KAMAN Rotor Tips

KAMAN AIRCRAFT CORPORATION

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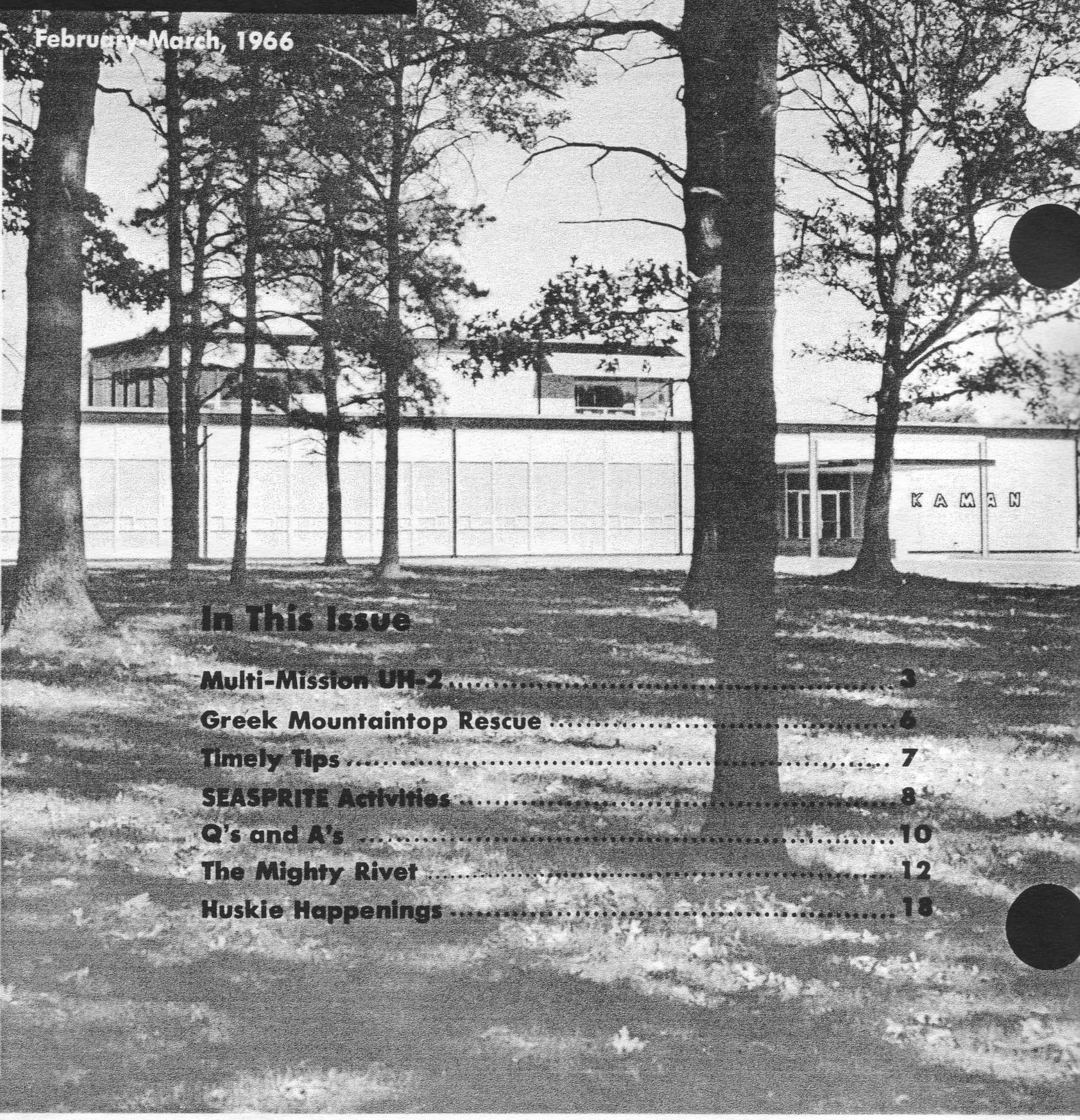
THE COVER

SEASPRITE and HUSKIE "Angels" rescue survivors of C-47 crash on Mt. Helmos. Cover by Donald Tisdale, Service Publications.

ADDRESS ALL INQUIRIES TO:
Kaman Rotor Tips
Customer Service Dept.
Kaman Aircraft Corp.
Old Windsor Road
Bloomfield, Conn. 06002



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KAMAN SERVICE REPRESENTATIVES

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NAS Lakehurst, N.J.

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NAS Cecil Field, Fla.
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ComFairMed

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Iran

JACK SMITH
Colombia

RAYMOND VOKES
USS Wright

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NAAS Ream Field, Calif.

JOHN HENDRICKSON
NAS Lakehurst, N.J.

CUSTOMER OPERATIONS SECTION — ROBERT L. BASSETT, *Supervisor*

MULTI-MISSION UH-2

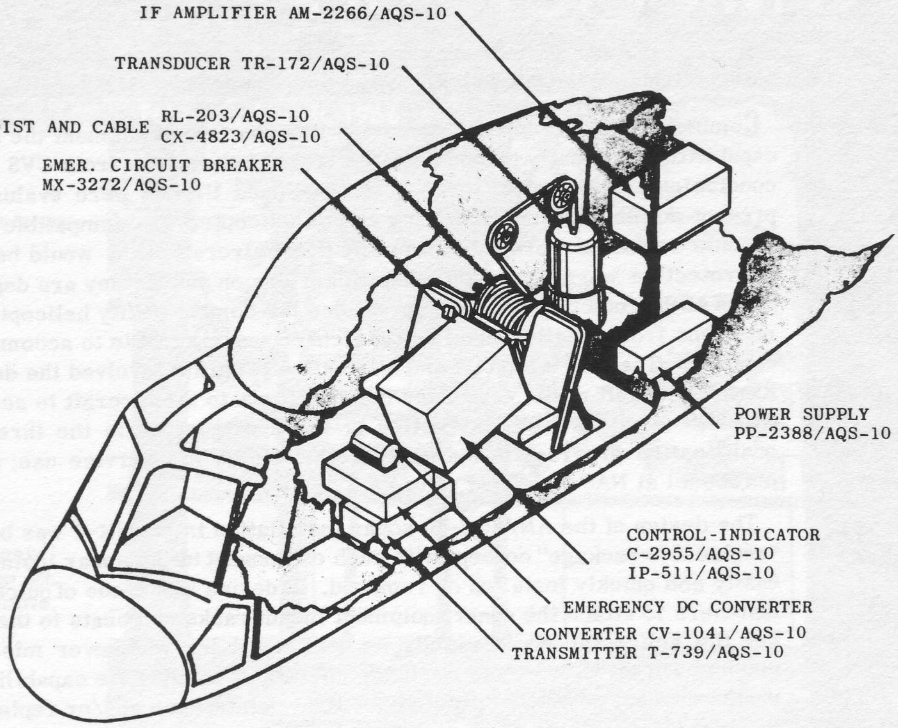
by Bruce A. Goodale
Senior Project Engineer

Combat utility helicopters equipped with sonar could augment the anti-submarine warfare capabilities presently provided by the larger helicopters from CVS carriers. This was the conclusion reached after three sonar-equipped UH-2's were evaluated to determine if the present duties of a standard Navy utility helicopter are compatible with the ASW mission. If sonar missions were to be flown by these aircraft, they would be used to provide close-in protective warning for the attack carriers on which they are deployed. To further enhance ASW protection for Fleet operations the combat utility helicopters could also fly sonar missions from smaller naval and merchant vessels unable to accommodate the larger helicopters. The four-step test and evaluation program involved the design and fabrication by Kaman Aircraft of the necessary modifications to the aircraft to accept the Bendix-Pacific AN/AQS-10 sonar; the installation of these provisions in the three UH-2A's; a test and qualification program to substantiate the design for service use; and evaluation by Navy personnel at NAS Key West, Fla.

The design of the AN/AQS-10 sonar installation in the UH-2 was based on the modular or "replacable package" concept with each component in the sonar installation capable of being easily and quickly installed or removed. Wide use was made of quick-disconnect structural fasteners to attach the sonar equipment mount racks and seats to the aircraft. In this manner the helicopter could rapidly be configured for whichever mission — utility, rescue, plane guard or ASW — was required, thereby expanding the capabilities of the UH-2. This design concept permitted rapid inspection, maintenance and/or replacement of any or all of the sonar components; thus, maximum utilization and minimum down time were provided.

The UH-2 sonar layout is shown on page four. The sonar operator's fully adjustable seat faced forward on the left side of the cabin, with a second seat and the sonar hoist on the right. The sonar hoist was slightly revised to eliminate the pulley boom. The sonar funnel was positioned aft of the cabin/fuel cell area and a mirror was installed to provide vision down the funnel. Some of the sonar black boxes were positioned in the cabin ahead of the sonar operator and the remainder were located aft of the cabin. Significant features of this installation were:

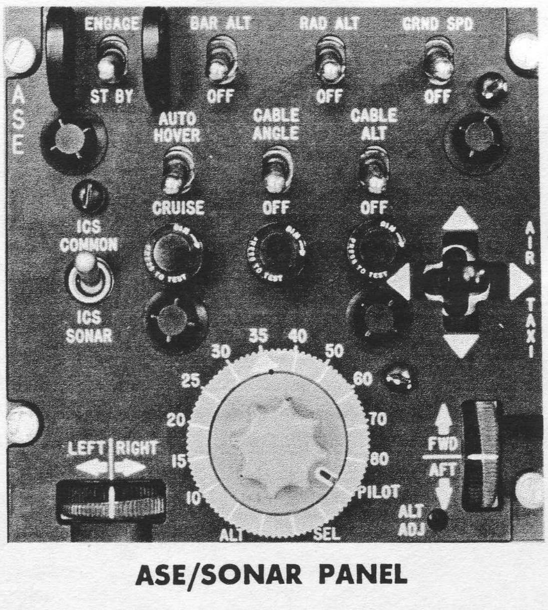
- The AN/AQS-10 sonar control-indicator was attached to the cabin overhead and side allowing complete freedom for leg movement.



- The forward right portion of the cabin inside the rescue doorway was left clear for performing a rescue.
- The large jettisonable sliding doors on each side of the cabin provided ready access and egress for the sonar crewman and maintenance personnel.
- The sonar transmitter was positioned ahead of the sonar operator where he could see the indicator lights from his seat.
- The sonar power supply was positioned where the sonar operator could reach the voltage check controls from his seat.
- The sonar operator's seat was comfortable and fully adjustable vertically, fore and aft, and in tilt.
- The sonar operator was provided with his own intercom and radio controls; a drift indicator to show cable verticality; a clock; a duplicate of the MA-1 compass for operator orientation; transducer position indication lights (submerged, trailed or stowed); and mode indication lights (cable angle and cable exposed length).
- The pilots were provided with controls for automatic flight approach to and egress from a sonar hover position. Other controls provided were: air taxi toggle; altitude selection dial; drift trim knobs; and sonar ICS switch. The pilots also have indication selector switches for doppler drift; cable angle drift; cable altitude; sonar submersion depth; and transducer position.

