

KAMAN *Rotor Tips*



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THE COVER

Twin-engine UH-2C, scheduled for delivery to the Fleet in a few weeks, utilizes the rescue net described in this issue. Cover by Donald Tisdale, Service Publications.

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What's With The Twin?

UH-2C NEW 'LOOK' REFLECTS SPEED, POWER AND MANEUVERABILITY

by Herbert W. Gewehr
KAC Project Flight
Test Engineer

The most basic difference between the UH-2A/B and UH-2C is, of course, the fact that the latter has two T58-GE-8 turbine engines instead of one. When the first "twin" is delivered to the Fleet, other changes will become readily apparent to Navy personnel. The following information deals with the step-cambered tail rotor pylon, the streamlined main rotor pylon, the relocated pitot tube, the static port flow fences, and the anti-icing chisel-nose engine nacelles.

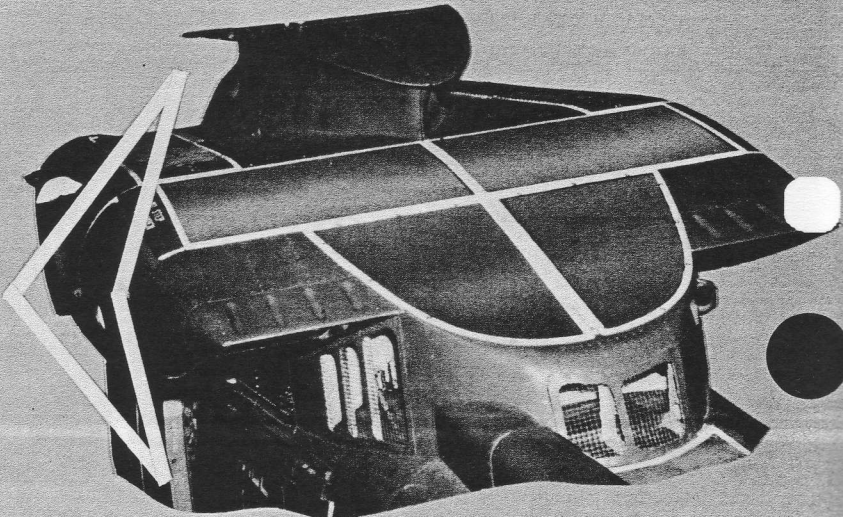
STEP-CAMBERED TAIL ROTOR PYLON

The step-cambered design of the tail rotor pylon is the optimum shape dictated by flight operations at: (A) near zero hovering airspeeds and (B) the higher forward flight speeds. Narrowing the chord of the pylon improves tail rotor effectiveness during hovering and sideward flight — the narrow pylon decreases the blockage to the tail rotor airflow. This feature is most important during crosswind hovering and sideward flight since a larger amount of tail rotor thrust is made available for these maneuvers. Directional stability and pedal control margins are improved by widening the chord and cambering the cross-section of the pylon. The wide area acts as a vertical stabilizer surface to improve directional stability. The cambered cross-section acts like a rudder as airspeeds increase above 80 knots. In this manner the tail rotor thrust required is reduced and the directional control pedals tend to become neutral. This feature provides a greater margin of control available for directional maneuvering.



TRANSMISSION AND ROTOR SHAFT FAIRING

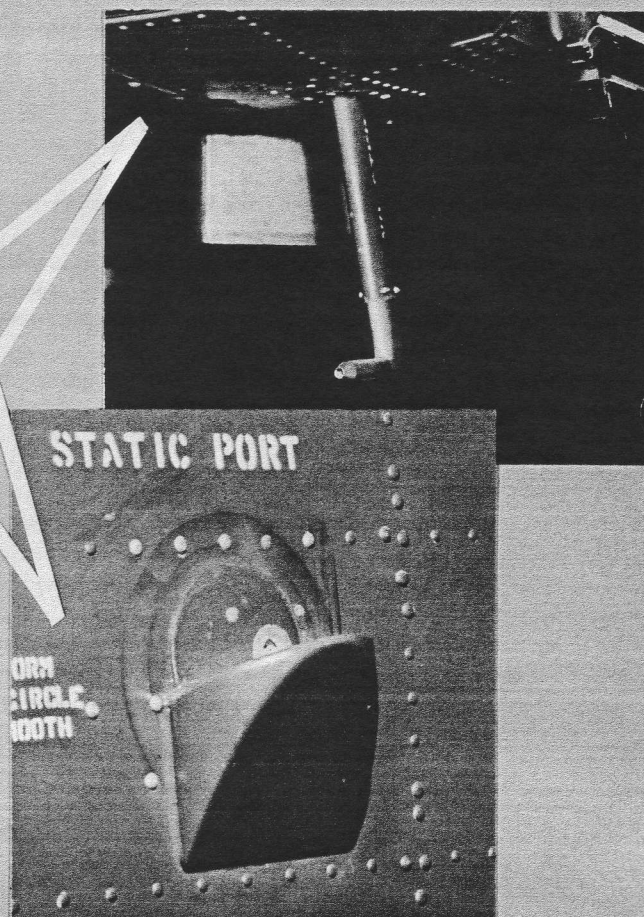
The streamlining effect of the UH-2C transmission and rotor shaft fairing raised the maximum level flight airspeed by about 5 knots. This was accomplished by the reduction in flow separation, and therefore drag, on the aft end of the engine and transmission compartment cowling. Tuft studies and smoke tests were conducted to define the optimum contour around the transmission, the size of the shelf below the hub and the minimum length along the after deck. The streamlined airflow along the top surfaces of the engine nacelles and aft cowling eliminates turbulent vortices from the tail rotor inflow and provides smooth flight characteristics at all airspeeds.



NEW PITOT TUBE LOCATION AND STATIC PORT FLOW FENCES

The pitot tube on the UH-2C is located on the fuselage directly beneath the copilot rudder pedals to provide accurate and steady airspeed readings in high powered climbs at low airspeed. On the UH-2A/B the pitot tube is located on the fuselage above and slightly ahead of the left cockpit door. It was found, however, that this location was unsatisfactory on the twin-engine helicopter since distracting airspeed indicator fluctuations were encountered during climbouts. This was due to the UH-2C's high velocity rotor downwash and greater rate of climb. The new location also improves indications at low speed because the fuselage screens the pitot tube from the turbulence of the rotor inflow air.

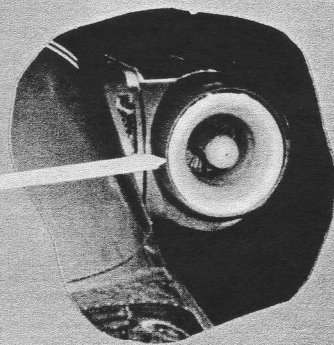
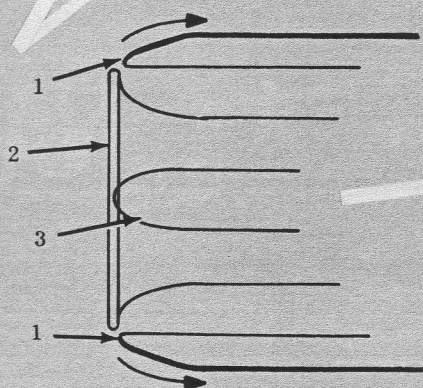
Flow fences are installed on the UH-2C below the static ports to provide a slight pressure head, thereby correcting indicated airspeed in hover to zero. The incidence angle of the flow fences was chosen to make the working surface align with the free stream at cruising airspeeds. These devices also contribute to the overall stability of the indicator needle from hover to maximum airspeed.

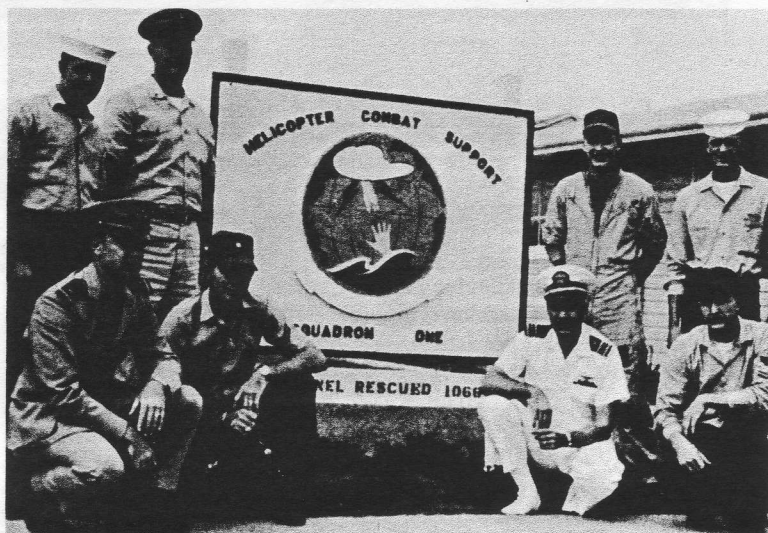


CHISEL-NOSE ENGINE NACELLES

The shape and location of the leading edge of the engine inlet nacelles provide maximum engine anti-icing protection. The leading edge is slightly behind the heated inlet bellmouth, thereby preventing ice build-up at the stagnation point. The sharp leading edge contour prevents ice build-up along that surface. Added to these features are the heated starter bulletnose and the engine anti-icing system for the inlet guide vanes and front frame struts. The result is complete engine anti-icing protection for the UH-2C helicopter.

1. ENGINE NACELLES
Chisel-like leading edge keeps air moving.
2. BELLMOUTH
Heated engine inlet
3. BULLETNOSSE
Heated engine starter





HC-1 DET AWARDED CITATION

DET 5 HONORED—Outlining HC-1's rescue board after their return from Vietnamese waters last year are, front row, left to right, Ens Robert H. Clark; James R. Hilley, AE2; LCdr David J. McCracken and Benjamin F. Hill, AMS1. Rear row, George E. McCormack, AMH2; Herbert G. Davis, AECS; Lt Robert Bednar and Henry S. Owen, ATN2. Not shown are Clarence J. Britt, AN; Edward B. Campbell, ADJ1; Wayne D. Meehan, AN and James R. Williams, AN. At the time the photograph was taken HC-1 had made 1066 rescues, nine of which were credited to Det 5. (USN photo)

HC-1 Det 5 personnel who participated in several hazardous rescue missions off the coast of Vietnam last year have been authorized by Secretary of the Navy Paul H. Nitze to wear the Navy Unit Commendation Ribbon. The unit was so honored "For heroic and exceptionally meritorious service from 23 February to 5 June 1966 while conducting Search and Rescue (SAR) operations off the coast of Vietnam. While based on various frigates during this period, Detachment Five's helicopter

crew carried out forty-eight combat SAR missions, rescuing five downed airmen from certain capture or death by the enemy. Rescue missions were repeatedly, aggressively and relentlessly pursued in the face of intense hostile fire. The outstanding professional skill, teamwork, coolness under fire, and devotion to duty of the officers and men of this helicopter-squadron detachment reflect great credit upon themselves and the United States Naval Service."

