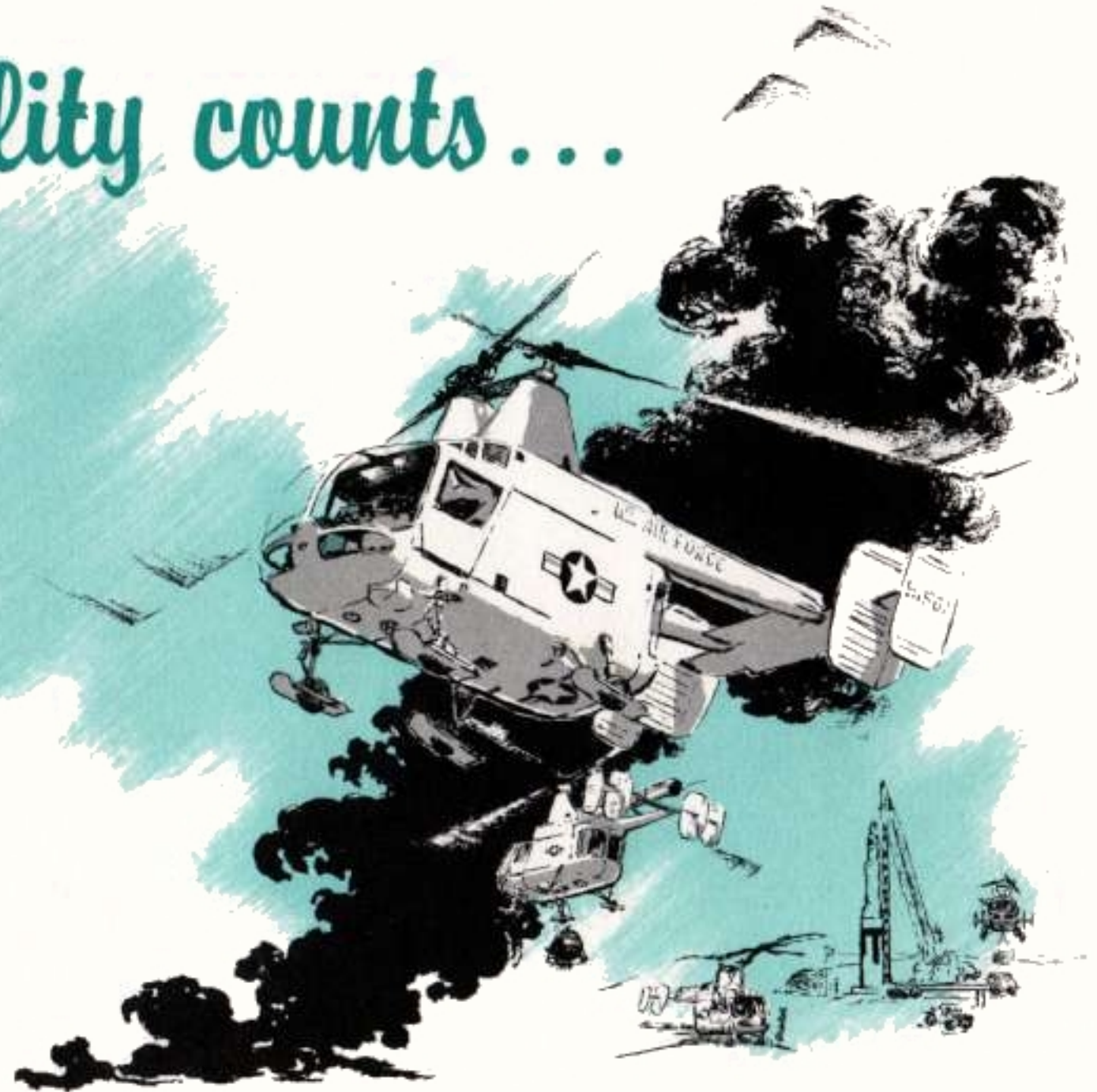


When reliability counts...





