The Mohawk Surveillance System

1963

The Mohawk Surveillance System

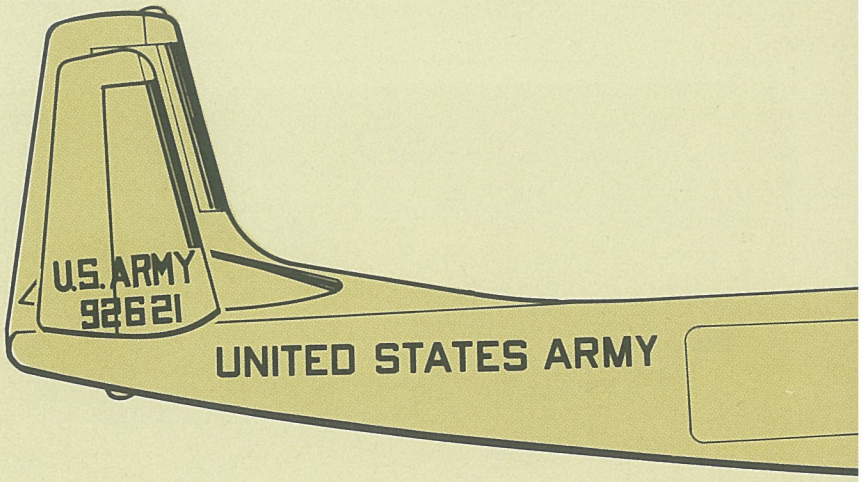
The Mohawk is a completely integrated battlefield surveillance system that supplies the army field commander with information on the strength, disposition, and activity of enemy forces. This two-place twin turboprop aircraft is equipped with the latest cameras and electronic sensory equipment and can perform its mission day or night or in inclement weather. Directly responsive to the field commander (and directly under his control), the Mohawk is designed to live in the field with the troops: It is extremely rugged, readily maintained without extensive support equipment, and capable of operating from small unimproved fields and roads. Trucks and trailers carry all ground-based system components. The aircraft is powered by two Lycoming T53-L-7 engines and has a speed range of 60 to 390 knots and excellent low-speed flight characteristics.

Three versions of the Mohawk have been produced: OV-1A, basic visual, photographic; OV-1B, visual, photographic, side-looking radar; and OV-1C, visual, photographic, infrared. (The OV-1A is, essentially, an OV-1B or OV-1C without electronic sensors.) All three versions are actively engaged in Vietnam and with Army units throughout the world.

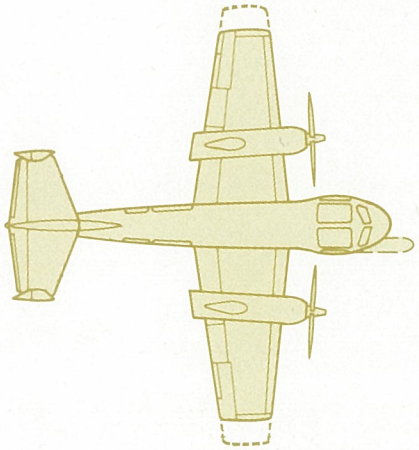
CONTENTS

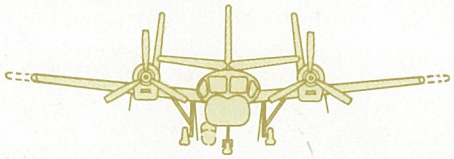
AIRCRAFT

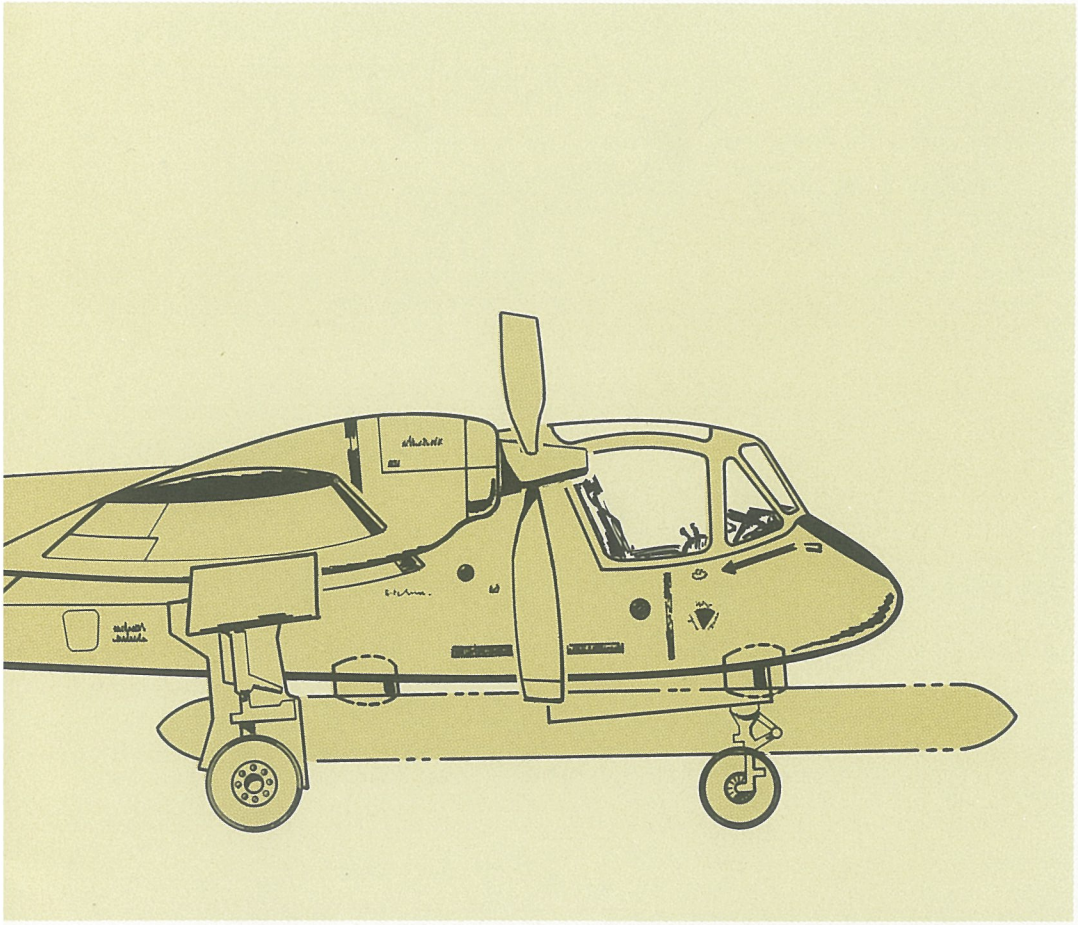
Wing span — OV-1B, 48 ft; OV-1C, 42 ft
Overall length — 41 ft
Tail height — 12 ft 8 in.
Aspect ratio — OV-1B, 6.11; OV-1C, 5.35
Fuel capacity — Up to 1930 lb (internal)
Power plants (2) — Lycoming T53-L-7
Take-off power — 1150 ESHP each
Take-off gross weight — OV-1B, 13,749 lb; OV-1C, 13,186 lb



OV-1B

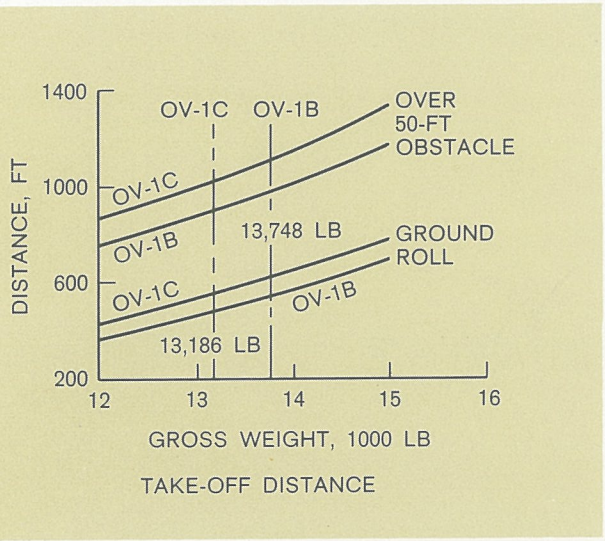




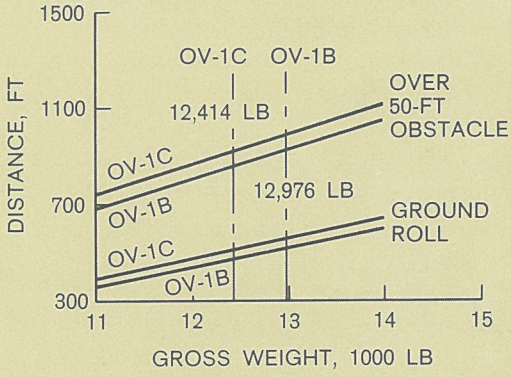


WEIGHT SUMMARY	OV-1B (lb)	OV-1C (lb)
Structure (wing, tail, body, landing gear, and nacelles)	4,425	4,186
Propulsion group	2,415	2,395
Electronics group (including autopilot)	1,697	1,315
Passive defense (armor, flak curtains, bullet-resistant glass)	239	239
Fixed equipment (flight controls, instruments, hydraulics, electrical, furnishings, air conditioning, photographic with V/H scanner, and auxiliary gear)	2,291	2,369
Total weight empty	**11,067**	**10,504**
Crew (2)	400	400
Usable fuel (297 gallons)	1,930	1,930
Photographic equipment (camera and accessories)	95	95
Oxygen installation	51	51
Observer's pack	25	25
Miscellaneous useful load	181	181
Total useful load	**2,682**	**2,682**
Take-off gross weight	**13,749**	**13,186**