USS REEVES — Operating over enemy waters during a pitch black night and in close proximity to the enemy shore, a UH-2 crew from HC-1's Det 17 from the USS Reeves rescued a pilot who had ejected from his crippled aircraft after a mid-air collision. The downed pilot had landed in the Gulf of Tonkin a short distance from shore in an area surrounded by islands which were also enemy occupied. While Lt Jaque L. Meiling, the SEASPRITE pilot, held the helicopter in a hover, gun flashes were observed in the distance as ground fire probed the darkness for the rescue chopper. After making the successful pickup, the helicopter crew returned to the ship without incident. With Lieutenant Meiling on the hazardous mission were Lt(jg) Gordon M. Williamson; Michael J. Rigby, ATN3; and Everett G. Pemberton, AN, aircrewmen. Afterward, Lieutenant Meiling had high praise for the highly competent manner in which the entire crew performed while operating under night combat conditions.

USS ROOSEVELT — A pilot and RIO who ejected from their F-4 after a flameout at night over the South China Sea were rescued soon afterward by a UH-2 crew from HC-2's Det 42 aboard the USS Franklin D. Roosevelt. During the rescue the loudhailer on the helicopter was used to direct the rescues in the water. The pickups were made by Lt Craig M. Forsgren and his crew despite two unforeseen emergencies — one of the rescues accidentally discharged his flare gun just forward of the rotor blade path, and for "five long seconds" the cockpit and console lights failed as a rescuee was being hoisted aboard. Lieutenant Forsgren said afterward that the copilot, Lt(jg) James E. Lois, and aircrewmen, Dennis C. Wisniewski, ABH3; and Randolph Coble, ADRAN, did "an outstanding and highly professional job throughout the entire rescue."

In a second Det 42 rescue, a man who fell from the deck of the Roosevelt while handling ordnance was rescued by a UH-2 crew a few minutes later. Lt(jg) Frank M. Dirren, Jr., the SEASPRITE copilot, said the loud hailer on the UH-2 was especially helpful in guiding the survivor to the rescue seat. Lt Vincent L. Onslow was pilot of the rescue helo and crewmen were Petty Officer Wisniewski and Rene J. Cote, AE3.

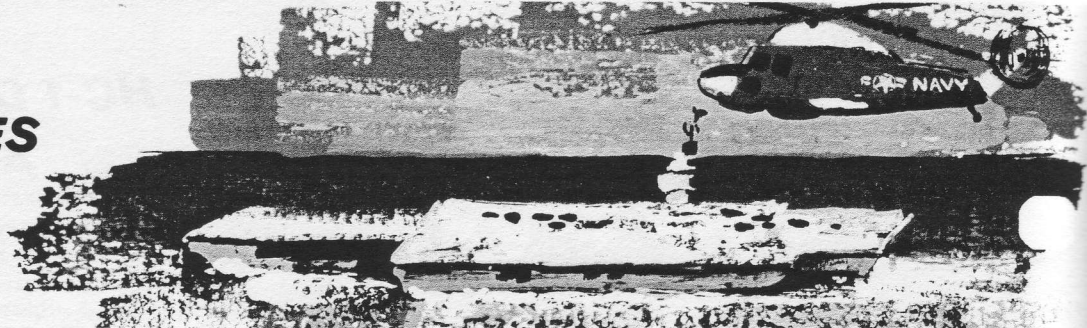
USS TICONDEROGA — A pilot who ejected from his plane, crippled by anti-aircraft fire, was rescued by a UH-2 crew from HC-1's Det Echo aboard this carrier. To assist the downed pilot, slightly injured and hampered by his gear, Charles W. Stecz, AMH1, dropped into the water from the hovering SEASPRITE and placed the survivor in the sling. He was quickly hoisted to the safety of the helicopter which was piloted by Lt(jg) Russell A. Jobst and Lt(jg) Douglas B. Hackett. The rescuee afterward commended the rescue crew for "their high degree of readiness and professionalism."

In a second Det Echo rescue, a pilot who ejected from his crippled plane was hoisted to safety a few minutes later by a UH-2 crew consisting of Lt(jg) John W. Donaldson, pilot; Lt(jg) James H. Henkel, copilot; Robert E. Ceccarini, ADJ2; and Alan S. Dougans, AE2, crewmen. During the rescue Petty Officer Dougans went into the water to assist the downed pilot.

USS CORAL SEA — Four minutes after one of the line-handling crew fell overboard, he was back aboard the carrier after having been rescued by a SEASPRITE crew from HC-1's Det Alfa. The helicopter, piloted by Lt(jg) Larry J. Vernon and Ens Jack M. Mulcahy, took off as soon as the "man overboard" call sounded and swung toward the wake of the ship. Larry R. Learning, ADJ3, was lowered into the water by Gary L. Fleck, AMH3, and aided the survivor into the sling.

SEASPRITE

ACTIVITIES



...UH-2 crew from HC-4, NAS Lakehurst, N.J., diverted from photo mission at request of Army command at Ft Monmouth, flies to scene of sledding accident in which small girl was seriously injured. Landing made in woods in isolated, tree-studded area. Girl placed aboard helicopter and flown to waiting ambulance. SEASPRITE pilot is LCdr William E. Lucas; copilot, Lt Richard C. Strand; crewman, W. D. McCraw, PR1; guide, Maj William L. Buck, USA. Letter of appreciation for their efforts later received from mayor of Oakhurst, N.J.

...SEASPRITE crew from SAR unit at NALF Crows Landing, Calif., makes futile night search over plateau at foot of Sierra Nevada Mountains for downed pilot. Search continued at dawn and wrecked aircraft located despite heavy ground fog. Injured pilot taken aboard and flown to Castle AFB. UH-2 crew consists of LCdr W. W. Wetzels, pilot; Blayne Camp, ADR2, copilot/flight engineer; and James Childers, ADR2, rescue aircrewman.

...Responding to a call from the Coast Guard for assistance, UH-2 crew from the SAR unit at NAS Corpus Christi, Texas, takes off in 40-knot winds to evacuate civilian injured when a derrick aboard a barge collapsed. Patient taken from barge by row boat and then placed in litter lowered from helicopter hovering nearby. Operation hampered by gusting winds, five-foot waves and closeness of obstructions. Fishpole boom on SEASPRITE gives needed extra clearance and assists pilot in maintaining close watch over hover area. Landing made at heliport afterward. UH-2 pilot is Lt Walter Lester and crewmen are V. W. Jennings, AM1, and A. C. Bettis, HN. ...In second SAR Corpus Christi mission, pilot injured after ejecting from F-9 40 miles from air station is picked up by UH-2 crew and taken to waiting ambulance. Pilot of UH-2 is Lieutenant Lester; copilot, Lt(jg) Jeffrey Lewis; crewman, T. L. Bodle, HN.

...UH-2 crews from SAR unit at MCAS Beaufort, S.C., conduct futile 10-day, dawn-to-dark search for Colonel Warren, commanding officer of station, who disappeared while on duck hunting trip with two civilians. Capsized boat found and SAR crew discovers body of one civilian. Search covers approximately 50-square miles including rivers, creeks, islands, salt marshes, sand and mud bars, and part of St. Helena Sound. SEASPRITE crews comprised of Capt Kelly Patterson, Capt Joe E. Gunnels, and CWO2 James R. Gauthier, pilots; Maj David L. Elam and Capt Lynne T. La Viano, copilots; Sgts Richard L. Shaughnessy, Charles F. Hancock and Edward C. Martens, Jr.; Cpls George D. Seuss, Michael E. Brossett and Charles R. Singley, crewmen. ...In other missions, UH-2 crews from the SAR unit at Beaufort: Make night flight to deliver critically-injured accident victim to Charleston Naval Hospital. CWO Gauthier, pilot; Corporal Seuss, copilot; Sgt Richard A. Wolfe, crewman. ...Deliver civilian, seriously injured in fall from hangar roof, to South Carolina School of Medicine at Charleston only 28 minutes after pickup at Beaufort Naval Hospital. Captain Patterson, SEASPRITE pilot; Corporals Brossett and Singley, crewmen. ...Locate missing fisherman stranded in marsh overnight by low tide and direct rescue boat to scene. Captain Patterson, pilot; Sergeant Shaughnessy and Corporal Brossett, crewmen.

...Man overboard rescued from Caribbean by UH-2 crew from USS Guam. LCdr Vance D. Proper, SEASPRITE pilot; Cdr William G. Davis, copilot; Charles R. Lester, AMS1, crewman. ...UH-2 crew from SAR unit at NAS Atsugi diverts from mission to rescue Japanese fisherman. Rescuee had fallen from a 60-foot cliff into rough and icy waters off Oshima Island and then was dashed against a rock. As SEASPRITE pilot Lt(jg) James G. Taylor holds helicopter in hover, Michael J. Deandressi, AN, drops down to rock and secures survivor in sling. Afterward, Ens Brit R. Armstrong, Jr., administers artificial respiration to revive fisherman who had stopped breathing. UH-2 then evacuates sick child, the original mission.

...Pilot who parachuted to safety after mid-air collision of two jets, picked up by UH-2 crew from SAR unit at NAAS Chase Field, Texas. Lt G. R. Webb is SEASPRITE pilot; Ens T. R. Patterson, copilot; M. Winfield, ADC and J. M. Long PH1, crewman. Also aboard rescue chopper is Dr. G. Reed. ...Pilot and RIO who ejected from crippled F-4 at night, rescued from sea by UH-2 crew from HC-2's Det 66 aboard USS America. SEASPRITE crew consists of Lt Kent L. Fixman, pilot; Lt(jg) Geoffery A. Foss, copilot; Ronald L. Foster, AE2; and Gerald E. King, AMH3, crewmen.

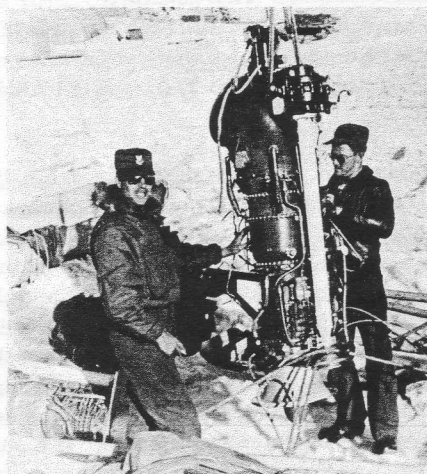
...UH-2 crew from SAR unit at MCAS Cherry Point, N.C., scrambles when occupants of F-4C eject from crippled aircraft. RIO hoisted from heavily forested area and downed pilot, located after short search, also hoisted to safety. Entire operation takes less than half-hour. Capt Norman A. Urban, SEASPRITE pilot; Cpl Kurt G. Helm, copilot; SSgt F. D. Atkins, crewman. ...In other missions, pilot who ejected at night from A-4C rescued by SEASPRITE. Crew locates wreckage, directs crash vehicles to scene and then picks up downed pilot after spotting signal flare in another area. Capt William W. Crews, UH-2 pilot; Cpl William T. Matthias, copilot; Sgt Dennis A. Bumgarner, crewman. ...Less than 20 minutes after marine is seriously injured in accident at MCALF Bogue Field, N.C., UH-2 crew from Cherry Point SAR unit delivers him to Naval Hospital at Camp Lejeune. CWO2 Robert B. Mason, SEASPRITE pilot; Sergeant Bumgarner, copilot; Cpl Jerry L. Leinert, crewman. ...Marine Corps dependent evacuated from Cherry Point to Camp Lejeune by UH-2 crew consisting of Captain Crews, pilot; Corporal Helm, copilot; Cpl Samuel E. Price, crewman; Lt R. A. Robinson (MC), USN, Lt M. C. Doss (MC), USN, doctors; R. E. Ernisse, HM3.