## *The Turbine Generation*

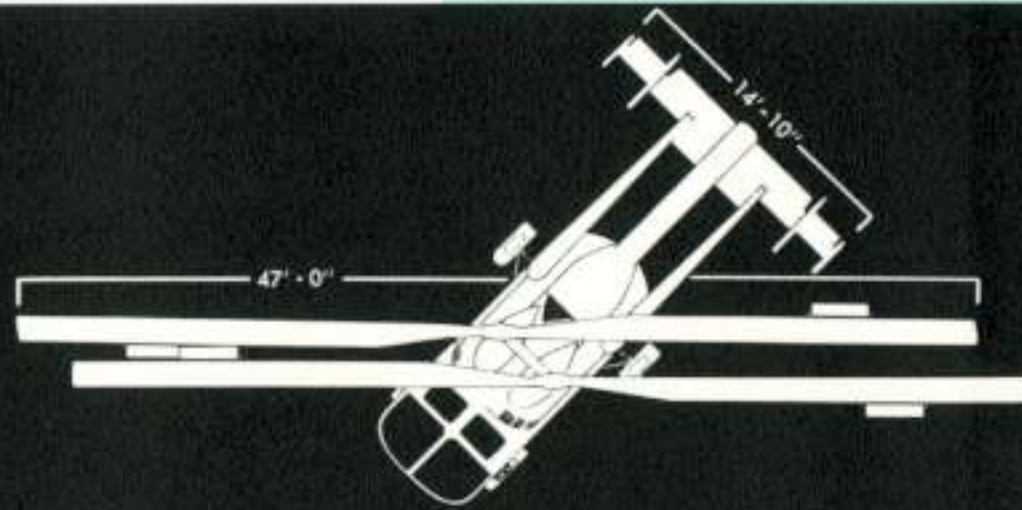
With the advent of the compact, lightweight gas turbine engine for helicopter application, a new generation of rotary wing aircraft came into being. In 1951, the Kaman Aircraft Corporation led the industry into this era by mounting a shaft turbine engine on one of its K-225 helicopters and making the first flight of a helicopter so powered. This was followed in 1954 by Kaman flying the first helicopter powered by twin turbines, a modified Kaman HTK-1. In 1956, Kaman flew one of its HOK-1's equipped with a Lycoming T53-L-1 engine, the first helicopter to fly with a gas turbine designed specifically for helicopters. From the latter aircraft, Kaman developed the H-43B HUSKIE, which has proved to be one of the most outstanding performers of the turbine generation of helicopters.

## The Huskie

The Kaman Aircraft Corporation takes pride in presenting the H-43B HUSKIE helicopter. This high performance turbine-powered rotorcraft, successor to the U. S. Air Force's H-43A, the Navy's HUK-1 and the Marine Corps' HOK-1, is in quantity production for local crash rescue and general utility employment in the U. S. Air Force.

The H-43B HUSKIE, powered by a Lycoming T53-L-1 gas turbine engine, holds the world's altitude record of 30,000 feet for medium utility helicopters. This record was achieved on 9 December 1959, utilizing a mission-configured aircraft with two pilots aboard, and reflects in part the outstanding performance qualities inherent in this aircraft.

The purpose of this brochure is to introduce the HUSKIE to those not already familiar with its capabilities and potential and to demonstrate that this versatile aircraft can be integrated into the programs of various operators throughout the world.



# *A Synchropter with Servo Flap Control*

## *The Synchropter*

The H-43B has twin, intermeshing two-bladed rotor assemblies mounted in a side-by-side arrangement on individual rotor pylons, and driven by the twin shafts of a single transmission. The intermeshing rotors are counter-rotating, eliminating rotor torque reactions and providing an aerodynamically balanced rotor system. Synchronous intermeshing, with blades held 90 degrees out of phase, is maintained by the gear train within the transmission. Hence — the term SYNCHROPTER.

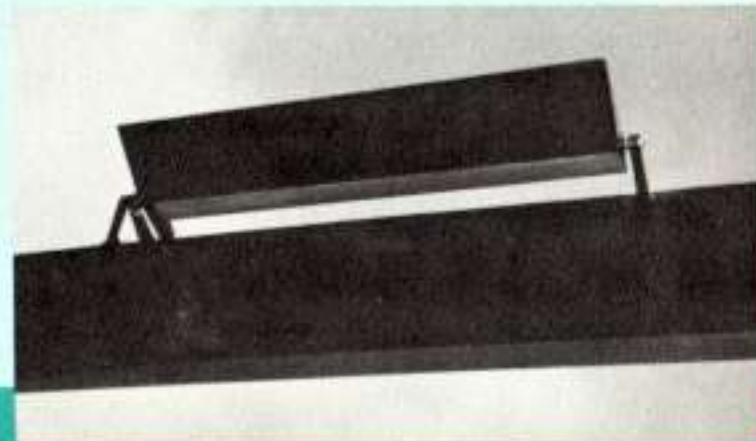
The synchropter configuration lends itself to the use of longer rotor blades for a given size helicopter. This provides low disc loading which produces greater lifting capacity per horsepower. The large area of the four blades results in low blade loading, which provides better stall margins at altitude, contributing to the HUSKIE's excellent high altitude performance.

In a synchropter, all available power is converted into lift, with none diverted for driving a tail rotor. Power changes can be made without compensating for torque, and the helicopter can maneuver in highly restricted areas. This high power utilization, coupled with low disc loading, gives the HUSKIE its outstanding lifting efficiency.



