KAMAN Rotor Tips

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THE KAMAN AIRCRAFT CORPORATION

PIONEERS IN TURBINE POWERED HELICOPTERS

KAMAN Rotor Tips

JUNE, 1961

ADDRESS ALL INQUIRIES TO:
Kaman Rotor Tips
Field Service Department
The Kaman Aircraft Corp.
Old Windsor Rd.
Bloomfield, Connecticut

THE COVER

Capt. Walter C. McMeen, USAF, of Luke Air Force Base, Ariz., before record-breaking altitude flight in H-43B. For story, see page eight.

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Due to temporary realignment of staff personnel, the next few issues of Rotor Tips will be published every other month.

PLEASE SHARE THIS COPY

MAINTENANCE IS THEIR MISSION

by WILLIAM G. WELLS
Senior Field Service Representative

"HELICOPTER CREW RESCUES DOWNED PILOT," "THREE ON SEA-SWEPT SAND BAR SAVED BY CHOPPER," "MOUNTAIN-TOP RESCUE MADE BY HELICOPTER"..... These, and similar headlines, often appear in the newspapers along with stories of helicopters rescuing lost hunters, children and even entire families; aiding crewmen to escape from burning aircraft by using the rotor downwash, picking up pilots who ditched far at sea, flying food to flood-marooned communities, airlifting accident victims to the hospital and many, many more. There are literally hundreds of such incidents.

Most newspaper readers may be inclined to take these rescues for granted, not fully realizing the tremendous effort which has gone into the training of the helicopter crews in order to prepare them to carry out their missions so successfully, despite the adverse situations they often encounter. It is a rare reader indeed who gives a thought to the maintenance men behind the scenes whose efforts months, even years, before contributed to the present-day skills of those who man the 'copters.

This particular story deals with the maintenance personnel at Stead Air Force Base, Nevada, where chopper pilots and their crewmen are cross-trained into the H-43B; but it is representative of any military training facility. No attempt will be made to cover the flying school headed by Major Francis Carney and his efficient group of instructors. That is a story in itself which will appear in a future issue of Rotor Tips.

During this H-43B training at Stead, emphasis is placed on local base rescue, and firefighting by helicopter. The maintenance work is preformed by personnel attached to the 3635th Flight Line Maintenance Squadron. The 29 men assigned to the H-43B section are divided into two groups——the flight line, and periodic inspection. At the present time, there are eight H-43B HUSKIES assigned; a few months ago at the height of the program, 12 were in use. In the last 12 months the combined effort of these two sections has resulted in 3,500 flying hours during which 24 major inspections, including component changes, and 29 minor inspections were performed.

Personnel from the H-43 Flight Line Maintenance Group at Stead AFB. Front row, left to right, S/Sgt. Ronald Winkler, A2/c Tom Lambert. Rear row, M/Sgt. William McCall, T/Sgt. Lyle Habershaw, S/Sgt. Gerry Doyle, S/Sgt. Joe Hatfield, S/Sgt. Roy Brewer. (USAF photo)

A2/c James Wells and A2/c Scott Vandenburg listen attentively as S/Sgt. Andrew Cota gives them instruction on the proper way to perform an azimuth bar runout check.

ChM/Sgt. Herman Gunser, T/Sgt. George Burris and S/Sgt. Garvin T. Smith review the log cards to ensure that every major component has received the necessary attention during this periodic check.

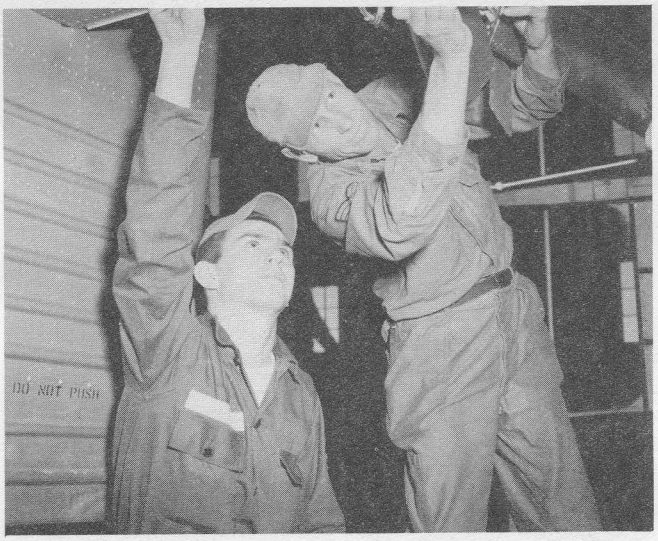
S/Sgt. Joe R. Hatfield opens the engine cowling during a preflight inspection.

The flightline personnel are responsible for pre-flighting, post-flighting, trouble-shooting, and preventative maintenance. Another of their important duties is to ensure rapid turnaround of the aircraft in order to get full utilization of the training day. I recall an instance whereby one helicopter logged 69.7 hours in 10 days. The aircraft was rolled out before dawn, pre-flighted, and airborne before 7:30 a.m. for a 2 1/2-hour flight. Upon its return, it was reserviced and launched for a second flight of 2 1/2-hours which was completed before 1 p.m. the same day. After the chow break the helo was flown for an additional 2-hour hop before being put to bed. This went on for several days. Maximum utilization was made possible through the efforts of the flight line crew.

An additional duty of the crew chiefs is to follow their bird through all inspections to assist the periodic section in expediting work on the helicopter. Theirs is a long day, starting at 6 a.m. and ending when the ships are put to bed at night with all minor discrepancies corrected. Some have worked until after midnight so that the aircraft will be available for the first launch the following morning.

The periodic section is responsible for all aircraft inspections including component changes and, usually, all major maintenance. It is their duty to see the helo completely through the inspection, test flight, and release to the flight line with no discrepancies.

This group, like the line personnel, has shown a willingness to completely disregard

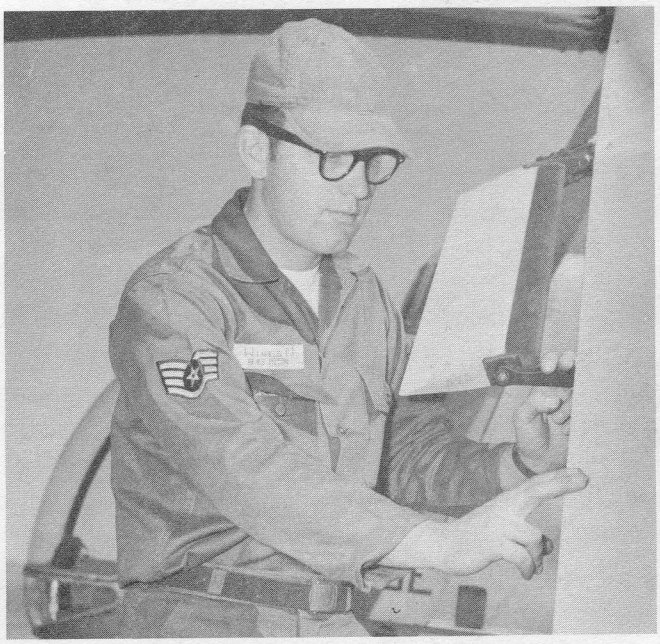


A2/c Clyde Hill and S/Sgt. R. V. Millar button up the inspection panels preparing the HUSKIE for test flight.

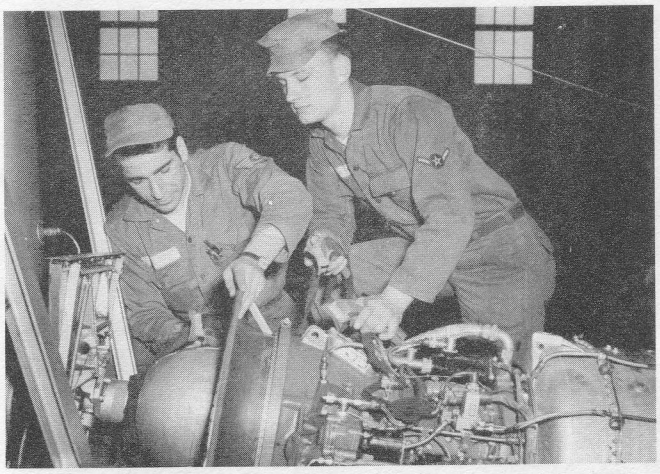
The afternoon crew before starting their shift. Front row, left to right, A2/c George Boone, S/Sgt. Joe Chesson, A1/c William W. Allen, A1/c James Breaux. Rear row, S/Sgt. Carrol Jones, T/Sgt. Norman Ray, A2/c George Webb, A1/c Delbert Dunn, S/Sgt. Tony Valuenzuela. (USAF photo)

the clock in order to "keep them flying" so the training schedule can be met. It is not at all unusual for this section to turn out component changes in two days. The efficiency of the crews and their rigging procedures is such that very rarely anything but minor adjustments for track and/or cone height settings are necessary when the aircraft goes into postdock.