DEEPFREEZE MAINTENANCE—H. B. Kilmer, AMH1, crew-chief from HC-1's Det 53, NAAS Ream Field, Calif., prepares engine for installation. A Seabee from Williams Field maneuvers "cat" to hang new engine in UH-2. Waiting to begin installation are, left to right, H. G. Barnes, ADJ3, W. E. Stevens, ADJ1, and W. H. Collins, ADJ3. Stevens and Barnes check lines and connections on new engine. (USN photos)

UH-2's In Antarctic

HC-1's Det 53, attached to the Coast Guard Ship Staten Island, is the first detachment to use UH-2 SEASPRITES in the Antarctic. Maintenance personnel attached to the detachment also had the opportunity to chalk up another first when, on January 1, they were called on to perform an unscheduled engine change after a landing at barren Williams Field. Undaunted by their frigid surroundings, the mechanics swung into action. A quick engine change assembly was brought from the ship and the work began. Because conditions were poor, with 30-knot winds and temperatures ranging from the mid-20's to high 30's, personnel were limited to the length of time they could spend working in the open — there are no hangar facilities at Williams Field. On the morning of January 5 the installation was completed and a successful test hop flown. The Staten Island has been deployed from the United States since Oct 5, 1966. It is one of the "wind" class icebreakers and has been assisting Operation Deepfreeze 66-67 in the Ross Sea area.



Lemoore SAR Unit Rescues 19

Nineteen civilians, trapped on two isolated islands in a deep canyon by raging flood waters, were rescued by a UH-2 crew from the SAR unit at NAS Lemoore, Calif. To reach the site, LCdr Joseph L. Kniely and his crew flew beneath a constantly lowering ceiling toward the Sierras and then made repeated landings and take-offs to evacuate 16 persons from one of the islands. The operation was carried on at 1500 feet in rain and fog from a small field surrounded by trees and power lines. The loud hailer was used to direct the rescuees on the ground. The SEASPRITE crew evacuated three more persons from an adjacent island afterward and then, despite lowering visibility and heavier rain, made a sweep to make certain no one else was trapped in the area. The chopper landed afterward at Visalia Municipal Airport to refuel. Sharing in the hazardous mission were LCdr John L. Bacon, copilot; Kenneth W. Creamer, AME2; and Kenneth D. Tebow, ADR2, crewmen.



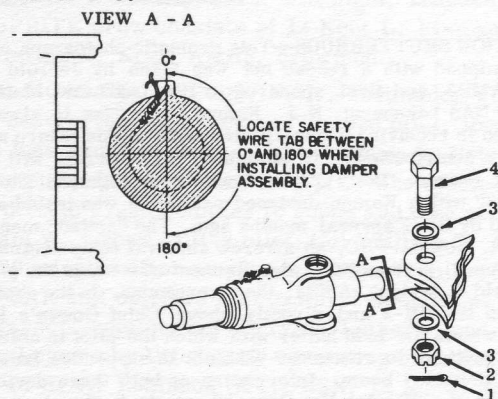
ATTENTION SHUTTERBUGS—This dramatic photograph of a UH-2 equipped with a rescue net was taken by Jerrold C. Bruce, AMH3, and first appeared in the Lakehurst Station Break at NAS Lakehurst, N.J. Kaman Rotor Tips is always interested in receiving unusual photographs of this nature and welcomes contributions. If published, name credit will be given, of course. Petty Officer Bruce's photograph shows "Angel 32" with a Kaman-designed net which was tested and evaluated by HC-2 several months ago. The "netted" man is George R. Gowan, PRC, an aircrew survival equipmentman. LCdr Leon C. Drake, HC-2 development officer, is the pilot and Donald L. Wright, AMH1, the aircrewman. In the photograph, on the UH-2 and directly above Chief Gowan's left hand, is shown the loud hailer with which the pilot is able to give instructions to rescuees. The net is suspended from a rescue "fishpole" boom. Information on both these devices appears in the "Design For Rescue" article in this issue of Rotor Tips.

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. (Applied UH-2) MAIN ROTOR BLADE DAMPERS, P/N K610029 AND 101264, HAVE A LOCKWASHER, P/N 100934, INSTALLED ON THE INBOARD END OF THE DAMPER TO LOCK THE RODEND TO THE PISTON SHAFT. AT DAMPER INSTALLATION SHOULD THE TAB ON THE LOCKWASHER FACE TOWARD OR AWAY FROM THE SPINDLE?

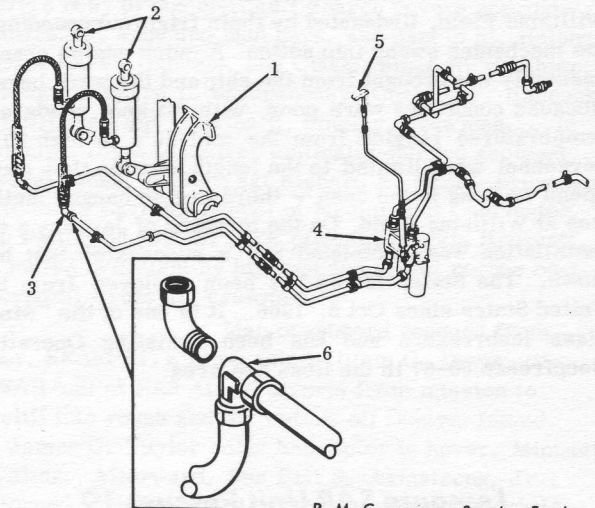
A. The lockwasher tab should face away from the spindle. If the damper is installed with the lockwasher tab facing inboard (toward the spindle), the tab lockwire may hit or rub against the retention lag spindle. If this is allowed to continue, the lockwire will break and the piston rod will back off from the rodend. In the event the damper is already installed on the aircraft with the tab facing inboard, move the blade and retention through the lead and lag range while checking for clearance between the lockwire and the retention spindle. If a sufficient gap is evident and no contact can be made, it is not necessary to take further action; however, if the clearance is marginal and contact could possibly occur, it is necessary to turn the damper rodend 180 degrees. Refer to the illustration and proceed as follows: Set the rotor blade at its lowest position and lock the rotor brake. A blade folding retaining assembly should be utilized to control the slight blade movement required to accomplish this change. Remove the cotter pin (1), nut (2), two washers (3), and the bolt (4) which attaches the damper rodend to the main rotor hub. Slowly move the rotor blade away from the damper just enough to expose the rodend. Turn the rodend 180 degrees so that the lockwasher tab faces away from the retention spindle. Guide the blade slowly back toward its original position until the rodend is aligned with the bolt holes in the main rotor hub. Attach the damper rodend to the hub with a washer (3), bolt (4), washer (3), nut (2) and the cotter pin (1). Inspect and, if necessary, service the damper according to the instructions listed in the HMI, NAVWEPS 01-260HCA-2-5.



W. J. Wagemaker, Service Engineer

Q. (Applies UH-2) WHAT METHODS ARE AVAILABLE TO UNLOCK THE MAIN LANDING GEAR PARKING BRAKE?

A. The standard method of unlocking the landing gear parking brake is to apply toe pressure to the left brake pedal (1) shown in the illustration. When toe pressure is applied, the control valve locking pin piston is forced inward releasing the valve lever, allowing the spring-loaded parking brake handle (5) to return to the down and unlocked position. If the master brake cylinder (2) is low in fluid and the brakes cannot be unlocked by applying toe pressure, the following procedure may be used: Open the nose doors and unzip the fuselage curtain which covers the fuselage tub area. Fold the curtain up and secure to the fuselage bulkhead with the two fasteners. Reach into the upper tub area, just inside the bulkhead, and locate the elbow (3) in the left brake line. Disconnect the brake line at the elbow (3) which protrudes through the cockpit floor. Screw a connector (6), P/N AN821-4, into the fitting on the brake line. Attach a pressure source, such as a hand pump, to the AN821-4 connector. Apply pressure to the line until the parking brake handle (5) returns to its down and unlocked position. This method applies pressure directly to the parking brake control valve (4) and simulates left pedal toe pressure with a full master cylinder. Refer to the HMI NAVWEPS 01-260HCA-2-2 for filling and bleeding the main landing gear parking brake system.



P. M. Cummings, Service Engineer

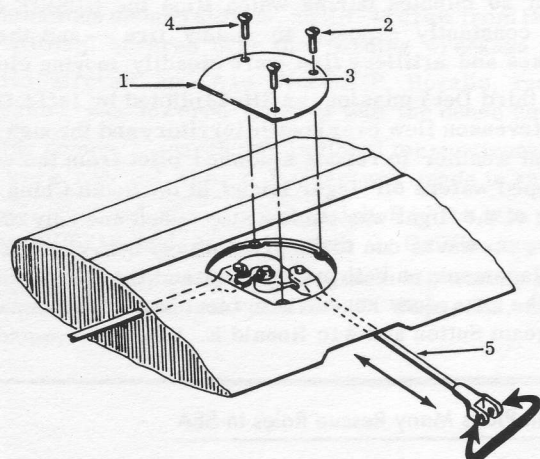
Q. (Applies UH-2) WHAT IS THE MOST PROBABLE CAUSE IF A NOISE OR RATTLE IS HEARD WHEN MOVING A NEW OR RECENTLY-OVERHAULED TAIL ROTOR BLADE?

A. The noise or rattle is probably caused by small pieces of cured adhesive and/or cherry rivet tails. In the normal build-up of a blade some adhesive is squeezed out from between bonding surfaces. When the adhesive cures these projections break off and fall into the blade spar cavity. During cherry rivet installation a center piece, or tail, can break off and fall into the spar cavity. The tail piece or adhesive left within the spar cannot be removed unless the blade tip cap is removed. Since they do not affect blade performance, the rivet tails and adhesive can be left entrapped within the blade.

W. J. Wagemaker, Service Engineer

Q. (Applies UH-2) MAY SUBSTITUTE SCREWS BE USED TO INSTALL THE FLAP CONTROL ACCESS COVER ON THE -209 MAIN ROTOR BLADE?

A. No substitutions are allowed. In the illustration, the access box cover (1) is secured in place by two NAS333CPA5 screws (2 and 3) and one NAS333CPA4 screw (4). When screw (2) is installed, it is directly over the path traveled by the flap control rod. If a screw with a greater length is used in place of screw (2), it could protrude enough to prevent the control rod from completing its full travel. To check for clearance, move the short rod to flap (5) in and out while rolling from left to right. IT MUST NOT HANG UP — THE ROD MUST TRAVEL FREELY. If a screw other than the one specified has been installed, interference will most probably occur when the flap rod (5) is rolled to the left while moving the rod in and out. The correct lengths for the specified screws are: NAS333CPA4 - 0.531-inch; NAS333CPA5 - 0.656-inch.

