots. Service ceiling: 13,800 feet. Hover ceiling (OGE): 1,100 feet. Maximum range: 488 nautical miles. Endurance: 3.5 hours. Rate of climb: 1,050 feet per minute.

**REMARKS:** The Army obtained four Sikorsky Aircraft YH-18A's for service test and evaluation in FY 1980.



# YH-41 SENECA

**DESCRIPTION:** Four-place observation helicopter.

**MANUFACTURER:** Cessna Aircraft Company, Wichita, Kansas.

**POWER PLANT:** One Continental FSO-526 horizontally piston engine of 270 hp.

**ROTOR SYSTEM:** Single two-bladed metal main rotor, 35' ft dia. Two-bladed metal tail rotor, 7 ft. dia.

**SPECIFICATIONS:** Gross Wt: 3,000 lb. Empty wt: 2,050 lb. Length: 42' 5". Height: 8' 5".

**PERFORMANCE:** Max speed (SL): 195 knots. Cruise: 160+ knots. Hover ceiling: 14,500 ft. (OGE): 6,500 ft. Max range: 464 nm. Endurance: 3.37 hrs. Rate of climb: 1,030 fpm.

**REMARKS:** The Army procured ten H-41 helicopters in 1957 for high altitude operation test and evaluation. None were bought after that date. The initial two YH-41 of the evaluation quantity went to Edwards AFB; the remainder were sent to Ft. Rucker.

In Dec '57 a YH-41, with Army CPT James E. Bowman as pilot, broke the then world altitude records for helicopters in two categories (under 2,204 lbs. and unlimited weight) reaching approximately 30,300 feet.



# YHC-1



**DESCRIPTION:** 28-place medium transport helicopter.

**MANUFACTURER:** Boeing Vertol Division, Morton, Pennsylvania.

**POWER PLANT:** Two General Electric Com-

pany T58-6 turbine engines of 1,050 shaft horsepower each.

**ROTOR SYSTEM:** Tandem three-bladed rotor system. The rotor diameter was 48 feet, 4 inches.

**SPECIFICATIONS:** Gross Weight: 18,700 pounds. Empty Weight: 11,716 pounds. Length: 44 feet, 7 inches. Height: 16 feet, 10 inches.

**PERFORMANCE:** Maximum speed (Sea level): 269 knots. Cruise speed (Sea level): 248 knots. Service ceiling: 13,700 feet. Hover ceiling (OGE): 6,500 feet. Maximum range: 184 nautical miles. Rate of climb: 1,700 feet per minute.

**REMARKS:** The U.S. Army procured three YHC-1's in 1959 for service test and evaluation. Engineering and operational data obtained from this aircraft led to the later development of the company-funded Boeing 107, the CH-46, and the CH-47 Chinook.

# YUH-1B

**DESCRIPTION:** High Performance Research compound helicopter.

**MANUFACTURER:** Bell Helicopter Textron, Fort Worth, Texas.

**POWER PLANT:** One Lycoming T53-L-11 tur-

bine engine of 1,100 shaft horsepower and two J69-T27 turbojet engines of 1,260 pound/thrust each.

**ROTOR SYSTEM:** Single two-bladed main rotor with tapered blade tips, 44 foot diameter. Two-bladed tail rotor.

**SPECIFICATIONS:** Basically the UH-1B with modifications for mounting the two turbojet engines, two stub wings, and additional fairings around the mast and cross tubes. Overall length: 53'. Fuselage length: 42' 7". Height: 12' 8".

**PERFORMANCE:** The YUH-1B was flown in excess of 250 mph in level flight during 1963-1964 time frame.

**REMARKS:** Developed under a joint Bell-U.S. Army Transportation Research Command (TRECOT), the YUH-1B test bed flew with a three-bladed rigid rotor, three-bladed gimbal-mounted rotor, and standard semi-rigid rotor.





# RSRA



**DESCRIPTION:** Multi-purpose 3-place flying test bed designed to flight test current and advanced rotor systems.

**MANUFACTURER:** Sikorsky Aircraft, Stratford, Connecticut.

**POWER PLANT:** Two GE T58-GE-5 turbines of 1,400 horsepower each. Compound has two auxiliary TF34-GE-400A turbofans with 9,275 lb. maximum thrust.