Another maximum effort stands out clearly in my mind. We were notified at 1 p. m. on a Friday that we were to have two H-43Bs ready for air pickup by a C124 by 4:30 that same afternoon. This entailed the disassembly, packing, and crating of the major components. At 4:45 that afternoon, the two HUSKIES were on the line, together with their respective packaged bits and pieces, ready for the airlift. Upon arrival at their destination, the crew of six mechanics started to build up the choppers. Exactly seven hours later, both aircraft were operational. One hour had been taken out for a well-deserved meal.

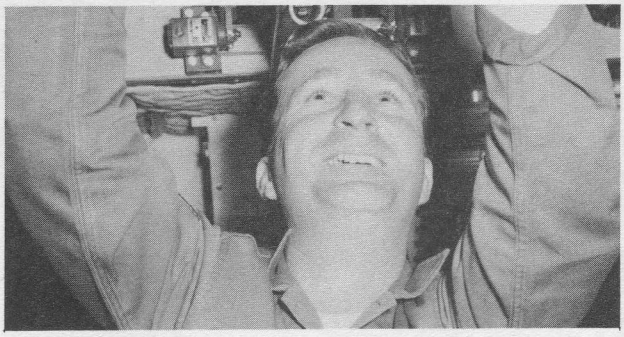


S/Sgt. Ronald J. Winkler preflights a blade assembly prior to the early morning launch.



S/Sgt. Tom Margagliano and A3/c James Brown insert the engine inlet housing protect plugs before starting a periodic inspection.

It has been approximately one year since the arrival of the H-43B here at Stead. I feel that it is fitting at this time that I pay tribute to the men who had made the success of the base mission a reality. The flight hour figure at Stead, 3,500 hours, is proof enough that the mechanics at this station have re-indoctrinated themselves to a newly-configured helicopter with thoroughness and enthusiam. No attempt has been made to individualize as it is my feeling that the combined efforts of the main-



S/Sgt. Ray Fischer checks the azimuth for security prior to calling the Quality Control inspectors

tenance personnel have made this program possible.

Outside of the personal satisfaction in their record, the helicopter men of the 3635th Flight Line Maintenance Squadron have another, but usually delayed reward—"HELICOPTER CREW RESCUES DOWNED PILOT," "THREE ON SEA-SWEPT SAND BAR SAVED BY CHOPPER," "MOUNTAIN-TOP RESCUE MADE BY HELICOPTER." K

STEAD AFB, Nev.—*Two H-43Bs were among six helicopters from Stead AFB which transported Secretary of the Interior Stewart Udall and other government officials during "Operation Rainbow Bridge." The copters also took part in a rescue operation when the occupants of a civilian helicopter were stranded on a sand bar near the base of 1200-foot cliffs.*

The Stead helicopters were utilized to carry the Secretary and his party to Utah's natural Rainbow Bridge to survey the area with an idea of making it into a natural park and to discuss ways it could be protected from water rising behind the new Glen Canyon Dam, scheduled for completion in 1965.

The emergency arose when the engine failed on a civilian helicopter also being used and which was ferrying two passengers back from the bridge to the temporary base at Page, Ariz. The civilian pilot landed on the sand bar and restarted the engine but declined to lift the passengers to the rim. They remained behind to build signal fires. The engine of the civilian helicopter failed again two miles short of Page.

Only 45 minutes of daylight remained when a "scramble" sounded for relaxing Stead men who had already "buttoned up" their craft and were in motel quarters in downtown Page. Within 15 minutes the two H-43Bs and four other helicopters were in the air. In a matter of minutes the H-43B, piloted by Capts. Phillip E. Maggart and John A. Link and with S/Sgt. Ronald J. Winkler as crew chief, spotted the two signal fires lit by the passengers. They battled tricky updrafts between the vertical cliffs to complete the rescue. The pilot of the civilian copter was picked up by one of the other Stead helicopters.

Other H-43B personnel who participated in "Operation Rainbow Bridge" were Maj. Jimmy Hamill, Capts. Eric W. Kurgas and Ben F. Card, A1/C Delbert B. Dunn and A2/C Allen D. Williams.

MERCY FLIGHT

H-43B and U3A crews from Minot Air Force Base, N.D., teamed up recently to help save the life of an airman's infant son.

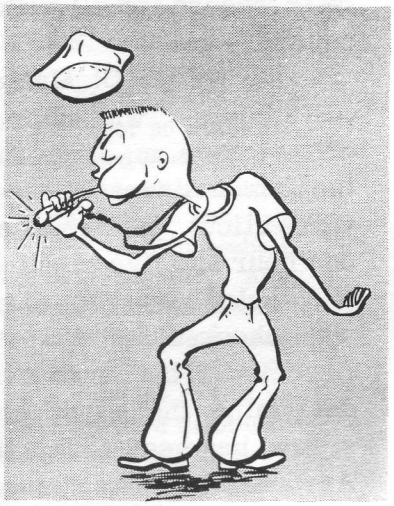
The drama began when A1/C and Mrs. Reese Belcher took their infant to John Moses Air Force Hospital in Minot; he had suffered a severe head injury, apparently in a fall. Doctors quickly determined that delicate surgery was necessary but of a type that could not be performed at the Minot hospital. Arrangements were quickly made by Capt. Richard Clark, a doctor at the hospital, to transport the baby to the Fitzsimons Army Hospital in Denver and shortly afterward an H-43B picked up the infant and delivered him to the waiting plane at the base. Three hours later the U3A landed at Lowry AFB in Denver, its mission completed and the race with death won.

Beside Captain Clark, those who took part in saving the child's life were Capt. Roy Baliles, Lt. Walter T. Malchiewicz and Lt. Wayne J. Wolf, the helicopter crew; and Capt. R. D. Mittler and Lt. N. T. Michelson, piloting the U3A.

RESCUE

DESCRIBING THE MISSION—Capt. William Greener of Kirtland AFB, N.M., tells how he flew H-43B into deep canyon to rescue civilian whose raft overturned while he and three companions attempted to "shoot the rapids" in the Rio Grande north of Albuquerque. The pickup was made from the river bank. Accompanying Greener on the flight were S/Sgt. D. Roberson, Kirtland Rescue; and A1/C C. W. Prevratil, Acting Crew Chief. Two other members of the illfated rafting party were rescued by ground parties, the fourth was drowned. Shown, left to right, are Capt. L. F. Wells, Captain Greener, Lt. Col. H. W. Stickle, Jr., and Col. Carmel Shook. (USAF photo).

Maintenance Mailbag



Dear Chuck,

Remember "Boats" McGoohan, the salty guy who ran his house like a carrier and even had his kids pipe him aboard each night? Well there's been a change of command and a new "captain" has taken over——his wife! She went along with him when he lined their seven kids up for personnel inspections, made them wash their dungarees in buckets and held weekly fire drills. She didn't object because every clock in the house struck in bells or that the cellar was painted battleship gray and had built-in lockers with big stencilled signs reading "Foul Weather Gear," "Paint Locker," "Health and Recreation," "Emergency Gear," etc. She even thought it was a big joke that the oldest boy was required to yell out the window, "Stand by to launch aircraft," everytime Boats got in his station wagon to go to the base.

The trouble started when "old salty" started requesting written reports on "Operation Household," and telling her he wanted a "clean sweepdown fore and aft." What really set her off though, was when he told her the funds originally appropriated for a new dress had been diverted to a project with higher priority, namely a gyro-horizon for his car so he could navigate better. She tore down the "watch bill" posted in the hall, ripped up the "duty roster" and kept hollering she was going to abandon ship. Boats finally hauled down his pennant after she shut down the galley for four days and cut him off from his favorite food——liver pizza.

