KAMAN Rotor Tips

KAMAN AIRCRAFT CORPORATION

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KAMAN Rotor Tips

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THE COVER

UH-2 with jet pod streaks across sky during test run. For description of current program at Kaman Aircraft, turn to page eight. Cover by Donald D. Tisdale, Service Publications.

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PREFLIGHTING THE HH-43B

by William G. Wells
Senior Representative
Customer Service Department

Through the years so much has been written about preflight inspection that the subject seemingly has been beaten into the ground. Actually, however, its importance to flight safety is such that, as long as we have aircraft flown and maintained by men, articles like this will always be "in style."

Of all the inspections performed on a helicopter, perhaps the preflight is the most important, It is the last "look" at the aircraft before flight, and is designed to insure that the bird is airworthy. Unfortunately though, the preflight is constantly in danger of being classified as "routine" by those who, day after day, must look at the same areas over and over again. This could be a fatal error. The nonchalant attitude and casual performance, bred by such familiarity, has no place in preflight inspection. An "unsafe for flight" condition is rarely found by kicking a tire or giving the fuselage an affectionate slap on the back.

The information in this article is not intended to be used in place of the technical orders; they are the "official word" and should be strictly adhered to. It is, however, almost impossible for the TO's to individually spell out the reasons for inspecting each area. This article has been prepared with this in mind. No attempt has been made to cover the entire HH-43B system but only those areas which I feel, through past experience, will be most helpful. If further information is desired, please send your questions to Rotor Tips.

I like to preflight from the heart! This statement has nothing to do with romance but is concerned with two things—human conscience and the helicopter itself. How well a preflight is carried out depends entirely upon the mechanic's will to do the job as thoroughly and conscientiously as possible. No man who calls himself a mechanic should show the faintest hesitancy when, without advance notice, he is asked to fly in an aircraft he inspected and certified as airworthy. If doubts suddenly arise when the safety of his own "hide" is at stake, he is not only failing in his profession but also failing those who have, literally, placed their lives in his hands. The other "heart" is concerned with those areas of the helicopter which are of a highly critical nature. Like the human heart, failure could mean disaster; so the mechanic must be thoroughly familiar with these areas and never, even under emergency conditions, let a helicopter take to the air without the personal knowledge that they have been thoroughly checked out.

To better illustrate my point, I'd like to pass on a few of my own experiences....

Several years ago when I was on assignment with a squadron, a helicopter was rolled out of the hangar after extensive maintenance work had been performed. This particular aircraft had been the duty AOCP bird and hadn't flown for a number of weeks, so the maintenance officer was understandably anxious to get it back in the air. Since the birds were relatively new to the organization, it was the policy that the service rep fly all maintenance test flights with the pilot. The crew chief announced that the bird had been "preflighted and was ready to go," so the maintenance check pilot and I went to the line and began our preflight inspection. A few minutes later, we found several nuts on the rotor head which had not been safetied and two hub-to-blade rods which were improperly adjusted. This was on the aircraft which was supposedly "ready to go."

After the discrepancies were corrected, we strapped in and got ready for flight. We checked the cockpit, the engine was started, and we prepared for clutch engagement. Engine rpm was set and the clutch handle placed to "engage." After several seconds nothing even faintly resembling an engagement had occurred, so we shut down. Investigation revealed that the quick disconnect coupling between the engine and transmission had not been connected. At this time it was decided to retire to the line shack and start all over again. How did this happen? Certainly no mechanic would ever intentionally allow his ship to go up for test with these discrepancies. It was simply that the crew chief, who was usually very conscientious, had overlooked these areas in his rush to please the maintenance officer by getting the bird in the air as quickly as possible. This makes a very important point—some things should never be rushed, and preflighting is one of them! This also caused me to do some soul searching. "Why hadn't I, with many years experience as a mechanic, discovered that unsecured coupling myself, BEFORE getting into the cockpit?"

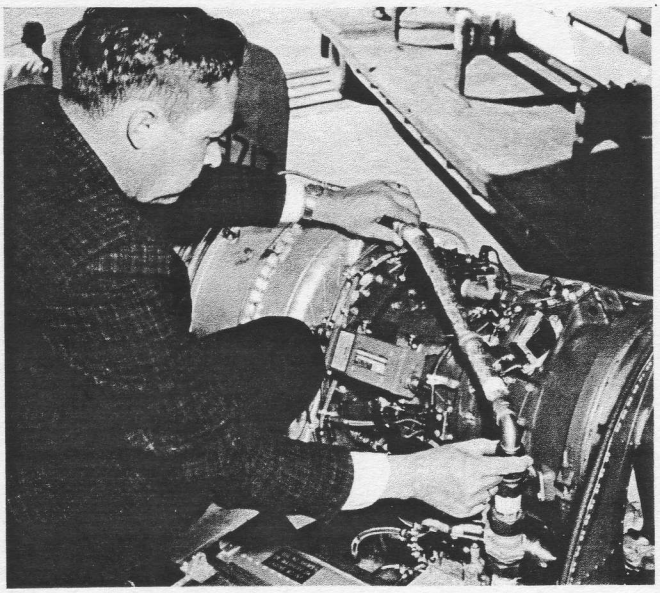
At the time I was embarrassed and even now I'm not too happy talking about it. However, it does point out that no one preflighting an aircraft, no matter how familiar he is with the machine, should ever take anything for granted or allow his attention to be diverted from the task at hand. It is a lesson I will never forget!

I recall another occasion when an HH-43B pilot returned from a flight and complained that every time he lowered the collective, he got a "lot of shake" in the cyclic stick. As soon as the collective was raised slightly, everything appeared normal. Investigation revealed that when the blades were placed in flying position after having been dephased the night before, a folding stop on the right rotor had been left unlocked. As the blade rotated, the U-crank hit the folding stop at the lower collective settings and caused the cyclic stick to bounce. Obviously, this condition should have been found on preflight.

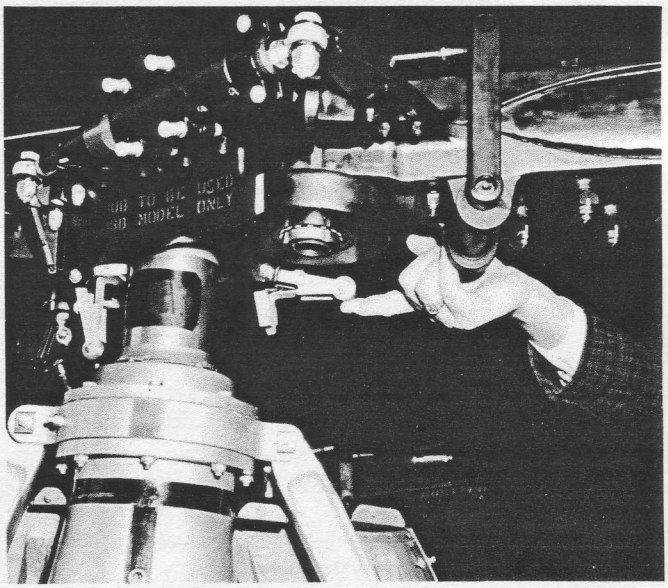
A maintenance test pilot, returning from a flight in the HUSKIE, noted that the helicopter turned to the right when he pulled in collective in the upper ranges while trying to top out the N_1 speed. He tried to correct with left rudder, but found that it would not move. Where would you look for this one? The obvious place would be the collective spindle height setting. In this case, both spindles were set high and unequally. When approaching "Up" collective, the right azimuth bar bottomed out on the spindle support while the left one continued to travel upward. This automatically induced differential collective and caused a turning movement to the right. As you know, in HH-43B powered flight the pitch of the rotor on the inside of the turn is decreased while the pitch on the outside is increased. When the pilot tried to apply left rudder, the pedal would not move since the right azimuth bar was bottomed out on its azimuth spindle support and therefore could not increase its travel. When the collective stick was lowered slightly, the aircraft performed as it should since both azimuth bars had moved away from their supports and the resultant clearance allowed proper function of the collective system. You might wonder what this has to do with preflight. Well, had the proper static control response checks been performed prior to flight, the interference would have been discovered. Controls should always be checked statically throughout their travels after any maintenance to the rotor system; and they should be checked in combinations since differentials of the collective and cyclic systems are used for directional control—up collective with FULL right and left rudder, FULL forward and aft cyclic. It doesn't do a bit of good to check the system with the controls relatively neutral. Go to all extremes of travel on all controls in all directions and combinations.

My practice is to spend considerable time in the rotor system area when preflighting the HUSKIE. This doesn't mean that I neglect structures and the like, but a bolt missing from the rotor control system or a missing cotter pin, if undetected, can spell disaster. Another thing I always keep in mind is this simple, but highly effective, rule passed to me a long time ago by an Air Force master sergeant who was introducing me to aircraft maintenance for the first time: "Don't just preflight with your eyes, but preflight with all your senses. Yes, your eyes, ears, nose, and also your hands. It is one thing to look at a bolt and assume that it is secure. It's quite another to feel a bolt and know that it is secure."

Now, let's talk about the rotor hub area for a few minutes. The HUSKIE has a simple rotor hub arrangement in comparison with many other helicopters, but this isn't any reason to be satisfied with giving it merely a passing glance during the preflight inspection. I never fail to insure that all four lag pin retaining nuts have at least one locking tang engaged and that the dust covers on the opposite end of the pins are properly secured. Teeter pin covers should also be inspected. The rotor hub should be checked for nicks and scratches and the attaching hardware connecting the upper and lower hub halves should be examined carefully. Inspect the rotor damper installation. The piston ends should be positioned between the grip ears so that they are opposite the folding locks. Make sure the pistons are free of grease. Check the droop stops by pulling them to the extreme of travel. When released, they should return to position without binding. In-flight tracking actuators and the attaching



USE HANDS—— Bill Wells uses hands as well as "eyes, ears and nose" on preflight.



LIKE THIS—— When checking droop stops, pull them to extreme of travel before releasing.

