KAMAN Rotor Tips

JULY-AUGUST, 1974

KAMAN AEROSPACE CORPORATION

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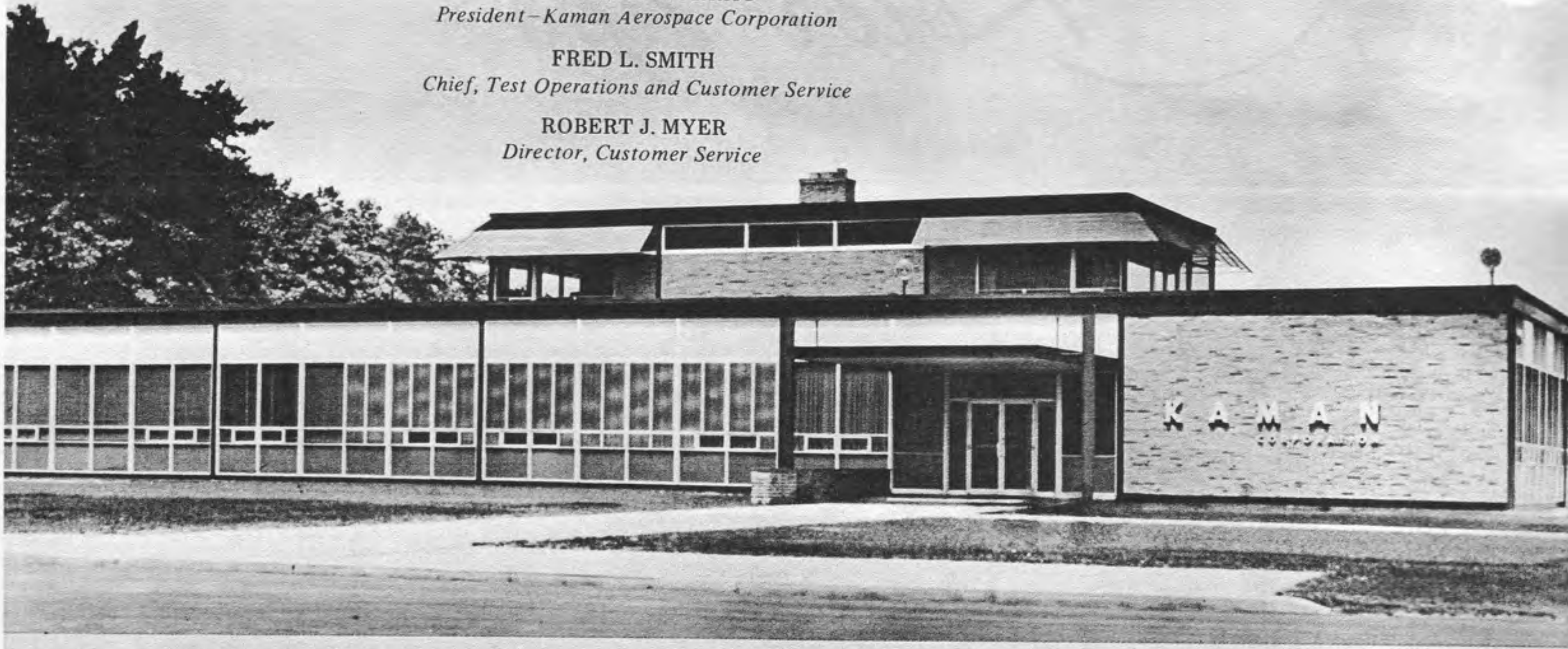

Rotor Tips

Dan A. D'Amelio *Editor*

Volume VIII No. 5

On The Cover

An SH-2 is shown on a recent training flight. The San Diego-Coronado Bridge is in the background.

Kaman Service Representatives

Features

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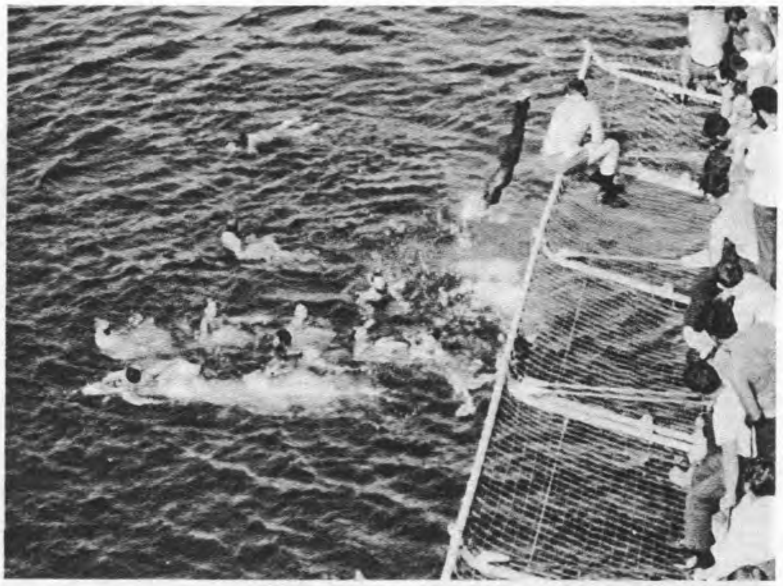


work . . . and play

Two Dets Return from Extended Deployments

Two HSL-33 dets, Det 10 and Det 4, returned recently from extended WestPac deployment.

Det 10 completed an eight-month deployment aboard the USS Brewton and the USS Schofield. The det participated in an ASW (Anti-Submarine Warfare) exercise in the Persian Gulf with foreign navies, including Iran, Pakistan and the United Kingdom. While deployed with the USS Schofield, Lt Robert Doane, OINC, learned that he had been selected the Navy Helicopter Association's West Coast Pilot of the Year (see story below).

The "Snakes" of HSL-33's LAMPS Det 4 completed a six-month deployment aboard the USS Kirk. The det provided naval gunfire support during critical phases of an international naval forces exercise involving units from Australia, Great Britain and Iran. When the USS Kirk was assigned to escort the USS Kitty Hawk in the Indian Ocean, the Snakes were utilized to provide plane guard duty for the Kitty Hawk, as well as providing the ship with logistics support. The det's OINC was Lt Lewis Madden.

Lt Doane Named Top West Coast Pilot

Lt Robert Doane, HSL-33, has been selected the Navy Helicopter Association's West Coast Pilot of the Year for 1973-74. Lt Doane is the third consecutive pilot from the LAMPS community to receive this honor.

Lt Doane was OINC of LAMPS Det 10, which recently returned from a six-month deployment aboard the USS Schofield. During the past year, he was assigned to two LAMPS squadrons: HSL-31 where he participated in CNO's DV-98 project and HSL-33 where he served as Training Officer until he deployed as OINC of Det 10 in October 1973.

In the DV-98 project Lt Doane was responsible for evaluating and developing new ASW/ASMD (Anti-Submarine Warfare/Anti-Ship Missile Defense) tactics and ASMD equipment. As a result of the experience he gained from these operations, Lt Doane made many recommendations for the squadron's tactical doctrine. An example of such recommendations was the development of dual LAMPS ship tactics, which are projected to become standard fleet operating procedures.

As Training Officer for HSL-33, he was responsible for developing training procedures and coordinating training of all personnel in the squadron. He also was responsible for writing the original LAMPS Addendum to the COMASWWINGPAC Squadron Tactical Doctrine.

H

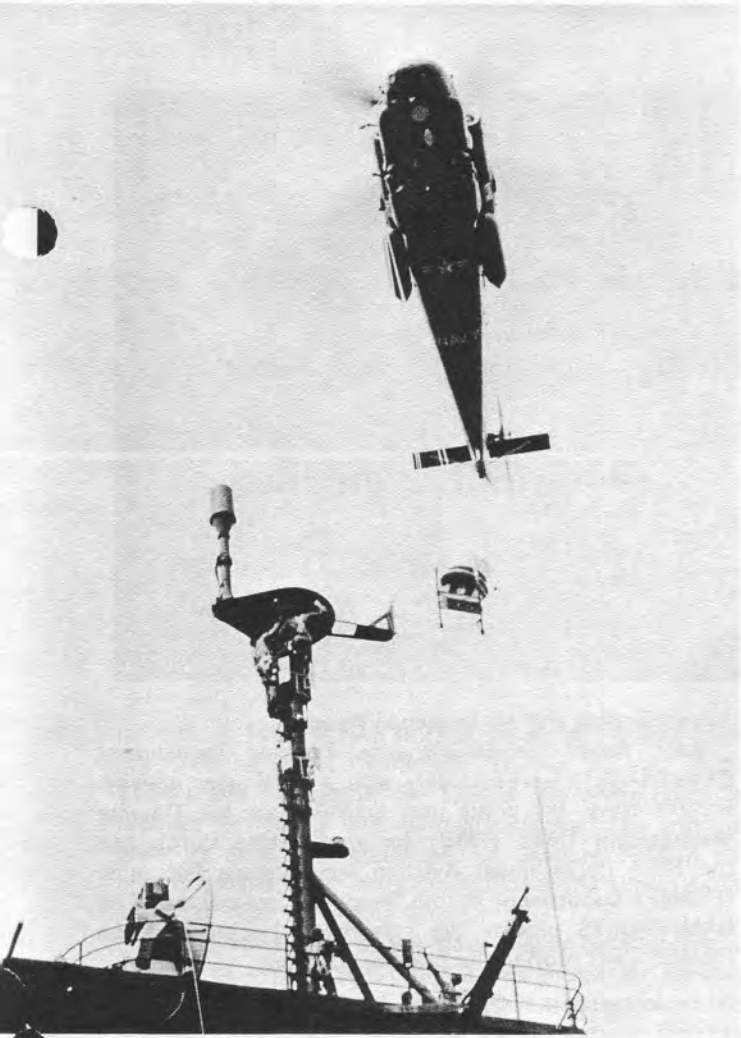
RETIRES — After 19 years of service, AW1 Wayne Jones, HSL-35, has retired from the Navy. He was instrumental in organizing and implementing the LAMPS AW Operator training course. Designated the first CNAP NATOPS Evaluator in SH-2 aircraft, he also played a major role in the implementation of a NATOPS program in the HSL community. Jones, who was made an aircrewman in January 1973 in HH/SH-2 aircraft, logged a total of 242.4 hours in the H-2. His total flight hours in his Navy career add up to an impressive 10,291.2. In the photo, he is shown receiving the well wishes of C.O. CDr J. L. Vanatta, while LCdr Kiseljack looks on.

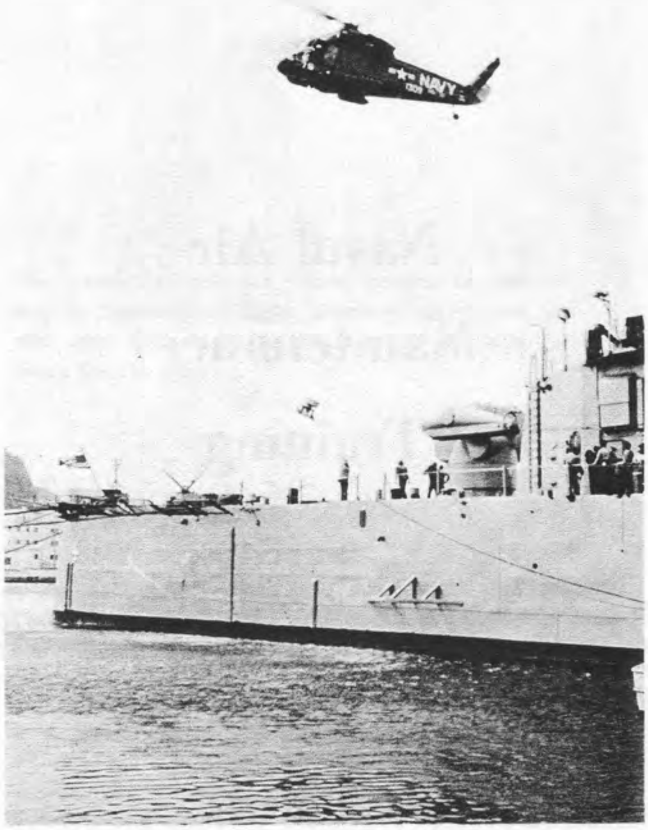
S

NOMINATED FOR AWARD — AW2 Carl Atkins, HSL-35, has been nominated for the Aircrewman of the Year award. An instructor and Training Petty Officer for aircrew in HSL-35 LAMPS, Atkins has over 500 hours in the H-2. He entered the Navy in October 1970, received his wings in February 1972 and was an instructor for H-2 aircraft until April 1973. A graduate of Oregon State University, Atkins has a B.S. degree in Zoology and, on completion of his Navy service, he plans to work for a Masters in Marine Biology and to pursue his hobbies of scuba diving and underwater photography.