I know you are always interested in trouble shooting tips so here are a couple I picked up recently. We traced a stiff throttle reported on one of our HUK-1s to the accelerator pump in the carbureter. The solution was simple, we applied two or three drops of #10 oil to the plunger and cycled it 10 times. The excess oil was then wiped off to prevent dirt pickup. It is now SOP in this squadron to apply a couple of drops of oil to the carbureter plunger once a week.

Another HUK was reported to be out of track and rough. Track correction was done but didn't eliminate the rough condition, so the flaps and cables were checked and the inter-blade dampers reset. This wasn't the answer either. We started a thorough check of the blade system and one of the senior mechs noticed that the adjustable rod ends on the hub to blade rods had excessive play in between the inner and outer race. All rod ends were replaced and the helo checked out fine with an additional track adjustment.

Gotta sign off, the movie is starting. It's a good one——"The Purple People Eaters Strike Back."

Bill

NEW WORLD'S RECORD SET BY H-43B

Air Force Captain in Turbine-Powered Helicopter Climbs to 25,814 feet to Break Russian Record

An Air Force H-43B HUSKIE has set a new world altitude record of 25, 814 feet for helicopters carrying a 1, 000 kilogram (2, 205.5 lbs.) payload, breaking a previous record held by Russia. Also established was a new national record which had never before been attempted. The flight was made May 25, 1961.

The previous record was held by a Russian MI-4 helicopter which flew to 24, 491 feet in March, 1960. The new mark set is a "Class E-1" record for all helicopters regardless of weight or size.

Capt. Walter C. McMeen from TAC's Luke AFB, Ariz., was helicopter pilot. He took off at 7:27 a.m. from the test flight area of the Kaman Aircraft Corporation at Bloomfield, Connecticut, and reached the altitude record one hour and five minutes later.

A sealed baragraph carried aboard the H-43B was checked for the National Aeronautics Association by personnel at Edwards AFB to determine the exact altitude reached. The record has been forwarded to the Federation Aeronautique Internationale for recognition.

The H-43B used in the record flight had a gross weight at take off, including payload, of 6,571.5 lbs; a Lycoming T-53 gas turbine engine developing 860 shaft horsepower powers the HUSKIE while the Russian MI-4 is powered by an engine developing 1450 horsepower.

WELL DONE—Capt. Walter C. McMeen from TAC's Luke AFB, Ariz., who flew an H-43B to new altitude record, receives congratulations from William Murray, left, KAC Vice President; and Edward J. Odlum, Senior Vice President and Assistant General Manager.

This is the second altitude record brought back to the United States from Russia by the H-43B. On Dec. 9, 1959, a HUSKIE flown by Air Force Capt. Walter J. Hodgson and Maj. William J. Davis flew to an altitude of 29, 846 feet to establish a new record in E-1D for helicopters weighing between 3, 858 lbs. and 6, 614 lbs. K

Captain Walter C. McMeen, 34-year-old Officer-in-Charge of the Helicopter Section at Luke Air Force Base, Ariz., is a former jet pilot, a Navy veteran with 26 months combat duty in the Pacific during World War II, and also saw action in Korea as an Air Force pilot when he flew 100 missions with the 80th Fighter Bomber Squadron.

During the seven years Captain McMeen has been a helicopter pilot, he has either evacuated or picked up 121 persons, many of them pilots or crewmen. In 1955 he chopped away a jammed canopy with an axe and helped a pilot to safety after an F-86 crash landed and caught fire. This was the only rescue Captain McMeen accomplished without using a helicopter.

A native of Texas, Captain McMeen joined the Navy after graduating from high school in 1943 and served aboard the "Young," a destroyer. When discharged in 1946, he enrolled at Texas Tech. and four years later joined the Air Force as an aviation cadet. Captain McMeen received his pilot's wings at Williams Air Force Base, Ariz., in 1951 and, after combat training at Nellis AFB, was assigned to Korean duty. Afterward, he returned to Nellis as an instructor in P-80 and F-86 aircraft. In June, 1954, he volunteered for helicopter training and graduated from the Air Force Helicopter School in San Marcos, Texas. Captain McMeen returned to Nellis as a helicopter pilot and remained there until January, 1956.

The captain served with the 6615th Air Transport Group at Goose Bay, Labrador, for three months and then was assigned to the 4510th Combat Crew Training Wing, TAC, at Luke in 1957. He recently completed more than 2,700 hours in helicopters and is a senior pilot with over 4,400 flying hours to his credit.

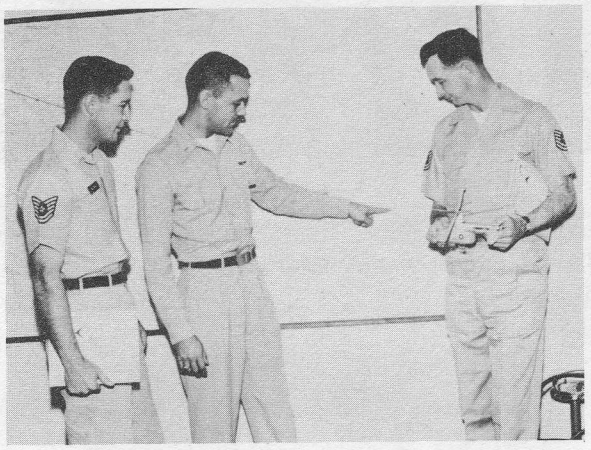
Captain McMeen has been awarded the Soldier's Medal, Air Medal with two Oak Leaf Clusters, and the Air Force Commendation Medal. He is married and has three children.

SCROLL OF HONOR

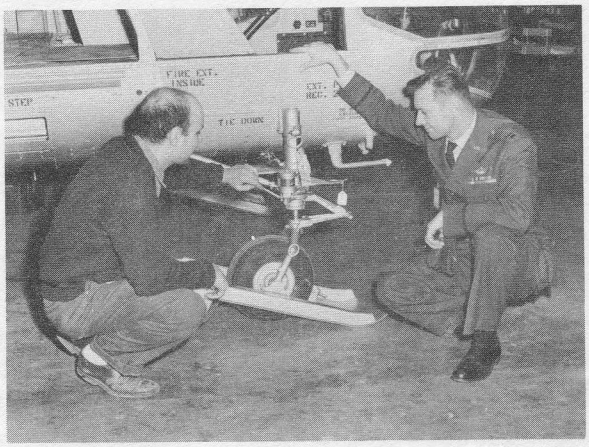
UNIT CITATION, first of its kind to be presented by KAC, is given to Maj. Donald V. Bouck, Officer in Charge, 814th Combat Support Group, Operations Squadron, Helicopter Section, Westover AFB. Making the presentation is William Murray, Vice President, Kaman Aircraft. The citation and Scrolls of Honor were awarded to nine Westover AFB helicopter crewmen in recognition of their activities a few months ago when they participated in a large-scale search mission and brought medical aid, under hazardous conditions, to one of the crewmen who bailed out of a B-52 over Vermont. The search lasted more than two weeks during which high winds, poor visibility and snow were encountered. Those honored were 1st Lt. Peter J. Kerrigan, 1st Lt. David D. Glick, 1st Lt. Otto J. Stupka, 2nd Lt. William J. Demming, S/Sgt. Benjamin Ellis, S/Sgt. Joseph H. Dodd, S/Sgt. Walter J. Stewart, T/Sgt. George J. Roche and A1/C Frederick Nehrings.

Two skin divers, almost exhausted after a four-hour battle against the tide and currents which prevented them from reaching the shore two miles away, were hoisted to safety from the wind-whipped waters of Peconic Bay by the crew of an H-43B from nearby Suffolk County Air Force Base, N.Y. Manning the HUSKIE were Lt. William V. Berry, pilot; Lt. Gordon A. Hecht, co-pilot; A1/C Herbert A. Henne and A1/C Gerald B. Sube.