## *Servo Flap Control*

The HUSKIE's simplified rotor control system is centered about the servo flaps, small airfoil surfaces mounted on the outboard trailing edge of each blade. These control the pitch or angle of attack of the blade and are themselves controlled by the pilot's collective stick, cyclic stick and/or directional pedals by means of lightweight mechanical linkages. The HUSKIE is thus free of any large and heavy rotor control system components generally required to overcome the large control loads present in other type rotor systems. These forces, as transmitted by the Kaman servo flap, are so light as to be negligible and permit a control design which eliminates the need for constant pilot attention, thus removing the pilot fatigue factor from the system. Control response is instantaneous and provides excellent maneuverability, while the servo flap-equipped rotor blades greatly increase the inherent stability of the helicopter, making the HUSKIE literally capable of "hands-off" flight.



# Flying Qualities

Designed to withstand a 3g positive load factor at a 6500 lb gross weight, and being free from adverse blade stall at all altitudes, the H-43B HUSKIE has virtually no rotor limitations and possesses such superior flight characteristics as:



Extremely low control forces requiring only "finger tip" force to fly the aircraft.

Low disc loading which contributes to the highest lifting efficiency of any helicopter configuration.

Superior autorotative characteristics of low descent rate and ability to be flared close to the ground.

A high degree of inherent flight stability contributing to its excellent night and instrument flying qualities and permitting "hands-off" flight.

Outstanding hovering capability either upwind or downwind, with no power changes required in turning crosswind during hover. Considered the best hovering helicopter in operation.

Translational lift is achieved at 8 to 10 knots and can be accomplished in rearward flight.

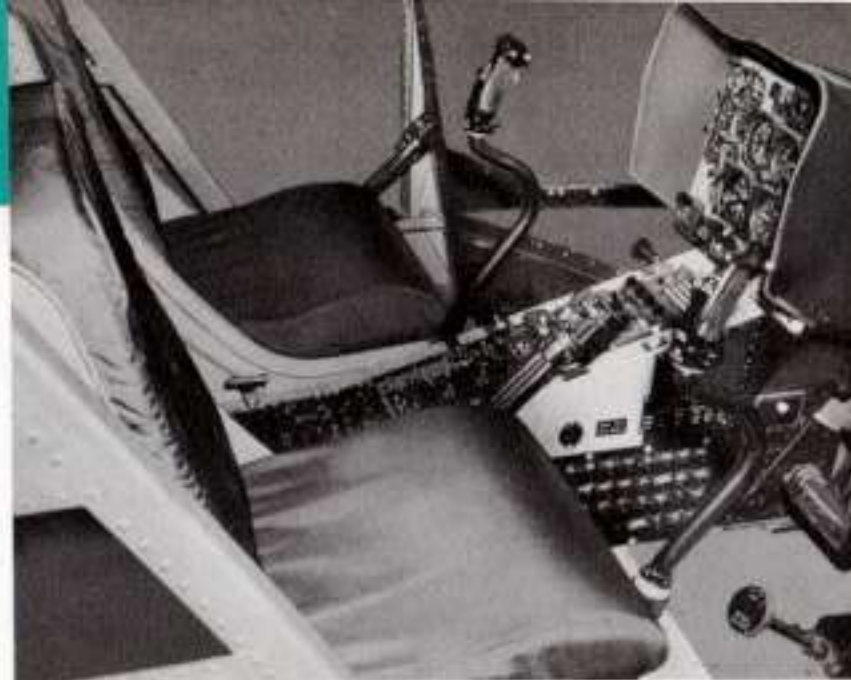
Normal operation in winds as high as 55 knots, and has the unique capability of starting and stopping rotors in winds up to 70 knots.

Excellent overall controllability, including exceptionally rapid response to collective pitch control.

A safe helicopter, inherently stable and easy to fly . . . this is the HUSKIE.

## Cockpit

The HUSKIE's cockpit is arranged in standard helicopter configuration with the pilot on the right and the copilot or observer on the left. Controls are provided at each position. The full panel flight instruments, the engine instruments and the console and overhead panel arrangements have been designed for maximum pilot convenience without compromising the excellent visibility so characteristic of Kaman helicopters.



Communication and navigation equipment is provided in the HUSKIE as follows:

