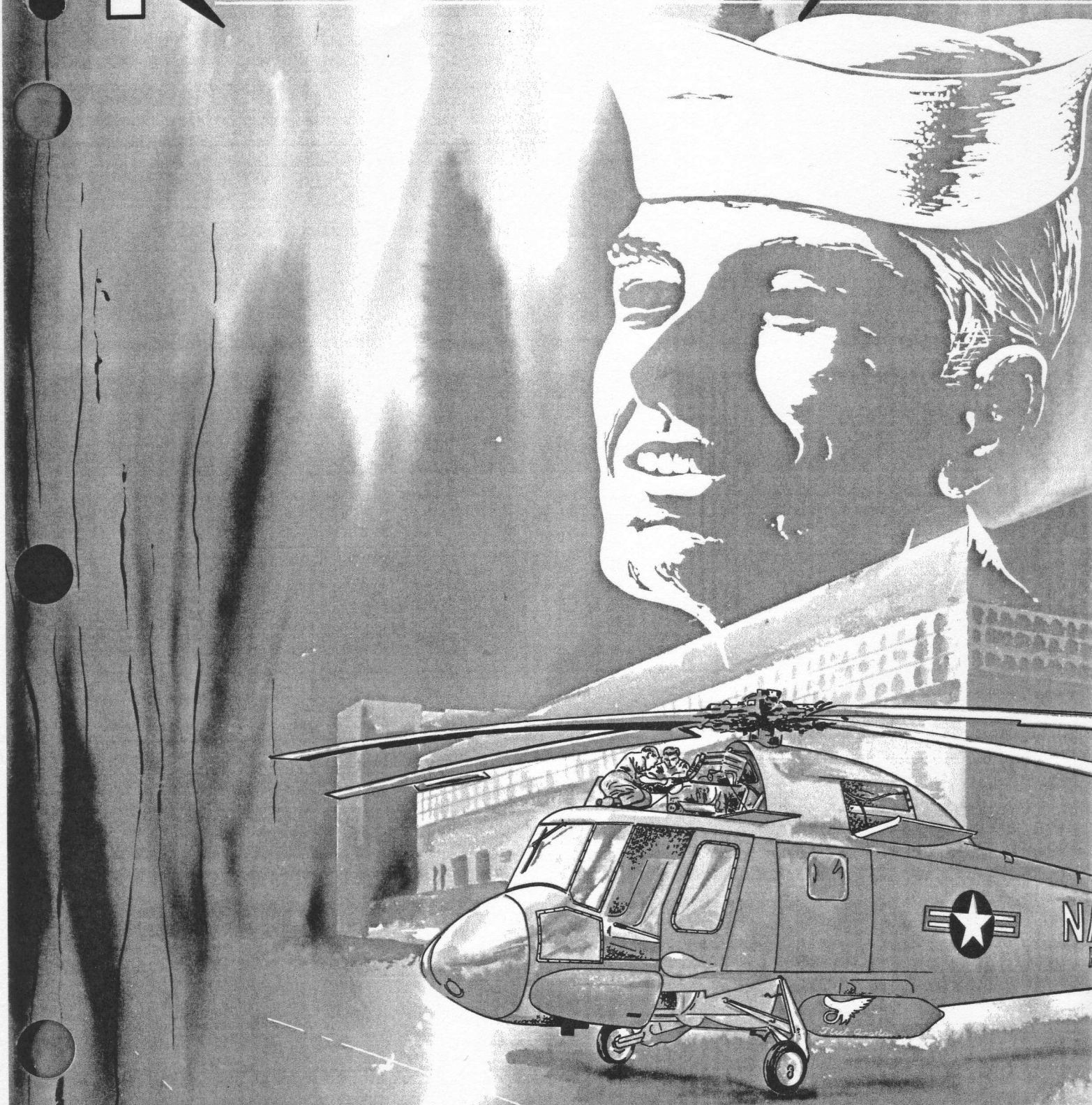
KAMAN Rotor Tips



KAMAN AIRCRAFT CORPORATION

PIONEERS IN TURBINE POWERED HELICOPTERS

AUGUST-SEPTEMBE
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KAMAN Rotor Tips

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In This Issue

THE COVER

Man behind the mission. Symbolic figure is used to portray "Can Do" spirit of HC-2 at NAS Lakehurst, N.J. Squadron personnel have rescued 1477 persons. Cover by Donald D. Tisdale, Service Publications.

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OPERATION MAVERICK

by Robert J. Myer
Customer Service Manager

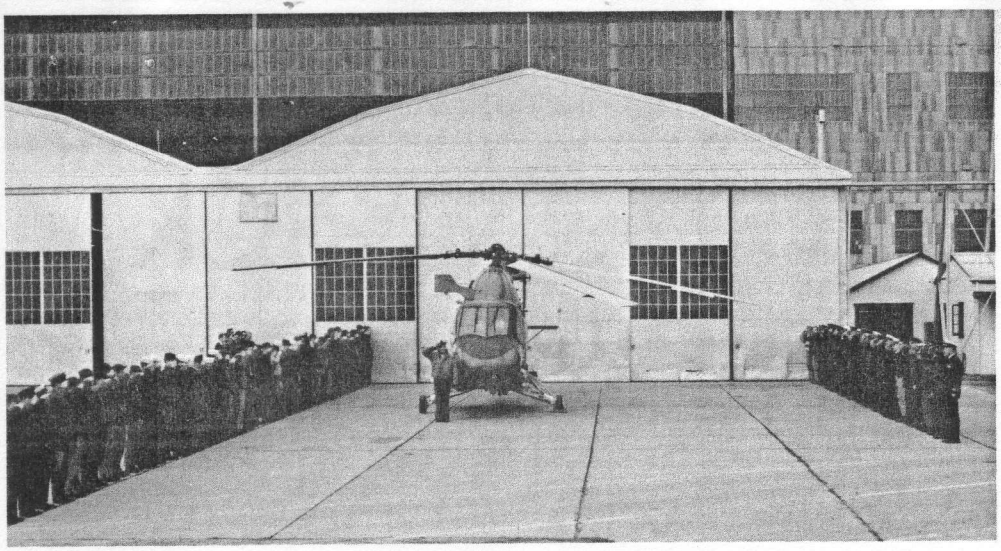
Prompted by enthusiastic reports from service representatives at NAS Lakehurst, N.J., officials from Kaman Aircraft recently visited Helicopter Combat Support Squadron Two (formerly Helicopter Utility Squadron Two) to get first-hand information about "Operation Maverick." Their findings about this unusual program and the "can do" spirit behind it are presented in the following article.

"Operation Maverick" had nothing to do with a Texas-style cookout — but it did involve a recipe based on affirmative thinking which led to a UH-2 SEASPRITE accumulating a pre-set goal of 240 hours flight time during a 23-day period with only minor problems encountered. The ingredients which went into this highly successful endurance program consisted of equal parts of Command "inspiration" and maintenance "know-how" well mixed in a bowl labeled "espirit de corps." It's a formula which HC-2 has used successfully for many years.

Cdr M. M. Gunter, Jr., commanding officer of the squadron during "Operation Maverick," chose this means of expediting evaluation of newly authorized service changes to enable an early lifting of operational restrictions on the UH-2. Commander Gunter's desire for prompt action in evaluating the changes was based on a philosophy shared by all HC-2 personnel — squadron detachments at sea should be aided in every way possible so as to operate at peak capability in their support of fleet operations. If these changes would help in achieving this goal then, the Commander felt, they should be tested and, if found suitable, incorporated without delay.

For proper evaluation it was decided a minimum of 240 hours operating time should be accumulated on the changes as soon as possible. Airframe Change 14 and AFC 62-Rev. A were aimed at providing greater engine FOD protection through the relocation and addition of air inlet screens in the induction system, and incorporation of improved plenum chamber sealing and adjustment provisions. AFC 86 was concerned with installation of an additional hydraulic filter in the Automatic Stabilization Equipment system to protect the ASE actuator from hydraulic fluid contamination which could originate from hydraulic power carts, aircraft sub-systems and even cans of new hydraulic fluid. AFC 58 called for replacement of the oil cooler blower flexible drive shaft with a coupling assembly and Interim Airframe Change 84 provided improved rotor retention hardware.

Helicopter BuNo 150177, which bears squadron number 32, was singled out as the test aircraft for the special change evaluation program. Since it would be different from all the rest, the helicopter was nicknamed "Maverick" and the designation was carefully painted in a conspicuous place on the aircraft. The new name and prominence was a decided promotion for, just prior to the start



HAIL TO THE "QUEEN"— In mock ceremony, Chief Charles A. Ogilvie acknowledges salutes of HC-2 personnel after Number 32 is placed in "up" status, giving squadron 100 percent UH-2 availability.

of the program, the aircraft bore the unenviable title of "Hangar Queen." It was honorably discharged from this long-standing status to provide LCdr I. B. "Pete" Clayton, HC-2 maintenance engineering officer, and his crew with 100% squadron UH-2 availability. Besides, it was decided, why not subject the squadron's "least favored" SEASPRITE to this grueling test.

The change evaluation program established by the HC-2 Operations and Maintenance sections consisted of an around-the clock operation which encompassed one three-hour flight and seven two-hour flights. An average of one-half hour turn-around maintenance time was allowed between flights, plus any heavy or non-scheduled maintenance that might arise. The programmed 17-flight hours a day actually averaged out to slightly more than 14 hours flown daily for 17 operational days out of a 23-day calendar period. Holidays, weather and one inactive weekend toward the end of the program accounted for the non-operational days. Unscheduled maintenance consisted primarily of correction of a transmission oil leak, replacement of a failed Nf tach drive, No. 2 generator protective panel difficulties (later traced to a malfunctioning generator), and replacement of a delaminated tail rotor blade. The total direct MMH/FH (Maintenance Man Hours/Flight Hours) during this program was established as five to one.

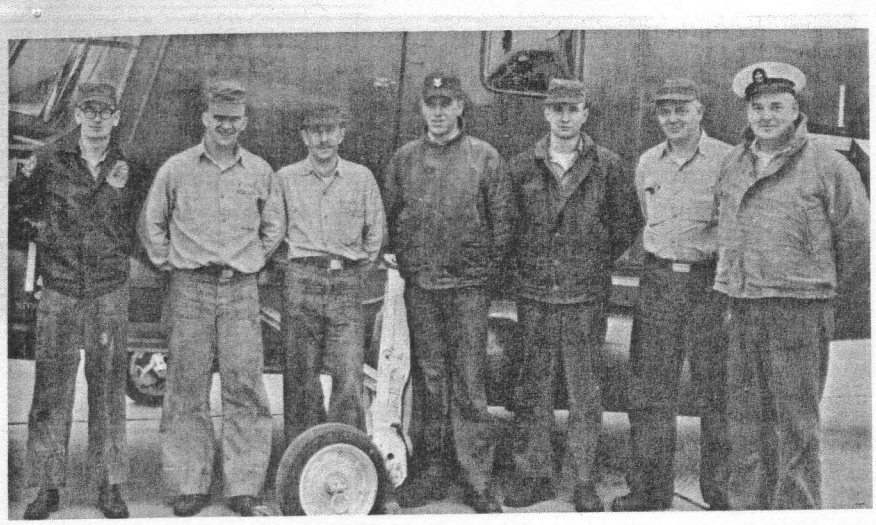
Maintenance coverage during "Operation Maverick" consisted of three shifts under the direction of Charles A. Ogilvie, ADRC; John E. Burns, AMHC; and Walter T. Shappley, Jr., AMS1. The 2nd and 3rd shifts included a compliment of seven men each. While their primary concern was with "Maverick," they also carried on their regular maintenance activities as well. The 1st shift utilized general day shift manpower as required. HC-2 had no extra men to devote exclusively to such a program but, as on past occasions, relied on careful planning and scheduling to meet the challenge.

