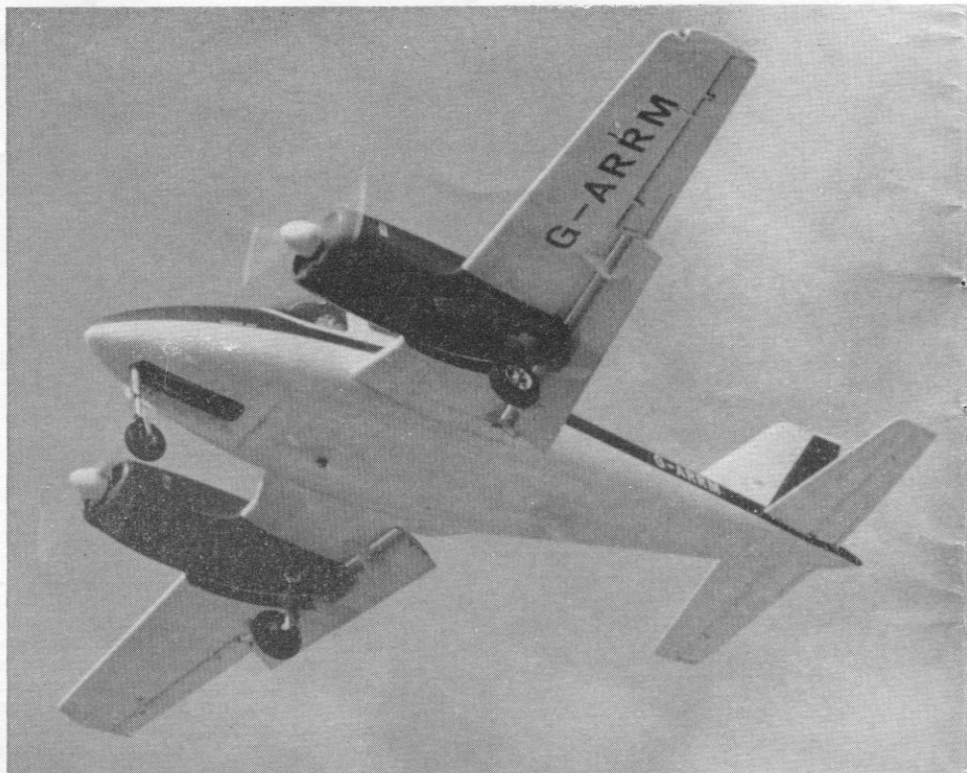


Farnborough Comment

by Paul Greenhayes

THIS YEAR'S S.B.A.C. Show at Farnborough differed a good deal from any of its predecessors. To begin with the Flying part of the Display much more nearly resembled a Service's Pageant than anything seen before, whilst the contribution by the Industry contained little that was new, and was notable for important absentees such as the Bristol B.188, and the Hawker Siddeley P.1127. On the other hand, a great deal of information about these, and other interesting new developments, was visible in the Static Exhibition which was bigger than ever. Thus the Display took on the dual personality of a predominantly Services Flying Display, in which current aircraft equipment played the major part; and a simultaneous exhibition by the Industry, which afforded a good look at things to come. One might almost say that, at any rate on the first four days of the Show, the centre of gravity of the whole affair was the Static Exhibition. Although this was in some measure due to the atrocious weather which interfered with rehearsals, as well as causing the cancellation of much of the flying on the first Monday, it is also significant, because a very strong proportion of the exhibitors are not involved in actual flying. The Aircraft Industry on show at Farnborough included almost everything from raw materials and tools, to complete components; electronics and electrics; instruments of all kinds; heating systems; cooling systems; life-saving equipment; clothing; furnishings; and a hundred and one other things that are involved in getting an aeroplane into the air. But the producers of complete flying machines are a small minority, and this is now reflected in the relatively small number of aircraft displayed in the air by manufacturers. Most significant is one newcomer to this exclusive group, the Beagle organisation. They showed four aircraft in the air, and deserve special mention, since at this time the year before, the Beagle organisation did not even exist. The Beagles have tremendous possibilities before them. On first showing, the B.206 looks like a winner and it was interesting to hear two U.S.A. colonels agreeing that it ought to find a ready market in the United States.

