

*the incredible*

# KIOWA



# FROM THE HOME

COMES







OF THE HUEY...

THE OH-58A KIOWA

**AN HEIR TO EXCELLENCE**

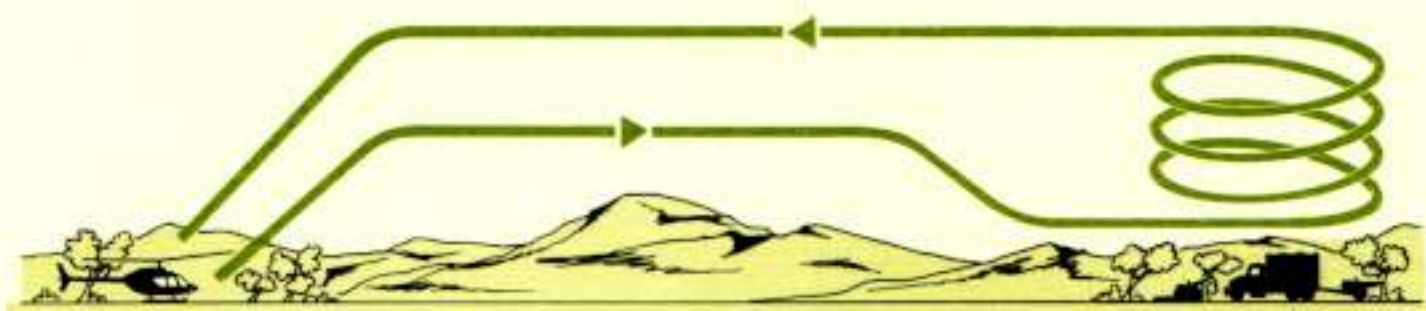
*In the proud production and support tradition of over 7500 Hueys, Bell introduces the OH-58A Kiowa. Now in volume production for the U.S. Army, versions of the Model 206 are also serving the U.S. Navy as a Primary trainer plus hundreds of other customers worldwide.*



# MISSIONS

Visual observation, target acquisition, armed reconnaissance or scout and command and control are primary among the assigned mission for the OH-58A. In addition to meeting the fundamental performance characteristics defined for it, the incredible KIOWA adds new dimension to mission fulfillment. Qualities of excellence uncommon in contemporary helicopters abound in the OH-58A. In all the essential categories, the KIOWA offers an extra measure. Power margin, maneuver margin, weight and space margin, design stress margin and safety margin are a few of the attributes which the field commander, the supported force and the combat aviator can expect . . . and get . . . from the incredible KIOWA!

## OH-58A observation mission

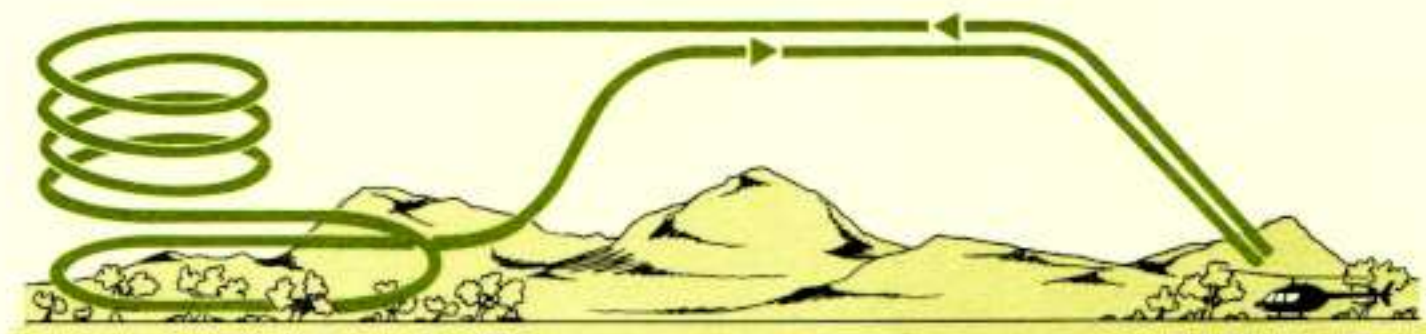


Take-off with crew of 2, personnel armor, 200 pounds of mission essential equipment, and fuel for 260 nautical miles range.

The OH-58A has a 3.5 hour endurance for the observation mission, a normal rate of climb in excess of 1200 fpm and a Vcr of over 110 knots. Vne is 120 knots.

MISSION ESSENTIAL EQUIPMENT	
M16 Rifles & ammo . . . . .	41 Lbs.
Smoke grenades (24) . . . . .	33 Lbs.
Oil, tools, gun parts . . . . .	24 Lbs.
Food & water . . . . .	33 Lbs.
Life vests . . . . .	12 Lbs.
Crew equipment . . . . .	27 Lbs.
Chest armor (2) . . . . .	30 Lbs.
<b>TOTAL . . . . .</b>	<b>200 Lbs.</b>

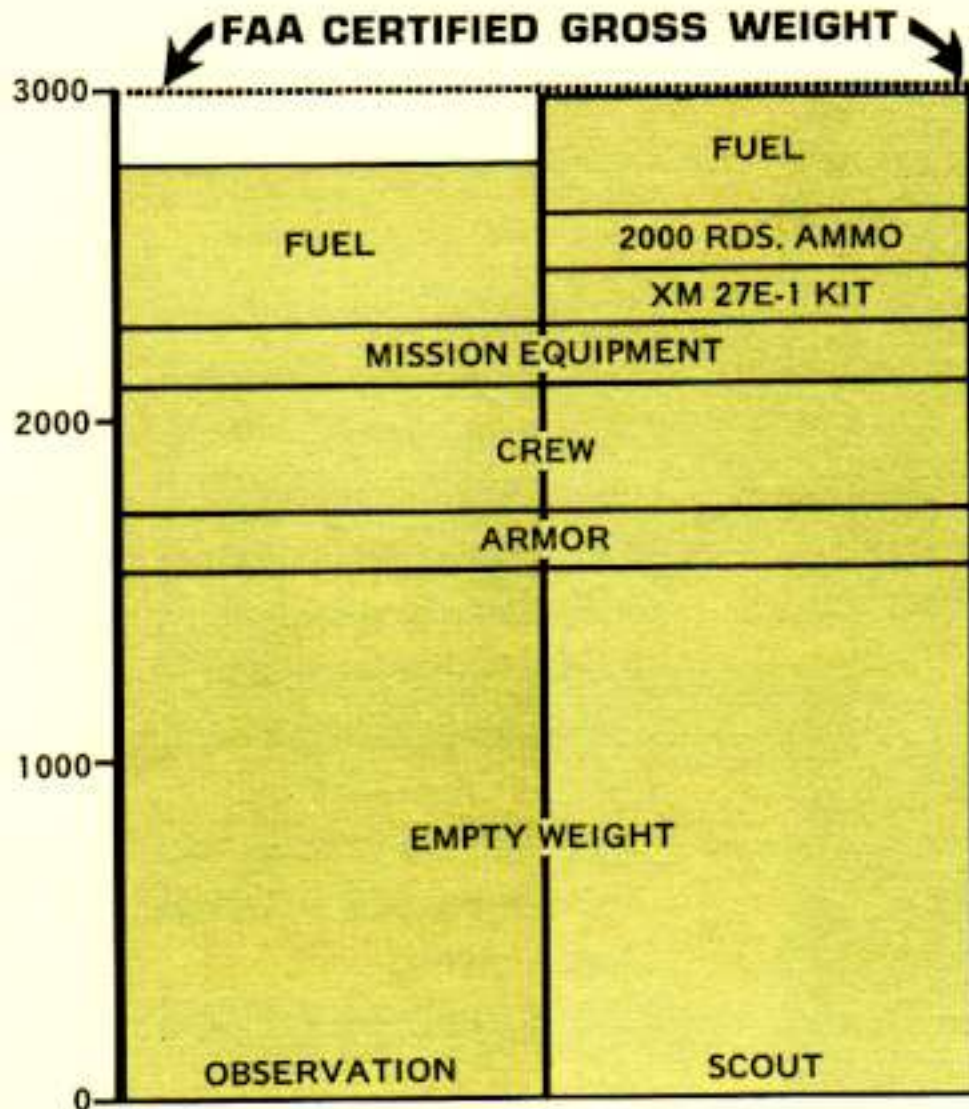
## OH-58A scout mission



Take-off with crew of 2, personnel armor, XM27E-1 7.62mm minigun kit, 2000 rds. ammunition, 200Lb mission equipment and fuel for a 230 nautical mile range.

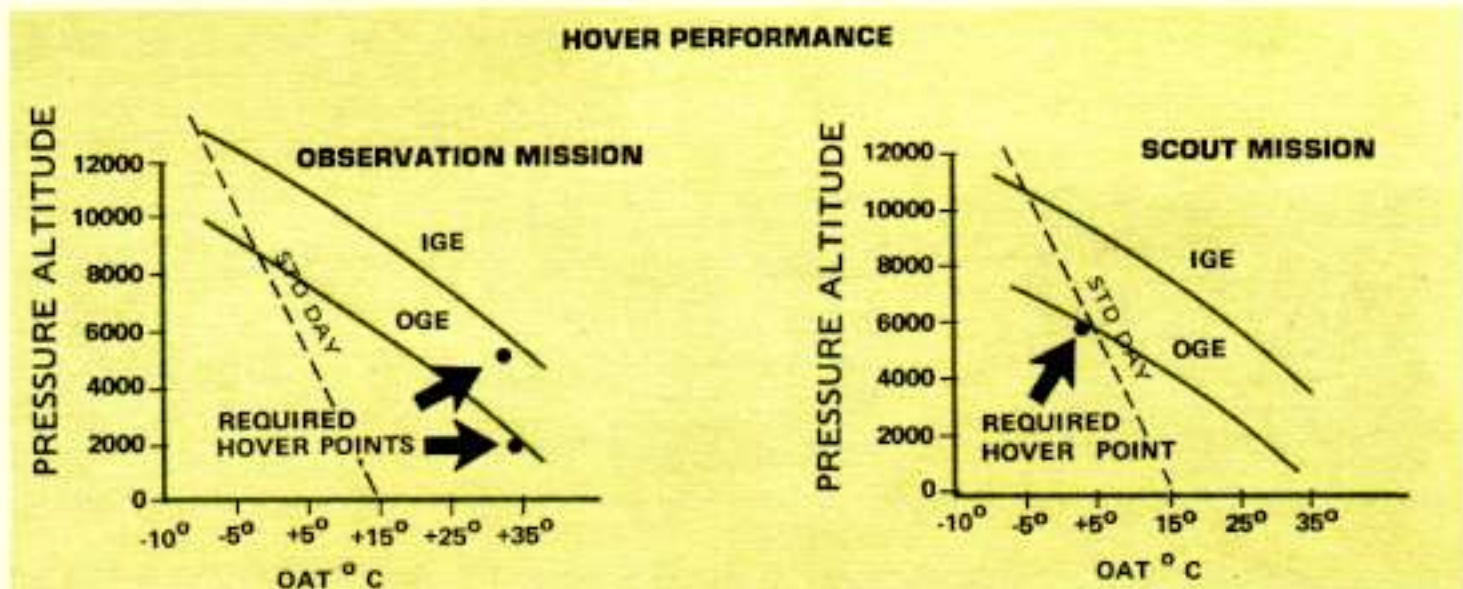


# MISSION WEIGHTS



Both primary assigned missions are performed *within* the FAA certified gross weight limit. The OH-58A has been designed, tested and qualified in all categories of performance and handling qualities for 3000 pounds. It is noteworthy that the 206A JetRanger, with same powerplant and smaller diameter rotor is certified for 3000 pounds internal and up to 3350 pounds for external sling load (overload) operations.