Despite the extra work, maintenance personnel soon developed a personal interest in the program and "How's Maverick doing?" was a question heard frequently as shifts changed. As the flight hours continued to pile up, this feeling spread throughout the squadron — HC-2's "can do" spirit was proving itself again. While HC-2 takes justifiable pride in "Operation Maverick," LCdr Clayton, Chief Ogilvie and other squadron personnel are quick to point out that the squadron received considerable assistance in the program. They had nothing but praise for the support given by Operations, the fuel farm, tower and weathermen, crash crews, and other station personnel.

Although it is true that a single evaluation cannot be considered an adequate sampling of any significant change, the results of "Operation Maverick" were considered most rewarding. No power losses or other indications of FOD were experienced; no Barometric/Altitude hold problems encountered, nor were there any ASE collective servo valve or other hydraulic oil contamination symptoms reported; the new solid oil cooler blower drive shaft was okayed by KAC engineering for another 240 hours of operation; and the IAC 84 retention hardware operated satisfactorily for the full 240 flight hours.

The group of visitors from Kaman Aircraft was taken on a tour of the hangar areas and, after watching squad-

NO TIME WASTED— Turn-around maintenance crew waits to pounce on "Maverick" after one of seven daily two-hour flights. In foreground is a new relay of pilots ready to swing into the cockpit.

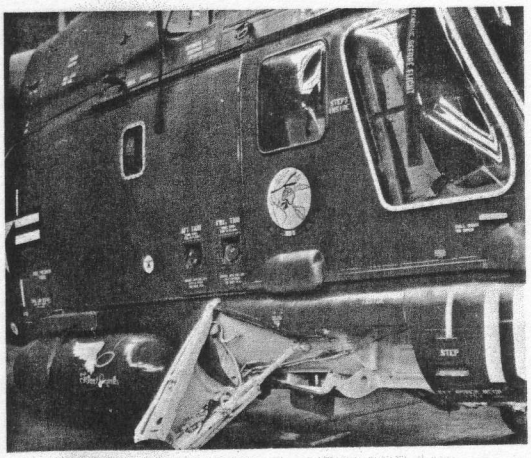


'CAN DO' CREW—Chief Ogilvie with some of the maintenance personnel who worked on "Maverick." Left to right are G.M. McKeon, AMH3; C.C. Fink, AMS1; C.J. Miller, AMS2; L.E. Gable, AE2; G.A. Clifton, ADR3; and D. F. Stiefel, ADJ1. Below, LCdr "Pete" Clayton, HC-2's maintenance engineering officer, receives congratulations from Cmdr M.M. Gunter, Jr., upon successful completion of "Operation Maverick." (USN photos)

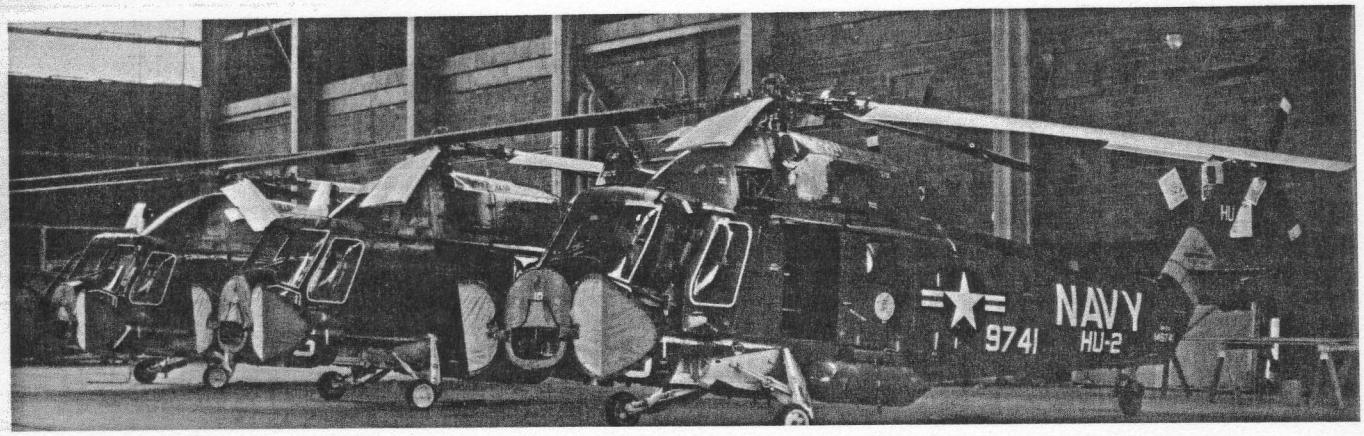
ron day-to-day operations, had a much better understanding of the spirit which inspired and carried "Operation Maverick" through to its successful conclusion. Many military activities have shown that the Marines do not have the corner on "esprit de corps," but nowhere was it more apparent than within HC-2. Here was an outfit which took obvious pride in its work. The cleanliness of the aircraft storage and maintenance hangars, as well as the outstanding appearance and condition of the aircraft, hit the visitors right between the eyes. The subtle, dressed-up treatment given the H-2's by incorporation of a white border on the forward glass panel edges, display of the colorful squadron mission symbol on the fuselage and the newly-conceived "fleet angel" wings emblazoned on the sides of the aux tanks would instill pride in the most passive individual. The work being performed on helicopters in the hangar and on the line was carried on in that business-like, orderly manner which spells PROFESSIONALISM to anyone connected with aircraft or the aircraft industry.

The results of HC-2's attitude are readily apparent in the aircraft maintenance records. Availability shows a definite increasing trend despite the steady drain of trained personnel needed to meet continuous heavy detachment deployment schedules and a personnel turnover which ran as high as an estimated 50 percent during the past year.

Primarily responsible for this impressive maintenance operation is LCdr Clayton and his staff. The Lieu-



INSPIRING SIGHT—The pride which HC-2er's take in their aircraft and mission is readily apparent in these photos. Note the like-new appearance of the helicopters, the dressed-up look given by the addition of borders around the glass panels and the insignia proudly proclaiming the squadron's mission. Despite their sparkling appearance, these are working aircraft which merely reflect HC-2's philosophy that good maintenance and cleanliness go hand-in-hand.



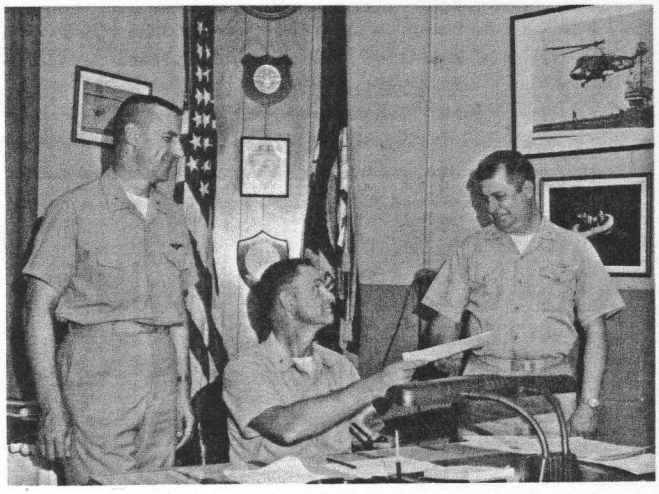
PERSONAL INTEREST— LCdr Clayton, William Wells, KAC senior service representative at HC-2, and Chief Ogilvie are shown during visit to the flight line.

tenant Commander is an inquisitive officer who would rather be out sticking his nose into the innards of an aircraft undergoing maintenance or kicking around possible problems with other pilots than stay chained to his desk. This personal contact may not be his entire formula for success as maintenance engineering officer, but it appears to play an important part in the results evident in the HC-2 maintenance operations.

What is the motivation which inspires LCdr Clayton and other HC-2er's to continually strive for greater aircraft availability? Why do they have this "can do" attitude despite the heavy personnel turnover which could be used as an excuse to turn out less or slip-shod work? The answer is simple — availability means lives saved and it's their job to see that helicopters are ready when needed. For most squadron personnel this knowledge stems from personal experience and background. Take three of the enlisted men who participated in "Operation Maverick" for example. Chief Ogilvie, a "golden shellback" with almost 24 years service, has served aboard eight different carriers. When he began his Naval career there were no "angels" flying plane guard to pick up a downed pilot or seaman overboard, and the chances for survival were slim. Chief Burns, with 17 years in the Navy, has seen duty aboard four carriers while with HC-2 and service with several other squadrons. He well knows the importance of helicopter availability — so does Shappley, first class petty officer, with 13 years service including duty aboard two carriers and with two other squadrons besides HC-2.

LCdr Clayton, head of the maintenance team, is also an old timer in this business. The Lieutenant Commander, who began his Navy career flying patrols in the Aleutians and Philippines during World War II, knows what a tremendous help a helicopter is in locating that tiny orange life raft or downed flyer on the vast face of the ocean. Even if he weren't both a fixed-wing and helicopter pilot, LCdr Clayton would be availability-minded through training and experience. He attended maintenance officers and aviation electronics schools and has served as maintenance officer with two other units besides HC-2.

The HC-2 maintenance organization is not only fortunate in having a capable and dedicated staff, but also in having a sympathetic, knowledgeable, and effective squadron management in the persons of Cdr Glenn E. Kemp, squadron C. O., and Cdr Glenn E. Skinner, Jr., executive officer. Commander Kemp recently took over the helm of HC-2 from Commander Gunter after serving ten months as HC-2's executive officer. His Navy background covers both fixed-wing and helicopter operations in a broad spectrum of duties including a tour as maintenance officer of an anti-submarine helo squadron. Commander Skinner, who started his Navy career as an enlisted man, has also seen active duty as both a fixed-wing and helo pilot on many carrier cruises. He is currently serving his second tour with HC-2 and is, therefore, eminently familiar with all aspects of the squadron operation.



GOOD NEWS—LCdr Clayton submits availability report to Cdr Glenn E. Kemp, HC-2's C.O., as Cdr Glenn E. Skinner Jr., looks on.

HC-2 helicopters and crews are constantly at sea in many parts of the world. Detachments have made the trip around the Horn, traveled the Panama and Suez Canals, operated with the first nuclear tasks force on its voyage around the world, and have been a thousand other places

continued on page 16

DAILY MEETING— Part of HC-2's efficiency stems from the meeting held each day in the pilots' ready room. Here suggestions, gripes, problems, informal progress reports and so on are aired for appropriate action.

Timely Tips

Locating Oil Leaks (UH-2, HH-43B, HH-43F)

To pinpoint elusive oil leaks, first clean the suspected area thoroughly, then dust with talcum powder or spray with non-flammable, white Zyglo developer (ZP9) from a 12-ounce pressure can onto the probable leak area. The developer forms a powder when it drys but is not as likely to be blown off as talcum. Start the engine and during runup the oil leak will show up on the white background, indicating the source.