In addition to this change in what might



The Beagle B.206.

be called the "centre of gravity" of this year's Show, other significant features were the continued emphasis on future VTOL and STOL developments, to which several exhibitors such as Rolls-Royce, Bristol Siddeley, Hawker Siddeley, and Westlands all gave special prominence; the devotion of a large section of the flying display to demonstrations of the uses of aircraft in support of ground forces; and the prominence given by aircraft constructors to all sorts of missiles, both air and ground launched. Finally, the unique position occupied by British aircraft powerplant manufacturers calls for special mention.

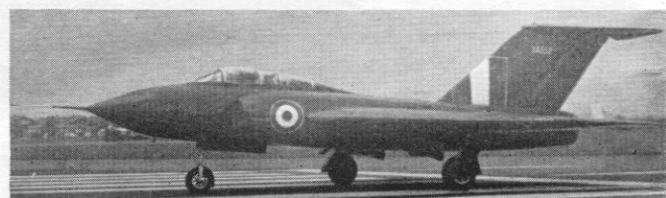
Aircraft Engines

The Rolls-Royce stand emphasised four lines of development: First there were the new lift engines, together with a series of models of the kind of aircraft in which they might be used; one was a strike fighter, with a wing plan similar to the Swedish Draken, a shape which was significantly repeated in another model of a similar VTOL strike fighter displayed on the Short and Harland stand. Secondly there were the new line of engines re-

presented by the Rolls-Royce Continental series from 90 to 310 h.p. The latter is to be fitted to production models of the Beagle B.206. Next were the by-pass engines, represented by the Conway, and the new "Spey". The Spey, in addition to being fitted to the de Havilland Trident, is to power the Series Two version of the Blackburn Buccaneer. Fourthly were shown the development of existing engines. One was a Dart shown exactly as removed from the aircraft after 2,983 hours; it had required only six igniters and two filters to be replaced. The second similar exhibit was an Avon, shown as removed after 3,184 hours; this had required only four igniters, and one gasket renewing. These are remarkable figures, and help to explain why the Dart is now doing trials for the extension of its life between overhauls up to 3,600 hours, a figure which no other aircraft engine in the world except perhaps another Rolls-Royce can approach.

Two makes of engines were shown on the Hawker Siddeley stand; these were Blackburn Turboméca engines and the de Havilland products. One particularly interesting exhibit was the Astazou II, a turbine of very small dimensions which

LEFT: *The P.R. Supermarine Scimitar.* RIGHT: *The Gyron Junior Javelin.*



produces a maximum of 595 equivalent h.p. for a weight of 269 lb.; four of these engines, built by Turboméca, power the interesting new Potez 840. Also on the Hawker Siddeley stand were a series of de Havilland Gnome engines, and of course the Gyron Junior which is the power unit of the Buccaneer.

The Bristol Siddeley stand displayed the BS53 engine, which powers the P.1127, including the rotating nozzles in operation. The same stand also showed an Olympus, beneath which was a modestly small board, stating that the engine was capable of 33,000 lb. thrust, thus making it the most powerful turbine on display. There were also examples of the Viper, as used in the Jet Provost, and the Orpheus 803 of 5,000 lb. thrust. The Orpheus has proved a particularly good export. Napiers and Alvis also showed engines, whilst Rovers showed the small turbine similar to the one which was recently flying in the Currie Wot.

Amongst the several types of rocket motor, a notable exhibit was the Rolls-Royce motor for the Blue Streak missile; this develops a sea-level thrust of 137,000 lb., and there is a developed version giving 150,000 lb. thrust.