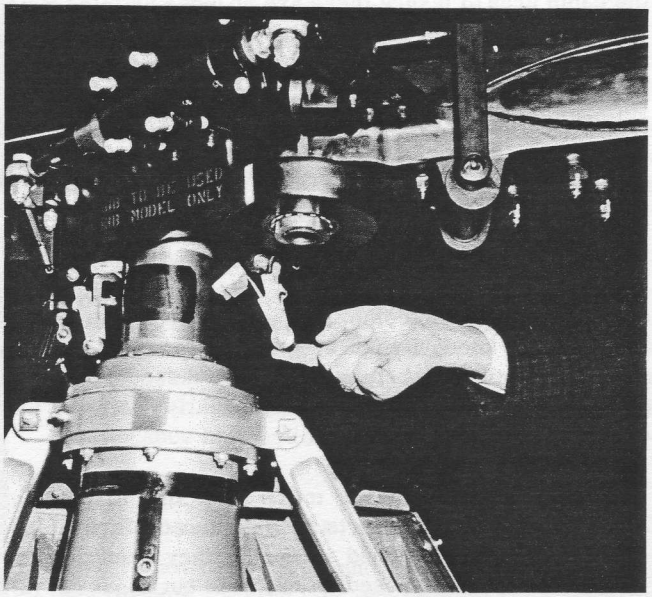
cannon plugs should be checked for security. Rotor hub L-cranks must be secure and the attaching hub-to-blade rod should have freedom to swivel (rod roll) and also be properly safetied. If you want an intermittent track problem in flight—and who does?—lock the jam nuts on these hub-to-blade-rods so that there is no freedom to swivel throughout the control input. It'll do it every time! Make sure the failsafe washer is installed on the blade end of this rod, and see that it is installed with the machined shoulder downward toward the rodend. If this washer is installed backwards it can interfere with the rodend as it travels through with the control input. Sight between the lower side of the rodend and the blade U-crank to insure that the small bushing is installed. This bushing is needed so that the rodend and U-crank maintain the optimum relative angle throughout the control travel. Make sure that the U-crank is secure and that no obvious excessive motion is evident in the bearings. While in this grip area, make certain all folding stops are in place and properly locked with their respective pins. Check the tracking turnbuckles and control rod idler cranks. Is everything properly safetied? Are jam nuts secure? How about bearing integrity? Examine the grip area for dents, nicks, scratches and similar damage. Always check the root ends as well as the tops and bottoms of all rotor blades. Ever find "hangar rash??" I have!!

Before climbing down from the pylons check the areas where the shear ties are attached. Look for cracks and security. Don't forget the rotating beacon, and all cowling should be secure and in good condition. OOOOOOps! We're ready to climb down, and an extremely important area of preflight inspection has been forgotten....

Turbine engines are still rather new in helicopters and sometimes we find it difficult to adjust to this fact after having been on "recips" for a long time. The engine on the HH-43B is susceptible to the same menace that plagues other jet-age aircraft—FOD! Open the engine cowling and make a thorough inspection of the plenum chamber area. Look for washers, pieces of cotterpins, nuts or any of the numerous other items that can play havoc if sucked into the engine. Make sure that intake protective plugs are removed and if you had any cleaning rags or tools in your pocket, make sure they ARE STILL THERE and haven't fallen into the intake. A real good look at the engine driveshaft and transmission input area is also in order. Got your grease gun handy? Remember, this drive shaft turns at better than 6,000 rpm and should be greased daily. Be sure to wipe off any excess grease after the lube job—we're burning JP-4, not MIL-G-25537. Before closing the cowling, inspect the engine thoroughly. Look for signs of leaks around the fuel control and governor and insure that the control rods are secure. This is another good place to apply the "senses" rule; use your hands again. Check electrical harnesses, fuel and oil lines for signs of leaks and security. Examine the compressor halves for signs of excessive oil seepage, cracks, etc. When satisfied that the engine is okay, check the transmission and engine oil tanks for proper servicing.

All set for the rotor blades now. The top and bottom of all blades should be carefully inspected for cracks, missing fabric, and general finish condition. The rubber and stainless leading edges should be checked for cracks, dents, etc. How long has it been since these blades were waxed???? I know of nothing that will preserve the finish and enhance the performance of the blade more than a good cleaning and waxing occasionally. (Any good paste or liquid wax is acceptable provided no cleaner compound or chemical has been added. If wax which contains a cleaner is used, it could cause the finish to erode or deteriorate.)

Check the inboard and outboard flap brackets for security by using gentle hand pressure to try and rock the brackets against their respective mounting pads. Look for signs of motion where the outboard bracket meets the blade. Don't "horse on it" but use a reasonable amount of pressure. I recall one instance where an HH-43B pilot came down complaining about track. Investigation showed that a bolt about half an inch too long had been used to secure the outboard flap bracket on one rotor. Because of the bolt's excessive grip length, it was impossible to get the proper degree of tightness. The bracket was attached, it's true, but was so loose its condition could



NOT LIKE THIS——Pulling droop stops out halfway and then releasing is not a true test.

LAST NOT FIRST—— Not one to break a tradition, Wells kicks tire AFTER preflight completion.

2,500 Hours

Congratulations were in order at VMO-2, MCAF Futema, Okinawa, when this OH-43D set down. It was the squadron's fourth helicopter of this type to pass the impressive 2500-hour flight mark. Shown after the landing are, left to right, WO H. L. Ritter, maintenance officer; LtCol J. L. Freitas, commanding officer; Cpl D. L. Curtis, crew chief; and GySgt E. G. Stover, maintenance control chief. Like the men of VMO-2, the OH-43D's have really "been around." This helicopter accumulated the 2500 hours while flying in the United States, Okinawa, Japan, Taiwan, the Philippines and Korea. (USMC photo by Sgt George Franco)

only be described as "sloppy." Don't you think this should have been discovered on preflight? Take special note of the flap cable installation. Insure that the cable is free to rotate and that it is properly safetied. Make sure that approximately one-quarter inch (1/4-inch) of the outboard bearing sleeve assembly protrudes on the inboard side of the bracket. Make sure the flap control rod clevis is safetied and that the bolt head faces inboard. Check the rod clevis for freedom of swivel and the bearing for excessive play or binding. Servo flap surfaces should be inspected for cracks or other finish defects and the rubber leading edge examined for nicks and cuts. Touching up minor defects on the neoprene leading edge will prolong its life in poor weather conditions. Pliobond, dope, and other similar liquids are acceptable. Remember, once the airflow gets under the rubber the adhesive qualities are greatly diminished.

There are five input rods leading to the HUSKIE azimuth and when the cabin ceiling doors are lowered, all are well exposed. Check each one individually by feel to insure that they are secure. The four bar-to-hub rods should never be overlooked during the preflight. Take the rodends in your hands and see that the proper rod roll exists, and then check for lost motion between the rodends and the azimuth bar. The bushings in the azimuth bar will prevent any lost motion between the rodends and their respective attaching bolts. If lost motion exists at this point, BEWARE! The bushings may be missing. The heads of these bolts should be installed in the direction of azimuth bar rotation and, of course, they must always be safetied. Always check for general azimuth condition and don't forget to include the lateral cam plate. Remember, this assembly is the heart of the rotating control system and deserves your full attention.

When satisfied with the azimuth, proceed to the lower transmission. The lines and electrical harness in this area should be checked for leakage and proper security. Don't hesitate to use your hands on cannon plugs, "B" nuts, fittings, etc., to make sure they are tight. Just because the previous preflight did not reveal any discrepancies in this area, don't assume that none now exist. Never take anything for granted.

Now lets consider the fuselage and structures. A real good walkaround is in order during which the cabin doors should be checked for proper operation and security. Pay particular attention to the landing gear attachment areas, and especially look for signs of a hard landing. Always visually check the fuel cell to insure proper servicing and don't forget to check all fuel sumps and the filter. All windows should be clean for maximum visibility and also examined for cracks, distortion and other damage.

The tailboom and empennage assembly should never be overlooked. Rotate the elevator from stop to stop in order to check for looseness or undue friction. Although it is difficult to determine the correct amount of friction exactly, with experience a mechanic develops the ability or "feel" for telling if the elevator is operating as it should. The damping should be adequate and smooth. If a "ratcheting" noise is heard when the elevator is moved, the friction pads should be removed, cleaned and reinstalled. The friction should then be reset. Check all elevators, tabs and vertical fins for cracks, dents or other damage. Unlock the rudders and move them gently from stop to stop to insure freedom of movement. Never use abrupt or erratic motions as this can cause stripping or other problems in the actuator gear train. When working around the empennage area, be careful of the frangible tip caps; they are easily crushed. Tailbooms should be checked for general structural condition and the boom brace cables for tautness and security.

The preflight is almost over, but don't forget to check the cabin area to insure there are no loose articles which might cause interference with the controls. Now that we are all through and strapped in, let's make sure we haven't forgotten anything. Gosh yes, we've got to get out and kick the tires!

In closing I would like to add that, in my opinion, the more curious or "downright nosey" a person is during preflight, the bigger asset he is to any organization. None of us should feel the least bit slighted to have someone preflight a helicopter just after we finished. We should, in fact, welcome an occasional double-check. It will let us know if we are really as sharp as we think we are and, if not, better to have it discovered on the ground than show up in flight. After all, "better a bent ego than a bent bird."

My job (and yours) is to make sure that all of the hundreds of working parts in a helicopter are doing what they were designed to do. If they aren't, I am (and so are you) supposed to: (1) Find out about it; (2) Fix it—It's that simple, but lives depend on how well it is done.