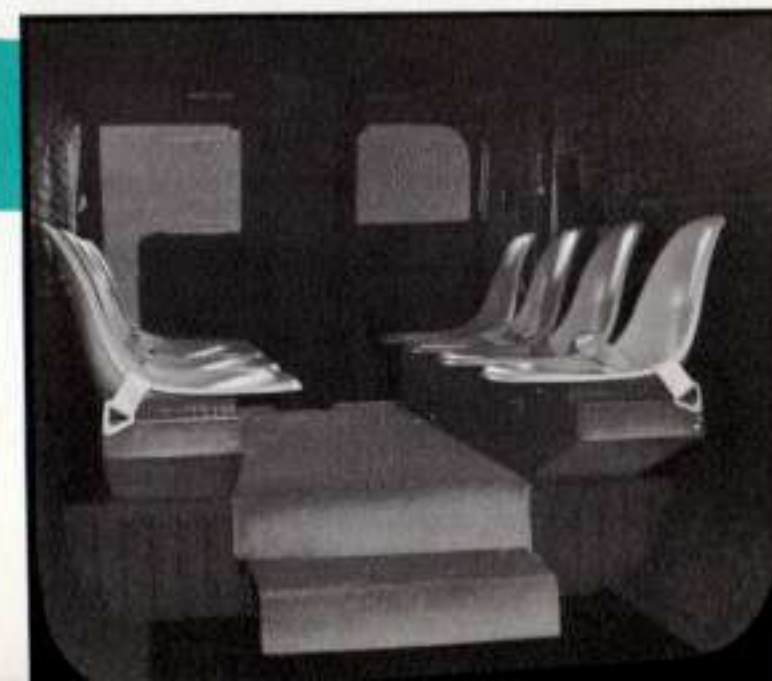
UHF COMMAND RADIO	AN/ARC-34
UHF AUTOMATIC DIRECTION FINDER	AN/ARA-25
LOW FREQUENCY AUTOMATIC DIRECTION FINDER	AN/ARN-59
INTERCOMMUNICATION SET	AN/AIC-10A
GYRO STABILIZED FLUX-GATE COMPASS SYSTEM	J-4
RADIO MAGNETIC INDICATOR	ID-250A/ARN

## Avionics

The HUSKIE's radio has 20 pre-set channels plus Guard for automatic selection, with a total of 1750 channels available over-all, any of which can be manually selected from the cockpit console without disturbing the pre-set channels. The ID-250A RMI provides complete heading information from the J-4, the ARA-25, and the ARN-59.

## Passenger/Cargo Compartment

This spacious aft compartment serves as a multi-function area. Provisions are made for up to ten seats which, together with the two seats in the cockpit, makes the HUSKIE a twelve-place helicopter. In an ambulance configuration, 4 litters and an attendant can be accommodated. In addition, the compartment's 166 cubic feet will accept a variety of cargo items, for which high strength tie-down fittings are provided. Ease of entrance and/or loading is enhanced by the rear-opening clam-shell doors.



# *A Utility Helicopter . . . with Utility Features . . .*

The H-43B HUSKIE incorporates features of design and equipment which, when combined with its excellent performance and flying qualities, offer a utility helicopter of unlimited versatility. These features include . . .

## COMPACT SIZE

Fuselage completely within the rotor diameter; point of minimum rotor clearance within pilot's range of vision on each side; no tail rotor; — all enhance operating capability in highly restricted areas.

## VISIBILITY

Unparalleled visibility from cockpit; "picture window" vision from aft cabin.

## IN-FLIGHT BLADE TRACKING

Track of rotor blades can be adjusted from cockpit in flight or on the ground, insuring smooth flights and eliminating ground tracking procedures after initial adjustment.

## LANDING GEAR

Specially developed landing gear, aided by low vertical c.g., permit steep side hill landings, adding to HUSKIE's rough terrain versatility.

## BEAR PAW GEAR

On all four wheels — while permitting unimpeded taxiing, makes possible landings in sand, snow and soft or marshy terrain.

## PERSONNEL HOIST

Electrically powered — 600 lb capacity — designed to withstand 3g static load — hoists at 100 ft/min. In full view of, and operable by, both the pilot and the crewman in the cabin. Easy entrance through rescue door on right side.

## EXTERNAL CARGO HOOK

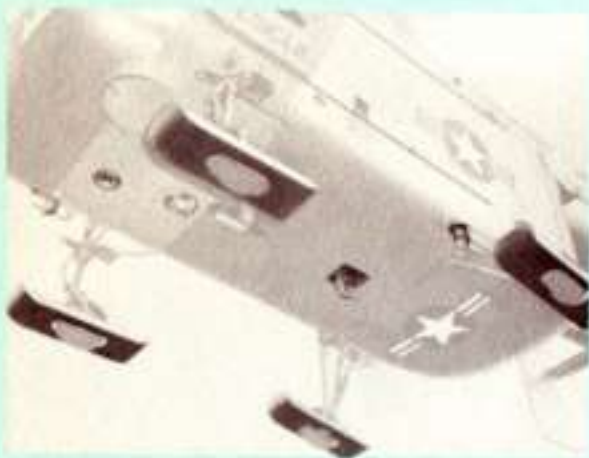
2500 lb capacity — has automatic touchdown release in addition to pilot's electrical and mechanical releases and an external mechanical release.

## RESCUE FLOOD LIGHTS

Illuminate night operations — a boon to rough terrain work.

## EMERGENCY FLOTATION GEAR

Instantly inflatable gear is available to provide complete flotation in the event of an emergency water landing.