**ROTOR:** 5-bladed, 62 feet diameter; 5-bladed, 10.67 feet diameter tail rotor.

**SPECIFICATIONS:** Span: 45'-½". Fuselage length: 70'-7". Height: 17'-10". Design gross weight: 18,400 lb. Yankee extraction seat. Controls: Fly-by-Wire Primary with Mechanical Back-up. Compound: 26,200 lb. design gross weight.

**PERFORMANCE:** Maximum speed (Sea level): 160 knots. RSRA Compound: 300 knots.

**REMARKS:** RSRA represents a significant advance in R/W technology by virtue of its adaptability to a wide variety of gimbaled, articulated, and hingeless rotors. RSRA is the first R/W aircraft to be built with a blade severance/ crew escape system.

# UNFLYABLES



**RIGHT:** Not a gag but a real nuts-and-bolts creation of the Maintenance Section of "The Real Cav" — B Troop, 7/17th Air Cavalry Squadron. The "OH-6C" underwent a few additions (nose gun and side-by-side rocket pods) while "The Real Cav" was in the Pleiku area in early 1972. CWO Bill C. Walton submitted the photograph of this "Unflyable."

**LEFT:** Tested with heavy ground fire in late '70, a full-scale mockup of Sikorsky Aircraft's Aerial Armored Reconnaissance Vehicle (AARV) passed the test! Both armor-piercing and ball projectiles were used with the armor plate being dented, but not penetrated. The impact of the projectiles can be seen on the AARV's lower front fuselage.





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U.S. Army's AAH - Hughes YAH-64

# THE UBIQUITOUS HUEY

More than 12,000 aircraft in Bell Helicopter's **UH-1** series have been produced in the United States for the military through March 1980.

**Colonel John W. Oswalt, Ret.**, Bell's Chief of Military Requirements Planning, indicated that "in some cases, an earlier model has been revised to a later model, such as the UH-1D being converted to the UH-1H and the AH-1G to the AH-1S.

The UH-1 production sub-totals prove to be as interesting as Bell's grand total:

UH-1A's.....	191
UH-1B's.....	1,059
UH-1C's/M's.....	748
UH-1D's/H's.....	7,584
UH-1E's.....	209
UH-1F's.....	146
AH-1G's.....	1,127
AH-1J's.....	68
AH-1J's (Iran).....	202
AH-1J's (Korea).....	8
AH-1T's.....	57

HH-1K's.....	27
UH/TH-1L.....	53
UH-1N's.....	334
AH-1S's (New).....	231
AH-1S's (Israel).....	6
TOTAL.....	12,050

On the horizon in the '80's are additional derivatives of the **Huey**, to include:

An **EH-1** electronic configuration capable of fielding the **QUICKFIX** and **MULTEWS** systems.

A **UH-1V**, created by requirements unique to the medical evacuation mission, a **UH-1H** with additional avionics, specifically, radar altimeter, DME, and in some cases, TACAN.

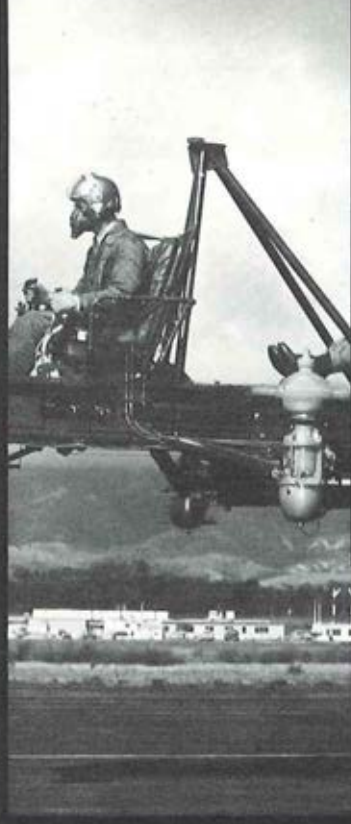
A **UH-1(X)**, ready to be used for combat multi-missions (Logistic, operational, etc.)

A **Huey II**, a composite of improved models of all three of the foregoing.