Bill Wells

Timely Tips

Refueling From Drums (HH-43B,UH-2)

When refueling with JP-4 or JP-5 that has been stored in drums, certain precautions should be taken to minimize the chances of contaminated fuel being pumped into the helicopter. Since, in most cases, it is necessary to truck or fly the drums to the site, try and choose a place to store them which will be as close as possible to the spot where the helicopters will land later on. This will make it possible to transfer the fuel without moving the drums for, once they have been positioned, they should not be disturbed. Standing allows any contaminants present to gradually settle. Keep this in mind when hand pumping—don't let the pump rest on the bottom of the drum as it can then pick up any particles that have settled; and always leave three or four inches of fuel in the drum. A chamois should be used to strain the JP-4 or JP-5, of course, but don't forget to check the filters every 10 or 15 hours of flight time since fine hairs may separate from the chamois and eventually clog up the fuel control filter. Procedures for handling these fuels may be found in applicable manuals. It is an excellent idea to refer to them periodically.

Darrell Heick, Field Service Representative

Instrument Breakage (UH-2)

The clock and pressure altimeter are two of the most common instruments which "mysteriously" turn up with the knobs broken off. In this instance, a little care in entering and/or leaving the helicopter's cockpit will prevent "missing knobs." Another area of concern is the radio console between the pilot and copilot where instruments have also been damaged. "Flying seat belts" are usually the cause of broken glass in the ASA-13A computer control panel. A little care can prevent damage to these instruments and, in many cases, prevent unnecessary replacement.

M. T. Fiaschetti, Service Engineer

Transmission Rev-O-Seal Replacement (HH-43B)

When reinstalling torque tubes, P/N K774542-1 or -3, while replacing Rev-O-Seals in the lower covers of the transmission end cases, pay particular attention to the alignment of the torque tube relative to the drive coupling, P/N K774541-11. It is imperative that the slots in the end of the torque tube be properly engaged with the tabs of the coupling before tightening the six screws (AN102920) which retain the tube in the transmission end case. If not properly engaged, the coupling tabs will fracture and removal of the transmission will be necessary.

F. E. Starses, Service Engineer

Disengage Before Cleaning (UH-2)

Before cleaning the windshields, make it a routine practice to first disengage the manual locks on each wiper motor. This eliminates the possibility that the lock will be bent when a wiper is lifted or moved. Remember, the locks should always be disengaged before turning the speed control to the "ON" position.

P. M. Cummings, Service Engineer

Precaution Saves Blades (HH-43B)

Make sure the cover assembly is taken from the alert pad after being removed from the Fire Suppression Kit. This precaution is necessary to prevent the possibility of the cover being drawn up into the rotor blades of the helicopter. At one base this did happen, although the cover was 30 feet from the HH-43B when it was caught by the rotor wash. Extensive blade damage resulted.

W. J. Rudershausen, Service Engineer

Battery Vibration Absorber (UH-2)

If a "four-per-rev" vibration is felt in the aircraft, one possible cause can be an improperly adjusted battery vibration absorber. The springs must be the proper length and the bolts on the battery tiedown bracket must be torqued properly or this type of vibration can develop. The length and torque specifications are given in the Handbook Maintenance Instructions, NAVWEPS 01-260HCA-2-1.

J. J. McMahon, Service Engineer

Seat Removal (HH-43B, OH-43D, UH-43C)

When removing the pilot and copilot seats from the aircraft, make sure the seats are lifted straight out of the fuselage fittings. A side load can damage the seat fittings or fuselage fittings.

W. J. Wagemaker, Service Engineer

UH-2 TOPS 216 MPH DURING TEST

Engineers Say Potential Even Greater

A Kaman UH-2 helicopter, using a General Electric YJ-85 Jet for horizontal thrust augmentation, repeatedly achieved true airspeeds of over 200 miles per hour during a flight test program conducted recently for the U.S. Army Transportation Research Command, Fort Eustis, Va.

The research UH-2 made its fastest level flight at a true airspeed of over 216 miles per hour during tests to investigate rotary wing characteristics at high speeds by use of jet augmentation. Because this is a research program, no attempts to establish world records have been made or are anticipated.

Based on the test results, Kaman and Army engineers believe that the airspeed potential of an augmented UH-2 is over 250 miles per hour. The company has completed its flight testing and the helicopter is now undergoing Army qualitative evaluation at Kaman's plant in Bloomfield, Conn.

The general objective of this research is to provide information on the use of auxiliary propulsion and/or auxiliary lift during which the rotors are partially unloaded. The advanced design data collected during these tests will eventually be required when designing high-speed rotary wing aircraft of the future. The program is providing facts on performance, stability and control, vibration and structural and control loads at speeds heretofore unattainable. In addition, it assists in establishing pilot techniques for future use.

Test pilots report that the UH-2's characteristic lack of vibration was maintained with the jet augmentation. Under a follow-on Army contract, Kaman will add wings to this aircraft and conduct further high-speed tests.

KAC "Chem-Milling"

Kaman Aircraft is beginning "Chem-Milling" at its Moosup, Conn., plant. Chem-Milling, which uses chemicals to shape metals, is a "nontraditional" metal working process new in the aerospace field. With the complex shapes and highly sophisticated metals demanded in the aerospace age, Chem-Milling frequently is less expensive or makes it possible to do jobs previously considered too difficult. Kaman is being assisted in the undertaking by the Grumman Aircraft Engineering Corporation of Bethpage, Long Island. Kaman has substantial subcontract work for the tail section of the Grumman Mohawk which requires Chem-Milling. The Mohawk is the U.S. Army's new high speed observation aircraft.

SEASPRITE Passes Flight Mark

One of the U.S. Navy's SEASPRITES recently attained the 1000-hour mark in flight time while undergoing high-speed flight testing at the contractor's facility in Bloomfield, Conn. The Kaman UH-2 has been assigned to the company under a bailment contract since coming off the assembly line in February 1961.

Shown checking the log after the flight are, left to right, W. R. Murray, KAC vice president - Flight Test Operations; Cdr M. R. Gromada, BUWEPSREP; C. H. Kaman, KAC president-general manager; LCdr R. F. Dawson, ASST BUWEPSREP; A. D. Ashley, KAC test pilot.

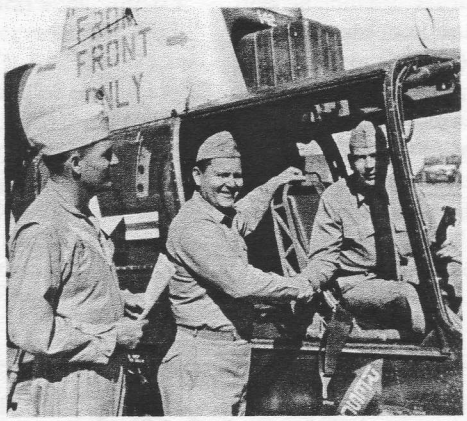
Of the many experimental flight test programs conducted on this helicopter, the most significant include: Development of structural modifications and an airframe vibration absorber utilizing the battery installation to achieve the exceptionally low vibration levels for which the UH-2 is noted. Development of an improved main rotor blade configuration. Measurement of main rotor bending moment distributions throughout the flight envelope. Demonstration of safe mechanical instability margins at overload gross weight. Accomplishment of 300 hours of accelerated endurance flight testing.

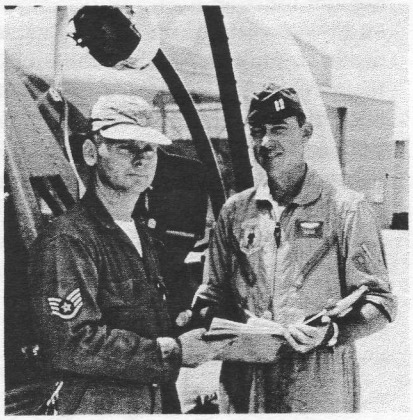
The aircraft is presently configured with a jet pod that provides thrust augmentation necessary to obtain high-speed flight data in the 200-knot regime. The addition of a wing to determine the benefit to be derived from an auxiliary lifting surface is planned for the immediate future. This research program is sponsored by the U.S. Army's Transportation and Research Command, in cooperation with the U.S. Navy.

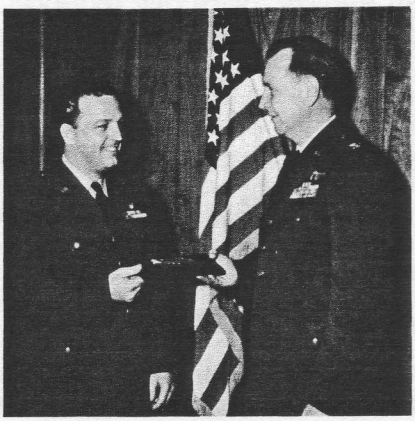
SAFETY AWARDS

ARS UNITS HONORED——In top photo, left, Capt H. P. Fogg, commander of Det 6, CARC, Kincheloe AFB, Mich., is presented with the MATS Flying Safety Plaque by Col W. W. Martindale, right, commander of the 507th Fighter Wing. The unit received the award for a year's accident-free flying record. In middle photo, Capt H. A. Lee, commander of Det 14, EARC, MacDill AFB, Fla., receives an award from Col G. J. Dunkleberg, commander of EARC, Robins AFB, Ga. In third photo, Capt L. J. Walsh, Jr., commander of Det 12, CARC, Randolph AFB, Texas, proudly displays plaque presented by Col E. H. Nigro, right, base commander. Present for the ceremony is LtCol W. A. Ryan, left, deputy commander of CARC, Richards-Gebaur AFB, Mo. The three units also received awards for their flying safety records in 1962. All operate HH-43B's. In last photo, Det 10, AARC, commanded by Capt J. A. Crupper and stationed at Aviano AB, Italy, received a similar award. The plaque was given by Col H. C. Wilder, center right, commander of AARC, Ramstein AB, Germany, to Col G. A. Stell, base commander at Aviano, for presentation to the unit. (USAF photos)