The photograph shows the ASE/sonar control panel installed in the three test aircraft. All of the features embodied in this panel (with the exception of cable angle, cable altitude and sonar ICS) can be used during a standard Fleet mission, and would provide the UH-2 with highly desirable features such as: automatic hover and egress, dialed altitude selection, and air taxi capability. Also provided are: the control of the automatic approach profile; a safety interlock to the barometric altitude (BAR ALT) in the event of radar altitude (RAD ALT) failure; and improved reliability of the BAR ALT system. Kaman Aircraft has submitted a proposal to retrofit such an installation in UH-2's, incorporating all of the improvements which resulted from the Navy's evaluation of these features at Key West.

Perhaps a brief description of the automatic hover and air taxi modes is in order at this point. By setting the desired hover altitude on the altitude selector dial and engaging the AUTO HOVER switch, the helicopter will automatically transition from the initial or "gate" airspeed and altitude to a hover at the selected altitude. One of the improvements resulting from the Navy's evaluation was to retain the effectiveness of the pilot's beeper trim in adjusting the approach time and profile, during the flight to AUTO HOVER position. In this manner the gate position becomes less critical. Precise adjustments when in the hover position may be made with the roller trim knobs on the control panel. The sonar dip may now proceed with the aircraft slaved to



ASE/SONAR PANEL

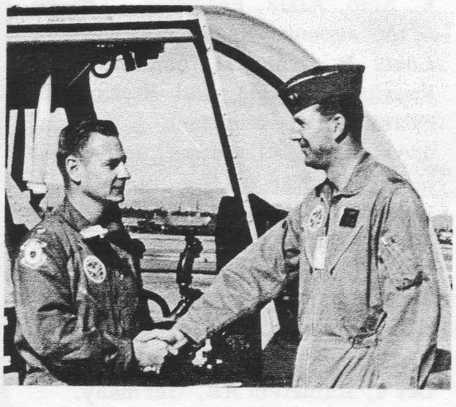
the cable. To air taxi, while in hover position, the toggle may be held in any quadrant to move the aircraft in that direction at a constant 5 knots ground speed. When the toggle is released, the aircraft will resume its hover reference. When the pilot is ready to depart from his automatic hover, he disengages the AUTO HOVER switch and the aircraft automatically programs cyclic and collective control to provide a smooth egress back to gate cruise altitude and airspeed. Two concentric knobs have been provided on the altitude selector dial — the large outer knob controls the altitude while in the AUTO HOVER mode and the inner knob controls the altitude during plane guard and other low-level utility missions when not in AUTO HOVER. Above 80 feet, the "bug" on the radar altimeter indicator controls the altitude.

The Navy evaluation was conducted during a six-week period at Air Development Squadron One (VX-1), NAS Key West. Squadron personnel, under the command of Capt Paul L. Ruehrmund, conducted the program in a spirited and expeditious manner, with 252 flight hours being accrued on the three aircraft during the program. Over-all aircraft/sonar availability was 78.3 percent, based on the ratio of number of flights satisfactorily completed to the number of flights scheduled. Program support requirements averaged 2.82 maintenance man hours per flight hour.

The VX-1 evaluation proved the practicality of operating the AN/AQS-10 sonar in the UH-2 helicopter. Sonar equipment, as installed, performed satisfactorily and VX-1 pilots and sonar operators were impressed with the low levels of vibration and noise in the SEASPRITE cockpit and cabin. After incorporation of suggestions made by VX-1 pilots for operations during high sea states, the automatic approach with beeper trim active, the air taxi feature, and the cable slaved-flight modes, were very satisfactory. The automatic egress feature was considered "outstanding." Another feature considered outstanding by the VX-1 evaluation team was the capability for rapid installation and removal of the sonar equipment for conversion between the utility and ASW configurations. In the best of only three time trails, a Navy crew of four men completely removed the sonar installation in 14 minutes and installed it in 31 minutes; after a 5-minute ground check, it functioned perfectly in a check dip. With familiarization and installation refinements, these times could be reduced even further. All of the ASE improvements suggested by the VX-1 team have been evaluated by Kaman engineers and pilots and will be included in any future installations.

While proving the compatibility between the helicopter and the AN/AQS-10 sonar, the test program also verified calculations that, under hot day conditions, the single T58-GE-8B engine in the UH-2A was marginal, powerwise, in performing ASW missions of significant endurance. This limitation will not exist when the twin T58-8 engine configuration is qualified and placed in Fleet use. The twin-engine program for the SEASPRITE is currently in the engineering and qualification stage and will be completed next October. Retrofit Fleet deliveries of the twin-engine UH-2 are scheduled for November of this year and will provide the Navy with an effective multi-mission helicopter. ⏴

1000-Hour Pilot Awards



In top photo, left, Col Lucian A. Dade, Jr., commander of EARRC, presents 1000-hour award to Capt Alex P. Lupenski of Det 19, Harmon AB, Newfoundland, as another recipient, Capt Owen A. Heeter of Det 12, Moody AFB, Ga., watches. Colonel Dade made the presentation at a recent Commander's Conference at Robins AFB, Ga. The KAC award is given to pilots logging 1000 hours in helicopters produced by the company. In second photo, Maj Charles R. Carpenter, left, of Det 8, PARRC, Yokota AB, Japan, is congratulated by Capt Ardith L. Kellar after chalking up his 1000th hour in the HH-43 HUSKIE. Three other awardees, all from Det 5, EARRC, Suffolk County AFB, N.Y., are shown in third photo. They are, left to right, Capts Charles A. Morrill, Franklin L. Chase and Joseph T. Herr. Also qualifying for the awards are: Capt Clyde W. Lemke, Hq., CARRC, Richards-Gebaur AFB, Mo.; Capt Ramon M. LeFevre, Det 15, EARRC, Patrick AFB, Fla.; Capt John H. Larson, 38th ARSq, PARRC, Tan Son Nhut AB, RVN; Capt Jerome R. Luttinger, Det 4, 38th ARSq, Korat AB, Thailand; Capt Carlton P. Vermeys, Det 10, CARRC, Laredo AFB, Tex.; Capts Donald W. Lajeunesse and Charles R. Pinson, Hq AARRC, Ramstein AB, Germany; Capt Kenneth W. Dotson, 31st ARSq, Clark AB, P.I. Other recipients are shown on page 19. (USAF photos)

GREEK MOUNTAINTOP RESCUE

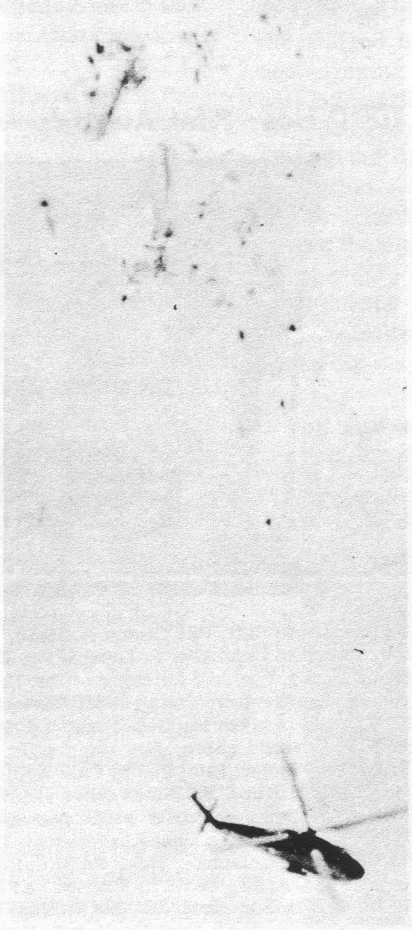
Two UH-2 SEASPRITE's from the USS Forrestal and an HH-43B HUSKIE from Incirlik AB, Turkey, teamed up recently to rescue the four survivors of a C-47 crash near the top of wind-swept Mt Helmos in Greece. The transport, assigned to NATO's European headquarters in Naples,was on its way there from Cigli, Turkey, when it slammed into the 7,680-foot level of the mountain during a blizzard. Aboard the aircraft were nine American Air Force officers and men and an Italian Air Force officer.

The four survivors spent almost 48 hours huddled together in sub-zero temperatures before a USAF search plane spotted Capt Thomas D. Smith, III, waving a red parachute. Although injured, Captain Smith had made a perilous 1000-foot descent down the mountain slope to get below the clouds covering the wreckage of the C-47. In response to a request for assistance from the SAR coordinator, both helos from HC-2's Det 59 made a night flight from the Forrestal to the crash area; however, they were forced to wait at a Greek airfield until daylight before attempting a rescue. Thirty Greek amateur mountain climbers and four policemen managed to reach the crash site but had no survival gear.

The pilot of the first UH-2 at the scene, LCdr Raymond K. McCullough, made several attempts to land at a site 300 feet above the wreck but was thwarted by the rugged terrain, high-winds, and turbulence. The SEASPRITE pilot finally dumped most of his fuel and lowered Lt James E. Mullen (MC), a Forrestal doctor, to the ground. After Doctor Mullen entered the wrecked plane, one of the survivors asked where he was from. The doctor replied that he was from the Forrestal.

"I knew those carriers would come through," the shivering survivor said.

Meanwhile, Commander McCullough had landed on a small, snow-covered area that topped the edge of a cliff adjacent to the C-47 wreckage on one side and an ice cliff and sheer bluff on the other two sides. Unable to land normally on the spot because of its size, he held the wind-buffeted UH-2 in flying position for nearly 30 minutes. Two of the survivors were carried to the helo and then the pilot of the second SEASPRITE, LCdr William Munro, repeated the difficult and dangerous maneuver while the third survivor was placed aboard. At this time the HH-43B arrived on the scene and picked up the fourth man.



RESCUE SITE—UH-2 flies near wreckage of C-47 partially hidden in snow. (USN photos)

The HUSKIE was one of two from ARRS Det 11 at Incirlik that had been loaded into a C-130 and flown to the Greek airport near the crash scene. After being reassembled, the HH-43B's joined in the rescue effort and later, when the UH-2's returned to the Forrestal, shuttled personnel to and from the accident site, removed the deceased and salvaged equipment. Several days of this type operation were conducted in marginal visibility and gusty winds. The weather was so bad that a guard placed at the accident site overnight became lost and was the subject of a successful search by the HUSKIE crews when the weather improved.

Later, acting on a report furnished by Captain Smith of the flying conditions which existed at the time of his rescue, Gen Bruce K. Holloway, USAFE commander-in-chief, sent the commander of the U.S. 6th Fleet, VAdm William E. Ellis, a message praising the "outstanding feat of airmanship performed by the helicopter pilots from the carrier Forrestal."

Flying with Commander McCullough on the hazardous mission were Lt(jg) Michael E. Howe, copilot; Estes P. Morrow, ADJ1, and John E. Keto, ADJ3, crewmen. Others in the second SEASPRITE were Lt Louis R. Grant, II, copilot; D. S. Vaughn, III, AM3, and Richard T. Ream, AE3, crewmen. Manning one of the HUSKIES were Capt James M. Layton, Jr., Capt Richard L. Brubaker and TSgt Braddy E. Poole. Aboard the other HH-43B were Capt David L. Wiest, Capt William F. Wall, and SSgt Donald N. Rivers. All are from Det 11 except Captain Brubaker who is attached to ARRS Det 4, Ramstein AB, Germany.

Timely Tips

Kaman Test Sets (UH-2)

To prevent overload damage to the transformers in Kaman test sets K604609-2 and K604610-2 (S/N 1 through 30), make certain that all connections are made in accordance with the Handbook of Operating Instructions, NAVWEPS 17-15KL-3 and -4. Several sets were damaged in the past when leads were erroneously connected to signal test points. This created a short across the secondary winding of the transformer and caused it to fail. In test sets K604610-2 (S/N 31 and subsequent) a 0.06 ampere fuse has been incorporated so that if test leads are incorrectly connected the fuse will open before any damage to the transformer can occur.