The mission began when a drifting boat containing diving equipment was spotted from a passing ferry boat. The H-43B, dispatched to aid the Coast Guard in the search, took off and proceeded to the area in winds which averaged 35 knots. On the second pass over the water the missing men were located and, despite their weakened condition, managed to get into the rescue sling without much difficulty. The divers, who said they didn't know just how much longer they "could have lasted," were flown to the Base and admitted to the hospital. Total time of the mission—25 minutes.



1ST LT. JOHN B. KNEEN, H-43B pilot from Charleston AFB, S. C., indicates on map where T/Sgt. Wayne L. Olsen, Medic (left); was lowered to Navy destroyer 90 miles offshore to aid crewman injured in an accident and suffering from internal bleeding. T/Sgt. George M. Brown, with model, was hoist operator and Capt. Harry W. Kruppenbach, recently transferred, was co-pilot. After examining the injured man, Sergeant Olsen decided his condition would not permit transfer back to the helicopter. The sergeant remained aboard the ship while the H-43B returned to base. On the homeward flight extra fuel was required when head winds were encountered and the helicopter had 20 gallons of fuel remaining when it landed at the Air Force Base. Scrolls of Honor have been awarded to all who participated in this mercy flight. (USAF photo)



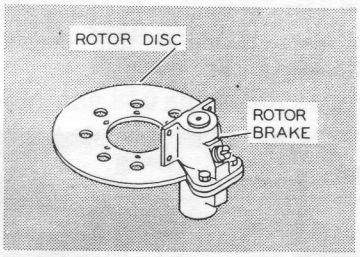
SCROLL OF HONOR RECIPIENT Capt. Howard J. Cochran of Larson AFB discusses H-43B landing gear with James Zocco, Kaman Aircraft employee. At the request of KAC management, Captain Cochran toured the Bloomfield, Conn., plant and, using the public address system, described the mission in which he and other H-43B crewmembers aided in saving 10 Air Force men aboard a crash-landed B-52 a few months ago.

Q's AND A's

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

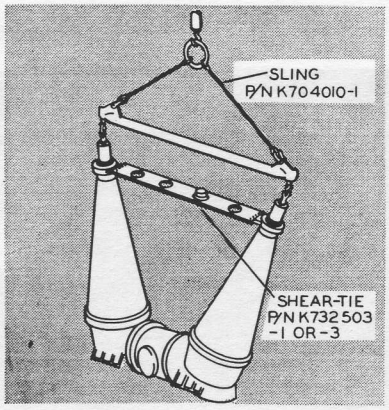
Q. WHAT KIND OF WEATHER PROTECTION IS RECOMMENDED FOR ROTOR BLADE FINISHES? (Applies HOK-1, HUK-1, H-43A, H-43B)

A. The Kaman Aircraft Corporation uses a product called "Wing Wax", Grade F.R.; but any good paste wax is acceptable. "Wing Wax" has no Federal Stock Number assigned, but suitable paste wax may be procured under FSN R7930-266-7125-G600. — N. E. W.



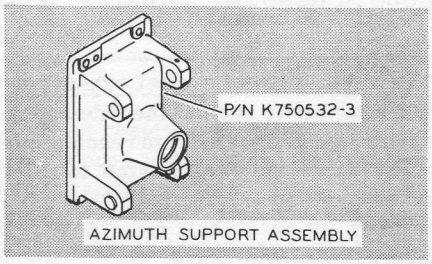
Q. WHAT IS THE FEDERAL STOCK NUMBER FOR THE ROTOR BRAKE UNIT AND THE ROTOR BRAKE DISC? (Applies HOK-1, HUK-1, H-43A)

A. Navy activities ordering Goodyear rotor brake unit number 9430361 should specify FSN R 1630-704-2212-XGYR. Navy activities ordering Goodyear rotor brake disc, number 9440247, should specify FSN R 1630-659-4139-XGYR. Air Force activities ordering Goodyear rotor brake disc, number 9440247, should specify FSN 1630-659-4139. No Air Force FSN has been assigned as yet to Goodyear rotor brake unit number 9430361. The next revisions to applicable handbooks will reflect this information. — W. J. W.



Q. HOW SHOULD THE TRANSMISSION ASSEMBLY, WITH SHAFT AND HOUSING ASSEMBLIES INSTALLED, BE HOISTED? (Applies H-43B)

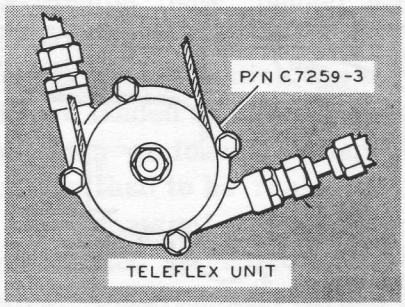
A. The recommended configuration for hoisting this assembly group, either into or out of the helicopter, is with P/N K732503-1, or -3 shear-tie installed, using helicopter sling P/N K704010-1. The use of this sling with the installation of the shear-tie, will preclude any possible damage due to irregular or jerky hoist operation. Next handbook revision will show the inclusion of the shear-tie in the appropriate illustration. — L. L.



Q. HANDBOOK, T.O. 1H-43B-6D REVISION, DATED FEB. 21, 1961, DROPS THE AZIMUTH SUPPORT ASSEMBLY, P/N K750532-3, FROM THE 150 HOUR INSPECTION. DOES THIS MEAN IT CAN GO TO 450 HOURS WITHOUT AN INSPECTION? (Applies H-43B)

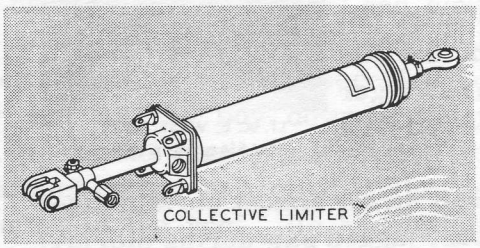
A. Yes, the K750532-3 azimuth support assembly can go to 450 hours without inspection. Since the item has been removed from the 150 hour inspection requirement, it is now

included in the primary assembly inspection requirement; and since the azimuth assembly is not inspected until 450 hours, except in rotor overspeed condition, all components of the azimuth are operable to 450 hours as noted in Section VI, Replacement Schedule, T.O. 1H-43B-6 handbook. It will be noted that the stud assembly is still replaced at 150 hours. The original support assembly, K750532-1, is still in use on some H-43Bs, it contains a casting, P/N K750533-11, and must be inspected at 150 hours and replaced at 300 hours. The newer assembly, P/N K750532-3, contains a forging, P/N K750572-11, designed to increase fatigue life; therefore, the assembly has been removed from the 150 hour inspection requirement. — W. J. W.



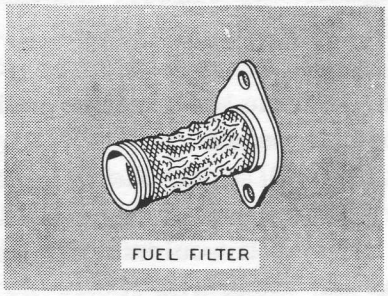
Q. WHAT CAN CAUSE THE COLLECTIVE LEVER TO BIND UPON ENTRY INTO AUTOROTATION? (Applies HOK-1, HUK-1, H-43A)

A. Dirt, grit, or corrosion in the elevator tab control cable, Teleflex unit, P/N C7259-3, can prevent proper collective stick operation. The Teleflex unit should be disassembled and cleaned at each second major or third periodic inspection. — G. M. L.



Q. FOR EASE OF REMOVING OR INSTALLING THE COLLECTIVE LIMITER ASSEMBLY, IS IT PERMISSABLE TO USE SAFETY WIRE AS A MEANS OF RETAINING THE LIMITER IN ITS INSTALLED COMPRESSED LENGTH? (Applies HOK-1, HUK-1, H-43A, H-43B)

A. No, safety wire should never be used to hold the limiter in its compressed length. The assembly is heavily spring loaded and by using safety wire it is possible to distort the limiter shaft. In addition, if the safety wire should break, or slip, personal injury or damage to the aircraft could result. The correct methods for removing the collective limiter are outlined in the -2 series of Technical Orders applicable to each aircraft model. — W. J. W.