J. D. Elliott, Field Service Representative

Heat Shield Replacement (UH-2)

H-2 Airframe Change 64 directs replacement of the present heat shield, P/N K670008-3 or -5, with a new improved heat shield, P/N K670008-7. The following instructions will facilitate installation of the new heat shield which is furnished as a kit per Airframe Change 64. (1) Attach the aft bracket, P/N K670008-101, to the forward face of the engine second stage turbine case (exhaust casing). Hold the bracket inboard (away from the drive shaft) and tighten the bracket mount bolts. (2) Install the two(2) special bolts, P/N K670023-11, in the forward bracket, P/N K670008-33, with the heads facing forward. (3) The forward bracket, P/N K670008-33, is attached to the forward face of the engine flange (1st to 2nd stage turbine case). While guiding the bracket into this position, slide the shanks of the two special bolts aft, through the two corresponding holes in the forward clip on the heat shield. This forward mount arrangement allows for expansion and contraction and will eliminate bracket failure, distortion of the heat shield and chafing against the drive shaft. (4) The distance between the heat shield and the engine is not critical and need not be held to any specific clearance. The critical clearance is that between the heat shield and the drive shaft and should be no less than 1/8 (0.125) inch. If installed as described above, the proper clearance will be obtained.

H. Zubkoff, Service Engineer

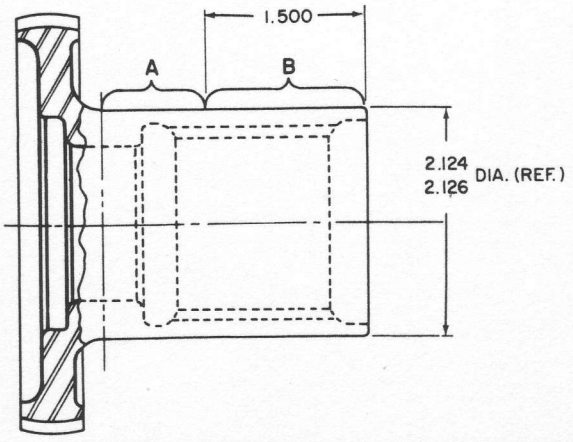
Strut and Tire Servicing (UH-2, HH-43B, HH-43F)

Since oleos and tires are essentially cushioning devices, the importance of proper strut and tire servicing should never be minimized. Too much air and/or oil will cause "hard" struts and tires with resultant shock loads transmitted to the airframe. Conversely, too little air and/or oil results in "soft" struts and tires with resultant aircraft ground instability. Soft struts may also bottom easily on landing which will give the same effect as hard struts in that the load is transmitted to the airframe. During servicing, maintenance personnel should always take precautions when working on any normally pressurized component. Be sure that it is deflated or properly discharged and when a high pressure air bottle is used for inflation, be certain it is provided with gages and a regulator to indicate bottle pressure and control servicing pressure. An air bottle without such equipment is like an armed bomb with a hair-trigger firing device!

P. M. Cummings, Service Engineer

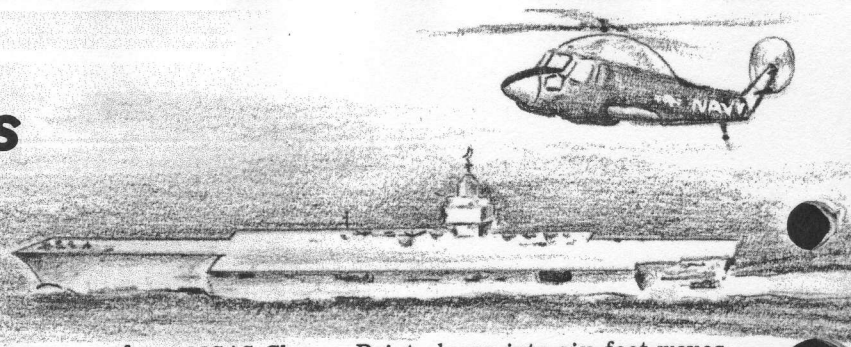
Main Drive Coupling Aft Hubs (UH-2)

Main drive coupling aft hubs (Zurn P/N 34203) occasionally are subject to circumferential scoring due to rubbing contact with improperly adjusted firewall heat shields. Discrepant hubs may be reworked, see drawing, by blending within the following limits: (Damage not cleaned-up by permissible rework is cause for hub scrappage.) "A" zone — Maximum depth of blend to be 0.005 inches. Minimum blend radius to be 0.12 inches. "B" zone — Maximum depth of blend to be 0.012 inches. Minimum blend radius to be 0.12 inches. Exposed steel surfaces in reworked areas must be protected, preferably by cadmium plate, but other processes such as zincalate are acceptable. The above information will be incorporated in the next revision to NAVWEPS 03-95D-10.



F. E. Starses, Service Engineer

SEASPRITE ACTIVITIES



...Cpl Lynn K. Radcliffe, Marine UH-2 SEASPRITE crewman from MCAS Cherry Point, leaps into six-foot waves driven by 35-knot winds off North Carolina Coast in vain attempt to rescue fisherman floating beneath surface of water. Finds man is beyond help and almost becomes entangled in net or rope near boat. Fights way free and is taken aboard SEASPRITE. Second fisherman rescued minutes later, then Corporal Radcliffe leaps into rough seas again in vain attempt to recover body of drowning victim. Capt Gerald E. Harbison, pilot of UH-2 and SSgt Fredie S. Hamel, other crewman.

...SEASPRITE crew from HU-2, NAS Lakehurst, N.J., makes night landing in hospital parking lot to pick up small boy, suffering from severe body burns, for air evacuation to McGuire AFB and waiting Air Force transport. Manning mercy helicopter are Lt William S. Munro, pilot; Lt(jg) Paul G. Carroll, copilot; and W. V. Larmie, Jr., ADJ2, aircrewman.

...RADM D. G. Baer among eight persons picked up from disabled Albatross by SEASPRITE crew from HU-1's Det Mike aboard USS Ranger in South China Sea. Mission carried out without incident and described as "routine." UH-2 pilot is Lt(jg) Glen A. Koelling; copilots are Lt(jg) Robert G. Nowak and Lt(jg) Terrance E. Garrison; crewmen, Roy W. Moore, AE3; and R. E. Brim, ATR3....SEASPRITE crew from HU-1's Det Echo aboard USS Bon Homme Richard rescues injured pilot after plane crashes into water near carrier. UH-2 crewman goes "down the wire" to assist and survivor hoisted to safety. Aboard helicopter are Lt(jg) James C. Brady, pilot; Lt(jg) Elmer K. Williams, copilot; B. C. Revels, AE2 and G. E. Morgan, PR3, crewmen.

...UH-2 crew from NS Adak, Alaska, makes 100-mile overwater flight through snow showers and fog to pick up ill sailor from Liberian freighter. Hover established 60 feet above violently pitching deck of vessel wallowing in 20-foot waves. Helo 30 feet below tops of masts and rescue further complicated by stack gas and turbulence caused by erratic movements of ship's superstructure. Sailor hoisted aboard and UH-2, dodging snow showers all the way, makes way safely to hospital where landing made in parking lot. As soon as helo lands at hangar, snow hits and lowers visibility to zero. Sharing in hazardous mission are Lt William H. Sumrall, UH-2 pilot; Ens Robert H. Hamel, copilot; James F. Daughtry, AE2 and Jimmie D. Petty, AMSAN.

...UH-2 crew from Det 42 aboard USS Franklin D. Roosevelt rescues T-28 pilot after crash near carrier. HU-2's SEASPRITE crew consists of Lt(jg) Oscar M. Harper, pilot; Lt(jg) Douglas E. Behm, copilot; and Olliver B. Lambert, ADJ3; and Joseph V. Tomlin, Jr., ADJ3, crewmen....SEASPRITE crew from HU-1's Det Lima aboard USS Hancock joins in rescue of survivors after helo from another ship settles in South China Sea. Aboard rescue UH-2 are Lt(jg) J. M. Fagundes, pilot; Lt(jg) H. A. Thienes, copilot; and H. D. Pennington, ADJ3, crewman.... Pilot whose A-1H lost power on test flight rescued by Det 60 UH-2 aboard USS Saratoga after he ditched in the Mediterranean. SEASPRITE piloted by Lt A. E. Gover and Lt(jg) H. T. Brandon. Survivor hoisted aboard by B. R. Evans, ADRAN, while other crewman, L. E. Loveless, ADRAN, stands by in "wet suit" in case pilot needs assistance in water.

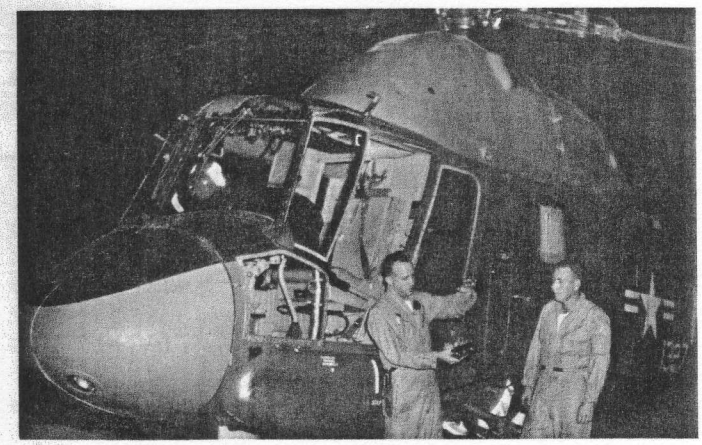
...Two of four crewmen who bailed out of crippled aircraft and landed in South China Sea rescued by SEASPRITE crew attached to HU-1's Det Delta aboard USS Coral Sea. Other two survivors also picked up. Manning rescue UH-2 are Lt(jg) R. A. McDaniel, pilot; Lt(jg) D. L. Kinsey, copilot; L. W. Kerns, AMS3; and M. J. Austen, ADJ3, crewmen....Sailor swept overboard by hose during refueling operation safely aboard Det Delta SEASPRITE two minutes later. Helo on photo hop at time of mishap. Pilot of UH-2 is Lt(jg) J. E. Linquist; Cdr Kimmons, USS Coral Sea AirOps officer, copilot; S. W. Richardson, ADJ3, crewman.

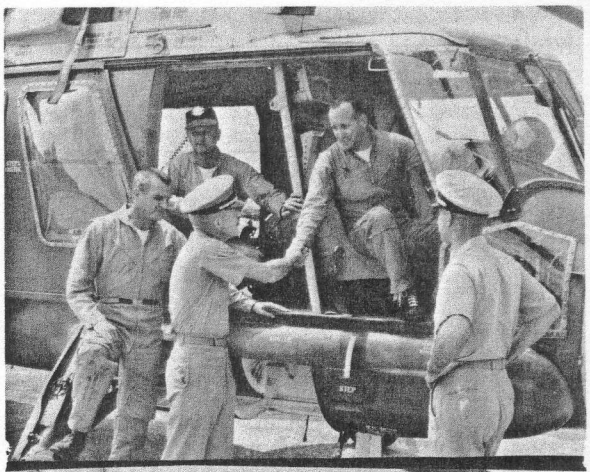
...SEASPRITE crew from Det Lima, HU-1, aboard USS Hancock, rescues sailor after he falls overboard during refueling operation. UH-2 pilot is Lt(jg) Jon W. Walker; copilot, Lt(jg) Craig B. Kaul; crewmen, A. P. Berthelet, ADJ3 and W. F. Carlson, ADJAN....Marine pilot who ejected from crippled plane rescued from Chesapeake Bay by UH-2 crew from SAR, NAS Patuxent River, Md., soon afterward. Manning SEASPRITE are Lt Larry W. McGuire, pilot; Gary Stephens, ADJ2; and Thomas Hamilton, ADJ3, crewmen....SEASPRITE crew from HU-2's Det 38 aboard USS Shangri-La rescues sailor who fell overboard from number three elevator. UH-2 crew consists of LCdr Joseph L. Dugas, pilot; Lt(jg) Craig M. Forsgren, copilot; Allen R. Wells, ADR2 and David C. Moehnke, AE3, aircrewmen....Pilot who ejects from burning aircraft 11 miles from USS Shangri-La rescued from life raft minutes later by UH-2 crew from Det 38. Angel pilot is Lt(jg) Louis H. Petersen; Lt(jg) Alfred J. Banford, copilot; Charles P. Palmer, ATN3; and Edward M. Coolen, ATR3, aircrewmen.