M. Whitmore, Jr., Service Engineer

T53-L-11A Engine Maintenance Instructions (HH-43F)

Maintenance information on the T53-L-11A engine is covered in the Navy publication "Handbook of Service Instructions for Shaft Turbine Engine, Model T53-L-11," NAVWEPS 02B-15AB-2. This publication is used by both the Air Force and Navy for the -11A. The primary difference between the two engines is in the fuel control governor and bleed actuator assembly.

H. Zubkoff, Service Engineer

Loud Hailer Operation (UH-2)

For the greatest clarity possible, personnel utilizing the loud hailer should speak slowly and distinctly; the words tend to run together if a normal conversational speed is used. Speaking slowly will be of particular assistance to a rescuee wearing a hard hat because the combination of headgear and normal helicopter flight noise can make instructions difficult to understand. A slight pause between words may also give an excited or injured rescuee time to better comprehend the instructions.

HC-1, Ream Field, Calif.

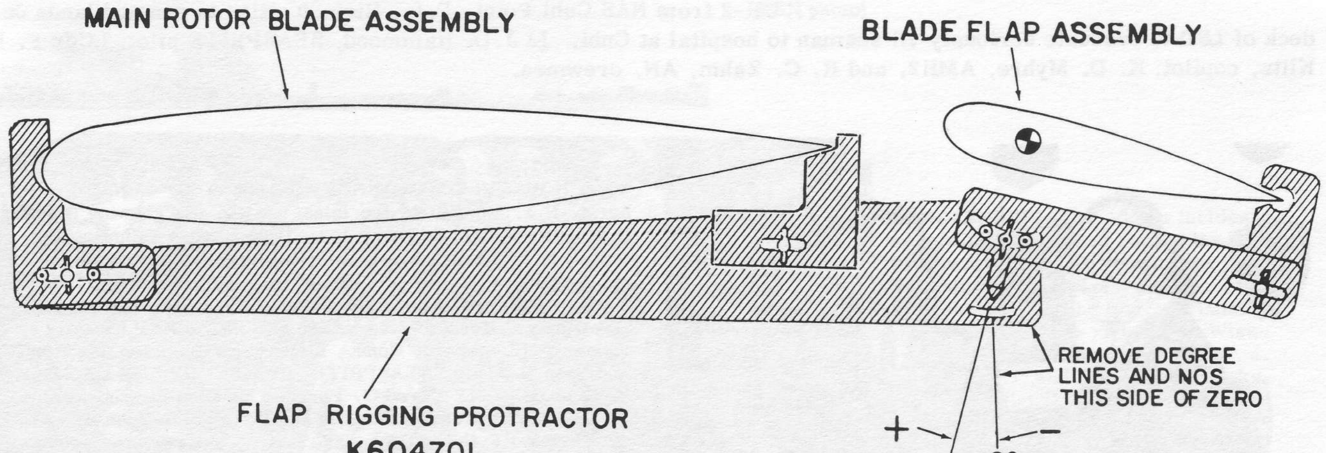
Centrifugal Fuel Purifier Servicing (UH-2)

First disconnect the drain line before attempting to remove the centrifuge cover. This will relieve the internal "suction" and facilitate cover removal. It will also prevent possible damage to the centrifugal purifier, centrifuge cover, or drive housing mating surfaces since there should be no reason to pry or hammer when separating the two housings.

D. M. Rush, Field Service Representative

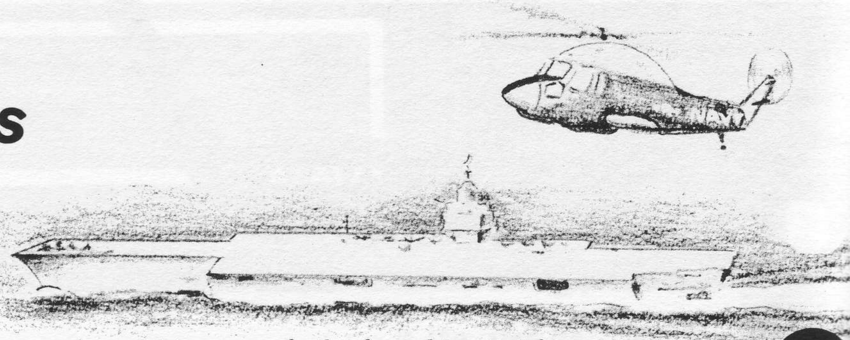
Flap Rigging Protractors (UH-2)

It is recommended that the negative graduations be removed from all flap rigging protractors, P/N K604701. Experience has shown that if, through error, the negative graduations are used, a grossly misrigged condition will result. Protractors issued in the future will not have the negative scale since these graduations are no longer required and should not be used.



W. J. Wagemaker, Service Engineer

SEASPRITE ACTIVITIES



...UH-2 crew from HC-2's Det 60 aboard USS Saratoga makes night rescue of pilot forced to eject from his plane. Use of "fishpole" boom said to have contributed to expeditious pickup. Lt(jg) Herman T. Brandon, SEASPRITE pilot; Lt(jg) Larry A. Patton, copilot; Thomas D. Chambers, AMS3, and David J. Demoor, ATN3, crewmen....Man overboard from USS Independence rescued soon afterward by UH-2 crew from HC-2's Det 62 aboard carrier. SEASPRITE pilot is Lt(jg) L. E. Thomassy; copilot is Lt(jg) D. C. Shelby and crewmen are J. Brady, AE3, and C. W. Watkins, ADR2.

...In night rescue, UH-2 crew from HC-1's Det Golf aboard USS Oriskany plucks downed pilot from heavy seas. Lt E. T. Saintsing, H-2 pilot; Lt(jg) J. F. Blakely, copilot; J. C. Smith, ADJ3, and J. L. Hug, AN, crewmen....Man overboard rescued by SEASPRITE crew from HC-1's Det Delta aboard USS Coral Sea. Crewman enters water to assist and rescuee back aboard ship in 16 minutes from time of call. Lt(jg) E. L. Pierce, Jr., pilot; Lt(jg) J. L. Galbraith, copilot; M. J. Austen, ADJ3, and L. V. Kerns, AMH3, crewmen.

...Five Navy men, marooned for two days on Great Sitkin Island while on hunting trip, rescued by SEASPRITE crew from SAR unit at Adak NS, Alaska. LCdr J. L. Kniely, UH-2 pilot; Lt(jg) R. B. Thabes, copilot; J. A. Kidwell, AMS1, plane captain.

...Plane guard UH-2 crew from HC-1's detachment aboard USS Midway rescues pilot of aircraft which goes over side while clearing arresting gear. SEASPRITE crewman lowered to water to assist rescuee. Lt(jg) R. G. Nowak, helo pilot; Lt(jg) F. C. Meyer, copilot; R. H. Murray, PRAN, and J.S.L. Hayes, ADJ2, crewmen.

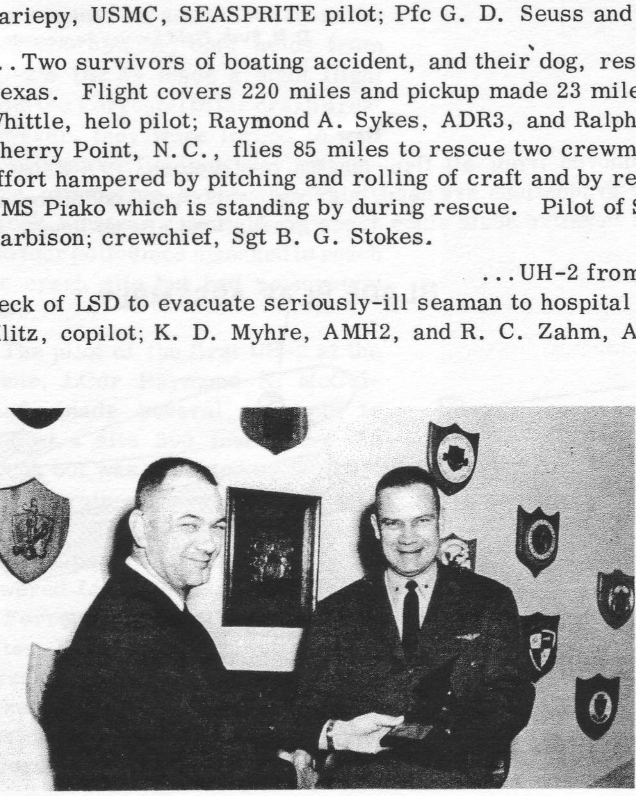
...In first UH-2 night mercy mission at NAAS Kingsville, Texas, SAR unit picks up pilot whose trainer crashed five miles from station and takes him to hospital. LCdr Garry D. Grant, SEASPRITE pilot; Terry J. Percle, ADJ2, and Edward M. Erdman, ADR3, crewmen.

...Fighter pilot who ditched near USS Ticonderoga rescued immediately afterward by UH-2 planeguard from HC-1's Det Bravo. SEASPRITE crewman goes into water to assist. Lt(jg) F. G. Riehl, helo pilot; Lt(jg) J. H. Henkel, copilot; P. R. Bohn, AMS1, and D. P. Walker, AMS2, crewmen....Man who fell overboard at night from USS Kitty Hawk rescued from South China Sea soon afterward by UH-2 crew from HC-1's Det Charlie. Lt(jg) Michael R. Zerbe, SEASPRITE pilot; Lt(jg) William L. Berry, copilot; Hugh E. Coleman, ADJ1, and Horst G. Rauch, AE2, crewmen.

...Pilots of two F8's who ejected after mid-air collision 25 miles from MCAS Beaufort, S. C., are picked up shortly afterward by UH-2 crew from SAR unit at air station. Capt D. J. Gariepy, USMC, SEASPRITE pilot; Pfc G. D. Seuss and LCpl B. C. Glaze, crewmen.

...Two survivors of boating accident, and their dog, rescued by SEASPRITE from SAR unit at NAS Corpus Christi, Texas. Flight covers 220 miles and pickup made 23 miles south of Port Isabel in Mexican waters. LCdr Claude B. Whittle, helo pilot; Raymond A. Sykes, ADR3, and Ralph L. Autry, AM3, crewmen....UH-2 from SAR unit at MCAS Cherry Point, N.C., flies 85 miles to rescue two crewmen aboard vessel sinking in extremely rough seas. Rescue effort hampered by pitching and rolling of craft and by rescuees unfamiliarity with use of sling. Survivors taken to HMS Piako which is standing by during rescue. Pilot of SEASPRITE is CWO2 W.E. Cavett; copilot, Capt G. E. Harbison; crewchief, Sgt B. G. Stokes.

...UH-2 from NAS Cubi Point, P.I., flies 80 miles to sea and lands on deck of LSD to evacuate seriously-ill seaman to hospital at Cubi. Lt J.D. Hammond, SEASPRITE pilot; LCdr F. H. Klitz, copilot; K. D. Myhre, AMH2, and R. C. Zahm, AN, crewmen.



