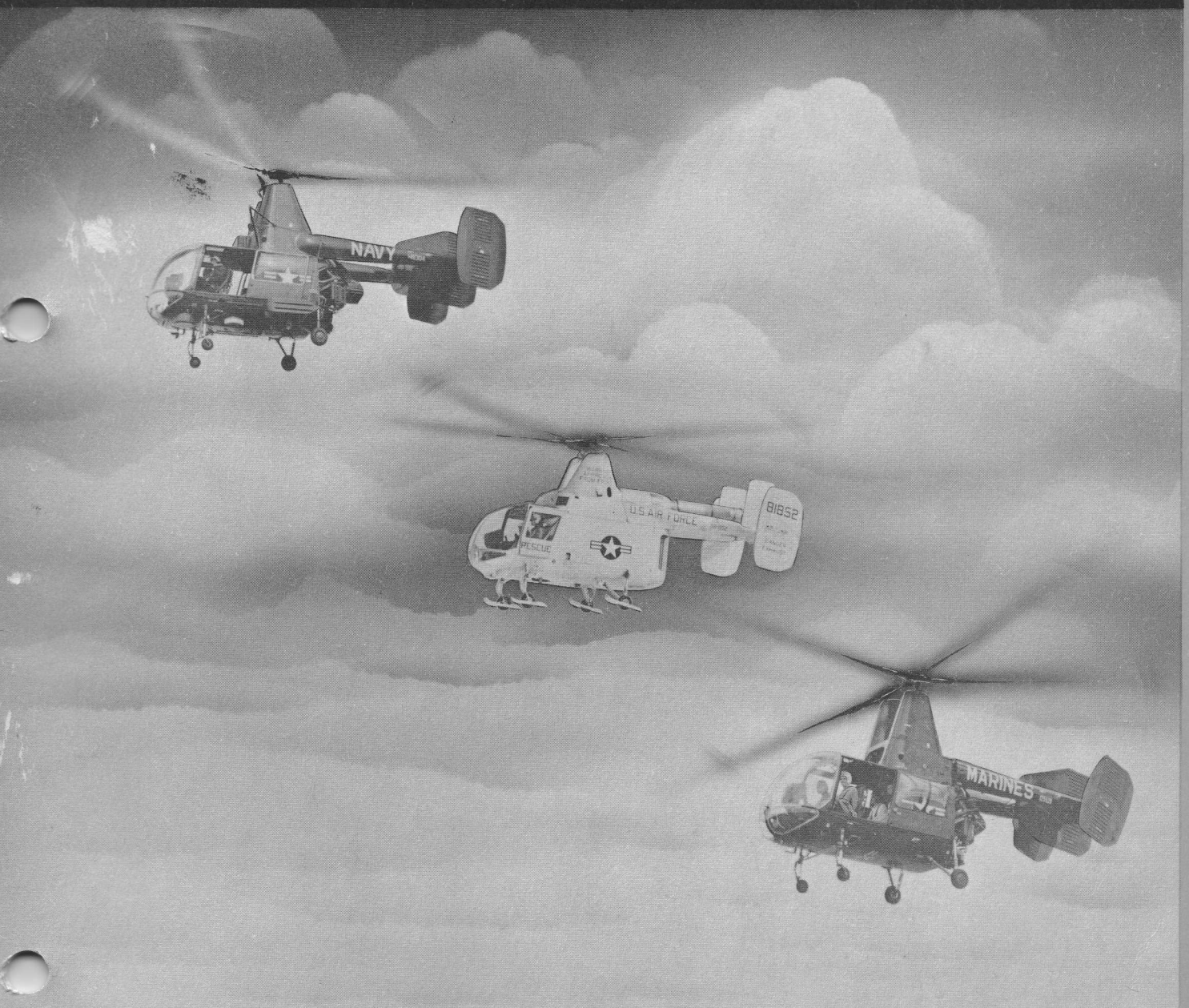
KAMAN

Rotor Tips

ISSUE NO. 1 APRIL 1960



THE KAMAN AIRCRAFT CORPORATION

PIONEERS IN TURBINE POWERED HELICOPTERS

KAMAN

Rotor Tips

APRIL 1960

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

IN THIS ISSUE

THE COVER

Kaman Aircraft is well represented in the Armed Services. Shown are the HUK-1, Navy; H-43B, Air Force, and HOK-1, Marine Corps.

PLEASE SHARE THIS COPY

CHARLES H. KAMAN

THE KAMAN AIRCRAFT CORPORATION
BLOOMFIELD, CONNECTICUT

OFFICE OF THE PRESIDENT

April, 1960

Dear Reader:

There was a time, in the earlier history of Kaman Aircraft Corporation, when I was privileged to know personally almost everyone in the military who used our product. In recent times, however, our company has had the good fortune of increasing its programs with the Armed Forces and along with this has come greatly increased managerial responsibilities. We have all grown to reluctantly realize that it is no longer possible for any one individual to maintain the earlier degree of personal association.

With this realization, we all welcome the opportunity to say "hello" to you in this first issue of Rotor Tips. We hope this publication will serve our mutual interests in continuing and expanding the closest possible working relationship, particularly with those who maintain or fly our various helicopters. It is our intention to present a variety of information based on operational and maintenance experience with the sincere hope that you will find it of value in your present and future programs.

May I add that we will welcome suggestions and ideas from everyone. Particularly sought are letters from individual Air Force, Navy and Marine pilots and mechanics, for they have accumulated a vast fund of practical knowledge which Rotor Tips would like the opportunity to publish when possible. Presenting this information will, I'm sure, be of mutual benefit to you and Kaman Aircraft.