Underside view shows cargo hook and floodlights.



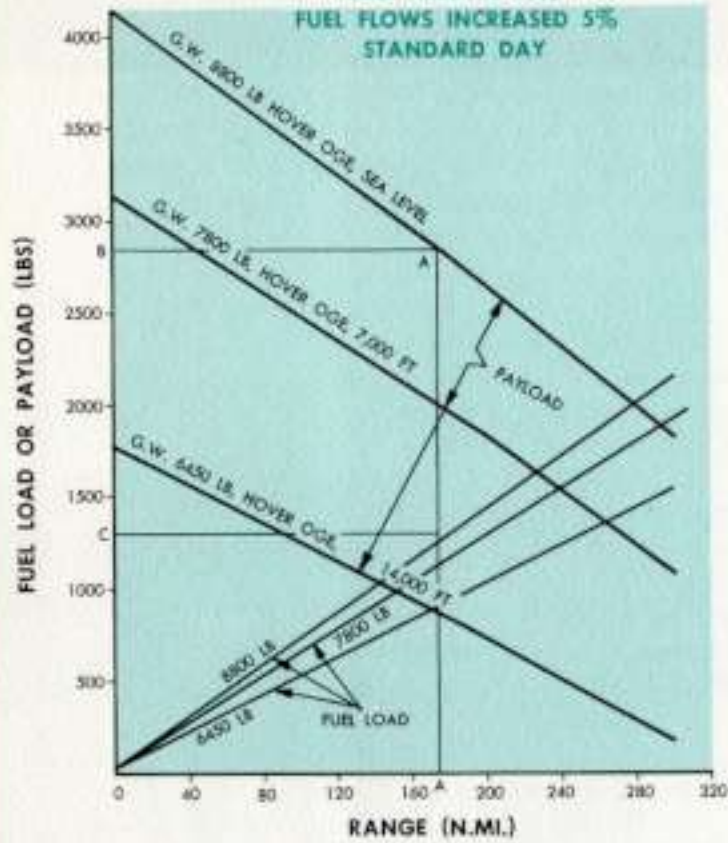
Bear Paw gear as mounted on forward wheel



Personnel hoist mounted directly above rescue door.

**PAYLOAD & FUEL LOAD  
VS  
RANGE**

FUEL RESERVE 10%  
FUEL FLOWS INCREASED 5%  
STANDARD DAY

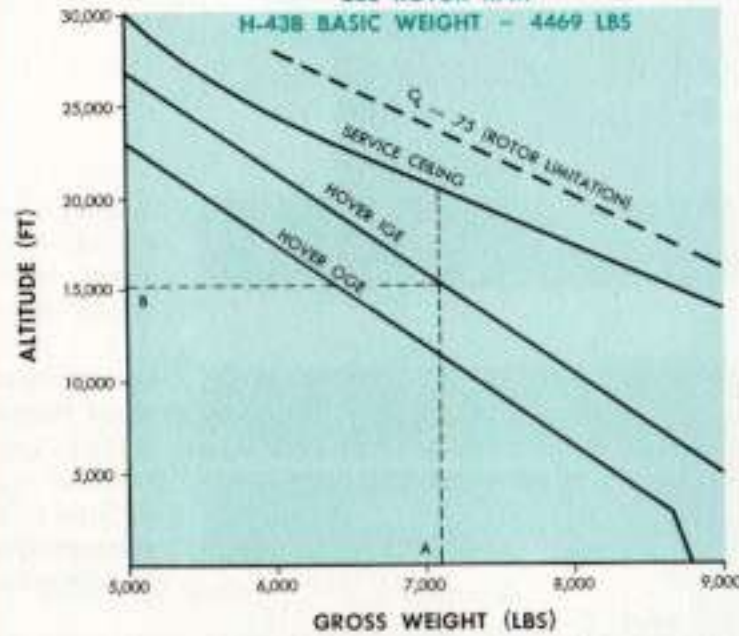


Example: With 8800 lb gross weight, hover age at sea level, standard day, cruise 174 nautical miles (A) with 2831 lb payload (B) and full internal fuel (C)