Q. WHY DO SOME FUEL CONTROL INLET FILTERS HAVE "WAVES" OR "KINKS" IN THEM? (Applies H-43B)

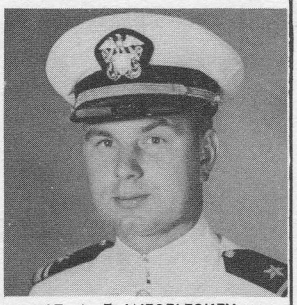
A. The screen is made to fit into a machined surface on the inside end of the inlet port. When installing the filter, if it is allowed to drop out of this machined receiving surface before the cover plate attaching screws are brought up snug, the end will lodge on the shoulder, or edge, of the inner surface of the port. The filter is then canted and, when the holding screws are tightened to proper torque, it is forced out of shape and partially collapsed causing the "kinks" or "waves." To prevent this misalignment of the filter, the cover plate must be positioned properly and then firmly held in place by hand as the screws are snugged-up alternately and equally. — A.A.W.

KAMAN SERVICE ENGINEERING SECTION—*R. J. Myer, Supervisor, Service Engineering; E. J. Polaski, G. S. Garte, Assistant Supervisors.*
ANALYSTS—*R. A. Berg, A. D. Cutter, P. M. Cummings, P. A. Greco, C. W. Jenkins, G. M. Legault, J. McMahon, C. J. Nolin, A. Savard, W. J. Wagemaker, N. E. Warner, A. A. Werkheiser, M. Whitmore, Jr., R. S. Wynott, W. H. Zarling.*

Report FROM THE READY ROOM

OVERWATER RESCUES — NAS AGANA

As a means of aiding other helicopter rescue units in their programs, Lt. Allen E. Weseleskey, USN, agreed to a Rotor Tip's request for a personal account of a mission, or missions, describing the conditions encountered and the action taken. Similar accounts written by Air Force, Navy and Marine helicopter pilots will appear from time to time with this purpose in mind.



LT. A. E. WESELESKEY
NAS Agana, Guam

I imagine everyone enjoys a little time off to relax. I was certainly looking forward to my afternoon off, even though we were on the verge of being hit by a typhoon on Guam. As I stopped by NAS Operations to check my mail box I noted everyone was still out to lunch, including the Duty Officer. No mail, no bills; so I started out the door only to be jolted by the frantic cry of the Air Controlman on duty: "There's a kid adrift in an outrigger canoe some 100 yards beyond the reef at Agat—and he's lost his paddle!"

The call to Rescue Coordination Center at NAS meant almost certain disaster, for the reef surrounding Guam is a vicious, jagged saw during stormy weather. It wouldn't take long for that little outrigger to be torn apart, and the boy along with it.

It was 12:52 p.m. as I dashed through operations and jumped into the jeep. I screamed over my shoulder for the tower controlman to alert the helo crew and bring out my flight gear to the Alert HUK-1. Although I wasn't on duty, I knew the "Angel" was preflighted and armed for an emergency scramble. (Once the preflight turnup is made at Agana, nobody touches the "Angel." Its switches are set, the rescue equipment is laid out for immediate use and the starter unit is standing by.) I hit the ramp beside the HUK-1 at the same time the crew did, jumped into my flight gear and engaged the starter switch. At 12:56 I lifted "Angel 326" off the ramp and turned on course toward Agat, with crewman Edward R. Molloy, ADR3; and Richard Jordan, AN; on board.

The winds were 20 to 25 knots with gusts to 30-plus knots. Although it was high noon the sky was dark gray, ominous and full of rain. About halfway to our destination we ran into a squall line of heavy rain. We could barely make out the coast line from 500 feet altitude so we dropped to the deck, following the inside portion of the reef. I briefed the crew hurriedly and prayed we weren't too late.

We spotted the outrigger about 10 minutes after takeoff, and it wasn't long for this world. The canoe was swamped, and huddled in the mid-section was a 14-year-old Guamanian boy. We were only a few yards from the reef, so

I maneuvered the HUK-1 around to blow the canoe back out to sea. As this was being done, Molloy got into the harness, for he was elected to strap the boy into the sling for rescue, and he had to get into the sinking canoe.

We managed to succeed in landing Molloy on board the outrigger, and we payed out extra line for safety sake. Then it happened; we went IFR as buckets of rain hit us and we smelled smoke! Everything looked fine on the console, and the gages were normal; then we found out the hoist motor had burned out. Now what?

The wind was out of the sea at 25 knots and I didn't dare turn around to check my position. I couldn't see the beach anyway! Jordan signaled Molloy to strap the boy into the sling and tighten it up as much as possible. With this completed I then added power and slowly ascended to about 40 feet of altitude, so the youngster dangled some 25 feet below us. I eased back the cyclic control and slowly air taxied backward toward the beach. Jordan directed me to the beach where I descended slowly and let the boy down in waist deep water, where his family was waiting for him. The rain let up and we spotted Molloy dangerously close to the reef. He had inflated his "Mae West" and was set to go swimming. The boat sank as we lifted Molloy out of the water. Again we air taxied back to shallow water, this time setting the crewman down on a sandbar. We circled back, landed and brought Molloy aboard; mission accomplished. We didn't realize what a beating the aircraft had taken until we landed at Agana. During post-flight inspection we found the flaps beaten so badly that they had to be replaced; it looked like hail stone damage!

THE TEAM THAT DID THE JOB—Front row, left to right, Richard W. Jordan, AN; Arlington Levi, ADR3. Rear row, Lt. Allen E. Weseleskey, Mark M. Miller, ADRC; Edward R. Molloy, ADR2; Samuel O. Davis, ADR3. (USN photo)

Our crew gained valuable experience from that mission. Unfortunately all our missions have not ended with a story-book finish. I recall distinctly a midnight launch in November that had all the earmarks of being a routine search and rescue mission. A doctor from the Naval Hospital was missing from a group of shell collectors. He and several others were on the reef at the southern end of Guam, and about midnight they became separated. Shortly after the call came in, I lifted "Angel 316" and headed South for the Village of Merizo. My crewman was Chief Mark M. Miller. The tower gave us a steer for the search area, and held us on course with their DF equipment until GCA could warm up. As we neared the rugged mountains we hit scattered clouds, and became intermittently IFR. Our hours of practice with NAS Agana GCA in the HUK-1 paid big dividends that night. We made two trips to the area and both were GCA controlled. Once at the search site we utilized the outstanding floodlight capability of the HUK-1 and moved slowly along every foot of the reef. The Marine Overland Rescue Team was launched in rubber rafts and we coordinated our search with them. As more "searchers" arrived to assist, we decided we could best help them by dropping parachute flares to illuminate the entire southern tip of Guam. We returned to Agana and loaded the HUK with 24 flares, set with 300-foot delay to deployment. Each flare gave us 1,250,000 candle power for three to five minutes. Over Merizo again we had GCA "mark" our first drop, and it went off with a real burst of light, right on target. As each flare would fade, GCA would bring us over the same drop spot. (Winds were blowing at 15 to 20 knots and created a large drift problem.) We kept continuous light over the area for an hour and a half. When our load was expended we were forced to return to home plate due to a low fuel state. We had been on station almost five hours during the

two flights. Dawn broke as we readied the HUK for the third flight, but we were held on deck for a rest. Shortly after dawn the Scuba divers found the doctor in 80 feet of water. The incident was closed. However, we learned that the night and instrument capability of the HUK-1, coupled with sharp support of GCA and on-scene ground radio crews, provide a powerful combination for a night search mission.

Another rescue mission with the HUK-1 involved two Navy picnickers. A Chief was wading along the beach when a rip-tide pulled him into a deep channel. A Warrant Officer rushed to his aid, believing he could tow the Chief back to safety. When it became apparent that both men were going to be swept out to sea, another companion called Air Sea Rescue and, after exclaiming two men were drowning, hung up the phone! The crew was scrambled and as I lifted "Angel 316" to orbit the field, I prayed that the person who telephoned would call back and furnish the information we needed——where were they drowning? He did phone again, and as we turned southeast we could only hope we were in time. Five minutes later we were over the channel, and my crewman, Sam Davis, ADR3; was ready to go swimming too, if necessary. One man was being floated by a swimmer who appeared to be exhausted. Davis lowered the sling and the first man was put into it. As he was brought into the HUK it became apparent he was close to death, if he wasn't already dead. Davis rolled him onto the platform and immediately administered artificial respiration. I maneuvered to spot the second victim, and caught a glimpse of him as he was dragged under water. I spotted the HUK over him as he came up. The first man had started coughing, so we knew he was going to pull through. I had already lowered the sling and Davis directed the HUK over the survivor. The pick-up was normal and once on board the second man was put in a rear seat. Davis then continued to aid the first survivor as we headed for the Naval Hospital. Another mission completed!