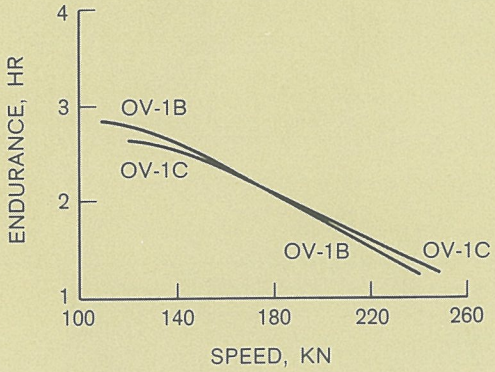
PERFORMANCE SUMMARY	OV-1B	OV-1C
Maximum speed at maximum power	259 kn	267 kn
Maximum speed at 5000 feet, MRP, level flight — 60% fuel	250 kn	258 kn
Stall speed at sea level, landing configuration, 10% NRP	70 kn	72 kn
Take-off distance over 50-foot obstacle	975 ft	1,025 ft
Landing distance over 50-foot obstacle — 60% fuel	925 ft	914 ft
Service ceiling, Take-off gross weight less 20% fuel	25,000 ft	25,000 ft
Rate/climb, 2 engines, MRP at sea level and take-off weight	2,775 fpm	2,760 fpm
Endurance at 200 knots, 5000 feet	1.80 hr	1.84 hr
Maximum endurance (two 150-gallon external tanks)	6.11 hr @ 20,000 ft	5.31 hr @ 20,000 ft
Range (two 150-gallon external tanks)	1,094 n mi	1,041 n mi
Time	5.49 hr	5.02 hr
Average speed	203 kn	214 kn
Cruise altitude	20,000 ft	20,000 ft



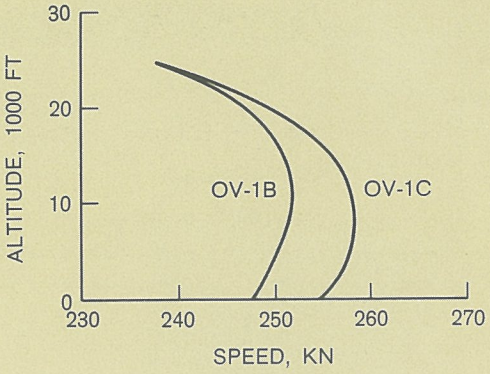
TAKE-OFF DISTANCE



LANDING DISTANCE



ENDURANCE AT 5000 FEET



MAXIMUM SPEED (MRP)

AN/APS-94 SIDE-LOOKING RADAR

The AN/APS-94 Side-Looking Airborne Radar (SLAR) system provides a permanent film record of fixed and moving terrestrial targets on either or both sides of the aircraft flight path. Either of two film recorders may be installed at the observer's position: the RO-225, which incorporates two 5-inch film rolls (one for the fixed targets and one for the moving targets), or the RO-166 rapid processor/viewer, which records both fixed and moving targets on a single 9-inch roll of film, quickly processes the exposed film, and then displays it moments later on an integral light table. This viewer gives the APS-94 a near-real-time surveillance capability.

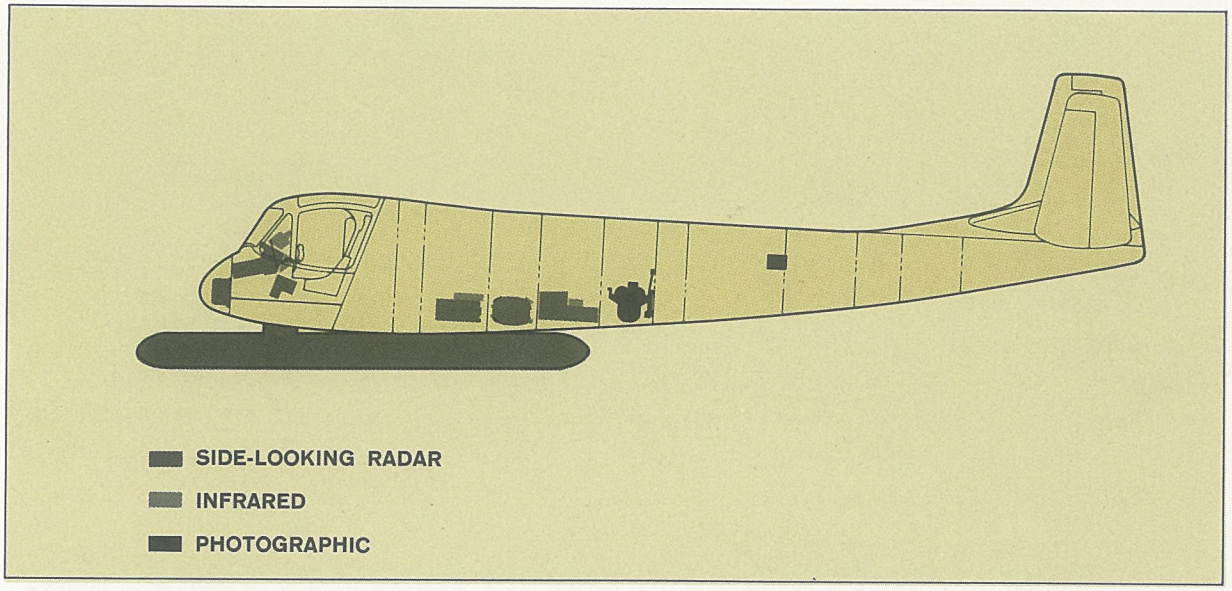
The radar imagery incorporates data annotation: Aircraft position, date, time, and other data are imprinted directly on the film edge to assist the radar operator or intelligence personnel in quickly orienting the imagery. The APS-94 also has a data transfer system, which enables the radar pictures and data-annotation information to be transmitted from the Mohawk to a ground station many miles away. The complete system is designated AN/UPD-2.

AN/AAS-14 INFRARED

The AN/AAS-14 Infrared (IR) Detecting Set is an airborne scanning device that provides a visual cockpit display and makes a permanent film record of terrestrial objects by means of small differences in their infrared or visual light emissions. This two-channel system permits a combination of detectors to be selected to provide optimum coverage for the particular circumstances anticipated.

Like the SLAR, the IR has a near-real-time cockpit display. The display uses CRT's; however, a permanent film record is also made by a printer, which is located in the sensor equipment bay beneath the wing.

The IR imagery incorporates data annotation: Aircraft position, date, time, altitude, and other data are imprinted directly on the film to assist intelligence personnel in orienting the imagery. A data transfer system transmits the IR picture and data annotation information from the Mohawk to a ground station many miles away. The complete system is designated AN/UAS-4.



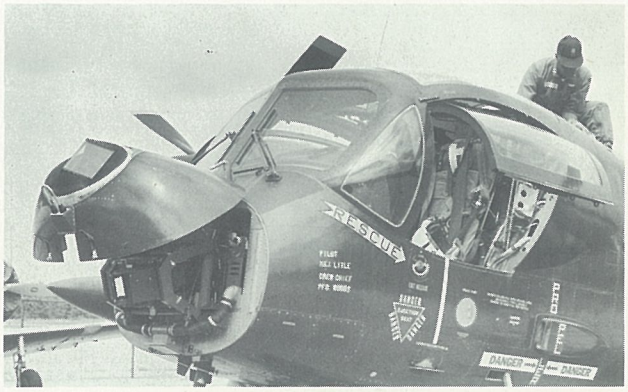
PHOTOGRAPHIC

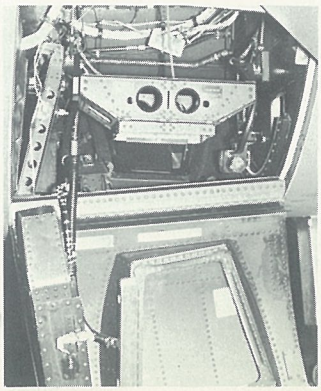
The photographic installation for all Mohawks comprises a remote-control KS-61 system and its KA-30 camera. The KS-61 system includes photographic, automatic exposure, actuator controls and an LS-59 electronic flasher. The photographic control panel, operable by either pilot or observer, includes the master system power and camera position controls together with an indication of camera operation, film remaining, film failure, and a flasher ready light. Image motion compensation and pulse control is provided by an optical V/h scanner system. Manual controls on the photographic control panel can be used to override the V/h scanner and supply altitude and speed data to the image motion compensation and pulse circuits. These circuits transmit signals to the camera control system to provide the desired overlap of vertical photographs for stereo viewing of the terrain photographed.

The camera, located in the fuselage midsection, is operated by the console operate switch, the manual switch on the pilot's control column, or a manual button on the observer's instrument panel. These switches pulse the cameras for extra pictures for day photography and pulse individual flashes for night photography.