...Three men in boat missing overnight located 15 minutes after sunrise launch of SEASPRITE from HU-1's Det Lima aboard USS Hancock. Boat found beached seven miles from NAS Cubi Point, P. I. and occupants airlifted from makeshift camp. Lt(jg) Jon W. Walker, UH-2 pilot; Lt Duane M. Rubink, aircraft commander; E. D. Hilty, ADJAN; and V. G. Cobb, AA; crewmen.

KEY WEST RESCUE—Shown is the UH-2 crew from NAS Key West, Fla., which plucked a critically ill man from the fantail of a civilian tanker 35 miles offshore. Oxygen was administered during the return flight and the patient later recovered. Standing are LCdr L. F. Bowman, pilot, and Lt C. A. Fargason, flight surgeon. Crewmen are P. E. Culbreath, HM3, and C. Smith, AMH2. LCdr G. L. Crowser, copilot, was on another flight at time the photo was taken. (Official USN photo)

HU-2 AIDS GREEKS—Two Greek fishermen, reported missing when their small boat failed to return home, were airlifted from an island in the Southern Aegean Sea by a UH-2 crew from HU-2's Det 38 aboard the USS Shangri-la. After more than two hours of searching, the pair was spotted from a SEASPRITE manned by LCdr J. E. L. Dugas, pilot; Lt(jg) R. D. Toombs, copilot; S. P. Sinkovich, AMH3; and C. P. Palmer, ATN3, crewmen. After refueling, the rescue was carried out without incident by a UH-2 piloted by Lt(jg) L. H. Petersen and Lt(jg) A. J. Banford. Sinkovich and Palmer were crewmen. The rescuees are shown being greeted aboard the Shangri-la by Commander Dugas as Lieutenant Petersen watches from the cockpit. (Official USN photo)





RESCUE AND ARRIVAL—Lt Rodney N. Whalen shows Carl L. Terrell, ADR2, how he maneuvered SEASPRITE to avoid the pitching 25-foot mast and antenna of a fishing boat during emergency evacuation of its seriously ill skipper. Terrell operated the hoist during the rescue which took place in the Gulf about 50 miles from Sherman Field, NAS Pensacola, where the SAR unit is based. The patient was treated during the return flight by Lt R. M. Hughes, flight surgeon. In photos at right, Lieutenant Whalen takes part in another operation — beginning of UH-2 coverage at NAAS Whiting Field. The SEASPRITE was sent to Whiting from NAS Pensacola to increase SAR effectiveness at Whiting during the daily 14-hour flight operation. Rounding out the UH-2 crew is J. W. Mitchell, ADJ2, mechanic, and E. Hazelwood, HM1, medic, both from the auxiliary air station. Lieutenant Whalen and crew are shown receiving a welcome from LCdr L. J. Liebe, assistant operations officer, and Lt D. E. Rollings. The UH-2 pilot points out a few items of interest on the SEASPRITE to Cdr T. W. Suther, operations officer. (Official USN photos)

Q's AND A's

If you have a question regarding Kaman Aircraft maintenance, send it along to Rotor Tips. The Service Department's engineers will be glad to answer it.

Q. (Applies HH-43B, HH-43F, UH-2) WHAT IS MEANT BY THE TERM "BOXING THE CONTROLS?"

A. This is a check to determine if any interference exists in the flight control system. The collective stick is placed in both extreme and various intermediate positions. While in each position the directional pedals and cyclic stick are moved to all extreme combinations. Any binding or roughness experienced while "boxing the controls" should be investigated further, and corrected.

P. M. Cummings, Service Engineer

Q. (Applies HH-43B, HH-43F) WHAT ADVANTAGES ARE GAINED BY WAXING THE ROTOR BLADES AND FLAPS?

A. Wax on the blades and flaps not only provides protection for the finish, but also makes cleaning a less time-consuming job because water, dirt, smoke, etc., will not adhere as readily on a waxed surface. Several recent reports indicate that the wax provides a really significant protective coating. For example, on one aircraft the flaps on one set of blades had been waxed, the other set had not. The flaps which had not been waxed were found with the fabric peeled after a flight through a driving rainstorm. The waxed flaps came through in fine shape. It takes a lot less time to wax than replace blades — and is less costly from a "down-time" point of view.

W. J. Wagemaker, Service Engineer

Q. (Applies HH-43B, HH-43F, UH-2) IN ADDITION TO CHECKING THE GENERAL CONDITION OF COMPONENTS AND THE SECURITY OF ATTACHING HARDWARE, WHAT ARE SOME OF THE TELLTALE SIGNS OF IMPENDING TROUBLE WHICH AN EXPERIENCED MECHANIC LOOKS FOR WHILE INSPECTING THE HELICOPTER?

A. An experienced mechanic looks for: excessive fuel, oil, and grease leaks; discoloration or finish blistering which is usually associated with an overheating condition; black lines on aluminum surfaces which can indicate the beginning of a crack; whitish color under fiberglass which indicates a void; white crazing lines which indicate a crack or surface failure; defects, such as lines in finish which, especially in wood, can foretell of cracks developing underneath; buckled or distorted skin which indicates possible damage underneath; rubbing or chafing marks which indicate something has shifted.

N. E. Warner, Service Engineer

Q. (Applies UH-2) WHY IS IT IMPORTANT TO PROPERLY SPACE THE SERVO FLAP PIVOT BEARINGS?

A. Proper pivot bearing spacing is important to ensure that no bind occurs during operation. Due to centrifugal loads in flight the flap moves outboard. Improper spacing can, therefore, allow contact between moving and non-moving parts which will result in a bind and subsequent track problems. Check NAVWEPS 01-260HCA-2-5 — Installation of blade flap assembly — for proper spacing.

W. J. Wagemaker, Service Engineer

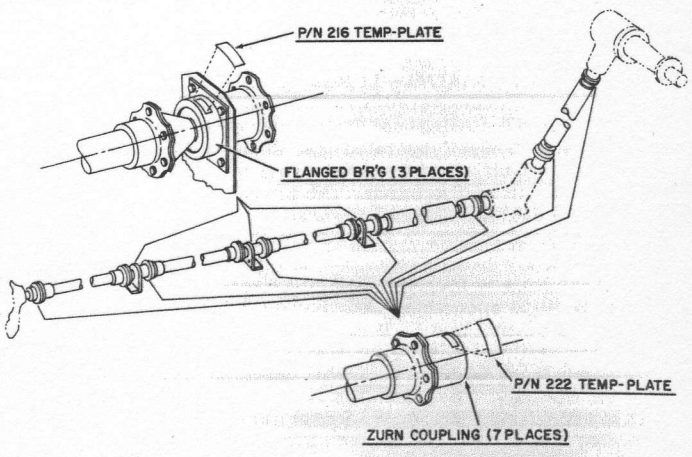
Q. (Applies HH-43B, HH-43F) IS IT PERMISSIBLE TO ROTATE THE BLADES WITH THE TEETER LOCKS INSTALLED? IF SO, WHAT PRECAUTION SHOULD BE OBSERVED?

A. It is permissible to rotate the blades with the teeter locks installed; however, be sure that the teeter locks are installed with the ears 180 degrees opposite and that the locks are securely tightened to preclude their slipping down the shaft. In one reported instance, a teeter lock slipped down the shaft and caused one droop stop to disengage in the process. The blades were later rotated without first checking the droop stops and the blades were damaged. The position of the droop stops should always be checked before blade rotation. Incidentally, incorporation of TCTO 570 modifies the teeter lock to eliminate the prime cause of slippage as well as to make it useable on all dash-number rotor hubs. If the blades are rotated with the teeter locks installed care should also be taken to ensure that the red streamers attached to the locks do not snag on the surrounding structure.

N. E. Warner, Service Engineer

Q. (Applies UH-2) WHAT IS AN EASY WAY TO REMEMBER THE CORRECT POSITION OF THE TEMP-PLATES DURING TAIL ROTOR DRIVE SHAFT INSTALLATION?

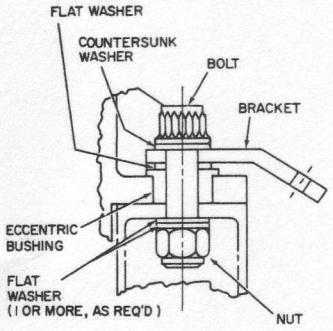
A. Remember: "216's on flanged bearings and 222's on Zurn couplings." The total number of plates to be installed includes three of P/N 216, and seven of P/N 222. The correct position of each is shown on the drawing below. This information will be included in the next revision to the Maintenance Handbook.



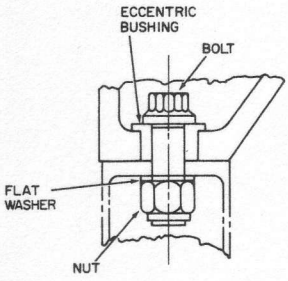
F. E. Starses, Service Engineer

Q. (Applies UH-2) WHAT HARDWARE SHOULD BE USED WITH ACCESSORY GEARBOX ATTACH BOLTS?

A. The following hardware is used on the upper attach locations: Flat Washer, AN960-616; Countersunk Washer, MS 20002C6; Bolt, NAS626-16; Bracket, K636078-11 (LH) and -13(RH); Nut, EB-064; Flat Washer, AN960-616 (1 or more as required); Eccentric Bushing, K674265-11. On the lower attach locations, use Bolt, NAS626-10; Eccentric Bushing, K674265-11; Flat Washer, AN960-616; Nut, EB-064. The drawings illustrate the proper installation. This information will appear in the next revision of NAVWEPS 01-260HCA-4-2.



TYPICAL UPPER ATTACH LOCATIONS



LOWER ATTACH LOCATION

F. E. Starses, Service Engineer

Q. (Applies HH-43B, HH-43F) WHY IS THERE SUCH A NOTICEABLE DIFFERENCE IN THE AMOUNT OF PEDAL DISPLACEMENT REQUIRED, FOR CERTAIN DEGREES OF BANK, IN A COORDINATED TURN WITH AND WITHOUT THE DSAS OPERABLE? THIS APPLIES TO AIRCRAFT WITH SERIAL NUMBERS PRECEDING 64-14213.

A. The difference (sometimes as much as 2 inches) is caused by the DSAS yaw rate gyro. In a normal turn, DSAS "off" and at any given degree of bank, the turning impetus is provided by the rotors via differential collective and differential cyclic control inputs. The rudder pedal position required to establish and hold this, or any turn, varies only slightly from aircraft to aircraft. This variation is the sum total of a number of variables such as: basic aircraft rigging accuracy, aerodynamic rotor blade response, gross weight, "hover" pedal position, air speed and so forth.