1000-Hour Pilot Awards







HONORED BY KAC——Latest pilots to receive desk set awards from Kaman Aircraft for logging 1000 hours in helicopters produced by the company are: Capt B. E. Warden and Capt C. R. Damonte, Det 11, EARC, Craig AFB, Ala.; Capt W. T. Hayes, Hdqrs, WARC, Hamilton AFB, Calif.; Capt L. E. Burke, Det 12, CARC, Randolph AFB, Texas; Capt H. A. Lee, Det 14, EARC, MacDill AFB, Fla.; Capt Pasco Parker, Det 6, CARC, Kincheloe AFB, Mich.; Capt D. M. Randall, Det 7, AARC, Torrejon AB, Spain and Marine WO R. L. Norton, VMO-1, MAG 26, MCAF, New River, N. C. In top photos, left to right, Captain Burke, Det 12 commander, logs his 1000th hour. He flew 630 hours in HH-43A's and 370 in the HH-43B. Warrant Officer Norton, in OH-43D, receives handshake from Col K. L. Reusser, commanding officer of MAG 26. LtCol J. A. Nelson, commanding officer of VMO-1, stands by to add his congratulations. Captain Lee, Det 14 commander, logs his 1000th hour beside HH-43B which also passed this milestone recently. With the captain is SSgt L. K. Henderson, crew chief. In photo at left, Captain Parker is presented a desk set by Col W. W. Martindale, 507th Fighter Wing commander. See page 17 for other ceremony. (USAF and USMC photos)

Q's AND A's

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

Q. (Applies HH-43B) WHAT ARE THE WEAR LIMITS OF THE ROTOR FLAP PIVOT BEARINGS?

A. Rotor flap pivot bearing, P/N K101030-11 inboard and K101031-11 outboard, wear limits are 0.020-inch maximum axial or 0.004-inch maximum radial looseness. (Reference TO 1H-43(H)B-2)

D. W. MacDonald, Service Engineer

Q. (Applies UH-2) WHAT PRECAUTIONS SHOULD BE OBSERVED WHEN INSTALLING FUEL QUANTITY PROBES?

A. To preclude improper installation of fuel quantity probes, the following procedures are recommended: (1) Before removing the probe assemblies from their respective cells, identify each according to the cell location. (See drawing) Use a marking pencil or small brush and paint. (2) Mark a reference line and arrow across the top of the probe and probe cover indicating the forward direction. Upon reinstallation, this reference will ensure that the probe is properly indexed within the cell so that it will not chafe against the internal plumbing or the bottom of the cell at the sump. (3) Before removing the probe cell cover, P/N K679104, identify the cover according to the cell location. An embossed arrow or painted line on the cell cover indicates the forward direction. Ensure that the proper cover is used for the respective cell, and that the indexing reference line or arrow points forward. NAVWEPS 01-260HCA-2-3 will be revised to include this information.

H. Zubkoff, Service Engineer

Q. (Applies UH-2, HH-43B) CAN THE BENDIX "CRIMP" TYPE PIN AND SOCKET CONTACTS BE PROCURED SEPARATELY FROM THE SOLDERLESS CONNECTOR? IF SO WHAT ARE THE PART NUMBERS?

A. Yes, these contacts can be ordered separately. Use the following Bendix part number.

Basic	Federal Stock Number
10-314980-16P	5935-376-2392(Air Force)
10-314980-16S	Not Stock Listed
10-314980-20P	5935-847-4372(Air Force)
10-314980-20S	5935-087-5320(Air Force)
10-314980-12P	Not Stock Listed
10-314980-12S	Not Stock Listed

These contacts fit the entire range of the "PT" series Bendix Pygmy solderless connectors. The size 16 contacts will accommodate wire gauges of #16, #18 and #20 per MIL-W-5086 type 1 or type 2. Size 20 contacts will accommodate a wire range from #20 to #24 gauge. The #20 and #22 should be per MIL-W-5086 type 1 or type 2, while #24 should be per MIL-W-16878 type EE.

A. Savard, Service Engineer

Q. (Applies HH-43B) WHAT IS THE PART NUMBER FOR THE RUBBER WASHERS THAT GO ON THE TAIL ISOLATORS?

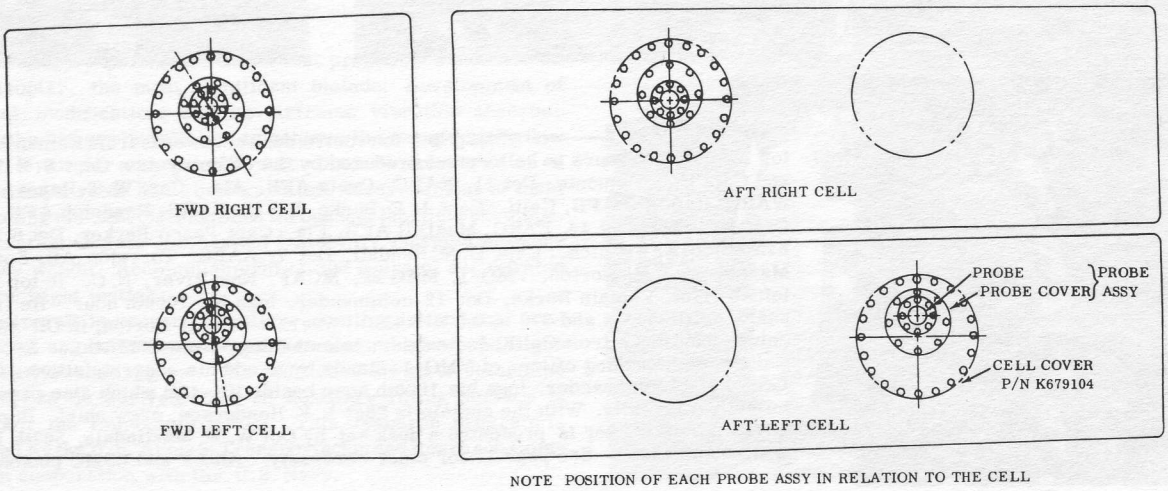
A. The rubber tail isolator washers, P/N K322035-13, may be ordered under FSN 5340-619-3838.

W. J. Wagemaker, Service Engineer

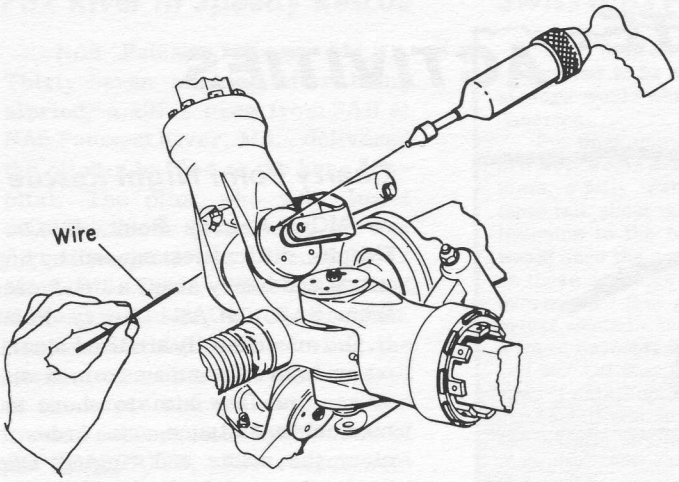
Q. (Applies UH-2) IS IT NORMAL FOR THE INDIVIDUAL "POWER FAILURE" INDICATING LAMP TO GLOW DIM INSTEAD OF GOING OUT COMPLETELY WHEN THE "POWER FAILURE" BUTTON FOR THAT PHASE IS PUSHED ON THE K604609 SENSOR UNIT TEST SET?

A. Yes! The power transformer in the sensor unit may cause feedback current to keep the indicating lamp glowing dim. This is due to both a slightly unbalanced transformer and loads on the transformer causing a current to trickle back through the indicating lamp and cause it to glow dim. This is not considered serious as the decrease in brilliance is detectable.

M. T. Fiaschetti, Service Engineer



NOTE POSITION OF EACH PROBE ASSY IN RELATION TO THE CELL



Q. (Applies UH-2) IS IT NECESSARY TO USE THE K604404 RETAINING TOOL WHEN GREASING THE TAIL ROTOR FLAPPING BEARINGS?

A. No. A recently introduced method for greasing the tail rotor flapping bearings eliminates the need for the K604404 retaining tool. Use an aluminum or brass wire and depress the ball valve in one of the four grease fittings on one cap while grease is being injected into a fitting on the opposite cap. Repeat with each grease fitting until all have been serviced. This procedure will be included in subsequent maintenance handbook revisions.

D. W. MacDonald, Service Engineer

Q. (Applies HH-43B) WHAT PROBABLE CAUSE IS THERE FOR HIGH-FREQUENCY AIRCRAFT VIBRATIONS DURING OPERATION?

A. One very likely cause is a loose rotor brake disc. Check the disc for radial and/or axial movement relative to the transmission input pinion shaft. If movement is noted, but vibrations are mild and tolerable, retorque the larger brake disc retaining nut, P/N K774554-11, to 150-200 pound feet and then the smaller retaining nut, P/N K774553-11, to 25-50 pound feet. It is absolutely necessary that the nuts be torqued in the sequence given. If brake disc movement is noted and vibrations are excessive, remove the transmission for overhaul. NOTE Special tools necessary to accomplish the above maintenance may be secured through Air Force channels.

F. E. Starses, Service Engineer

Q. (Applies UH-2) WHAT PRECAUTION SHOULD BE OBSERVED WHEN THE RESCUE HOIST IS OPERATED WITH THE HYDRAULIC EMERGENCY LEVER?

A. The hoist up and down electrical limit switches become inoperative when the emergency lever is used; therefore, care must be taken to avoid unreeling the cable too far. If the cable should be permitted to completely unwind, it may begin to rewind backwards, causing a hoist jam-up. As a visual aid to prevent the above from happening, the last 15 feet of the cable are coated with Red Dykem.

W. J. Rudershausen, Service Engineer

Q. (Applies UH-2) DURING AIRCRAFT TURN-UP, WHAT COULD CAUSE BOTH GENERATOR CAUTION LIGHTS TO REMAIN "ON?"

A. The battery may be the cause. If, prior to sufficient rotor speed for generator cut-in, and the APU is disconnected, all aircraft DC power would come from the battery. If the open circuit battery voltage has decreased below the minimum voltage specified in the HMI, the DC-controlled relays may not energize. This can prevent the generator outputs from being applied to the generator busses and consequently to the converter. To find out if the battery is at fault, apply external DC power while the rotors are at operating speed. If the generator caution lights go out, check the battery voltage.