A mount selector switch on the photographic control panel is used to rotate the camera mount remotely to left or right 15- or 30-degree oblique and vertical positions. The left, right, and vertical camera window protective doors open only when the corresponding mount position is selected. For the KA-30 camera, 3-, 6- or 12-inch lens cones may be installed. No adapters are needed.

A limited number of aircraft have been configured with the KA-60 camera system for forward oblique panoramic photography—primarily during low-altitude missions. This system comprises the camera, electronic controls, and a cockpit control panel. The camera is rigidly mounted in the nose of the aircraft at a depression angle of 20 degrees from the horizontal. The mount rotates to a vertical position for fast, easy access to the camera for installation and removal of the film magazine. The film capacity is sized to permit 60 percent overlap photographic coverage of a flight line 60 miles long from an altitude of approximately 1000 feet.





item		system
COMMUNICATIONS		
(1)	UHF	AN/ARC-51BX RECEIVER-TRANSMITTER (OR AN/ARC-55 RECEIVER-TRANSMITTER)
(2)	VHF-FM	AN/ARC-54 RECEIVER-TRANSMITTER
(3)	VHF	AN/ARC-134 RECEIVER-TRANSMITTER
(4)	HF	AN/ARC-102 TRANSCEIVER WITH 490T-1A ANTENNA COUPLER*
(5)	ICS	AN/AIC-12 (2) INTERCOMMUNICATION SYSTEM
(6)	VHF-FM AUX	R-1297/ARR**
NAVIGATION		
(7)	ADF	AN/ARN-59 LOW-FREQUENCY DIRECTION FINDER
(8)	COMPASS	MA-1 OR AN/ASN-76 GYROCOMPASS
(9)	VOR	ARN-30E VHF NAVIGATION RECEIVER
(10)	MARKER BEACON AND GLIDE SLOPE	R844/ARN-58 MARKER BEACON AND GLIDE SLOPE RECEIVER
(11)	FLIGHT SYSTEM	AN/ASN-33 INTEGRATED FLIGHT SYSTEM
(12)	RADAR ALTIMETER	AN/APN-22 RADAR ALTIMETER
(13)	AUTOPILOT	AN/ASW-12 UNIVERSAL AUTOMATIC FLIGHT CONTROL SYSTEM
(14)	DOPPLER	AN/ASN-64 NAVIGATION AND FLIGHT CONTROL SYSTEM
(15)	TACAN	AN/ARN-52 TACTICAL AIRBORNE NAVIGATION
(16)	VHF-FM (HOMING)	AN/ARC-54 WITH ARA-( )***
IDENTIFICATION		
(17)	IFF	AN/APX-44 OR AN/APX-72*

*Complete provisions
**Space, weight, and power provisions only
***Navigation function of ARC-54 receiver-transmitter

AN/ARC-51BX RECEIVER-TRANSMITTER

The AN/ARC-51BX UHF airborne transceiver provides two-way communication on 3500 crystal-controlled channels in the 225.0- to 399.95-mc frequency range. The transmitter power output is 20 watts. A separate built-in receiver provides continuous monitoring of a guard channel.

AN/ARC-55 RECEIVER-TRANSMITTER

Two-way UHF voice communication is provided by the AN/ARC-55 equipment over the frequency range of 225.0 to 399.9 mc in increments of 0.1 mc. The set's built-in receiver permits continuous monitoring of a guard channel, even during normal operation. The minimum output of the transmitter is 9 watts.

AN/ARC-54 RECEIVER-TRANSMITTER

Two-way VHF-FM voice communication is provided by the AN/ARC-54 equipment over the frequency range of 24.0 to 51.9 mc in increments of 0.05 mc. This equipment may also be used for homing operations. It is frequency-modulated for improved reception under adverse atmospheric conditions. The minimum power output of the transmitter is 10 watts.

AN/ARC-134 TRANSCEIVER

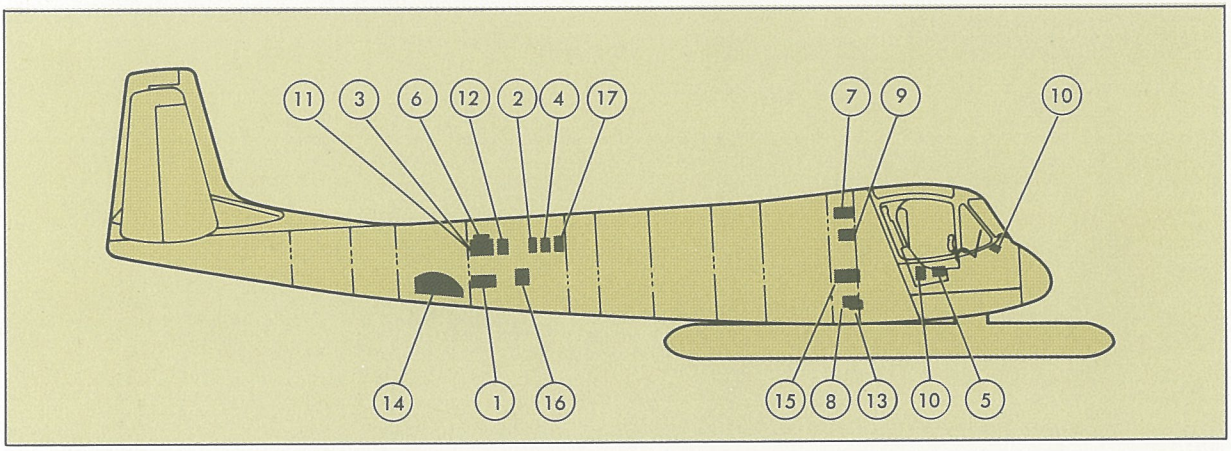
The AN/ARC-134 transceiver provides air-to-air and air-to-ground communication. The transceiver transmits and receives voice communications in the VHF range from 116.000 through 149.950 mc in increments of 0.05 mc. Minimum transmitter power output is 25 watts.

AN/ARC-102 TRANSCEIVER

The AN/ARC-102 HF airborne transceiver has a tuning range of 2 to 30 mc and a power output of 400 watts on single sideband and 100 watts on AM. The set is crystal controlled and can be tuned to any of 28,000 discrete channels.

AN/AIC-12 INTERCOMMUNICATION SYSTEM

Intercommunication system AN/AIC-12 provides communication between pilot and observer and permits individual operation of communication and navigation equipment. Each crew station has identical control panels with amplifiers, selectors, and volume controls. Transmitter operation requires actuation of the pilot's control stick or the observer's foot switch.



AN/ARN-59 LOW-FREQUENCY DIRECTION FINDER

The AN/ARN-59 LF direction finder receives and produces bearings in three bands over the frequency range of 190 to 1750 kc. These are displayed on the ID-663 bearing distance heading indicator.

MA-1 OR AN/ASN-76 GYROCOMPASS

Both the MA-1 and the AN/ASN-76 gyrocompasses provide heading reference inputs to the Mohawk navigation system, including the integrated flight system, VOR, and Doppler. In addition, the AN/ASN-76 provides attitude reference inputs to the AN/ASN-33, thereby eliminating its vertical gyro and rate switch.

ARN-30E VOR NAVIGATION RECEIVER

The ARN-30E navigation equipment receives and interprets VHF omnidirectional range (VOR) and ILS localizer signals. Aural identification of a selected ground station is provided through the Mohawk's intercommunication system. The bearing to the selected VOR ground beacon is provided on the pilot's ID-663 BDHI. Course deviation and steering commands to the selected VOR radial are presented on the pilot's integrated flight director system.

R-844/ARN-58 RECEIVER

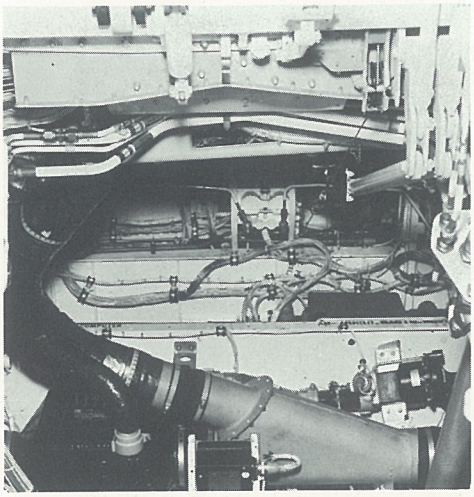
The R-844/ARN-58 receiver has two functions: glide slope and marker beacon. It accepts signals from the ground station glide slope transmitter in the frequency range from 329.3 to 335.0 mc on 20 different channels. The glide slope information indicates whether the aircraft is above or below the glide slope path. The receiver also accepts signals from ground station marker beacon transmitters, which present definite fix and range information. This information is presented visually by an amber colored light on the pilot's instrument panel and aurally in his earphone.

AN/ASN-33 INTEGRATED FLIGHT SYSTEM

The AN/ASN-33 provides the pilot with information directly related to the aircraft flight pattern and navigation. Information is integrated from such systems as VOR, ADF, TACAN, and Doppler. Course and altitude indication are provided on cockpit readouts.

AN/APN-22 RADAR ALTIMETER

The AN/APN-22 microwave altimeter measures aircraft terrain clearance over land or water. Operational ranges are zero to 10,000 feet over land and zero to 20,000 feet over water. Accuracy is ±2 feet from zero to 40 feet and ±5 percent of the indicated altitude from 40 to 20,000 feet.