12,050 **Hueys**? That's a lot of aircraft, and we wonder how the 12,050 figure stacks up against the long-term DC-3 production.



HZ-1DE PLATFORM



VZ-7AP JEEP



XC-142A TILT-WING

# V/STOL, JEEPS, AND GEMS

1980 EQUIPMENT ISSUE



## VZ-1E FLYING PLATFORM



Greater mobility for the individual soldier on scouting missions was the object of this '55 Hiller vehicle. A ducted fan, powered by three 40 hp Nelson engines, provided lift. Known as the Pawnee, the VZ-1 weighed 465 pounds.

## VZ-2PH TILT WING



This Vertol VTOL (commercially called the Model 76) completed full transition from vertical takeoff to cruise and back in July 1958. Its interconnected propellers were powered by a 600 hp Lycoming turbine (T53-L-1A).

## VZ-3RY DEFLECTED SLIPSTREAM



Called the Vertiplane by Ryan, the VZ-3 employed two propeller-deflected slipstreams aided by a high-flapped wing. Its interconnected propellers were powered by a T-53-L-1 Lycoming 825 hp turbine in the fuselage.

## VZ-4DA DUCTED PROPELLERS



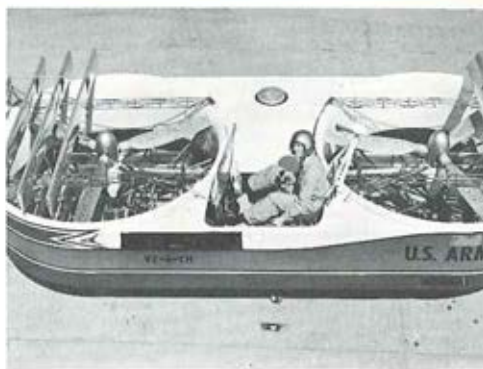
The Doak Aircraft two-place convertiplane's ducted props in its wing-tips rotated through 90° to convert the plane in flight. The Model 16 used one 825 horsepower T-43-L-1 turbine engine with its interconnected propellers.

## VZ-5FA DEFLECTED SLIPSTREAM



This one-place research aircraft by Fairchild achieved VTOL by deflecting the slipstream downward by means of a high-flapped wing. Four interconnected props were powered by one 1,100 hp GE T-58-2A turbine engine.

## VZ-6CH DUCTED PROPELLERS



A single place research aircraft designed by Chrysler to explore the aerial jeep concept. The shafting from a single 380 horsepower reciprocating engine transmitted the power to the aircraft's two ducted propellers.

## VZ-7AP DUCTED FAN



This aerial jeep research vehicle was originally designed and constructed by the Curtiss-Wright Corporation and utilized four ducted fans. Later, the ducts were removed. Power came from one Artouste II turbine engine.

## VZ-8PB DUCTED FAN



An aerial jeep powered by two Artouste II turbine engines. Built by Piasecki Aircraft, the VZ-8PB derived lift from two three-bladed rotors. An earlier version, utilizing a single turbine, made its first flight in 1958.

## VZ-9A AVROCAR GEM



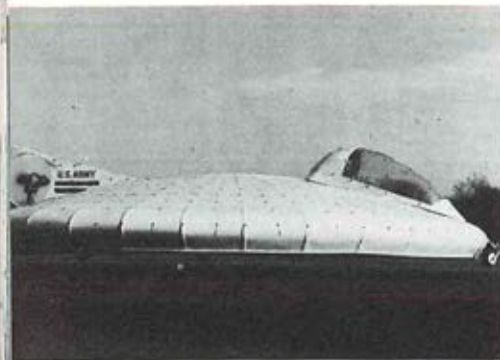
Designed to explore VTOL techniques, this vehicle operated in ground effect only. Developed by AVRO Aircraft of Canada, the VZ-9A Ground Effects Machine was a joint project of the U.S. Army and the USAF.

## CURTISS-WRIGHT AIRCAR



A four-place Ground Effects Machine (GEM) designed by the Curtiss-Wright Corporation to skim six to 12 inches off the ground at speeds up to 35 mph. Two of these machines were bought "off-the-shelf" for research.