# MISSION PERFORMANCE



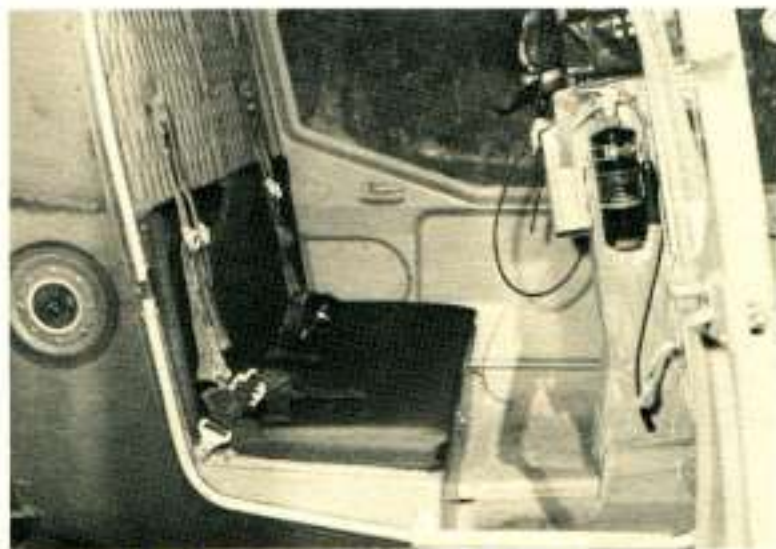
The OH-58A meets the LOH Lot II hover performance criteria, the most severe ever required of a light helicopter. Careful attention to rotor design and airframe aerodynamic cleanliness also permit the KIOWA to meet or exceed all other mission performance requirements for Speed, Range and Rate of Climb.

SPEEDS	
VNE	120 KNOTS
SIDWARD	35 KNOTS
REARWARD	30 KNOTS

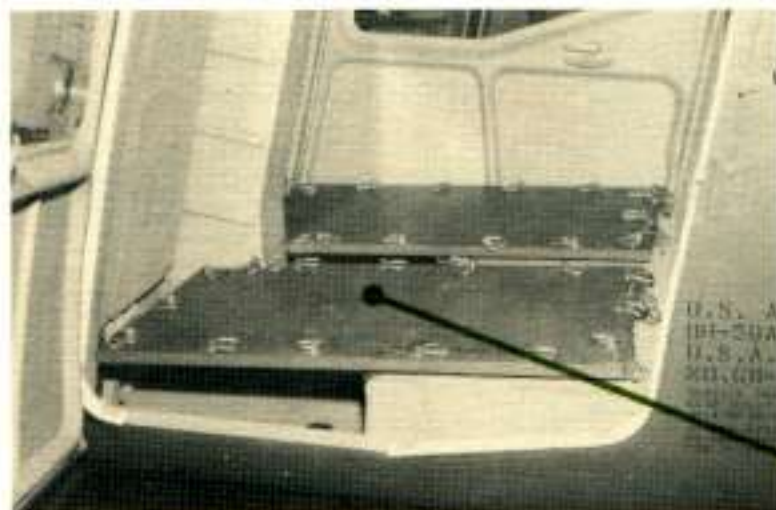


# ...ALTERNATE OH-58A MISSION CAPABILITY

In addition to its primary missions, the *KIOWA* will be assigned a variety of secondary support roles. With the most useful load capacity of any light helicopter, the OH-58A readily fulfills the task of supplementing larger helicopters or supplanting ground vehicles.



□ FIVE PLACE CAPABILITY



□ FORTY CUBIC FEET CABIN VOLUME

- COMMAND AND CONTROL
- LIAISON-COURIER
- REAR AREA SECURITY
- MEDICAL EVACUATION
- COMMUNICATIONS RELAY
- PATHFINDER INSERTION
- COMPANY RESUPPLY
- SURVEY AND MAPPING
- BATTLEFIELD ILLUMINATION
- PSYCHOLOGICAL WARFARE
- WIRE LAYING
- FLIGHT TRAINING

**MISSION KITS** have been developed for other models of the *JetRanger* line and could be adapted to the **OH-58A** to further enhance its mission capability.



**EXTERNAL CARGO SLING**  
Rated at 1200 pounds



**TWO LITTER KIT**  
Installed in 60 seconds



**FIXED FLOATS**



**RESCUE HOIST**  
Capacity 300 pounds



**POP-OUT FLOTATION**  
Inflates in 3 seconds

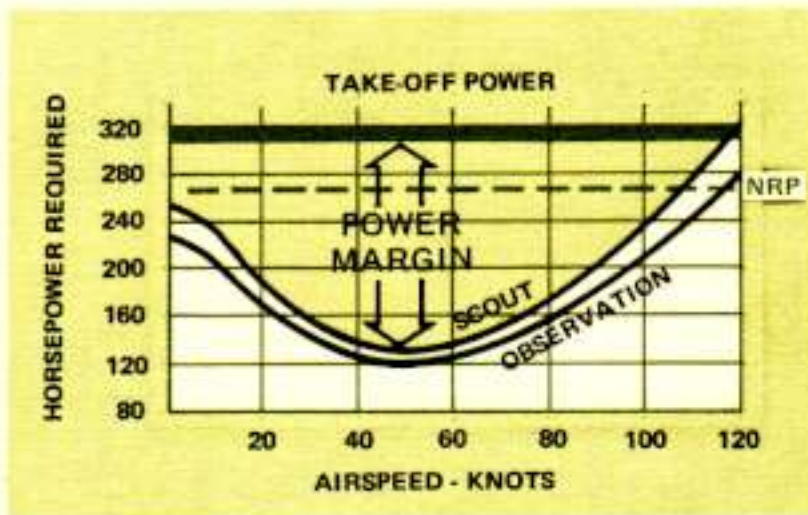
## PLUS:

- UNIVERSAL STORES MOUNT  
carry alternate ordnance/utility stores
- HIGH SKID GEAR  
Provide 24" ground clearance
- WINTERIZATION KIT  
Extend operating range to -65°F



# MISSION POWER MARGIN

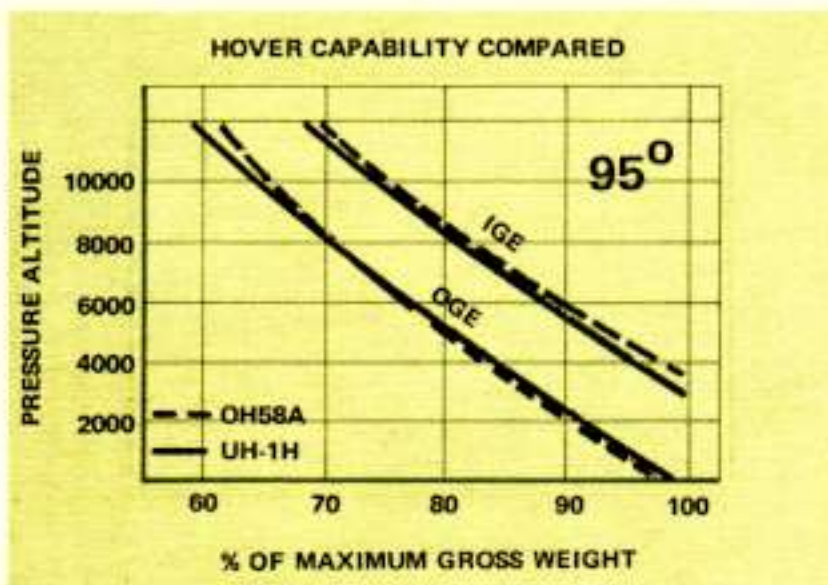
Balanced design best describes the OH-58-A blend of advanced rotor technology with the 317 HP Allison turbine. The rotor is optimized to provide hover OGE at maximum gross weight at less than the engine's normal rated power. IGE hover at maximum gross weight requires only 70% of the T63's NRP. Thus, the KIOWA has power to spare in hover.



flight. For climb, maneuver at constant altitude or for evasive combat action at tree top level, the balanced design of the KIOWA provides more performance power margin than any light turbine helicopter.

Since the OH-58A is qualified for the full 317 HP engine rating an even greater mission power margin is available to the pilot in forward

## KIOWA-IROQUOIS TEAM...



As a tactical team, the OH-58A and the Huey are ideally matched. The UH-1H with the T53-L-13 engine, newest and best performer of the troop transport series has proven its merits in combat. For adverse density altitude hovering, it is the best in the field. The KIOWA offers a striking similarity in hover capability. At equivalent percentages of maximum gross weight, their hover performances are virtually identical. Note that at full gross weight, the OH-58A is better than the UH-1H!

GROSS WEIGHT	2400 LBS.	2700 LBS.	3000 LBS.
CRUISE SPEED S.L./4000 FT.	115/115 kts.	113/112 kts.	111/109 kts.
CRUISE RANGE* S.L./4000 FT.	294/325 nmi	287/315 nmi	279/303 nmi
HOVER OGE STD. DAY	13,000	9,200	5,400
HOVER IGE STD. DAY	17,300	13,800	10,500
RATE OF CLIMB S.L./N.R.P.	1520 fpm	1260 fpm	1050 fpm
VERTICAL CLIMB S.L./T.O.P.	1770 fpm	1280 fpm	800 fpm

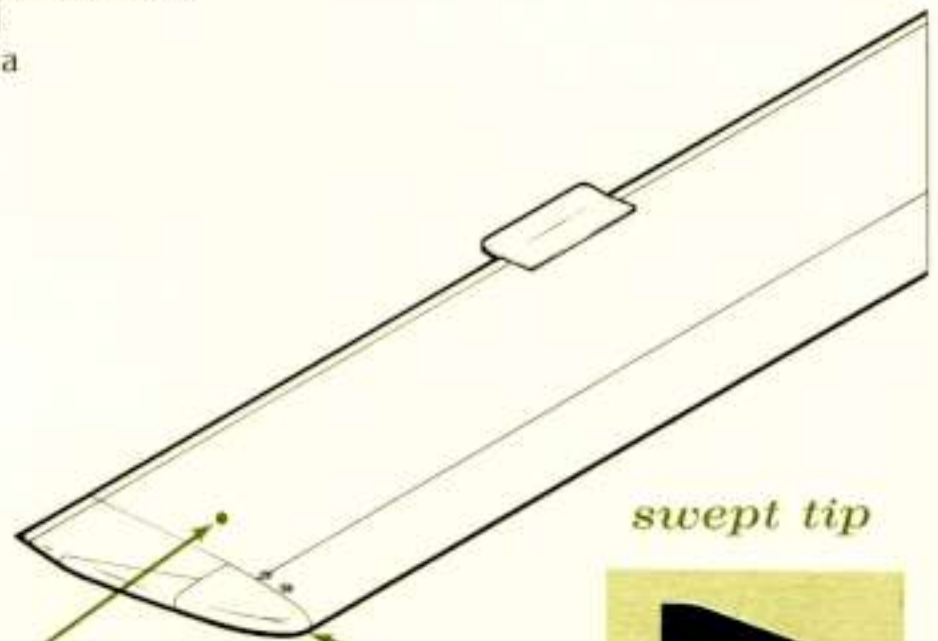
\* No Reserve



# ROTOR

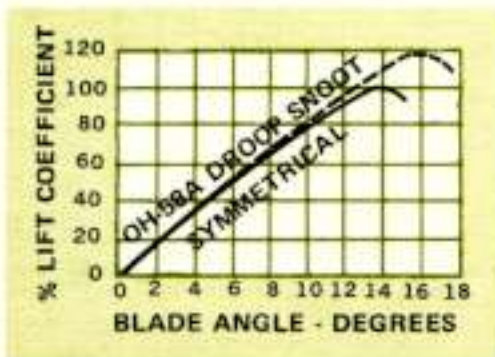
SAFETY  
-SEMI-RIGID-  
SIMPLICITY

Fulfillment of the demanding Army LOH mission requires a helicopter with "lots of rotor." This phrase best describes the KIOWA. The qualities of advanced aerodynamic efficiency, ruggedness and simplicity are blended in a blade designed to meet the mission and leave a margin for the pilot. Wide thrust margin for maneuverability, high efficiency in hover, particularly under adverse combinations of gross weight, altitude and temperature, plus high inertia for ease of autorotation are the attributes the OH-58A brings to the tactical aviator.