Rotor Tips is dedicated to your service.

Sincerely,

Charles H. Kaman

Charles H. Kaman

FACILITIES AT BLOOMFIELD, CONN. — In foreground is the main plant while the test and development hangar and flight test rigs are on the right. In the rear of the picture are the flight test buildings, soon to be expanded, and the Engineering and Administration Building.

Kaman Aircraft - 1960

The Kaman Aircraft Corporation (Kaman rhymes with Japan) is the largest independent manufacturer of helicopters in the United States. The firm employs 3,300 persons and sales last year amounted to $34,747,453.

The aircraft which the Bloomfield, Conn., plant produces may be found at military installations and on naval ships all over the world. Kaman has helicopters in service with three branches of the Armed Forces: HOK-1s in this country and overseas with the United States Marine Corps; HUK-1s with the United States Navy, operating from shore installations and with the fleet; and H-43As, with fire-fighting capabilities on local base rescue duty at United States Air Force bases.

H-43Bs (HUSKIES) now coming off the production line are being delivered to the Air Force. It was one of these craft piloted by Air Force Capt. Walter J. Hodgson of the Flight Test Center at Edwards Air Force Base, which recently established an official world altitude record for its class by climbing to almost 30,000 feet. Maj. William J. Davis, project officer on the H-43B development project, was co-pilot on the record-breaking flight which was performed in a standard 'copter off the production line.

The newest aircraft which Kaman has designed for Navy use is the HU2K-1 (SEASPRITE), a high-speed, utility helicopter which was shown publicly for the first time a short while ago. A $14,000,000 contract for these helicopters has been awarded to the firm by the Bureau of Naval Weapons.

Kaman Aircraft is also presently engaged in ex-

NEXT MONTH: *Meet the Air Force HUSKIE!*

tensive research and development work which includes VTOL (Vertical Take-off and Landing Aircraft) and electronic devices. In addition to producing helicopters, Kaman Aircraft is or has, engaged in sub-contract work for such companies as Martin, Grumman, Trane, Raytheon and McDonnell.

Last year Kaman Aircraft became the first major helicopter manufacturer to convert to 100 per cent turbine helicopter production. The company is the only manufacturer producing gas turbine helicopters for the Air Force and is also the only company with contracts to produce two different types of turbine helicopters for two branches of the Armed Forces.

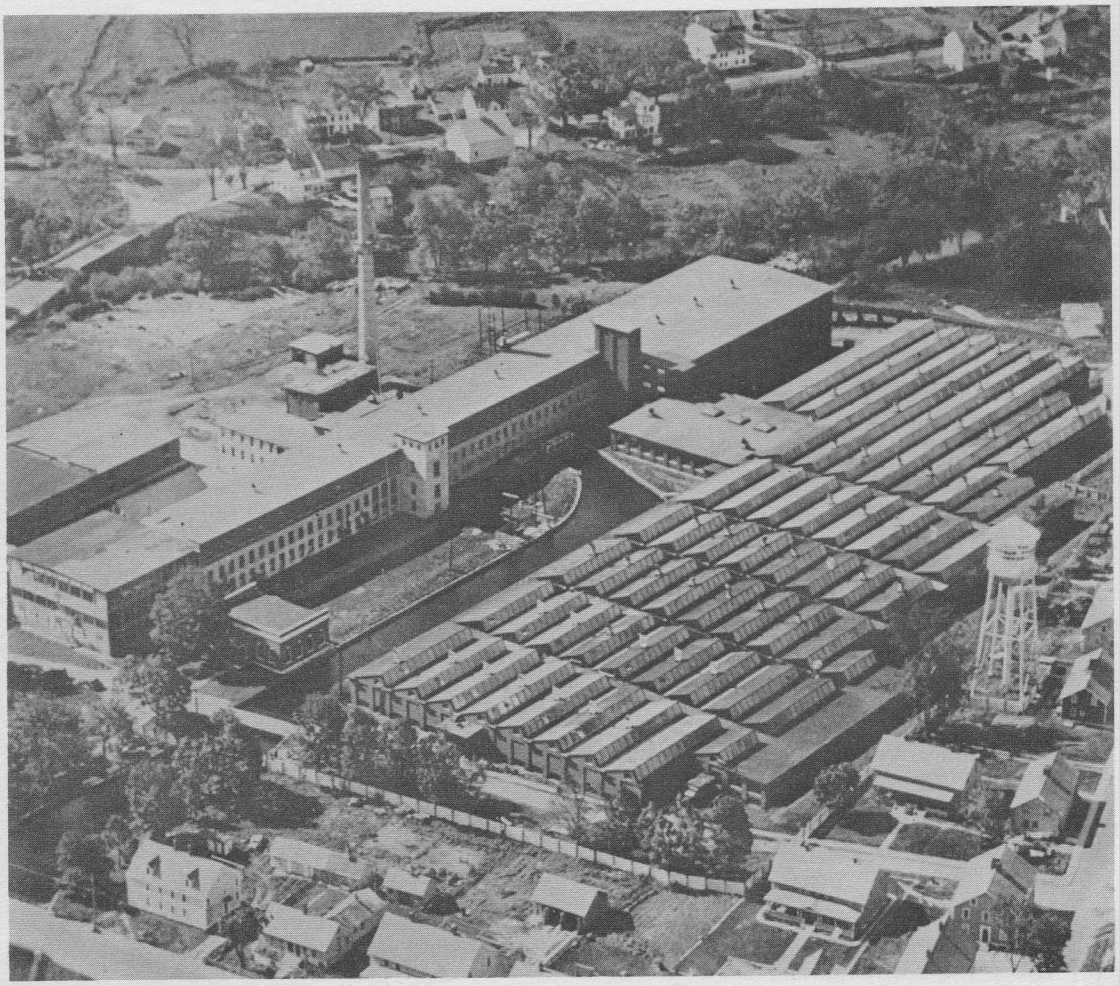
Kaman production installations now have a combined square footage of 746,645 square feet and are spread through several different locations in Connecticut. The main plant is in Bloomfield while others are in Hartford, Suffield, Bradley Field and Moosup. There is also a company subsidiary, Kaman Nuclear, in Colorado Springs, Colorado, which is engaged in weapon system analysis, missile and space technology, and similar research involving military and industrial problems of a broad and basic nature.