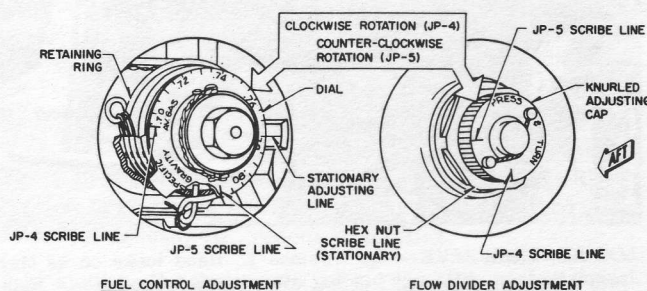


W. J. Wagemaker, Service Engineer

Q. (Applies UH-2) WHEN CHANGING FROM ONE TYPE FUEL TO ANOTHER, WHAT ADJUSTMENT SHOULD ALWAYS BE MADE? WHY?

A. Adjust the fuel flow divider and fuel control for the type of fuel being used according to NAVAIR 02B-105AHB-2. Such adjustments must be made in order for the engine to operate properly. Due to the many variables, no definite statement can be made as to exactly how the engine will be affected in all flight regimes with improper adjustments. In a new engine, probably very little change will be evident; however, with an engine which has been in operation for some time, improper adjustment could either cause hot starts, cold starts, failure to accelerate, fast acceleration, low topping or high topping. On some engines the stall margin may be affected, particularly if the compressor performance has deteriorated. It should also be noted that when changing from one fuel to another, the fuel in the lines must be expended before the engine will receive the different type fuel. If trouble is experienced on a start immediately after changing fuels and the flow divider

and fuel control have both been set for the new fuel, restart the engine until the old type fuel in the lines is replaced by the new. The T-58 engine is supplied fuel on a pounds-per-hour (pph) rate which is determined by the density of the fuel. The need for adjusting the flow divider and fuel control to the density of the fuel type being used will be most evident during initial start. The following chart illustrates probable initial start problems caused by various flow divider and fuel control settings. Note that the pph rate, which is determined by the fuel control and flow divider setting, can have a wide variation. When this variation occurs on initial start it can amount to almost 10% of required starting fuel.

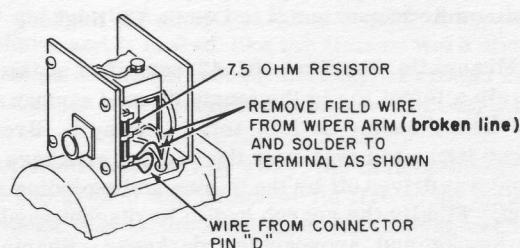


SETTINGS				
Fuel Type	Fuel Control	Flow Divider	Pounds Per Hour Differential	Probable Effect On Engine Start
JP-4	JP-4	JP-4	0	Normal
JP-4	JP-4	JP-5	+24	Hot
JP-4	JP-5	JP-4	-3	Cold Hang-up
JP-4	JP-5	JP-5	+21	Hot
JP-5	JP-5	JP-5	0	Normal
JP-5	JP-4	JP-5	+3	Warm to Hot
JP-5	JP-5	JP-4	-24	Cold Hang-up
JP-5	JP-4	JP-4	-21	Cold Hang-up

H. Zubkoff, Service Engineer

Q. (Applies HH-43B/F) WHAT WIRING CHANGE IS NECESSARY WHEN A 100-FOOT HOIST CABLE IS REPLACED WITH A 200-FOOT CABLE?

A. Reposition the field wire from the 7.5 ohm resistor in the hoist motor relay assembly without disturbing the wiper setting. The illustration shows where the wire (broken line) is connected to the wiper when using the 100-foot cable. Remove the wire from the wiper and resolder it to the base of the resistor (solid line) where the wire from pin D is soldered. Repositioning this wire shunts the resistor. Do not change the wiper setting; in the event a re-conversion back to a 100-foot cable is desired, the wire can be resoldered back to the wiper terminal.



M. Whitmore, Jr., Service Engineer

During 1966 a total of 214 Kaman Scrolls of Honor were awarded to HH-43 pilots and crewmen serving in Southeast Asia. All of the rescue flights were carried out under hazardous conditions involving either enemy fire, poor weather, limited visibility, rugged terrain or various combinations of these factors. The following are only a few of the missions for which Scrolls were awarded.



LOG ANOTHER SAVE—SSgt Thomas E. Hand looks on as Maj Joseph Watson, fills out his log after a rescue mission. Both men are assigned to Det 8, 38th ARRSq, at Cam Ranh Bay AB, RVN. During the past year the squadron has flown approximately 2200 missions in the HH-43 HUSKIE helicopters assigned. Included are local base emergencies, base support, medical evacuations, intelligence surveys, transporting vital blood, and emergency aircrew recovery missions. (USAF photo)

Pedro Flight comprised of two HH-43's from Det 7, 38th ARRSq, Da Nang AB, RVN, rescued three crewmen from a Marine helicopter which had been downed by intense ground fire. The rescues were made despite the fact that the site was infested with hostiles and there were nine confirmed 50-caliber machine guns within 300 meters of the downed aircraft. In addition, a raging brush fire had developed from a heavy artillery barrage. The immediate rescue area was surrounded by high ridges, whipped by turbulent winds and covered with 10-foot-high elephant grass.

While Armed helicopters suppressed ground fire, the two HUSKIES landed and the rescue specialist and helicopter mechanic were deployed from both aircraft. As flames burned the grass beneath the rotor blades of the rescue helicopters, the crewmen made their way through the heavy undergrowth and fire to lead the dazed survivors back to the HH-43's. Because of the heat and exploding ammunition they could not get to the crash to search for a fourth man in the wreckage. The secondary helo took off with the survivors and headed for safety. Piloting the second HUSKIE were Capt John B. Kneen and Lt Frederick D. Gregory. Crewmen were TSgt Delmar R. Mapes and A1c Dennis C. Hughes.

Meanwhile, the first HH-43 remained at the scene in a vain attempt to aid the fourth downed airman. Despite the heavy enemy action, 1stLt Tommy L. Brown tried three times to hover over the burning wreckage but each time was driven off by the flames and exploding ammunition. Finally the search had to be discontinued because of smoke and approaching darkness. Sharing in the hazardous flight with Lieutenant Brown were Capt Joseph E. Symond, Jr., the copilot, and TSgt Patrick A. Bowers and SSgt William C. Sutton, crewmen.

In a similar mission, an HH-43 from Det 7 rescued two Marine crewmen from their helicopter which had crashed in a combat area on the side of a steep, tree-covered hill swept by strong, gusty air currents. At the time, shell fire was falling on three sides of the crash area, an air strike was in progress on the fourth, and heavy fighting was going on nearby. Capt Gary E. Robertson and his copilot, Lieutenant Gregory, held the HUSKIE in a hover at tree-top level after A1c Albert W. Foster, III, the pararescueman, was lowered to the ground. The two downed airmen were hoisted to the chopper by SSgt David L. Lancaster, helicopter mechanic, with the aid of the pararescueman. Disregarding enemy fire, Airman Foster then assisted in removing the other crewman who had been killed in the crash. The pickup took about 20 minutes during which time the HUSKIE crew was constantly exposed to enemy fire—and the air strikes and artillery fire were steadily moving closer.

In a third Det 7 mission, an HH-43 piloted by 1stLt David E. Stevenson flew over hostile territory and through turbulent weather to rescue a downed pilot from the wind-whipped waters off Tiger Island in the South China Sea. Part of the flight was made at top speed and only 20 feet above the waves due to the proximity of heavy hostile gun emplacements on both the mainland and the island. Sharing the hazardous rescue with Lieutenant Stevenson were Sergeant Sutton and A1c Ronald E. Renard.

38th Plays Many Rescue Roles In SEA

Det 1 Aids Tiger Victim

Saigon (7AF) - Many dangers lurk in the jungles of Vietnam, but those bred by nature can hardly compete for headlines with mortars, snipers, claymore mines and the like. Still, to the Montagnards, a tribal people who inhabit the mountains, nature's booby traps play a large role in day-to-day living. The Det 1, 38th ARRS, alert crew recently played a supporting part in this Montagnard-jungle saga which has taken place for hundreds of years.

The Montagnard runner told his story to the first field radio position he could find—a young man of his village had been attacked and seriously hurt by a large tiger. Word was flashed to Phan Rang Air Base and the Det 1 alert crew. Minutes later, an HH-43 HUSKIE crewed by Capt Lamonte M. Kahler, Lt David W. Barksdale, and A1c Gerald O. Steiff, was off and enroute to the village 10 miles from Phan Rang. After landing in the village square, the chopper crew found that the Montagnard had indeed been badly mauled and was bleeding profusely from a clawed leg and many deep cuts on his body.

While taking off from the village with the wounded man aboard, the HH-43 pilots caught sight of the tiger's body stretched out on the edge of the square. No doubt the highly prized skin would soon become a warm blanket for the Montagnard's family. But the big cat's intended dinner would be the first to agree that the price for tiger skin blankets is high in Vietnam.

In a combined operation, two HH-43's from Det 10, 38th ARRSq, Binh Thuy AB, rescued eight crewmen from an Army helicopter which had crashed in a rice paddy and was under constant enemy fire. Manning the primary alert helicopter, which picked up three survivors, were Capt Robert D. Vespico, RCC; Capt Alma L. Williams, CP; A2c Terry M. Dicken, Jr., HM; and A2c Michael P. Benno, RS. Aboard the second HUSKIE, which rescued the remainder of the downed airmen, were 1stLt John M. Armstrong, RCC; Maj Charles R. Kay, CP; A1c Malcolm G. Aldridge, HM; and A1c Patrick J. Geisler, RS. Protective cover during the rescue was provided by armed helicopters and an AC-47.

After flying through heavy cloud formations and dodging numerous thunderstorms, an HH-43 crew from Det 5, 38th ARRSq, hovered over the burning wreckage of a downed aircraft and A1c Vincent P. Rogalio, rescue specialist, was lowered 100 feet into the dense jungle. Finding no one, a search was initiated for survivors and they were rescued after a landing was made in an extremely confined area. 1stLt Ralph E. Vick was pilot of the HUSKIE and 1stLt Kenneth G. Griffis, copilot. Others in the crew were TSgt Reginald W. Willis, rescue specialist, and A1c Andrew C. Paparella, flight mechanic.

Det 11 Helps Shipwrecked Survivors

Quick thinking by an HH-43 pilot from Det 11, 38th ARRSq, at Tuy Hoa AB, and prompt application of his idea by two sergeants from Det 6, Bien Hoa AB, resulted in the saving of more than a dozen civilians after a Vietnamese vessel, battered by wind-driven seas, sank near the harbor.