NAS Agana received its first HUK-1 in April, 1959. None of the crew had ever attended any formal helicopter training, so a field classroom was set up at Agana. With the cooperation and able assistance of Kaman Technical Representative Dave Rush, the crew went to "school." Larry Lynes completed the basic course when Mr. Rush was transferred. The crew utilized the class work well and whenever they ran into trouble-shooting problems, the welcome assistance of Ed Polaski, Ed Noe and Ray Russell, usually pulled them out of the fire. KAC Test Pilot Pete Russell not only showed the finer points of HUK-1 flying to the pilots, he boosted the crew's confidence in maintenance procedures. The entire crew is grateful to the efforts of all the Kaman representatives for their support and a fine product, the HUK-1. K

Lt. Allen E. Weseleskey, was born in 1935 and is from Springdale, Pa. Having completed five years naval service, Lieutenant Weseleskey has logged 1600 pilot hours, with 550 logged in helicopters. He has made 12 rescue pickups from the HUK-1.

Mark M. Miller, ADRC; was born in 1921 and is from Alabama. He has 19 years naval service completed. Having been previously schooled and assigned to a multi-engine crew, Chief Miller found a new horizon in helicopters. He has made three rescue pickups as an air crewman.

Richard W. Jordan, AN; was born in 1939 and is from Freeport, Pa. He has four years naval service completed. Jordan has made five rescue pickups as a crewman, two of which were made utilizing the "Chicago grip" on survivors in an open sea.

Arlington L. Levi, ADR3; was born in 1936 and is from Lockhaven, Pa. He has seven years naval service completed. Levi has made six rescue pickups as a crewman. During one of his rescues, Levi was lowered into dense jungle underbrush on a mountain side where he rescued two young girls who had been lost for two days.

Edward R. Molloy, ADR2; was born in 1927 and is from Denver, Colo. He has been awarded the Scroll of Honor twice and has made five rescue pickups as a crewman.

Samuel O. Davis, ADR3; was born in 1934 and is from Pittsburgh, Pa. He has eight years naval service completed. Davis has made two rescue pickups as a crewman. Formerly an instructor at the Navy Aircrew Survival School, San Diego; Davis trains all helicopter crewmen in survival techniques.

SHOT PEENING

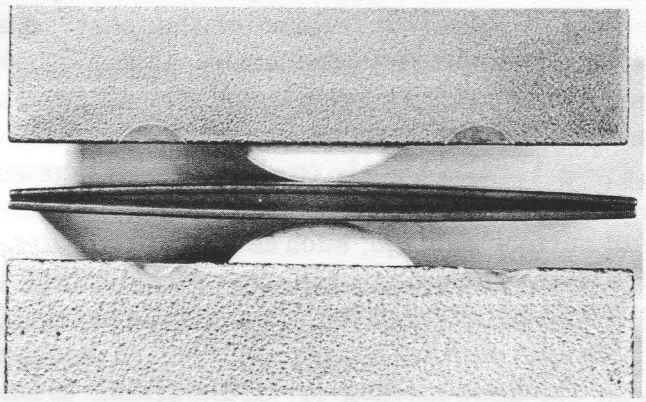
by M. L. WHITE
Senior Metallurgist

ENGINEERING

Reliability and component life is significantly improved by shot peening, a process primarily used for increasing the resistance of metal parts to fatigue cracks resulting from vibratory loading.

Shot peening consists of subjecting the part to a bombardment of substantially round steel or iron pellets which are propelled at the part through airblast nozzles or centrifugal impeller wheels under controlled conditions. The conditions of control include the size, material, hardness and velocity of the shot, and the angle of impact between the shot and the workpiece. The sizes of shot normally used range from about 0.007 to 0.175 of an inch in diameter. In certain specialized applications, shot peening may be performed with such diverse materials as stainless steel bearing balls, cut steel wire, or small glass beads projected at the parts in a water slurry.

During the peening process each shot striking the work acts as a tiny hammer and makes a small dent in the surface of the metal. The pattern of overlapping dents or dimples produced by the action tends to spread the surface layer of metal. If, for example, a thin strip of metal is peened on only one surface, the spreading of that surface causes the strip to bow, with the peened side becoming convex.



THE TWO ALMEN strips in the center have been placed with the unpeened sides facing each other in order to illustrate the curvature produced by peening. The top and bottom strips illustrate the appearance of shot peening on a steel and an aluminum surface respectively. Both of the samples were peened with rather large shot (approximately 0.06 inch diameter) at a high intensity. Smaller shot and lower intensities would produce a finer dimple pattern. The actual size is approximately three inches long by three-quarter inches wide.

This effect is shown in the accompanying photograph which also illustrates the appearance of a shot-peened surface. This tendency of a shot-peened strip to bow is used in controlling the peening process. The intensity of peening on a part is specified by defining the curvature or "arc rise" of a standard specimen which is subjected to the blast. This specimen is called an Almen strip after the man who developed the technique.

If the strip described above is peened at equal intensities on both sides, the forces tending to spread the surfaces will be balanced about the center of the strip and bending will not occur. There will be a slight lengthening and widening of the strip, but the core of material at the center of the strip will prevent the surfaces from spreading appreciably. Thus, the peening has produced a surface layer of compressed metal (i.e., metal which tends to expand). The depth of this layer of compressive residual stress, as it is usually called, may range from a few thousandths to several hundredths of an inch, depending on the part material and peening conditions.

It has long been known that parts, or specimens, subjected to steady compressive loading can withstand a greater magnitude of vibratory stressing without forming fatigue cracks, than those which are not so loaded. The surface layers of compressively-stressed material produced by shot peening improve the resistance of parts to fatigue failures because fatigue cracks start at the metal surface, except under certain unusual conditions. The peening also work-hardens the deformed surface, which in itself provides some improvement in fatigue strength. This effect is usually negligible compared with the improvement resulting from the residual stresses induced.

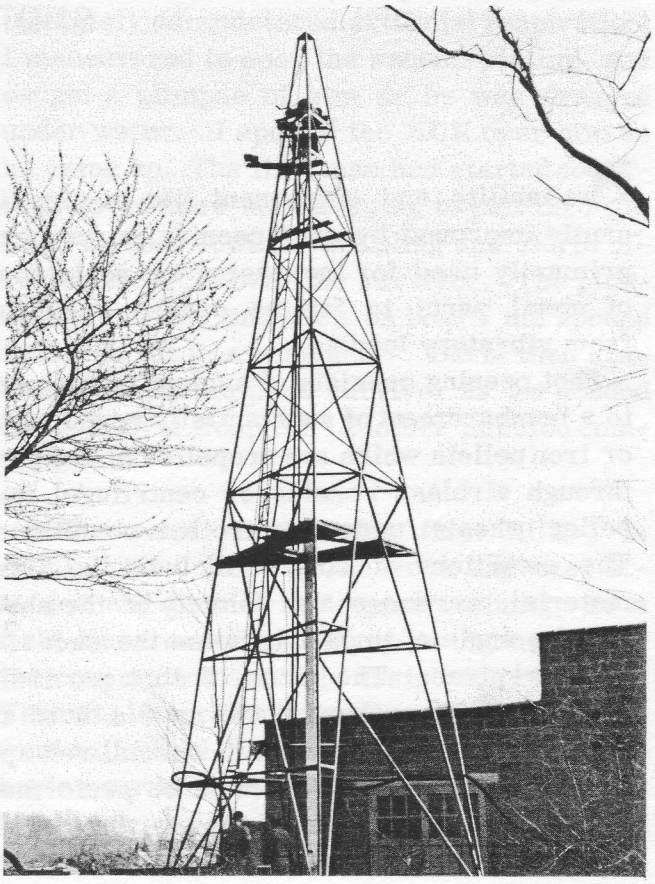
The compressive stresses induced by peening have also been found to be effective in preventing stress corrosion cracking, and in improving the static and impact properties of parts made from relatively brittle materials, such as ultra-high-strength steels.