1000 HOURS—LCdr Richard B. Dawson of HC-4, NAS Lakehurst, N.J., is one of the latest to join the growing list of U.S. Navy pilots who have logged 1000 hours in helicopters produced by Kaman Aircraft. Presenting an award given in recognition of the achievement is Donald P. Alexander, KAC senior field service representative at Lakehurst. Commander Dawson, who formerly served in a BUWEPSREP capacity at Kaman's Bloomfield, Conn., facility accumulated his 1000 hours in the UH-2 SEASPRITE, HH-43B HUSKIE and other H-43 models. Lt Alfred G. Perry of HC-2 at Lakehurst also qualified for the award recently and three pilots from HC-1 at NAAS Ream Field, Calif., have logged the required number of hours. They are Lt H. Edmond Logan, Lt Glen A. Koelling, and Lt(jg) Frank C. Koch. (USN photo)

UH-2 CREWS SAVE COMBAT FLIERS

East and West Coast UH-2 personnel pooled their professional "know-how" recently during the night rescue of two survivors who ejected from their crippled aircraft and landed in the rain-swept, choppy waters of the South China Sea. The rescuing SEASPRITE was manned by a "mixed" crew from HC-1, based at NAAS Ream Field, Calif., and HC-2 at NAS Lakehurst, N.J. Lt Leif A. Elstad, pilot, and Douglas Larson, ATN3, crewman, were from HC-2's Det 65 while Lt(jg) Michael A. Johnson, copilot, and Michael Laws, AN, the other crewman, were from HC-1's Det Mike. The combined crew was operating from the USS Enterprise.

The UH-2 was flying plane guard during the early morning hours when the crew was directed to the rescue scene 18 miles away. Due to difficulties caused by the rain, darkness, high seas and gusty winds — instruments, floodlights and visual reference were all used in picking up the survivors, drifting in rafts almost three miles apart. The "complete coordination" of the whole crew was responsible for the successful completion of the mission, it was reported afterward.

A pilot who ejected from his aircraft after flying the battle-damaged plane to the vicinity of the USS Enterprise was rescued afterward by a UH-2 crew from HC-1's Det Mike. During his descent the pilot experienced difficulty in releasing the raft from his seat pack and in the process of freeing it, punctured his life vest. With no flotation gear, unable to get into his raft and suffering from exhaustion and shock, he was virtually immobile when the helo arrived. UH-2 crewman Roger L. Symensma, ATN2, immediately plunged into the water to disengage the chute and later re-entered the water again when it was found the pilot's feet were entangled in the shroud lines. Lt James H. Biestek was pilot of the rescue chopper and LCdr Robert L. Wheeler, the copilot. Marvin L. Farris, AMHAN, was the other crewman.

In a similar incident, a pilot who bailed out of his flak-damaged plane off the coast of Vietnam was rescued soon afterward by a UH-2 crew from HC-1's Det Golf from the USS Oriskany. The loud hailer was used to direct the survivor during the pickup which was described as "routine" and made approximately 33 miles from the ship. Lt E. T. Saintsing was pilot of the SEASPRITE and Lt(jg) J. R. Welsh, copilot. Crewmen were J. L. Hug, AN, and J. A. Shanks, ADJ3.

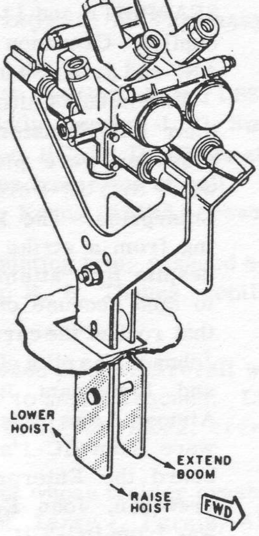
Two minutes after ejecting from their F4B Phantom, the pilot and observer were plucked from the water by a UH-2 crew from the USS Enterprise. The F4B was returning from a strike in Vietnam but, despite five attempts, was unable to land because of the heavy seas that rocked the carrier. Lieutenant Johnson was pilot of the SEASPRITE and Lieutenant Biestek, copilot. Airman Laws was crewman. All were from HC-1's detachment aboard the Enterprise. The other crewman, John E. Jackson, AE2, was from HC-2.

FISHPOLE BOOM "RESCUE"—A UH-2 piloted by LCdr H. J. Fox of HC-4, NAS Lakehurst, N.J., utilizes eight-foot rescue boom to pluck a USAF pilot from the icy waters of the Toms River. The Navy helo squadron participated in the exercise with the 539th Fighter Interceptor Sqdn from McGuire AFB to qualify the Air Force pilots in air-sea rescue work. An extra touch of realism was added when the fighter pilots had to break a thin layer of ice to enter the water and they were pelted with icy fragments as the helicopters hovered overhead to effect the "rescue." (USN photo)

1000TH LANDING—The 1000th incident-free landing of the UH-2 aboard the USS Wright was celebrated recently by personnel attached to HC-4's Det 85. Personnel shown after the historic landing are: front row, left to right, K. L. Wiseman, ADR2; R. G. Hanna, AMS1; W. J. Maxson, ADR1; and Lt M. J. Koutsky. Rear row, Lt(jg) D. E. Kent; L. R. Paulk, AE2; F. A. McSwain, ATN3; W. E. Graber, ADJ3; and N. I. Ellsworth, AMH3. (USN photo)

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 UH-2) WILL THE UP AND DOWN LIMIT SWITCHES FUNCTION WHEN THE RESCUE HOIST MOTOR IS OPERATED WITH THE EMERGENCY CONTROL LEVERS?

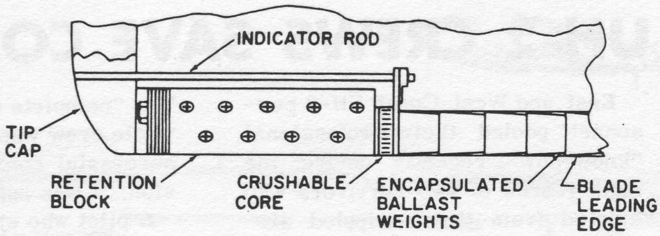
A. The UP and DOWN limit switches are inoperative when the rescue hoist up-down emergency lever is in use. Since the DOWN limit switch is not functioning, care must be taken to avoid unreeling the cable too far or it will start to rewind backwards on the drum. The last 15 feet of the cable is painted red as a visual warning to the operator to prevent this from occurring. Since the UP limit switch is not functioning, caution must be exercised when winding cable with the emergency lever to prevent the cable bumper from damaging the UP limit switch on the hoist motor (or the UP limit switch on the eight-foot rescue boom when the boom is utilized).

P. M. Cummings, Service Engineer

Q. (Applies HH-43B/F) WHAT AMOUNT OF WEAR DETERMINES REPLACEMENT OF THE WHEEL BRAKE LININGS?

A. T. O. 1H-43(H)B-2 states that "if the measurement is less than 0.250, visually check the thickness of the brake lining and replace any lining with thickness less than 1/16 of an inch..." As a rule, however, the first measurement (0.250) is the determining factor in lining replacement. If the distance measured from the housing to the disc is over 0.250, the linings should be replaced. A change will be incorporated at a future revision to the 1H-43(H)B-2 handbook deleting reference to the 1/16-inch lining thickness.

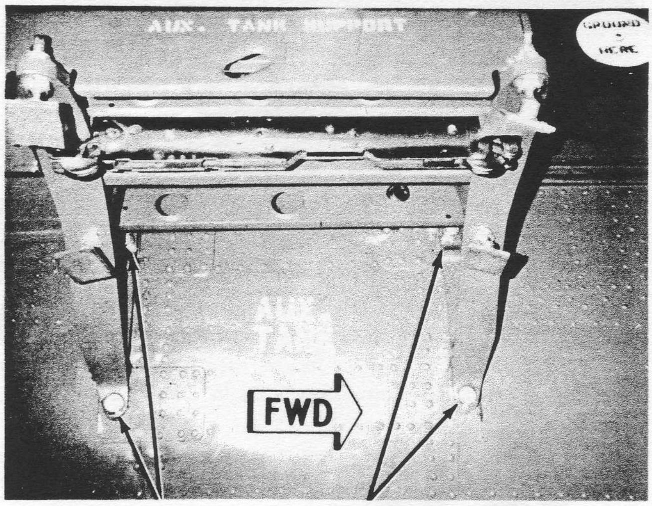
P. M. Cummings, Service Engineer



Q. (Applies UH-2) IS MAIN ROTOR BLADE REPLACEMENT MANDATORY IF THE INDICATOR ROD IS FOUND PROTRUDING THROUGH THE STAINLESS STEEL TIP CAP ON THE K611008-209 ROTOR BLADES?

A. In the Kaman Rotor Tips issue of June-July, 1965, it was stated that "any protrusion of the indicator rod through the tip cap makes blade replacement mandatory." This is no longer applicable since blade replacement is not always mandatory. To determine if a blade change is necessary when a fail-safe indicator rod is found protruding: (1) remove tip cap and, using a mirror and light, check impact assembly for evidence of having been crushed. If impact assembly has not been crushed, adjust length of fail-safe indicator rod by screwing it into the blade so that it will be flush or to within 0.060 inches below surface of tip cap. Reinstall tip cap and blade is ready for use. (2) If impact assembly has been crushed, the leading edge weights have shifted in an outboard direction and the main rotor blade should be removed and returned to the proper facility for overhaul. This information will appear in the next revision to the handbook of maintenance instructions NAVWEPS 01-260HCA-2-5.

W. J. Wagemaker, Service Engineer



K679140-11 K679140-13

Q. (Applies UH-2) CAN STANDARD HARDWARE ATTACHING BOLTS BE SUBSTITUTED TO SECURE THE AUX FUEL TANK SUPPORT TO THE AIRCRAFT?

A. Standard bolts do not have the proper strength to be used for this purpose and should never be used as substitutes to secure the aux fuel tank support to the aircraft. The two forward attaching bolts, P/N K679140-13, and the two aft attaching bolts, P/N K679140-11, are special bolts. These bolts are of different lengths so if they are removed, make certain upon reinstallation that they are located properly — all should be tightened to 300-325 pound inches. See photo for bolt location.

H. Zubkoff, Service Engineer

(a) Proper (b) (c) Deformed Fuse Clips (d) (e) Burr On Fuse

Q. (Applies UH-2, HH-43B/F) WHAT IS USUALLY THE CAUSE FOR PREMATURE ELECTRICAL FUSE REPLACEMENTS?

A. Probably the greatest cause of premature fuse failure is poor contact or connections between the fuse and fuseholder. If proper contact does not exist between the fuse and its mounting clips, fuse failure can occur as low as 20 percent of rated current. View (a) shows a properly installed fuse which is in close contact with the fuse clips at all points. This is the ideal case, but it is not too often realized in practice, with the result that fuses continually fail for no apparent reason. Following are some of the easily overlooked situations which maintenance men should be aware of (reference drawing): 1. View (b) illustrates the wrong size fuse for the holder. It is apparent that good contact between the fuse and the fuse clips is impossible. 2. Views (c) and (d) show the effect of bent or damaged clips which cannot possibly grip the fuse properly. How many times have you noticed that the fuse can be rotated after it is inserted? If such a poor contact is apparent and cannot be remedied, replacement of the fuse holder is necessary. 3. In view (e) the fuse appears to be tight because the burr on the fuse tends to "bite" the metal clip, but the contact area in this case is extremely limited. The best solution is to throw the burred fuse away and replace it with one having a smooth surface.