When the DSAS is "on," the normal turning moment has added to it the effect of the tail surface rudders. In a normal coordinated turn there is no skidding or sideslip to cause the DSAS accelerometer to produce a corrective rudder positioning signal; therefore, the position of the rudders remain as established by the pedal transducer. However, during this turn the position of the rudders is affected by the DSAS yaw rate gyro signal. This rate-of-turn signal is used to dampen out any oscillations of the rudders and is proportioned and phased to provide a small amount of opposition to the rudder actuator command signal. In the turn then, the yaw rate gyro signal is opposite to the turn signal and subtracts from the rudder position established by the pedal transducer (turn signal). As this happens, more pedal input is required to hold the turn as originally set up.

Other conditions that affect the control that the yaw rate gyro signal has on rudder position are the rate of turn and rudder effectiveness. The faster the rate of turn, the larger the signal the rate gyro produces and the greater effect the signal has on the rudders. With increasing airspeed the rudders become more effective and, consequently, less rudder is required to achieve the same turning force. The major command signals (pedal transducer and accelerometer) are, therefore, reduced or attenuated with increasing airspeed by an airspeed transducer; the yaw rate dampening signal is not. With increasing airspeed, the dampening signal remains the same while the major command signals decrease. This means that the yaw rate gyro signal has a greater affect on rudder position at the higher airspeeds. When this is coupled with the large signal induced by a fast rate of turn it is possible to deflect the rudders opposite to the original rudder position. Edwards Air Force Base recognized this side effect of the unattenuated rate gyro signal and subsequent flight evaluation resulted in Kaman submitting an engineering change proposal(ECP) 117. The DSAS circuitry was modified so that the effect of the gyro signal is reduced with increasing airspeed thus maintaining correct proportions to other DSAS responses. The ECP was installed as a class II production change in aircraft serial number 64-14213 and subsequent. Retrofit action was disapproved.

Note: A description of the function and operation of the Directional Stability Augmentation System (DSAS) was presented in the December, 1961, issue of Kaman Rotor Tips. Reprints of this article will be supplied upon request.

A. Savard, Service Engineer

Q. (Applies HH-43F) WHY IS IT THAT ON SOME HH-43F HELICOPTERS THE STARTING SYSTEM DOES NOT CUT OFF UNTIL, OR SLIGHTLY ABOVE, GROUND IDLE RPM?

A. Speed switches P/N 10669-3, serial numbers 101 through 139, were set by the vendor to cut off the starting circuit at ground idle or slightly above. Production switches subsequent to serial number 139 will be set to cut off the starting cycle at 37-39% N1 RPM. It is recommended that aircraft having speed switches with serial numbers 101-139 not be operated below ground idle (immediately after start) for more than 5 minutes. Operation in excess of 5 minutes with the starter engaged may result in starter damage. If prolonged low RPM operation is required, first advance the throttle beyond ground idle to cut out the starter circuit, then retard to the desired RPM.

H. Zubkoff, Service Engineer

KAMAN SERVICE ENGINEERING SECTION—*E. J. Polaski, Supervisor, Service Engineering, G. M. Legault, G. S. Garte, Asst. Supervisors.*

UH-2 FUEL SYSTEM

by Herman Zubkoff
Service Engineer
Field Service Department

PART V

Part 5, the last of this series, covers the UH-2A/2B Helicopter Fuel Control System. The four preceding parts appeared in the Kaman Rotor Tips issues indicated: Part 1. The Aircraft Internal and Auxiliary Fuel System — Dec-Jan 1964/65. Part 2. The Fuel Transfer System — Feb-March 1965. Part 3. Pressure Fueling, Suction Defueling and Fuel Quantity Systems — April-May 1965. Part 4. Power Plant Fuel System — June-July 1965.

The fuel control system will be discussed in the following order: (a) general (b) pilot's and copilot's collective control stick RPM range control (c) normal (automatic) operation (d) emergency operation.

(a) General: The aircraft fuel management system includes the pilot's and copilot's inter-connected twist-grip type throttle or RPM range control, linkage and teleflex cable connected to the engine fuel control input shaft, the NORMAL actuator, the EMERGENCY actuator, the fuel NORMAL-EMERGENCY selector switch, the RPM switch and associated electrical circuitry. The system permits simple and efficient operation by manipulating only two controls: the RPM range control and the RPM switch. Rotary movement of the RPM range control is transmitted to the engine fuel control through a system of mechanical and teleflex cable linkage. In NORMAL operation, the pilot-selected engine output speed is automatically maintained within 5%. A selector switch permits operation in NORMAL (automatic) or in EMERGENCY. In NORMAL, fuel flow is automatically metered by a system of signals integrated in the fuel control unit to position the throttle valve. This permits fuel flow commensurate with the selected power setting. In EMERGENCY, the fuel control throttle valve is opened by pilot manipulation of the RPM control switch and the desired fuel flow must be manually controlled by the pilot. A mechanical RPM compensator linkage from the collective pitch lever is connected through a common torque tube to the teleflex cable which is connected to the fuel control unit. When the collective pitch lever is moved, the teleflex repositions the fuel control unit input shaft to compensate for varying power requirements as a function of rotor blade loading. A throttle inter-lock device is mounted on the bell crank assembly support at station 174.0 to prevent engine operation at speeds in excess of idle with the rotor brake engaged. A flight idle detent is incorporated in the RPM range control linkage to assist in power recovery during practice autorotation. This detent is ground adjustable and is normally set to provide 69% to 71% gas generator RPM.

(b) Pilot's and Copilot's Collective Control Stick RPM Range Control: An RPM range control or twist-grip throttle is incorporated on both the pilot's and copilot's collective pitch control lever or stick. The RPM range controls are inter-connected through separate linkage to a common torque tube. The torque tube is connected to the engine fuel control unit by mechanical and teleflex control linkage. The RPM range controls are indexed to three positions; OFF, IDLE and FLY. Rotated completely to the right (clockwise) the RPM range control is indexed to OFF. In this position the engine fuel control unit is stop-cocked and fuel cannot flow through the fuel control unit. A limit switch, actuated by the RPM range control, will prevent starting of the engine if the control is rotated beyond 3° from the OFF position. Rotating the RPM range control towards the left (counter-clockwise) will place it in IDLE (52% to 60% gas generator RPM-Ng). The RPM range controls are positively indexed in a detent, at this position. The pilot can override this detent towards OFF, whereas the copilot cannot. Rotated completely to the left will place the RPM range control in FLY. This is the governed RPM range and is the position required for all powered flight.

(c) NORMAL (automatic) Operation: The NORMAL linear actuator is located in the controls tunnel and is connected to the engine control linkage. This actuator is controlled by an RPM INCrease DECrease (BEEP) switch located on the pilot's and copilot's collective stick switch boxes. When the fuel system selector switch is on NORMAL, and the RPM range control is in FLY, or the governed range, specific RPM within this range is further established by means of the RPM INC-DEC switch. This actuator permits precise adjustment of the fuel control unit input shaft thereby allowing selection of the exact RPM setting required. In the event of actuator failure, although the automatic portion of the fuel control unit will operate normally, BEEPING up or down will not be possible. If RPM beyond this point is required, the fuel system selector must be placed to EMERGENCY and then manually increased. BEEPING down in EMERGENCY will be possible only to the setting at which the NORMAL actuator failed. Further RPM decrease must then be accomplished by using the RPM range control.

(d) EMERGENCY Operation: An EMERGENCY fuel control is provided in the event of engine fuel control unit malfunction or failure of the NORMAL actuator in the lower parameter of the governed or FLY range. When the fuel system selector switch is placed to EMERGENCY, the electrical circuit from the INC-DEC RPM control switch (on the collective stick switch box to the NORMAL linear actuator) is deactivated and the circuit from the INC-DEC switch to the EMERGENCY rotary actuator is activated. The EMERGENCY actuator is mounted on a bracket directly behind the engine fuel control unit. It is connected to the fuel control unit main throttle valve by means of external linkage and a gear actuated lever inside the fuel control. When the fuel system selector switch is positioned to EMERGENCY and the RPM INC-DEC switch is moved to 'INC,' the actuator opens the main throttle valve and allows unmetered, unrestricted fuel flow through the

control to the engine. In EMERGENCY, full power will be available; however, it will be available only from the power setting which existed prior to switching from NORMAL. As an example, if switching to EMERGENCY is accomplished at 93% and the switch is held in INC position, there will be a delay of several seconds while the main throttle valve is manually being opened to reach the 93% position. As soon as the 93% position is reached and then exceeded, additional fuel flow through the main throttle valve will occur to develop RPM in excess of the 93%. Conversely, RPM decrease in EMERGENCY is possible only to the setting at which the switch-over was made. Further RPM decrease must then be accomplished by use of the NORMAL actuator, or, if the NORMAL actuator is inoperative, by the RPM range control.

On switching to EMERGENCY, the delayed reaction while the throttle valve is manually opening, can create the erroneous impression that the EMERGENCY system is inoperative. Lack of attention to the engine tachometer and turbine inlet temperature, during 2 or 3 crucial seconds at which time the manual throttle valve opening reaches and exceeds the automatic position, can allow the engine to overspeed or overtemp. It is therefore important, while checking the EMERGENCY fuel control operation under such circumstances, that the instruments be closely monitored. When a rise in RPM and turbine inlet temperature (T5) occurs, indicating that the throttle valve has manually been opened beyond the automatic position, extreme care must be exercised to prevent an inadvertent overspeed or overtemp. When returning the fuel system selector switch from EMERGENCY to NORMAL, the electrical circuitry passes through the EMERGENCY actuator, CLOSED, limit switch. This causes the EMERGENCY actuator to return the main throttle valve to its original position before the NORMAL actuator circuitry is again activated. Thus if EMERGENCY is selected at 93%, and RPM is increased to 98%, when the fuel selector switch is returned to NORMAL, the EMERGENCY actuator will return to full off position. However, since the automatic position is at 93%, RPM will drop off from the 98% and will stabilize at 93%.

When operating in EMERGENCY, extreme caution should be exercised when changing power output. Since fuel flow through the fuel control now by-passes the parameter sensing portion of the control, the automatic governing protection no longer exists. Rapid acceleration or deceleration can result in overtemp and/or overspeed and necessitate much undesirable extra maintenance in the way of premature engine, drive and rotor component changes.

FUEL *Contamination* FUNDAMENTALS

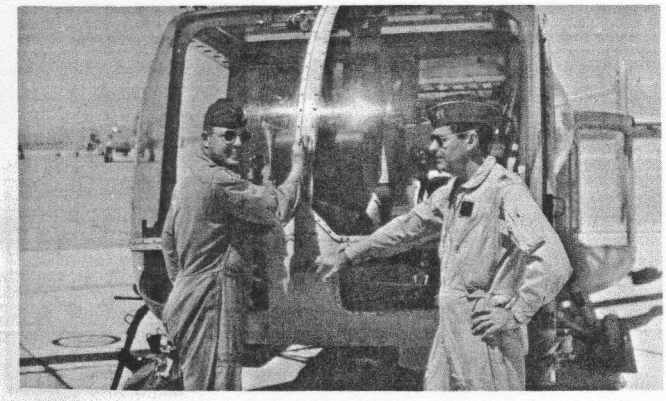
DO YOU KNOW THAT — Many ground filter/separators satisfactory for use with aviation gas are unsuitable for use with JP-type fuels unless the JP fuel flow is decreased? For example, a filter rated at 600 GPM flow with aviation gasoline must be down-rated to approximately 400 GPM to perform satisfactorily with JP fuel. If fuel flow is not decreased, the filter may collapse.