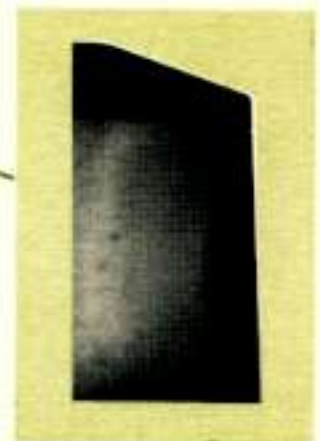


*swept tip*

*advanced airfoil*

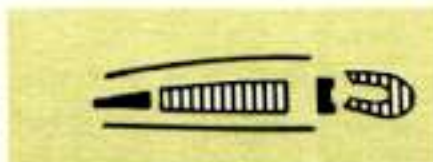


A droop-snoot airfoil section developed for the KIOWA brings a significant improvement to rotor blade efficiency. Compared to conventional symmetrical blade shapes, the OH-58A airfoil has a 15% higher maximum coefficient of lift and an 18% wider blade angle range. (Curve compares %  $C_L$  since absolute values vary with blade span position.)



Blade tip sweep adds to hover efficiency by reducing hover power required. Reduced rotor noise is a distinctively valuable side benefit.

*simple rugged construction*



*high inertia*

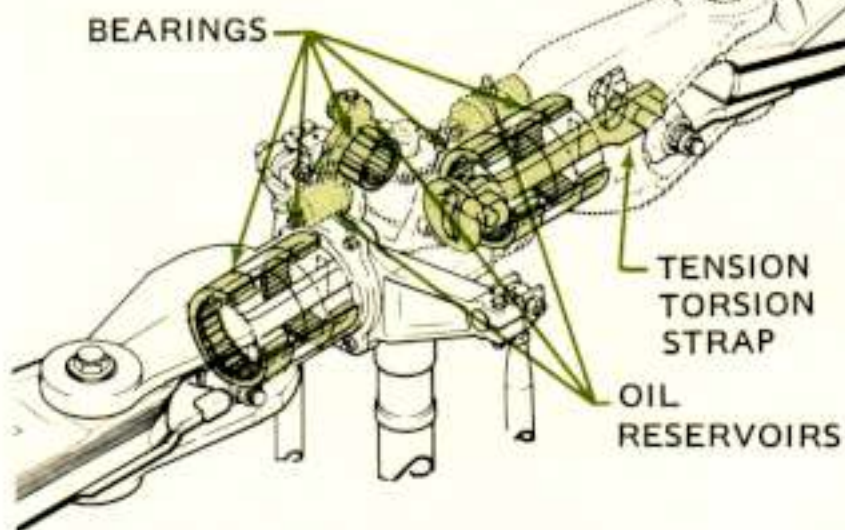
High inertia means a forgiving rotor. Twenty-two pounds of weight in each blade increase stability and assure safe, easy autorotation.

The blade is built of six basic parts plus root and tip details. Honeycomb core provides a tough light structure and retains airfoil shape. A hard aluminum nose block minimizes erosion and can easily withstand branch and small tree strikes without damage or absorb ground fire.





## UFA HUB



The KIOWA, like over 11,000 other Bell helicopters, is carried aloft by the proven semi-rigid rotor. In common with the Huey family, the OH-58A uses an underslung-feathering-axis (UFA) hub. This design is mechanically simple, provides good stability and quick control response. No stabilizer bar is required. Additional significant advantages inherent in the OH-58A two-bladed semi-rigid rotor include:

- MECHANICAL SIMPLICITY
  - NO CONTROL LOSS WITH STALL
  - LOW GUST SENSITIVITY
  - NO GROUND RESONANCE
- Only 6 bearings, oil lubricated. Two blades, least cost.
  - Approaching blade stall does not induce pitching moments as in articulated rotors.
  - High kinetic energy reduces effect of turbulence.

### *outstanding autorotation characteristics*

#### HIGH INERTIA

Even more inertia (relative to gross weight) than the UH-1 is available for the pilot. Sketch shows pilot options extend more than half a mile from the point of autorotation entry.



#### LOW RATE OF DESCENT

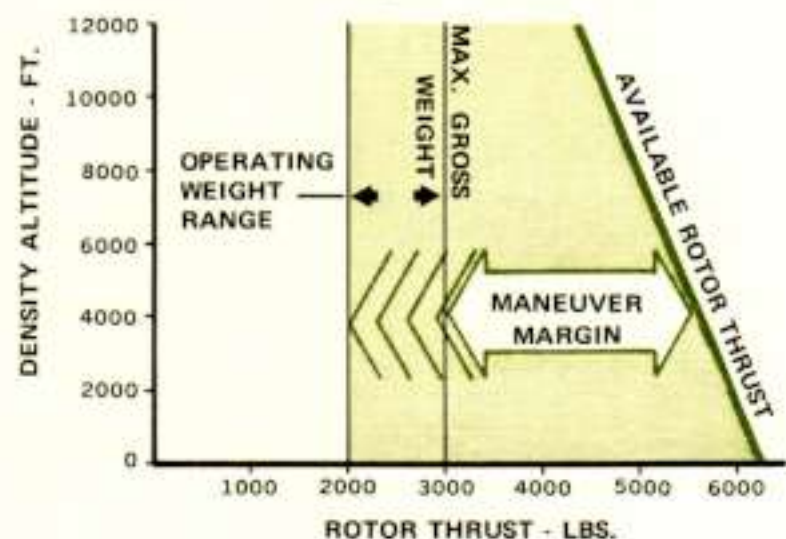
Rates of 1300-1500 feet per minute are normal at maximum gross weight depending on airspeed and collective position.

#### ZERO SPEED TOUCHDOWN

Safety and survivability are the pilot's inheritance in the KIOWA where high inertia permits easy zero speed touchdown even at maximum gross weight.

## OH-58A ... *outstanding maneuverability*

A margin for maneuver and safety is what the KIOWA pilot has in reserve when he needs it. Maneuverability requires rotor thrust or G's. On an observation mission the KIOWA has 2.3G at S.L. and 2.0G at 6000 foot density altitude. That's maneuver margin!!! Precise control gives the pilot the additional low speed agility required by its nap-of-the-earth environment.



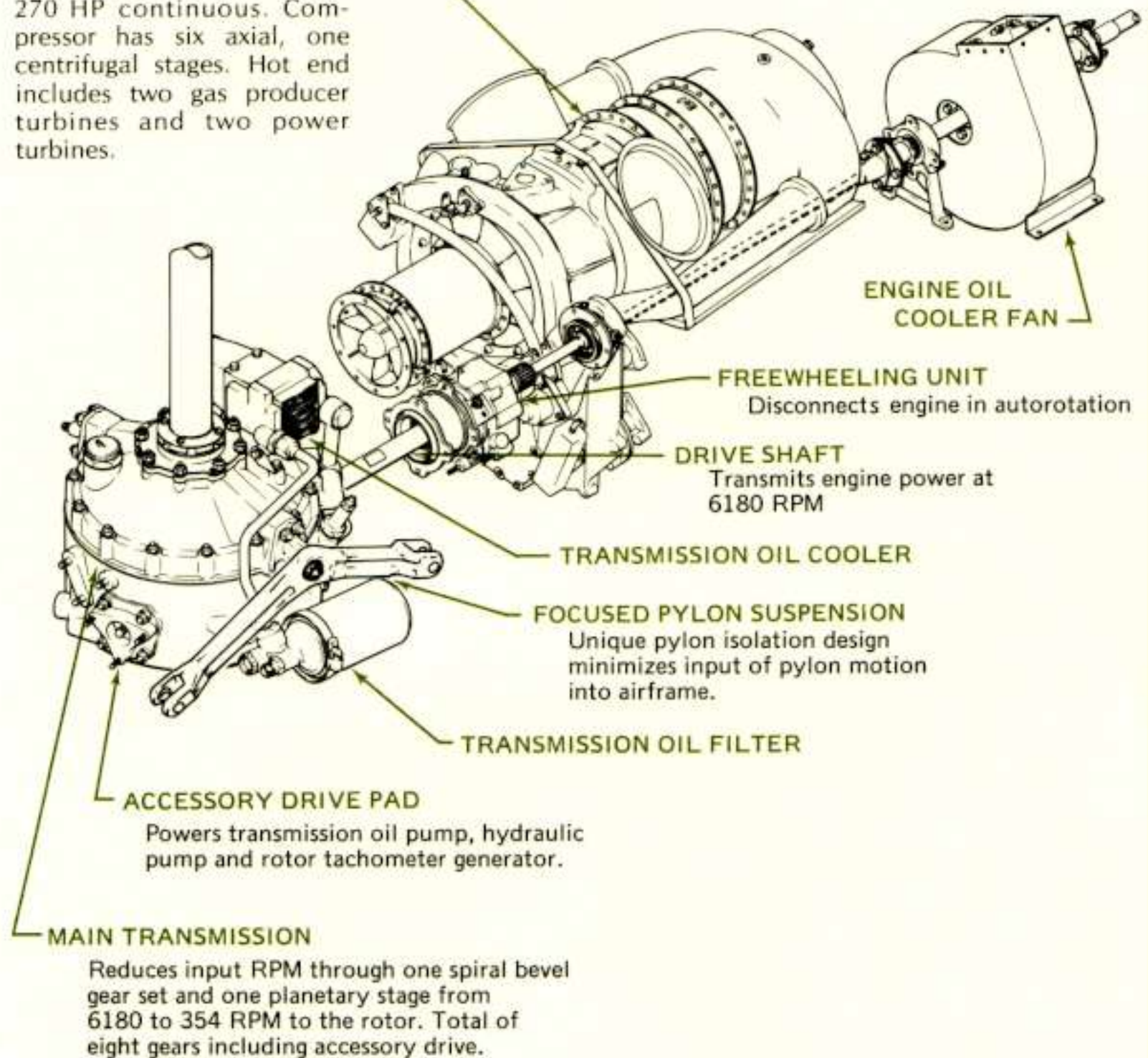


# POWER TRAIN

Adequate power to get the job done is provided by the T63-A-700 turbine. And the KIOWA in-line drive system is matched to the available power. Rated and qualified to give the pilot the full 317 HP of the engine, the dynamics normally load as full power is not required for either hover or cruise. A self-cleaning particle separator extends engine life and maintains new engine power output.

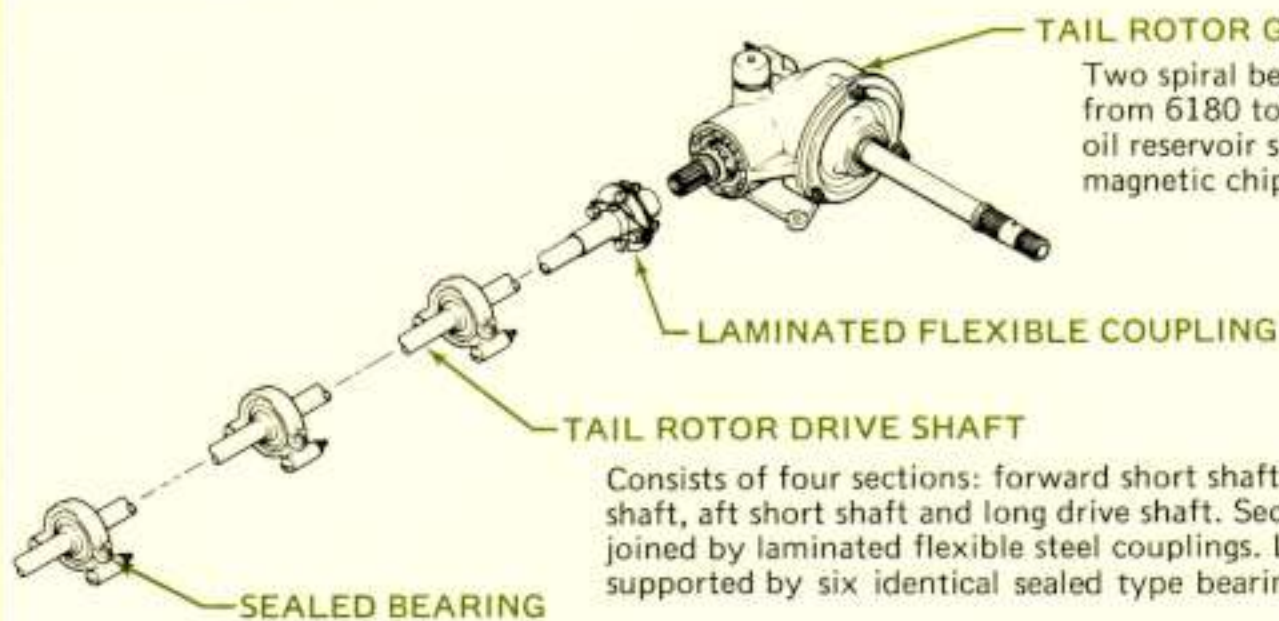
## ALLISON T63-A-700 TURBINE

Rated at 317 HP take-off and 270 HP continuous. Compressor has six axial, one centrifugal stages. Hot end includes two gas producer turbines and two power turbines.