J. J. McMahon, Service Engineer

Q. (Applies UH-2) WHAT PRECAUTION SHOULD BE OBSERVED WHEN TIGHTENING THE BOLT, P/N MS15993-7, ON THE DOWTY MAIN LANDING GEAR?

A. The Dowty main landing gear shaft, P/N 3283129-3, which attaches the upper end of the liquid spring to the main member assembly is retained by a retainer pin, P/N 3283134-1, and bolt, P/N MS15993-7. If this bolt is too tight, it can cause failure of the retainer pin. For this reason the torquing requirement was recently changed. The bolt should now be torqued to 15/20-inch pounds. Reference NAVWEPS 01-260HCA-4-6.

R. W. Spear, Service Engineer

Q. (Applies UH-2, HH-43B, UH-43C, OH-43D) WHAT LOAD SHOULD BE APPLIED TO 3/32-INCH DIAMETER CABLE ASSEMBLIES FOR PROOF TESTING AND PRESTRETCHING?

A. The proof test and prestretching load for swaged cable and terminal assemblies using 3/32-inch diameter cable (conforming to MIL-C-5424) is 552 pounds. The breaking strength of 3/32-inch diameter cable is 920 pounds. The information below is presented to aid in field fabrication of other swaged cable and terminal assemblies in which flexible cable conforming to MIL-C-5424 is used. T.O. 1-1A-8 and/or NAVWEPS 01-1A-8 should be consulted for additional information.

Cable Diameter (inches)	Min. Breaking Strength (lbs)	Min. Load Proof Test & Prestretching (lbs)
1/16	480	288
1/8	1,760	1,056
5/32	2,400	1,440
3/16	3,700	2,220
7/32	5,000	3,000
1/4	6,400	3,840
9/32	7,800	4,680
5/16	9,000	5,400
3/8	12,000	7,200
7/16	16,300	9,780

(1) Apply tape to cable where it enters terminal prior to proof test to determine any slippage during proof test. (2) Apply proof load gradually (not less than 3 seconds) and then maintain load for at least 3 minutes. Release load evenly and gradually. (3) After test, run soft cloth along entire cable length around diameter to check for broken wires. (4) Do not mark terminals with metal stamp after swaging.

W. J. Wagemaker, Service Engineer

KAMAN SERVICE ENGINEERING SECTION—*E. J. Polaski, Supervisor, Service Engineering, G. M. Legault, G. S. Garte, Asst. Supervisors; N. E. Warner, A. Savard, W. J. Rudershausen, W. A. Saxby, C. W. Spencer, Group Leaders.*

Squadrons Report On

SEASPRITE ACTIVITIES

WELCOMING COMMITTEE——Crew and part of receiving committee pose with SEASPRITE after landing. Left to right are: K. J. Golden, UH-2A pilot program weapons manager; D. Lockridge, KAC field service representative; Lt(jg) J. D. Karr, HU-1, Ream Field, copilot; C. R. McMillan, KAC test pilot; W. J. Edwards, ADR3, HU-1, crewman. (USN photos)

NAS North Island... A new work program was launched late in April by the Overhaul and Repair Department at the Naval Air Station, North Island, San Diego, Calif., when the department began the pilot rework of a Kaman UH-2A SEASPRITE jet helicopter. Based upon knowledge gained during the pilot rework, full rework production of the aircraft will start in about three months.

The SEASPRITE is a two-crew, four-passenger, utility helicopter, powered by a single T-58-GE turboshaft engine. All aircraft carriers in the Pacific Fleet are equipped with UH-2A's which serve as "angels" when fixed-wing aircraft are operating. Since the new all-weather helicopters were delivered to the fleet early in 1963 they have performed 21 confirmed rescues with 37 people saved.

The particular aircraft selected for the pilot rework is assigned to Helicopter Utility Squadron One at NAAS Ream Field. It has been used since early 1963 for training pilots and crewmen operating from carriers off the Southern California coast.

Planning for the UH-2A program commenced in August 1961 when North Island was selected as the rework point. A station-wide pilot rework board was established with members from Supply Department, Training Division of Industrial Relations, and Aeronautical Engineering, Quality Assurance, Production Planning, Production Engineering, and Shops Group of the Overhaul and Repair Department.

One important step in the get-ready phase was pilot overhaul of many of the 46 major components selected as components pilot overhaul packages. These, the more complex of the UH-2A components, were received for rework as packages, each containing the component, technical data, tooling and support parts. Other useful experience was gained through the crash-damage overhaul of two SEASPRITES. One was returned to service in January of 1964 and the other is nearing completion. In these, as in other preparations for the program, the Kaman representative, Don Lockridge, provided valuable assistance.

North Island is the rework point for six basic models of helicopters, plus eight models of fighter, anti-submarine warfare, airborne early warning, and carrier logistic aircraft. O&R is scheduled to process about 1,198 aircraft the fiscal year ending 30 June 1964, plus reworking jet engines, missiles, accessories, and components.

Cherry Point Night Rescue

MCAS Cherry Point, N. C.... Despite difficulties caused by high winds and heavy seas, a UH-2 crew from SAR, MCAS, Cherry Point, N. C., successfully airlifted a seriously injured seaman from a ship at sea and flew him to shore and medical assistance. In order to clear the masts and rigging, Capt J. L. Pipa, USMC, OinC of the rescue unit, found it necessary to hover the UH-2 60 feet above the deck of the wildly pitching and tossing ship. At one time the hoist cable became fouled in the rigging and considerable difficulty was encountered in attaching the hook to the litter because of the constant movement of the ship. Captain Pipa kept the SEASPRITE in position over the vessel for more than 20 minutes in order to accomplish the pickup. UH-2 crewmen were SSgt F. S. Hamel and LCpl L. K. Radcliffe.

HU-1 Aids Crewman

NAS Atsugi, Japan... A UH-2 crew from Det 1, HU-1, NAS Atsugi, flew 55 miles to sea recently and landed aboard the SS Long Line in order to pick up a member of the ship's crew who had been injured when a cable snapped. The Long Line, which has a helo platform, is engaged in laying a trans-Pacific telephone cable. Lt John B. Spafford of Det 1, and Lt William H. Englund of NAS, were pilots of the SEASPRITE and R. W. Johnson, ADR3, was crewman.

SEASPRITE AND THE WAVE——Unfortunately for UH-2 personnel at NAS Barber's Point, the young lady has not been assigned as a regular member of the crew. She's Lurlene "Lee" Warner, YN3, of NAS Operations and was selected to represent the Navy in Hawaii during observance of Armed Forces Week. (USN photo)

Pax River in Speedy Rescue

NAS Patuxent River, Md.... Thirty-seven minutes after being alerted, a UH-2 crew from SAR at NAS Patuxent River, Md., delivered the pilot of an A-4 to the base hospital. The pilot, who was almost 30 miles from shore when he was forced to eject, was rescued by Lt Marvin J. Pratt, UH-2 pilot, and Howard R. Liddle, ADR2, crewman. Another aircraft was circling the rescue area when the helo arrived at the scene and the survivor was spotted seconds later by the crew of the SEASPRITE. The rescue seat was lowered and within a minute the dripping pilot was aboard and headed for shore. A UH-2, again piloted by Lieutenant Pratt, also took part in a night search for the occupant of a sail boat which had capsized 300 yards off shore. The SEASPRITE and a CH-19 searched the dark, wind-whipped water for more than five hours. Lieutenant Pratt located the boat and body of the boatman.

HU-2 Aids Ship's Officer

NAS Lakehurst, N.J....Due to the efforts of a SEASPRITE crew from HU-2, NAS Lakehurst, N.J., an officer aboard the USS Basilone was quickly delivered to the bedside of his seriously ill child. The UH-2 took off on its mercy flight after word was received from the Philadelphia Navy Yard that the child had been rushed to the hospital and was in grave condition. The father was hoisted from the deck of the vessel to the helicopter and then flown to the Philadelphia International Airport where an automobile was waiting to transport him to the hospital. Pilot of the UH-2 was LCdr A. E. Fulmer and Lt Walter Lester was copilot. Richard Taylor, ADR3, and Lewis L. Cota, AN, were crewmen.

Swiss Miss Praises Det 46

"Luck in life means to be at the right place at the right time." Very true indeed. I happened to be at the right moment in a Mediterranean port to meet members of strange world which is entirely a man's world—a warship of the United States of America.

But what members! "The Magnificent Seven + Two," as they call themselves, are well worth knowing. The crew of the only helicopter aboard, they are, each of them, a fully trained specialist in every possible respect. You should have heard them talk about their work. To be proud of one's work is a great thing. I have been listening to the tune behind the words and wish many other people in this world would have the same confidence, the same good will, the same faith in what they do as these few men of the helicopter crew. They are, first of all, lifesavers. Man overboard - they get him; surgeon needed - they bring him over from another ship; priest wanted - they find him in time for Mass. All this means a lot of precision, a lot of concentration and skill. Most of the men are amazingly young, between 19 and 25. Off duty they nearly give the impression of being like everyone else at that age. I said "nearly" for one good reason; they are, and I believe only an outsider can feel it that strong way, far more serious than the average young man of their age. Definitely there is something about their job which gives them an anticipated maturity. Oh, they are no saints at all. They like good fun, they enjoy life with tremendous pleasure as soon as there is an opportunity. But even when it comes to the point of "seeing pink elephants," they remain what they are—nice and educated people...