For example, under a Navy Bureau of Ordnance contract, the Division is analyzing all possible countermeasures that might conceivably be employed against a re-entry body. The study includes self-induced countermeasures and natural or other inadvertent countermeasures, as well as those that might be used by a potential enemy.

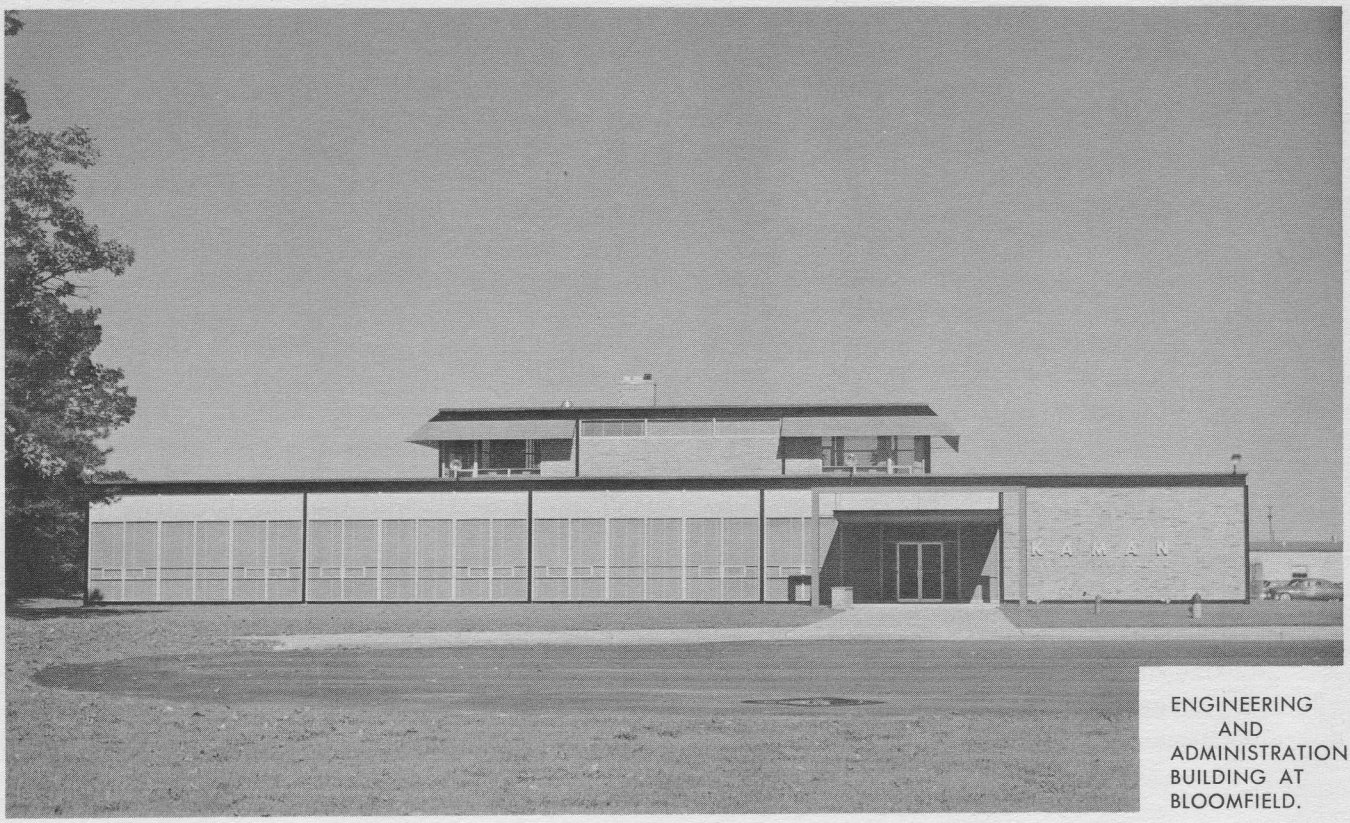
Kaman Aircraft has established many aeronautic "firsts" during its 15-year history.

About 10 years ago the company began looking forward to the day when gas turbine engines, suitable for helicopter use, would be developed and made available. Kaman was convinced the gas turbines would be the helicopter engine of the future since they are lighter, simpler, smaller and have other operating characteristics that make them much more suitable as helicopter power plants.

At approximately the same time, Boeing Airplane Co. developed a small 190-horsepower turbine for use in land and water vehicles. Working with the Boeing engineers, Kaman won a Navy-sponsored competition for a program of design, flight



KAMAN AIRCRAFT'S PLANT AT MOOSUP, CONN.