L-35

ON SIX-MONTH DEPLOYMENT — The crew of Det 1 deployed aboard the USS Fanning: (standing) AT2 Richard Mayo; AMHC Curtis Venable; AE3 Robert Kuech; ADJ2 Bruce Maier; AW2 Raymond Murphy; AX2 Archie Irvin; Ens Peter Rothwell; Lt Robert Hofstetter, OINC; (kneeling) ADJ3 Charles Graves; AWAA Steven Markle; AMH3 William Martin; AE3 Dennis Clay; and Lt Robert Turunen.





ABOARD SIXTH FLEET FLAGSHIP

A First for 'Snoopy'

Det 31, HSL-30, aboard the Sixth Fleet flagship, USS Little Rock, recently was given the unusual task of lifting the ship's TACAN off the mast for repairs. The task was assigned to Lt Tom Dean and Lt (jg) Mike Connelly. Shown above is "Snoopy" lifting the TACAN from the mast and placing it on the fantail. Commenting later on this display of airmanship, Captain P. K. Cullins, the Little Rock's skipper, extended a "well done" to Lt Dean and his crew — a first for the H-2 and, perhaps, for cruiser aviation, as well.

In ceremonies aboard the USS Little Rock, VAdm D. J. Murphy, Commander of the U.S. Sixth Fleet, presented ADR1 James Bailey the Navy Commendation Medal (presentation shown in photo at right) and the Air Medal to Lt Tom Dean and Lt Larry Poh for their contributions to the Tunisian flood relief effort last March. The citations for the award read, in part: ". . . landing in confined landing zones surrounded by high voltage lines, trees and antennas. Additionally, participated in the rescue of 279 Tunisians from a narrow, inundated dike."

In other ceremonies held aboard the Little Rock, Lt Tom Dean received the Kaman Aerospace Corporation's Pilot Award for logging 1000 hours in the H-2. Shown in the photo (at right) are Lt (jg) Mike Connelly, KAC Representative Horace Fields, Lt Tom Dean, Lt Larry Poh, Det OINC, and KAC Representative John Hendrickson.

Naval Air Maintenance Training

a long and proud history

In the May-June issue of Kaman Rotor Tips, we reported on the first graduating class trained by NAMTD 1070 at its new Norfolk station. We thought KRT readers would be interested in learning about the Naval Air Maintenance Training Group.

By means of Naval Air Maintenance Training Detachments, the Naval Air Maintenance Training Group (NAMTRAGRU), headquartered at NAS Memphis, Tenn., provides technical training for officers and enlisted men in the maintenance of aircraft systems and group support equipment.

Each year, approximately 100,000 course graduates—including personnel from all branches of the military, as well as civilians and foreign nationals—receive training in NAMTRAGRU. Nearly 1500 instructors teach over 800 courses at Navy and Marine Corps Air Stations throughout the U.S.

Most detachments specialize in teaching one particular model aircraft and, in most cases, all systems of that aircraft are taught—Fuel, Armament, Air Frames, Avionics, Power Plants, Hydraulics, Electrical, and associated support equipment. Other detachments are organized to teach Aviation Support Equipment, Aircraft Maintenance Administration and Air Launched Weapons.

Each Naval Air Maintenance Training Detachment (NAMTRADET) works closely with a local user activity. For the Navy, the prime user activities are the Training Management Units (TMU) for the Marine Corps and the Fleet Replacement Aviation Maintenance Personnel (FRAMP) Department of the Readiness squadrons. The NAMTRADETS provide the classroom training and the FRAMP/TMU provide the practical training.

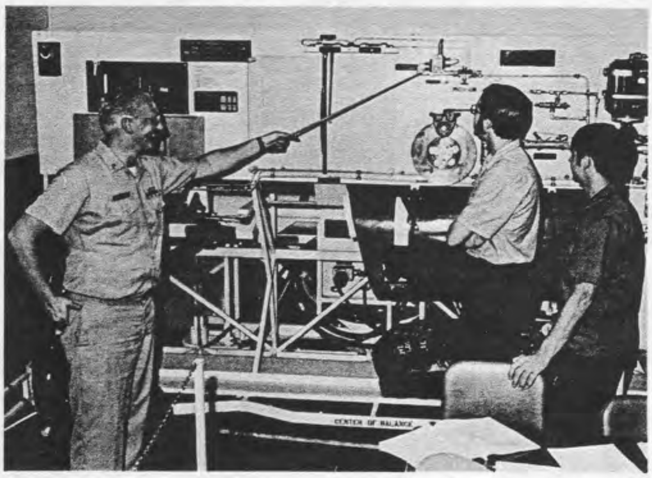
The Early Days

The concept of the Naval Air Maintenance Training Group was developed in 1942. Naval aviation was faced with the problem of turning raw recruits into dependable maintenance personnel, as well as keeping personnel in the field up-to-date on new developments and constant changes.

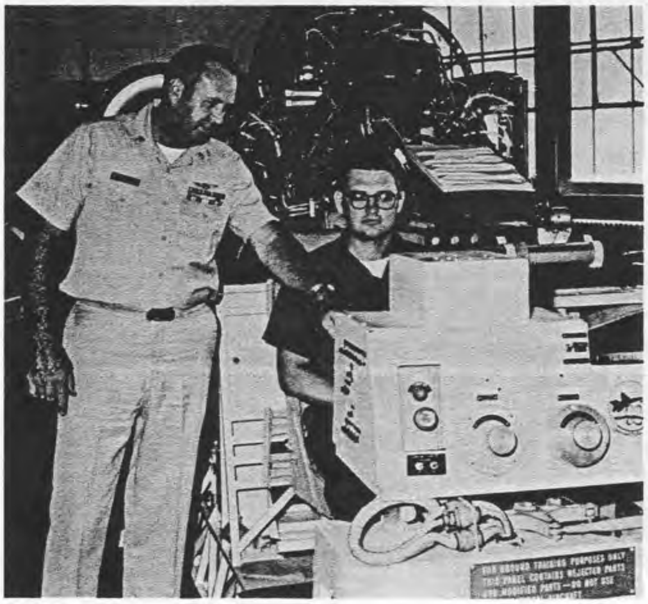
At first, training was given at factories, but soon the number of trainees became greater than the factory schools could handle. More technical training centers were established throughout the country to help meet the training need, but the problem remained.

The solution: instead of sending the students to the maintenance school, the school would be brought to the students, and so evolved the concept of "Mobile Maintenance Training."

The first Naval Air Training Detachments were formed



AMHC Garling using the hydraulic trainer panel to instruct students in the operation of the helicopter hydraulic system. The panel is used to demonstrate actual operation and troubleshooting of the system.



The trainer is used for actual training on the engine, hydraulics, flight controls, gearboxes and drive systems. It is also used for ASE and blade tracker training.

in January 1944 at NAS Norfolk, as a training unit under the Chief of Naval Operations. During the rest of the 1940's and throughout the 1950's, the organization increased in number and instructor forces. The unit outgrew its dependent status and in January 1960 it was commissioned as an independent command known as the Naval Air Mobile Training Group.

In the early 1960's, the Navy began base-loading all aircraft of a particular class at designated air stations. Consequently, the need for "caravan classrooms" decreased significanty (although the demand for fleet training personnel continued to rise).

Furthermore, training equipment became too large, complex and costly to haul in vans and, with the instructors on the road most of the time, many classroom hours were being wasted. So, the command set aside most of its rolling stock and in February 1962, in order to more adequately describe its present function, the word "Mobile" was dropped from its name and replaced with the word "Maintenance."

NAMTD 1070

Naval Air Maintenance Training Detachment 1070 was placed in operation at NAS Lakehurst, N.J., in May 1961, and the first class began training in November of that year. Since then, an annual average of 400-500 fleet personnel have undergone training by the detachment.

NAMTD 1070 was relocated from Lakehurst to NAS Norfolk on January 1, 1974. The detachment presently provides 15 courses of instruction. The courses include: Aircraft Familiarization, which teaches pilots the purpose and operation of the HH-2D/SH-2D aircraft systems; Power Plants and Related Systems Organization Maintenance, which provides personnel with the latest maintenance and operating procedures required to maintain the SH/HH-2D power plant, transmission and fuel systems at the organization level of maintenance; SH-2F Automatic Stabilization Equipment Organizational Maintenance and SH-2D LAMPS Avionics Equipment Organizational Maintenance.

NAMTD 1070 has a complement of 15 instructors: AXCS R. E. Rodgers, Chief Petty Officer in Charge; AMHC R. Garling, Senior Metal Smith Instructor; ADRC O. McLaughlin, Senior Machine Mate Instructor; AEC H. A. Morris, Senior Electrical Instructor; AT1 W. E. Hall, Senior Avionics Instructor; ADJC J. Barrentine, Machinist Mate Instructor; ADJ1 J. Leindecker, Machinist Mate Instructor; ADJ1 V. Zabicki, Machinist Mate Instructor; AT1 M. Hotsko, Avionics Instructor; AT1 J. Stanfield, Avionics Instructor; AMS1 P. B. West, Metal Smith Instructor; AX1 J. McFadden, Avionics Instructor; AX1 G. Bond, Avionics Instructor; AT2 S. Barbee, Avionics Instructor; AE2 A. C. Smith, Electrical Instructor.

AXCS Rodgers instructs a student on the Avionics equipment in the SH-2 using the LAMPS Organizational Maintenance Trainer. The panel contains all the ESM-ASW equipment that is in the aircraft.

New Weather Recon System for Air Force

This year's hurricanes and other weather phenomena will be watched more closely than ever before because of a new USAF Airborne Weather Reconnaissance System (AWRS) developed by Kaman Aerospace Corporation.

On its first mission in a tropical storm environment, AWRS could produce more accurate, useful data for scientific study than the entire 20-year history of airborne weather reconnaissance has produced to date, according to an Air Weather spokesman.

The system consists of an Air Weather Service WC-130 four-engined turboprop aircraft, especially modified and equipped with a variety of integrated meteorological and electronic sensors and instrumentation designed to automatically collect, analyze, process, display and record key weather data. The selected data, processed by on-board computers, is encoded and radioed to ground stations.

The new airborne equipment will be capable of providing data more rapidly to ground stations, allowing more timely and accurate forecasts of tropical storm movements and intensity. Under the present system, 30 minutes are required for two people to process a complete cycle of data; the new system permits one operator to transmit to ground stations *a complete cycle of higher quality data every five minutes.*

The Airborne Weather Reconnaissance System, designed, developed and assembled by Kaman Aerospace Corporation, was delivered to the U.S. Air Force on June 3rd for operational testing with Air Weather Service's 53rd Weather Reconnaissance Squadron, Keesler Air Force Base, Miss. The six-month operational test period will span the U.S. hurricane season with AWRS aircraft flying weather reconnaissance missions over the East.