AN/ASW-12 UNIVERSAL AUTOMATIC FLIGHT CONTROL SYSTEM

The AN/ASW-12 is an attitude stabilization and flight-path guidance system. It can be coupled to various navigational systems for automatic flight-path control. Automatic altitude control is maintained by signals from the barometric and radar altimeters or from the glide slope system. A maneuver controller permits the pilot to impose commands through this system.

AN/ASN-64 NAVIGATION AND FLIGHT CONTROL SYSTEM

The AN/ASN-64 all-weather, self-contained navigation system comprises a navigation set group, a computer group, and a true airspeed transmitter. The equipment employs FM-CW Doppler radar to compute and display ground speed and track information. Present position from the Doppler is fed into the SLAR and IR equipment.

AN/ARN-52 TACAN

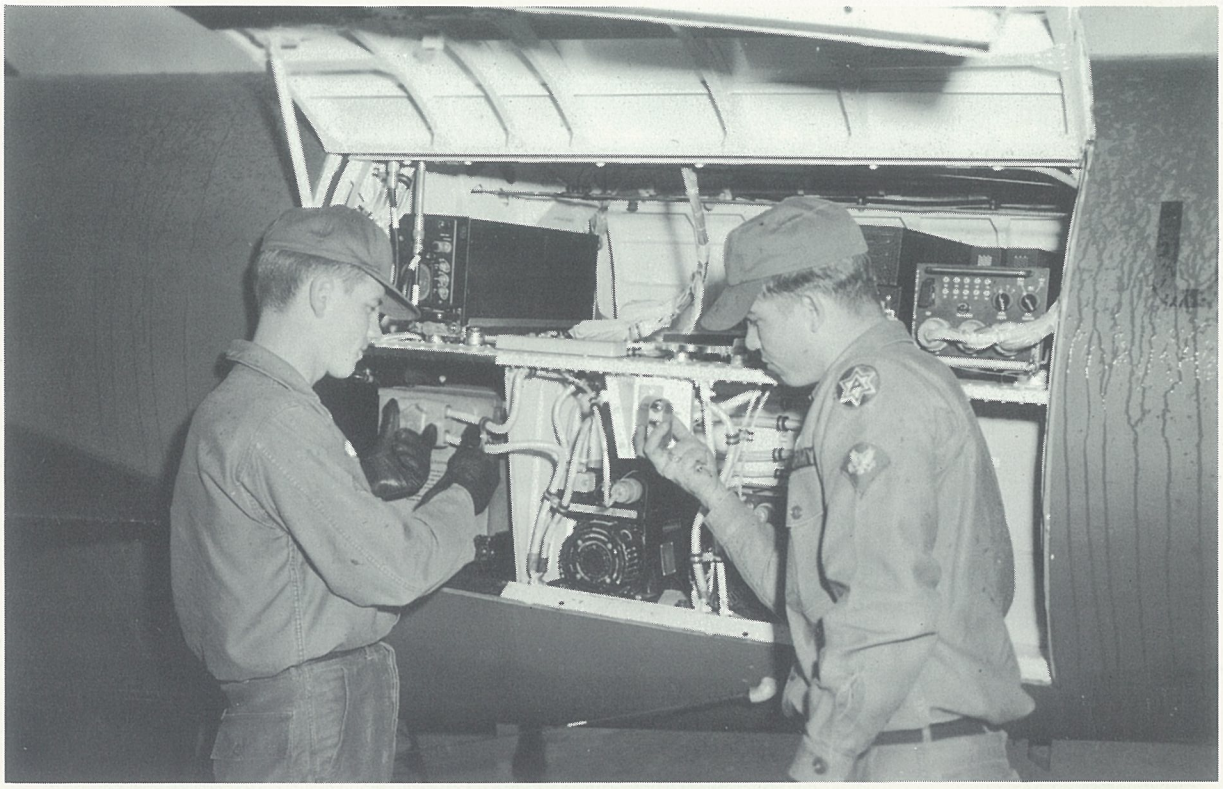
The AN/ARN-52 TACAN set provides the pilot with bearing and distance referenced to the geographical location of the ground beacon tuned in by the pilot. The equipment is also designed to provide air-to-air ranging between equipped aircraft.

AN/APX-44

Coded interrogation pulses received by this system cause an automatic response with one, two, or four coded pulse trains. For reception, the equipment operates over the frequency range of 1010 to 1030 mc; for transmission, from 1090 to 1110 mc. The IFF is controlled by either pilot or observer.

AN/APX-72

Coded interrogation pulses received by this system cause an automatic response with a coded pulse train. The equipment receives on a fixed frequency of 1030 mc and transmits on a fixed frequency of 1090 mc. The IFF is controlled by either pilot or observer.



COCKPIT

Optimum visibility is achieved in the Mohawk cockpit by use of a bubble-type canopy and a nose section that falls away at a sharp angle. Either crewman has unobstructed vision 20 degrees down over the nose of the aircraft along the centerline of the seats. Maximum side and rearward visibility is afforded by bubbled side hatches and a low main supporting longeron. The bubbled side hatches increase downward visibility to such an extent that the lines of sight of the pilot and observer converge at a point 36 feet below the aircraft. A transparent hatch permits complete vision directly overhead. It can be jettisoned to provide an unobstructed path for ejection.

In the cockpit the pilot sits on the left, the observer on the right. All instrumentation and controls are convenient to the pilot and visible to the observer. The low-profile instrument panel is sloped 15 degrees forward of the vertical for good pilot instrument visibility. A central pedestal provides one set of control levers equally accessible to both pilot and observer. The observer's position is equipped with either SLAR or infrared control and display equipment. If desired, this sensory equipment can be removed and replaced with flight controls for training or other purposes.

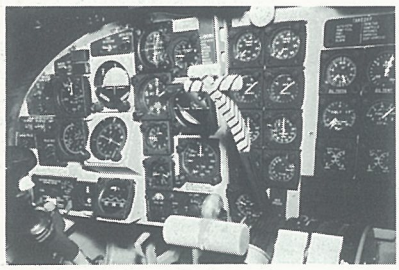
Major communications, navigation, and photographic panels are housed in a double-width console located between the pilot and observer. Store release, IFF, HF communication, ventilation, and lighting panels are housed in a single-width overhead console, also between the pilot and observer. "Eyebrow" panels, above the windshield, accommodate engine, fuel, and electrical master panels on the left and weather controls and OAT on the right.

Regulators for the gaseous oxygen system are located on the lower outboard edge of both pilot's and observer's panels. This system comprises two 514-cubic-inch oxygen bottles and two panel-mounted regulators with associated piping. A circuit-breaker panel, first-aid kit, binoculars, and a fire extinguisher are located on the sloping bulkhead aft of the crew.

ESCAPE

A Martin-Baker ejection seat provides safe escape at all altitudes within range of the aircraft and at speeds from 100 to 450 knots.

For ejection, the occupant pulls either the face curtain or the secondary firing



handle on the leading edge of the seat bucket. Primary ejection is through the overhead hatch (if time permits, the hatch may first be jettisoned). After ejection, the main parachute, stowed on the seat behind the occupant's shoulders, is automatically deployed and separates him from his seat. A barostat delays deployment of the parachute if ejection is initiated at high altitude; a "g" limiter delays it if ejection is at very high speeds. A seat mounted bail-out oxygen system is automatically actuated upon ejection.

The seat bucket is designed to accept an energy-absobing-type seat cushion and a survival equipment container. An electrical actuator provides 5 inches of vertical seat adjustment.

PROTECTION

The Mohawk is designed and constructed for maximum protection from ground fire. The crew compartment is surrounded by 239 pounds of armor protection and has a 1-inch-thick flak- and bullet-resistant windshield, a ¼-inch-thick dural cockpit floor, and removable flak curtains on the fore and aft cockpit bulkheads in the area above the floor. A field kit provides additional armor protection in the cockpit area for those aircraft sent to combat areas. The aircraft's structural members protect critical systems and components: The self-sealing fuel cell is mounted above the wing structure, the engines are located above the wing, and the longitudinal control system incorporates dual control runs separated as widely as possible.

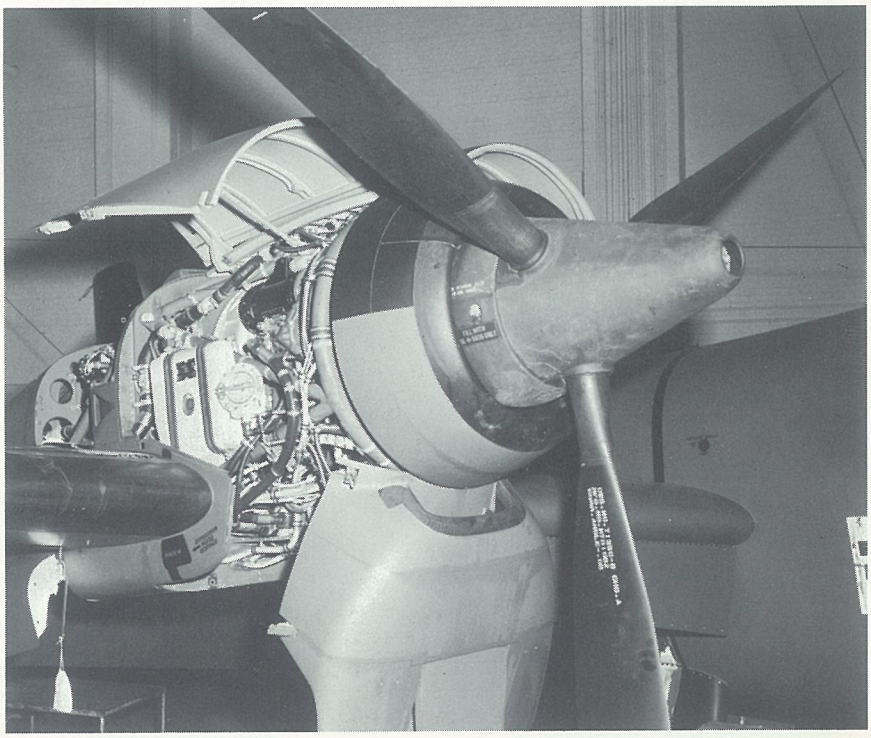
PROPULSION

The Mohawk is powered by two Lycoming T53-L-7 turboprop engines installed in nacelles above the wings. Each engine has a single-stage free-type power turbine, combination axial-centrifugal compressor driven by a single-stage turbine, and an external annular vaporizing combuster. The propellers are Hamilton Standard hydromatic, 10 feet in diameter, and incorporate variable-pitch, full-feathering, reverse-pitch, synchronizing, and synchrophasing features.