An operational check of the EMERGENCY system is normally accomplished by the pilot prior to take-off. Although pilot techniques vary some what, basically, the check is accomplished by switching to EMERGENCY, BEEPING up enough to satisfy the pilot that an RPM increase is being obtained, then BEEPING down or switching back to NORMAL. Power output should stabilize at the same power setting which existed prior to switching to EMERGENCY. If this check is accomplished at IDLE and the rotor brake is engaged, Ng should not be increased above a maximum of 65%. Ng speed in excess of 65% may cause slippage of the rotor brake, resulting in excessive wear, overheating of the brake assembly and possible damage.

This concludes the 5-part UH-2A/2B Fuel System Article. The intent has been to explain each sub-system of the complete fuel system and the functions of each component in the respective sub-systems. A review of each part is suggested, from time to time, on the premise that an understanding of the system and the functions of the various units will be of assistance in trouble-shooting.

It may have been noticed by the reader, that many components and internal plumbing have more than one function. This design concept not only contributes to a considerable over-all weight reduction, it also greatly simplifies trouble-shooting. However, a knowledge of these dual functions is imperative. Malfunction of one part of such a dual-function component will not necessarily affect the other function. As an example, the

1000-Hour Pilot Awards



Capts Donald F. Donk, left, and Tom W. Brumfield, Jr., of ARS Det 16, WARC, Williams AFB, Ariz., are shown after each logged his 1000th hour in the HUSKIE. Both will receive the award given by Kaman Aircraft in recognition of this achievement. Other pilots who recently qualified are: Capt Dennis M. Chase, Det 1, 36th ARSq, PARC, Misawa AB, Japan; Capt David D. Glick and Capt Armand J. Fiola, Det 2, AARC, Laon AB, France; Capt Arthur Farrell, TUSLOG, Det 153, Cigli AB, Turkey; Capt James V. Berryhill, Det 5, PARC, Danang AB, Vietnam. (Official USAF photo)

FAR NORTH MISSIONS

TYPICAL—HH-43B landing at isolated village on mercy mission attracts throngs of children to scene. Crewmen carry patient to HUSKIE for transportation to hospital.

Capt John E. Duffy, HH-43B pilot who originated the ARS-approved Range Extension External Tank (REET), had the opportunity recently to prove how effectively the system worked when two civilian flyers made a forced night landing in rugged terrain 150 miles from Ernest Harmon AFB, Newfoundland. Captain Duffy, flying a HUSKIE from Det 2, 54th ARSq at Harmon, made the trip and pickup without incident in what probably is the first rescue made with "REET" assistance. Other crew members were Capt Alex P. Lupenski, copilot; A1c Cheryl B. Siebrecht, medical technician; and A1c John A. Debell, helicopter mechanic. During the mission RCAF aircraft furnished navigational assistance and weather information.

In other missions flown by Det 2 personnel, two seriously ill women were evacuated to the hospital; two fishermen marooned on an island were rescued in a night pickup; an officer at a survival camp whose foot had been scalded with boiling water was evacuated; a seriously ill woodsman in an isolated camp was taken to the hospital despite marginal weather; an attempt was made to evacuate a man needing brain surgery but the flight was halted by worsening weather and the HH-43B crew was forced to land in a farm area. Medical assistance was secured by other means.

Due to the efforts of HUSKIE crewmen from the 54th ARSq's Det 1 at Thule AB, Greenland, a seriously ill Eskimo woman was evacuated to the hospital. Dog sled was the only other means available to make the 32-mile trip. Capt Arthur W. McCants, RCC, and Capt Clarence C. Campbell, copilot, first flew to the Danish-Greenland village of Kanak, 60 nautical miles north of Thule, to pick up a Danish physician and then to Siorupluk 82 miles northwest of Thule to pick up the woman and deliver her to Kanak. Also aboard the HH-43B were Maj Bealer T. Rogers, flight surgeon and director of base medical services; SSgt Lyle G. Noah, medical technician; and A1c Thomas D. McKiddie, crew chief. K

fuel-defuel shutoff valve in the aft tank opens during pressure fueling. During transfer it must be closed to prevent recirculation within the aft tank; however, it can malfunction and fail to close after pressure fueling thereby preventing fuel transfer to the forward tank. In this case, its function in the pressure fueling system was normal, but its function in the transfer system was not. This also applies to several other units; therefore, when trouble occurs, confine the problem to the applicable sub-system. By reviewing the functions of the units within the affected sub-system, the suspected failure can usually be isolated before "tearing into the system."

In conclusion, no fuel system article is complete without a word of caution concerning contaminated fuel. It is conceded that servicing is often accomplished away from the home station, and that the source of contaminated fuel is often beyond the scope of authority of the operating activities. It is, however, incumbent upon each organization to accomplish periodic fuel filter inspections. The frequency of such inspection is not an iron-bound rigid requirement. The interval of filter inspections should be based on the concept that the fuel contamination level is an unknown factor and must be checked. Both the main aircraft filter and the fuel control filter are most effective in filtering foreign matter out of the fuel. Unfortunately, however, if not cleaned frequently the pressure drop across partially clogged filters causes the by-pass valve to open. When this happens, fuel control malfunction will occur. This not only creates a flight safety hazard, but also increases the maintenance man-hours per flying hour ratio, increases the aircraft down time and adversely affects the mission capability.

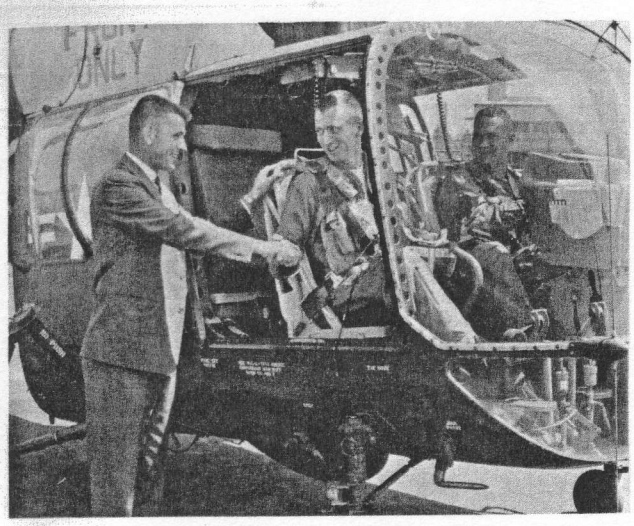
It should also be remembered that the fuel tank sumps and drains have been so designed that complete drainage of water and foreign matter is possible. Frequent samples should be taken in order to determine the condition of the fuel and, if the condition warrants, fuel tanks should be cleaned. Do not overlook the auxiliary tanks as a source of contamination. Prior to installation, especially if tanks have been stored, they should be purged. Since auxiliary fuel is transferred to the sump tank before fuel feed to the engine occurs, any foreign matter in the auxiliary tanks will soon contaminate the "very heart" of the fuel system.

As one last thought: There have been many changes in aircraft design, technology, methodology and concepts, but one thing still holds true — the basic doctrine of Preventive Maintenance will never change! K

Subsequent issues of Rotor Tips will include a series of service-proven, practical trouble-shooting tips. Contributions from readers — especially those regarding unusual malfunctions, unique trouble-shooting procedures and time-saving tips — are solicited. The material should be sent to Kaman Rotor Tips, Customer Service Dept., Kaman Aircraft Corp., Old Windsor Rd., Bloomfield, Conn. Be sure to include name, rank and organization, in order to permit due credit to the initiator.

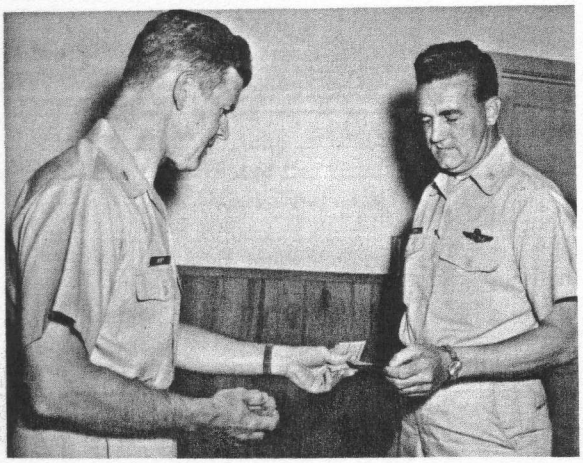
"SAYONARA"

Veteran OH-43D Retires



Jack King, technical representative for KAC, says "sayonara" to 1stLt Don W. Cantrell, OIC of VMO-2's Sub Unit 1 as the pilot and his copilot, 1stLt Wayne W. Crews, prepare their unit's OH-43D Syncropter for its final flight to Kisarazu where it will be phased out of the Naval-Marine service. The VMO-2 Sub Unit is the last Navy organization to utilize the services of the piston-driven helo. Since 1958 the unit has supported Marines attached to Camp Fuji, located at the base of Mt Fujiyama. King was at Naha air station in 1956 when the first OH-43D was unloaded. (Official USN photo)

TELEVISED CEREMONY—UH-2 crewmembers from NS Adak, Alaska, were presented Kaman Scrolls of Honor for hazardous night and day flights made in freezing rain to rescue four lost hikers. During a televised ceremony the presentations were made by Capt J. W. Bartol, commanding officer at Adak. Left to right are: B. B. Stevenson, ADR3, Lt(jg) R. H. Hamel; Captain Bartol, Mr. H. C. Helm, Kaman Representative; LCdr D. A. Meyer; C. F. Blanchard, ADJAN. Missing when this photo was taken is LCdr W. H. Sumrall. (Official USN photo)



Stead Mission Awards

Col Archer E. Lackey, commander of Stead AFB, Nev., faced an unusual situation recently while presenting KAC Mission Awards and rescue pins to Stead personnel. Colonel Lackey made the presentation to five of the recipients without hesitation, then the base commander presented the sixth award — to "Col Archer E. Lackey!"

Colonel Lackey was copilot aboard one of two HH-43B's which rescued three Marines and a newspaperman after their helicopter crashed on Disaster Peak near Bishop, Calif. In photo, bottom left, Colonel Lackey is shown making the presentation to LtCol Francis M. Carney, right, who piloted one of the rescue craft. Colonel Carney has received two mission awards so far as well as a clock-barometer set and gold HH-43B for setting a world altitude record and three time-to-climb records in the HUSKIE. Another recipient was SSgt Charles Baker, crewman, who is a three-time awardee. Others receiving awards for the Disaster Peak rescue were Capt J. F. Patterson, pilot; Capt D. J. Rensch, copilot; and A1c J. W. Alcorn, crewman. (USAF photo)

—— Pakistan Crews Honored by KAC ——

Six HH-43B members of the Pakistan Air Force have been awarded Scrolls of Honor by Kaman Aircraft for the hazardous rescue of four civilians who survived after a Pakistan International Airlines DC-3 slammed into a mountainside near Lowari Pass in West Pakistan. Two HUSKIES participated in the rescue which was made at 9,500 feet despite deep snow and strong gusting winds. Manning one HUSKIE were Flt Lt M. Rafiq, pilot; Fly. Off. Riaz Shah, copilot; and Sgt Zaidi A. Y., crewman. The crew of the other HH-43B consisted of Flt Lt M. Ahmad Khan, pilot; Flt Lt Moin U1 Islam, copilot; and Senior/Tech Ala Din, crewman.