J. J. McMahon, Service Engineer

Q. (Applies HH-43B) WHICH METHOD SHOULD BE USED IN THE FIELD FOR TOPPING THE T53-L-1B ENGINE—PRIMARY OR ALTERNATE?

A. The primary method of topping is used, providing a valid N_1 do not exceed (DNE) is entered on the DD Form 829. The DNE speed on the DD Form 829 is considered valid as long as no replacements or repairs of rotary or hot section components have been made subsequent to recording the DNE. Initially, the DNE speed is determined in the test cell prior to release of the engine from either production or overhaul, whichever occurs last. This listed DNE is based on Standard Day Sea Level conditions. Prior to a topping test flight, this listed DNE speed must be corrected to obtain the ACTUAL DNE by applying the outside air temperature (OAT) against this listed DNE, using the applicable chart in T. O. 1H-43(H)B-2. This corrected N_1 speed is max for the specific conditions prevailing at the time.

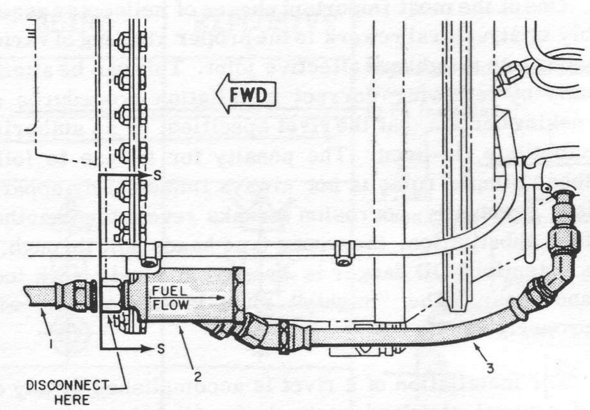
The alternate method of topping is used when a new N_1 DNE speed must be established. A new DNE speed is required upon replacement or repair of any rotary or hot section components. The DNE arrived at by this method is the ACTUAL N_1 DNE. To obtain the Standard Day DNE, apply the OAT against the applicable curve on the chart. This Standard Day DNE is then entered on the DD form 829 as the new listed DNE and subsequently becomes the basis for future topping checks using the primary method as described above.

H. Zubkoff, Service Engineer

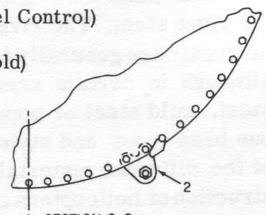
Q. (Applies UH-2, HH-43B/F) HOW MANY DIFFERENT TYPES OF SAFETY WIRING MAY BE FOUND IN KAMAN HELICOPTERS?

A. Three types of safety wiring are found on UH-2 and HH-43B/F aircraft. They are: (1) Lock Wiring — The application of wire to prevent relative movement of structural or otherwise critical components subjected to vibration, tension, torque. Material: inconel, uncoated; aluminum alloy, 5056 clad is used for lock wiring magnesium parts. (2) Shear Wiring—Applications are those where it is necessary to purposely break or shear the wire to permit operation or actuation of an emergency device. Material: copper. (3) Seal Wiring — Applications are those where the wire is used with a lead seal to indicate if a device has been tampered with. Material: copper.

G. M. Legault, Service Engineer



1. Main Fuel Hose (From Fuel Control)
2. Bypass Filter
3. Main Fuel Hose (To Manifold)

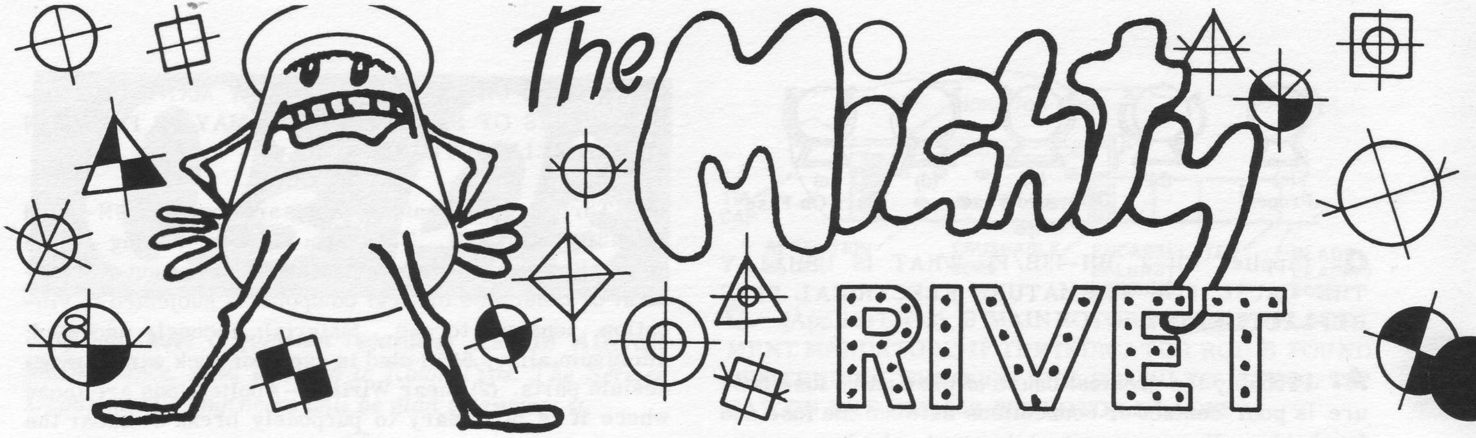


Q. (Applies HH-43F) WHERE SHOULD THE MAIN FUEL SYSTEM LINE BE DISCONNECTED WHEN PREPARING FOR THE "HOT END" INSPECTION ON THE T53-L-11A ENGINE?

A. A common, but not the most desirable, practice has been to disconnect the main fuel line at the main fuel manifold fitting because of the ease of accessibility. Since there is no filter in the main fuel manifold, dirt or other contaminants may enter the open connection during inspection and later cause a stoppage of fuel. The suggested procedure for main line fuel disconnection follows: (a) Disconnect the main fuel hose from the forward (inlet) end of the bypass fuel filter, see figure. (NOTE: Disconnect hose only at the point indicated.) (b) Close the filter inlet with a plastic cap and the hose with a plastic plug. (c) Remove the combustor housing from the engine as prescribed in applicable maintenance manuals. (d) Reattach the bypass filter to the combustor housing flange; use two bolts, AN 101010, originally furnished to attach the filter.

H. Zubkoff, Service Engineer

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



Everybody knows about rivets...or do they? These fasteners are so commonplace in aircraft that their correct use tends to fall into a "routine" category. However, like nuts and bolts, rivets are occasionally misused or unauthorized substitutions are made which may lead to maintenance problems or even stress failures. As an aid to those maintaining Kaman helicopters, information regarding rivet identification, materials, applications, and so on, has been drawn from several military and contractor sources for presentation in the following article.

One of the most important phases of helicopter assembly or structural rework is the proper riveting of various parts into a tight and effective joint. This can be attained only by following correct installation procedures and making certain that the rivet specified, or an authorized substitute, is used. The penalty for failure to follow these simple rules is not always immediately apparent but, eventually, corrosion streaks reveal the unauthorized substitution, the wrong type heads pull through, or a potential FOD danger is created as rivets work loose and shear. The "mighty" rivet is mighty only when properly used!

The installation of a rivet is accomplished by any one of several standard methods familiar to maintenance personnel, and the use of various tools to upset or "buck" the rivet stem. The rivets used in aircraft construction or repair are generally fabricated from aluminum alloys, although in certain areas, monel, corrosion-resistant steel, mild steel or copper rivets are used. The various head types and styles of rivets are needed because of the different materials and metals used in the construction of helicopters and the varying degrees of stress imposed. In the UH-2 SEASPRITE and HH-43 HUSKIE, the following standard rivets are used: Standard Solid Shank, Structural Blind (Cherry) Rivet, Structural Blind Rivet - Explosive Type, and Chobert (Tack) Rivet. A comprehensive description of each is included in this article. First, however, let's deal with the subject of rivet identification.

IDENTIFICATION

Rivets are identified by: 1. style of head 2. size (diameter and length) and 3. material (aluminum alloys principally). These three identifying terms must be used to obtain the MS number for a specific rivet if it is not called out on a blueprint or similar guide. To make certain the right rivet is used in the right place, identification marks on the rivet heads are used in conjunction with symbols and numerical codes in military specifications, Kaman blueprints, Airframe Changes and Time Compliance Technical Orders. Figure 1 and Tables A and B supply this information. A lack of this fundamental knowledge, or failure to apply it, can lead to problems such as those mentioned in the introductory paragraph.

Style of Head and MS Series

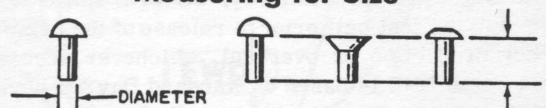
MS20426 Series - Rivet, solid, countersunk 100°, precision head, aluminum and aluminum alloy. For flush applications.

MS20427 Series - Rivet, solid, countersunk 100°, carbon steel, corrosion-resistant steel, monel or copper. Recessed dash identifies corrosion-resist steel while the triangle denotes mild steel rivets. There is no head marking requirement for copper or monel rivets in the MS-20427 series. For flush applications.

MS20435 Series - Rivet, round head, steel, monel or copper. A recessed triangle is used only to denote a mild steel rivet. For non-flush applications.

MS20470 Series - Rivet, universal or brazier head, aluminum and aluminum alloy. For non-flush applications.

Measuring for Size



NOTE: Length of countersunk rivet is measured from top of head.

Material and Identification

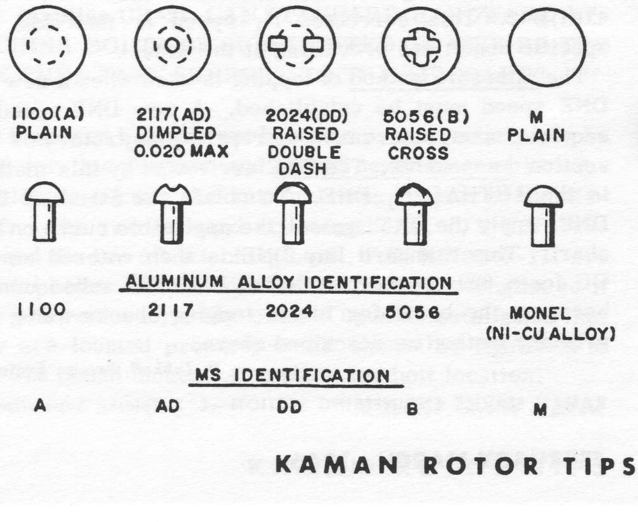
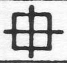
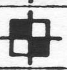


Figure 1

Rivet Composition	Rivet Code	Rivet Application
1100-F	A	Rivet made from virtually pure aluminum and used in riveting non-structural parts fabricated from the soft aluminum alloys such as 1100, 3003, and 5052. ("Exceptionally soft" rivet)
2117-T4	AD	Used in aluminum alloy structures for sizes 5/32 inch diameter and smaller. ("Normally used" rivet)
2024-T4	DD	Used in aluminum alloy structures for sizes 3/16 inch diameter and larger. (Must be kept under refrigeration and driven cold after full natural aging.)
5056-H32	B	Used for riveting magnesium alloy structures or combinations of magnesium and other alloys in order to minimize galvanic corrosion of magnesium. Also used in riveting laminated fiberglass assemblies. ("Soft" rivet)
MONEL (Ni-Cu Alloy)	M	Used primarily in riveting cres, carbon, nickel and other alloy steels. Cadmium plated monel rivets shall not be used in applications where the ambient temperature is above 400°F. ("Hard" rivet)

TABLE A - List of common aircraft rivets used in Kaman helicopters and their applications. Note: 2017-T4D rivets are not used on Kaman aircraft. Such rivets require extra handling since they are driven cold immediately after solution heat treatment, or when refrigerated to defer natural aging.