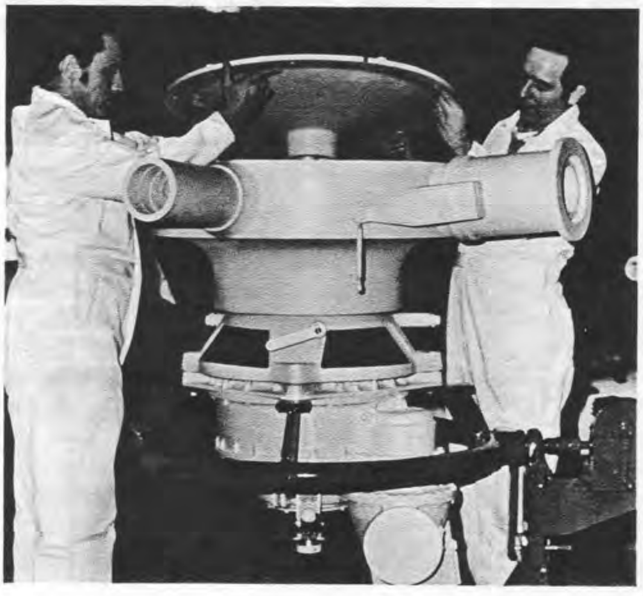
Circulation Control Rotor Under Study

A circulation control rotor system for helicopters is presently under study at Kaman Aerospace Corporation. Funded by the Naval Air Systems Command, the study is expected to lead to improved efficiency and lift capability.

The system's configuration includes a narrow slot extending full span near the rotor blade's trailing edge; compressed air is blown through this slot. The air flow, which can be modulated to provide control, improves the lift characteristic of the retreating blade.

A full-scale mockup of the circulation control rotor system is shown in the photo at the right. The mockup was recently exhibited at the American Helicopter Society Forum in Washington, D.C.

Kaman Aerospace Corporation has 28 years of pioneering experience in helicopter research, design and fabrication. The company has introduced innovations to the industry, including the first operationally successful rotor blade without pitch change bearings and the first all-fiberglass, reinforced plastic blade.



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TECHNICAL SECTION

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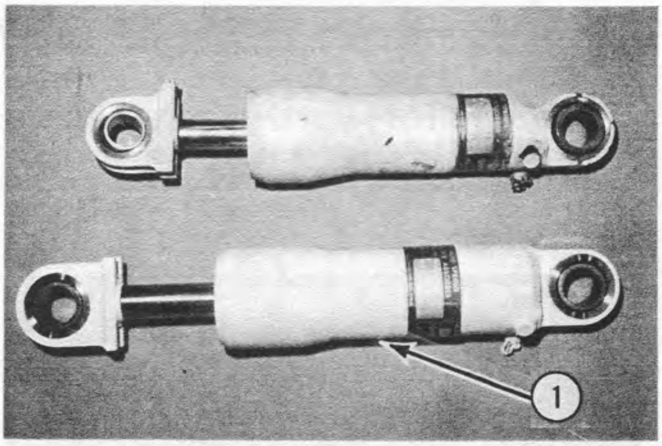
H-2 LIQUID SPRING APPLICABILITY–TIME BETWEEN OVERHAUL

H. Zubkoff, Service Engineer

The H-2 liquid spring has been improved and strenghtened to keep pace with the several growth phases the aircraft has gone through since its introduction. Note that the improvements provided by Airframe Change 151 increased the Time Between Overhaul (TBO) by 1000 hours. Introduction of the beefed-up landing gear on the SH-2F model aircraft necessitated a new liquid spring that would be compatible with the longer link and axle assembly. This liquid spring, part number 3323300-1 (FSN RH1620-042-7274BH), can only be used on SH-2F aircraft and/or aircraft having Airframe Changes 195 and 216 incorporated.

The accompanying photo shows the obvious difference in sizes between the components. Item 1 is the new liquid spring, Part Number 3323300-1.



H-2 Liquid Spring Applicability–Time Between Overhaul

Part Number	Time Between Overhaul	Aircraft Application	Remarks
3283300-13	600 Hours	UH-2C, HH-2D	Basic Configuration
3283300-15	1600 Hours	UH-2C, HH-2D, SH-2D	After AFC-151 (Improvement of Dowty Main Landing Gear Liquid Spring)
3323300-1	1600 Hours	SH-2F	After AFC-216 (High Energy Main Landing Gear). Provides longer Liquid Spring

SERVICE ENGINEERS: Avionics, N.L. Hankins, J.M. Nenichka; Mechanical, E.F. Noe, R.J. Trella, W.J. Wagemaker, H. Zubkoff

TAIL ROTOR BLADE INTERCHANGEABILITY

W. Wagemaker, Service Engineer

Tail rotor blades P/N K614701-1 may be used only on HH-2D and SH-2D aircraft; tail rotor blades P/N K614001-205 and -207 may be used only on UH-2C aircraft; and tail rotor blades K614701-3 can be used only on SH-2F aircraft. The restrictions on the blades are due to differences in arm flyweights and the incorporation of the new K616295-13 pitch bearings on the K614701-3 blades.

If, after installing replacement tail rotor blades, a noticeable tail rotor vibration is apparent, check tail blade part numbers and flyweights to be sure they all are of the same type. As the photo shows, flyweight differences are slight. Because of this slight difference, it is possible (and permissible) in the event of a temporary shortage to modify most blades to another configuration. Modification consists of changing the attaching bolt, flyweight, and stencil as detailed in the accompanying list and illustrations 1 and 2.

Note that the K614001 and/or the K614701-1 blade cannot be completely modified to the K614701-3 configuration unless the new K616295-13 pitch bearings have been installed. Check the hard cards for the information and be sure to indicate on the cards any modification made to the blades.

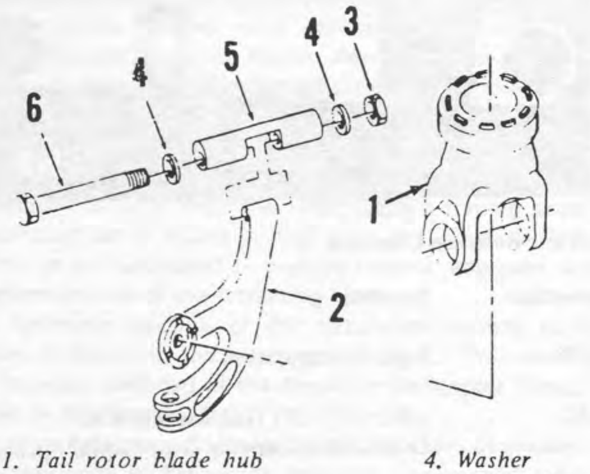
Necessary for K614001-207 Configuration (UH-2C only)
(3) MS20365-624 Nut
(4) AN960-616 Washer (under head and nut)
(5) K616709-11 Flyweight
(6) AN6C25A Bolt

Necessary for K614701-3 Configuration (SH-2F only)
(3) MS20365-624 Nut
(4) AN960-616 Washer (under head and nut)
(5) K616709-13 Flyweight
(6) AN6C32A Bolt

Incorporation of K616295-13 pitch bearing IAW ECP-369. Prior to deployment, detachment personnel should screen spare tail rotor blades in their packup and ensure that blades are the correct configuration for their model aircraft. Federal Stock Numbers for H-2 tail rotor blades presently in use are as follows:

K614001-205	RQ1615-942-8186BH
K614001-207	RQ1615-879-6224BH
K614701-1	RQ1615-251-9686BH
K614701-3	RG1615-261-2619BH

(Continued on page 11)



1. *Tail rotor blade hub*
2. *Pitch arm*
3. *Nut*
4. *Washer*
5. *Flyweight*
6. *Bolt*

Illustration 1

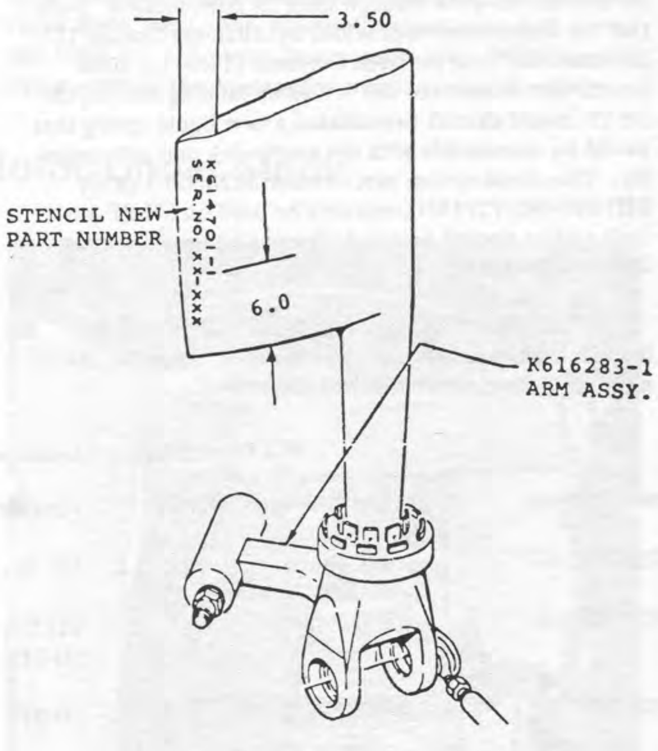
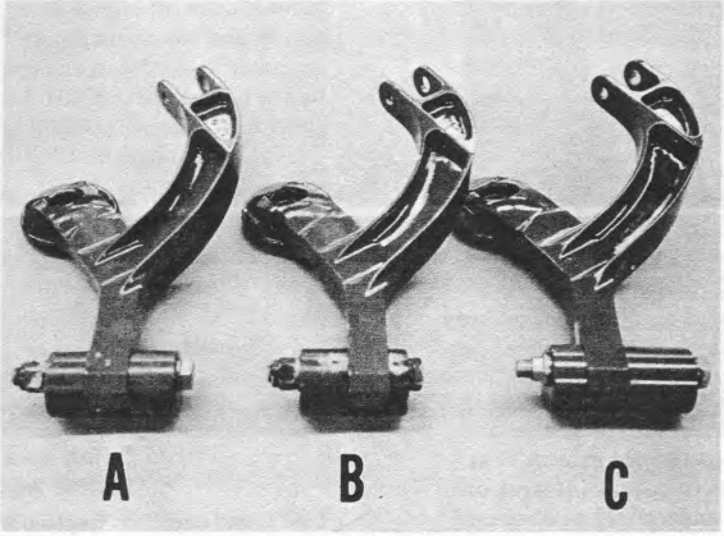


Illustration 2



A. Flyweight, P/N K616288-11. Use on UH-2C aircraft with blades K614001-205 and -207.
B. Flyweight, P/N K616709-11. Use on HH-2D/SH-2D aircraft with blades K614701-1.
C. Flyweight, P/N K616709-13. Use on SH-2F aircraft with blades K614701-3.