ENGINEERING AND ADMINISTRATION BUILDING AT BLOOMFIELD.

evaluation and study in 1951. A Kaman K-225, powered by a Boeing 502, took off on its first flight at Bradley Field, Windsor Locks, Conn., that year making history as the world's first gas turbine-powered helicopter.

Three years later, the company modified an HTK-1 (K240) helicopter by installing twin turbines, which was also a world's first, and then, in 1956, Kaman and Lycoming engineers achieved still another first with the initial flight of a helicopter with a gas turbine designed specifically as a helicopter power plant. This was the T-53 turbine which was installed in a Kaman HOK-1. This turbine-powered aircraft was the forerunner of Kaman's new H-43B Air Force helicopter.

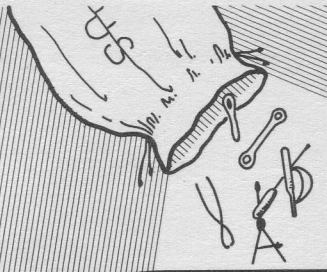
Founder, and now president and general manager of Kaman Aircraft, is Charles H. Kaman. A graduate of Catholic University in Washington, D.C., with a degree magna cum laude in aeronautical engineering, Kaman was 26 when the company was formed in 1946 to develop the ideas of a radically new and different kind of helicopter which he had formulated.

The principal difference between the aircraft Kaman designed and still manufactures and conventional helicopters are the "servo flaps" which are mounted on the rotor blades of the Kaman craft. Most of the helicopters made by Kaman also have intermeshing rotor blades.

In most 'copters rotor control calls for considerable and constant activity on the part of the pilot. Kaman's idea was to let the forces of the air do much of the work involved. He attached a small secondary, or "servo" flap to the rotor blade which could be trimmed by fingertip control in the cockpit. The airstream acting on the flap, as it was adjusted by the pilot, moved the whole blade in the

(Continued on page 13)

HU2K-1 — The U.S. Navy's new high speed, all-weather helicopter. The aircraft is powered by a T-58 Turbine Engine.



MAINTENANCE MAILBAG

Dear Joe,

Sorry to hear about you frost bit nose but that will teach you not to go sticking it in every igloo you pass just because you heard a rumor that some Eskimo glamour girl was looking for a partner on a blubber-hunting expedition. How long you been up there, anyway?

Anyway, in answer to your question about the sluggishness in the oil pressure gages and transmitters on your choppers because of the cold weather, we used to fill the pressure line from the engine to the instrument with MIL-O-6081, Grade 1010, or low temperature oil, MIL-L-7870. This light oil mixes very slowly with the engine oil and one filling will be good for 60 to 90 days of operation. If they start to get sluggish again, just add more oil. NavAer 05-10, Sept. 3, 1959, from BuWeps gives all the dope.

Got anymore problems, let me know. I think we ran into just about everything while I was up there including a polar bear that thought the crew chief was his mother.

Your friend,
Flaps

Dear Robbie,

Well it was a good leave but in a way I'm kinda glad to be back, especially as all my money was gone anyway. Oley, the kid I told you about is back too and I guess those people in his home town in Oregon were glad to see him go, especially the taxi company. I haven't got the whole story yet but I do know there was some sort of beef about him trying to get a horse into a cab. It was O.K. with the horse but the taxi driver got all shook up. Oley always did have a kind heart, especially with animals.

While I think of it, be careful when you tie down the rotor blades on your 'copter. The other day one of the boys in my crew used manila line and must have lashed it pretty tight. It rained during the night and that line took up and bent one of the blades down so much it looked like a Chinese crossbow with the bends. We had to work a couple of hours extra to change it.

Guess that's all for now. Will let you know how Oley makes out. I understand those taxi people want $25 from him for cleaning the upholstery in the cab. The horse got excited or something. Probably thought he'd get stuck for the fare.

Bill

More From Les . . .

Each month in this column, C. L. Morris, Assistant Vice President-Field Service Manager, reports on a subject in which particular interest has been shown.

Following an azimuth collective spindle bearing failure in an HOK last May, much information aimed at preventing a similar occurrence has been circulated in various forms. However, a brief summation may also be of help in understanding the situation.

There are two azimuth collective spindle bearings in each aircraft, one in the right-hand, the other in the left-hand spindle. These bearings transmit the collective control motions from the non-rotating to the rotating control system. They were developed for this application only after successfully completing an exhaustive series of tests.

Also, in accordance with good design practice, a "fail safe" washer was incorporated in the original installation so that if the primary bearing should fail for any reason, the failure would immediately become apparent. In the meantime the washer would carry the operating loads for several hours while trouble shooting was accomplished. This sequence actually did occur in the May failure, and trouble-shooting steps were in process when the safe-guard washer itself finally failed after eight hours of operation.

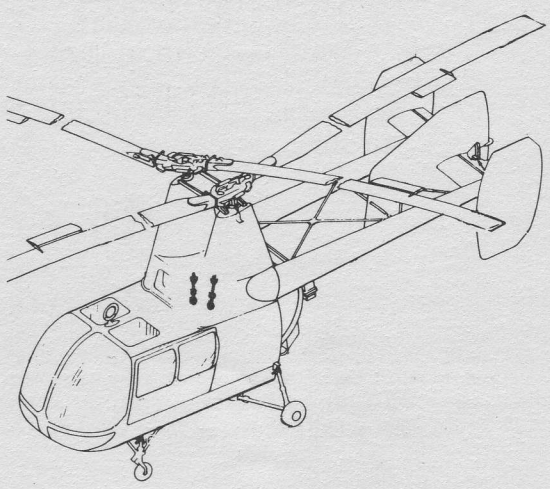
While the primary cause of the failure was attributed to probable lack of lubrication, there were various other possible contributory factors which were also considered and became the subject of continued research by Kaman engineers. This research has led to the installation of additional refinements which are explained below. The aircraft handbooks were also revised to incorporate explicit trouble-shooting instructions so that minimum time would elapse before a bearing failure would be recognized and located. Strong re-emphasis was placed on the need for adequate lubrication; and instructions were also issued to establish a specific method of checking the bearing condition.