**HOVER CEILING & SERVICE CEILING  
VS  
GROSS WEIGHT**

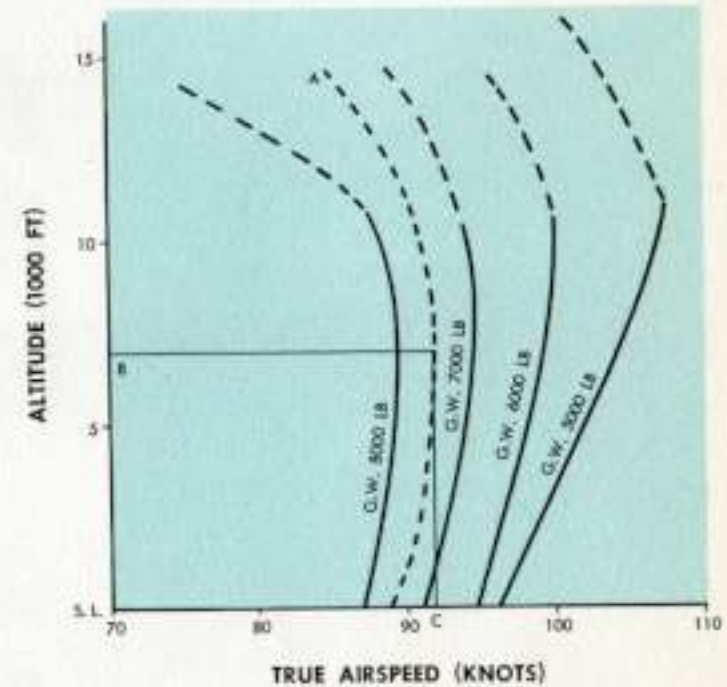
MIL POWER (30 MIN RATING)  
STANDARD DAY  
260 ROTOR RPM

H-43B BASIC WEIGHT - 4469 LBS



Example: With 7100 lb gross weight (A) hover age at 15,200 feet (B)

**MAXIMUM SPEED  
VS  
ALTITUDE  
STANDARD DAY**



Example: 7570 lb gross weight (A) 7000 feet altitude (B) 900 FPM maximum rate of climb (C).

*Performance*

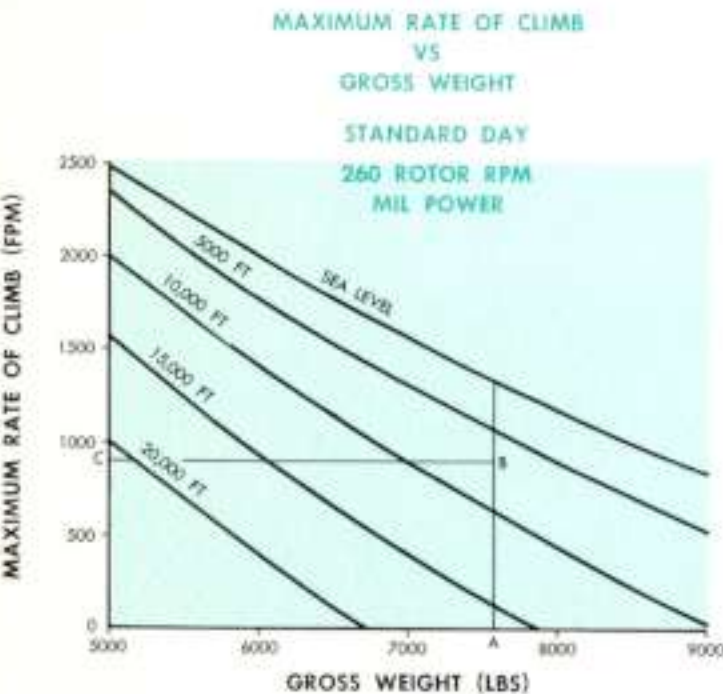




# Performance Summary

The following tabulation of performance is based upon flight test data accumulated on the H-43B HUSKIE, and is shown at the basic mission gross weight of 5900 pounds.

GROSS WEIGHT.....	5,900 LBS
NORMAL CRUISE.....	95 KTS
MAXIMUM SPEED, STRAIGHT & LEVEL.....	104 KTS
MAXIMUM DIVING SPEED.....	130 KTS
MAXIMUM RATE OF CLIMB (Sea Level).....	2,000 FPM
VERTICAL RATE OF CLIMB (Sea Level).....	1,530 FPM
*SERVICE CEILING.....	25,000 FT
HOVER CEILING — IN GROUND EFFECT.....	21,800 FT
HOVER CEILING — OUT OF GROUND EFFECT.....	18,000 FT
ENGINE RATING OF LYCOMING T53-L-1 GAS TURBINE:	
MILITARY HORSEPOWER.....	860 SHP
NORMAL RATED POWER.....	770 SHP
RANGE.....	205 NAUT. MI.
FUEL.....	1,300 LBS.
BEST RANGE CRUISE SPEED.....	85 KTS
**NORMAL PAYLOAD .....	2,800 LBS
ENDURANCE.....	3.2 HRS



Example: 7570 lb gross weight (A) 7000 feet Altitude (B) 92 knots true airspeed

\*Service ceiling of 29,000 feet and absolute ceiling of 30,000 feet achieved with 5443 pounds take-off gross weight on 9 December 1959 to attain the world's altitude record for helicopters of its class.

\*\*Overload gross weight limit varies with atmospheric conditions. This factor permits higher payloads to be carried.