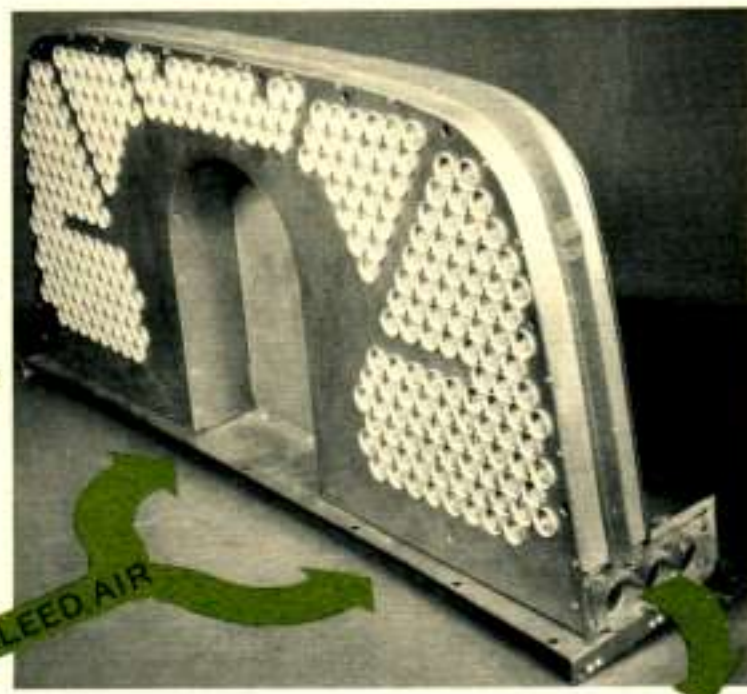
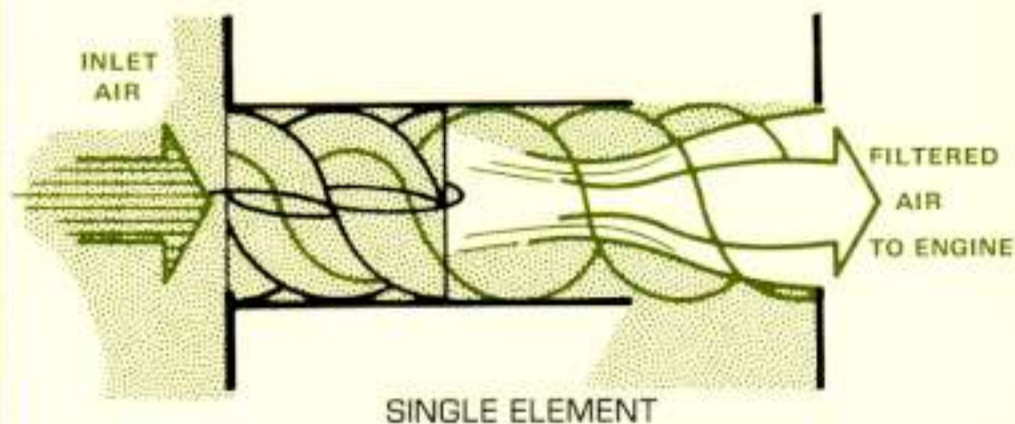


*... the OH-58A drive train is designed and qualified for the full 317 HP output of the T63 turbine ... but rarely uses it!*





### PARTICLE SEPARATOR



**OVERBOARD DRAIN**

**FILTER ASSEMBLY**



**FILTER INSTALLATION**



**FILTER ICING TEST**

Full time protection of the T63 is provided by an inertial type self-cleaning particle separator. The single element sketch illustrates how contaminated air is swirled by the guide vanes separating dust from filtered air. The assembly is composed of 283 filter elements. Dust falls to the bottom of the unit and is purged overboard with compressor bleed air pressure. Effectiveness is an estimated removal of:

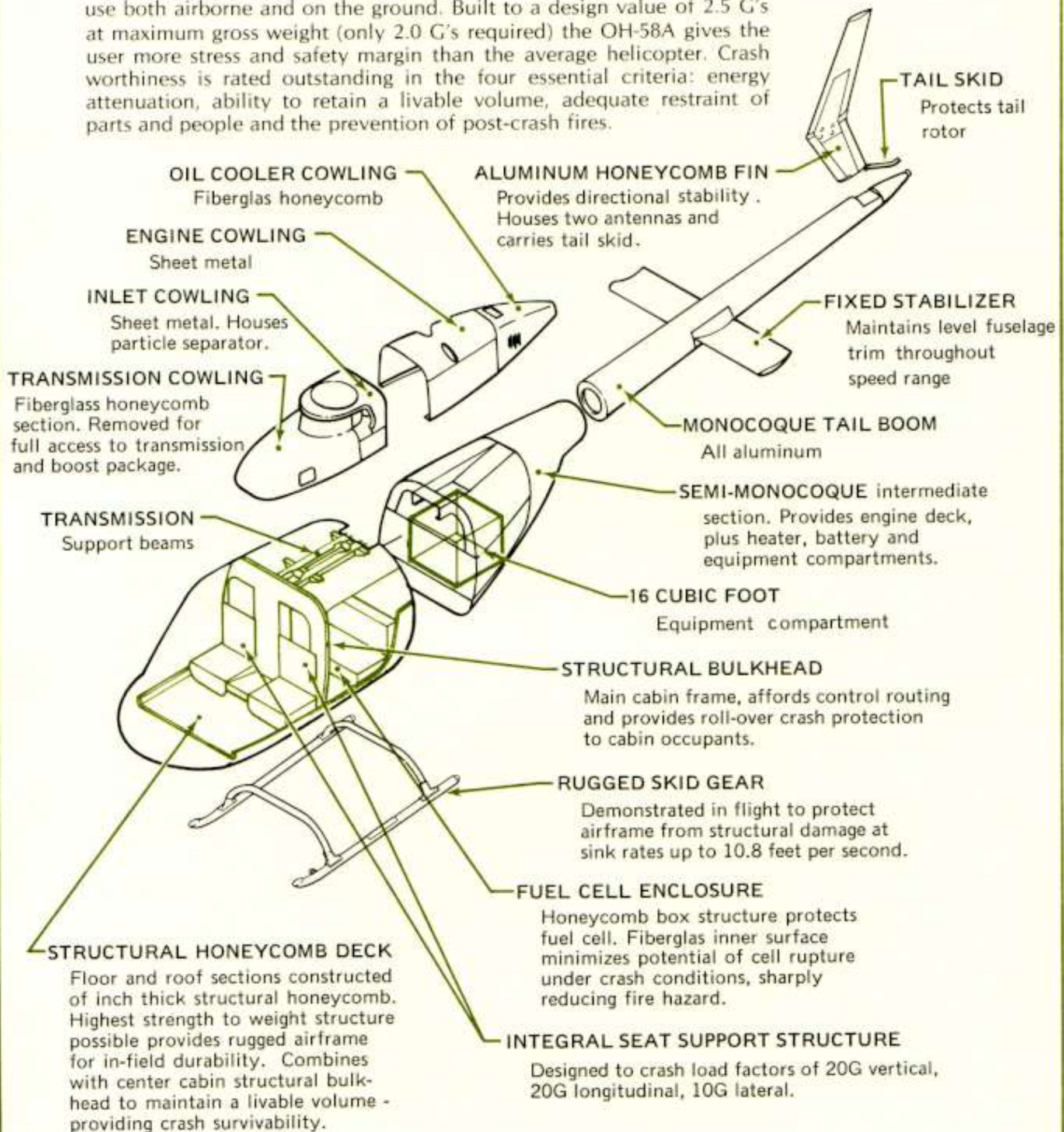
0-200 micron particles. . . . 85%

The system has been extensively tested and qualified in both dry and ice environments.



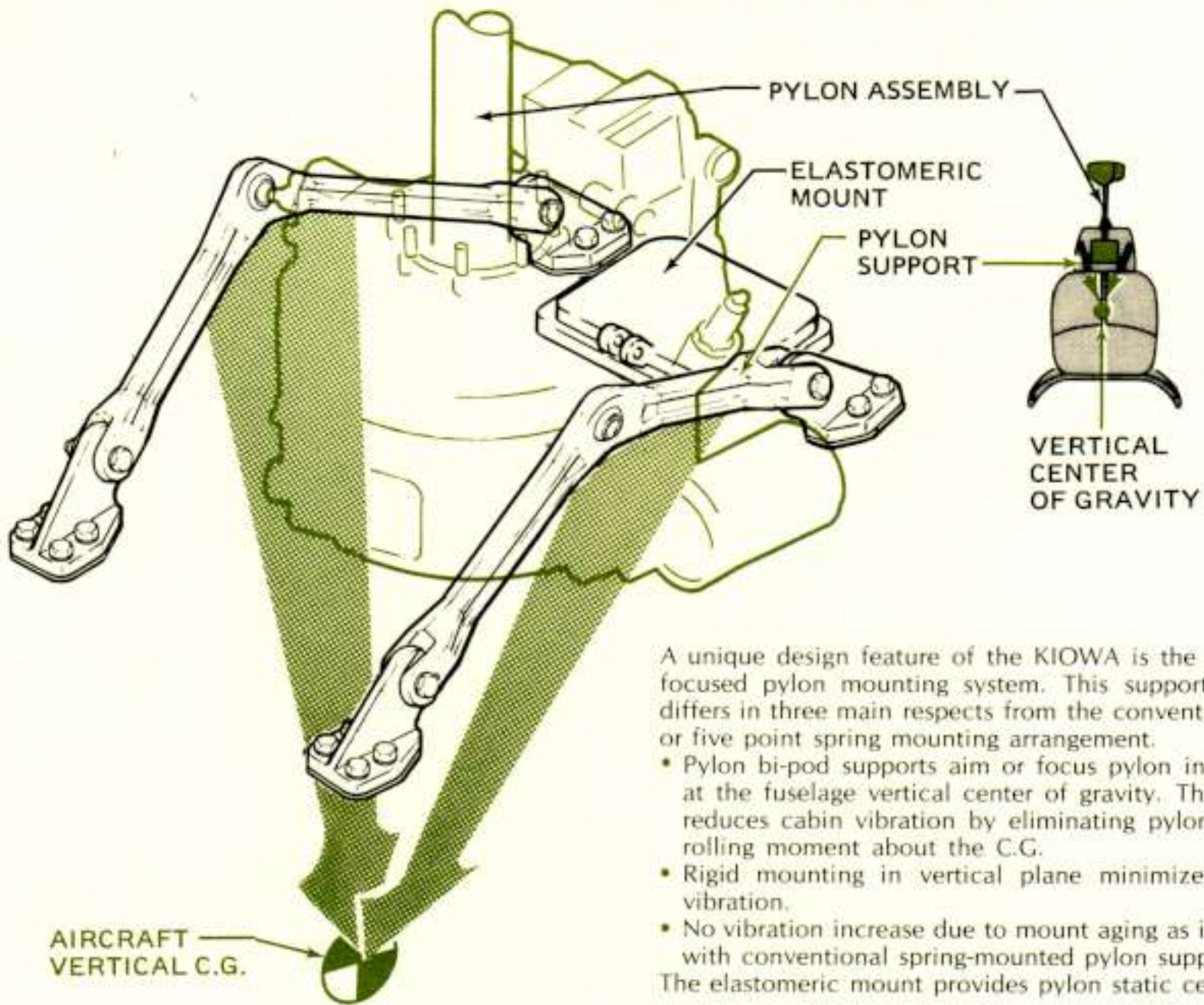
# STRUCTURE

Live-in-the-field ruggedness is what the Army LOH assignment demands . . . and the KIOWA's got it. Judicious combining of tough honeycomb and sturdy sheet metal result in a structure that shrugs off tactical hard use both airborne and on the ground. Built to a design value of 2.5 G's at maximum gross weight (only 2.0 G's required) the OH-58A gives the user more stress and safety margin than the average helicopter. Crash worthiness is rated outstanding in the four essential criteria: energy attenuation, ability to retain a livable volume, adequate restraint of parts and people and the prevention of post-crash fires.