A HUSKIE piloted by Capt Zack L. Stockett joined the mass rescue effort by military and civilian personnel at Tuy Hoa after the tragedy occurred. Also aboard the helicopter were MSgt Donald F. Larsen, flight engineer, and SSgt Calvin H. Felts, medic, both TDY from Det 6. When they reached the scene, panicky passengers and crewmen from the sunken vessel were being slammed into the side of an old, half-submerged LST nearby and others were hanging onto pieces of wood and inner tubes which had broken away from the wreckage. Due to the rough water and heavy undertow it was impossible for the survivors to reach shore. The Det 11 chopper and an Army helo tried to hoist them from the water but the victims were too exhausted or panicky to hang on; the sunken ship's masts and superstructure also made hoisting almost impossible. Captain Stockett then got the idea of using the hoist cable with the sling to tow survivors to the beach. The system worked and the Army helicopter began using the same procedure. In all, 60 Vietnamese were rescued, either by the helicopters or shore personnel — the HH-43 crew was responsible for saving 16 persons.

Two HH-43's from Det 6, 38th ARRSq, Bien Hoa AB, teamed up to rescue the crew of a C-123 downed by enemy fire while flying over dense jungle in the Iron Triangle. Guided by the other crew members of the HUSKIE, Capt David L. Wiest held the helicopter in a hover with the rotor blades clearing the trees by a scant six inches as two of the three survivors were hoisted aboard. The second HH-43, piloted by Capt James F. Jansa, then moved in and repeated the hazardous maneuver to rescue the third survivor. Although no hostile fire was encountered, gusty winds made hovering difficult for both choppers. With Captain Wiest were Lt Wendell B. Wood, the copilot; A1c Harrison H. Ewton, flight engineer; and A2c Steve M. Northern, rescue specialist. Those in Captain Jansa's crew were Lt Charles I. Rice, copilot; SSgt Barry Sherman, flight engineer; and A2c John J. Dagneau, III, rescue specialist.

In another Det 6 mission, Maj David M. Randall and his crew disregarded enemy fire nearby to search for, and rescue, the pilot of an F-100 who bailed out of his crippled aircraft and landed in such dense foliage he could hardly be seen. As in the previous mission, the HUSKIE pilot held the chopper in a hover below the tree tops while the rest of the crew checked for blade clearance. With the Major were Lt Robert A. Reilly, the copilot; A1c Melvin G. Goff, flight engineer; and SSgt Robert S. Loud, rescue specialist.

Det 7 In Fiery LBR Mission

Crew members of an Air Force HH-43 HUSKIE rescue helicopter headed off what might have become a flaming inferno at DaNang recently after an F-4C Phantom landed but was unable to engage the barrier and skidded wildly past the overrun and into the mud. The F-4C crew had flashed an in-flight emergency call while en route back from a strike mission north of the DMZ and the HH-43 alert crew, commanded by 1stLt Frederick D. Gregory, were aloft and waiting for the stricken Phantom.

"We were following him slightly to his rear," related Lieutenant Gregory, "when he went off the end of the runway. When they came to rest, the aircraft burst into flames but there was no explosion. The fire was pretty big," he added.

"I saw the pilot and aircraft commander starting to get out," said 1stLt Donald D. Sams, the HUSKIE copilot. "The pilot got out right away but the aircraft commander was still there and it looked like the flames were about to reach him so our pilots brought the chopper around and fanned the flames away from him while he got out," he said.

After the pilots were safely away, the helicopter crew dropped to the ground and detached its fire suppression kit. "Although this is the first time we've ever used a fire suppression kit on the real thing, it worked perfectly," said A1c Wayne L. Boteler.

Working feverishly, the firemen put out the fire before the first fire truck arrived.

Design For **RESCUE—**

PART II

by David G. Uitti
UH-2 Project Office

A few years ago, the Naval Air Systems Command awarded Kaman Aircraft a research and development contract to investigate ways and means of improving helicopter rescue equipment and techniques. This relatively small contract has paid big dividends in terms of better rescue capability — it led to the production of the open sea rescue boom and loud hailer as integral features of the UH-2 helicopter, and a universal rescue net which is suitable for helicopter air-sea rescue operations.

The Fishpole Boom

"Fishpole" is an apt description for the open sea rescue boom on the UH-2 — this versatile device enables the pilot to place a rescue sling or seat near a survivor in much the same manner as a fisherman drops his hook in a designated spot. Due to the length of the curved rescue boom, and the manner in which it can be controlled from the cockpit, the pilot can view the rescuee more easily. This reduces the chance of disorientation often caused by the pilot having to turn in the seat to view the operation when using the short boom. It also lessens and in most cases eliminates the need for crewman guidance. The boom also grants the pilot greater rotor clearance from obstacles that may hamper a rescue operation.

When the fishpole is not used, it is difficult for the pilot to keep the rescuee in view while preparing for a pickup and he must rely on the crewman for guidance in positioning the helicopter over the survivor.

DESCRIPTION

The open sea rescue boom assembly (fishpole), P/N 683334, is a curved extruded aluminum tube 3 inches in



Fishpole Boom — Boom on UH-2 is shown in stowed position with hoist hook suspended over the rescue door.

diameter with a 1/4-inch wall. It is 8-feet, 10-inches long and, like the net, is rated to simultaneously lift two soaking wet, fully-equipped rescuees from the water. The boom is mounted in a socket on the right side of the fuselage, just aft of the nose door hinge line. The rescue hoist cable is threaded over the pulley in the eye at the upper end of the fishpole. When the pole is in the stowed position, the eye is directly under the rescue hoist, suspending the hoist hook over the rescue door. When extended, the pole swings forward about 110 degrees and suspends the hoist cable eight feet outboard of the fuselage thus putting the pickup point within the pilot's line of vision. A series of relays and limit switches interlink the rescue hoist and fishpole control circuits.

OPERATION

Since the fishpole is used in conjunction with the hoist, the crewman or hoist operator threads the hoist cable through the fishpole eye and then notifies the pilot. The pilot places the boom control toggle switch, located on the instrument panel, in the "extend" position. When the pilot or hoist operator places his hoist switch in the "down" position, the boom extends with the cable. Once the boom has reached its fully-extended position it is hydraulically held in place while the hoist cable is lowered with the rescue device — sling, net, or seat. As the cable is reeled in, with the device and rescuee, the hoist bumper assembly contacts the tip-limit switch in the fishpole eye. This reduces hydraulic pressure in the extend circuit by placing the boom actuator in neutral, and allows the hoist cable to return the fishpole to the stow position. When the boom reaches the stowed position, a micro-switch at its base shuts off the hoist motor, hydraulically and mechanically locks the fishpole in place and automatically returns the pilot's boom control switch to the stow position. The hoist hook can then be lowered to bring the rescuee into the cabin. Normally, the boom will not extend unless the hoist bumper maintains contact with the tip-limit switch in the fishpole eye. An emergency extend switch is provided on the boom control panel in the event the boom control switch is accidentally placed in the stow position during a rescue. If the hoist motor is stopped before the fishpole is in the stow position, hydraulic pressure on the boom keeps the cable taut.

Boom and Net —Twin-engine UH-2C is shown with boom in extended position and rescue net ready for lowering. A rescue sling or seat may also be used with the boom which allows the pilot to keep the survivor in sight at all times.



The Rescue Net

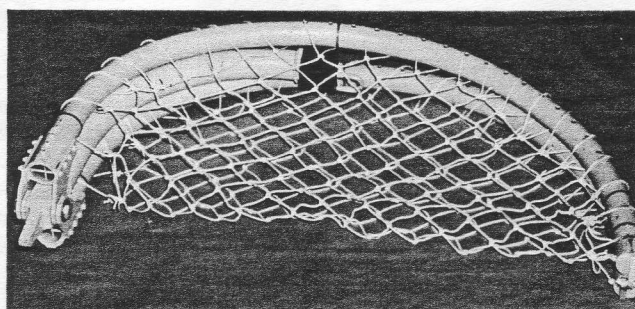
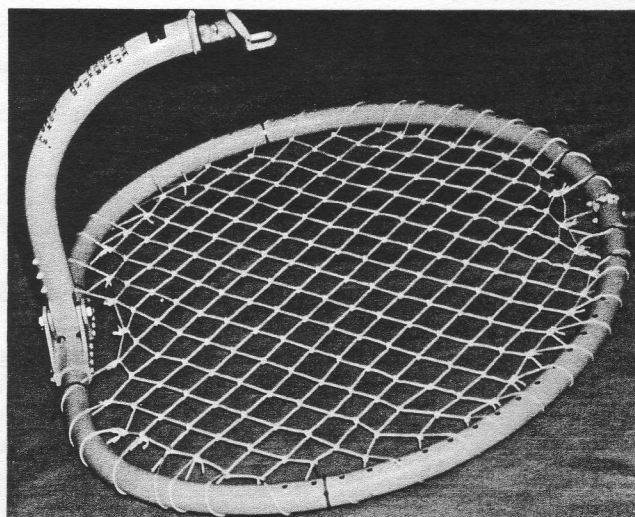
The delivery of BuWeps P/N 64-A-110H1 rescue nets has added a significant asset to the inventory of specialized helicopter rescue equipment. Although the net may be used for any water rescue, it is particularly adapted for use if the rescuee is injured or unconscious and it is inadvisable to use the sling or seat. The device is often referred to as a "scoop-type" net, however, the term does not properly describe either its primary function or the technique recommended for its operation. The manner in which it is used depends upon the circumstances. Experience has shown that it is best utilized as a platform from which the crewman can, if the situation requires, help the rescuee into the net. The pilot then lifts both men free of the water eliminating any need for leaving a crewman in the water due to lack of space or discomfort of the injured man when using the rescue sling or seat.

DESCRIPTION

The rescue net assembly, BuWeps P/N 64-A-110H1, was carefully developed and center of gravity controlled to achieve the characteristic which keeps the mouth or opening always facing forward relative to the direction of motion through the water. The design criteria requires that the net be structurally capable of simultaneously handling two, water soaked, fully equipped rescuees or crewmen. Subsequent static tests to proof load the net included loading the net with more than 1400 pounds. This structural criteria, therefore, provides the capability of rescuing two persons in one pick-up, or allows the helicopter crewman to ride down in the net to assist an injured rescuee.

The net face is essentially a five-foot diameter circle supported by two tubes shaped into semi-circles. The tubes are hinged at two points to permit folding and facilitate stowage. A ladle-like handle is mounted at the main hinge point, while the rescue hook receptical, on the opposite end of the handle, is located at a point precisely above the center of the net.

The materials used for the net have been chosen for their corrosion resistant properties. The tubing and hinge fittings are extruded from 6061-T6 aluminum and protected by a finish system consisting of MIL-S-4383 sealing compound as well as a multi-coat lacquer finish.



The netting itself is made from high strength nylon chord. Moveable parts at the hinge pins, inherently vulnerable to corrosion by virtue of the relative motion between parts, are easily replaceable aluminum sleeves. The sleeves are made from stock tubing to minimize future maintenance in these areas.