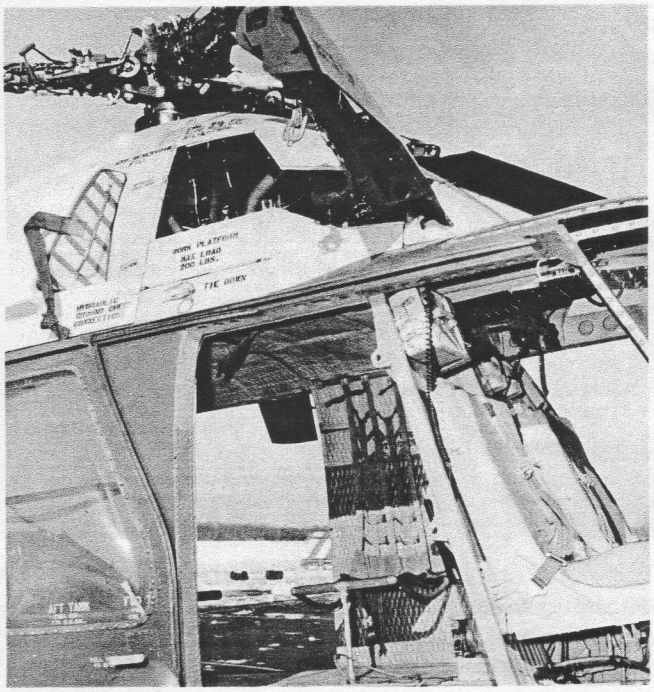
Excerpt from letter written by Suzanne Reichel who toured the USS Albany and met personnel attached to Det 46, HU-4. The young Swiss student was also introduced to the UH-2 SEASPRITE.

Det 65 Saves Pilot

USS Enterprise...A jet pilot was rescued by the crew of a UH-2 from Det 65, HU-2 after his plane skidded across the flight deck of the USS Enterprise and fell in an inverted position into the Mediterranean. In less than a minute the SEASPRITE, piloted by Lt(jg) C. Kiseljack, was over the downed flyer who had managed to escape from his plane but was obviously injured. J. A. Lukens, ADRAN, one of the helicopter crewmen, went into the 53-degree water to assist. He was successful in getting the pilot into the rescue sling and the helicopter rushed him back to the ship. The UH-2 then returned to pick up Lukens and a swimmer from the destroyer USS Beale, who had been put into the water to aid if necessary.

FOD FACTS

Anyone who has spent any time at all in aviation has been exposed to frequent warnings against the danger of FOD—a menace which has cost lives, wrecked aircraft and caused other damage running into many thousands of dollars. Posters, magazine articles and directives all emphasize the necessity for being constantly on the alert to spot loose objects which could be ingested into an engine. The ability to detect sources from which FOD may originate is also extremely important. How good are you at finding these sources? To check yourself, study the photograph and then see the answer below. To make things more difficult for our "detective types," the FOD sources are partially hidden in the photo, but they should be obvious when the helicopter is being worked on.



Shown are three possible sources from which FOD can originate—the work platform on a UH-2, the open hoist compartment and the rotor head. Note their relative positions to the engine air inlet. This inlet, which could be compared to an oversized vacuum cleaner nozzle, is just waiting to suck up any cotter pins, metal clippings, safety wire, nuts, bolts, screws, washers or other debris left behind after maintenance work in these areas. ALWAYS CHECK YOUR WORK AREAS FOR FOD.

LINE LEVEL HELICOPTER MAINTENANCE

by Robert J. Myer
Customer Service Manager

Part V

With the completion of Routine Maintenance in the last issue of Rotor Tips, we now take up the subject of Non-Routine Maintenance.

NON-ROUTINE MAINTENANCE

Unlike routine maintenance, the prime considerations under this category are more specifically influenced by their application to helicopters. The basic requirements of good aircraft maintenance practices and quality control still apply, but a greater understanding of the theory of operation and criticalness of helicopter components is necessary to avoid inadvertent malpractice. The subjects to be considered in this category are: Trouble-shooting; Adjustments and Rigging; and Limited Repair and Changes.

Trouble-Shooting

This area of non-routine line-level maintenance is as subjective as it is intangible. Although, like the other aspects of aircraft maintenance, the fundamentals concerning specific systems, components or types of components can be taught, significant levels of achievement in "trouble-shooting" usually come only after long periods of firsthand experience. The following points and recommendations will, therefore, be limited to the approach rather than detailed procedures on any specific component or system:

1. Consider the problem. Most problems can be classified as to nature and type. By "nature" we mean operational malfunctions, roughness, noise, etc. By "type" we mean mechanical, electrical, aerodynamic, etc. Obviously a given problem can encompass one or more conditions in both groups, but by considering these points we start our deduction processes going and usually arrive at a logical approach. If the problem is simple or a report of previously experienced conditions, we can usually establish the method of analysis and pinpoint the concern in a minimum of time.
2. Detailed analysis is required when the problem is more complex. Before haphazardly plunging into the mechanics of the first suspected item or area, review all related trouble histories, aircraft and component records, pilots' reports, reports relating to component changes or maintenance recently accomplished, etc. This practice will usually not only save time and effort* but it will avoid unnecessary operation of malfunctioning equipment which could possibly lead to additional damage or personnel injury.
3. Take one corrective action at a time. Although it is seldom considered in the haste to correct a problem and get an aircraft operational, the secondary benefit, gaining important experience, can be of more lasting value than the quickly-achieved fix. By making one corrective action at a time, you can ultimately pinpoint the problem area and store away the knowledge for quicker, less costly trouble resolution in the future.
4. When flight performance concerns are being analyzed and all safety of flight aspects have been thoroughly reviewed and insured against, a well planned, appropriately cautious flight evaluation is in order. A qualified test or high-time pilot in the affected type aircraft should always be chosen for such flight checks.

In order to successfully trouble-shoot helicopter in-flight performance or roughness problems, both the principles of general helicopter operation and those of the specific type involved must be thoroughly understood. The easiest concern of this type to use as an illustration is roughness. When this condition is reported, the first thing to be determined is the approximate frequency. Lower frequency vibrations are usually the result of a problem in the lower speed main rotor system, while higher frequency vibrations (above 1000 cycles per minute) are usually the result of a problem in the higher speed drive system or tail rotor system. Rotor system roughness can be attributed to dynamic unbalance or a mechanical malfunction or failure. If the helicopter previously operated satisfactorily with the same components installed, and no major maintenance performed subsequently dynamic unbalance in either system is unlikely or the fault should be relatively obvious, i.e., a portion of one of the components would have had to come

*Providing adequate records are maintained. This point is well illustrated by an article in the November '61 issue of Aerospace Accident & Maintenance Review entitled "Trouble-Shooting Nightmare." Numerous man-hours were spent tracing down a T-33 fuel system problem because earlier maintenance work was not recorded.

off. Assuming that this did not happen and that the roughness was of a low frequency nature, it is logical to deduce that it is caused by a rotor blade aerodynamic unbalance or a mechanical malfunction or failure somewhere in the rotor or related control system. A thorough inspection of the rotor system is in order, not only to determine that a mechanical malfunction is not the cause of the problem, but also to insure that the rotor system is safe to turn up for further evaluation. If such was the case, the rotor turnup would very likely substantiate an aerodynamic unbalance as indicated by an out-of-track condition.

To further complicate this analysis, the condition might vary in different operational modes. For instance, the problem may evidence itself in forward flight and not in hover. Having determined that present blades operated satisfactorily previously and that they appear to be structurally sound, only two probable causes remain—deterioration of control linkages or a control or trimming device maladjustment. This may seem like an involved method to arrive at such a basic conclusion. You might rightly reason that had the pilot noticed a significant blade out-of-track condition when the roughness occurred, the controls or trimming device could be readjusted and the problem resolved forthwith. In case you haven't already detected it, the fallacy with such an approach is the possibility that the problem was caused by a mechanical or structural discrepancy. Temporary relief might be obtained by the superficial adjustment only to result in a catastrophic failure during subsequent operation.

As mentioned earlier, the above illustration has only been presented as an example of the type of trouble-shooting problems and analysis peculiar to helicopter operation. The general nature of this article does not permit dwelling further on this area; however, application of the recommendations provided herein with reasonable judgement and experience should minimize the problem of analyzing similar concerns. K

Dependents Visit Rescue Personnel

Reprinted From the Brookley AFB "Spotlight"

If your wife and family know something about your work, and the everyday activities which you are engaged in, home life will be much more enjoyable. At least this is the feeling of the Brookley detachment of the Eastern Air Rescue Center (EARC).

In line with this thinking, Detachment 13 EARC held an open house for the dependents of the assigned and attached personnel.

Captain Herbert G. Gates, commander of the Detachment briefed the 30 people who attended on the organization, mission, and important position that the Air Rescue Service occupies in the defense effort. He also tried to give them a little information concerning the future plans of the EARC.

Captain R. N. Greene, Lt. F. M. Espiau, and TSgt. Dunn conducted a tour of the facilities, pointing out the maintenance repair effort which is necessary to insure the safety of all who must be on constant alert.

The group was then given a demonstration of what would take place in the event that an aircraft crashed. A simulated aircraft crash and fire were demonstrated to show the actual use of the fire suppression kit and all the related equipment.

The open house was concluded with a luncheon and "get acquainted" party.

CAPTAIN GATES AND "FRIENDS"

Captain Herbert Gates, commander of Detachment 13 EARC is shown with several of the children of the military personnel of the det. who attended the open house. The children were thrilled to sit in the helicopter while the captain told them about its operation.

REPORT FROM KOREA

A few issues ago Rotor Tips reported on the activities of Det 4, 36th Air Rescue Squadron, Osan AB, Korea. Since then the detachment has continued to carry out a busy schedule ranging from personnel evacuation to airlifting deactivated bombs from a gunnery range.

● An HH-43B crew from the detachment made a night flight to evacuate an ill soldier from a unit on a tiny peninsula in the Yellow Sea. The helicopter was aided by ground personnel turning building lights off and on. Aboard the HUSKIE were Capt Stanley O. Schaetzle, RCC; Capt Walter A. Malkiewicz, copilot; A2c Charles E. Fettinger, crew chief; and Capt Mark Gabel, MD.

● The crew of an HH-43B scrambled when an aircraft crashed short of the runway. The HUSKIE—first to arrive at the scene—set the FSK down, landed the firemen and then took its position over the burning plane. The firemen quickly extinguished the fire but, unfortunately, the pilot had not survived the crash. Captain Schaetzle was pilot of the HUSKIE, Captain Malkiewicz, copilot; and A1c Raymond A. Groll and James J. Gallagher, firemen.