RIVET DIA	*MS20426 MS20470	*MS20426 MS20470	*MS20427 MS20435	MS20600 *MS20601	MS20602 *MS20603
	AD & DD	B	M	BLIND	EXPLOSIVE
1/16					
3/32					
1/8					
5/32					
3/16					
1/4					

*Symbols which indicate how and where flush rivets are to be installed.

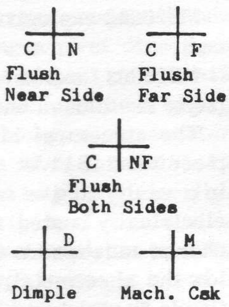


TABLE B - List of rivets found on Kaman helicopters and the symbols and codes found on drawings, Airframe Changes, Time Compliance Technical Orders, bulletins, documents, etc. EXAMPLES:

 DENOTES MS20600B4 BLIND RIVET  DENOTES MACH. CSK FLUSH FAR SIDE

SELECTION

Rivets should normally be selected according to the materials being joined. Where more than one material is involved, the rivet should not be harder than the material next to the driven head.

DESCRIPTION AND APPLICATION

Conventional Solid Shank Rivets and Application

Standard solid shank rivets are those generally used in aircraft construction or repair. They are manufactured in the following head styles: roundhead, countersunk and standard or brazier head (similar to roundhead except the head is reduced to about 2/3 the thickness of the roundhead). Roundhead rivets are generally used in the interior of the aircraft except where clearance is required for adjacent structural members. Brazier head and the universal head rivets are generally used on the exterior surfaces of the aircraft where strength requirements necessitate a stronger rivet head than that of the countersunk head rivet. Countersunk head rivets are generally used on the exterior surfaces of the aircraft to minimize turbulent airflow.

Structural Blind Rivets (Cherry Rivet)

MS20600 self-plugging, protruding head (series "W" - serrated stem). (See figure 2)

MS20601 self-plugging, 100-degree countersunk head (series "W" - serrated stem). (See figure 2)

The structural blind rivet is a two-piece tubular blind rivet consisting of a preassembled hollow rivet on a pull stem. The enlarged portion of the stem is mechanically

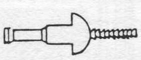
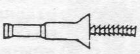
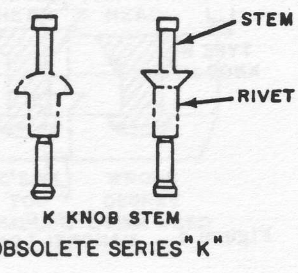
SERIES "W"	MATERIAL	HEAD	SERRATED STEM
	2117 AL 5056 AL MONEL	PROTRUDING PROTRUDING PROTRUDING	MS20600AD __W MS20600B __W MS20600M __W
	2117 AL 5056 AL MONEL	100° CSK 100° CSK 100° CSK	MS20601AD __W MS20601B __W MS20601M __W

Figure 2



OBSOLETE SERIES "K"

pulled into the rivet, expanding the shank to fill the hole. The conical tip on the bottom of the stem then upsets ("bucks") the blind head. Continued pull on top of the stem fractures the stem at the preformed notch, leaving the sleeve (rivet) plugged. The fractured stem on top of the rivet head is then filed smooth. Whenever possible, the exposed end of the fractured or clipped stem should be coated with zinc chromate primer. The knob stem rivets (series "K") are being superseded by the series "W," indicating a serrated stem rivet (see figure 2).

Structural blind rivets are used when it is impossible, due to location, to install conventional solid rivets. They can be used advantageously when enclosing components during repair work and it is impossible to buck conventional rivets. Since this is a hollow type rivet it should NOT BE USED in hulls, floats, or tanks except for an interim repair in cases of absolute necessity and then they should be replaced with conventional rivets as soon as facilities are available.

Structural Blind Rivets - Explosive Type

MS20602 explosive, protruding head (style A - closed end).

MS20603 explosive, 100-degree countersunk head (style A - closed end). (See Table B)

The structural blind rivet (explosive type) is a one-piece tubular rivet containing a small explosive charge in a cavity at the end of the shank. Application of an electrically heated iron to the rivet head activates the charge and expands the shank in the drilled hole and below the sheetmetal, thus, locking the rivet in place (see figure 3). Explosive rivets may be used only when there is insufficient blind-side clearance to permit installation of the self-plugging (Cherry) type rivet. Since the explosive rivet presents a safety hazard, extreme caution should be observed during its use.

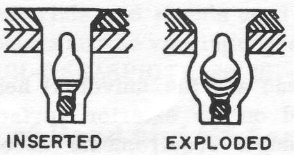


Figure 3 STYLE A (CLOSED END)

For obvious reasons, explosive rivets SHOULD NEVER BE USED where ANY inflammable vapor or liquid is present. Since they do not always form a perfect seal, explosive rivets SHOULD NEVER BE USED in the manufacture or repair of fuel or oil tanks. For the same reason, these rivets SHOULD NEVER BE USED for water or fuel-tight joints such as in hulls, tanks, floats, or other confined spaces.

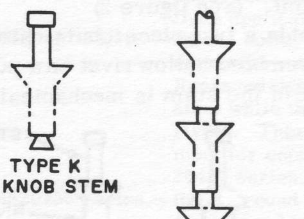


Figure 4

Chobert Blind Rivets - Non Structural (Tack-Rivet)

MS20605 self-plugging 100-degree countersunk head (type C - mandrel loaded). (See figure 4)

The Chobert blind rivet has a tapered hole in the rivet shank into which the flared mandrel of the riveting gun is inserted. The rivet is upset (bucked) as the mandrel is pulled through the tapered hole. Chobert rivets are most often used as temporary "holding" rivets in sheetmetal sub-assembly work and are later replaced with a conventional solid rivet; in some cases, however, Chobert blind rivets (countersunk head) may be used to permanently attach nutplates which use a 3/32-inch diameter rivet for attachment. If a larger size rivet is required with the nutplate attachment, use the conventional MS20426 series solid rivet. (See figure 1)

Use of Chobert rivets should be limited to aluminum alloy, AD (#2117) material. If rivets are to be used with magnesium, use conventional MS series B solid rivets in #5056 material. (See Table A) Chobert (tack) rivets should NOT BE USED for attachment of structural doublers, when fuel or waterproof requirements exist, or as substitutes for structural rivets (see figure 4A).

SUBSTITUTION

a. When replacing Standard Solid Shank Rivets in an installation, it is desirable to use the rivet that corresponds to the type of rivet removed. Since smaller rivets lack the proper structural qualities and larger rivets may dangerously reduce the splice or patch area, care must be exercised before substituting other than the specified sizes of rivet diameter. When any rivet hole becomes enlarged, deformed, or otherwise damaged, use the next larger size rivet and the same or higher strength material as a replacement. Replacements should not be made with rivets of lower strength material unless they are larger in diameter than those rivets removed. (See Table A and B.)

b. Countersunk head rivets are to be replaced with rivets of the same type and degree of counter sink.

c. The Structural Blind Rivets (Cherry) usually are replaced with the same or greater strength material and one size larger than the rivet it replaces.

d. When aluminum rivets are not available, stainless steel or monel rivets can be used temporarily with a generous application of zinc chromate primer. This should be done only to permit necessary flights of the aircraft until the proper replacement of rivets can be accomplished.

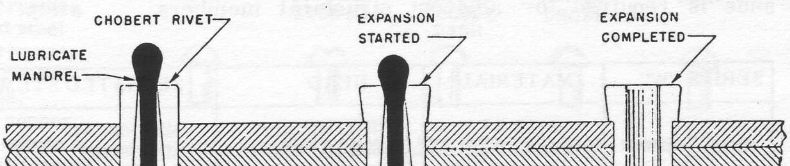


Figure 4A

STANDARD HOLE SIZES

Common rivet diameters range from 3/32 to 3/8 inches. The 3/32, 1/3, 5/32 and 3/16-inch diameter sizes are the most frequently used. Table C specifies the size holes to drill for the application of the various sizes of rivets.

TABLE C

RIVET DIAMETER	DRILL SIZE
3/32	41
1/8	30
5/32	21
3/16	11
1/4	F
5/16	P
3/8	W

PRACTICES

a. Regardless of the upsetting (bucking) or driving method, the result should be consistently uniform. Figures 5 and 6 show several specimens of properly and improperly driven rivets. Figure 7 shows the basic standard for judging a good rivet installation.

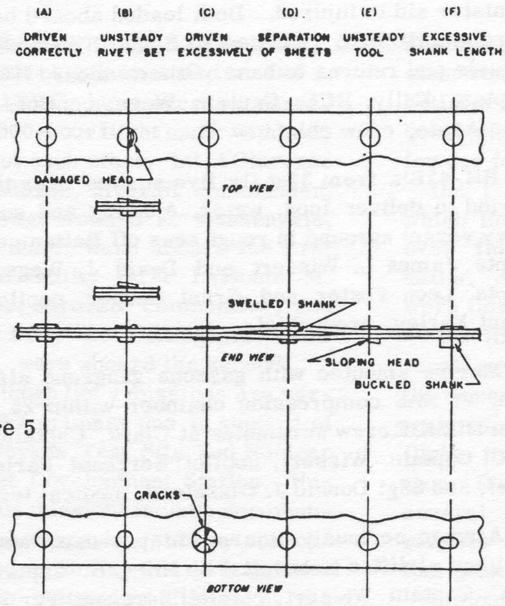


Figure 5

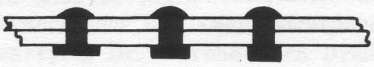
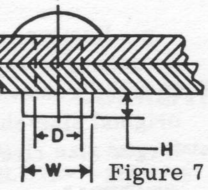


Figure 6

TOO FLAT CORRECT TOO HIGH



The width W should equal 1-1/2 times the original diameter D, and the heigth H should equal one-half the original diameter.

Figure 7

b. Rivet Lengths: Selecting the proper length of rivet is an important factor of the repair. Should too long a rivet be used, the formed head (bucked-tail) may bend or be forced between the sheets of metal being riveted. Should too short a rivet be used, the formed head (bucked-tail) will be too small to hold properly or the riveted material will be damaged (see figure 5). If proper lengths are not available, longer rivets may be cut off to equal the proper length. The rivet length is based on the grip (see figure 7).

c. Determining Edge Distance: Minimum edge distance (ED) of rivet holes is determined by the rivet diameter. Correct edge distance of the rivet hole to the edge of stock is equal to twice the rivet diameter (see figure 8).