Since the effectiveness of shot peening in preventing failure depends primarily upon the surface layer of compressively stressed metal, any subsequent operations or damage which would remove or relieve this compressed layer must be avoided. Operations involving metal removal, mechanical bending or straightening, or heating are prohibited or strictly controlled. Bruises which visibly dent or deform the surface, and nicks, cuts or scratches which extend below the base of the peening dimples, are cause for rejection.

Shot peening has been specified on a number of Kaman parts in order to provide greater service reliability and allow lighter design with consequent improvement in aircraft performance. It is primarily used on parts in the transmission, rotor, and control systems where high cyclic loads are most often encountered. Typical examples of shot-peened parts include the rotor hubs and numerous gears, shafts, and control cranks on both the H-43B and HU2K aircraft.

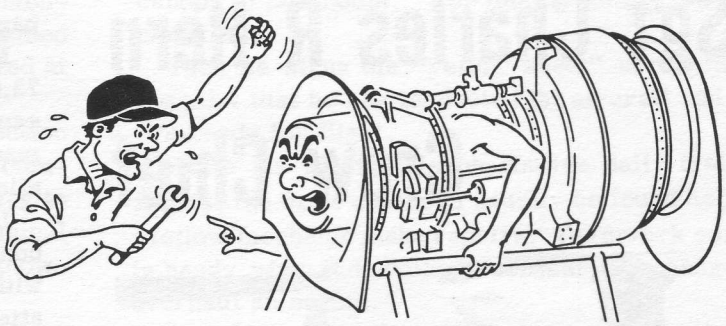
One shot-peened part of particular interest is the main rotor blade spar for the HU2K aircraft. This is a D-section, hollow aluminum alloy spar approximately 20 feet long. These spars are now shot peened in certain critical areas, and production of spars which are peened all over, both internally and externally, is scheduled to begin shortly. This application is interesting because of the variety of benefits to be gained by peening, the internal peening operation is unique, and the development of special equipment was required as indicated by the photograph. This development effort was undertaken primarily in order to mitigate the effects of small manufacturing flaws on the spar internal surfaces. These defects are so small that it is impractical to ensure 100 percent detection and removal in the confines of the spar cavity; yet they have a detrimental effect on fatigue life if peening is not performed. Another purpose for peening is to mitigate the effects of corrosion and small surface nicks which sometimes inadvertently occur in service. Still a third reason for shot peening is to prevent stress corrosion and fretting-induced fatigue failures.

Shot peening is only applied to parts which are heavily loaded and, therefore, its presence on a part should be interpreted as a label reading "handle with care." Although shot peening greatly reduces the failure-inducing characteristics of slight surface nicks and scratches, heavier damage may locally overcome the strengthening effect of the peening and result in failure of the part. The applicable aircraft handbooks describe the extent of damage allowable, and provide approved rework procedures for many of the shot-peened parts used on Kaman helicopters. Where such information is not provided, cases of serious damage, such as nicks or scratches extending below the base of the peening dimples, should be referred to the manufacturer through the field service representative. In addition, mechanical bending or straightening of shot peened parts may effectively wipe out the desirable effects of peening. Such operations are prohibited or strictly controlled by manufacturing specifications, and must not be attempted in the field. K



SHOWN IS THE initial apparatus built for internal shot peening of the HU2K-1 blade spar. The spar, which is visible in the photograph, is raised and lowered over rotating internal nozzles. This equipment has since been refined and enclosed in a building, but the original concept is unchanged.

TURBINE TALK



The introduction of the turbo-jet engine into the rotary-wing field has also introduced "jet-talk," a language with which many of our readers are probably already familiar. A refresher of basic physics terms in this issue will help to visualize how the principles are used in the turbine-jet engine. Questions from readers are always welcome.

AIR START: When, for whatever reason, the engine stops during flight and is then restarted by the pilot while still airborne, the operation is called an "air start." Usually an air start is made in the same way as a regular ground start except that the starter is not necessarily energized because the compressor and other rotating parts of the engine may be turning fast enough from momentum and ram effect.

ABORT START: An "abort start" is the name used to denote the conditions of engine shutdown when a starting cycle has been perfectly normal but then the operator sees some sign of irregularity in performance and decides to stop the engine.

HOT START: When an "overtemp" occurs during the starting cycle, the condition is called a "hot start." This condition, as is true for most abnormal operating experiences, may be caused by any one or a combination of factors.

HUNG START: The term used when the engine fails to reach normal idling rpm during the starting phase. Many of the terms described here may be the cause of one of the other conditions. For instance, a "hot start" may be the result of a "hung start," and a "hot start" almost always results in an "overtemp."

OVERSPEED: This term is used to describe the operating condition of a jet engine whenever the gas generator components exceed the design maximum rpm. An engine overspeed may occur if the fuel control is out of adjustment, or for any of several other reasons which will be discussed under "trouble shooting" in a future issue.

OVERTEMP: An engine is said to experience an "overtemp" when, for any reason, the temperature of the escaping gasses on the discharge side of the turbine exceed the maximum allowable design temperature for that point in the burning cycle. This temperature is usually read on a cockpit instrument as "turbine temp."

TRANSIENT CONDITIONS: Conditions which may occur briefly while accelerating or decelerating, or while passing through a specific range of engine operation. Fluctuations in instrument readings, noise levels or vibration patterns are typical of "transient conditions."

STABLE CONDITIONS: Exist when no appreciable fluctuation, intentional or unintentional, is occurring to any of the engine's variables such as rpm, temperature, pressure, or vibration; and the engine is running smoothly, delivering constant thrust. K

MEET A MARINE

Sgt Charles R Hern
Crew Chief

When the United Nations forces intervened in Korea (1950), Marine helicopter pilots made front-page headlines with their varied combat operations.

Marine Observation Squadron Six pilots flew 73,000 hours in Korea. They averaged 1311 flights each month. The missions of their rotary-wing machines included wire laying, rescue and evacuation, reconnaissance and command flights.

Little mention, however, was made of the backbone of Marine aviation; the man on the ground without whose motherly patience, care and skillful attention, the aircraft would be an inoperative metal mass.

Meet Marine Sergeant Charles R. Hern, helicopter crew chief of an HOK-1. His job: keep it flying.

With its 550 horsepower Pratt and Whitney engine, the HOK is recognized by its two-bladed intermeshing rotors. The unique rotor design and lack of tail rotor simplifies the mechanic's job and adds maneuverability.

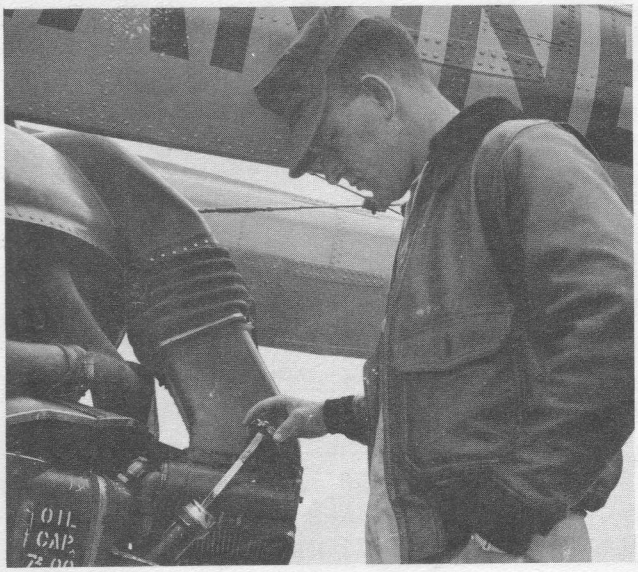
Although the crew chief accompanies the pilot on missions, his job continues after the pilot has secured.

On the ground, the crew chief acts as the aircraft's "physician." Using gauges and instruments, he must diagnose malfunctions and complaints reported by the pilot. Once the ailment is located, he must perform the necessary "operation."

Must-know items include: what types of fuel and lubricants to prescribe for the helicopter's "health"; weight and balance limits; cargo stowage and sling-hoist and rescue procedures.