Guided by a C-130A, the HUSKIE crews flew 85 nautical miles through high winds, low clouds, rain and snow over mountainous terrain studded by peaks reaching as high as 14,000 feet. Deep snow thwarted attempts to land on a flat area 500 feet below the wreckage so the HH-43B pilots moved closer and, despite the strong winds, hovered with the wheels in the snow while the survivors were loaded aboard. The next day the helicopters retraced the treacherous route again and again to recover the bodies of the 22 persons who did not survive the crash. K

continued from page 6

where a helicopter was needed. The designation of all Helicopter Utility Squadrons was recently changed to Helicopter Combat Support Squadron to better reflect their essential combat support duties. VX-3, from which HC-2 evolved, was the Navy's original helicopter development squadron and on April 1, 1947, was first based at NAS Floyd Bennett Field, Brooklyn, N.Y. In 1948, VX-3 split into two squadrons; one became HU-2 and moved to Lakehurst; the other became HU-1 and is presently based at Ream Field, Calif. An article on the West Coast activity, now designated HC-1, will appear in a subsequent issue of Kaman Rotor Tips.

The mission of HC-2 is to provide helicopter rescue, combat and utility support for attack aircraft carriers of the Altantic Fleet. The primary duty is to supply plane guard cover near the ship during flight operations. However, the UH-2's can leave this position, proceed for almost 300 miles, pick up a downed pilot and return to the ship, using "self contained" navigational equipment. In carrying out its mission, HC-2 has amassed an enviable record for rescues. The names of pilots who have rescued 1477 persons are displayed on plaques in the squadron ready room. The names of the crewmen on these rescue flights are prominently displayed in a place of honor in the hangar near the quarter deck. Not only do these give recognition to the rescue crews, they also serve as a constant reminder of the importance of the squadron's mission. The 1477 total includes the rescue of 682 persons at sea and the evacuation of 795 disaster victims. Two of the more spectacular mass rescue operations occurred when the tanker African Queen split in half off the Ocean City, Md., shoreline in 1958 and the liner Shalom and tanker Stolt-Dagali collided off the Jersey Coast on Thanksgiving day last year. Shipboard rescues from the beginning of fiscal year 1964 to 2 June 1965 include 46 pilot and crew members and 16 men overboard.

RESCUE IS THEIR BUSINESS— Downed flyer who was plucked from the sea by HC-2 crew is offloaded from SEASPRITE. Squadron personnel have rescued 1477 persons. (USN photo)

These statistics, of course, only provide a small insight into HC-2 operations as they don't begin to cover the thousands of angel hours, personnel transport, photography missions, gunfire spotting, mine reconnaissance, tracking drills and numerous other duties the squadron is called upon to perform.

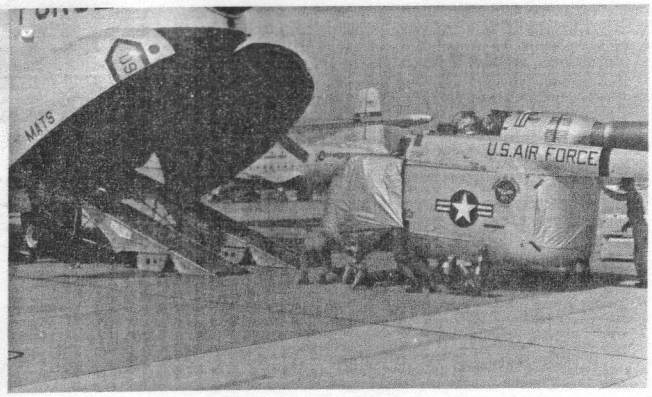
Squadron personnel take pride in the fact that the majority are "Cruisers" who frequently leave their land-based assignments to serve with detachments deployed at sea. Although they may enjoy the opportunity to visit all the interesting ports-of-call, their greatest reward is the saving of lives and fulfillment of their mission as "Fleet Angels." K

FOD FACTS

HC-2 at NAS Lakehurst, N. J., uses a "FOD team" as part of its campaign against foreign object damage. The team, composed of an officer and enlisted man, inspect the aircraft line and hangar area each day for potential FOD and also put up posters, reminders and so on to keep all personnel aware of the FOD potential. In addition, HC-2 also has a notice on the Flight Operations counter which is directed specifically at the pilots. It reads:

DO NOT ACCEPT ANY AIRCRAFT UNLESS....

1. Yellow sheet is signed by FOD inspector.
2. FOD card on side of pilot seat is dated and signed by FOD inspector.
3. FOD inspection meets your approval.
4. All requirements are met.



ARS DET 7 ACTIVITIES—During "Operation Quick Kick VII," the entire complement from Det 7, EARC, Seymour Johnson AFB, N. C., was dispatched to Ramey AFB, Puerto Rico, to furnish HH-43B rescue support. In top photo, left, Puerto Rico-bound HUSKIE is loaded aboard C124; right photo shows Det 7 HH-43B on patrol. Temporary coverage at Seymour Johnson was supplied by Det 8 personnel from Myrtle Beach AFB, S. C. Soon after returning to Seymour Johnson, one of Det 7's HUSKIES reached the 1000-hour flight mark. In third photo, SSgt Oneil L. Griffin, crewchief, middle left, is shown receiving congratulations from Capt Glen L. McFarlane, detachment commander. Others are A1c James R. Perry, RS; A3c Douglas E. Walters, HM; SSgt George E. Bostick, MT; A2c Charles R. Knight, HM; 1stLt John D. Oliver, pilot; 1stLt Gary N. Beson, pilot; A1c David R. Helm, RS; SSgt Gordon L. Ball, HM; and A3c Haskew Warren, HM. (USAF photos)

Mountain Rescue

Capt Tom W. Brumfield, Jr. from ARS Det 16, (WARC), Williams AFB Ariz., slowly moved the HH-43B forward until the front gear was only 10 feet below the spot where the injured hiker was wedged behind a rock to keep him from falling the rest of the way down the 1000-foot, 80 degree slope. Rotor clearance from a towering rock on the left was only four feet. Although hampered by the inevitable turbulence around the Superstition Mountains, the pilot then inched his way up the slope until a giant cactus was a scant three feet from the blade tips. SSgt Edgar Bryant, rescue technician, and the litter were quickly lowered.

As the Sergeant prepared the injured man for his aerial journey, Captain Brumfield backed the helicopter away from the precarious position and again searched in vain for a more suitable pickup point. For the second time the HH-43B made the hazardous trip and the crew began the tricky maneuver of retrieving the injured man. Capt Joe H. Watson, det commander and copilot, and A3c Roger Graham, crew chief on his first operational mission, carefully "threaded" the big basket between the cactus and boulders, up between the landing gear, out from beneath the fuselage and then alongside and through the cabin door. Again Captain Brumfield backed the HH-43B from the slope but this time the chopper turned away from the foreboding area and headed toward medical assistance — the crew happy in the knowledge of a job well done!

58th ARSq in Sea Rescue

An Italian crewman had been badly burned when a fishing boat in the Mediterranean caught fire. Would the 58th ARSq at Wheelus AB, Libya, assist?

Response was swift and involved help in the form of a long-range HC-97 Strato Rescuer aircraft, an HU-16 Albatross and a HH-43B HUSKIE. It also involved an Air Force flight surgeon who turned sailor to aid the injured man.

The burning vessel was located 55 nautical miles offshore by the HC-97 but the HU-16 with a medical technician aboard was unable to land due to the high seas. The HH-43B, piloted by Capt Richard J. Bouckhout, was dispatched to the scene but again difficulties were encountered when an attempt to lower a crewman was prevented by the combination of high seas and tall masts. Captain Bouckhout's solution was a quick one — he requested the HC-97 to drop a raft in the water near the vessel and then proceeded to lower Capt Ray A. Carlsen, flight surgeon, from the helicopter into the raft. The transfer to the tiny raft bouncing about the surface of the rough seas necessitated an extended hover only 20 feet from the water but was accomplished without incident. The doctor then rowed to the fishing boat and his waiting patient.

The HH-43B crew didn't have a chance to relax, however, for considerable fuel had been used up on the trip to the vessel and during the hovering period. Now strong headwinds were encountered and it took a long 53 minutes to reach land. Just as the HUSKIE passed over the shoreline the minimum fuel warning light came on, but three minutes later the helicopter landed safely at Wheelus. HH-43B crewmen sharing in the mission were SSgt Donald H. Holloman, hoist operator; A1c Joseph E. Busch, medical technician; and A1c Charles Comer, rescue specialist.

Huskie Happenings

...Two Tacoma mountain climbers suffering from exhaustion rescued from 12,200-foot level of Mount Rainier by HH-43B flown by Capt Warren K. Davis, commander of ARS Det 5, WARC(MATS), McChord AFB, Wash. Rescue reported to be highest helicopter airlift ever carried out successfully on the mountain. Other members of HUSKIE crew include Capt Harold A. Solberg, copilot; TSgt John Glenn, crew chief; and SSgt Enoch Benson, medic.

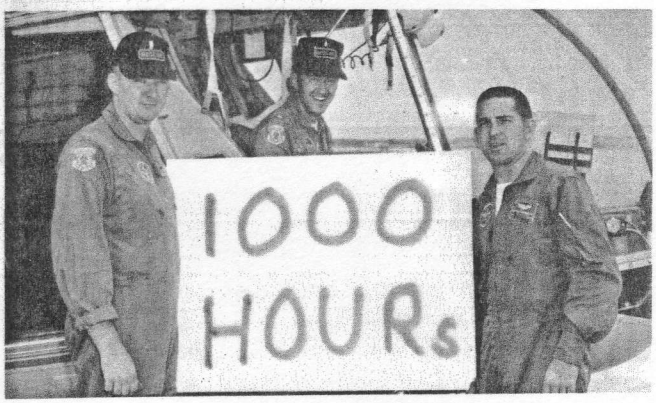
...ARS Det 6, CARC(MATS), Kincheloe AFB, Mich., utilizes HH-43B to rescue two civilians whose aircraft crashed on Drummond Island 45 miles from base. Both men, injured in accident, taken to hospital in HUSKIE. Capt Donald R. Hamilton, RCC; 1stLt Thomas H. Gardner, copilot; SSgt Otha Gatlin, medic....Paratrooper suffering from head injuries evacuated to Tachikawa AB hospital by HH-43B crew from Det 2, 36th ARSq, Yokota AB, Japan. Capt Michael P. Pido is RCC; TSgt Lawrence P. Meadows, medical technician; A1c Richard D. Long, crew chief. In similar incident, soldier with broken leg evacuated to hospital by HUSKIE crew consisting of 1stLt Marvin A. Cleveland, RCC; Capt Pido, copilot; MSgt Anthony F. Biancuzzo, medical technician; SSgt Willie Lovins, crew chief.

...Two HH-43B crews from ARS Det 5, EARC(MATS), Suffolk County AFB, N.Y., join in extensive search for Navy aircraft which ditched off Montauk Point, L. I. Capt Joseph T. Herr and Capt Arthur D. Kwiatkowski, RCC's. Other crew members are MSgt D. R. Pavel, SSgt D. A. Bidwell, A1c M. E. Smith, L. W. Forehand and M. Dolhancryk....Capt Alma L. Williams, Det 9, CARC(MATS), named "Tiger of the Week" at England AFB, La. The Captain, at England since July, 1964, served earlier at Incirlik AB, Turkey, and received Kaman Scroll of Honor for 14,000-foot-altitude rescue of Turkish officer from snowbound mountain village.