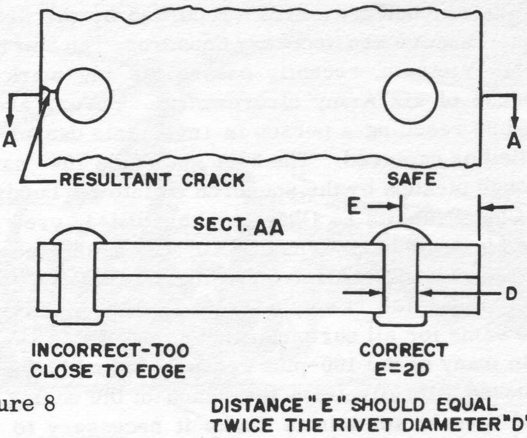


Figure 8

d. Riveting Laminated Fiberglass Assemblies: (1) Use soft aluminum alloy "B" (5056 material) rivets when possible. (See Table A.) (2) Washers are not required under countersunk heads of rivets. (3) When riveting through a laminate of #181 or #181-150 glass fabric of 4 or more plies, no washers are required under the upset head. (4) When upsetting a rivet directly against a laminate of 3 or less plies of #181 or #181-150 glass fabric, use a washer under the upset head to prevent tear-out. (5) The minimum thickness for countersinking for a 3/32 rivet is 3 plies of #181 or #181-150 glass fabric. Anything less should be built up locally.

e. Flush Riveting: Two distinct types of countersinking for flush rivet installations are available (see figure 9). The selection of which type to use is based on the thickness of the sheet of metal being joined. Figure 10 shows the minimum sheet metal thickness for "machine" and dimple countersinking for flush rivet installation.

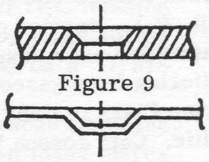


Figure 9

a) Machine Countersinking where metal is removed to form a conical recess.

b) Dimpling where a conical wall is formed by indenting the area around the rivet hole.

RIVET DIA	A
3/32	.040
1/8	.050
5/32	.063
3/16	.071
1/4	.100

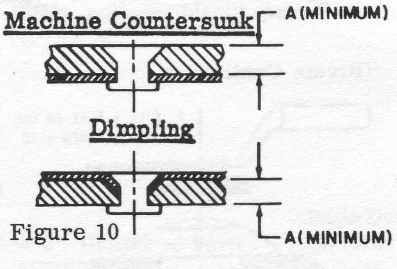


Figure 10

f. Rivet Countersinking: Care must be exercised when machine countersinking to obtain correct degree angle and depth of countersink as shown in figure 11.

Figure 11

Southeast Asia

The number of "saves" recorded by the 38th Aerospace Rescue and Recovery Squadron, Tan Son Nhut AB, South Vietnam, recently passed the 100 mark with the rescue of six Army aircrewmen. "Saves" are identified as rescuing a person in immediate danger of being killed or captured. The 38th has made 104 "saves" although pickups by the squadron go into the hundreds.

Capt Franklin L. Chase and his HH-43 crew rescued the six Army men. The HUSKIE was on the scene within 25 minutes after receiving a distress call. "The pickup was uneventful," Captain Chase said, "I wish I could say the same for all our pickups."

In many of the 100-plus rescues, downed airmen were plucked literally from the hands of the enemy. Trees and terrain sometimes make it necessary to lower a pararescueman to assist during a pickup.

Recognition for their efforts has already been given to several ARRS pilots and crewmen who participated in such hazardous missions. Among the most recent to receive such recognition is Capt Kenneth L. Spaur, now serving as commander of Det 5, WARRC, McChord AFB, Wash. Captain Spaur has been awarded the Silver Star for the rescue of a flier from a Viet Cong-dominated section of South Vietnam. He made the pickup Dec. 1, 1964, after searching the area in D-Zone for more than 20 minutes. At that time the Viet Cong reigned unchallenged in the Zone. The downed pilot had taken cover in the jungle while two VC squads dismantled his aircraft. After they left, he appeared and was spotted and picked up by Captain Spaur. At the time, the Captain was attached to a Bien Hoa AB recovery unit.

Report From The 31st ARRS

● HH-43B crew from 31st Aerospace Rescue and Recovery Squadron, PARRC, Clark AB, P.I., carries out night air evacuation in marginal weather and over mountainous terrain to deliver patient suffering from gaseous gangrene to hospital. Rapid trip from Clark to Cubi Pt NAS credited with saving patient's life. Capt Joseph W. Kelly, RCC; Capt Larry C. Evans, copilot; SSgt Charles A. Sullivan, Jr., medical technician; and A3c Stanley Y. Asato, crew chief.

● Marine stationed at U. S. Embassy in Manila airlifted by HH-43B crew to Clark AB for emergency treatment of kidney malfunction. Patient delivered to hospital only 90 minutes after HUSKIE took off from Clark. Captain Evans, RCC; Capt Kenneth W. Dotson, copilot; TSgt Forrest W. Farley, crew chief; and Sergeant Sullivan, medical technician.

● HH-43B and HU-16 from 31st team up to evacuate seriously injured American college student and Filipino after automobile accident in mountains of northern Luzon more than 150 miles from Clark. Area accessible only by helicopter due to washed out roads. Fuel airlifted by U-6A and C-47 to Baguio where HUSKIE later lands to refuel. HU-16 provides air cover, communications relay and navigational assistance as HH-43B threads its way through rugged mountains despite scattered showers and overcast. HUSKIE crew vectored to Bontoc and lands in school yard. Capt Thomas Walker (MC), flight surgeon, and Sergeant Sullivan, medical technician, administer aid to injured. Both loaded aboard helo afterward and HUSKIE returned to Baguio, offloads injured, refuels and returns to base. Others aboard HUSKIE are Captain Kelly, RCC; Captain Wege, copilot; and Airman Asato, crew chief.

● HH-43B's from 31st fly five sorties over three-day period to deliver food, water, clothing and supplies to Navy vessel aground in rough seas off Battan peninsula. Capts James L. Wissert and David J. Wege, RCC's; Capts Leon Foster and Grant Kerber, copilots; Sergeant Farley, crew chief.

● Marine amputee with gaseous gangrene airlifted to Cubi Pt NAS compression chamber within 25 minutes after HUSKIE crew scrambles at Clark. Captain Dotson, RCC; Captain Wissert, copilot; Sergeant Farley, crew chief; and SSgt Donald J. Glassford, medical technician.

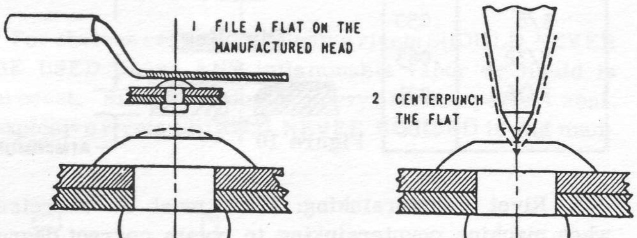
● Airman seriously injured in pre-dawn automobile accident airlifted to hospital by HH-43B. Captain Wege, RCC; Captain Wissert, copilot; Sergeant Farley, crew chief; Maj L. T. Patterson (MC), flight surgeon; Sergeant Sullivan, medical technician.

(Rivets Continued)

g. Removal of Solid Shank Rivets: When it becomes necessary to replace rivets, great care should be taken in their removal so that the rivet hole will retain its original size/shape and not require replacement with a larger size rivet (see figure 12).

CRITERIA

Good judgement, know-how, experience and personal pride in his work — these are the marks of a good "sheetmetal man."



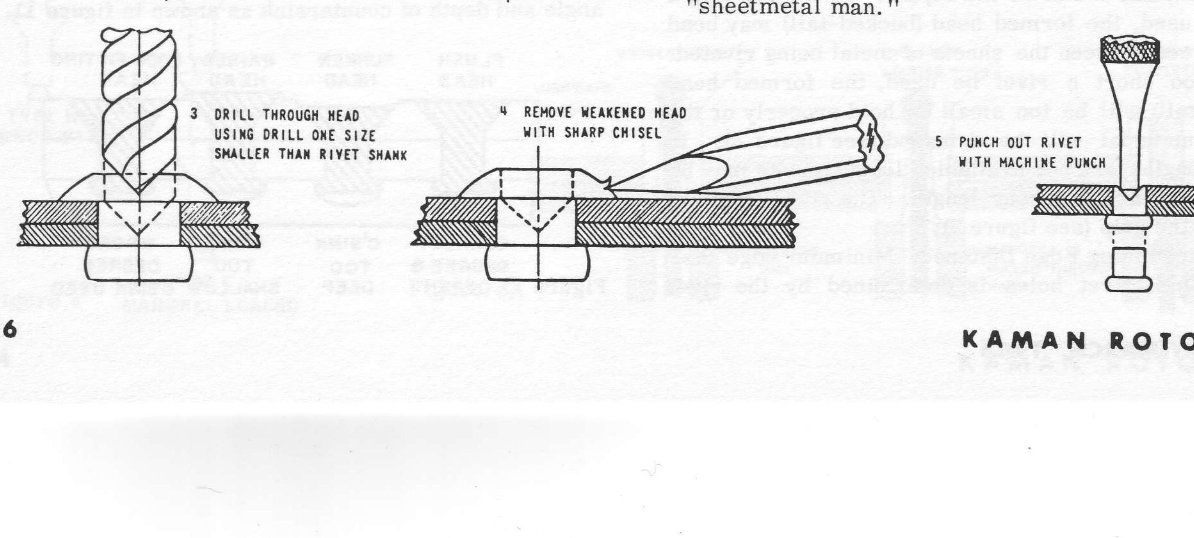


Figure 12

HIGH-FLYING HUSKIES HIT 1000

by 1st Lt. Clarence N. Cochran, Jr.

1000 EACH— Standing in front of HUSKIES are, left to right, A2c Rodger L. Noble, SSgt Vincent D. Androwsky, SSgt Billy D. Willingham, Lts Richard O. Hulme, LaMonte M. Kahler, Clarence N. Cochran, James H. Brahney, TSgt Howard E. Massengale, SSgt Edward Manghum and A2c Clyde E. Chavez. (USAF photo)

INDIAN SPRINGS AFAF, NEV... Two HH-43B's stationed at Det 1, Hq AFSWC, here recently passed the 1000-hour flight mark within 45 days of each other. 1stLt Clarence N. Cochran, aircraft commander, and TSgt Howard E. Massengale, crew chief, were aboard the first H-43B while 1stLt LaMonte M. Kahler, aircraft commander, and SSgt Billy D. Willingham, crew chief, were aboard the second.

Although Det 1 missions are varied, the primary one is support of the Nevada Test Site and Nuclear Rocket Development Station. Numerous missions include documentary photography, standby search/rescue capability, and distinguished visitor orientation flights at the Nevada Test Site. Recently, the Detachment had the privilege of carrying Dr. Wernher Von Braun and his party on a tour of the Nuclear Rocket Development Station. NRDS is carrying out a program of developing nuclear rocket engines for our future space efforts.

Det 1 has also flown missions which they believe are the highest ever flown in conventional HH-43B's. Six consecutive missions were flown to above 20,000 ft MSL — the lifting of an 880-pound external payload to 22,300 ft MSL was the most demanding. Although critical missions such as this are rare, flights to 16,000 feet MSL are common. During another type mission several months ago, three forest rangers were landed on a 11,918 foot peak.

Although not a rescue unit, the Detachment has flown many mercy missions and is quick to lend support for any search and rescue effort when called upon. On one occasion Det 1 H-43B's were called upon for rescue support after an airliner crash near Las Vegas, Nev. Other such missions included transportation and standby rescue for skin divers while they were involved in a search for two boys lost in an underground lake known as the Devil's Hole in Death Valley, Calif. The Detachment has also supported Nellis AFB rescue and accident investigation teams on numerous occasions.