## PRINCETON GEM



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

## HZ-1DE FLYING PLATFORM



Another flying platform design, the DeLackner provided data on an unducted propeller concept. A later version used metal skids instead of outriggers—inflated bags. A 40 hp Mercury Mark 55 marine outboard engine.



## VZ-10 (XV-4A) HUMMINGBIRD

**DESCRIPTION:** Experimental augmented jet ejector VTOL aircraft.

**MANUFACTURER:** Lockheed-Georgia Company, Marietta, Georgia

**POWER PLANT:** Two Pratt & Whitney JT-12 turbo jets of 3,300 lbs. thrust each with 40% augmentation for a total of 8,300 lbs. thrust in the VTOL mode.

**LIFT SYSTEM:** The aircraft achieved vertical flight by diverting the high velocity jets from both engines through a series of nozzles and ducts into mixing chambers in the center of the fuselage and thence downward toward the ground. Bomb bay-type doors in the top and bottom of the fuselage opened to expose the mixing chambers and nozzles.

**SPECIFICATIONS:** Span: 25' 10". Length: 33'. Height: 11' 9". Empty wt: 5,000 lb. VTOL gross wt: 7,200 lb.

**PERFORMANCE:** Max speed (SL): 1,056 knots. Service ceiling: 50,000 ft. Max range:



1,472 nm. Rate of climb: 18,000 fpm.

**REMARKS:** The Army procured two test models; one was destroyed in an accident. In mid-1966, the USAF took over XV-4A operational control.

## XV-5A VERTIPLANE

**DESCRIPTION:** Experimental fan-in-wing aircraft.

**MANUFACTURER:** Ryan Aeronautical Company, San Diego, California.

**POWER PLANT:** Two GE J85-5 turbines of 2,650 shaft horsepower each.

**LIFT SYSTEM:** The aircraft gets its vertical lift from downward thrust produced by two five-foot diameter fans submerged in the wings. The fans are powered by the exhaust from the engines.

**SPECIFICATIONS:** Span: 29 feet, 9 inches. Height: 14 feet, 8 inches. Empty weight: 7,500 pounds. VTOL Gross weight: 12,500 pounds. STOL Gross weight: 15,500 pounds.

**PERFORMANCE:** Maximum speed (Sea level): 872 knots. Cruising speed (30,000 feet): 704 knots. Service ceiling: 45,000 feet. Hover ceiling (OGE): 12,000 feet. Maximum range: 1,920 nautical miles. Rate of climb: 9,500 feet per minute.

**REMARKS:** Two XV-5As were built under the Army program; one being destroyed in an accident. Transition to forward flight was accomplished by vectoring control vanes (louvers) mounted under the back wing fan.



## XV-6A HARRIER



**DESCRIPTION:** One-place vectored thrust V/STOL strike-reconnaissance fighter aircraft (First designated the P.1127, then the "Kestrel", then the Harrier.)

**MANUFACTURER:** Hawker Siddeley Avia-

tion, Ltd., Kingston-Upon-Thames, England.

**POWER PLANT:** One Bristol Siddeley Pegasus engine of 15,500 pounds/thrust.

**SPECIFICATIONS:** Span: 22 feet, 10 inches. Length: 42 feet, 4 inches. Height: 10 feet, 8 inches. Empty weight: 13,159 pounds. Gross weight: 23,500 pounds.

**PERFORMANCE:** Maximum speed (Sea level): Mach +. Cruise speed (Sea level): 0.89 Mach. Cruise speed, 10,000 feet: 0.90 Mach. Service ceiling: 45,000 feet. Maximum range: 1,992 nautical miles. Endurance: 2.75 hours. Rate of climb: 13,000 feet per minute.

**REMARKS:** In 1961 the U.S. Army procured three of the nine XV-6As in the Tripartite Squadron and later took control of the three F.R.G. aircraft. The six XV-6As underwent tri-service evaluation in the U.S. in early 1966. A later version has been employed by the USMC. The aircraft has exceeded the speed of sound in forward flight.

