

MAINTENANCE OF HELICOPTERS . . .

had been re-assembled properly. They had had little trouble at Bristol with blade tracking, for which they always used the "cat's eyes" method.

S/L. G. C. Matthews (Air Eng. Branch, R.A.F.) said that experience in the R.A.F. had been similar to B.E.A.'s but different solutions had been found. Overseas maintenance had to be done in the open but serviceability had been maintained in spite of torrential rain and hot sunshine. He asked whether the time was not approaching when a re-examination of the necessity for crack detection should be made. Better accessibility was a feature to which he felt designers should pay more attention. He would like to see a helicopter in which unit replacements for a complete overhaul could be effected in 24 hours.

Lt-Cdr. M. Hayward (R.N.A.S. Gosport) considered that tracking was an essential feature of naval operation, owing to the need for rotor blade folding afloat. They could track a rotor in ten minutes using the flag method. He paid a tribute to the ruggedness of helicopters. On one occasion, a broken hoist wire had sliced 6-8 feet from the tip of one of their blades while hovering over a ship but the machine had been able to fly back to its base successfully, a distance of 28 miles.

J. Leason (B.E.A.) thanked the Helicopter Association for the invitation to S.L.A.E. members. He thought that the stage for adopting the "leave well alone" policy had not yet been reached. He proposed the use of ultra-sonic or X-ray equipment to attempt to anticipate the detection of fatigue cracks before the actual crack occurred.

W. Gibson (British Timken) thought the lecturer had dealt unfairly with the question of tapered roller bearings. Their bearing life expectancy was higher than that of ball bearings and thrust races and they were used exclusively in British helicopter designs as well as in some notable American designs.

J. Shapiro (consultant) agreed with the principle of leaving well alone but said that wear in moving parts could result in a redistribution of load and it was up to the maintenance engineer to keep a close watch on this and prevent fatigue from having serious results.

G. Newbery (M.o.S.) was of the opinion that fatigue was not entirely the designers' responsibility. When a component was tested for fatigue limits, the results only held good whilst that component was operating under the same conditions as in the test. In the actual machine, the conditions deteriorated. In

addition, corrosion could produce severe stress concentrations; it was the duty of the maintenance engineer to watch this. He was interested in the proposal to use X-ray equipment to detect weaknesses but, so far, nobody had succeeded in devising a satisfactory method of doing so.

I. Chichester-Miles (Hunting-Percival) asked what proportion of the passenger fare was absorbed in maintenance costs.

R. H. Whitby (B.E.A.), replying on the lecturer's behalf, stated that the proportion was approximately 2d out of every shilling.

Mr. Willans, in reply to the discussion, said B.E.A. could not use the naval methods of tracking satisfactorily, nor would the A.R.B. allow them to work on the 400 hours' military overhaul life for transmission components. He stood by his own man-hour figures for overhauls as being more realistic than those quoted by Mr. Voss.

PUBLICIZING NATO AIMS

AN extensive advertising campaign in European newspapers as a means of helping to explain the aims of NATO has been embarked upon by United Aircraft Corporation. Full-page advertisements are being printed in 25 leading newspapers in 13 countries.

Mr. H. M. Horner, the company's president, has said that he hopes the series will help to build popular support for the policy of collective defence against aggression; stress the war-prevention possibilities of NATO; and offer convincing evidence of the sincerity of American participation. The advertisements have no direct connection between United Aircraft and the issues discussed.

THIRSTY WORK

A "BASE RECORD," and possibly a record for the U.S.A.F.'s 2nd Air Force, has been set up by Boeing KC-97 tankers of the 2nd Air Refuelling Squadron at Hunter Air Force Base, Georgia. The KC-97s transferred more fuel to B-47 Stratojets during January than, it is stated, "the average filling station would pump in three years." A total of 563,270 U.S. gallons was transferred in sixteen flying days. One crew alone transferred 56,600 U.S. gallons in a one-month period. Since its inception four years ago, the 2nd Air Refuelling Squadron has transferred more than six million U.S. gallons of fuel—two million from KB-29s and four million from the more efficient KC-97s, which were received during November 1953.

LANDING-GEAR BY HISPANO

IT is not generally known in this country that the great international Hispano Suiza group make many things besides armaments and turbojets. Typical examples of their airframe accessories are the two sets of undercarriage legs illustrated here. Both sets are in full production, the manufacturing methods being very similar to those employed in this country.

Initial forging or casting is carried out to limits very near the finished dimensions, and high-strength light alloy is used throughout. The undercarriage units for the Vautour are made in Hidu-

minium RR-58 and those of the Fouga Magister (and for the SE-210 Caravelle) in Zical (AZ 5 GU). The legs have oleo-pneumatic cylinders incorporating a diaphragm with variable characteristics.

Hispano supply the units complete with mounting, wheels, brakes and the associated hydraulic piping. The brakes, which are of the disc type on the units shown (not yet fitted to the Vautour units illustrated), are made under licence from Dunlop. Maxaret units are also made under a similar licence.

Five undercarriage units now being produced by Hispano Suiza. From left to right: the outrigger unit for the S.O.4050 Vantour (70 Vantours are on order), the steerable forward unit of the Vautour "bicycle," the rear Vautour unit, the nose undercarriage of the Fouga CM.170R Magister (100 of these aircraft are on order) and the Magister main unit.