These missions not only exemplify H-43B performance but also the professionalism of the pilots and crack maintenance team which keep them in the air. The Detachment has never had an engine failure or incident while flying the HH-43B's and is justly proud of its record. **K**

CURRENT CHANGES

	Issue Date
AFC 73 - ROTOR AND FLIGHT CONTROL SYSTEMS; Improvement of Collective Controls.	12/10/65
AFC 74 - ELECTRICAL SYSTEM; Modification of Numbers 1 and 2 Generator Controllers.	11/30/65
AFC 89 - FLIGHT CONTROLS; Azimuth-to-Hub Control Rods, Phasing Device; Installation of.	12/31/65
NAVWEPS 01-260HC-8 - TECHNICAL MANUAL, AIRCRAFT MAINTENANCE, WORK UNIT CODE MANUAL	4/15/65 changed 12/15/65
NAVWEPS 01-260HCA-2-4 - Handbook Maintenance Instructions, TRANSMISSION SYSTEM	10/15/62 changed 9/15/65
NAVWEPS 01-260HCA-3 - Handbook, Structural Repair	10/15/62 changed 10/1/65
NAVWEPS 01-260HCA-4-5 - Illustrated Parts Breakdown, FURNISHINGS	10/15/62 changed 12/1/65
NAVWEPS 01-260HCA-4-6 - Illustrated Parts Breakdown, AIRFRAME	10/15/62 changed 9/1/65
NAVWEPS 01-260HCA-4-8 - Illustrated Parts Breakdown, NUMERICAL INDEX AND REFERENCE DESIGNATION INDEX	9/1/65
SEB 76 - TEST SET; Use of Test Table, Scorsby Model Number 1406R, with H-2 Helicopter ASE Sensor Unit Test Set, Part Number K604609-2.	10/25/65
T.O. 1H-43(H)B-4 - ILLUSTRATED PARTS BREAKDOWN	3/16/64 changed 7/19/65

F. G. Weber, Service Publications

Huskie Happenings

...Det 18, EARRC(MAC), Thule AB, Greenland, starts off 1966 with New Year's Day mercy mission flown after darkness to village 75 miles from base. HUSKIE lands on sea ice at foot of 30-degree slope and crew makes way to home of seriously-ill woman 150 yards away. Capt Thomas L. Kelly, Jr. (MC), flight surgeon, determines she is suffering from appendicitis. Hunting sled used to transport patient to chopper and she is flown back to base for successful operation. Capt Henry Q. Long, Jr., RCC on mission; Capt Lonnie C. Luttrell, copilot; A1c Jerome A. Tuttle, crew chief; and A2c Harold W. Hammett, medical technician.

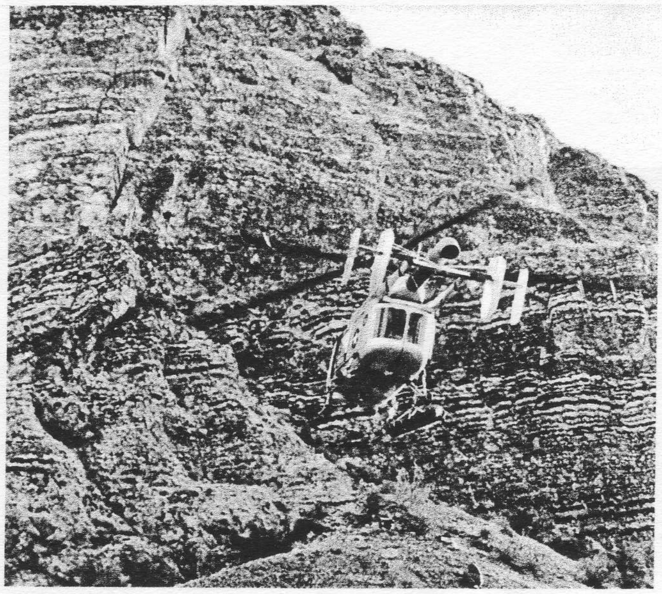
...Mountain climber, seriously injured in 70-foot fall, rescued from 6200-foot level in Cascade Mountains by HH-43B crew from Det 5, WARRC(MAC), McChord AFB, Wash. Helicopter leaves McChord at 0630 in darkness and light rain, crosses mountains, picks up member of Mountain Rescue Council and proceeds to rescue area where ground party waits in 5-degree temperatures. Pickup made from 50-foot hover to ensure adequate blade clearance from nearby 3000-foot cliff. Stokes litter hoisted to bear paws and held in place by A2c Frank P. Hanutke, HUSKIE crew chief, while descent to base camp is made. Rescuee loaded aboard HH-43B and flown to waiting ambulance. Other members of helo crew are Lt Donald M. Welsh, RCC; Capt Robert S. Michelsen, copilot; and SSgt Karl F. Aldridge, medic.

...HH-43B crew from ARRS Det 15, WARRC(MAC), Luke AFB, Ariz., makes 400-mile trip to evacuate woman seriously injured in fall while on camping trip at bottom of Grand Canyon. HUSKIE makes two refueling stops at 6700-foot altitudes and 100 miles of rescue trip made at 8,000 feet over extremely rugged terrain. Heavy turbulence encountered over Colorado River gorge. Capt Fredrik M. Bergold, pilot; Capt Thomas F. Madden, copilot; Capt Rodney D. Gladhart (MC), flight surgeon; A2c William E. Brooks, medical technician; A3c Jose Avina-Ceja, helicopter mechanic....Search for four officials from ECAFE, United Nations organization, conducted by HH-43B crew from Det 4, 38th ARRSq(MAC), Korat AB, Thailand. Officials, missing for three days, located on sand bar in Hain Sei Noi River in jungles of Khao Yai National Park. Rescue site located in narrow gorge surrounded by 100-foot tall trees. SSgt Allan N. Bantle goes down 90 feet on hoist, determines party does not need assistance. Helicopter directs ground searchers through jungle to location. Pilots on mission are Captains John S. Lapham and Lew E. Phillips, crew chief is A2c Roger R. Shell.

...Air Force doctor, civilian nurse and HH-43B crew team up to keep critically-injured automobile accident victim alive. Flying at 7600 feet over Mazatzal mountain range, HUSKIE from Det 15, WARRC (MAC), Luke AFB, Ariz., makes 65-mile trip to Payson where nurse Betty Jarret fights to save injured man's life. Capt James Conley, flight surgeon, advises immediate evacuation to Phoenix. HUSKIE pilot, Capt Thomas F. Madden, takes helo back over mountains and heads at top speed for city as doctor and nurse work continuously to save patient. Operation at hospital relieves pressure on brain and accident victim lives. Sharing in the mercy flight were Capt Fredrik M. Bergold and A1c William Dunbar.

Colombian Air Force HUSKIE Logs 1000

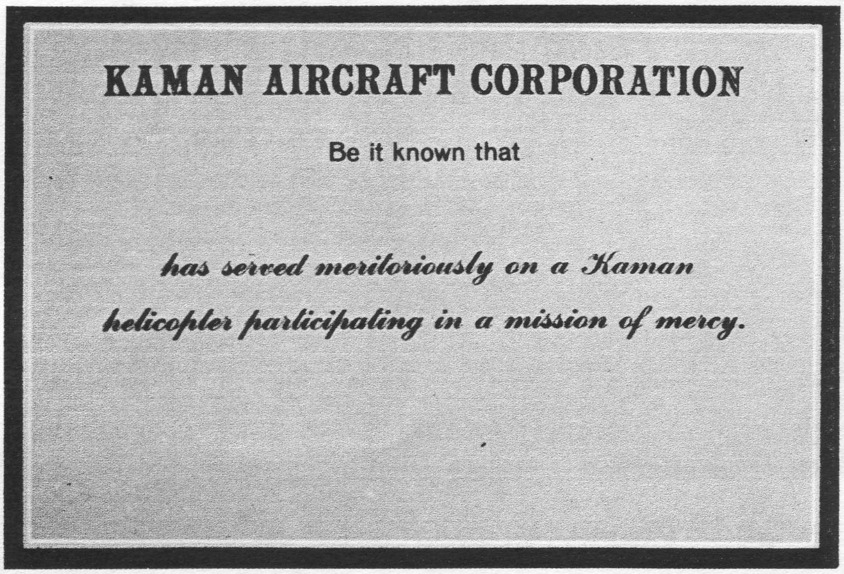
1000 HOURS—HH-43 crew is shown after historic flight during which the 1000th flight hour was logged on FAC 252. Left to right are ST2 Guillermo Rivers and ST3 Guillermo Gonzales, mechanics; Cap Nigiuel Romirez, pilot; and Cap Guillermo Ruiz, copilot. In second photo TC Jose B. Cabrejo, base commander, German-Olano, congratulates Cap Romirez. Looking on are My Augusto Moreno, combat group commander; My Jose O. Satizabal, operation officer; Mr. Ken Simpson, Lycoming technical representative; Capt Louis Baudoin, USAF supply advisor; Capt Donald E. Harrell, USAF helicopter advisor pilot; Cap Luis Restrepo, assistant maintenance officer; Cap Luis Romirez; Mr. Jack Smith, Kaman technical representative; Cap Hugo Riveros, and TE Niguel Mesa, helicopter pilots; Cap Armando Rodriguez, helicopter operation officer. In third photo, next page, helicopter maintenance personnel proudly pose around "252." (FAC photos)



NEVADA MERCY MISSION—HH-43B from Det 14, WARRC, Nellis AFB, Nev., is shown after crew plucked a critically-injured Navy man from a precarious position 2500 feet up the side of a 70-degree shale slide at the base of a vertical cliff. To effect the rescue, Capt Csaba L. Magassy (MC), flight surgeon, and TSgt Archie R. McCall, medical technician, of the 4520th USAF Hospital were lowered to a more level spot and then climbed to the rescuee. Rotor blade clearance during the litter pickup afterward was three feet. Capt James T. Riley was pilot on the hazardous mission; Capt Thomas E. Fallows, copilot, and A2c Daniel H. Salmon, crewman. (Review Journal photo)

NATO PILOT RESCUED—After a night in the rugged Vosges mountains, an RCAF pilot serving with NATO forces was hoisted to safety by an HH-43B crew from Det 3, AARRC, Toul AB, France. A 600-man search party had combed the area in freezing rain and snow for the Canadian after he ejected from his crippled T-33. Earlier a Det 3 HUSKIE had been forced to temporarily abandon the search because of fog. Members of the helicopter crew are shown looking over a map of the area after the rescue. Left to right are A2c Carl Schroeder, airborne medic; SSgt Charles W. McNeill, airborne firefighter; Capt William F. Glover, pilot; and Capt Price S. Summerhill, copilot and detachment commander. (USAF photo)

AWARDS AT EARRC— Members of the Eastern Aerospace Rescue and Recovery Center at Robins AFB, Ga., after an award ceremony. Left to right are Capt Robert E. Lee, Air Force Commendation and Kaman 1000-Hour Pilot Award; Capt John A. Boyes, Air Medal; Col Lucian A. Dade, Jr., EARRC commander; Capt Grant D. Kerber, KAC 1000-Hour Pilot Award; and SSgt Kitts, Air Force Commendation. (USAF photo)



THE WALLET-SIZED KAMAN MISSION AWARD, AND RESCUE PIN, ARE PRESENTED TO PILOTS AND CREW MEMBERS IN RECOGNITION OF THE HUMANITARIAN SERVICE PERFORMED WHEN THEY PARTICIPATE IN A ROUTINE RESCUE OR MISSION OF MERCY.