# FOCUSED PYLON SUPPORT STRUCTURE



A unique design feature of the KIOWA is the advanced focused pylon mounting system. This support concept differs in three main respects from the conventional four or five point spring mounting arrangement.

- Pylon bi-pod supports aim or focus pylon input loads at the fuselage vertical center of gravity. This sharply reduces cabin vibration by eliminating pylon induced rolling moment about the C.G.
- Rigid mounting in vertical plane minimizes vertical vibration.
- No vibration increase due to mount aging as is possible with conventional spring-mounted pylon supports. The elastomeric mount provides pylon static centering.

## ADVANTAGES OF HONEYCOMB

### ● REDUCED AIRFRAME SIZE

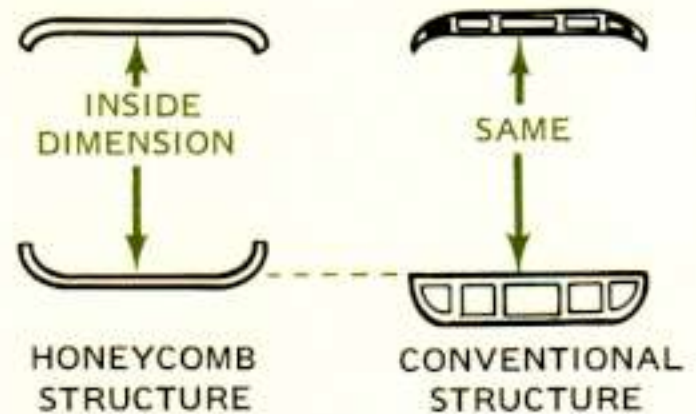
A primary design advantage of structural honeycomb is in reduced fuselage dimensions compared with conventional frame structure. This means savings in profile drag and consequent increased performance.

### ● STRENGTH/WEIGHT RATIO

For cabin primary structure, the strength to weight ratio of honeycomb is superior to that of conventional structure. The result is more strength for equivalent weight.

### ● CRASH WORTHINESS

In the event of accident, the structural rigidity and multiple load paths of honeycomb construction serve to maintain a livable cabin volume under higher impact conditions than possible with a more conventional cabin.





# ARMAMENT

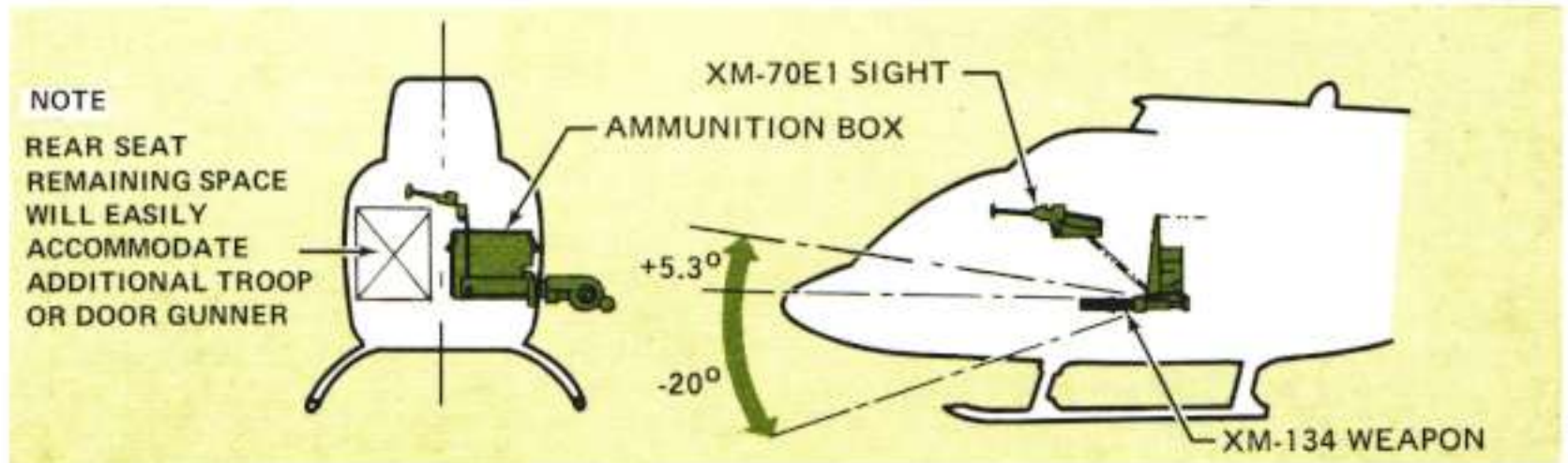
For armed reconnaissance the KIOWA is quickly fitted with the standard XM27E1 weapon kit. The mount assembly attaches by means of quick disconnects to structural fittings in the rear cabin.

## WEAPON

An XM-134 7.62 mm machine gun fires at trigger selectable rates of 2000/4000 spm. Weapon is belt fed and has a muzzle velocity of 2850 fps.

## AMMUNITION

A rear cabin container carries 2000 rounds of 7.62 mm ammunition. NATO ball, tracer, armor piercing or dummy cartridges are usable.



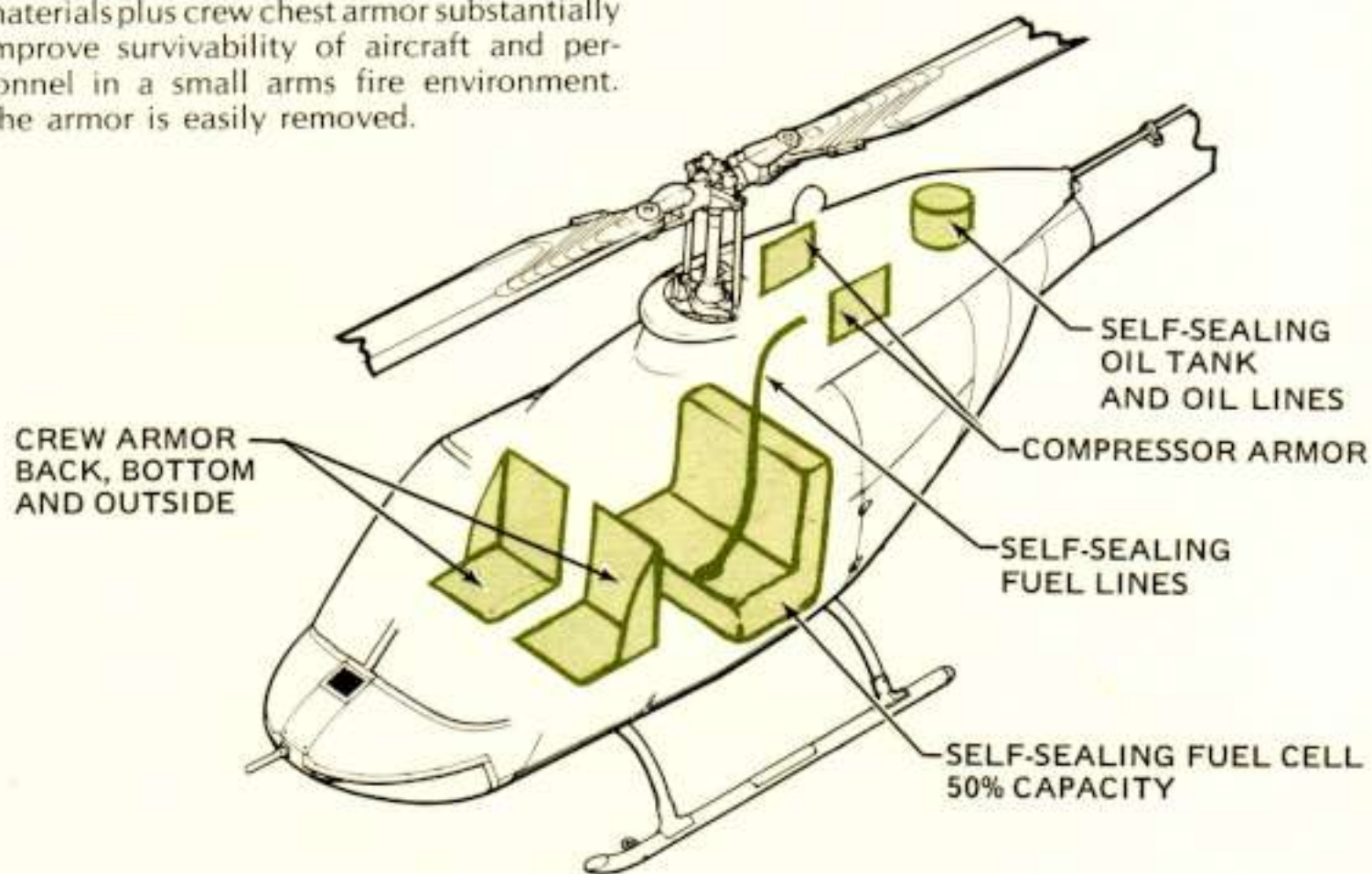
## FIRE CONTROL

Weapon firing is normally controlled by the pilot although trigger plus elevation/depression switches are installed on both cyclic grips. The XM70E1 reflex sight is usable from the pilot's station only. It includes a height adjustment to adapt to convenient pilot's eye level plus an estimated range adjustment. The sight moves in elevation/depression with the weapon when commanded by the cyclic thumb control. A fire control function panel is located on the console accessible to both crewmen.



# PASSIVE DEFENSE

Crew and vital components are protected by a combination of ceramic/fiberglass composite, or dual hardness steel armor plus self-sealing fluid systems. These materials plus crew chest armor substantially improve survivability of aircraft and personnel in a small arms fire environment. The armor is easily removed.

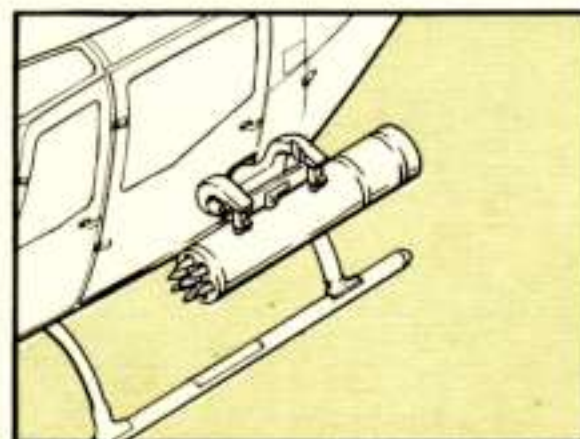


## ... alternate weapon kits

An external universal stores kit now in design will make possible the adaptation of alternate weapons to the armed OH-58A.