Example: At sea level, 59°F., able to hover out of ground effect with 8800 lbs gross weight at maximum power.

LBS.
4469 AIRCRAFT BASIC WEIGHT
1300 FUEL
200 PILOT
-----
5969 OPERATING WEIGHT
2831 PAYLOAD
-----
8800 GROSS WEIGHT

## *Crash Rescue and Disaster Control*

H-43B HUSKIE helicopters are being stationed at U. S. Air Force installations throughout the United States, maintaining a condition of ready alert for performance of the local base crash rescue mission. In addition to performing hoist rescues and serving as an aerial ambulance, an important function of the HUSKIE in this mission is the suppression and control of crash fires sufficient to allow rescue. Experience in hundreds of simulated crash fires has demonstrated the effectiveness of the HUSKIE, with its directional synchropter downwash and the use of foam from its fire fighting kit, to cut a path through large crash fires, permitting rescue of occupants and/or classified equipment. The HUSKIE is also extremely well suited for large area radiation monitoring, evacuation, and the movement of rescue crews and damage control teams and their equipment.



## *Missile Site Support*

It has been well established that a requirement exists for support of dispersed Strategic Air Command missile sites by some form of ready air transport. Although served individually by road from a central supporting base, these sites are relatively isolated from one another by distance and rugged terrain, which places excessive demands on the time of key personnel spent in travel while performing the vital functions of command liaison, security, and maintenance support. The versatile HUSKIE helicopter, with its superior high altitude performance, its ready adaptability for use in transporting either personnel or cargo, and its ready availability in the U. S. Air Force inventory, is the ideal choice to meet this vital requirement.



#### FREE POWER TURBINE DESIGN

An air drive between the turbine which drives the compressor and the turbine which operates the power output shaft eliminates the need for a clutch between the engine and rotor.

#### NO PRE-TAKE-OFF WARM UP

Permits engine start and take-off in less than one minute.

#### ENGINE GOVERNOR

Automatically provides pilot with desired rotor rpm and eliminates continual throttle adjustment.

#### POWER TURBINE DROOP COMPENSATOR

Positive acting; no rpm loss due to control inputs to the rotor system.

#### PERFORMANCE

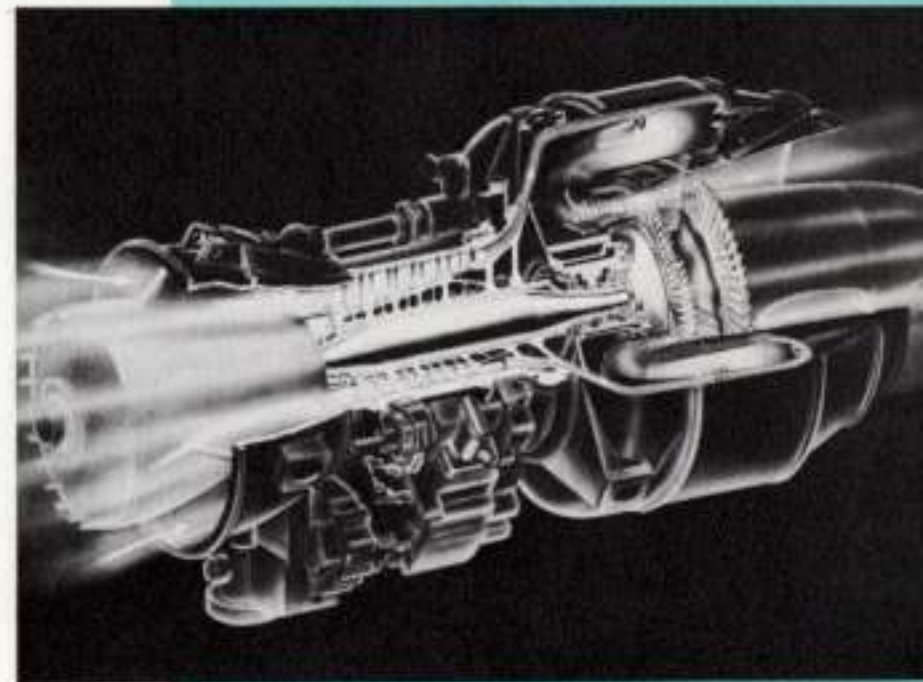
Greatly increased, particularly at high altitudes, over reciprocating engines.

#### INSTALLATION

Location enhances accessibility and results in low noise levels in cockpit and cabin.

#### HIGH POWER-TO-WEIGHT RATIO

Permits greater useful load without increasing helicopter size.



*Plus Factors of Huskie's Gas Turbine Engine*

Military policy dictates that any aircraft system must be adaptable to multiple missions to constitute an economical procurement. The HUSKIE's outstanding performance, handling qualities and special features enable the aircraft to assume any of a variety of roles, including:

As further evidence of the versatility of this helicopter, endurance tests conducted on the HUSKIE's drive system have established the ability of the dynamic components to absorb higher power ratings. This factor, plus the absence of adverse blade stall under operational conditions, provides a substantial growth capability as new missions for the aircraft are developed.