The company continued to study bearings returned after service use, and shortly the evidence indicated the possibility of defective material in some bearings. In August, a campaign was initiated which utilized several Company teams to accomplish a 100% change of spindle bearings in Kaman aircraft operating throughout the world.

Desiring to further reduce the loads on the thrust bearing, the Company has developed a so-called

(Continued on page 12)

LOCATION
Azimuth Spindle Assembly



TRAINING

FIRST H-43B MAINTENANCE CLASS — Left to Right Front Row — S/SGT. Forest W. Farley, Sen. M/SGT. Dwight B. Sexton, Mr. Harlan E. Kenyon. Rear Row — Capt. Phillip E. Maggart, S/SGTs Gerald E. Doyle, Carroll D. Jones, Garvin T. Smith, Mr. Richard H. Maxwell.

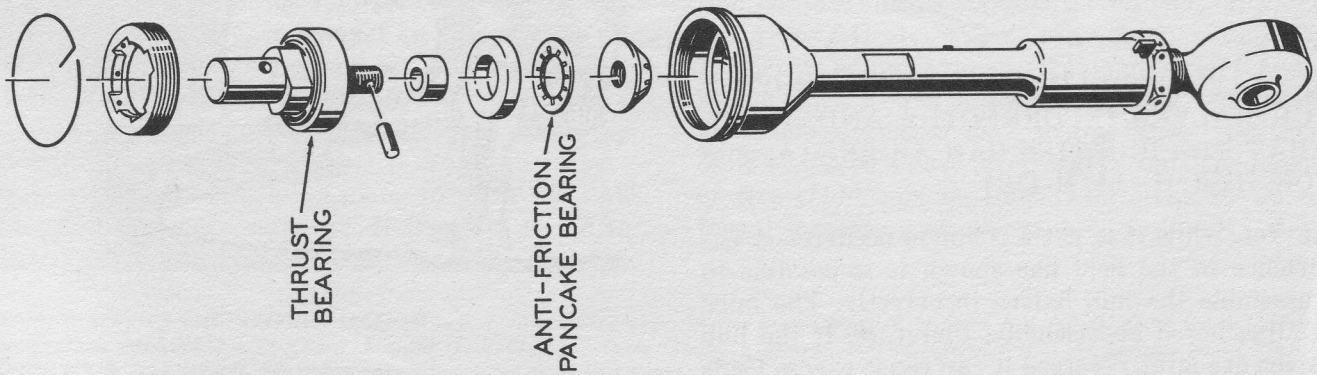
Personnel from Sheppard and Stead Air Force Bases recently completed the first H-43B Helicopter Maintenance and formal Pilot Classes at the Kaman Aircraft Corporation main plant in Bloomfield, Conn.

Included in the maintenance class were four instructors from Sheppard AFB, S/SGT Forest W. Farley, Harlan E. Kenyon, Richard H. Maxwell and Sen. M/SGT Dwight B. Sexton. They will instruct additional personnel in the H-43B mechanic school at Sheppard.

Capt. Phillip Maggart, who attended this course, will be responsible for academic training of student pilots at Stead AFB. S/SGT's Gerald D. Doyle, Carroll D. Jones and Garvin T. Smith, who also attended the course, will be responsible for maintaining the aircraft at the Stead AFB School.

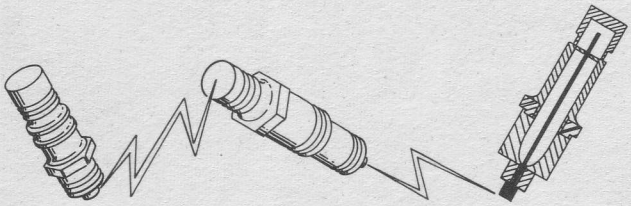
Attending the pilot training class on the H-43B were Maj. James M.Hamill, 1st.Lt. Angelo Pullara, and Capt. Walter T. Leslie. Major Hamill, commanding officer of the 3638 Flying Training Squadron at Stead AFB, has the responsibility of all Air Force helicopter training at that base. Lt. Pullara is a helicopter instructor who will train Air Force pilots at Stead. Capt. Leslie is the helicopter quality control pilot.

EXPLODED VIEW
Azimuth Spindle Assembly



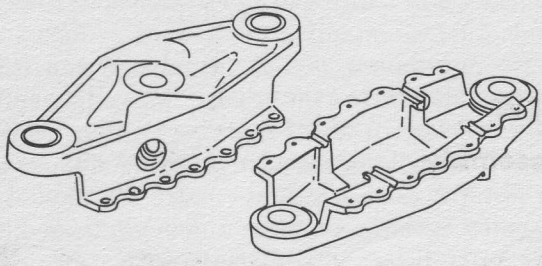
Q's AND A's

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.