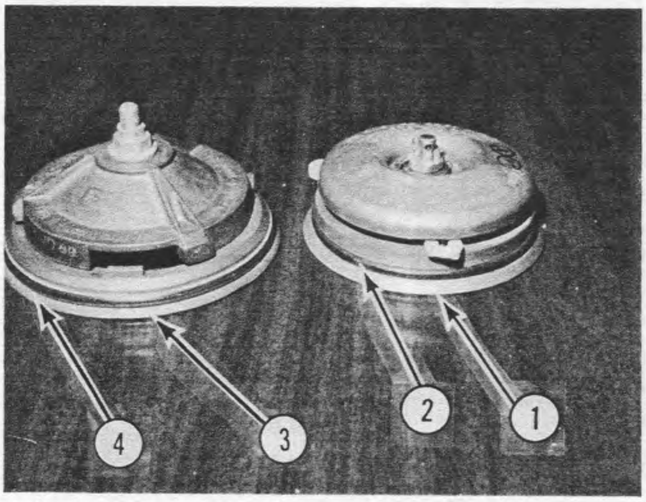
NOTE: Blades with the new pitch bearings incorporated can be modified to fit all H-2 aircraft; blades without the new pitch bearings cannot be used on SH-2F aircraft.

LEAKING AUX TANK FILLER CAPS

If fuel is discovered leaking from an aux tank filler cap, be sure to determine which cap is installed BEFORE ordering a replacement O-ring. Aux tanks may have one of the two filler caps shown in Photos A and B. The caps and their related components are not interchangeable.

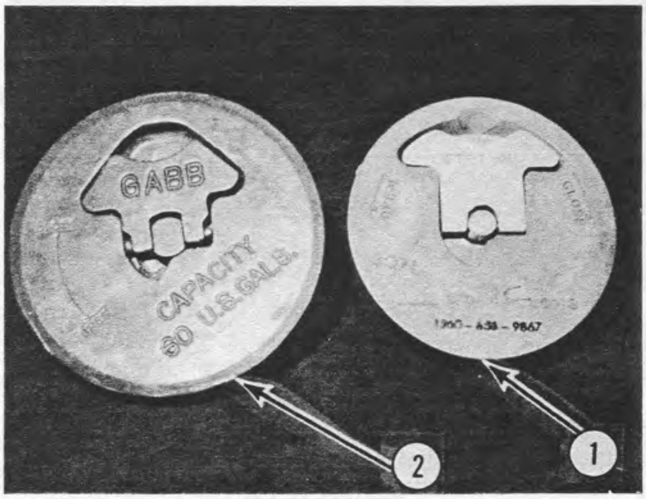
In addition to the aux tanks, the Gabb filler cap is also used on the engine and transmission oil tanks and the Shaw cap is also used on the internal fuel cell gravity filler necks.

H. Zubkoff, Service Engineer



1. Shaw Inc., cap assembly
2. O-ring, MS29513-232
3. Gabb Inc., cap assembly
4. O-ring, MS29513-339

PHOTO A. TOP VIEW



1. Shaw cap assembly
2. Gabb cap assembly

PHOTO B. BOTTOM VIEW

SPEED DECREASER GEARBOX

OIL TEMP (HOT) TIP

External cleanliness of the aircraft oil cooler cores and proper sealing of the engine compartment from the SDG are two important requisites for proper SDG oil temperature operation. During aircraft operation under high OAT conditions the SDG oil will probably be at the upper end of the operating temperature range. Any degradation of the oil cooling provisions could be "just enough" to increase the temperature to or above the MAX limit.

Oil cooler cores should be cleaned externally at each Calandar Inspection. The frequency (of wash or cleaning) should be increased under dusty or dirty operating environmental conditions. Cooler cleaning should be accomplished from the plenum chamber out, using aircraft pressure cleaning compound or solvent. Be sure to fresh water rinse after cleaning. Gain access to the inside of the plenum chamber, by opening the starboard hinged "butterfly" door shown in Photo A. Remove the access panel on top of the plenum, item 1, Photo B.

The engine aft (flexible titanium) firewall, between the SDG and the exhaust case, should be checked periodically for proper seating and sealing against the nacelle upper and lower aft engine doors.

Photo C shows a bent firewall. Note the seal which should be replaced. Note the seal appears to be worn/distorted and has been forced forward of the firewall; if installed on an aircraft, the seal could not make contact with the upper nacelle door and would allow hot air flow into the SDG area. Photo D shows a serviceable seal attached to the aft engine firewall. If the firewall does not seat against the doors properly, either the firewall is distorted or the seal is worn. Corrective action, depending on the nature of the deficiency should be taken, especially under summer OAT conditions.

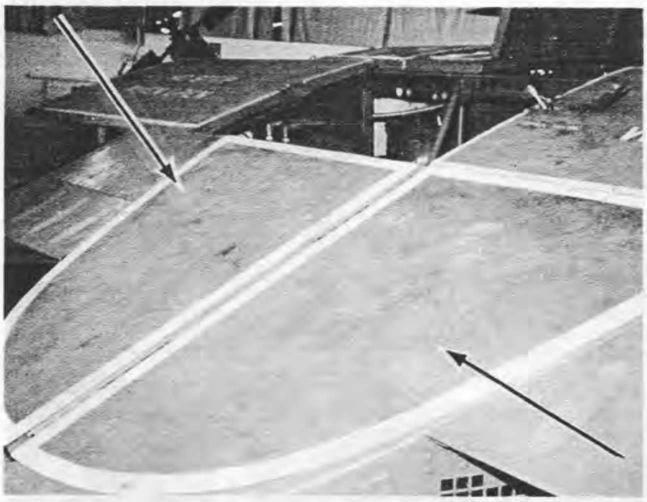
The following SDG oil temp limits apply.

Up to 127°C	MAX temp for continuous operation.
Over 127°C but less than 135°C	Maximum for 1 minute. If less than 1 minute, check chip detector and oil filter. If no chips, continue in service. Over 1 minute, replace SDG.
135°C and over	Replace SDG.

It is suggested that before replacing an SDG in compliance with the above limits, the cognizant T-58 engine field service rep be contacted regarding the possibility of obtaining a waiver. Mitigating circumstances such as high OAT, less than 5 minutes of overtemp operation, readings at the low end of the overtemp limits, clean chip detector and filter may be sufficient grounds to obtain a waiver, and may save the time and expense of an SDG change.

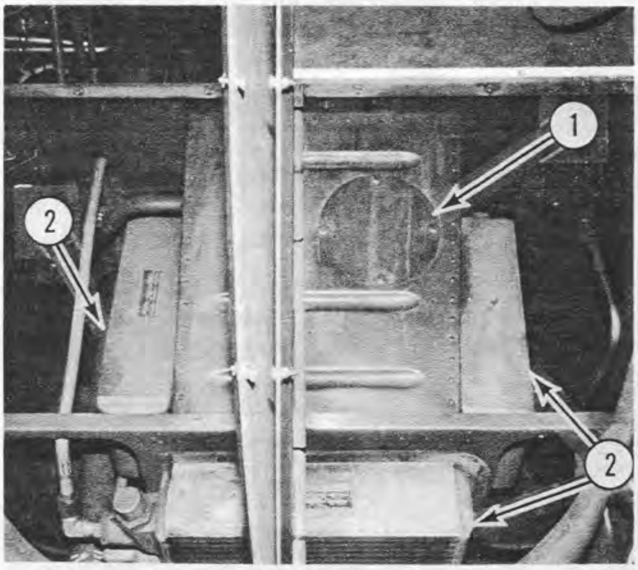
Obviously, a waiver possibility will not apply to a gross overtemp condition. Remember, when an overtemp occurs, something caused it. It is important that the "something" be discovered and corrected. In addition to dirty coolers or defective fire wall seals, other factors may be low oil supply, defective coolers (internal blockage, thermo-static bypass), or a defective blower.

(Continued on page 13)



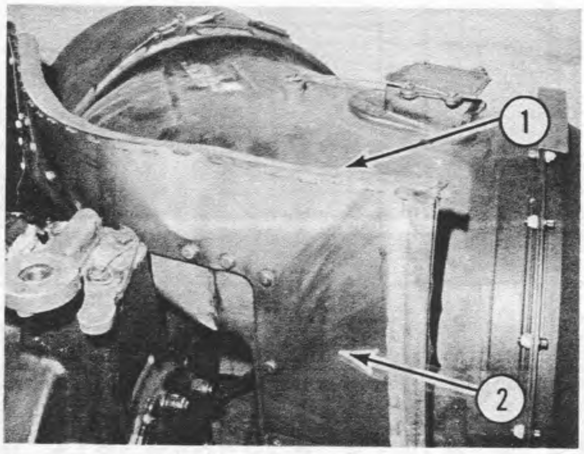
Arrows point to butterfly doors

PHOTO A



1. Plenum chamber access panel
2. Coolers (3)

PHOTO B



1. Deformed seal
2. Damaged firewall

PHOTO C

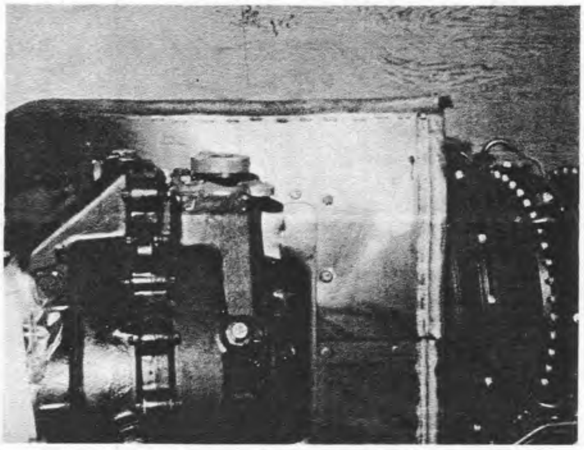


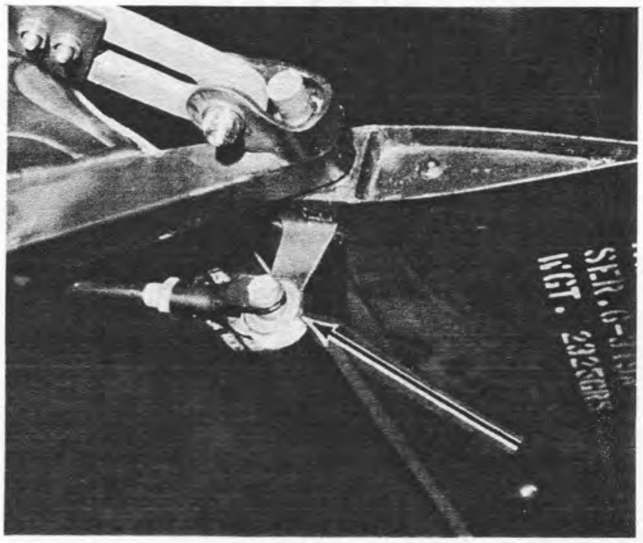
PHOTO D

H. Zubkoff, Service Engineer

Q. Are flap clevis bolts, P/N VS2667-4P18D and NAS 464P4-17, interchangeable between the 101 and the standard rotor system?

A. No. The NAS464P4-17 flap horn bolt cannot be used on the 101 rotor system because the high torque (90-150 inch-pounds) required for clamp up on the KAmatic bearing can very well cause bolt failure. (See the arrow in the accompanying photo.) TheVS 2667-4P18D bolt was selected because of its high tensile strength and corrosion-resistant properties. (Experience has shown this area is exposed and susceptible to corrosion.)

W. Wagemaker, Service Engineer



Q. The average magnetron current in wide pulse in the LN-66HP R/T unit is adjusted to 5.67 VDC by means of a VARIAC (T203). At what value should the overload voltage check be performed?

A. The overload voltage check should be performed at 6.5 VDC. If a higher voltage is applied, insulation breakdown of the pulse transformer (T207) could result.

J. Nenichka, Service Engineer

Q. How many turns at the flap clevis are required in order to obtain 3 inches of movement at the main rotor blade tip?

A. A 1/2 turn at the flap clevis produces approximately 3.0 inches of movement at the main rotor blade tip on both the standard rotor and the new "101" rotor system. It is recommended that no more than 1/2 turn adjustment be made at any one time and that records of adjustments be maintained. Repeated adjustments in the same direction are an indication of wear or excessive looseness and should be investigated.