● At the request of base officials, four 750-pound deactivated bombs were airlifted from the gunnery range by a detachment HH-43B. The cargo hook was used to carry the bombs from the soft, explosive-churned mud. Taking part in the operation were 1stLt Walter E. Hogan, RCC; Capt Joseph H. Pinaud, copilot; TSgt James K. Langston, SSgt Frank G. Messina and A1c Hubert O. Marsh, crew chiefs; and A2c Joseph R. Capper, firefighter.

● A HUSKIE crew scrambled when an Army helicopter made a forced landing in a dry river bed. There were no injuries and little damage. The HH-43B crew consisted of Capt Maxie L. Trainer, RCC; Capt Franklin L. Chase, copilot; and A2c Thomas A. Roberts, HM.

● A detachment HUSKIE evacuated a critically injured Korean from Osan AB to the Army hospital near Seoul. Captain Trainer was RCC; Captain Malkiewicz, copilot; Airman Fettinger, crew chief; and A2c Landrum C. Shaeffer, medical technician.

● An HH-43B evacuated a soldier injured in an automobile accident to the hospital in Seoul. Aboard the HUSKIE were Captain Pinaud, RCC; Lieutenant Hogan, copilot; and Airman Shaeffer, medical technician.

BOMBS AWAY——The last of four undetonated 750-pound bombs is released from the cargo hook. The bombs were retrieved from Kooni Bomb Range. Shown flying the HH-43B are Lieutenant Hogan, and Captain Pinaud. (USAF photo)

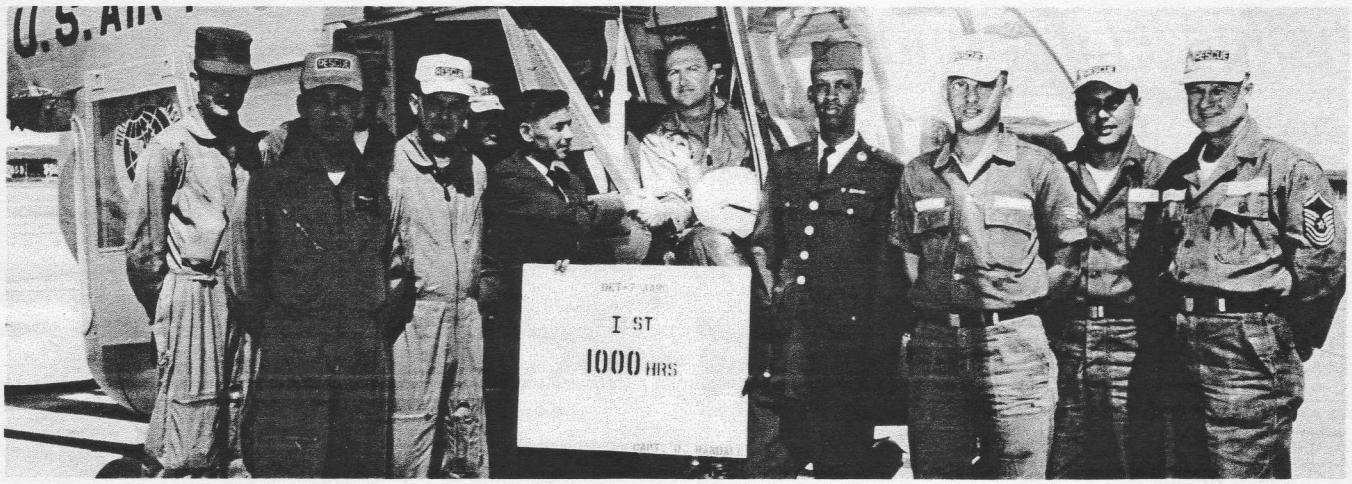
● Father Edwin Kelleher, a Maryknoll missionary who had been ill for four days and was bleeding internally, was evacuated from an island in the Yellow Sea and flown to the hospital. A C-47 from Kunsan AB flew cover for the 100-mile portion of the mission flown over water. Aboard the HUSKIE were Captain Trainer, RCC; Captain Schaetzle, pilot; Lieutenant Hogan, copilot; SSgt Jan Gale, crew chief; and SSgt Donald Poulin, medical technician.

● An injured soldier from Suwon Air Base was flown to the hospital in an HH-43B with Captain Malkiewicz as RCC; Captain Pinaud, copilot; and Sergeant Langston, crew chief. Captain Gabel and Sergeant Poulin attended the patient.

● Detachment helicopter also made four trips to evacuate patients from Osan AB to Taejong-ni, Korea. An airman from the base in need of an emergency appendectomy was taken to the hospital in an HH-43B flown by Lieutenant Hogan. Captain Pinaud was copilot; Sergeant Poulin, medical technician and Sergeant Langston, crew chief. A small Korean boy, critically injured in a traffic accident, was attended on the flight by Captain Gabel and Sergeant Poulin. Lieutenant Hogan was RCC; Captain Pinaud, copilot, and Sergeant Langston, crew chief. Another Korean child, the victim of a similar accident, was flown in an HH-43B piloted by Captain Pinaud. Captain Malkiewicz was copilot and Airman Marsh, crew chief. Captain Gabel and Sergeant Poulin attended the child. A Korean suffering from a gunshot wound was taken to the hospital in a HUSKIE piloted by Lieutenant Hogan. Captain Trainer was copilot and medical aid was given by Capt Tom Sakoda, MD, and Sergeant Poulin.

● Detachment 4 was host to the Surgeon General of the Korean Air Force and his staff. Captain Schaetzle briefed them on the ARS mission and the HUSKIE. The guests were taken on helicopter flights afterward.

GENERAL INSPECTS—— On his visit to Far East rescue units, BrigGen Adriel N. Williams, ARS commander, was escorted through Japan and Korea by LtCol Robert L. Dyberg, commander of the 36th ARS at Tachikawa AB. While at Osan, General Williams met Det 4 personnel and toured the unit's facilities. He is shown inspecting the alert HH-43B with Capt M. L. Trainer, detachment commander, and Colonel Dyberg. In second photo, General Williams meets the alert crew. Left to right are General Williams, Capt W. A. Malkiewicz, RCC; A2c C. E. Fettinger, crew chief; A1c R. E. Johnson and A2c J. R. Capper, firefighters. (USAF photos)



CEREMONY IN SPAIN——— Capt D. M. Randall, commander of Det 7, AARC, Torrejon AB, Spain, is greeted by detachment personnel and R. L. Lambert, KAC field service representative, after logging 1000th hour in Kaman helicopters. Captain Randall lays claim to being the first HH-43B pilot in the European Theatre to reach this milestone. He has been flying in the HUSKIES since 1960 when he participated in the flight test program at Edwards AFB, Calif. Shown are, left to right, A2c C. B. Shomake, SSgt R. Garza, TSgt H. F. Alford, A1c P. R. Martin, 1stLt K. E. Ernest, Mr. Lambert, A1c C. C. Sealey, A1c A. R. Battaini, SSgt R. L. Minnich and SMSgt C. L. Cloud. (USAF photo)

HH-43B's Mountain Rescue

Two HH-43B's from Stead AFB, Nev., played a major role in rescuing the occupants of a civilian Cessna 182 which crashed high in the rugged mountain country near Mono Lake, Calif. Also taking part in the search was another HUSKIE from Det 12, WARC, George AFB, Calif., and a UH-16 from Hamilton AFB, Calif.

In one Stead HH-43B were Capt W. L. Henderson, mission commander; Lt R. J. McGeechan, copilot; SSgt C. E. Baker, crewchief; and Capt D. R. Olson, flight surgeon. In the second HH-43B were Capt L. P. Anatrella, pilot; Capt R. H. Finley, copilot; SSgt E. E. Hawley, crewchief; and SSgt C. D. Lewis, medical technician. Manning the HUSKIE from George AFB were Capt Ray Lefevre, RCC; 1stLt Jim Crabbe, copilot; SSgt Charles Butcher, crewchief; and SSgt Truman Kilburn, medical technician.

The wreckage of the plane was spotted by Captain Anatrella. The almost white Cessna lay in deep snow at the 11,000-foot level of a 12,250-foot peak.

It was decided to first land the helicopter with the doctor aboard, so Captain Finley dropped smoke grenades to aid Captain Henderson and Lieutenant McGeechan in making the approach. They landed on the steep slope within 50 yards of the crash site. As they began removing snow and attending the survivors, the other HUSKIE dropped blankets, snow shoes and survival gear and also acted in a liaison capacity. Later the HH-43B from George AFB landed farther down the slope to give aid and shortly afterward the second Stead helicopter set down beside the first. Snow, three to six feet deep, made the operation extremely difficult. One of the survivors was ambulatory, but Doctor Olson labored over the other two much more seriously injured survivors for long hours in the cramped space of the Cessna's cabin before they were ready for evacuation. Six men were required to move one man with a possible fractured spine from the plane's cabin to a Stokes litter. After this delicate task they began the painfully slow job of moving the litter patients through the deep snow to the HH-43B's. The Stead helicopters evacuated the survivors to an airport where they were transferred to a waiting aircraft. Doctor Olson accompanied them on the flight to Reno.

Det 14 Fights Highway Fire

Latest example of ARS adaptability to unusual situations comes from Florida where HH-43B personnel attached to Det 14, EARC, MacDill AFB, answered a call for assistance from the Florida Forestry Service and ended up fighting a fuel truck fire on the highway.

Det 14 swung into action after the truck, loaded with 7,700 gallons of fuel, collided with a pickup hauling farm produce on Interstate Highway Four near Plant City. Forestry men in the area, seeing the roaring gasoline fire that resulted, called MacDill and asked that a crash truck of the type used to fight aircraft fires on the base be dispatched. MacDill officials decided this would be too slow and sent two HH-43B's instead. Aboard the first HUSKIE were Capt Guy S. Hahn, RCC; A1c Leonard C. Shea and A1c Kenneth Myers, firefighters; and SSgt Delmar R. Smith, medic. In the second HUSKIE, which left five minutes later, were Capt Carl G. Layman, RCC; Capt Waino E. Arvo Jr., copilot; A3c Andrew C. Paparella, helicopter mechanic; and SSgt Nelson Turkovsky, fireman.