UTILIZATION

The net was designed after rescue reports indicated the need for a device that would aid SAR crewmen in rescuing immobile survivors. Often, after going into the water, the crewman encountered considerable difficulty in placing the rescuee in a sling or onto a rescue seat without causing further injury to the survivor. Although the original concept of the rescue net was to provide pilot capability for an unassisted trolling retrieval of an immobile rescuee, actual testing proved the method

to be less than optimum in realistic operating conditions. In an open sea environment this purely pilot controlled "ladle-type" scooping rescue necessitated a high degree of pilot proficiency and was not the quickest means of completing the pickup. However, the outstanding advantage of the net over all existing hardware was found in its utilization as a concave container in which the crewman rests as he is lowered to assist the rescuee. This method has been termed "drop point pickup," so called because the net and crewman are deployed imme-

diately adjacent to the rescuee and permits the crewman to remain securely in the net while using both hands for quick retrieval. This later method was explored at great length during flight tests at Kaman and included one and two man net pickups in the open sea with eight to ten foot waves and winds over 30 knots. A complete pilot report on these tests will appear in the next issue of Rotor Tips. This report will include the several methods of retrieval used during the tests in the various sea states and simulated conditions of the rescuee. **K**

CURRENT CHANGES

	Issue Date
H-2 Airframe Change 114 - Electrical System: DROOP STOP LIGHT	14 April 1967
H-2 Airframe Change 119 - Airframe: METAL FAIRING FOR RESCUE HOIST	11 January 1967
H-2 Airframe Change 122 - Airframe: REPLACEMENT OF TAIL ROTOR GEARBOX SUPPORT FITTINGS	31 May 1967
NAVAIR 01-260HCA-1 - NATOPS FLIGHT MANUAL, Navy Model UH-2A/UH-2B Helicopters	15 October 1966
NAVAIR 01-260HCA-1C - AIRCREWMAN'S POCKET CHECKLIST, Navy Model UH-2A/UH-2B Helicopters	15 October 1966
NAVAIR 01-260HCA-2-1 - Handbook, Maintenance Instructions, Navy Model UH-2A/UH-2B Helicopters, GENERAL INFORMATION	15 October 1962 changed 15 October 1966
NAVAIR 01-260HCA-2-3 - Handbook, Maintenance Instructions, Navy Model UH-2A/UH-2B Helicopters, POWER PLANT AND RELATED SYSTEMS	1 August 1965 changed 15 January 1967
NAVAIR 01-260HCA-2-5 - Handbook, Maintenance Instructions, Navy Model UH-2A/UH-2B Helicopters, ROTOR SYSTEM	1 November 1963 changed 15 January 1967
NAVAIR 01-260HCA-2-6 - Handbook, Maintenance Instructions, Navy Model UH-2A/UH-2B Helicopters, HYDRAULIC SYSTEM	15 June 1963 changed 15 January 1967
NAVAIR 01-260HCA-2-10 - Handbook, Maintenance Instructions, Navy Model UH-2A/UH-2B Helicopters, RADIO AND RADAR SYSTEMS	15 February 1967
NAVAIR 01-260HCA-2-11 - Handbook, Maintenance Instructions, Navy Model UH-2A/UH-2B Helicopters, WIRING DATA	15 July 1965 changed 15 January 1967
NAVAIR 01-260HCA-4-2 - Illustrated Parts Breakdown, Navy Model UH-2A/UH-2B Helicopters, DRIVE SYSTEMS	15 January 1967
NAVAIR 01-260HCA-4-3 - Illustrated Parts Breakdown, Navy Model UH-2A/UH-2B Helicopters, UTILITIES	1 April 1964 changed 15 January 1967
NAVAIR 01-260HCA-4-4 - Illustrated Parts Breakdown, Navy Model UH-2A/UH-2B Helicopters, RADIO AND ELECTRICAL	15 January 1967
NAVAIR 01-260HCA-4-6 - Illustrated Parts Breakdown, Navy Model UH-2A/UH-2B Helicopters, AIRFRAME	15 October 1962 changed 15 January 1967

NAVAIR 01-260HCA-4-8 - Illustrated Parts Breakdown, Navy Model UH-2A/UH-2B Helicopters, NUMERICAL INDEX AND REFERENCE DESIGNATION INDEX	15 January 1967
NAVAIR 03-95D-11 - Technical Manual, Overhaul Instructions, Navy Model UH-2A/UH-2B Helicopters, MAIN ROTOR SYSTEM	15 January 1966 changed 15 August 1966
NAVAIR 03-95D-14 - Technical Manual, Overhaul Instructions, Navy Model UH-2A/UH-2B Helicopters, TAIL ROTOR GEARBOX ASSEMBLY	1 April 1966 changed 1 April 1967
NAVAIR 17-15BAB-24 - Technical Manual, Operation and Service Instructions with Illustrated Parts Breakdown, Navy Model UH-2A/UH-2B Helicopters, AC CONTROLLERS LINE AND BENCH TEST SET	1 March 1967
Support Equipment Change 567 - SET-RIG FIXTURE (Cyclic and Directional) Modification of: UH-2A/UH-2B Helicopters	31 March 1967
T.O. 1H-43(H)B-1 - FLIGHT MANUAL, HH-43B Helicopter	22 September 1966 changed 10 March 1967
T.O. 1H-43(H)B-1CL-1 - PILOT'S ABBREVIATED FLIGHT CREW CHECKLIST, HH-43B Helicopter	22 September 1966
T.O. 1H-43(H)B-2 - Technical Manual, MAINTENANCE INSTRUCTIONS, HH-43B and HH-43F Helicopters	16 September 1966 changed 12 January 1967
T.O. 1H-43(H)B-4 - Technical Manual, ILLUSTRATED PARTS BREAKDOWN, HH-43B and HH-43F Helicopters	16 March 1964 changed 22 July 1966
T.O. 1H-43(H)F-1 - FLIGHT MANUAL, HH-43F Helicopter	22 September 1966 changed 5 October 1966
T.O. 1H-43(H)F-1CL-1 - PILOT'S ABBREVIATED FLIGHT CREW CHECKLIST, HH-43F Helicopter	22 September 1966
T.O. 3R1-2-6-3 - Technical Manual, Overhaul; ROTOR BLADE ASSEMBLY COMPLETE, P/N K711501-301, -302	15 August 1966
T.O. 3R1-2-6-4 - Technical Manual, Illustrated Parts Breakdown; ROTOR BLADE ASSEMBLY COMPLETE, P/N K711501-301, -302	15 December 1961 changed 10 February 1967
T.O. 3R7-2-3-23 - Technical Manual, Overhaul, TRANSMISSION ASSEMBLY, HH-43B Helicopter	17 October 1966
T.O. 3R7-2-3-24 - Technical Manual, Illustrated Parts Breakdown, TRANSMISSION ASSEMBLY, HH-43B Helicopter	17 October 1966

F. G. Weber, Supervisor, Service Publications

Timely Tips

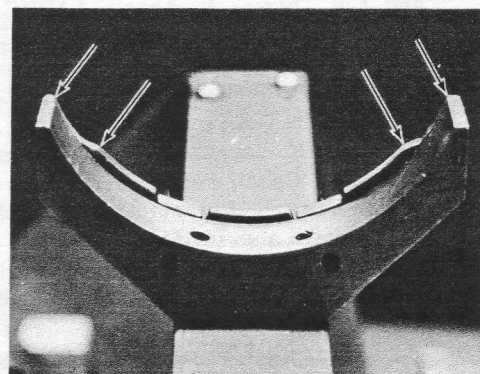
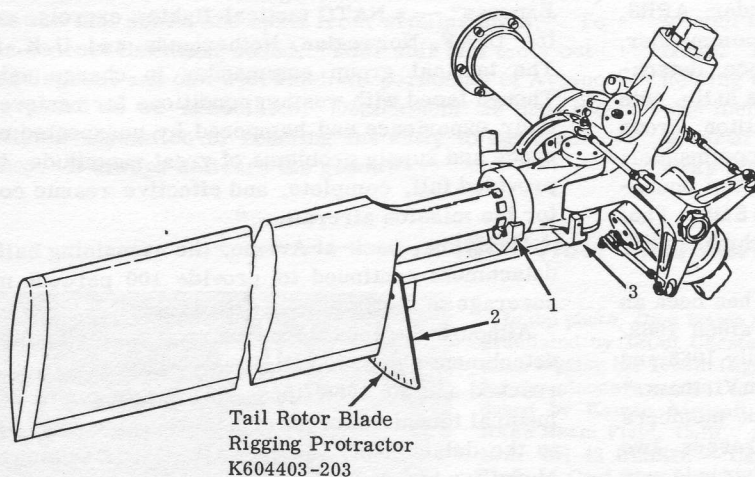
Removing Transmission Torque Tubes (HH-43B, HH-43F)

When attaching the torque tube puller to the torque tube prior to removal of the tube, use two 1/4-28 screws with enough washers to prevent the screws from bottoming and damaging the tube. After the torque tube has been removed, disconnect the puller and lock the puller in a bench vise. Before lowering the tube onto the puller, check the slots. Only two of the four slots in the end of the tube are in line with each other — be sure the puller is engaged in these slots. Also, when removing or installing the transmission seal locknuts, remember the left-hand nut has a left-hand thread and the right-hand nut has a right-hand thread.

F. E. Stares, Service Engineer

Tail Rotor Blade Rigging Protractor (UH-2)

A minor modification of a support, P/N K604403-47, on the tail rotor rigging protractor, P/N K604403-203 (shown in the illustration), will eliminate the interference occasionally encountered between the protractor and the tail rotor blade lock. The support (1) located between the protractor dial (2) and the rocking pin support (3), has a lip or flange which fits over the outboard edge of the tail rotor blade grip. The modification consists of removing approximately 3/4-inch of the lip from both outboard edges as shown in view A. File the lip flush with the contoured portion or wall of the support (1). If slightly more material is removed from the lip portion of the support no damage will result, but care should be taken not to alter the contour of the support wall.



View A

W. J. Wagemaker, Service Engineer

Rotor Blade Repair (HH-43B, HH-43F)

Information contained in the Structural Repair Manual, T.O. 1H-43(H)B-3 is an excellent aid in determining whether a damaged rotor blade should be repaired locally or sent to an overhaul facility. Recently, several rotor blades with comparatively minor damage were received by an overhaul facility. If there is doubt as to whether repairs fall within the scope of the local activity, reference can be made to the inspection criteria and other information contained in the manual. Local repair, whenever possible, will allow maximum use of the rotor blades and save considerable time and money.

W. J. Wagemaker, Service Engineer

Microphone Use (UH-2)

Correction to related Timely Tip in the January-February, 1967 issue. The "Tip" should have read: "When a pilot's or crewmember's station cannot be heard on the AN/AIC-14 interphone system, check the microphone type. The interphone and loud hailer are wired to accept carbon mikes, therefore, if a dynamic mike is used in the system it will be inoperable unless a jumper change is made. Changing the links in interconnecting box J1013/AIC routes the signal through a 60 db gain amplifier to make the signal amplitude equivalent to a carbon mike signal. This allows operation of both the interphone system and the loud hailer."