W. Wagemaker, Service Engineer

H-2 PRESSURE SWITCHES

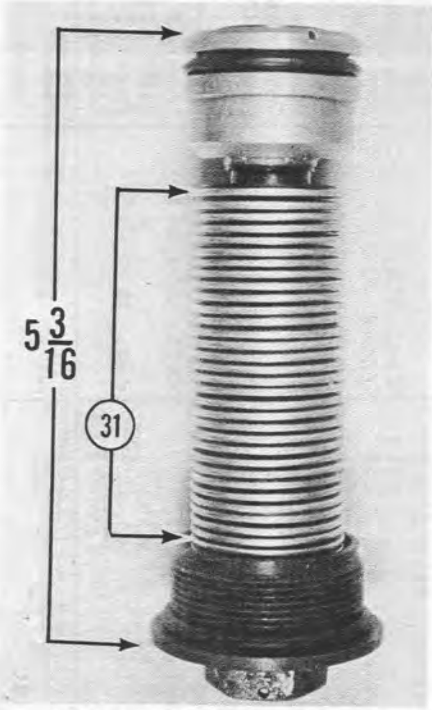
The accompanying list of pressure switches used in H-2 aircraft will aid maintenance personnel in locating, identifying, and ordering. Switches can only be interchanged when the part numbers are the same. IPB's referenced have the same change date: 15 December 1973.

Compiled by:
J.M. Nenichka
Service Engineer

NOMENCLATURE	P/N	FSN	FUNCTION	LOCATION: IPB	LOCATION: AIRCRAFT
MGB OIL PRESSURE SWITCH	1137	RM5930-837-5508 V170	Transmission oil pressure light: Actuates at/below 20 psig; Deactuates at/above 22 ± 1 psig	NA01-260HCB-4-6 Fig. 15 Index 49	Fwd Main Trans. Mount LH Side
CGB OIL PRESSURE SWITCH	1137	SAME	CGB oil pressure light: Actuates at/below 20 psig; Deactuates at/above 22 ± 1 psig	NA01-260HCB-4-6 Fig. 15 Index 113	Fwd. Side of CGB RH Side
NO. 1 SDG OIL PRESSURE SWITCH	1137	SEE ABOVE	No. 1 SDG oil pressure light: Actuates at/below 20 psig; Deactuates at/above 22 ± 1 psig	NA01-260HCB-4-5 Fig. 12 Index 34	Nacelle Frame Sta. 242 Aft of SDG LH
NO. 2 SDG OIL PRESSURE SWITCH	1137	SEE ABOVE	No. 2 SDG oil pressure light: Actuates at/below 20 psig; Deactuates at/above 22 ± 1 psig	NA01-260HCB-4-5 Fig. 12 Index 34	Nacelle Frame Sta. 242 Aft of SDG RH
NO. 1 ENGINE OIL PRESSURE SWITCH	1152	RM5930-801-0020-V170	No. 1 Engine oil pressure light: Actuates at/below 10 psig; Deactuates at/above 12 ± 1 psig	NA01-260HCB-4-5 Fig. 10 Index 2	Fwd. MGB Mount LH Side
NO. 2 ENGINE OIL PRESSURE SWITCH	1152	SAME	No. 2 Engine oil pressure light: Actuates at/below 10 psig; Deactuates at/above 12 ± 1 psig	NA01-260HCB-4-5 Fig. 10 Index 2	Fwd. MGB Mount RH Side

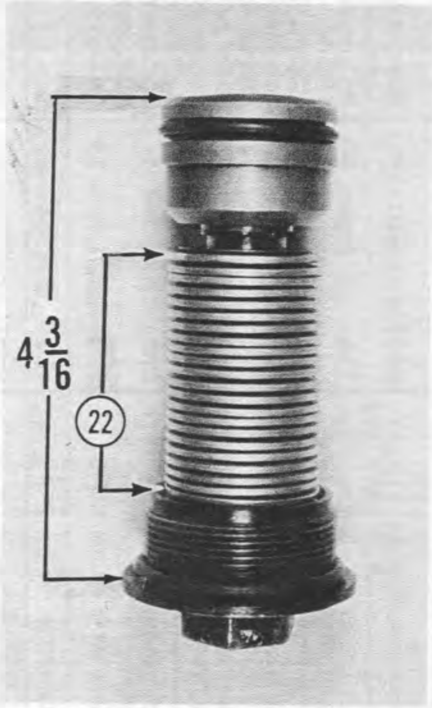
NOMENCLATURE	P/N	FSN	FUNCTION	LOCATION: IPB	LOCATION: AIRCRAFT
HYDRAULIC PRESSURE SWITCH	96007	RD5930-804-8397-V170	Hydraulic pressure light: Actuates at/below 800 psig for 5 seconds Deactuates at/above 900 psig	NA01-260HCB-4-4 Fig. 27 Index 60	Mounted on LH Side of Power Relay Box Sta. 120 WL 120 LH
SUMP TANK PRESSURE SWITCH	42G38	RM5930-886-3635VH	Fuel transfer pumps and compressor: Actuates at/below 0.25 psig Deactuates at/above 1.0 psig	NA01-260HCB-4-5 Fig. 18 Index 56	Located Inside Cabin on RH Side Aft of Cabin Door
EMERGENCY PUMP PRESSURE SWITCH	1062	RM5930 811-9607-V170	DC boost pump/emergency pump caution light: Actuates at/below 5.0+.8,-0 psig Deactuates at/above 7.0 psig	NA01-260HCB-4-5 Fig. 22 Index 19	Located Under Fwd. RH Fuel Cell
FUEL TRANSFER PRESSURE SWITCH	1G122	RM5930 225-3834VH	Fuel transfer light: Actuates at/below 1.5 psig for 5 seconds Deactuates at/above 2.25 ± 0.25 psig	NA01-260HCB-4-5 Fig. 27 Index 1	Under Fwd. Sump of RH Aft Cell
FUEL BOOST PRESSURE SWITCH	1055	RM5930-787-3804-V170	Fuel boost light: Actuates at/below 2.0+0.8,-0 psig Deactuates at/above 4.0 psig	NA01-260HCB-4-5 Fig. 39 Index 11	Located Aft Tunnel Between Fuel Filters RH Side
COMPRESSOR CONTROL PRESSURE SWITCH	1061	RM5930-845-1461-V170	Air compressor control: Actuates at/below 14.5 ± 0.5 psig Deactuates at/above 16.0 ± 0.5 psig	NA01-260HCB-4-5 Fig. 35A Index 40	Mounted Near Compressor Motor Sta. 242 BL 12.75 LH
COMPRESSOR WARNING LIGHT PRESSURE SWITCH	1147	RM5930-060-4645VH	Compressor caution light: Actuates at/below 5.0 ± 0.5 psig Deactuates at/above 7.0 psig	NA01-260HCB-4-5 Fig. 35A Index 38	Mounted Near Compressor Motor Sta. 242 BL 12.75 LH
DIFFERENTIAL PRESSURE SWITCHES	52-2889-033	RH2915 782-1851VH	Fuel bypass caution light: Actuates at 1.5 to 1.8 psig drop across filter	NA01-260HCB-4-5 Fig. 39	Located on RH Side Aft Tunnel. Part of Fuel Filters.
AIRSPEED PRESSURE SWITCH	MD247BAR 1W	RM5930-062-4733BH5X	Blade tracker/ASE longitudinal accel. solenoid: Actuates at/above 50 knots Deactuates at/below 25 knots	NA01-260HCB-4-4 Fig. 17 Index 12	Fwd. of Co-pilots Console Sta. 64 WL 80

H-2 LUBE OIL PUMP FILTER ASSEMBLIES



ENGINE SPEED DECREASER
GEARBOX (SDG) FILTER

PHOTO 1



MAIN AND COMBINING
GEARBOX FILTER

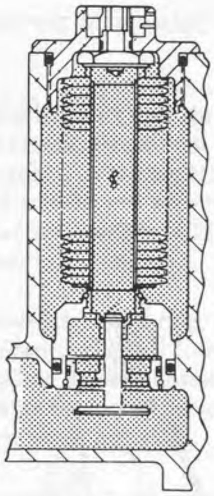
PHOTO 2

Lube oil pumps in the main gearbox, combining gearbox and some engine speed decreaser gearboxes (SDG), use filters with wafer packs. (A number of SDG's use a cleanable, pleated type filter assembly, P/N R9W1104. The intent of this article applies only to those SDG's with the wafer filter pack.) Main and combining gearbox lube oil filters are the same length, use the same micron-rated wafers, and are interchangeable. The SDG oil filter however, can only be used in the SDG. The filter used in the engine SDG cannot be installed in the main or combining gearbox. Care must be taken, however, to avoid installing a main or combining gearbox filter into an SDG.

The covers on all three filters have the same threads and can be easily interchanged; therefore, the part number is of little use. Comparing the length of a removed filter against a new or cleaned filter is not a positive check because an incorrect installation may have been previously made. Once assembled, the most positive checks are the length, measured from the bottom of the check valve to the flange on the filter cover, and/or the number of visible wafers. (When assembled, three of the wafers are hidden from view by the recessed portion of the filter cover.)

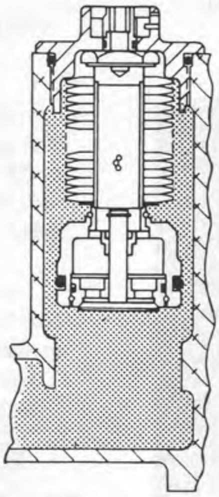
An assembled SDG filter can be identified as shown in Photo 1. Note it must be 5-3/16-inches long with 31 wafers visible below the filter cap. (Three wafers are hidden within the cap recess.) Assembled main and/or combining gearbox filters are identical to each other and can be identified in a like manner as shown in Photo 2. The length must be 4-3/16-inches; wafers visible below the filter cap must be 22 (3 wafers are hidden by the cap). Obviously the SDG filter is 1-inch longer than both the main and the combining gearbox filters.

The simplified drawings show why it is imperative to install the correct filter in the correct lube pump. View A illustrates a filter correctly installed. The properly seated valve O-ring prevents oil from bypassing the filter. In this installation, all oil must pass through the filter in order to reach the system because the O-ring is properly seated. View B shows what would happen if a main or combining box filter were installed in the SDG lube pump. It is obvious that because of the shorter filter, the O-ring cannot seat and unfiltered oil will flow through the system. View C shows what could happen if a SDG filter, with its greater length, were installed in the main or combining box lube pump. Here again it is obvious that the O-ring cannot seat



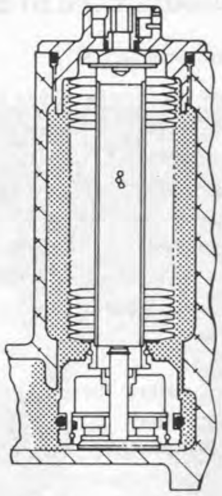
CORRECT

VIEW A



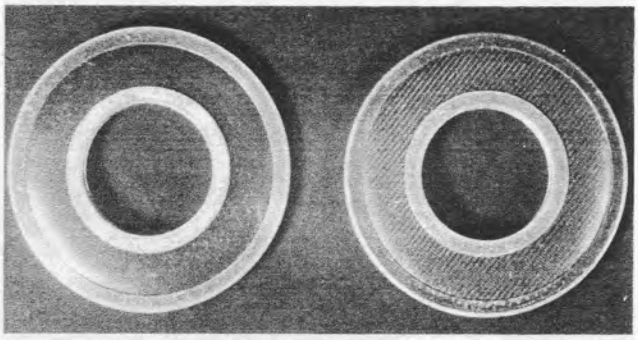
INCORRECT

VIEW B



INCORRECT

VIEW C



46 MICRON 81 MICRON

PHOTO 3

PHOTO 4

properly because it has passed beyond the machined surfaces. This installation will also allow unfiltered oil to flow through the system. When assembling filters, care should be taken to be sure that only correct micron-rated wafers are used. Under no circumstances should they be mixed.