## XV-8A FLEEP

**DESCRIPTION:** One-place flex-wing utility man-carrying vehicle designed to demonstrate the para-glider concept.

**MANUFACTURER:** Ryan Aeronautical Company, San Diego, California.



**POWER PLANT:** One Continental pusher piston engine of 210 horsepower.

**SPECIFICATIONS:** Span: 33 feet, 5 inches. Length: 26 feet. Empty weight: 1,029 pounds. Gross weight: 2,359 pounds.

**PERFORMANCE:** Maximum speed (Sea level): 130 knots. Cruising speed (Sea level): 88 knots. Maximum range: 213 nautical miles.

**REMARKS:** Developed and wind-tunnel proven by Francis M. Rogallo, a NASA aeronautical engineer at the Langley Research Center, the paraglider began as a flexible, high performance tail-less toy kite. Later, Ryan Aeronautical was awarded a 30-hour flight test contract to prove the flight envelope with the first flight being completed in March 1961. The hang-gliders in use today stem from the development of the Rogallo Wing and Army-funded R&D on this program.

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## XV-9A HOT CYCLE



**DESCRIPTION:** Two-place hot cycle research helicopter.

**MANUFACTURER:** Hughes Helicopters, Culver City, California.

**POWER PLANT:** Two General Electric Com-

pany YT64 gas generators with the main rotor being driven by tip propulsion.

**ROTOR SYSTEM:** Single three-bladed main rotor. Rotor diameter: 55 feet.

**SPECIFICATIONS:** Fuselage Length: 45 feet. Height: 12 feet. Empty weight: 8,600 pounds. Gross weight: 15,300 pounds. Overload gross weight: 25,500 pounds.

**PERFORMANCE:** Maximum speed (Sea level): 221 knots. Cruising speed (Sea level): 147 knots. Cruise speed, 5,000 feet: 145 knots. Service ceiling: 17,300 feet. Hover ceiling (OGE): 13,200 feet. Rate of climb: 2,000 feet per minute.

**REMARKS:** In September 1962, the Army procured one XV-9A for research and evaluation. Fuselage-mounted turbojets supplied high energy gas through ducts to the blade tips to drive the rotor. Light ducting was substituted for heavy, complex power turbines, gear boxes, shafting, and tail rotor.

## X-19 TILT WING

**DESCRIPTION:** Six-place high-wing tilt-prop experimental V/STOL aircraft.

**MANUFACTURER:** Curtiss-Wright Corporation, Wood-Ridge, New Jersey.

**POWER PLANT:** Two Lycoming T55-L-7 tur-

bine engines of 2,650 shaft horsepower each mounted at the top of the aft fuselage.

**PROPELLERS:** Four Curtiss-Wright plastic 3-bladed propellers cross-shafted and mounted on the ends of two stub wings. 13 foot diameter.

**SPECIFICATIONS:** Span: 34 feet, 6 inches. Length: 44 feet, 5 inches. Height: 17 feet. Empty weight: 9,750 pounds. Gross weight in VTOL mode: 13,660 pounds. Gross weight in STOL mode: 14,750 pounds.

**PERFORMANCE:** Maximum speed at sea level: 736 knots. Cruising speed at sea level: 640 knots. Maximum range: 832 nautical miles. Rate of climb: 3,250 feet per minute. Other performance data unavailable.

**REMARKS:** Two X-19 aircraft were procured under a tri-service test and evaluation contract managed by the U.S. Air Force. Prior to termination of the program, one X-19 was destroyed in an accident in late 1965.



## X-22A DUCTED FAN

**DESCRIPTION:** Eight-place V/STOL research aircraft.

**MANUFACTURER:** Bell Aerosystems Company, Buffalo, New York.

**POWER PLANT:** Four General Electric YT58-GE-8D turboshaft engines of 1,250 horsepower each mounted on aft wing.

**PROPELLERS:** Four three-bladed Hamilton Standard cross-shafted propellers of 7-foot diameter each.

**SPECIFICATIONS:** Span: 39.2 feet. Length: 39.6 feet. Height: 20.7 feet. VTOL gross weight: 16,274 pounds. Maximum gross: 18,016 pounds. STO over 50 feet. obstacle: 720 feet.

**PERFORMANCE:** Maximum speed (Sea level): 515 knots. Hover ceiling: 11,000 feet. Range: VTOL, 455 nautical miles; STOL, 685 nautical miles. Endurance: 4.4 hours.