At take-off power each engine develops 1100 shaft horsepower at a gas producer speed of 25,000 rpm and a propeller shaft speed of 1700 rpm. The gear ratio between the power turbine and propeller drive is 12.40:1.

Anti-icing of the power plant is accomplished by electrically heating the propeller blades, spinner, and engine inlet cowling and by air heating the engine inlet struts.

The engine nacelle allows easy access to



the engine, controls, and accessories. The two side panels are hinged at the top and swing upward; the lower panel is hinged at the forward end and swings down to provide 360 degrees of accessibility. The lower panel contains the oil cooler, oil cooler ducts, and the oil cooler flap.

All fuel control adjustments are easily accessible for servicing. The entire power plant package including propeller, engine accessories, and engine mount with vibration isolators may be removed as one assembly and is interchangeable with the package on the opposite side.

A combination starter-generator is employed for all starting requirements, both air and ground.

ELECTRICAL

Two parallel-connected 400-amp starter-generators (1 per engine) provide 28-volt dc electrical power for the Mohawk. A 24-volt, 34-ampere-hour nickel-cadmium battery provides emergency backup for the generators and starting power for the aircraft engines. A separate inverter is also supplied for either the SLAR system in the OV-1B or the infrared system in the OV-1C.

The ac system consists of dc-powered 750- and 2500-volt-ampere inverters. The 2500-volt-ampere inverter furnishes power to all ac equipment except instruments and the deicing system. It is also capable of assuming the full system load should the 750-volt-ampere generator become inoperative.

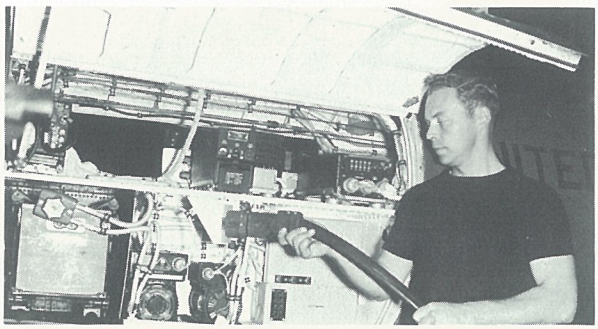
FUEL

The Mohawk fuel system is simple and reliable. All fuel is contained in one internal self-sealing 297-gallon tank and two external 150-gallon drop tanks.

All tanks may be fueled through 3-inch gravity filler units, one at each tank, or by single-point pressure fueling. Float switches in the drop tanks and a pilot valve in the main tank control automatic tank shut-off.

Fuel is fed to the engines by two centrifugal pumps in the main tank. These fore and aft pumps provide positive fuel flow for all conditions of aircraft attitude and fuel quantity. A secondary ejector-type pump backs up the forward pump. Two electric motor-driven vane-type pumps in the wings transfer fuel from the drop tanks to the main tank.

The fuel system is controlled from the cockpit: left and right engine master switches control the fuel gate valves; a fuel master switch arms the main tank fuel pump switch and energizes the drop tank transfer system.



Fuel quantity is measured by a capacitance-type system that indicates total fuel or fuel in each tank. Flowmeters indicate the rate of fuel flow to each engine. Lights warn the crew of such system conditions as fuel transfer and low pressure.

HYDRAULICS

The Mohawk hydraulic system is a 3000-psi, variable-volume pump system that supplies power for normal operation of the following subsystems:

- Alighting gear
- Inboard aileron (for landing and take-off)
- Flaps
- Wheel brakes
- Speed brakes (OV-1C only)
- Windshield wipers
- Ski retraction and extension (when applicable)
- Power steering (nose wheel)

Hydraulic power is supplied by two engine-driven variable-volume pumps (one per engine) that draw from a common reservoir in the fuselage. The reservoir is pressurized by engine bleed air to maintain proper pump inlet pressure at high altitudes. In the absence of hydraulic power, emergency gear extension is accomplished by a single-shot stored air system.

ENVIRONMENTAL CONTROL

The Mohawk environmental control system provides cockpit heating and ventilating, air-blast defogging of all transparent areas, camera compartment heating, and ram air cooling of electronic compartments.

The cockpit is heated by engine bleed air, which is first cooled in a heat exchanger located in the nose-wheel equipment compartment. Ventilation is by diverting ram air to the cockpit air distribution system. This system also includes defogging nozzles for transparent areas and foot air diffusers and face nozzles for each crewman. A control panel in the overhead console permits selection of various heating, venting, and defogging combinations and automatic control of the heating and defogging air temperature.

The camera compartment has a separate automatic temperature sensing control system. The system regulates the flow of bleed air to the camera window defogging nozzles. A 6-quart-capacity windshield anti-icing and washing system is also provided; its tank filler is located in the nose of the airplane.

FLIGHT CONTROLS

DIRECTIONAL — Conventional pedals at the pilot's station control the rudders through a simple mechanical system consisting mainly of cables used as tension members between cranks. Each set of pedals incorporates a mechanism for adjusting both pedals simultaneously. Trim is controlled by a manual cable and drum system operating a tab on the center rudder. The tab is geared to deflect with rudder position. Pedals may also be installed at the observer's station.

A built-in gust lock system is controlled by a lever in the cockpit. With the gust lock lever engaged, the handle blocks the throttle levers to prevent take-off. Locking is effected at the rudder torque tube by a latch that engages a pin on the torque tube arm. Duplicate safety springs disengage the latch if any system component fails.

LATERAL — Control sticks at the pilot's and observer's stations are mechanically connected to aileron spring tabs. A pushrod system provides direct mechanical connection between both ailerons.

Separate auxiliary surfaces (inboard ailerons) on each wing are used when additional lateral control is required for slow-speed flight conditions. Irreversible power systems drive these surfaces; they are linked to the basic control system only when the flaps are extended. When the flaps are retracted, flap motion mechanically shifts them out of this control system. Failure of the power actuators does not limit aileron motion.

Trim is controlled by a manual cable and drum system operating a tab on the right aileron. A built-in gust lock is similar to the one for directional controls.

LONGITUDINAL—Conventional control sticks actuate the elevators through a simple mechanical system consisting mainly of cables used as tension members between cranks. Pulleys and sectors have been avoided to minimize friction. Two independent systems run the full length of the fuselage.

Trim control is accomplished through a manual cable and drum system controlling the neutral position of the geared tab.

A built-in gust lock, similar to that for the directional system, locks the longitudinal control system at the aft end of the fuselage.

AUXILIARY FLIGHT CONTROLS

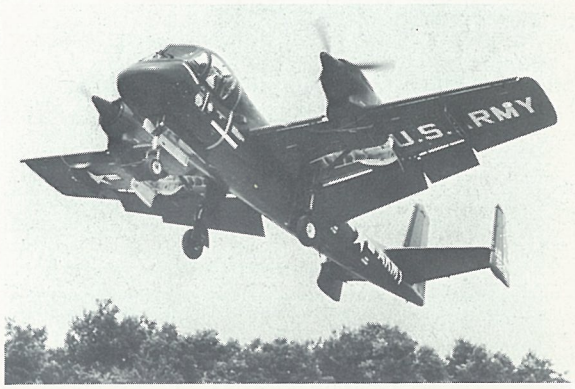
WING FLAP ACTUATING MECHANISM — Each flap is supported and guided by two pairs of swing links situated near the flap ends. Motion is imparted to one inboard flap link by a hydraulically actuated linkage in the fuselage. This linkage both drives and interconnects the flaps. A pushrod is attached at the outboard end of each flap to operate the inboard aileron shift mechanism. Three positions of flap extension can be selected through a follow-up system between the pilot's control and actuating cylinder. A lock for the zero-degree position is incorporated in the cylinder.

SPEED BRAKE ACTUATING MECHANISM (OV-1C only)—Two speed brakes are located on the sides of the fuselage in the aft section. They swing about vertical hinge lines. Each is extended and retracted by its own hydraulic cylinder mounted between the brake and fuselage structure. The two brakes are synchronized aerodynamically with a 5 percent maximum error in synchronization.