A close look at the two wafers shown in Photo 3 will be of help when determining which wafer is the correct one to use. Notice that a crosshatch design can easily be seen on the 81-micron wafer at the right; this wafer is only used in the main and combining gearboxes. The 46-micron wafer on the left displays no such design; this wafer is only used in the SDG lube pump. It might prove handy to mark one wafer and keep it as a reference so that it will always be available to refresh memories whenever a question arises.

Photo 4 shows a partially-assembled filter. The retaining nut which secures the washer and the wafers should be hand-tightened until the wafers cannot be turned individually. The wafer pack, however, should turn relative to the cap when firm hand pressure is applied. Care must be taken not to over-tighten the retaining nut and thereby crush the wafers. After tightening the nut, carefully check for crushed wafers by viewing the wafer pack while it is back-lighted. After the inspection, install the cap assembly. The cap assembly, when installed, bears against the retaining nut; consequently, do not tighten the cap assembly beyond the point of firm resistance.

COCKPIT CONSOLE/COPILOT SEAT VIBRATION

H. Zubkoff, Service Engineer

The close proximity of the inboard side of the copilot seat to the throttle quadrant cover on the left side of the center console can result in chafing due to normal rotor 4/rev vibrations and structural tolerances. To prevent chafing and to null console vibrations, rubber snubbers have been bonded to the seat in the area shown on the illustration. (Refer to NAVAIR 01-260HCB-4-4, Copilot Seat Assembly.)

In order to allow for variances in gap width, two snubbers are provided: P/N K673844-11, 0.125-inch (1/8) thick and P/N K673844-13, 0.062 inch (1/16) thick. Both snubbers are made from synthetic rubber sheet, MIL-R-6885, Class II, Grade 60. Cut the snubbers 1-inch square.

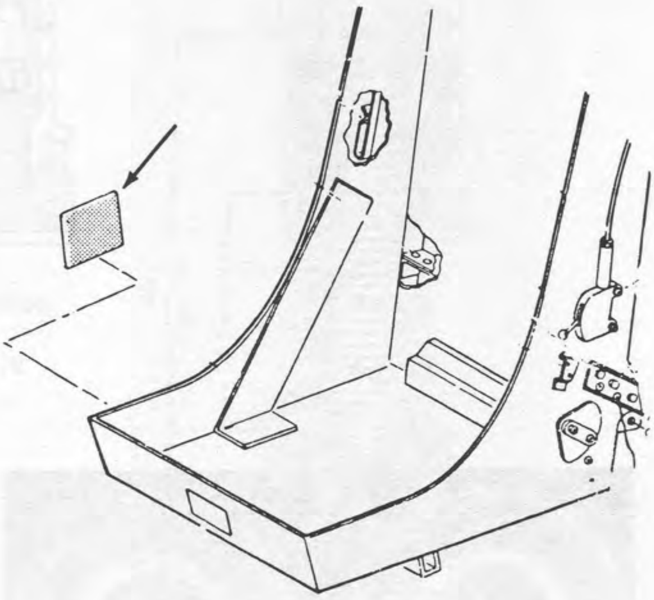
To install the snubbers, proceed as follows:

1. Temporarily install the seat without snubbers.

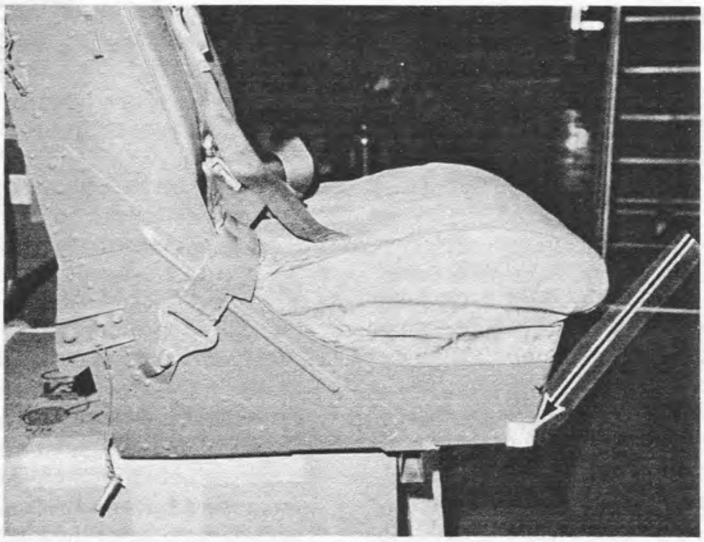
2. Determine the point of possible contact. Most probable area will be between the throttle quadrant cover and the vicinity of the forward lower corner of the inboard side of the seat.

3. Measure the gap between the seat and the throttle quadrant and add 3/16-inch. This sum is the total thickness required to fill the gap and to exert a slight preload to dampen the seat/console vibration.

4. Remove the seat from the aircraft.



5. Select the necessary snubber or snubbers and bond them to the inboard side of the seat. Be sure the snubber is flush with the lower forward corner of the seat. Use adhesive conforming to MIL-A-5092, Type II, or an equivalent.



Note arrow pointing to installed snubber

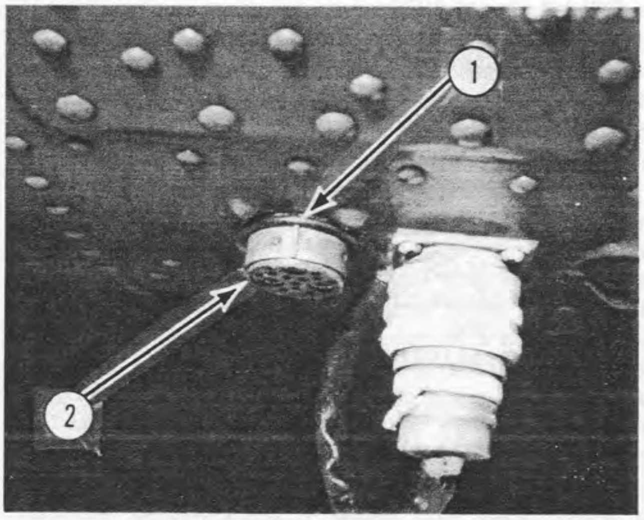
WATERPROOFING AUX TANK HARNESS AND CONNECTOR

N. Hankins, Service Engineer

An O-Ring installed over the fuselage receptacle (Photo A) will effectively seal out water from the aux tank harness connector. The O-ring, MS29561-118, FSN-9Z 5330-827-4961 fills the gap between the fuselage and the aux tank connector as shown in Photo B, and can be used with any harness configuration.

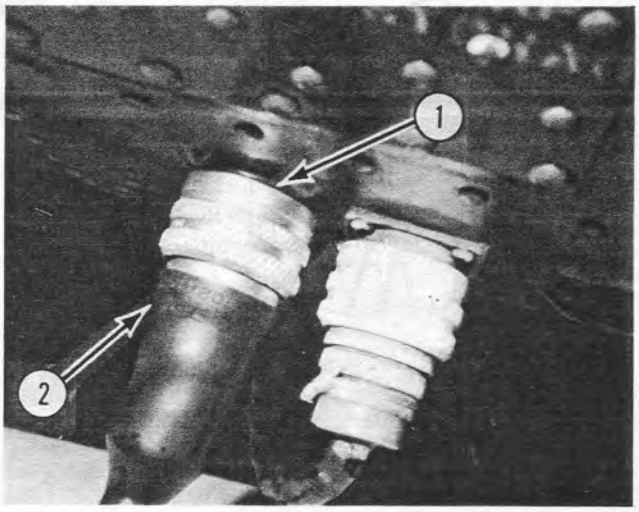
Before installing the O-ring, remove all traces of sealant and other foreign material from around the fuselage receptacle. If sealant is not removed, it could prevent the O-ring from filling the gap or prevent the connector from locking properly when installing.

Photo C shows features which have been added to the new harness, P/N K683025-101, FSN 1RM1560-918-7145BH, to prevent water entry. These features are: shrink boots and joint sealing.



1. O-ring
2. Fuselage connector

PHOTO A



1. O-ring
2. Aux tank connector

PHOTO B

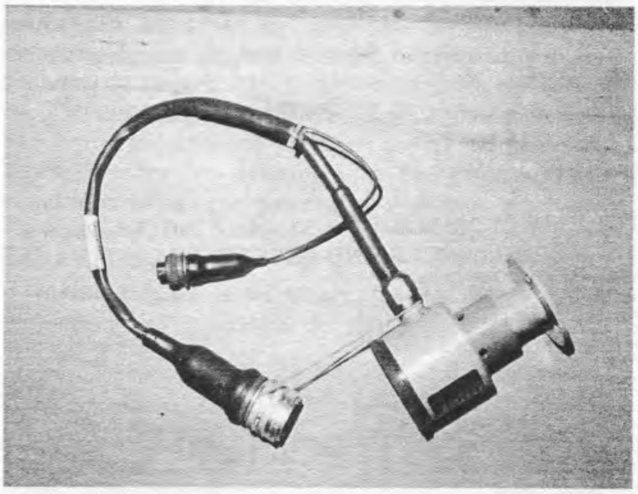


PHOTO C

LOADING THE MK-46 POSITIVE BUOYANCY EXERCISE TORPEDO

During practice missions, the Positive Buoyancy Exercise Torpedo (PBET) is occasionally installed in lieu of the standard MK-46 torpedo. When this occurs, it becomes necessary to remove the main landing gear fairing in order to provide adequate clearance since the PBET is 7-1/2 inches longer than the standard MK-46 torpedo. Remove the main landing gear fairing in accordance with NAVAIR 01-260 HCA-2-2.

H. Zubkoff, Service Engineer

Q. (Applies H-2) What is the correct torque for the blade fold stop bolt?

A. The blade fold stop bolt, part number AN4H42A, should be torqued to 15-25 inch/pounds. This information will be incorporated into applicable manuals by future changes.

W. Wagemaker, Service Engineer

PUBLICATION INFORMATION

This list reflects latest manual changes and technical directives released to the field.