**REMARKS:** Tri-service program under a Navy-administered contract. Roll-out took



place on May 25, 1965 with maiden hovering flight on March 17, 1966. STOL completed on June 30, 1966 with first VTOL, transition to conventional flight, and return to VTOL on March 1, 1967.

## XC-142A TILT WING

**DESCRIPTION:** 35-place, tilt-wing, deflected slipstream V/STOL medium transport aircraft.

**MANUFACTURER:** LTV Aerospace Corporation, Dallas, Texas.

**POWER PLANT:** Four General Electric T64-6 turboprops of 3,080 shaft horsepower each.

**PROPELLERS:** Four four-bladed Hamilton Standard cross-shafted propellers of 15' 6" diameter each. Three-bladed tail rotor for longitudinal control at low speeds.

**SPECIFICATIONS:** Span: 67 feet, 6 inches. Length: 58 feet. Height: 26 feet. Empty weight: 23,000 lb. Gross weight, STOL: 41,500 lb. Gross weight, VTOL: 37,500 lb.

**PERFORMANCE:** Maximum speed (Sea level): 688 knots. Cruise speed (Sea level): 371 knots. Cruise speed, 10,000 feet: 547 knots. Service ceiling: 25,000 feet. Hover ceiling (OGE): 6,000 feet. Maximum range: 720 nautical miles. Endurance: 6.5 hours.

Rate of climb: 6,800 feet per minute.

**REMARKS:** Five XC-142A's were built under a tri-service developmental program with Hiller Aircraft and the Ryan Aeronautical Company as associate contractors.



## ABC (XH-59A)



**DESCRIPTION:** Advancing Blade Concept (ABC) research helicopter.

**MANUFACTURER:** Sikorsky Aircraft, Stratford, Connecticut.

**POWER PLANT:** Twin P&W PT6 engines of

1,825 hp each. Aux propulsion: two outboard P&W J60 engines with 3,000 lb. add'l thrust.

**ROTOR SYSTEM:** Two three-bladed, counter-rotating, coaxial, rigid rotors, 36 ft. dia.

**SPECIFICATIONS:** Overall length: 41'-5". Height: 12'-11". Design gross weight: 9,000 lb; aux. version: 11,100 lb.

**PERFORMANCE (Aux):** Max speed (SL): 237 kph (Aux: 437 kph). Service ceiling: 14,000 feet. Hover ceiling: 6,700 feet.

**REMARKS:** Currently a tri-Service/ NASA/ Sikorsky-funded program. ABC flight testing began July 1975 with modification into a compound following. In April 1980 the compound reached 273 miles per hour. ABC's counter-rotating rotors on a common main shaft permit the advancing side of both rotor discs to generate lift, offering the potential of 300 knot speeds without the need of a wing to offload the rotor and the need for a tail rotor.

## XV-15

**DESCRIPTION:** NASA/ Army/ Navy tilt-rotor research aircraft.

**MANUFACTURER:** Bell Helicopter Textron, Fort Worth, Texas.

**POWER PLANT:** Two Lycoming LTC-1K-4K

turbine engines of 1,550 shaft horsepower each.

**ROTOR SYSTEM:** Two three-bladed semi-rigid tilt-rotors of 25 foot diameter each.

**SPECIFICATIONS:** Fuselage length: 42'-1". Span: 32'-2". Height: 15'-4". Max gross weight: 15,000 lb. Design gross weight: 13,000 lb. Empty weight: 9,700 lb.

**PERFORMANCE:** Max level flight speed (SL): 554 kph\*. Altitude ceiling: 28,000 feet. Hover ceiling: OGE, 9,300 feet; IGE, 2,500. Maximum range: 400 nautical miles. Rate of climb: 2,875 feet per minute.

**REMARKS:** In April 1973, Bell received a NASA-Army contract to design, manufacture, and test two tilt-rotor aircraft, and to determine the tilt-rotor technology's potential for civil and military applications. The Navy joined the program in 1979. Rollout, 1976; first flight, 1977; first airplane mode flight, 1979; rotorcraft world speed record\*, June 1980.