XM-8 40mm Grenade Launcher



2.75" Rocket Pod



# CONTROLS

A typical LOH combat mission involves rapid situation development at nap-of-the-earth altitudes. To the pilot, this means a need for QUICK RESPONSIVE CONTROL, GOOD STABILITY, EASE OF HANDLING, and EXCELLENT MANEUVERABILITY. These qualities describe the OH-58A. Its flight control system is simple, rugged and effective.

**FLIGHT FINESSE . . .**  
*for the average pilot!*

## HYDRAULIC BOOST

Three servo actuators provide cyclic and collective control boost. Light precise control results with no control force feedback even in turbulent air. Pilot can continue flight boost-off.

## DUAL CONTROLS

Two control stations are provided. The left or co-pilot's controls are quick removable.

## CONTROL FRICTION

Pilot can adjust both cyclic and collective control friction.

## ADJUSTABLE PEDAL POSITION

## PUSH-PULL CONTROL RODS

All flight controls are push-pull rods, most of fixed length and all with self-aligning spherical rod end bearings.

## FORCE GRADIENT TRIM

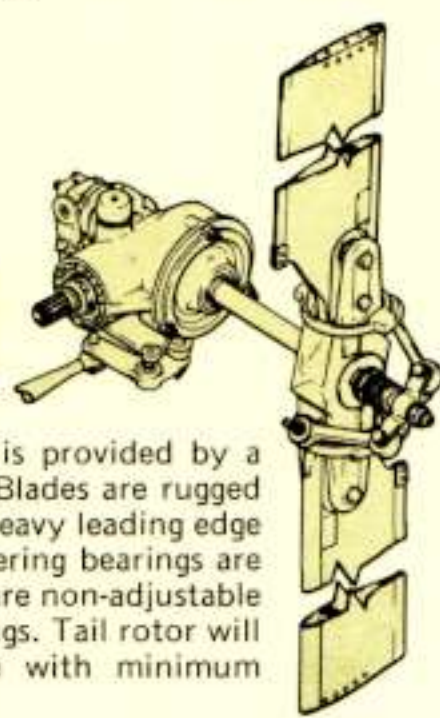
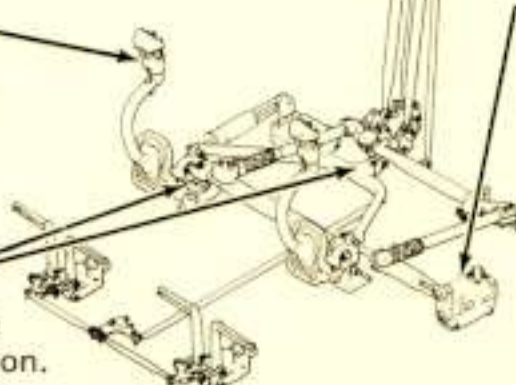
Cyclic has fore-aft and lateral force gradient trim. Dual magnetic brakes rapidly respond to the trim position selected by a button on the cyclic grip to provide a zero stick force at any cyclic position.

## TAIL ROTOR

Quick sure directional control is provided by a two-bladed semi-rigid tail rotor. Blades are rugged all-aluminum construction with heavy leading edge and honeycomb core. Dry feathering bearings are installed in the blade. Pitch links are non-adjustable and also use non-lubricated bearings. Tail rotor will withstand tough tactical service with minimum maintenance.



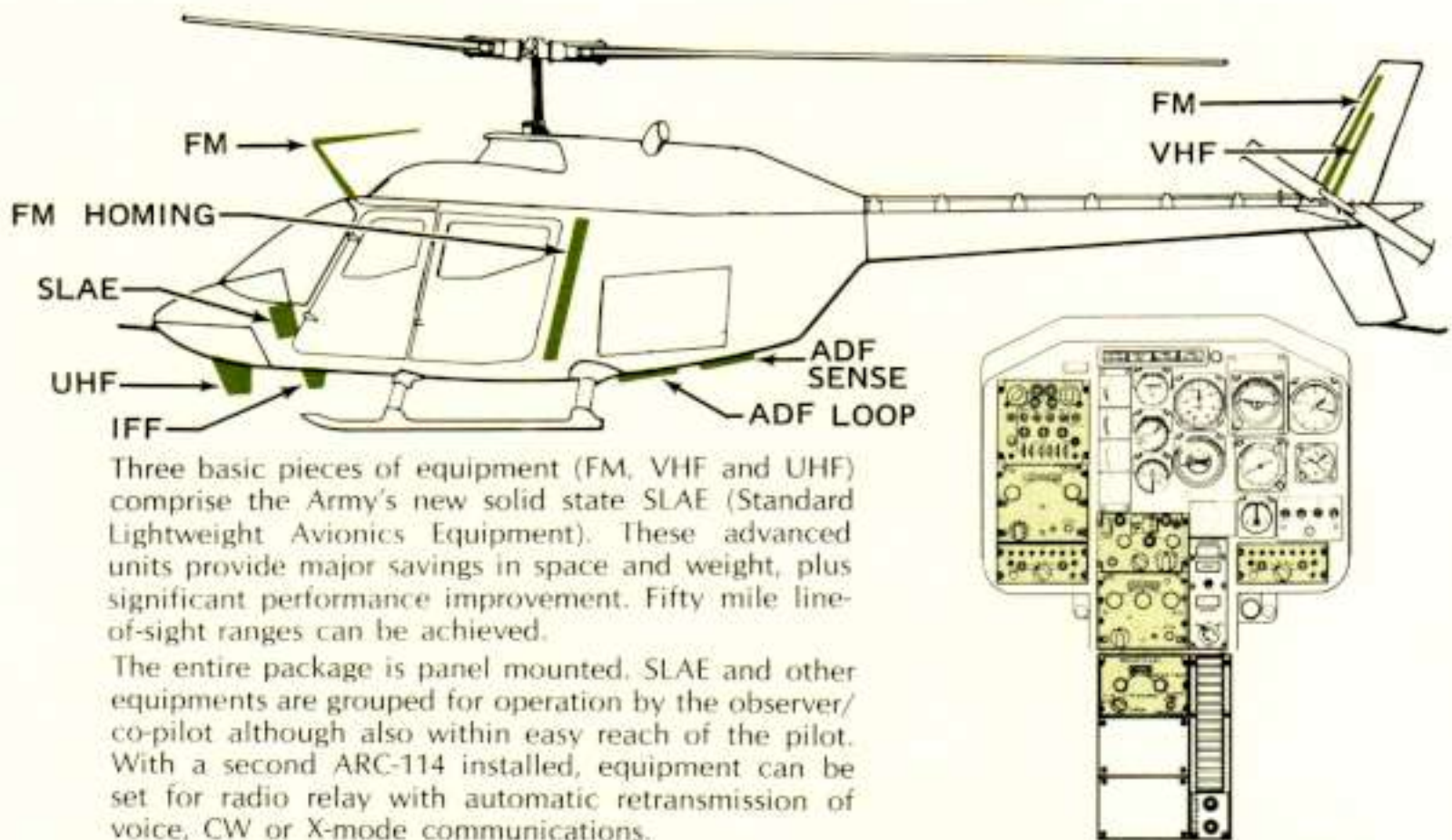
**PUSH-PULL TAIL ROTOR CONTROL**





# AVIONICS

Light helicopter tactical communication and navigation capability achieve new standards of excellence in the KIOWA. At moderate altitude, the pilot can respond to any three of 5780 voice channels covering a communications area of over 8000 square miles! A 150 mile or more navigation reach is possible depending on signal strength. Command and control, communications relay and normal tactical operations will be greatly assisted by these capabilities. And most significant, the OH-58A is, by Army test standards, the **first** Army tactical helicopter to meet ALL the rigorous specifications for avionics performance including communications range and navigational accuracy!



Three basic pieces of equipment (FM, VHF and UHF) comprise the Army's new solid state SLAE (Standard Lightweight Avionics Equipment). These advanced units provide major savings in space and weight, plus significant performance improvement. Fifty mile line-of-sight ranges can be achieved.

The entire package is panel mounted. SLAE and other equipments are grouped for operation by the observer/co-pilot although also within easy reach of the pilot. With a second ARC-114 installed, equipment can be set for radio relay with automatic retransmission of voice, CW or X-mode communications.

## COMMUNICATIONS

SYSTEM	NOMENCLATURE	FREQUENCY/USE	CHANNELS
VMF-FM	AN/ARC-114	30.00 — 79.95 MHz	920
VHF-AM	AN/ARC-115	116.00 — 149.975 MHz	1360
UHF-AM	AN/ARC-116	225.00 — 399.96 MHz	3500
INTERCOM	C-6533/ARC		
UHF-AM	AN/ARC-51BX (ALT. TO ARC 116)	225.00 — 399.96 MHz	3500

## NAVIGATION

FM HOMING	AN/ARC-114	AS ABOVE	150-200 MI RANGE
ADF	AN/ARN-89	100 — 3000 KHz	
GYRO COMPASS	AN/ASN-43	MAGNETIC HEADING	

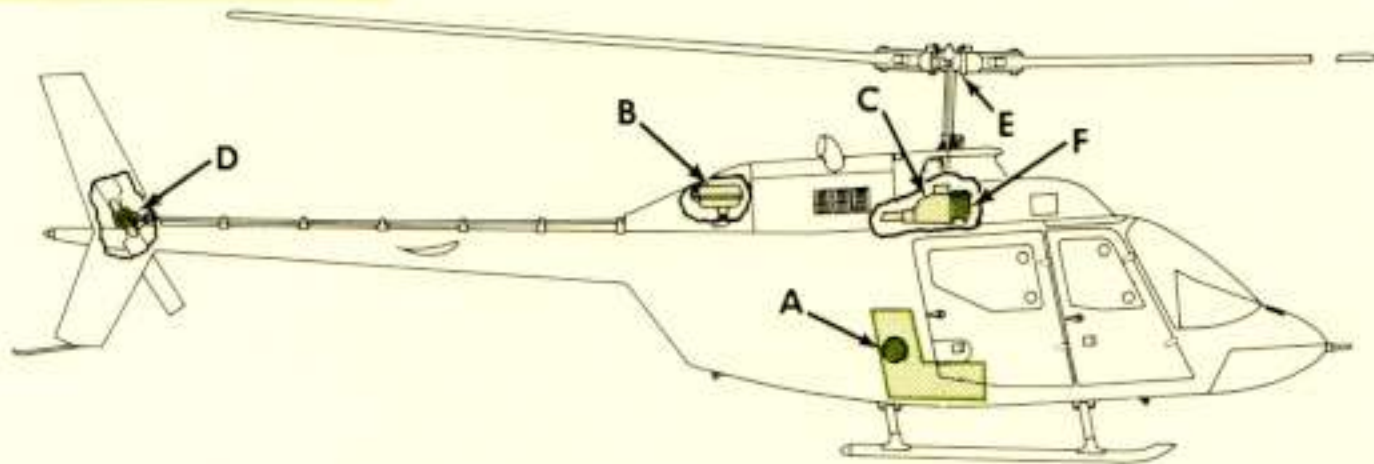
## IDENTIFICATION

TRANSPONDER	AN/APX-72	IFF RADAR INTERROGATOR
PLUS PROVISIONS FOR TSEC/KY 28 VOICE SECURITY UNIT, AND A SECOND ARC-114		



# SYSTEMS

## FUEL AND OIL



SYSTEM	TYPE	QUANTITY
A FUEL	JP-4, 5 (AVGAS-EMERGENCY)	73 GALLONS
B ENGINE OIL	MIL-L-7808 or 23699	1.5 GALLONS
C TRANSMISSION	" "	4.0 QUARTS
D TAIL ROTOR GEAR BOX	" "	1.25 PINTS
E MAIN ROTOR HUB	MIL-L-2104, 10W30 MOTOR OIL	1.0 PINTS
F HYDRAULIC	MIL-H-5606	2.25 PINTS SYSTEM/1.375 PTS RESERVOIR