#### ALL-WEATHER CAPABILITY

Equipped with full panel flight instrumentation, the HUSKIE combines fixed-wing flying qualities with helicopter versatility, enabling mission operation in all but a small percentage of instrument weather conditions. This capability can be further extended by including automatic stabilization equipment plus additional navigation equipment and icing control.

SEARCH AND RESCUE—

MISSILE SITE SUPPORT—

PASSENGER OR TROOP TRANSPORT—

AERIAL AMBULANCE—

OBSERVATION/RECONNAISSANCE—

ARMED ASSAULT—

CARGO TRANSPORT—

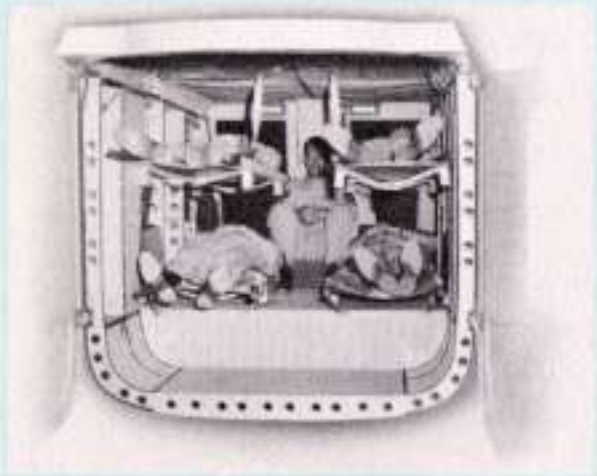
CRASH FIRE RESCUE—

AERIAL CRANE—

OFF-SHORE OIL UTILITY—

FORESTRY & AGRICULTURAL WORK—

## *Mission Flexibility*



*four litters and attendant . . .*



*seating for ten troops . . .*



*effective rescue capability . . .*



*transporting 3400 lb. jeep-mounted  
105mm recoilless rifle . . .*

*Ruggedness*

*Maintainability*

*Reliability*



Designed and built to military specifications stressing maintainability and serviceability.

Test-proven to 3g flight loads

Simplicity of synchropter configuration requires no intermediate gear boxes, tail rotors or lengthy shafting.

Elimination of cyclic boost reduces control system maintenance.

Exposed position of the light weight engine permits rapid removal and replacement and facilitates maintenance and repair.

Easy and immediate access to all components requiring inspection or periodic maintenance.

Compact size requires minimum of hangar or stowage space.



USAF pilots who set four world records with their aircraft are awarded the Distinguished Flying Cross by General Thomas D. White, USAF Chief of Staff, shown here second from left. At General White's left are Captain W. J. Hodgson (holding HUSKIE model) and Major W. J. Davis, the pilots who flew the H-43B HUSKIE to its world's altitude record. [Courtesy of Wide World Photos]



This, then is the H-43B HUSKIE — a rugged helicopter, inherently stable, with virtually no operational limitations. Already holder of the world's altitude record for its class, its performance indicates other record achievements are certain to follow. The H-43B HUSKIE — a product of Kaman Aircraft Corporation, pioneers in the field of gas turbine powered helicopters.





When reliability counts...



The  **AMAN** Aircraft Corporation





# **UNITED STATES AIR FORCE H-43B HUSKIE**

The HUSKIE is a crash rescue vehicle designed specially for the life-saving local base rescue mission. In less than a minute the HUSKIE can be airborne with a fireman and crash entry specialist aboard and with its fire suppression kit slung from the cargo hook. Flying over wires, woods, swamps and other obstacles to ground apparatus, the HUSKIE can be at the scene of an aircraft accident in minutes.

With its rotor downwash blowing smoke, heat and flames away from the burning aircraft, the HUSKIE is an integral part of the crash-entry procedure. Already the H-43B has proved its effectiveness in several crashes, saving the lives of 10 crewmen, in one case, with only rotor downwash.

Because it is so rugged and maneuverable, the HUSKIE can perform many jobs other than its primary mission of local base rescue. The HUSKIE has two counter-rotating, intermeshing rotors which give the helicopter more lifting ability than any other helicopter.

A further advantage is the gas turbine (jet) engine which powers the HUSKIE. Use of such a powerplant, which Kaman Aircraft pioneered in helicopters, reduces the over-all weight of the helicopter, adds horsepower and increases the payload carrying capacity. More than 100 of these versatile helicopters have been ordered by the Air Force.

**MANUFACTURED BY**

**THE KAMAN AIRCRAFT CORPORATION**

**Bloomfield, Connecticut**

**PIONEERS IN TURBINE-POWERED HELICOPTERS**