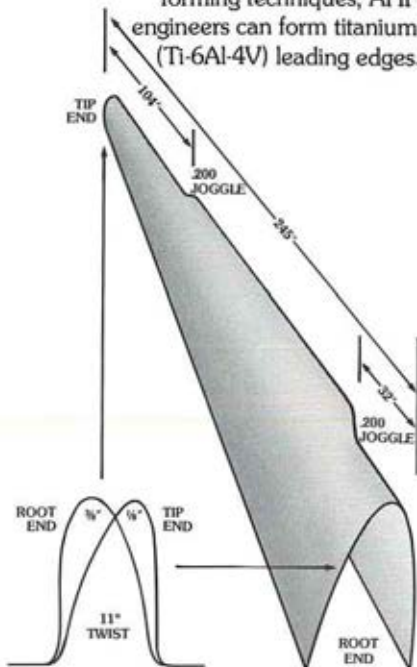


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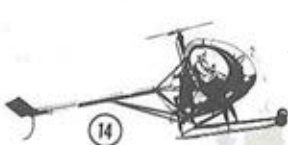
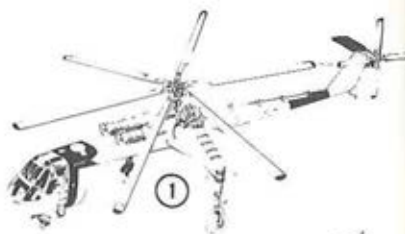
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# WOTIZZ?

## IT'S QUIK QUIZ #2.

Are you sharp in recognizing the not-so-well-known aircraft designs that have graced our magazine pages over the years? If you can name either the model number or the year in which 12 of the 21 models pictured were produced, consider yourself an aviation intellectual. The answers appear on Page 117.



# months takeoffs

## Generals

BALLANTINE, JOHN L., III  
DCG, USAARMC & Fort Knox  
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# HERE ARE THE ANSWERS TO QUIK QUIZ #2

- 1. SIKORSKY AIRCRAFT. . . . . CH-54  
FLYING CRANE (HELICOPTER). . . . . 1964
- 2. BOEING AIRPLANE COMPANY.  
SCOUT (OBSERVATION AIRCRAFT). . . . . 1947
- 3. LIV AEROSPACE CORP. . . . . XC-142A  
TULI-VING (MEDIUM TRANSPORT AIRCRAFT). . . . . 1964
- 4. TAYLORCRAFT MANUFACTURING.  
GRASSHOPPER (LIAISON AIRCRAFT). . . . . 1941
- 5. BOEING VERTOL COMPANY. . . . . CH-47  
CHINOOK (MEDIUM LIFT HELICOPTER). . . . . 1962
- 6. SIEBEL HELICOPTER COMPANY.  
(OBSERVATION HELICOPTER). . . . . 1951

- 7. CESSNA AIRCRAFT COMPANY. . . . . YH-41  
SENECA (UTILITY HELICOPTER). . . . . 1957
- 8. PIPER AIRCRAFT CORPORATION.  
(OBSERVATION-MED EVAC AIRCRAFT). . . . . 1947
- 9. SIKORSKY AIRCRAFT. . . . . CH-37  
MOJAVE (MEDIUM CARGO HELICOPTER). . . . . 1956
- 10. DE HAVILLAND AIRCRAFT.  
OTTER (GENERAL UTILITY AIRCRAFT). . . . . 1955
- 11. BELL HELICOPTER TEXTRON.  
SIOUX (OBSERVATION-MED EVAC HELICOPTER). . . . . 1946
- 12. BEECH AIRCRAFT CORPORATION.  
SEMINOLE (UTILITY, COMMAND, LIAISON). . . . . 1952
- 13. DE HAVILLAND AIRCRAFT. . . . . U-6  
BEAVER (GENERAL UTILITY AIRCRAFT). . . . . 1951
- 14. HUGHES HELICOPTERS. . . . . TH-55  
OSAGE (PRIMARY TRAINER). . . . . 1964
- 15. PILSCECKI AIRCRAFT CORPORATION. . . . . CH-21  
SHAWNEE (CARGO HELICOPTER). . . . . 1950