R.H. Chapdelaine, Manager, Service Publications

NAVAIR 01-260HCD-1 — NATOPS FLIGHT MANUAL, Navy Models, SH-2D/SH-2F Helicopters
1 September 1972
changed 1 February 1974

NAVAIR 01-260HCD-1B - NATOPS PILOT'S POCKET CHECKLIST, SH-2D/SH-2F Helicopters
1 July 1973
changed 1 February 1974

NAVAIR 01-260HCA-2-4 — Technical Manual, Maintenance Instructions, Navy Models UH-2C/HH-2D/SH-2D/SH-2F Helicopters, POWER PLANT AND RELATED SYSTEMS
15 February 1974

NAVAIR 01-260HCS-2-4.2 — Manual, Maintenance Instructions, Navy Models UH-2C/HH-2D/SH-2D/SH-2F Helicopters, ROTOR SYSTEM
1 April 1973
changed 1 May 1974

NAVAIR 01-260HCA-2-6 — Manual, Maintenance Instructions, Navy Models UH-2C/HH-2D/SH-2D/SH-2F Helicopters, ELECTRICAL SYSTEM
1 March 1972
changed 15 March 1974

NAVAIR 01-260HCB-4-1 — Illustrated Parts Breakdown, NUMERICAL INDEX AND REFERENCE DESIGNATION INDEX
1 April 1973
changed 15 April 1974

NAVAIR 01-260HCB-4-2 — Illustrated Parts Breakdown, AIR FRAME' Navy Models UH-2C/HH-2D/SH-2D/SH-2F Helicopters
1 June 1967
changed 15 May 1974

NAVAIR 01-260HCB-4-6 — Illustrated Parts Breakdown, TRANSMISSION SYSTEM, Navy Models UH-2C/HH-2D/SH-2D/SH-2F Helicopters
1 June 1967
changed 15 April 1974

NAVAIR 01-260HCB-4-7 — Illustrated Parts Breakdown, ROTORS, Navy Models UH-2C/HH-2D/SH-2D/SH-2F Helicopters
1 April 1973
changed 15 May 1974

NAVAIR 01-260HCB-4-8 — Illustrated Parts Breakdown, RADIO AND ELECTRICAL, Navy Models UH-2C/HH-2D/SH-2D/SH-2F Helicopters
1 June 1967
changed 15 May 1974

NAVAIR 03-25KAM-1 — Manual, Overhaul Instructions, MAIN LANDING GEAR SYSTEM, Navy Models UH-2C/HH-2D/SH-2F Helicopters
15 September 1965
changed 1 February 1974

NAVAIR 03-95D-11 — Manual, Depot Maintenance Instructions, MAIN ROTOR SYSTEM, Navy Models UH-2C/HH-2D/SH-2D/SH-2F Helicopters
15 January 1966
changed 1 April 1974

NAVAIR 03-95D-31 — Illustrated Parts Breakdown, MAIN GEARBOX ASSEMBLY, P/N K671802-1, -3, -5, -7, -105, -107, -205, -207
1 November 1973
changed 15 February 1974

* * * * * * * TECHNICAL DIRECTIVES RELEASED * * * * * * *

This list reflects information released to the customer by KAC for distribution.

SEC/AFC No.	TITLE	RELEASE DATE (KAC)
H-2 Airframe Change 176, Amend 1	Rotor System, IMPROVEMENT OF RETENTION CONTROL PIVOT BEARINGS	9 March 1974
H-2 Airframe Change 181,	Main Rotor System, INSTALLATION OF 101 ROTOR SYSTEM	5 March 1974
H-2 Airframe Change 204, Part 4	LN66HP RADAR SYSTEM, NORTH STABILIZATION	9 March 1974

New LAMPS Training Program Underway

by William Magnan

An audio-visual training program has been launched by the Navy for use by all LAMPS ships, squadrons and trainers. Developed by Kaman Aerospace under the auspices of NAVAIR/NAVSHIPS, the program is initially aimed at indoctrination of fleet (particularly flight deck) personnel into the LAMPS community. Plans call for extension of the program to include training in specific SH-2 aircraft systems maintenance tasks.

The audio-visual system (the commercial identification is Audiscan) consists of a pre-packaged tape cartridge, which contains a pulsed audio tape loop with narration and a 16mm color filmstrip that is timed to the audio tape loop. The cartridge is inserted in a projector, and a simple flick of a switch activates the program. The system is being utilized in the program because of its compactness and flexibility, which makes it ideal for LAMPS-type ships.

Program lengths are held to a minimum, usually 12-15 minutes, centering on a single task performance to accommodate the usual attention span factor. Used in conjunction with approved operating and maintenance manuals, it is expected that the filmstrips — which include photos taken under actual operating conditions, as well as appropriate cartoons and drawings — will be an invaluable aid to personnel requiring refresher training in operation, maintenance or inspection tasks.

Four training films are presently being delivered to all LAMPS ships, squadrons and trainers: **Aircraft Handling, In-Flight Refueling, Aircraft Firefighting** and **Vertical Replenishment.** Here is an example of how the program will assist in indoctrination of fleet personnel:

A sailor who is unfamiliar with LAMPS operations reports aboard a LAMPS ship or squadron. During his indoctrination he views the new Audiscan training films and learns about the LAMPS mission, the importance of handling the helo aboard ship, in-flight refueling, vertical replenishment procedures and aircraft fire-fighting techniques — which may save his life, the lives of the aircrew and those of his shipmates.

Programs covering main and tail rotor systems, ASE (Automatic Stabilization Equipment) and other specific LAMPS equipment maintenance tasks are presently being considered by Kaman and NAVAIR to aid maintenance personnel. Many trouble-shooting and maintenance man-hours can be saved by personnel who refresh their memories by viewing and listening to taped cartridges on a particular system. Of course, no training aid can ever replace the one-to-one communication between student and instructor, but with judicious use of the program — ashore or afloat — training time can be lessened and taped information can be recalled whenever required.

William Magnan is Assistant Manager, Kaman Service Engineering and coordinator for KAC Audiscan programs.

A program is viewed with a simple flick of a switch, which activates the narrated 16 mm color film.

The ARTIST

by William H. Weaver and Bert Howard, Jr.

The sophisticated LAMPS SH-2 aircraft drops rakishly onto the 9° sloped macadam ramp. It settles carefully for a few seconds on its precarious perch, then lifts gracefully into the air. Moments later, from a 20' hover, 13,000 pounds of complicated electronic gear and metallic assemblies, plus 400 pounds of humanity, again hit the simulated destroyer deck in what flight test personnel like to call a "hard landing."

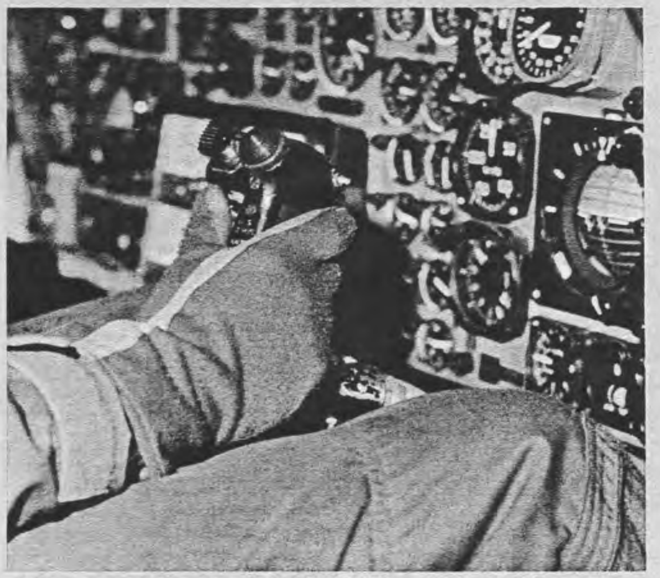
On this particular afternoon, this unusual cycle of events was repeated at least a dozen times. Then, after a few short hours of testing, the pilot made his final landing for the day; the test for the increased strength landing gear (required by SH-2 seaboard operations) was complete. Kaman's ARTIST had once again contributed to a safe, fast and accurate test program.

What is ARTIST? As pictured on these pages you can see that artist is a complex organization of telemetry equipment, computer, printer, plotter and electronics. The name ARTIST is an acronym for **A**utomated **R**eal **T**ime **I**nformation for **S**ystems **T**est.

ARTIST provides Kaman's Test Operations with instantaneous flight and ground data, calculation, analysis, and feedback. Instead of taking days, sometimes weeks, to pass through all of these phases, data is processed in seconds, and the pilot is informed immediately whether he can safely proceed to the next dimension of the parameters undergoing test. Before ARTIST's arrival on the scene, it would have taken several days to analyze and interpret each simulated destroyer landing described above.

What makes ARTIST so versatile and quick-thinking? Let's take a close-up look at her in terms of the functions she performs.

Mr. Weaver is Assistant to the Chief of Test Operations and Customer Service at Kaman and Mr. Howard is a KAC Test and Development Group Leader.



The data trigger starts the ARTIST.

Data Collection

Data collection is handled by a PCM (Pulse Code Modulation) encoder, which is the heart of the Telemetry portion of the system. It will measure simultaneously up to 93 different test parameters at the amazing rate of 500 times a second. Quick thinking? You bet! That's 46,500 measurements *every second*.

Th encoder not only measures each parameter, it also converts these measurements into a series of pulses representing that data. The pulses are transmitted to the ground station by either a radio link for flight tests, or by a coaxial cable for static and fatigue tests.

Ground Station

The ground station organizes the PCM pulses and records the data on magnetic tape. A key feature of ARTIST is that it allows the test pilot to control the operation, which is ideal since the pilot is in the best position to determine when the aircraft is in the desired flight test condition. To an observer, it is impressive to hear (via radio) the pilot, airborne many miles away, readying for the next data point, then suddenly see tape recorder reels spinning and a teleprinter typing important test results.

Across the room a recording oscillograph quickly spews out as many as twenty curving lines, depicting waveforms of selected parameters. At the same time, a test engineer reviews the results, which are tabulated in engineering units (pounds, g's, volts, velocity, etc.), and informs the pilot that all loads are within limits and that he is cleared to move to the next test condition. In some cases, closed circuit television is used as a visual monitor, bringing the test even closer to the engineers.

Data Analysis

Although the flight phase is over, the important task of data analysis has only started. Using a self-contained mini-computer, ARTIST quickly reviews the test data and performs many complex pre-programmed calculations, providing the engineers with further detailed analyses of the particular test.

Data Display

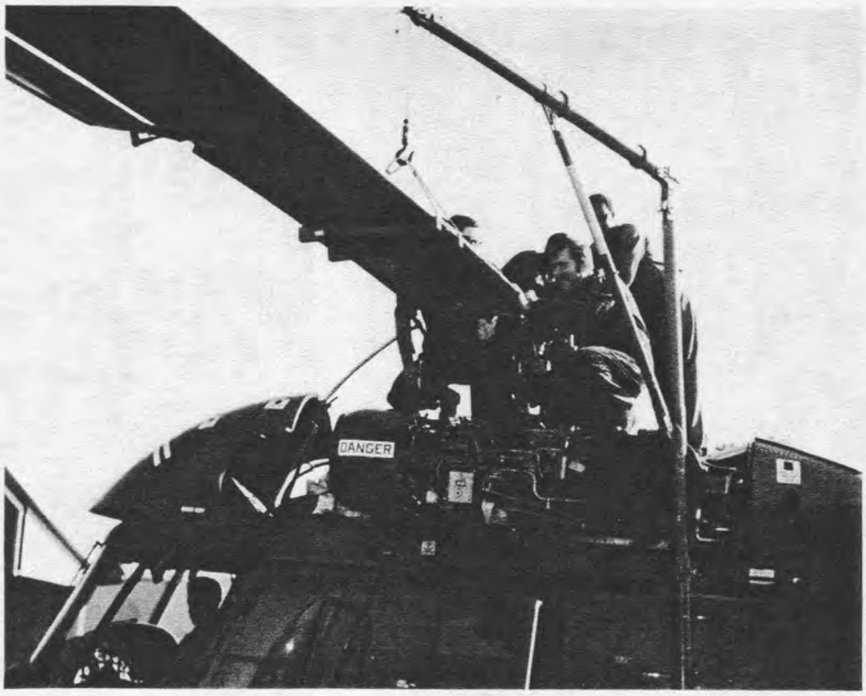
Later, with pen in holder, Kaman's ARTIST begins to draw additional pictures. (Engineers call them plots.) Calibration curves, time history plots, performance curves and spectral frequency displays are typically required for a test. The displays are turned out automatically since ARTIST's plotting device is guided by her computer, which reads the information stored on the magnetic tapes.

Perhaps less spectacular, but vitally important is the role that ARTIST plays during fatigue tests where full-scale, aircraft prototypes and components are deliberately stressed and vibrated, often until failure. Not only are test parameters monitored, but additionally, ARTIST has the capability of shutting down a test immediately should one or more parameters exceed a predetermined tolerance. This instantaneous sensing and response has frequently saved valuable hardware from unnecessary damage or destruction. (cont'd on p. 28)

'...the right combination of the efficiency of the machine and the ingenuity of man.'