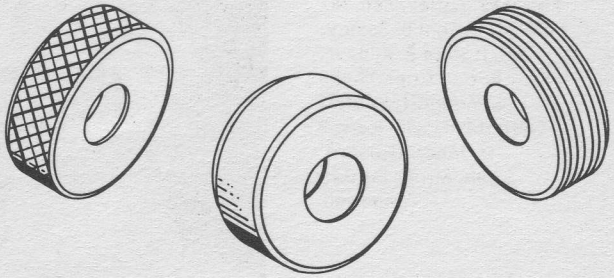
Q. SHOULD SPARK PLUGS WHICH ARE FOUND TO BE LOOSE IN CYLINDERS BE REPLACED OR IS IT O.K. TO RETORQUE THEM? (Applies HOK-HUK-H43A)

A. Spark plugs should be replaced if they are found to be loose. I could find no T.O. that states this but unless you can be absolutely sure the plug is all right, I would not retorque it. If the plug was loose during engine operation, it has been subjected to pounding and vibration. The only sure way to prove the plug is all right is to send it through bomb test. If it passes this test, then, yes, you may reinstall it. — *R. C.*



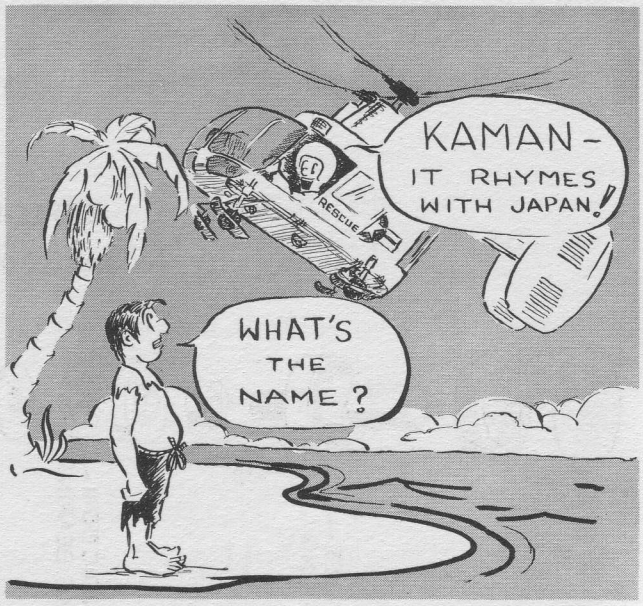
Q. IS IT POSSIBLE TO ASSEMBLE ROTOR HUB HALVES INCORRECTLY AND, IF SO, WHAT DIFFICULTIES CAN ARISE? (Applies HOK, HUK, H-43A, H-43B)

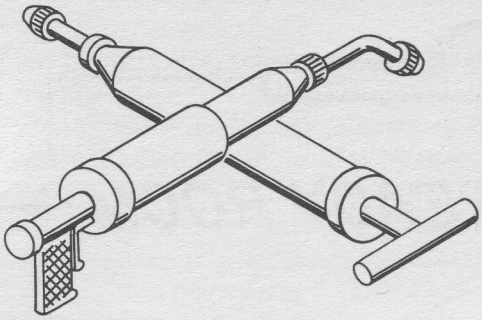
A. Yes, while it is not a common occurrence, experience in the field has shown it is possible to reassemble the hub halves incorrectly. The hubs are line bored at assembly, therefore, if the hub halves are later reversed it can cause excess loads in the lag pin boss area. Also, the "L" crank pivot holes are line bored at assembly and they can also be misaligned if the hub is incorrectly assembled. The next revision of the hub overhaul handbook will contain a caution to line up the scribed index numbers on each hub flange after overhaul. In addition, a dowel pin is now being installed in the new hubs being produced. This pin prevents the halves from being assembled unless they are lined up correctly. — *C. N.*



Q. BOTH SMOOTH AND THREADED TIRES HAVE BEEN RECEIVED UNDER FEDERAL STOCK NO. R-2620-269-7556-Y120. IS IT ALL RIGHT TO USE BOTH TYPES? (Applies HOK & HUK)

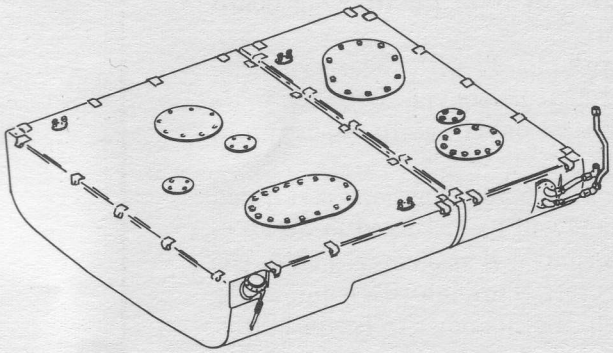
A. It has been determined that it is permissible to use either the smooth or tread tires. BuWeps personnel also feel that this point is not significant on helicopters. — *D. G.*





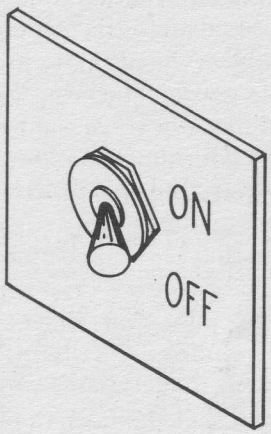
Q. IN THE EVENT THAT AN OPERATING ACTIVITY LOSES OR NEEDS MORE OF THE SHAFER N-2 OR ALEMITE 314150 GREASE GUN NOZZLES, WHAT ARE THE CORRECT STOCK NUMBERS?