## HEATING AND VENTILATING

NORMAL OPERATING RANGE  $-25^{\circ}\text{F}$  to  $+125^{\circ}\text{F}$

### HEATER

Bleed air (shown)  
or combustion heater location

### UNDERSEAT OUTLETS

### AIR SCOOPS

### RAM AIR INLET

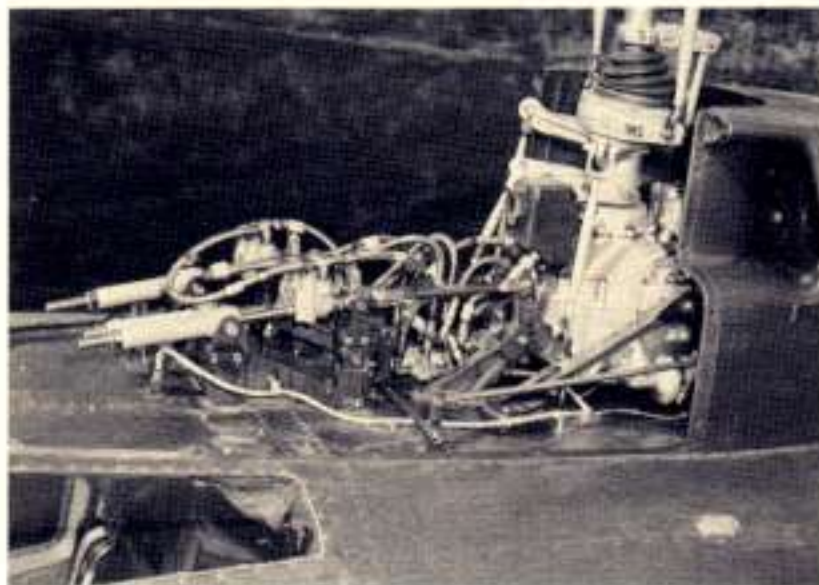
### DEFROST/DEFOG NOZZLES

Cabin comfort is provided the OH-58A by a combination of ram air and bleed air heating. The ventilating/defogging system in the nose consists of ram air inlet, two blower fans and defrost/defog nozzles. To provide defrost/heat the compressor bleed air heater valve is opened. Ambient temperature can be increased by up to  $65^{\circ}\text{F}$ . For continuous operation below  $-25^{\circ}\text{F}$  a combustion heater can be installed for even greater cabin temperature rise.



## HYDRAULIC

Cyclic and collective controls have hydraulic boost, giving the pilot light, precise control feel. As shown, the three servos are mounted in a single compact package atop the main cabin and are readily accessible for inspection. A multi-accessory output on the front of the transmission drives the hydraulic pump providing a system pressure of 600 psi in both powered and autorotation flight. Each servo incorporates an irreversible valve to isolate the pilots' controls from main rotor feedback in the event of hydraulic malfunction. The KIOWA is flyable boost-off when necessary.



## COCKPIT

A full yet compact instrument panel is accessible to both pilot and observer/co-pilot. Although small enough to minimize obstruction to forward visibility, the panel provides the aviator all the equipment the mission demands. Instruments and avionics are adequate for tactical IFR flight.

- A Flight Instruments
- B Engine Instruments
- C Avionics
- D Armament Control

**E COMPREHENSIVE WARNING SYSTEM**

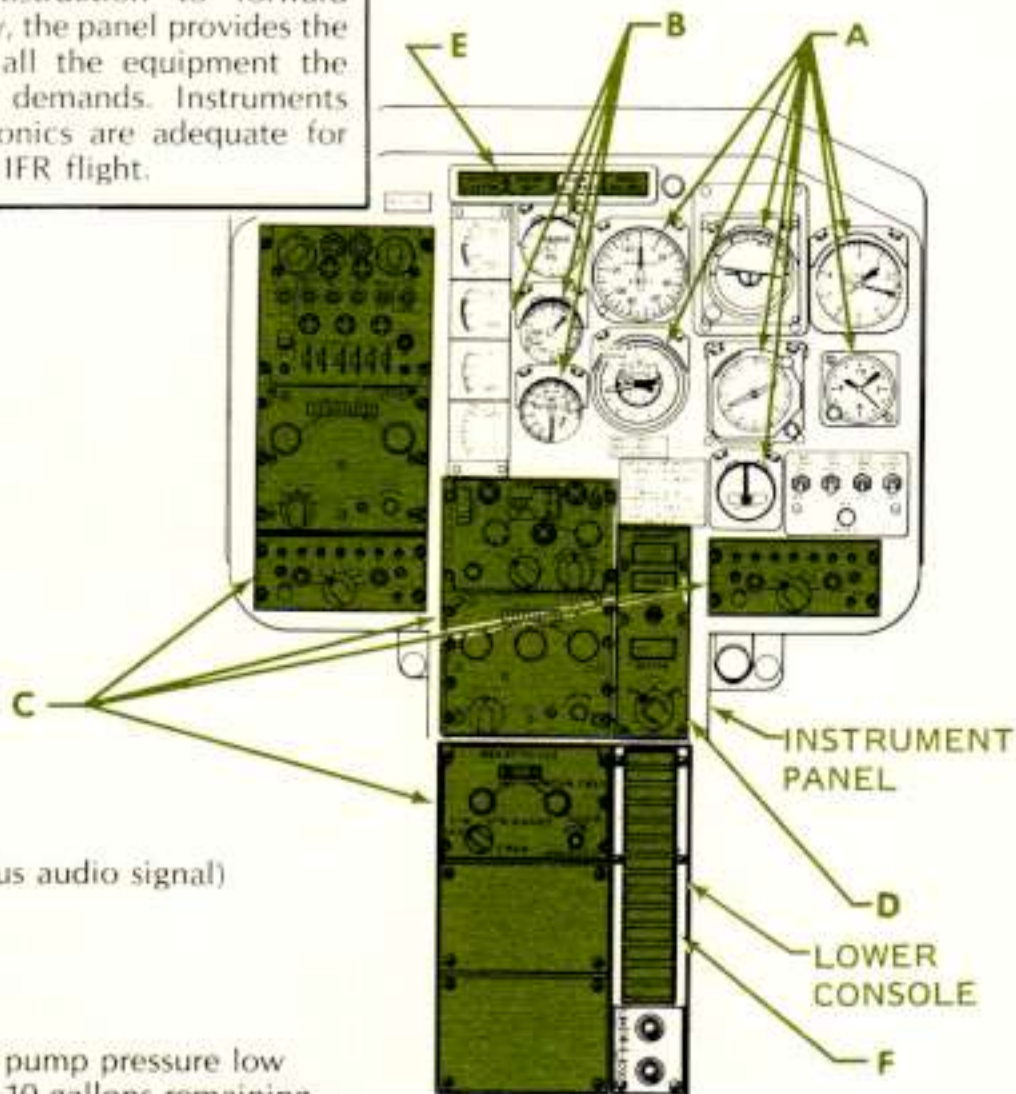
To the tactical aviator who is concentrating outside the cockpit as much as possible a full time monitor and alert system is essential. The KIOWA system provides this assist with two warning light panels.

### PANEL E

MASTER CAUTION  
ENGINE OUT — (Plus audio signal)  
XMSN OIL PRESS  
XMSN OIL TEMP

### PANEL F

FUEL BOOST	— pump pressure low
20 MIN FUEL	— 10 gallons remaining
FUEL FILTER	— filter being bypassed
ENG OIL BYPASS	— oil bypassing cooler or very low
ENG CHIP DET	} metal particles present
XMSN CHIP DET	
T/R CHIP DET	
INST INVERTER	— A/C inverter failed
DC GENERATOR	— generator failure
HYD PRESS	— pressure low
IFF	— system inoperative

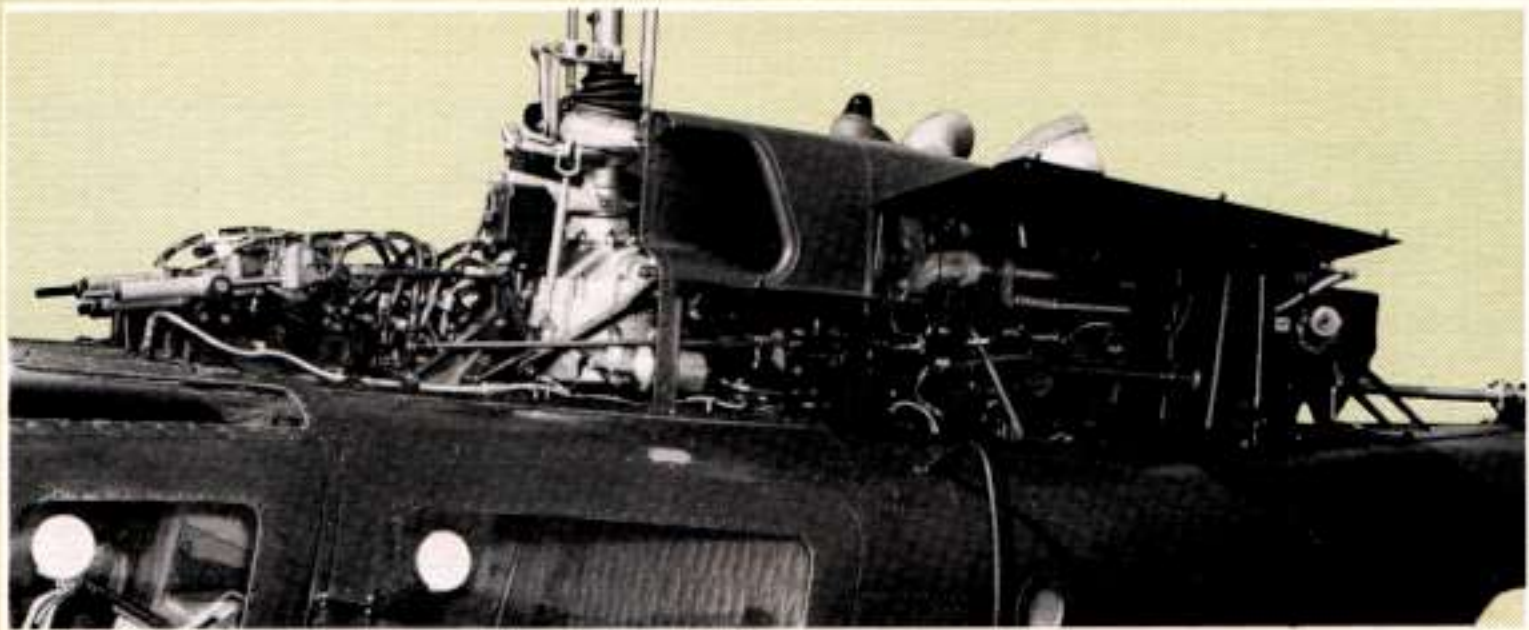




# MAINTENANCE

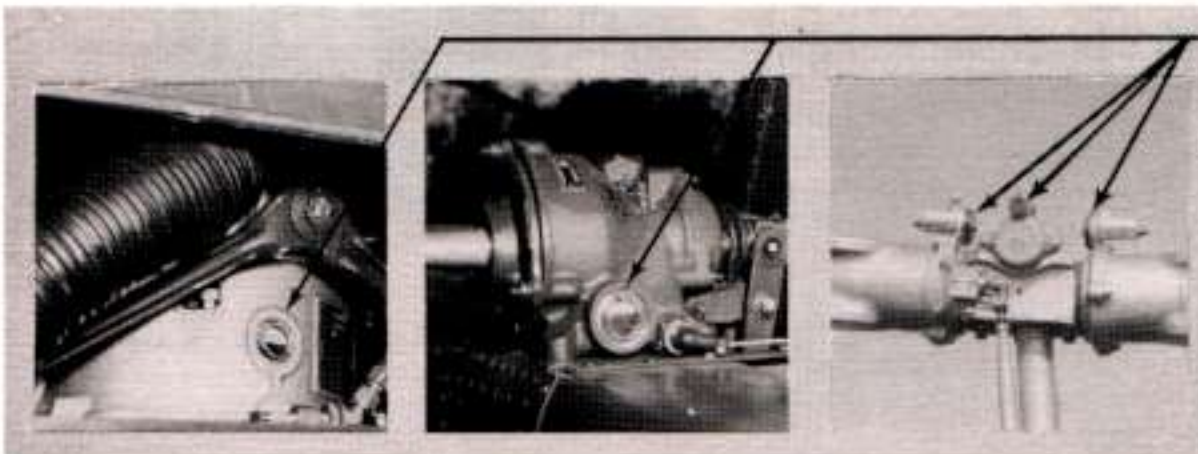
## SIMPLICITY

The unique maintenance quality of the OH-58A is design which reduces the need for maintenance. Its rugged airframe plus a tough dynamics system can absorb the in-flight and ground handling punishment which typifies the tactical environment. It is tolerant of abuse without demanding a high level of unscheduled maintenance. Simple two-bladed rotor, easy access, long TBO, straight forward visual inspection and low skill-level demand all mean a reduced task for the field mechanic.