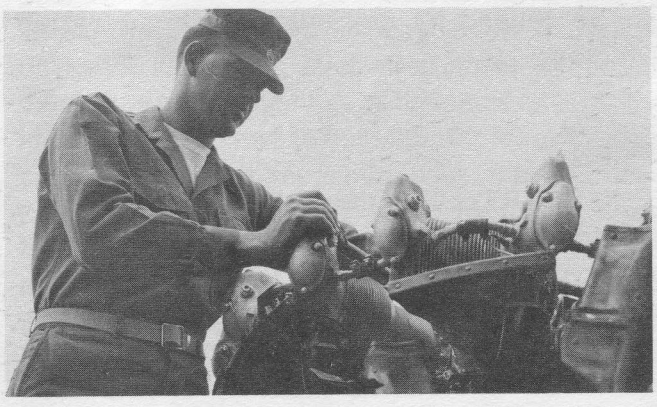
The 24-year-old Missouri born Marine enlisted in the Corps in December, 1953 at Kansas City, Mo. After San Diego recruit training, he was assigned to the Aviation Preparatory School at Jacksonville, Fla. There, he underwent eight weeks of instruction in fundamentals necessary to begin a Marine aviation career.

TO CONTROL THE PITCH, each rotor has wing-like "servo flaps" adjusted to 1/1000 of an inch.



CHECKING THE HOK'S seven gallon oil tank is part of the chief's preflight inspection.

ON A RESCUE MISSION, the crew chief usually performs hoist operations.



LIKE THE M-1 RIFLE, an HOK's 500 hp Pratt and Whitney radial engine requires periodic and thorough inspection.

Reprinted from
The Pendleton SCOUT

Almost all enlisted personnel in Marine aviation, expecially those associated with aircraft maintenance, go through this school. The school, renamed Aviation Fundamentals School, is now located at Memphis, Tenn.

At Jacksonville, Sgt. Hern received instruction in basic mathematics, became familiar with common aircraft hardware, basic physics relating to mechanics and electricity, the use of technical publications and hand tools and a working knowledge of layout and measuring tools.

With fundamentals school behind him, Hern underwent 14 weeks of study at the Memphis advance mechanics school. There he learned the principles of aircraft power plants, fuel systems, propellers and external oil systems. Many hours were spent learning the intricate details of various reciprocating engines.

After Memphis, a tour at the Cherry Point, N.C., Marine Corps Air Station and with VMO-2 on Okinawa, Hern decided to give civilian life a try. He was released from active duty in 1957 and joined a reserve squadron in Olathe, Kan. Six months later, he decided on a Marine career and reenlisted to be reassigned to his former unit, VMO-2 on Okinawa.

Hern came to Camp Pendleton's VMO-6 in April 1960 after attending Kaman's four-week factory school at Bloomfield, Conn. He plans to reenlist again in May and request a continuous tour with his present squadron.

As all unmarried members of VMO-6, Hern lives in barracks 13142 and shuttles by truck to and from the airstrip each day. His first job each morning is a "pre-flight" of his assigned aircraft. "pre-flight" is a detailed inspection of the HOK, checking every item from rotor to landing gear and canopy to tail boom. For this he uses a 38-item check list.

Then he signs the "yellow-sheet" certifying to the pilot that he has inspected the aircraft and that it's ready for flight.

While his aircraft is on routine daily training flights, the crew chief can usually be found helping a fellow mechanic make repairs. Teamwork comes in handy when it becomes necessary to change or overhaul an engine.

One of the extra duties of a crew chief is that of "standby rescue team." A VMO-6 helicopter and crew are on the alert at all times, prepared for any emergency.

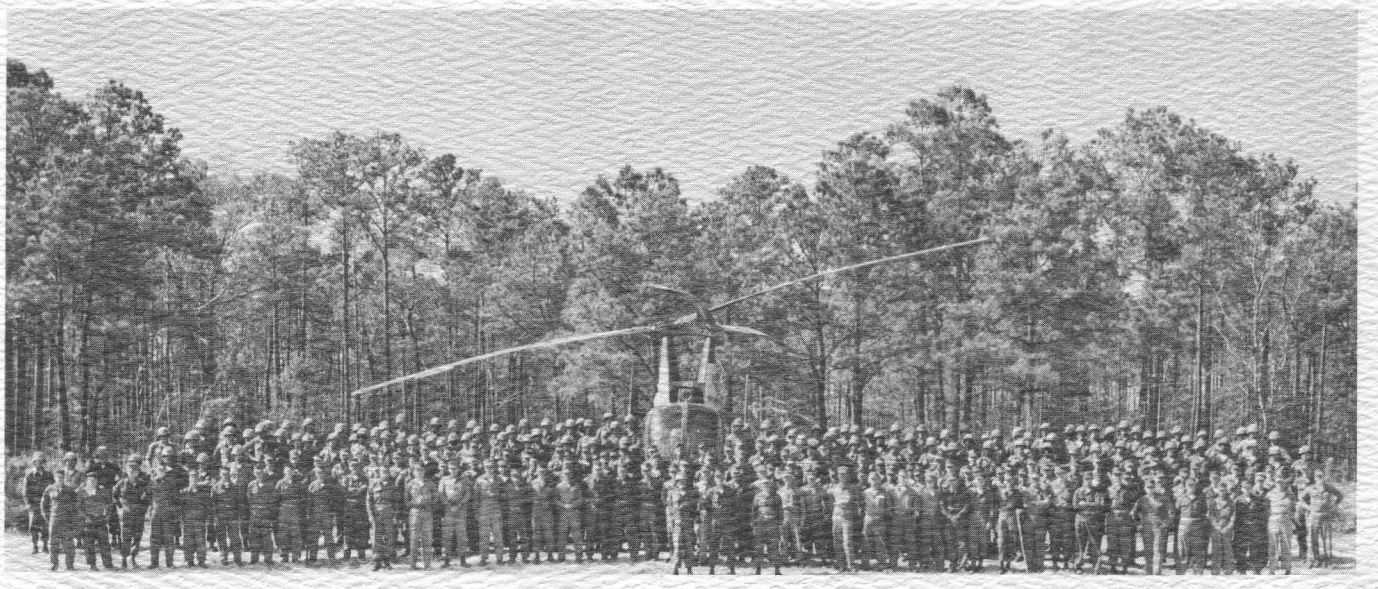
During Operation Packmule last November, Hern and the pilot on duty were called on to evacuate an injured Leatherneck from the rugged hills of Case Springs. Flying by instruments through heavy fog, they accomplished their mission.

The Kaman Aircraft Corporation placed their names on the Scroll of Honor, an award paying homage to men who accomplish hazardous missions involving flying over water, rugged terrain, at night or during adverse weather conditions. Less than 100 persons have won the honor during its five-year existence.

But, like all Marines, Hern is a rifleman first, specialist second. He is a qualified marksman with the .38 and .45 caliber pistols and the M-1 rifle. He attended the 3rd Marine Division's NCO Leadership school on Okinawa and was selected as VMO-2's "Marine of the Month" in June, 1959.

Story By:
Sgt. C.C. Stibbens

Photos By:
LCpl. J.J. Polovich



VMO-1 MOVES OUT—Personnel from Marine Observation Squadron, Reinforced; MCAF, New River, N.C., pose with one of their HOKs before "hitting the gravel trail" to test the unit's combat readiness and ability to live under combat conditions as a self-sustaining unit. During this time, the annual Operations Readiness Inspection was conducted by Second Marine Air Wing and Second Division personnel, to determine the unit's ability to perform those missions for which it was originally designed and formed. VMO-1 came through with the proverbial "flying colors." (USMC photo)

Kaman Service Representatives

on field assignment

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Myrtle Beach, N.C.

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RAY G. RUSSELL

VMO-1 MCAF
New River, N.C.

JACK SMITH

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Limestone, Maine
Plattsburgh AFB
Plattsburgh, N.Y.
Pease AFB
Portsmouth, N.H.
Griffiss AFB
Rome, N. Y.

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WILLIAM G. WELLS

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Mt. Home AFB
Mt. Home, Idaho

HENRY J. TANZER

Okinawa

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CUSTOMER OPERATIONS SECTION—*R. L. Bassett, Supervisor;*
G. D. Eveland, Asst. Supervisor, Field Service Representatives.
R. W. Spear, Asst. Supervisor, Training.