A. ASO Stock No. R41-N-725, Fed. Stock No. R4930-300-8596-S231.



Q. IS IT POSSIBLE, ESPECIALLY AT OVERSEAS BASES WHERE SUPPLY PROBLEMS ARE MULTIPLIED, TO USE A FUEL CELL EVEN THOUGH THE NUTS THAT ARE MOULDED INTO THE RUBBER CELL ARE FOUND TO BE CORRODED WHEN THE CELL IS READY FOR INSTALLATION? (Applies HOK, HUK, H-43A, H-43B)

A. The cell may be used if the corrosion can be removed. Naturally, care must be taken when removing corrosion to prevent damage to the cell itself. I suggest a small wire brush, similar to a typewriter brush, for cleaning the nuts. After the cleaning process is completed a thorough inspection of the nuts should be made to make sure all corrosion has been removed. If they are found to be satisfactory, Alodine 1200 solution should then be applied, either with a brush or spray gun. Incidentally, it is a good idea to check the manufacturing date on the tank. The manufacturer (Goodyear) says fuel cells may be initially installed in an aircraft up to a total of two (2) years after fabrication. Once the cell is installed there is no limit on its life. The two-year limitation is set because a cell will take a permanent set and/or shape whenever stored for this length of time. This set and/or shape may be different than it would be when the cell was installed in an aircraft. This might cause wear on the cell by the adjacent structures and result in leakage. Refer to Spec. MIL-T-5578, which is what Kaman Aircraft goes by concerning the above limitations. Final decision is, of course, up to the engineering officer or similar authority. — *R. C.*



Q. IS IT POSSIBLE TO START THE ENGINE WITH THE FUEL SWITCH OFF? IF SO, WILL THIS HAVE A DETRIMENTAL EFFECT ON THE ENGINE? (Applies H-43B)

A. Yes, the engine can be started with the switch off, in fact there is even a possibility the aircraft might become airborne before the engine quit due to lack of fuel. In addition, the engine should never be run with the fuel switch in the off position because this also closes the oil shut off valve. Refer to T.O. 1H-43B-2, page 3-19, para. 3-21. When this happens the small amount of oil trapped in the lines would be cycled through the engine and then scavenged back to the tank, from then on it would be a case of oil starvation. The effects of this could only be fully determined by an internal inspection at overhaul. — *T. C.*

KAMAN SERVICE ENGINEERING SECTION — *R. J. Myer, Supervisor, Service Engineering; H. N. Rose, E. J. Polaski, G. S. Garte, Assistant Supervisors.* **ANALYSTS** — *Roy Berg, Richard (Ted) Chaapel, Dave Godbout, Wayne Jenkins, Chuck Nolin, Al Savard, Norm Warner, Loring Lynes, Ross Wynott, Bill Wagemaker, Frank Bober, Robert Krans.*

REPORT FROM THE READY ROOM

This being the first column on the Ready Room, it will be most appropriate to introduce the function of Kaman Aircraft's pilot staff and how its activities dovetail with several other departments.

The primary function is to establish and evaluate the flight characteristics of the Kaman aircraft by exhaustive testing under many different conditions. During these flight tests, the pilot's duties may vary anywhere from evaluating the location of a new switch to collecting data on the performance and stability or structural soundness of the product.

The information thus accumulated by the pilots, and their recommendations, is passed on to the test engineers and Engineering Department whose goal is to establish the ultimate in flight and performance characteristics in the aircraft. This pilot-engineering team works with the aircraft from the drawing board and mockup stage right through its service tour.

In addition, the pilots are called upon to work closely with the Service Department. In this function, with service department personnel, they help write flight manuals, train customer pilots and visit operational bases to discuss problems that may come up in the field.

The above is a brief rundown on only a few of the many functions performed by the pilot staff. Each of these and many others will be discussed in detail in future informal writeups to come. These discussions will also cover each of the current models being produced by Kaman Aircraft. Through this column it is hoped that the Kaman pilots will be able to help the customer to better understand our company and our products.

W. R. Murray
Vice President,
Flight Test Operations.

More From Les . . . *(continued from page 8)*

"unloading springs" installation which extends the life of the bearing by some 400%. Also, to reduce the frictional wear of the fail-safe device, an anti-friction "pancake" type bearing is available for installation in place of the earlier washer. If by some extremely remote circumstance a primary bearing and its pancake fail-safe should both fail, there is still a frictional fail-safe feature below the pancake bearing.

Inasmuch as it may be desired from time to time to check the axial play in the spindle bearing assembly, the company is designing a device to simplify the process. The method now described in the handbooks is adequate but more time-consuming.

The Service Dept. has also prepared a "pigeon-band" label that can be installed around the spindle to draw attention to the grease fitting. This is being offered for optional use at local operating bases. Thus a chain of safety devices is now available so that in combination with the reduced operating loads, there will never be a repetition of the May azimuth spindle bearing failure.

KAMAN AIRCRAFT — 1960 *(continued from page 6)*

same way that an elevator on the tail of a fixed-wing aircraft tilts the whole plane, thus making the helicopter more stable and maneuverable.

The first Kaman helicopters also used an intermeshing rotor system (which led to the company coining the name "synchropter") instead of a tail rotor to overcome rotor torque. The synchropter system, still in use, provides a symmetrical design in which the torque is inherently equalized and balanced.

A short while before the company was formed Kaman left his job with another aircraft firm so he could develop his own designs. These designs proved successful and the first Kaman helicopter, a twin intermeshing rotor machine designated K-125, made its initial flight in January, 1947. In 1949, the Kaman K-190 and K-225 were certified by the Civil Aeronautics administration for commercial use.