Aircraft and Missiles

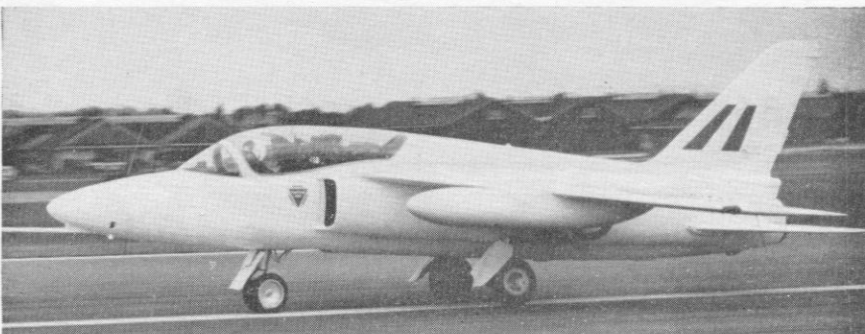
One of the only completely new aircraft flown were the Handley Page H.P.115 flown by S/Ldr. Henderson of the R.A.E. This is a very slim delta, designed to test the low-speed handling characteristics of a possible future supersonic shape. Visitors to Handley Page's stand in the Static Exhibition will have found much interesting information about this aircraft, as well as some interesting hints about higher speed transports. As is well known, the Victor has flown supersonically; and Handley Page are quite obviously not the only people wondering when plans for the high-speed end of the research on the H.P.115 shape will be announced.

Another exhibit of particular interest on the Handley Page stand was a military transport variant of the Herald. This aircraft uses a large proportion of the existing Herald design, but incorporates rear loading somewhat similar to the Argosy. In view of the known capabilities of the Herald, it should be an extremely pleasant aircraft, and is clearly something likely to be of great future interest to Transport Command.

The other newcomers were the Beagle Airedale, which was first seen at Bagington, together with the A.O.P. Mark XI, and the



The Handley Page Herald in the livery of Maritime Central Airways.



The all-white Gnat Trainer.

very eye-catching B.206. The A.O.P. Mark XI was demonstrated by Ranald Porteous. Long before Oliver Stewart had announced him, it was possible to recognise Porteous' "signature" and one only wishes that he had been permitted longer in the air, so that visitors could enjoy one more of his classic aerobatic displays which are in a class by themselves. The A.O.P. Mark XI looks a most interesting small aircraft, and with its new Rolls-Royce Continental engine giving 260 h.p., has an impressive take-off and initial climb. The B.206 proved a centre of attraction, both in the Static Park, where it was visible before flying, and in the Static Exhibition, where the cabin part of the fuselage was displayed. On the same indoor stand was an Airedale fuselage, incidentally the only exhibit in the show to have a visible price tag. The Airedale costs £4,750 complete and ready to fly. In addition was the cabin portion of the forthcoming light twin, the Beagle M.218. This is going to be one of the most exciting small aircraft yet produced.

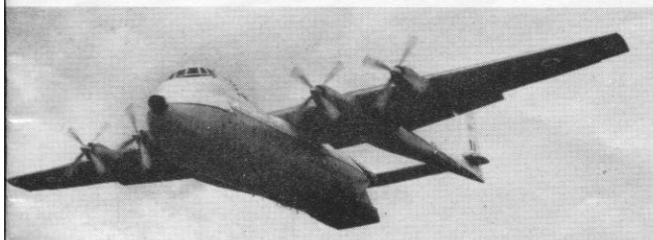
The Westland exhibit included an attractive civil version of the Scout helicopter fitted with smart and comfort-

able looking passenger accommodation. There were also models showing the capabilities of the Rotodyne both as a military and civil transport, and full information about all the other numerous helicopters now gathered together under the Westland banner. One notable omission, however, was the Westminster, which suggests that less importance is attached to the really big weight lifter than might have been thought necessary.

On the aircraft side, Hawker Siddeley showed models of the complete range of all their current products, as well as some to come. This included the Trident, and the D.H.125, the Jet Dragon, as well as the Caribou, Otter and Beaver from the Canadian division of the Group. Two Vulcan models showed how the Blue Steel, and later the Skybolt missiles, will look when carried by this aircraft, and in the outside display was exhibited a complete Blue Steel missile.

The Hawker Siddeley stand also displayed a pair of Firestreak missiles as carried in the Lightning, together with the aircraft part of the installation. The infra-red head was visible. Other missiles on this stand included a large model of Blue

LEFT: *The A.W. Argosy with rear loading doors.* RIGHT: *The Beagle-Auster A.O.P. Mk. XI.*





The Beagle-Auster Mk. XI with Rolls-Royce Continental engine.

Streak set up on a launching pad, and Sea Slug.

It would be unfair to omit from mentioning the astonishing array of cactus and other succulents which were an unusual and attractive feature of the décor of Hawker Siddeley's impressive display.