ALIGHTING GEAR

The Mohawk incorporates a conventional tricycle landing gear and auxiliary tail bumper designed for a limit sink speed of 17 feet per second. Pneudraulic shock struts are used at each wheel. The main gear is a simple cantilevered shock strut supported between rear and center beams of the wing center section. Both left- and right-hand struts are interchangeable. An oleo shrink rod shortens the gear during retraction to permit the gear to be housed within the wing in the engine nacelle. The nose wheel is mounted on a fork and spindle and incorporates nose wheel steering to facilitate ground handling. Both nose and main gear are retracted and extended hydraulically with mechanical up and down locks; their struts are fitted with low-pressure tires to provide acceptable rough-ground operating characteristics.

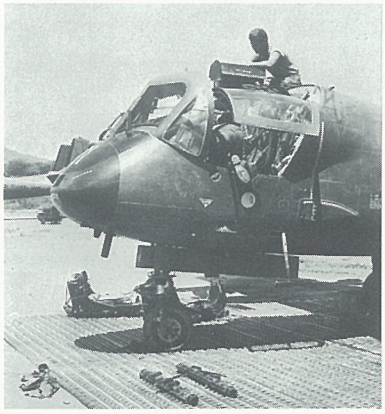
Both nose and main landing gear can mount skis for operation from snow.

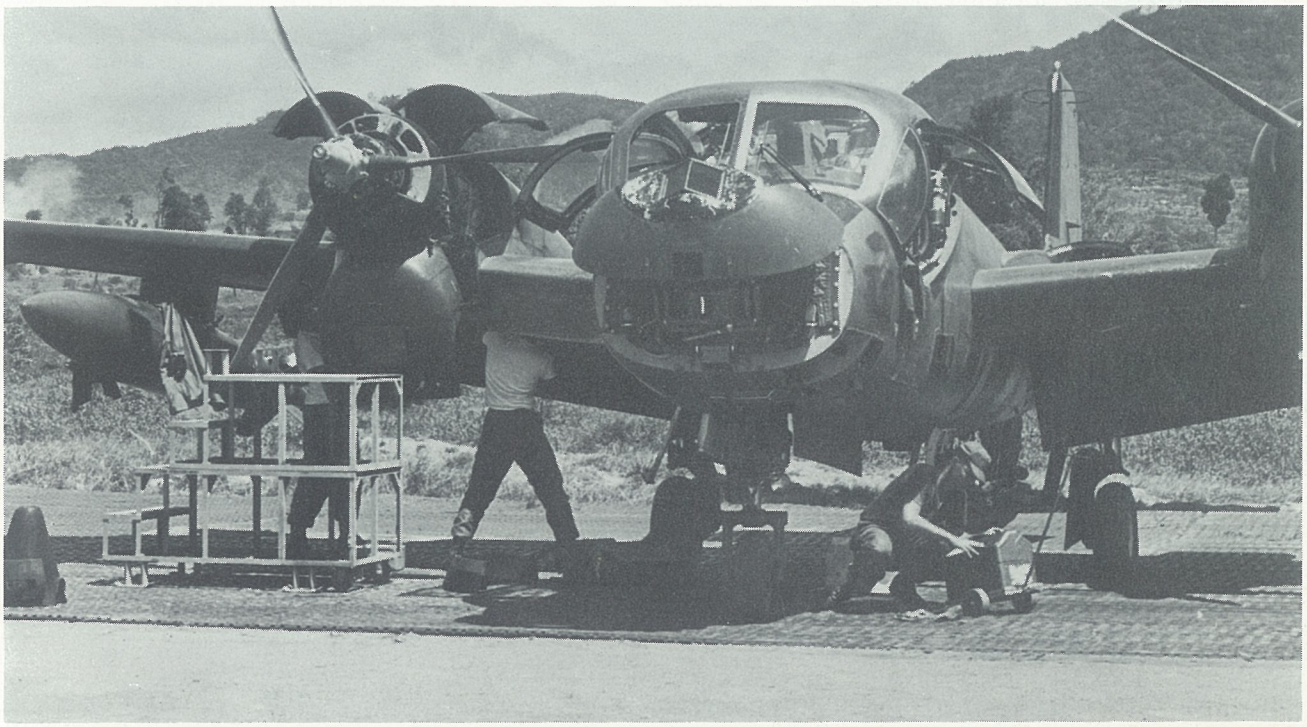


For optimum serviceability, quick access is provided to all aircraft equipment. Wherever possible, access is directly from the ground with minimal dependence on work stands. Access to the No. 1 equipment compartment is through the nose wheel doors; the No. 2 compartment, under the wing through a door on the left side of the fuselage; and the No. 4 compartment, through doors on either side of the airplane. Access to the camera compartment is directly from the ground through the two camera doors. The single fuel cell is readily replaceable through two removable panels on the top of the fuselage. Additional access panels are provided for servicing where required.

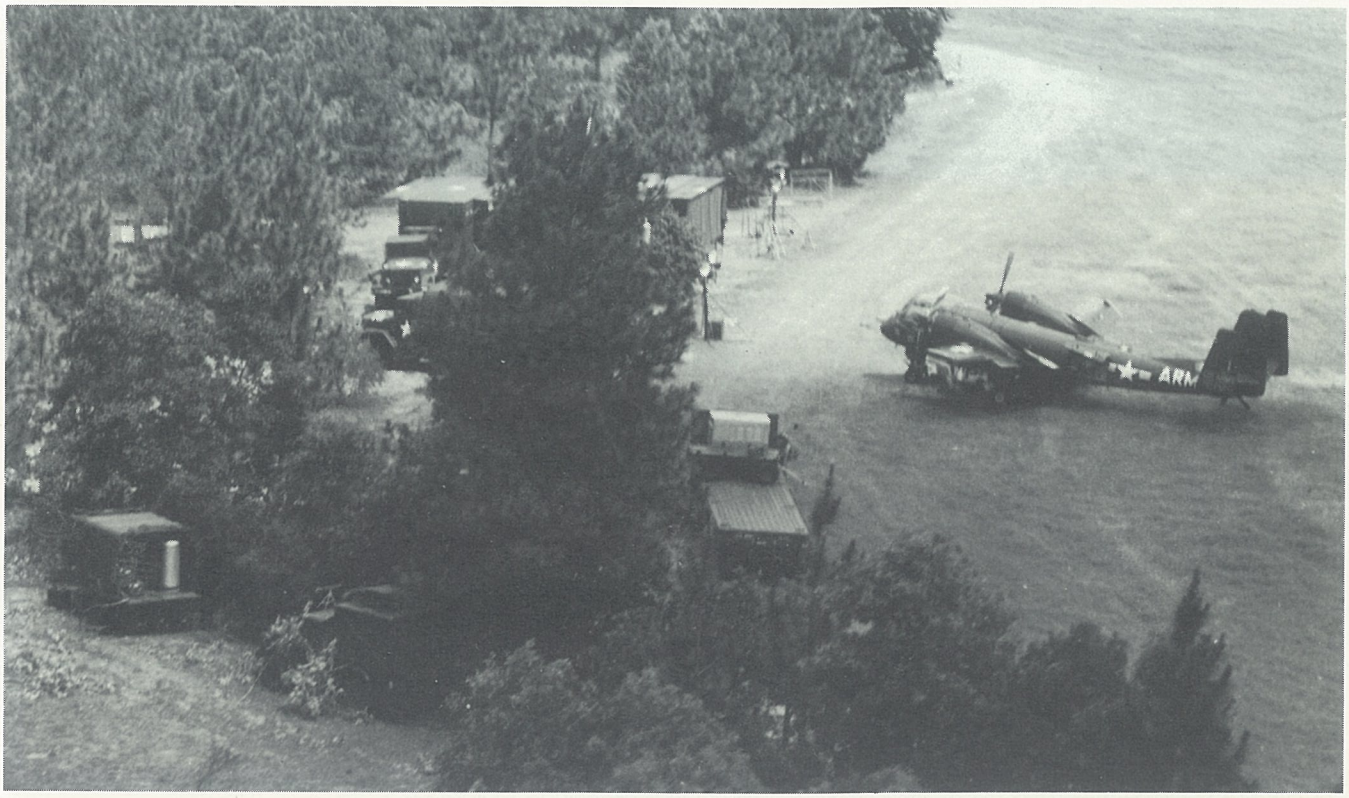
In addition to ease of accessibility, all major assemblies are interchangeable: The power plant assemblies will fit either wing; the left and right members of major landing gear components, stabilizers, elevators, outboard fins, and rudders are interchangeable. The wing tips, horizontal and vertical tails, and fuselage nose and tail sections are all readily replaceable as units.

Mohawk electronics are maintained in the field by the replacement of faulty black boxes. In many instances, electronic test equipment is available as an aid in determining the precise location of a malfunction. All U.S. Army divisions include a third-echelon repair capability that can perform limited repair of electronic components in the field.





GROUND COMPONENTS



AN/TKQ-2 GROUND SENSOR TERMINAL

The AN/TKQ-2 Ground Sensor Terminal is the ground portion of the AN/UPD-2 Radar Surveillance System*. The TKQ-2 receives, dispays, and records radar pictures and data annotation information transmitted to it from the APS-94 SLAR system aboard the OV-1B Mohawk. The radar display within the terminal is identical with that in the aircraft. Either the RO-225 5-inch film recorder or the RO-166 rapid processor viewer may be installed.