Photos by D. Ruggiero

HSL-31's FRAMP Department



Students learning to remove blade with a portable hoist.

by AT2 William E. Clifton

HSL-31's FRAMP (Fleet Readiness Aviation Maintenance Personnel) Department trains replacement helo maintenance crews in the LAMPS detachment concept. The main objective of the FRAMP Department is to ensure that fully qualified maintenance crews are available to the supported squadrons and shore stations.

The department has ten highly qualified career orientated instructors who have an average of over 15 years of naval experience, 4.5 years of H-2 experience and 3.5 years of instructor experience. The instructors plan, supervise and conduct the training received by each maintenance man destined for a Pacific fleet unit that operates or services the H-2.

Each student in FRAMP training receives from 4 to 16 weeks of individualized instruction. All aviation rates and ratings, from the recruit training graduate to the master chief unfamiliar with the H-2 helo, are given the training in their particular ratings required to fully qualify them in the maintenance program. The training is tailored to the student's previous experience and qualifications and the requirements of his ultimate duty station.

Students receive 6 to 9 weeks of formal schooling at NAMTRADET 1071, NAS Imperial Beach, Calif.; the rest of their time is devoted to practical job training in shop, aircraft and ordnance. The shop training consists of instructing students in shop maintenance practices; aircraft training involves actual work on a fully equipped, operational SH-2 helo. The crews perform all maintenance associated with removal and installation of equipment and components; troubleshooting — utilizing appropriate test equipment; and corrosion control requirements. The ordnance training includes weapons and sonobuoy loading/unloading procedures.

During the fiscal year 1973, HSL-31's FRAMP Department trained 73 maintenance personnel, and 147 personnel were trained in 1974.

Det Crew Saves Heart Attack Victim

"Those guys gave me back my life," said TSgt Thomas Mix after being medevaced by Det 3, 40 ARRSq, Ubon Airfield, Thailand, following a heart attack.

TSgt Mix, a member of an explosive ordinance team, had been complaining of severe chest pains. Since the distance from his unit to Ubon Airfield, where medical help was available, was over 18 miles by roadway, Pedro was called to evacuate the patient to Ubon.

Four minutes after arriving at Ubon Hospital, Mix suffered a massive cardiac arrest and was revived only after electrical stimulation. Doctors at the hospital said that if Mix had been brought in ten minutes later they wouldn't have been able to save his life.

Crew members of the Pedro were pilot, Major Thomas Madden; co-pilot, 2nd Lt Thomas Kemper; Sgt. David Southard; and Sgt Oliver Chapel.

Iranian H-43 Crew Helps Rescue Passengers in Jetliner Crash

An HH-43 team played a major role in saving 77 people aboard a Danish-chartered Caravelle jetliner that caught fire at Mehrabad Airport, Tehran, Iran. Nineteen of the 96 passengers and crew aboard the Sterling Airways plane were killed and 47 were injured.

The control tower spotted a fire in the jetliner's wheels while it was on the run-way, taxiing for take-off. Suddenly an explosion tore through the jetliner and it was engulfed in flames.

An HH-43 from the Imperial Iranian Air Force's 11th SAR was the first to reach the site. The rescue crew was dropped, then the Pedro hovered over the burning Caravelle to clear the smoke and beat down the flames. The Caravelle's cockpit and first-class passenger section were completely destroyed by the explosion. The rescue crew cut into the fuselage with acetylene torches and pulled trapped passengers and crew out. Several of the passengers' clothing was on fire and the rescue crew extinguished the flames.

The airport and base fire teams soon arrived, and they were directed by the Pedro as it hovered over the burning jetliner. An HH-43 crew member, MSgt Behashti, gave emergency first aid to the more seriously burned cases. Badly burned women were medevaced to the AF hospital some ten miles away, and the Pedro crew was credited for their survival. In all, 77 people were rescued from the burning jetliner.

For their outstanding skill and courage, the HH-43 crew members have been awarded the Kaman Scroll of Honor. Crew members were: pilot, WO G. H. Zeinali; copilot, WO A. Sayehbarg; 2nd WO M. Shahsavar; MSgt A. D. Aliri; TSgt K. H. Hakimi; and MSgt Behashti.

Thailand-based Pedro Medevacs to Bangkok

Det 12, 40 ARRSq, made two medical evacuations to Bangkok within a five-day period.

A call was received from Capt Thomas Hilsman, flight surgeon, 11th USAF Hospital, U-Tapao, Thailand, requesting a medevac of Mrs. Sandra Watkins to Bangkok. Mrs. Watkins, wife of Sgt Donald Watkins, was suffering from a miscarriage and had serious internal hemorrhaging, requiring immediate surgical attention. With the patient aboard, Pedro 37 proceeded to Bangkok and arrangements were made with the 5th Field Hospital in Bangkok to land at a nearby soccer field where transfer to a waiting ambulance completed the mission. Were it not for Pedro and her crew, Mrs. Watkins would have faced a three-hour ambulance ride over rough roads — a probable difference between life and death.

Five days later, Det 12 was called again for an emergency medevac to Bangkok, this time of a premature baby. A portable incubator was hooked into the Pedro's electrical system and Pedro, with Dr. Hilsman and Lt Beverly Wright aboard, took off at 1945. Because of the emergency, the night flight was flown over the Gulf of Siam, direct to Bangkok. Landing was made at a nearby soccer field, illuminated by automobile lights and night flares, and the baby was transferred to the hospital by ambulance. Dr. Hilsman later notified the pilot that the crew's quick reactions saved the baby's life.

Crew members on the two missions were Capt Hal Schwartz, Lt Ralph McNally and SSgt Gary Brown.

SSgt Gary Brown discusses pre-flight procedures with Lt Ralph McNally and Capt Hal Schwartz. The men made two saves on medevacs to Bangkok.

Coming down on its last flight . . .

the HH-43 touches down.

Presidential Missions End for a Pedro

It has set eight world records. It has made more combat saves than any other aircraft. Men get emotional talking about it. No one has anything but praise for it.

The aircraft, of course, is Pedro — alias, the Huskie, officially the HH-43. Recently, a Pedro, an HH-43F, serial number 60-0289, was retired to a museum. The aircraft, which has been placed on exhibit at the Bradley Air Museum in Connecticut, flew protective coverage missions for the President of the United States.

It was back in January 1962 that 60-0289 was delivered by its manufacturer, Kaman Aerospace Corporation, to the Air Force. The aircraft was first assigned to Detachment 41, Eastern Aerospace Rescue and Recovery Center at Loring Air Force Base in Maine. In August, 1962, the Pedro was transferred to Andrews Air Force Base, Maryland. For the next 11 years the 44th Aerospace Rescue and Recovery Squadron serviced and flew 60-0289 and its sister aircraft 60-0288. During that time, the two Pedros responded to over 2500 aircraft emergencies in the vicinity of Andrews Air Force Base and a total of 35 lives were saved by that Pedro unit.

An important mission of 60-0289 and 60-0288 was to provide airborne crash rescue coverage for all movements of the President of the United States into and out of Andrews Air Force Base and between Andrews and the White House.

The crew for the Presidential missions, in addition to the pilot, consisted of two airborne firefighters, a flight surgeon and a medical technician. When deployed, a 1000 pound Fire Suppression Kit was carried beneath

The Pedro crew is shown below. At right the HH-43 flying protective coverage for the Presidential plane, Air Force One.

the aircraft; the kit was capable of dispensing 690 gallons of fire suppressing foam.

In 1970, this protective coverage was extended to the Vice President on all his movemenets into and out of Andrews. Coverage was also provided to all foreign heads of state who visited Washington, D.C., arriving and departing via Andrews. From April 1962 until March 1973, over 1100 Presidential, Vice Presidential and foreign heads of state precautionary sorties were flown. Some of the more significant of these sorties were President Kennedy's ill-fated trip to Texas and President Nixon's trips to China and Russia.

In a letter dated March 15, 1973, to the personnel of Detachment 6, 44th Aerospace Rescue and Recovery Squadron, President Nixon wrote:

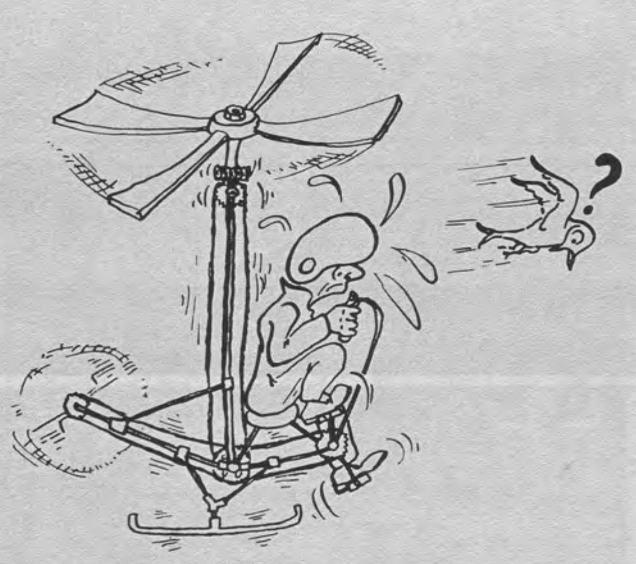
> *As your mission draws to a successful conclusion, I want to take this opportunity to express my deep appreciation for your dedicated service. It has meant a great deal to me and to the members of my personal and official families to know that such capable men and women were helping assure our safety.*
>
> *Mrs. Nixon joins me in wishing each of you success and happiness in the years ahead.*

Taken out of the hangar . . .

Dedicated to informing the public of its aeronautical heritage, the Bradley Air Museum is operated by the Connecticut Aeronautical Historical Association. The museum's collection, the fourth largest in the United States, includes almost 100 aircraft which are displayed in groupings — the Fighter, Bomber, Transport and Vertical Lift Group. In addition to the HH-43F that flew Presidential missions, ten other helicopters are included in the collection.

the HH-43 is placed on exhibit.

The Helicopter
as seen by . . .



The Fixed-Wing Pilot

The Rescued

drawings by R. L. Allen

The ARTIST (cont'd from p. 22)

Although the ARTIST contains complex state-of-the-art electronics, it is important to note that the system has been designed by, and remains under the direction of, a highly skilled team of test engineers, computer programmer-operators, instrumentation technicians, data analysts, and of course, test pilots. In short, ARTIST's success is the right combination of the efficiency of the machine and the ingenuity of man.

Here are just a few of Kaman Aerospace programs which can utilize ARTIST's unique capabilities:

Circulation Controlled Rotor System (CCR)

Under a Navy contract, Kaman is developing an advanced rotor blade system in which compressed air is circulated through the blade to achieve improved efficiency and lift capability, along with an expected increase in speed. (See page 8 for story on CCR.)

Controllable Twist Rotor (CTR)

Extending the servo-flap concept that has been well-established on earlier Kaman helicopters, Kaman is embarked on an Army-contracted program involving analysis, fabrication, and test of an advanced controllable twist rotor.

Dynamic Anti-Resonant Vibration Isolators (DAVI)

A number of programs are currently underway at Kaman utilizing an advanced concept developed by company engineers to isolate complete crew stations, aircraft seats, and even individual electronic components or systems.

Elastic Pitch Beam Tail Rotor (EPBTR)

The aim of this program is to design, test and develop a new helicopter tail rotor system that will improve maintainability and lower costs by eliminating the pitch bearing used in conventional helicopter tail rotor systems.

As you might gather, ARTIST is pretty well booked at Kaman. But occasionally she has some free time — and visitors are welcome.