Reaching the accident scene, the HUSKIE crew found a wide variety of civil firefighting equipment gathering and firemen and volunteers working to keep the fire from spreading. They were unable to fight the blaze itself, however, because of its intensity and the tremendous heat. The firemen from the HH-43B quickly evaluated the situation and decided to use the rotor downwash of the hovering chopper to open a path through the flames and to cool the metal of the tank truck so as to lessen the chance of an explosion. The silver-clad firefighters quickly made their way to the center of the fire and within minutes had it under control. Civilian firemen standing by were then able to use their equipment to cool the twisted smouldering metal. Both trucks were partially melted from the intense heat of the burning gasoline. The driver of the vehicle had escaped injury but the occupant of the pickup died in the crash.

Huskie Happenings

...Two HH-43B crews from Det 12, WARC, George AFB, Calif., make mountain ridge landings at more than 12,200 feet in what are believed to be "firsts" at this altitude in the United States. Landings made to identify and evacuate personnel aboard Navy C-45 which struck mountain near Mt Whitney while enroute to China Lake NAF, Calif. HH-43B's land in rocky area just below wreckage. Aboard one HUSKIE are Capt David E. Longnecker, RCC; Lt Jim Crabbe, copilot; SSgt Charles Butcher, crew chief; and SSgt Truman Kilburn, medical technician. Aboard second HH-43B are Capt Jack D. Peak, RCC; Capt Conrad Badger, copilot; A1c Alexander Montgomery, crew chief; and two passengers from China Lake NAF.

...HH-43B crew attached to Det 4, 36th ARS, Osan AB, Korea, scrambles when F-105 crashes during night landing and bursts into flame. HUSKIE over aircraft in 90 seconds, firemen use FSK, disarming tool and ladder to remove pilot while helicopter utilizes rotor wash to blow fire aft of cockpit. Entire procedure carried out with split second timing and efficiency but pilot did not survive crash. Capt Stanley O. Schaetzle, RCC; 1stLt Walter E. Hogan, copilot; A1c Raymond O. Groll, A2c Lonnie W. Bunting, firemen; and A1c Keith R. Holder, medic....Det 5, AARC, Hahn AB, Germany, deploys two HH-43B's to Scotland to aid in search for missing F-102....HH-43B crew from Det 4, Ramstein AB, Germany, scrambles after Canadian F-104 pilot bails out 16 miles from base. Locates pilot, who suffered minor cuts, and delivers him to hospital. Capt William J. Murphy, RCC; SSgt Thomas Nesko, medic; A1c Billy E. Slaughter, crew chief; SSgt Harry McAllister and A1c Wayne Mote, firemen.

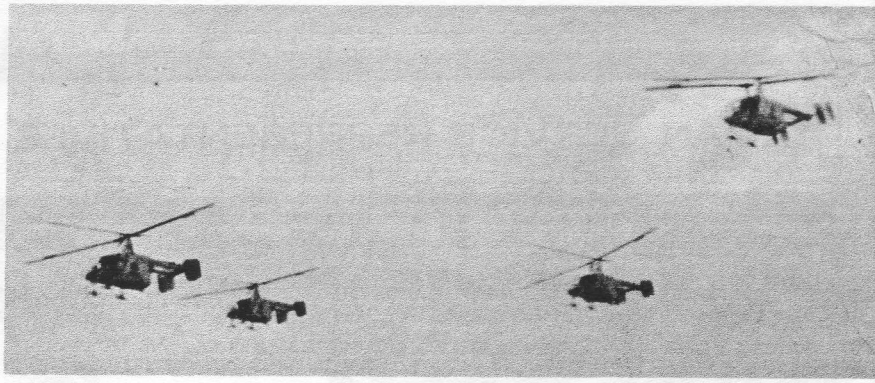
...HH-43B crew from Det 4, WARC, Paine Field, Wash., rescues lost 11-year-old boy from 6000-foot mountain side while hovering between cliff and 100-foot trees. Hover established 75 feet from ground as rotor tips clear cliff and trees by less than 10 feet. Survivor and member of ground party hoisted aboard, chopper executes rearward takeoff because of tight area. HUSKIE lands in schoolyard later and boy given immediate medical attention. Earlier, in order to reach rescue site, chopper flew through heavy overcast, was forced down twice and finally "made it," by going on top of overcast, finding a hole and then dropping through. Capt Robert D. McDougal was pilot of the HH-43B; Lt Karl G. King, copilot; SSgt George A. Cronk, crew chief; A2c William A. Shook, medical technician.

...HUSKIE from Det 84, TUSLOG, Incirlik AB, Turkey, flies doctors, nurses and medical supplies to four isolated Turkish villages where measles epidemic has caused 28 deaths. Capt Robert C. Collom is RCC and 1stLt David L. Wiest, copilot, on the missions....For second consecutive year, Det 5, CARC, K.I.Sawyer AFB, Mich., receives MATS Safety Award for maintaining zero accident rate throughout 1963 while flying in HH-43B's. ...Two crewmen who survived a Navy plane crash near Calverton, L.I., rescued by HH-43B from Det 5, EARC, Suffolk County AFB, N.Y. Quick response to emergency credited with saving lives of survivors. Aboard HUSKIE are Capt Arthur Kwitkowski and Lt Charles Mayes, pilot and copilot; TSgt Alvin C. Reed, crew chief; Capt James Fisk, Md, and A1c Barry Emmons, medic.

...HH-43B crew from Det 3, AARC, Toul AB, France, on training mission, switches to search after report received of ejection from disabled aircraft. Using dead reckoning, proceeds to bailout area 30 miles away and locates downed pilot, RCAF flight leader. Returns him to base. HUSKIE crew consists of Capt Ervin L. Schaefer, IP; Capt James R. Lisko, pilot; SSgt Maurice D. Stagers, crew chief; TSgt James Arnold, medic; and SSgt Milton Boyd and A1c Joseph Longworth, firefighters. Three hours later detachment joins in search for French Air Force jet fighter. Burning aircraft found and HUSKIE crew determines pilot, found later, not in aircraft. Aboard HH-43B are Captain Lisko, pilot; TSgt Albert Lee, crew chief; SSgt Charles McNeil and SSgt Bobby Hudson, firefighters.

SECOND HUSKIE PASSES 1,000———Crewmen and maintenance men of Det 5, WARC, at McChord AFB, Wash., are congratulated by their commander, Capt E. A. Henningson after second detachment HUSKIE passes 1,000-hour mark. HUSKIE number three is scheduled to "hit 1,000" soon. Left to right are A3c G. O. Lepsey, A1c M. L. Gentzler, SSgt J. F. Glenn, Capt Warren Davis, TSgt Eddie Hagerman, A2c Gene Sellers (half hidden), SMSgt H. J. Luty, Capt H. A. Solberg, A1c Gerald Twiggs, A1c G. E. Lynn, SSgt H. M. Lord, and Captain Henningson. (USAF photo)

BURMA DRILL——An 1800-pound field gun is transported by a Burmese Air Force HH-43B during practice.



THAI FLY-BY—— HH-43 assigned to the 63rd Sqdn, 6th Wing, Royal Thai Air Force, fly over base in formation.

SCROLL OF HONOR——Four members of the 58th Air Rescue Squadron, Wheelus AB, Libya, have received Kaman Scrolls of Honor for the rescue of a Libyan seaman. Displaying their awards are A1c J. B. Henley, medic; and A2c A. R. Henderson, firefighter. Other recipients, not shown, are Capt J. A. Simmons, pilot of the HH-43B, and A1c Bernice Gardner, firefighter. With Henley and Henderson are, left to right, Capt A. E. Hooper, flight commander; LtCol W. M. McDonald, squadron commander; and R. I. Wilson, KAC field service representative. (USAF photo)

GERMANS BRIEFED—— Capt J. A. Crupper, left, commander, Det 10, AARC, at Aviano AB, Italy, and Capt H. A. Jones, explain HH-43B's operational capabilities to German newsmen who toured the NATO base as USAF guests. A briefing by Captain Crupper was followed by a static display and an airborne fire-fighting demonstration by the chopper crew. (USAF photo)

HITS 1,000 ON MISSION——While on a mission to pick up the pilot of an F-100 who bailed out, this HH-43B from Det 15, WARC, Luke AFB, Ariz., passed the 1000 flight-hour mark. Shown at "log-checking" ceremony afterward are, left to right, Capt H. D. Salem, maintenance officer; Capt C. R. Kay, detachment commander; CMSgt G. E. Moore, maintenance NCOIC; and SSgt K. R. Hughes, crew chief of the HUSKIE. (USAF photo)

SPANISH COMMANDER MEETS HUSKIE——Colonel Llosa, commander of Zaragoza AB, Spain, examines bear paws on HH-43B as R. L. Lambert, KAC field service representative, explains their use. Watching is Capt F. W. Schnee, commander of Det 8, AARC, stationed at the base. Captain Schnee later took the colonel on an aerial tour of the base. (USAF photo)

GRACIOUS LADY——Det 14, EARC, MacDill AFB, Fla., was included in a visit to the base by Mrs. Leslie MacDill. The base was named after her husband, the late Col Leslie MacDill, killed in an aircraft crash in 1938. Shown is Mrs. MacDill, beside HH-43B, and her grandchildren. In second photo, Capt H. A. Lee, detachment commander, aids another grandchild trying the rescue hoist "for size." Capt C. G. Layman, Capt W. E. Arvo, Jr., SSgt Perrin and A1c Tasker also demonstrated a scramble takeoff in the HUSKIE and, after a rescue hoist pickup, Captain Layman showed the HH-43B's performance capabilities. (USAF photos)

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