The various components of the TKQ-2 system are housed in a standard shelter, which is mounted on a ¾-ton truck. The system power supply is mounted on a trailer that is towed by the truck.

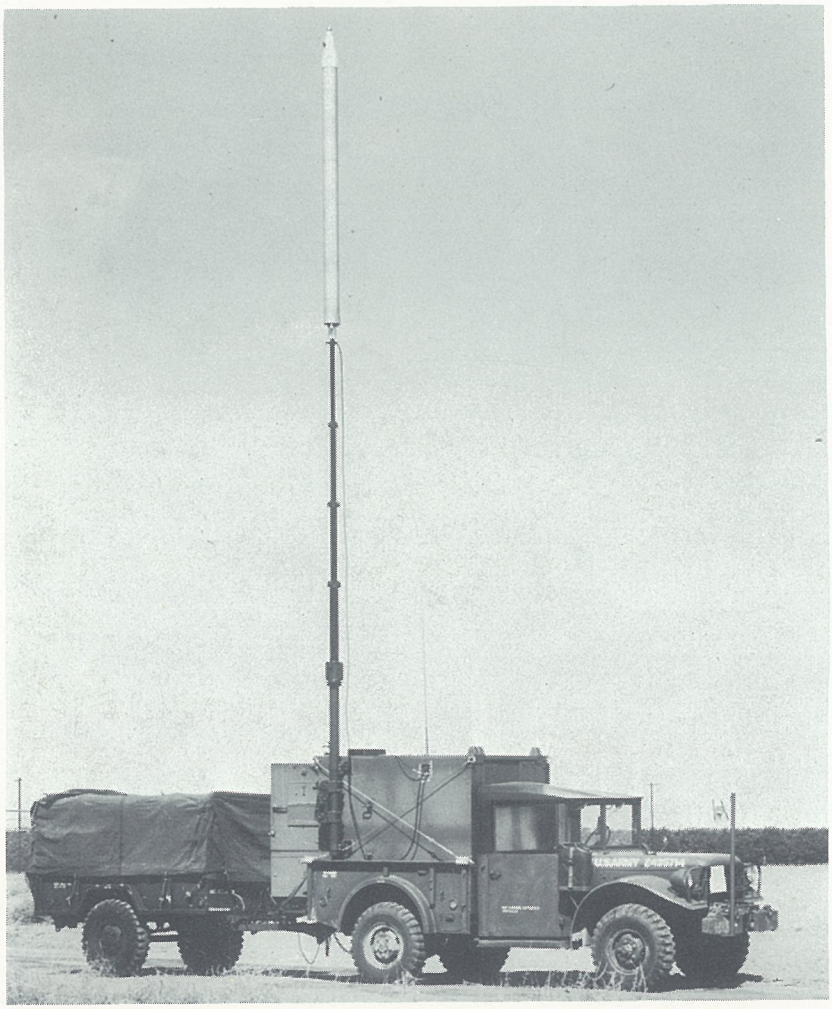
*The airborne portion of the UPD-2 system comprises the AN/APS-94 Side-looking Radar System and the AN/AKT-18 Data Transfer System.

AN/TAQ-1 GROUND SENSOR TERMINAL

The AN/TAQ-1 Ground Sensor Terminal is the ground portion of the AN/UAS-4 Infrared Detection System**. The TAQ-1 receives, displays, and records IR pictures and data annotation information transmitted to it from the AAS-14 IR system aboard the OV-1C Mohawk. The infrared display within the terminal is identical with that in the aircraft.

The various components of the TAQ-1 system are housed in a shelter that is carried by a ¾-ton truck.

**The airborne portion of the UAS-4 system comprises the AN/AAS-14 Infrared Detecting Set and the AN/ART-41 Data Transfer System.



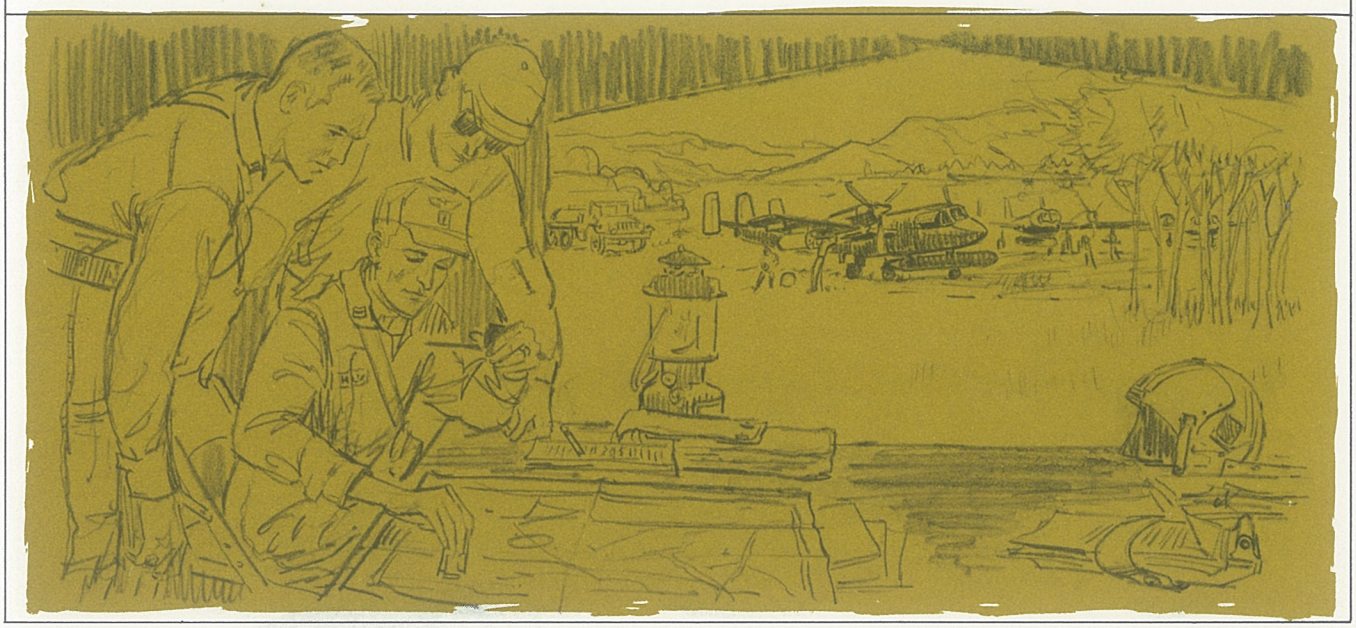
AN/TSQ-43 ( ) TACTICAL IMAGE INTERPRETATION FACILITY

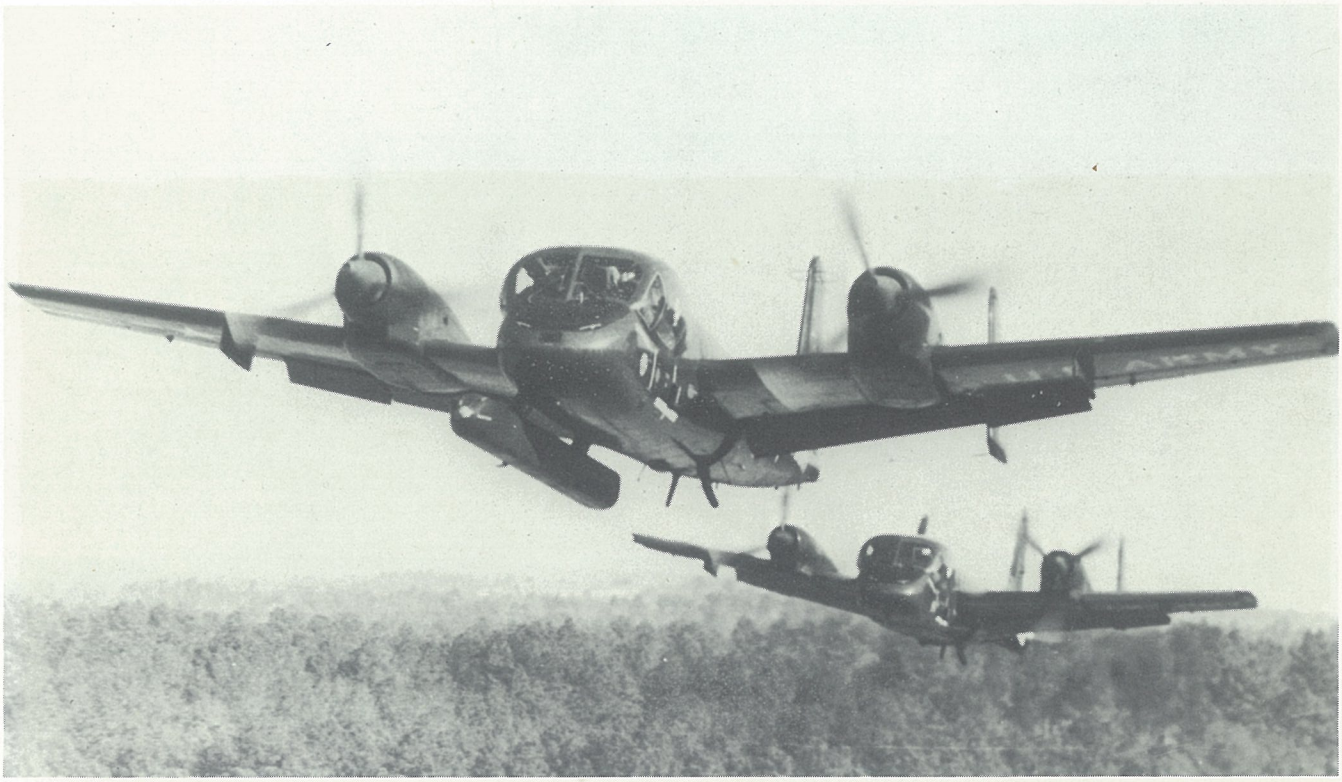
The AN/TSQ-43 ( ) is a portable tactical imagery interpretation facility mounted within a M4 van body installed on a prime-mover chassis. The facility contains all of the equipment required by the imagery interpreter for the interpretation and handling of photographic, SLAR, and IR imagery obtained from the Mohawk. The TSQ-43 ( ) is equipped with a trailer-mounted power supply and heating and air conditioning systems that permit completely independent operation in the field for extended periods.