M. Whitmore, Jr., Service Engineer



AVIANO DET IN ACTION—A basket rescue demonstration shows method used by A1c Roger Mullins in rescuing three Italians from inside a house inundated during floods. Airman Mullins was awarded the Air Force Commendation Medal for his heroic action. An unrehearsed scramble enlivened the photographer's visit to the detachment. One minute and fifteen seconds after the alert siren sounded, the fully-crewed helicopter was airborne. In other photo, Maj Philip S. Prince, center, briefs his HH-43B crew on a projected training mission. Left to right are TSgt Heideman, Capt James A. Darden, Jr., and A1c Charles Henske. (USAF photos)

DET TEN RECEIVES OUTSTANDING UNIT AWARD

by MSgt R. E. Rogge

Aviano AB, Italy - Det 10, AARRC, received the Air Force Outstanding Unit Award at ceremonies held here recently. Col Allison C. Brooks, commander, ARRS, and Col Thomas R. Aaron, AARRC vice commander, made the presentation to Maj Philip S. Prince, detachment commander. Attending the ceremonies at Hq. 40th Tactical Group, were Col Richard L. Hamilton, group commander; Col Vincent R. LaBerge, vice commander; Col Glenn K. Sorensen, deputy commander for operations; Maj Cabell Fearn, civil engineer; and SMSgt Paul W. Risher Jr., fire chief. Wives of detachment personnel were also invited.

The 25-man, two-helicopter detachment has been an integral part of the 40th Tactical Group since 1962. Major Prince has been commander since July 1965 and during his tenure also served a 90-day tour in Vietnam. * During the morning ceremonies detachment members were awarded two Distinguished Flying Crosses, two Scrolls of Honor and two 1,000-flying-hour plaques from the Kaman Aircraft Corporation. Major Prince and Capt Franklin L. Chase received the DFCs and the Scrolls of Honor; Major Prince and Capt James A. Darden, Jr., received the 1,000-hour plaques.

Flying HH-43B HUSKIE helicopters, the detachment performed yeoman service during the disastrous floods that struck this part of Italy in 1965 and 1966. Captains Darden and Robert Henderson were selected as co-winners of the 1965 Cheney Award for their valorous acts during the 1965 floods. Captain Darden was also awarded the Airman's Medal for his spectacular aerial rescue of an elderly Italian. Captain Henderson was awarded the Air Medal for his many flights during that time. Also, for the same period, members of the detachment were awarded eight Air Force Commendation Medals and eleven Scrolls of Honor.

During the 18-month period covered by the Award citation (1 Dec 64 to 31 May 65) the detachment's outstanding duties involved operations from the Mediterranean to north of the Arctic Circle. In March 1966 the detach-

*See mission account, opposite page.

ment was split in half and one-half was deployed to Bodo Air Station, Norway, in support of "Exercise Winter Express" — a NATO tactical fighter exercise employing USAF, Norwegian, Netherlands and U.K. forces. The tactical group commander in charge said: "... Though faced with weather conditions far removed from their experience and hampered by unexpected maintenance and supply problems of great magnitude, the unit provided full, complete, and effective rescue coverage for the mission aircraft..."

Meantime, back at Aviano, the remaining half of the detachment continued to provide 100 percent mission coverage to the 40th Tactical Group.

Although the 1965 floods marked the high point of the detachment's rescue activities — when 46 persons were rescued and the 1966 floods saw A1c Roger C. Mullins, medical technician of the 40th USAF Dispensary attached to the detachment, win the Air Force Commendation Medal for his daring rescue of three persons — aerial heroism alone was not the sole criteria for the detachment's signal honor. Its maintenance and supply functions as well played important roles. For 14 of the 18 months covered by the citation, the detachment "by diligent planning and rigid adherence to proven supply principles, was able to claim a zero percent NORS (Not Operationally Ready for Supply) rate." Also, Det 10 maintained an "82 percent operationally ready rate which was well above that required and significantly greater than that expected..."

Speed is the essence of all aerial rescue operations and Det 10 must hold a record in this department. Last summer an F-100 pilot was forced to eject at 8,000 feet some five miles from the base. By the time he had parachuted down to 4,000 feet, a detachment helicopter was circling him and within six minutes after he had punched out of his crippled fighter he was in the HUSKIE and on his way back to the base. The unit reacted 94 times to possible emergencies and one such scramble was in response to an F-100 crash 200 yards short of



the runway. Protected from the searing flames by the rotor downwash, rescuemen pulled the injured pilot to safety. He has since recovered and returned to duty.

The detachment's eminently successful OJT program also played its part in winning the coveted Award. All 3-level airmen assigned attained their 5-levels with excellent scores, tribute to the dedication of the trainees and the knowledge and experience of the trainers.

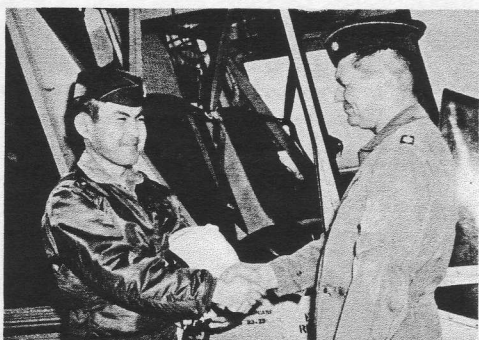
Colonel Brooks, who in May 1966 took part in the first successful, live, double pickup of men on the ground by a passing plane, cited Air Force Manual 900-3 which states that to win the Air Force Outstanding Unit Award a unit "must display exceptionally meritorious service or exceptionally outstanding achievement which clearly sets the unit above and apart from similar units." To this Colonel Hamilton added, "Your unit is a truly outstanding unit and one with which all personnel of Aviano are proud to be associated. Detachment 10 has the enviable reputation of reacting instantly to any emergency. It always delivers the goods!"

Aviano Pilots In SEA Mission

Braving flames and exploding ordnance, an HH-43 crew from the Headquarters Detachment, 38th ARRSq (MAC), Tan Son Nhut AB, RVN, rescued five injured survivors from an Army helicopter which crashed at a Vietnamese airfield. The hazardous night mission was accomplished successfully despite the fact that, just after scramble, the instruments, directional stability system and other electrical equipment aboard the rescue helicopter became inoperative due to an inverter malfunction. Maj Philip S. Prince, RCC, and his co-pilot, Capt Franklin L. Chase, had only ground lights to rely on to avoid spatial disorientation.

Six minutes after the HUSKIE began orbiting, the pilot of the battle-damaged Army chopper was unable to keep the aircraft in the air and it plunged to earth and burst into flames. Within seconds Major Prince placed the fire suppression kit in position and off-loaded SSgt Ramon N. Colunga and A2c Wylie G. Cox, the airborne firefighters, and A1c Thomas W. Buggie, medical technician. As the HUSKIE hovered over the blazing wreckage, using the rotor downwash to beat down the flames, ordnance aboard the downed helicopter began to explode. Disregarding the danger, Airman Buggie ran to the aid of the five injured survivors who had made their way from the aircraft and then collapsed. At the same time Sergeant Colunga and Airman Cox began laying foam from the FSK on the ammunition and grenades in an effort to cool the explosives and reduce the number of detonations. Then they assisted the medical technician in helping the last of the survivors to safety. Afterward it was found that the HH-43 had been hit three times as it hovered over the burning helicopter to keep the flames away from the men on the ground.

1000-Hour Pilot Awards



In top photo, Capt Isamu S. Momii, Det 8, PARRC, Yokota AB, Japan, is congratulated by LtCol Chester R. Ratcliffe, Jr., right, detachment commander, after logging his 1000th flight hour in the HH-43B. Others who qualified recently for the plaque awarded to those pilots logging 1000 hours in helicopters produced by Kaman Aircraft are: UH-2 SEASPRITE — Lt John T. Keith, HC-1, NAAS Ream Field, Calif., and Lt Benjamin B. Vincent, HC-2, NAS Lakehurst, N.J. HH-43 HUSKIE — Capt Bobby L. Meadows, TUSLOG Det 153, Cigli AB, Turkey; Capt Glen P. Walther, Det 7, PARRC (MAC), Misawa AB, Japan, and Capt Ronald I. Pass, Det 16, CARRC, McConnell AFB, Kan. In bottom photo, Captain Pass, second from right, is congratulated by Capt Robert C. Collom, left, detachment commander, upon breaking the "1000-hour barrier in the HUSKIE." Capts James C. Rodenberg, second from left, and Walter D. Murphy are holding the "barrier." (USAF photos)



Det 16 Record

After Capt Ronald I. Pass logged his 1000th hour in the HUSKIE (see opposite photo), he and the other four pilots in Det 16, CARRC, at McConnell AFB, Kan., came up with some flight time data which they feel will be of interest to other detachments. Capts Robert C. Collom, commander; James C. Rodenberg, Robert S. Henderson, Walter D. Murphy and Pass all have been awarded the Kaman 1000-hour plaque. They have an average of 1215 HUSKIE hours while amassing a total pilot time of more than 10,250 flight hours.

Huskie Happenings



...HH-43B from Det 5, EARRC(MAC), Suffolk County AFB, N.Y., conducts night search 30 miles off shore and rescues three survivors who ejected from two crippled F-101B's. Two survivors use pen flare guns to guide helicopter and lights on HUSKIE are used to keep them in view during rescue operation. Capt Gerald L. Petty, RCC, holds HH-43 in hover as A2c Clarence Haynes, RS, hoists first one and then the other survivor aboard. Advised by search plane in area that another survivor had been sighted, Captain Petty moves to new location and third airman is hoisted to safety. HUSKIE crew then continues looking for fourth man who bailed out but after 30 minutes heads for shore as other aircraft and ships continue search. Other members of HH-43 crew sharing in the hazardous mission are Capt Israel Freedman, copilot; A1c George Bankston, medical technician; and A2c Norman Wrigley, rescue specialist. Although none of the three non-rated crew members had actual mission experience, they all performed admirably, "especially under the conditions of a night over-water mission," Captain Petty said. ... In another Det 5 mission, HH-43B crew locates 18-month-old boy who had wandered from his home in near freezing weather. During search Capt Frederick Dykes, pilot, hovers HUSKIE as low as 15 feet in expanding circle. Captain Petty, copilot, spots boy and SSgt Roy Taulbee lowered to ground and carries child to safety. Other HH-43 crewmember is SSgt Curtis Yancy.

...Det 13, WARRC(MAC), Reese AFB, Texas, reports HH-43B crews made 667 airborne scrambles during 1966.

...Forty boys and two dogs, stranded in mountain youth camp wrecked by heavy rain and flash floods, evacuated by HH-43B crew from Det 14, WARRC(MAC), Nellis AFB, Nev. During mission, HUSKIE lands time-after-time at 5,000-foot level in small clearing. Area surrounded by telephone lines and tall trees. Capt James H. Black, Jr., is pilot of HH-43B, Capt Cortland D. Field, copilot, and SSgt Daniel M. Stensland, crewman.

...Two pilots who bailed out of crippled F-4C, evacuated by HH-43B crew from Det 14, EARRC(MAC), MacDill AFB, Fla. HUSKIE, piloted by Maj Edwin J. Christy, lands in small clearing and injured survivors loaded aboard after treatment by MSgt Jefferson D. Smythe, medical technician. Other members of HUSKIE crew are A1c Lawrence E. Gosford, flight engineer; SSgt Roy E. Bailey and A1c Lawrence R. Pearson, firefighters.