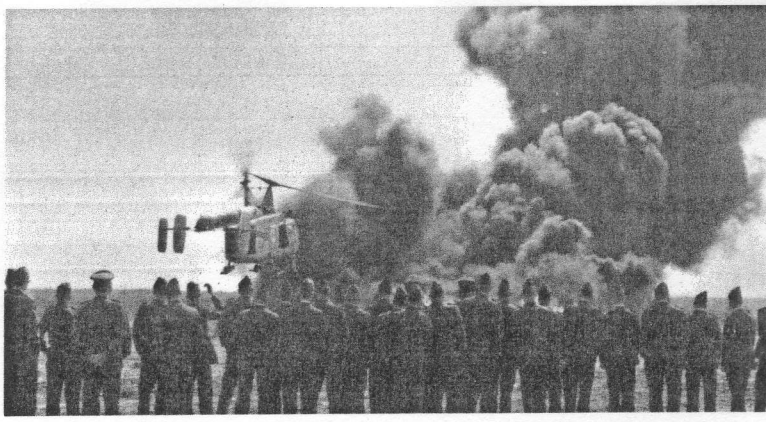
...Flying in fog and heavy rain, HH-43B crew from 33rd ARSq, Naha AB, Okinawa, conducts close-to-water, dusk search for occupants of T-33 which flamed out over East China Sea five miles offshore. Flying done by exclusive reference to instruments and search pattern flown by headings only as there are no visual check points and radar assistance is marginal. Survivors sighted and brought aboard without incident. Capt Bruce B. Duffy, HUSKIE pilot; Capt James L. Cantey, copilot; SSgt David H. Blouin, medical technician; A1c Richard G. Cournoyer, rescue specialist....HH-43B crew from ARS Det 6, EARC(MATS), Andrews AFB, Md., rescues youth from rock in swirling Potomac River. Capt Harry W. Kruppenbach, RCC; Capt Donald L. Harrell, copilot; SSgt Howard Stoller, medical technician; SSgt Lafayette Sullivan, firefighter.

...HH-43B crew from Det 153, TUSLOG, Cigli AB, Turkey, makes 130-mile night flight, part of it through cloud-shrouded mountain pass, to rescue Turkish shepherd trapped on island in flooded river valley. Rescuee further endangered because of necessity to open floodgates on island in vicinity. Capt Arthur Farrell is RCC, 1stLt Ronald Pass, copilot, and TSgt Laurence Cowles, crewman....HUSKIE crew from ARS Det 4, CARC, Duluth MAP, Minn., rescues 77-year-old woman lost for two days in rough, swampy area. Object of wide-spread ground search, woman spotted from air by HH-43B crew consisting of Capt John B. Riederich, pilot; Capt Robert W. Moore, copilot; TSgt John J. Kelly, crew chief; A1c David Rodriguez, crew member; and A1c Henry D. Takala, medical corpsman.

SCHOOL'S OUT —Thirteen mechanics recently completed a three-week HH-43B familiarization course at AARC Headquarters, Ramstein AB, Germany. Instructors were Mr. Richard Reynolds, KAC tech rep, and Mr. Grady B. Gaines, Lycoming tech rep. The two top students, A1c James S. Kirby, Det 4, Ramstein AB, and A1c Edward F. Gerstenkorn, 58th ARSq., Wheelus AB, Libya, are shown afterward with, left to right, CMSgt Frank O. Proctor, NCOIC, maintenance section, Hq., AARC; Col Donald E. Matthews, Commander, Hq., AARC; and Mr. Reynolds. Others who attended the course were: A3c P. A. Meyer, Det 1, Spangdahlem AB, Germany; A3c J. C. Byrd, Jr., Det 3, Toul AB, France; SMSgt R. M. Messner, Det 4, Ramstein AB; A3c W. B. Andrews, III, A3c T. O. Foy, Det 5, Hahn AB, Germany; A1c T. E. Mason, A3c C. A. Gaboardi, Det 6, Cigli AB, Turkey; A3c Z. Hamilton, Det 9, Moron AB, Spain; A3c R. F. Dibenedette, Det 10, Aviano AB, Italy; A3c D. E. Brimm, Det 11, Incirlik AB, Turkey; A3c J. R. Shebesta, 58th ARSq. (USAF photo)



1,000 HOURS—HH-43B crew from ARS Det 11, EARC(MATS), Craig AFB, Ala., proudly display poster after flight during which HUSKIE passed its 1000th incident/accident-free hour. Shown are, left to right, 1stLt Darrell A. Lowery, copilot; 1stLt Joseph W. Sprague, pilot; and A1c George J. Sheehan, Jr., firefighter. (USAF photo)



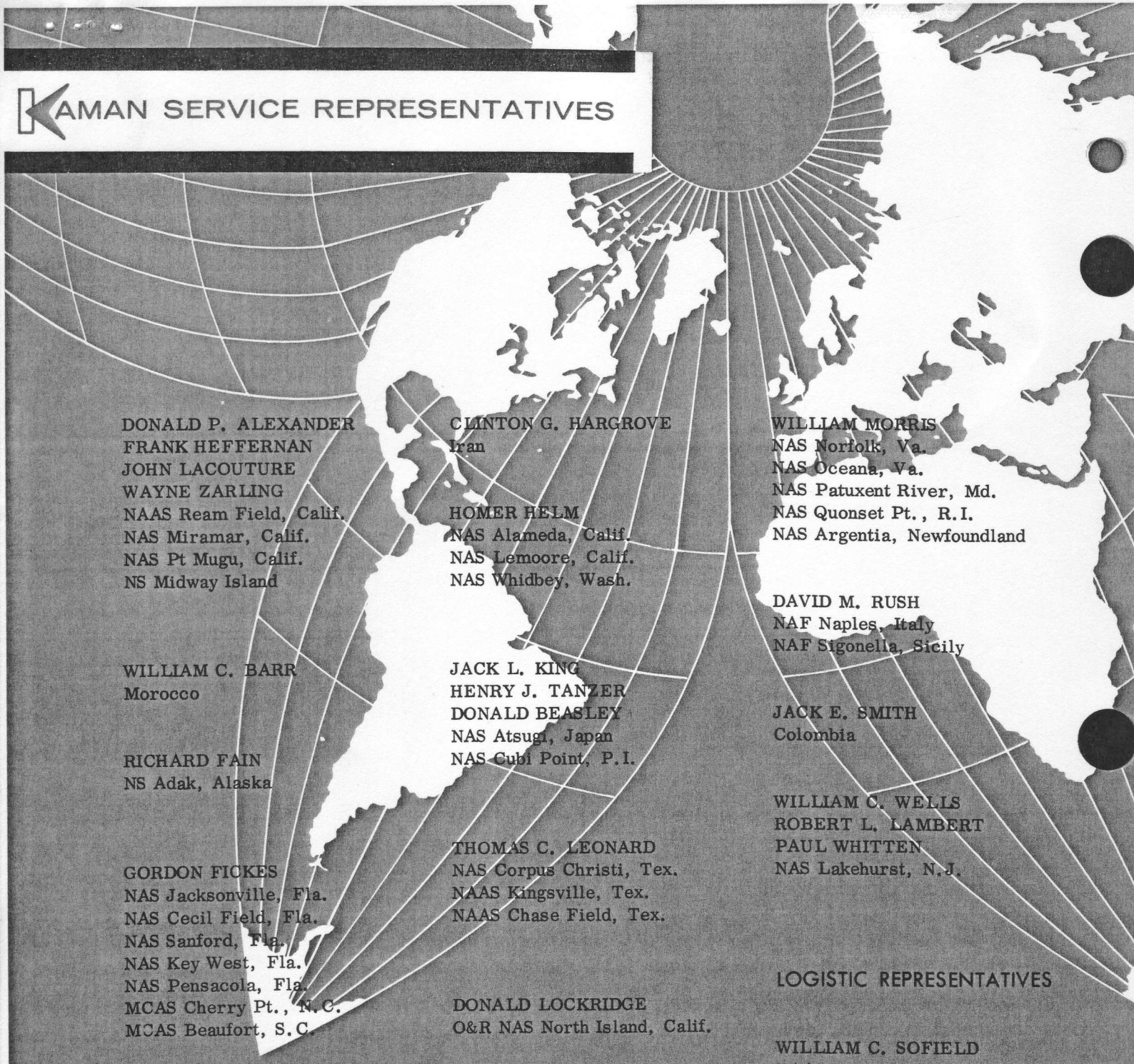
HOW IT'S DONE—HH-43B crew from ARS Det 5, EARC, Suffolk County AFB, N.Y., demonstrates fire-rescue techniques for cadets from U. S. Air Force Academy. (USAF photo)

SCROLL OF HONOR—LtCol Willard D. Welsh, Hq Air Rescue Service, Orlando AFB, Fla., second from left, presents Kaman Scrolls of Honor to two HH-43B crews from Det 15, WARC(MATS), Luke AFB, Ariz., for the rescue of 85 flood victims. Capt A. J. M. Archer, copilot; Capt H. D. Salem, pilot; and MSgt R. J. Hallman, crewman, left photo, rescued 18 persons. Capt D. L. Potter, copilot; Captain Archer, pilot; and A3c W. E. Van Asdlan, crewman, evacuated 67 people. (USAF photos)

MODEL RESCUE— A2c Shirial Mosley carefully guides the cable lifting a "downed" light aircraft from a warehouse roof at Bitburg AB, Germany, as Capt Dick Shriber pilots HH-43B from Det 8, AARC. The recovered aircraft, which had apparently crash-landed, was without "occupants" (much to everyone's relief) and sustained minor damage. (USAF photo)

END OF SEARCH—The photo at right graphically portrays the difficulties which sometime face air searchers seeking to locate a downed aircraft. The snow-covered wreckage of a DC6 which crashed at the 9,800-foot level on Mount Rainier can be seen at the bottom of the photo; the barely visible impact point is at the top. HH-43B crews from Det 5, WARC(MATS), McChord AFB, Wash., landed 400 feet below the spot in order to remove the bodies of the five crewmen killed in the crash. Capts Harold Solberg and Tom Precious piloted the two helicopters, Capts Paul Schildgen and Ronald Bachman were copilots, and A2c Richard Landry and SSgt Howard Lord, crew chiefs. The grim task ended a three-day rescue effort conducted under the personal direction of Col Robert A. Stribling, WARC commander at Hamilton AFB, Calif. Aiding in the search was Portland's 304th Air Rescue Reserve Sqdn, a SA16 amphibious plane, a Navy helicopter and mountain rescuemen. (Official USAF photo by A2c Sam Bishop - McChord)

KAMAN SERVICE REPRESENTATIVES



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JOHN LACOUTURE
WAYNE ZARLING
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NAS Miramar, Calif.
NAS Pt Mugu, Calif.
NS Midway Island

WILLIAM C. BARR
Morocco

RICHARD FAIN
NS Adak, Alaska

GORDON FICKES
NAS Jacksonville, Fla.
NAS Cecil Field, Fla.
NAS Sanford, Fla.
NAS Key West, Fla.
NAS Pensacola, Fla.
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