The company's first helicopters were leased out that summer and engaged in crop dusting activities from Maine to Florida. They earned $25,000 for the growing company, but even more important, the work proved the ruggedness and practicability of the machines.

In the latter part of 1949, Kaman Aircraft received a contract from the Navy Bureau of Aeronautics for two K-225 helicopters to be evaluated at the Naval Air Test Center, Patuxent River, Maryland. The U.S. Coast Guard also purchased a K-225 for evaluation testing.

Largely as the result of these tests, a $2,000,000 Navy production contract was signed and the young firm really "began rolling."

Soon after the war broke out in Korea in June, 1950, the Navy awarded Kaman a $26,000,000 contract for military 'copters. The following year the firm showed its first profit, $27,000 on sales of $4,800,000, and from then on sales grew steadily. All profits, however, were retained for expansion purposes until 1955 when the company began paying a 10 cent quarterly dividend.

Under the Navy contracts Kaman Aircraft designed, developed and produced the HTK-1 training helicopter and also produced the HOK-1 observation and utility helicopter in quantity. HTK-1's were in production until the end of 1953. The HOKs started in production in 1952 and were delivered to the Marine Corps. The craft were instrumental in saving many lives involving airmen down at sea, nighttime medical evacuations of seriously ill personnel, flood victims, evacuation of personnel critically injured on maneuvers and other types of mercy missions, as well as tactical support for military operations.

During December, 1957, production started on HUK-1 Navy utility helicopters which are similar to Marine HOK-1's. Both have twin intermeshing rotors and are powered by Pratt and Whitney Aircraft R-1340 piston engines.

K-225 — Commercial crop dusting proved the aircraft's ruggedness and ease of maintenance.

The same year, as the result of winning an Air Force competition for a local crash rescue helicopter, Kaman Aircraft was awarded an Air Force contract to produce H-43A and H-43B helicopters. Both are twin intermeshing rotor helicopters. The "A's" have P&WA R-1340 piston engines, the "B's" are powered by Lycoming T-53 gas turbines.

Also in 1957, as the result of winning a Navy Bureau of Aeronautics design competition, the company received a Navy contract to design, develop and produce a prototype quantity of HU2K-1 utility helicopters. The HU2K-1 is a single rotor helicopter powered by a General Electric T-58 gas turbine.

In addition, Kaman Aircraft developed the K-17 helicopter, a pressure-jet, two-man craft designed with an eye toward low cost field operations and simple maintenance. This test and evaluation aircraft has provided much data for the company's additional tip-jet programs.

Kaman is also the sole U.S. licensee for the manufacture, sale and service of the Fairey Rotodyne Airline Transport, a craft which combines the best features of the helicopter and autogiro with the speed of fixed wing aircraft and which will be available for airline operations in 1964. The

H-43B — Designated the HUSKIE, turbine powered aircraft of this type are now being delivered to the Air Force.

British-developed craft is powered with two Rolls-Royce Tyne, 5,000 hp turbo-jet engines, will climb vertically at 2500 feet per minute, cruise at 200 miles an hour and operate from a landing pad only 200 feet square. It carries 54 to 65 passengers, baggage and cargo over distances up to 300 miles. Several U.S. airlines have expressed a deep interest in this aircraft as the answer to many of the problems related to short-haul, city center-to-city center scheduled air transportation.

No story about Kaman Aircraft would be complete without a word about its personnel. Many of those now working for the company pioneered in the helicopter or fixed-wing fields and a large percentage were members of the Armed Forces. Many served during World War II or the Korean conflict as pilots, technicians, crewmen or in other capacities. At the present time, a considerable number of Kaman's employees are members of Reserve groups.

Because of this familiarity with military life and a first-hand knowledge of the problems which often confront pilots and maintenance crews, major emphasis is placed by those who work at Kaman on providing the best possible service to those in the Armed Forces who use and maintain its product.

H-43A — On local base rescue duty at United States Air Force Bases.

CURRENT CHANGES

TIME COMPLIANCE TECHNICAL ORDERS (USAF)

Applies — H-43A

T.O. 1H-43A-507, Data Code 0113244, 12 Aug., 1959, Safety of Door Emergency Release Handles — URGENT.

AIRCRAFT SERVICE CHANGES (USN)

Applies — HOK-1 HUK-1

HOK/HUK ASC No. 95, 21 Jan., 1960
Relocation of AN/ARC-39 radio antenna lead-in. — ROUTINE ACTION.

HOK/HUK ASC No. 99, 21 Jan., 1960, Addition of Clutch engagement warning nameplate. — ROUTINE ACTION.

FIELD INFORMATION DIGESTS (KAMAN)

Applies — H-43A H-43B

No. B-8, 7 Jan., 1960
Reduction of torque limits on drive shaft and rotor brake installation nuts. (H-43A)

No. B-2, Positioning of J-8 Attitude Indicator (H-43A & B) 12 Jan., 1960

No. B-3, Servicing Instructions for Viscous Damper Assys (H-43A & B) 12 Jan., 1960

No. B-4, Fan Disc Wobble Limitations H-43A only, 11 Jan., 1960

Applies — HOK-1 HUK-1

A-25 Supplement (1) Cancellation of previously issued FIDs.

A-43 Rev. (1) Servicing Instructions for the Viscous Damper Assys, 22 Jan., 1960

A-44 Fan Disc Wobble Limitations, 4 Jan., 1960

A-45 Modification of Blade Lag Stops, 13 Jan., 1960

A-46 Reduction of Torque Limits on Drive Shaft Rotor Brake Nuts, 20 Jan., 1960

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