...Crew of HUSKIE from TUSLOG Det 153, Cigli AB, Turkey, flies to mountain-top radar site to evacuate enlisted man with broken leg suffered in fall over steep embankment. Flight over mountainous territory and landing made in confined area. Piloting HH-43B is Capt Charles W. Burridge; crewmen are A1c Frederick P. Pecotte, medical technician; and A2c John M. Adrian, helicopter mechanic.

...HH-43B crew from Det 4, AARRC(MAC), Ramstein AB, Germany, makes 100-mile night flight to evacuate enlisted man seriously injured by falling fork lift while deactivating Phalsbourg AB, France. Crew of HUSKIE consists of Capt Joseph V. Leech, pilot; Capt Leonard N. Buck, copilot; Capt Frederick W. Hornick (MC), flight surgeon; and TSgt Don E. McFarland, crewman. ... In another Det 4 mission, two students from Army Airborne School, injured while training, are evacuated by HH-43B crew. Helicopter aid called for when ambulances unable to reach injured men because of mud. Captain Leech is pilot of HUSKIE, Sergeant McFarland, crewchief; A1c Larry L. Johnson, rescueman; Capt Edward L. Hudson (MC), flight surgeon.

Det 11 Rescue Team Saves Four

In a well coordinated team effort, HH-43B crews from Det 11, EARRC(MAC), Craig AFB, Ala., rescued four pilots who bailed out after the midair collision of two T-38's. Maj Clifford E. Brandon and his crew in the first HUSKIE located two of the survivors on top of a small rise surrounded by 100-foot trees and used the helicopter's public address system to direct them to a roadway where both were hoisted aboard. Meanwhile, the second HH-43, piloted by Maj Charles P. Nadler, was being vectored to the area where the other two survivors had landed in a heavily-wooded, almost inaccessible swamp 16 miles from the base. The first HUSKIE joined in the search in the gathering darkness after flying to Craig to unload the pilots already rescued. The crews of both helos spotted a penguin flare and Major Brandon's HH-43, which had Capt John M. Nayden (MC), aboard, moved in to make the pickup. Aided by the flood and landing lights, and using more than 90 feet of

cable, the survivor was hoisted from the heavily wooded area. As the two crews continued the search, Major Nadler's crew saw a red star flare and prepared for the pickup as the other helo flew cover. Again 90 feet of cable was needed to hoist the survivor from the swamp.

Major Brandon said afterward that assistance from the control tower and RAPCON personnel was "timely, accurate, and proved to be an invaluable aid in the final location of all four pilots." The Major also said that the use of the penguin flares reduced the search time and in the case of two of the survivors, probably saved their lives.

Other members of Major Brandon's crew were Capt Kenneth C. Franzel, copilot; SSgt William V. Overstreet and A1c Gene R. Carnes, rescuemen. With Major Nadler were Capt William C. Wirstrom, copilot; and A1c James R. Shebesta, flight engineer.



FOR VALOR—Capt David B. Hightower, Det 17, WARRC (MAC), Davis-Monthan AFB, Ariz., was presented the Distinguished Flying Cross and the First Oak Leaf Cluster recently for heroism while flying HH-43's on two crash-rescue missions in Southeast Asia. The presentations were made by Col Robert D. Lipton, base deputy commander, as Maj Elmer L. O'Banion, Det 17 commander, and Mrs. Hightower watched. On one mission, Captain Hightower disregarded exploding ordnance and piloted the HUSKIE through towering flames and smoke to release the FSK and firemen; he then provided cooling rotor downwash over the burning plane. In the second mission, despite fire and burning ordnance, the Captain landed the HH-43 within feet of a crashed fighter to offload the FSK and personnel. While almost straddling one bomb, another exploded within 20 feet of the hovering HUSKIE. After rescue of the fighter pilot, Captain Hightower continued to provide cooling rotor wash and "by exposing himself to burning ordnance, he undoubtedly prevented the remaining scattered ordnance from burning and exploding, killing or seriously injuring numerous firemen and explosive ordnance disposal personnel in the crash area." (USAF photo)



DET SIX HONORED—A Military Airlift Command Plaque recognizing five years of sustained accident-free flying operations with the HH-43B was presented recently to Det 6, CARRC (MAC), Kincheloe AFB, Mich. The presentation was made to the detachment commander, Capt William J. Deming, left, by Col Ward W. Martindale, 507th Fighter Wing commander, and covers the period from Jan 1, 1962 through Dec 31, 1966. (USAF photo)



WOODSMAN HONORED—Osie C. Helton, center, a civilian logger from Darrington, Wash., was presented a KAC Scroll of Honor recently for his part in the hazardous air evacuation of a hunter who broke his neck after being thrown from a horse. The logger, intimately familiar with the rugged, heavily-forested Glacier Peak area where the accident occurred, guided an HH-43B crew from Det 4, WARRC, Paine Field through a dense overcast to the remote site. Maj Erling R. Drangstveit, detachment commander, made the presentation as Helton's wife and children watched proudly. At right is Deputy Sheriff Glenn Mann of the Snohomish County Sheriff's Office who was with the ground party during the combined rescue effort. Members of the HH-43B crew who also received Scrolls for the rescue mission were Capt Bruce C. Hepp, pilot; Capt John Duffy, copilot; A1c William Walczak, heli mechanic; SMSgt John I. Williams and A2c Helmut Keller-mann, medics. (USAF photo)



HH-43B PASSES 2000—Personnel from Det 5, WARRC, McChord AFB, Wash., proudly advertise the fact that HH-43B 91550 has passed the 2000-hour flight mark. Kneeling, left to right, are A1c William Owens, A1c David Anderson and A2c George Lepsey. Standing are A2c Duncan Scott, SSgt James Hines, Capt Donald Welsh, Maj Kenneth Spaur, commander; A1c Gordon Greever, SSgt Gerald Reinhardt, SSgt Loney Martin, SSgt David Bierley, 550 crewchief; TSgt Howard Lord, A2c Mark Erickson and A1c Ernest Parker. (USAF photo)

SCROLL OF HONOR

1964

Dachtler, Edward J., ADR1, USN
Daniel, Arthur D., A2c, USAF
Davis, Frank, SSgt, USAF
Davis, Warren K., Capt, USAF
Dibble, Phil L., AMS2, USN
Donegan, Michael R., A2c, USAF
Dotson, Kenneth W., Capt, USAF
Duffy, John E., Capt, USAF
Dunbar, William R., A1c, USAF
Dunn, Charles R., Capt., USAF
Dyess, G. E., ADR3, USN
Eagle, J. N., Maj, USMC
Eaton, G., LCpl, USMC
Elstad, Lief A., Lt(jg), USN
Emery, William J., A1c, USAF
English, Dorland E., SSgt, USAF
Ertons, Leon, SSgt, USAF
Evans, Larry C., Capt, USAF
Ezell, Colbert, SSgt, USAF
Farley, Forrest W., TSgt, USAF
Farris, Donald E., A1c, USAF
Feder, J. L., PFC, USMC
Fink, Charles C., AMS1, USN
Finley, R. H., Capt, USAF
Firse, John A., Capt, USAF
Flower, William J., A2c, USAF
Fogel, Gerald, Capt, USAF
Franzel, Kenneth C., 1stLt, USAF
Fredrick, William E., Civilian
Fujishige, Kenneth T., 1stLt, USAF
Fulfond, William, SSgt, USAF
Fulmer, A. E., LCdr, USN
Gagnon, Joseph E., Capt, USAF
Gallager, G. F., Capt, USMC
Gardner, Joseph W., LCdr, USN
Gardner, Robert L., 1stLt, USAF
Garrett, James H., A1c, USAF
Gates, Herbert G., Capt, USAF
Gentzler, Max L., A1c, USAF
Gerhard, J. W., SSgt, USMC
Gilpin, George W., Lt, USN
Glen, John, SSgt, USAF
Glover, Gerald, L., A1c, USAF
Gomez Delgado, Abel, Sbtte, FAC
Gordon, Richard S., Lt(jg), USN
Graham, Alva G., Capt, USAF
Greene, Rockwell N., Capt, USAF
Greenway, J. R., Lt, USN
Gregory, Herbert W., Lt(jg), USNR
Hagerman, Eddie, TSgt, USAF
Hall, Franklin J., Lt(jg), USN
Hall, Ron E., AE2, USN
Hall, R. H., ADJAN, USN

Hallman, Robert J., TSgt, USAF
Hamel, Freddie S., Sgt, USMC
Hamlet, Richard B., AD2, USN
Hanson, A. O., LCdr, USN
Harper, Oscar M., Lt(jg), USN
Harting, C. S., ADJ3, USN
Hartley, Jim F., Capt, USAF
Hathaway, H. R., SSgt, USAF
Hauser, Edward C., AD2, USN
Hawley, E. E., Sgt, USAF
Henderson, Larry K., SSgt, USAF
Henderson, Robert S., Capt, USAF
Henderson, W. L., Capt, USAF
Henningson, Edwin A., Capt, USAF
Hepp, Bruce C., Capt, USAF
Hermann, Frank, Civilian
Hill, Charles F., A2c, USAF
Hockenbury, R. W., Cpl, USMC
Hollyfield, Turllis E., A1c, USAF
Hooks, James F., A1c, USAF
Hughes, Eugene L., MSgt, USAF
Hughes, Kelly R., SSgt, USAF
Hurt, Hoyt B., Capt, USAF
Irvin, Richard K., Civilian
Ivansco, Joseph E., A1c, USAF
James, Charles F., SSgt, USAF
Jenkins, Will D., SSgt, USAF
Johnson, Walter, SSgt, USAF
Jones, Richard A., 1stLt, USAF
Jordan, E. B., AE3, USN
Kay, Charles R., Capt, USAF
Kayle, Paul W., Lt(jg), USN
Kilpatrick, Dewey A., SSgt, USAF
Knight, Ralph W., Lt, USN
Ladewig, H., PFC, USMC
Lakeway, Fredrick J., Lt, USN
Landry, Richard H., A2c, USAF
Lawrence, Byron N., Capt, USAF
Lee, Granville D., A1c, USAF
Leech, Joseph V., 1stLt, USAF
Lehrfeld, Phillip R., Lt(jg), USN
Lemke, Clyde W., Capt, USAF
Lepsey, George O., A3c, USAF
Lester, William B., Lt, USN
Lewis, C. D., Sgt, USAF
Lintz, Charles, A2c, USAF
Litke, Donald P., Capt, USAF
Lockhart, Floyd R., Capt, USAF
Longnecker, David E., Capt, USAF
Lord, Howard M., SSgt, USAF
Luca, M. J., Cpl, USMC
Lukens, J. A., AN, USN
Lupenski, Alex P., Capt, USAF

THE PERSONNEL ABOVE WERE HONORED FOR THEIR SKILL, COURAGE AND JUDGEMENT DISPLAYED WHILE PARTICIPATING IN RESCUE OR MERCY MISSIONS PERFORMED UNDER ADVERSE OR HAZARDOUS CONDITIONS WHILE FLYING IN KAMAN HELICOPTERS.