- 16. AMERICAN HELICOPTER COMPANY. . . . . H-26  
(OBSERVATION-RECONNAISSANCE AIRCRAFT). . . . . 1952
- 17. RYAN AERONAUTICAL COMPANY. . . . . XV-8A  
FLEEP (FLEX-WING PARAGLIDER). . . . . 1961
- 18. HUGHES HELICOPTERS. . . . . OH-6  
CAYUSE (LIGHT OBSERVATION HELICOPTER). . . . . 1965
- 19. McCULLOCH MOTORS CORPORATION. . . . . H-30  
(OBSERVATION HELICOPTER). . . . . 1952
- 20. AERO COMMANDER. . . . . U-9  
(UTILITY, COMMAND, LIAISON AIRCRAFT). . . . . 1953
- 21. SIKORSKY AIRCRAFT. . . . . CH-34  
CHOCTAW (LIGHT TACTICAL TRANSPORT). . . . . 1955





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## HARDWARE

(Continued from Page 10)

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wing capabilities will soon enable the Corps commander to see deep into the enemy's territory with timely information he must have to fight and win the Corps' battle.

Where we are today is the result of a pioneering "can do" spirit, of teamwork, and of initiative that we must not lose. It took the combined efforts of AMC (now DARCOM) and CDC (now TRADOC) to successfully match the mission, the man, and the machine to enable us to be where we are today.

CDC/TRADOC defined the requirements of an ever-changing and increasingly complex world and AMC/DARCOM pulled together the right requisites from fast evolving technology. These commands played a major role in our successes with their initiative, daring, and team effort.

With the same breath, we must tip our cap to our mechanics, crew chiefs, aviators, and support personnel who have performed brilliantly under adverse conditions and have contributed so much through their application of our new systems to making Army Aviation what it is today.

Although we've not enjoyed 100% success in our hardware programs, we've seen a vastly improved capability in the decade of the '70's. Continuing teamwork, positive attitudes and hard work will provide even more capability to support the Army's overall mission in the '80's.

Let's keep charging!

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## UPDATE

(Continued from Page 16)

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### TECHNOLOGY

The developments in technology are not oriented toward an aircraft system or an ROC requirement but are intended to develop the state-of-the-art for future developments or inventory modifications.

The Army initiated the Advanced Digital Optical Controls System (ADOCS) in early FY80 with the objective to develop, demonstrate, verify, and apply improved flight control technology to provide greater helicopter mission capability, survivability, RAM, and cost effec-

tiveness while significantly decreasing pilot workload. Supporting development will include evaluation of digital/fiber optic components and flight test/demonstration of a complete control system in FY83.

The Advanced Composite Airframe Program (ACAP) will demonstrate methods for employing advanced composites in the primary airframe structure of military helicopters. The first phase of the program, preliminary design and concept selection, is currently in progress with the major helicopter manufacturers.

### PROGRAM GOALS

Program goals include: 22% structural weight saving; 17% production cost reduction; ballistic tolerance to 12.7mm and 23mm HEI; reduced radar cross section; crashworthiness; reduced maintenance and increased life; laser burn through resistance; long term resistance to environmental degradation; etc. Successful demonstration of this 1980's technology will enable Army to pay less per pound of aircraft, carry more ordnance or fuel and enhance survivability.

In 1977, competitive contracts were awarded to Lycoming and Detroit Diesel Allison for design, fabrication, and testing of an Advanced Technology Demonstrator Engine (ATDE). The program objective is to determine the achievable level of performance of an ATDE in the 800 shp class and to provide a validated technology base. Performance objectives include 17% to 20% fuel consumption reductions and a specific horsepower increase of 25% to 35% as compared to current engines in this class.

### 1981 PROGRAM COMPLETION

Completion of the two current programs is expected early in 1981 with approximately 500 hours of testing on each engine. The ATDE is following the development path of the T-700 engine and should provide the Army with the most advanced technology engine in the world in this size.

There it is in a nutshell — a look at Army Aviation research, development and acquisition programs in the 1980's!

Obviously, each system mentioned could be described in more detail. However, the intent was to expose what Army Aviation has planned or already has in progress in the 1980's.

It should be an exciting decade!



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