## ACCESSIBILITY

Ease of access to all components and systems is the KIOWA's primary maintenance asset. The in-line drive system is located above the fuselage, not buried within. Hinged panels afford ready daily inspection. Removable cowling sections permit total access for component replacement. A kick-in step plus non-skid roof surface are provided for on-top maintenance although all normal inspection is done from ground level.



## SIGHT GAGES

All fluid systems; main and tail rotor hubs, transmission, engine oil, hydraulic oil include fluid level sight gages. Ground level visibility simplifies pre-flight walk around and provides rapid assurance of flight readiness.



## INSPECTION AND SERVICING

### INSPECTIONS

- DAILY . . . Prior to flight, as required. Visual walk-around.
- 300 HOUR . . . Next level inspection. More thorough visual plus filter cleaning and greasing input drive shaft and swashplate.
- 1200 HOUR . . . Currently established airframe component overhaul interval.

### SERVICING

Transmission, engine and tail rotor gear box are serviced with turbine oil as required by visual inspection. The main rotor hub is serviced with standard 10W30 motor oil. Aircraft hydraulic fluid is used in the control system. All other bearings in the drive and control systems are dry (teflon) or sealed types and require no servicing.

### RIGGING

All control rigging, when required following component change, is done by use of simple dimensional checks. Few adjustments are required.

## GROUND HANDLING



## SUPPORT

Once in the field, a product is only as good as the depth and quality of the Army/producer support team behind it. In customer service, Bell's leadership is unequalled. Bell provides logistics support to thousands of military and commercial helicopters and their operators, world-wide.

Bell has concentrated control of its comprehensive yet responsive customer services organization in a new Logistics Center.

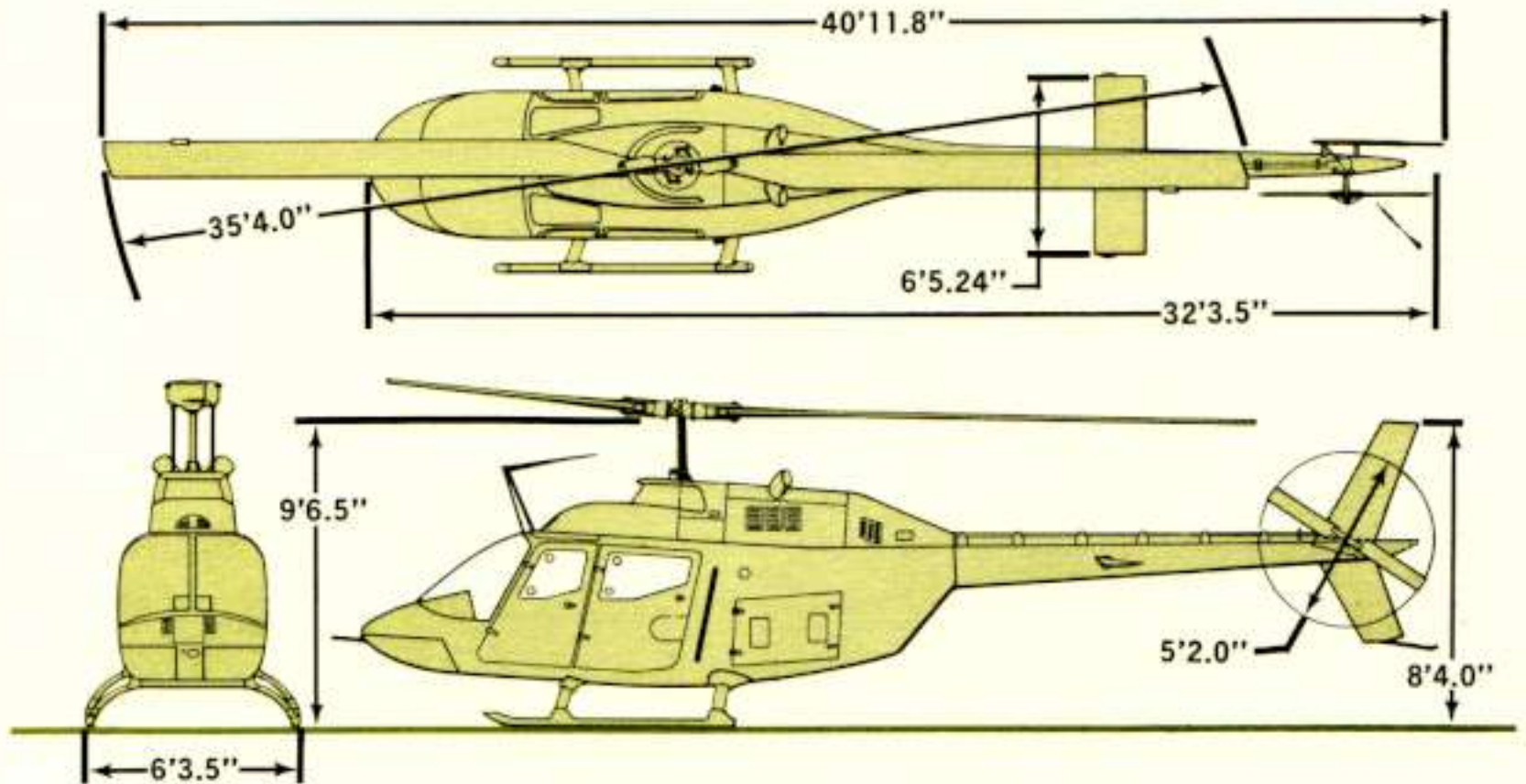


### SERVICES INCLUDE:

- SPARES MANAGEMENT
- PACKING & SHIPPING
- FIELD SERVICE
- SERVICE ENGINEERING
- TECHNICAL PUBLICATIONS
- TRAINING SCHOOL (PILOT'S & MECHANICS)



# DESIGN DATA



## *power plant*

Allison T63-A-700  
 Take-off rating . . . . . 317 SHP  
 NRP . . . . . 270 SHP  
 Dry Weight . . . . . 135 Lbs.

## *weights*

Empty Weight . . . . . 1583 Lbs.  
 Maximum Gross Weight . . . 3000 Lbs.  
 Armor . . . . . 112 Lbs.  
 XM27E1 Kit . . . . . 106 Lbs.  
 2000 Rds. 7.62 . . . . . 128 Lbs.  
 Oil & Trapped Fuel . . . . . 21 Lbs.  
 Fuel (73 gal.) . . . . . 475 Lbs.

## *general data*

RPM at 6180 Engine RPM  
 Main Rotor . . . . . 354  
 Tail Rotor . . . . . 2627

### Drive Ratios

Engine: Main Rotor . . . . . 17.44:1  
 Engine: Tail Rotor . . . . . 2.353:1

### Blade Chord

Main Rotor . . . . . 13.03"  
 Tail Rotor . . . . . 5.27"

Disc Loading @ 3000 Lbs. 3.07 Lbs/Ft<sup>2</sup>

Cargo Volume . . . . . 40 Ft<sup>3</sup>





HOT ARID DESERT

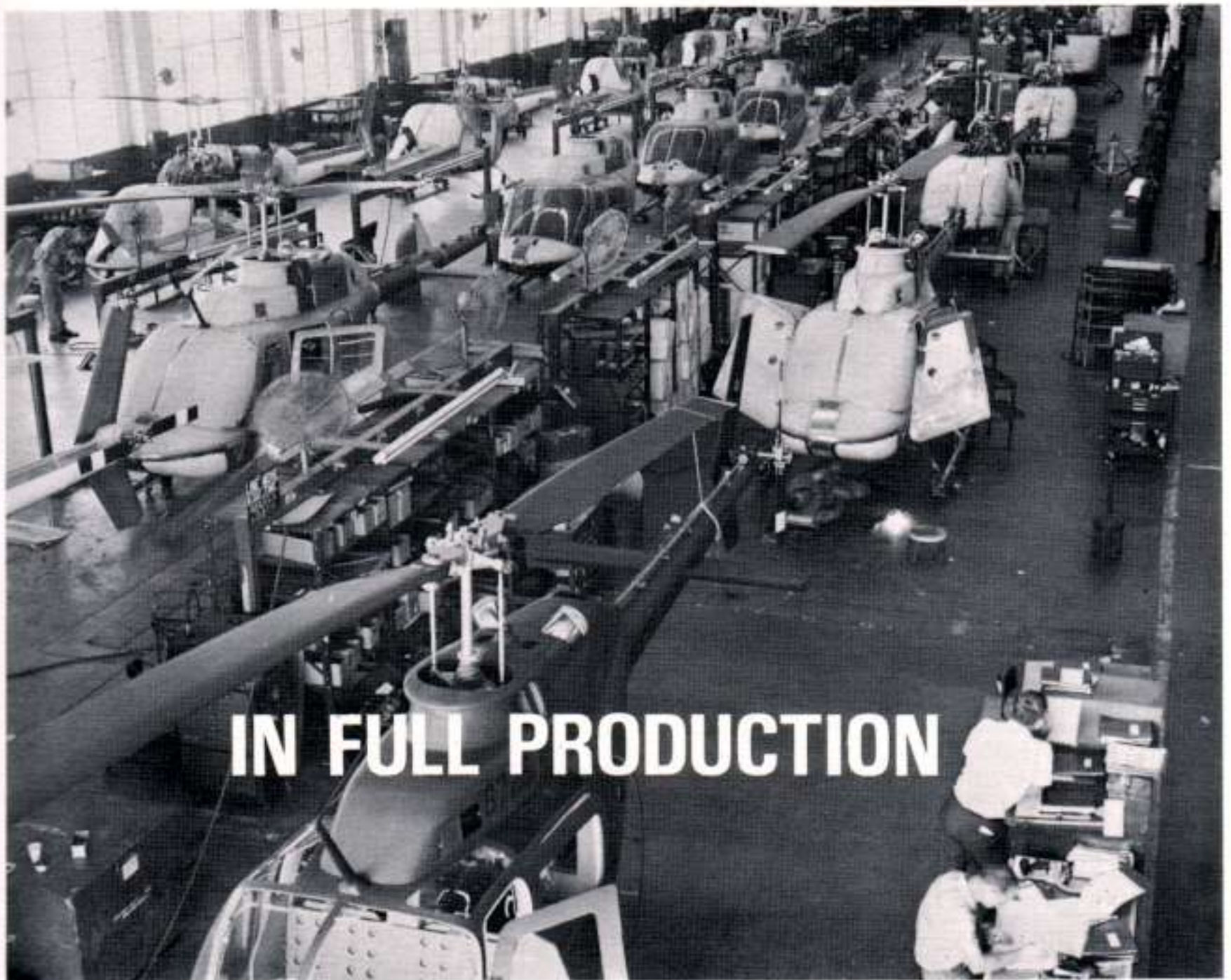


FRIGID HIGH ALTITUDE



ICING - OTTAWA

TESTED & PROVEN



IN FULL PRODUCTION





OH-58A KIOWA

TH-57A SEARANGER



206A JETRANGER

 **BELL**  
**HELICOPTER COMPANY**  
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15 AUGUST 1969