ES-38 LABORATORY DARKROOM

The ES-38 is a portable film processing laboratory darkroom mounted in a shelter and carried by a 2½-ton truck. The darkroom contains complete provisions for developing and printing various types of film used with the Mohawk Surveillance System. A trailer-mounted power supply, self-contained water supply, and heating and air-conditioning systems permit the ES-38 to operate independently in the field for extended periods.

MISSIONS



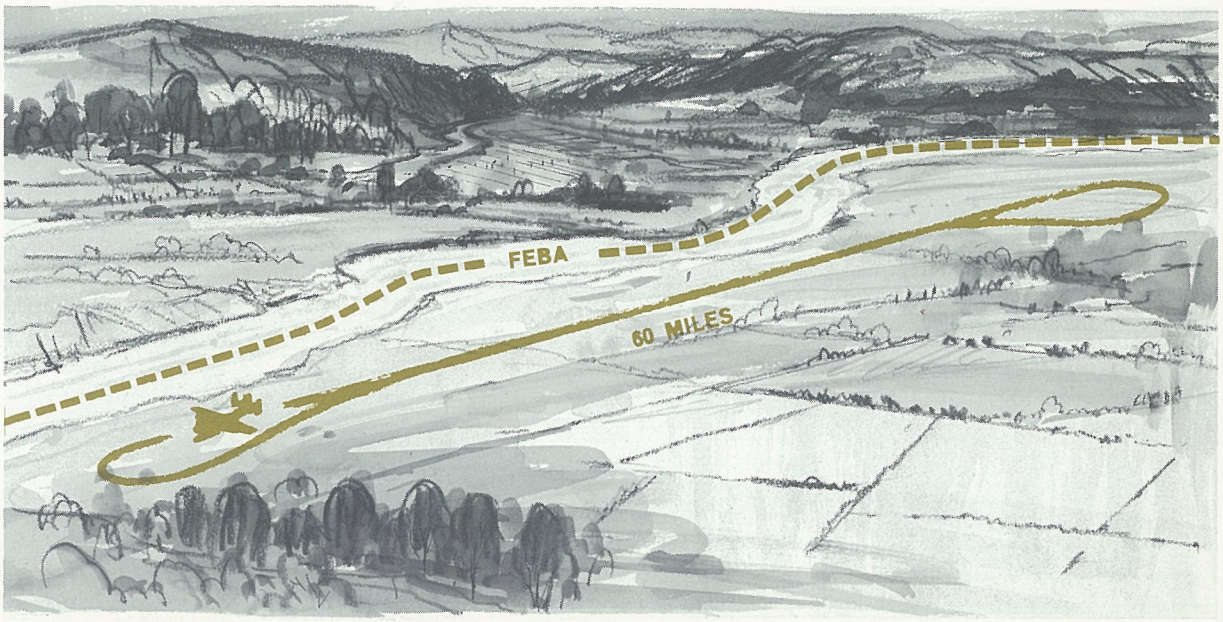


The Mohawk Surveillance System provides the battlefield commander with a highly responsive and flexible intelligence-gathering and reporting capability directly under his control. Intelligence information gathered by the side-looking radar (SLAR) or infrared (IR) sensors is immediately displayed in the cockpit and fed via data transfer links to the system's ground stations.

The Mohawk has shown its flexibility as a surveillance system in CONUS, Europe, Alaska, Korea, and South-East Asia under diverse conditions and has proved its effectiveness in guerilla, defined-front, and cold-war operations in these areas. In all its operations, the Mohawk is flown to optimize the effectiveness of the particular sensor being employed while providing the greatest survivability for both aircraft and crew.

In guerilla-type operations, the Mohawk negates the one advantage the guerilla has: Mao Tse Tung has declared that the guerilla will always use darkness and weather to cloak his activities to defeat a superior enemy. The Mohawk surveillance system denies the guerilla the protection once afforded by these conditions: the radar, by detecting a wide variety of vehicular movement, land or water borne; the infrared, by detecting heat emissions, such as cooking fires or boat engines, associated with guerilla activities. These sensors are not dependent upon ambient light, but are equally effective at night — when the guerilla is most active.

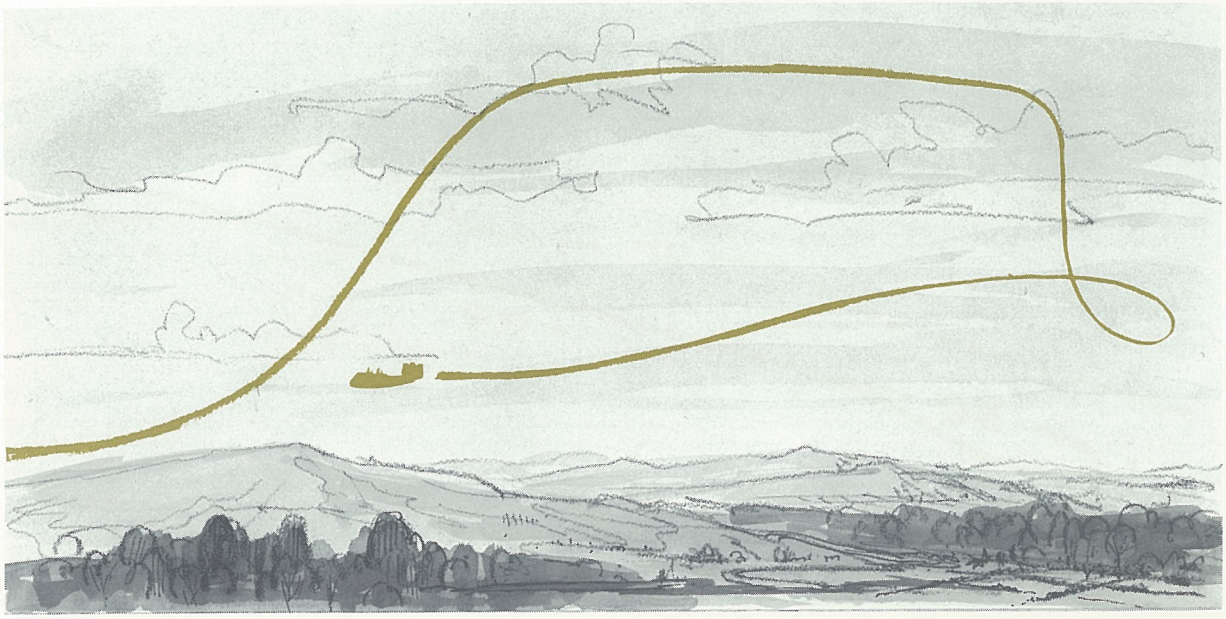
In a European-type air-defense environment where the front is more clearly defined, the SLAR-equipped Mohawk is deployed in a stand-off mode to monitor vehicular traffic in the enemy-held sector beyond the forward edge of the battle area (FEBA). Because of the long-range capabilities of the SLAR, the OV-1B can operate safely some distance behind the FEBA, beyond the range of enemy tactical air-defenses, and still see a considerable distance into the enemy-held area. If a regular patrol is maintained, the enemy activity can be kept under continuous surveillance to preclude surprise build-up and attack. Once the activity is localized, an OV-1A (photographic) or OV-1C (infrared) aircraft



may be dispatched on a penetration mission to pinpoint and further define the activity.

In the penetration mission, the OV-1A or OV-1C Mohawk is flown into enemy-held territory at minimum altitude using terrain features to mask its passage. (Tests and combat experience have proven that an aircraft operating at lower speeds and minimum altitudes is exposed to fire no more than high-speed aircraft, which must fly at higher altitudes to preclude literally flying into the ground.) Once in the target area, the penetration aircraft climbs rapidly (pops up) to a somewhat higher sensor altitude, makes its run, and then returns to the protection of the terrain, where its quiet operation (owing to its free turbine engine and low propeller speed) further reduces exposure to ground fire.

In cold-war operations, the OV-1B Mohawk offers the capability of monitoring the activities of a potential aggressor without committing border violations. Most important this capability can be used **at will** regardless of time of day, weather, or political situation.



For further information,
please call or write Mr. R. Spencer, Business Development
Grumman Aircraft Engineering Corporation, Bethpage, N. Y. 11714
Telephone: Area Code 516, LR 5-2579

GRUMMAN AIRCRAFT ENGINEERING CORPORATION
BETHPAGE, NEW YORK