The British Aircraft Corporation also had a particularly large stand upon which were shown models of most of the aircraft produced by the Group. Of particular interest were a model and some information about the Bristol B.188, and the forthcoming B.A.C. One-Eleven to be powered with two Rolls-Royce "Speys" mounted in similar fashion to the four Conways of the VC10. A large part of the B.A.C. stand was devoted to missiles, which included Blue Water, a surface-to-surface missile; the Bristol Bloodhound, now adopted by both Sweden and Switzerland and a life-size battle scene depicting the Vigilant anti-tank missile. An accompanying set of models illustrated the fact that one Bristol Britannia, can transport a force of 87 men, armed with 250 Vigilant missiles thus pointing the fact that this weapon could become the basis of an extremely effective and mobile anti-tank unit, capable of rapid movement to anywhere that air transport can take it.

Finally, over the whole of the Static Exhibition towered the huge Blue Streak missile itself, exhibited outside, together with one of its Rolls-Royce motors capable of 137,000 lb. thrust.

The Flying Display

Bad weather not only ruined the flying on the first Monday of Farnborough, but had already interfered with the rehearsals. Poor weather continued during the week; nevertheless there was some notable exhibition flying, and great praise is due to the pilots, who put up very fine shows often in very difficult conditions. The Display opened each day with the take-off of a P.R. Scimitar of the Royal Navy, which,

having taken photographs during a low-level run, landed back afterwards, so that the finished prints were delivered to the President's tent during the Display. The flying after that really comprised five separate acts, one each by the Royal Navy, the Army, and the Royal Air Force; a combined operation by the R.A.F. and the Army, and the demonstrations by the Industry.

The Display by the Royal Navy was given by nine Scimitars of No. 800 Squadron, operating from Farnborough; two Sea Vixens of No. 899 Squadron from Yeovilton, and aircraft of the Carrier Air Group from H.M.S. *Hermes* operating in the Channel. First arrivals were a Scimitar and Sea Vixen, approaching low at near sonic speed, and pulling up to demonstrate the method of bombing these aircraft would use from low level; both disappeared into cloud, going vertically upwards before everybody had realised that they were there, and were not seen again. Following them the two Sea Vixens of 899 Squadron flew past, with fuel hose connected, demonstrating the so-called "Buddy" system of air-to-air refuelling. This is a standard N.A.T.O. system, so that aircraft from any

N.A.T.O. Air Force can refuel any other; the system is principally due to the work of Flight Refuelling, Sir Alan Cobham's Company whose base is at Tarrant Rush-ton. The two Sea Vixens later flew past a second time, during the course of which they disconnected from each other. No. 800 Squadron then put on a very polished show of formation aerobatics, first as a formation of nine aircraft, and later breaking off five, so that the display continued with a flight of four alternating with a sole performer, whilst the other four Scimitars remained offstage. At the end of their show, the nine rejoined, and landed in quick succession. The last aircraft of the stream used the new arrester gear, which rapidly brought it to a standstill only a little way past the President's tent. This was the first public demonstration of this gear, which can be used on any runway airfield, and has been developed by Dunlops in conjunction with the R.A.E. The Naval act concluded with a fly-past by the *Hermes* Air Group, comprising Scimitars, Sea Vixens, and Gannets. The Gannets each feathered one aircrew as they went past.

Air Transport and the Army

The Army Air Corps put on a demonstration by eight Skeeters, which arrived simultaneously, four from each end of the airfield, and indulged in a sort of synchronised insect ballet. They were followed by three Austers from which six members of the 22nd S.A.S. Regiment jumped, holding coloured smoke candles. Low cloud prevented the long delayed drop which had been intended, but the accuracy of landing was excellent, all six being close to the mark on nearly every jump. The Army also played a large part in the Tactical demonstration by aircraft of No. 38 Group. This demonstration was said to represent an airborne assault on the Flying Control Tower. It began with the arrival overhead of Hunters of 54 Squadron, providing air cover for the assault. These were quickly followed by six Whirlwinds and two Belvederes, from which the first men of the Assault Force, all from No. 16 Parachute Brigade, landed. Following them four Beverleys brought more men, and in addition vehicles, and

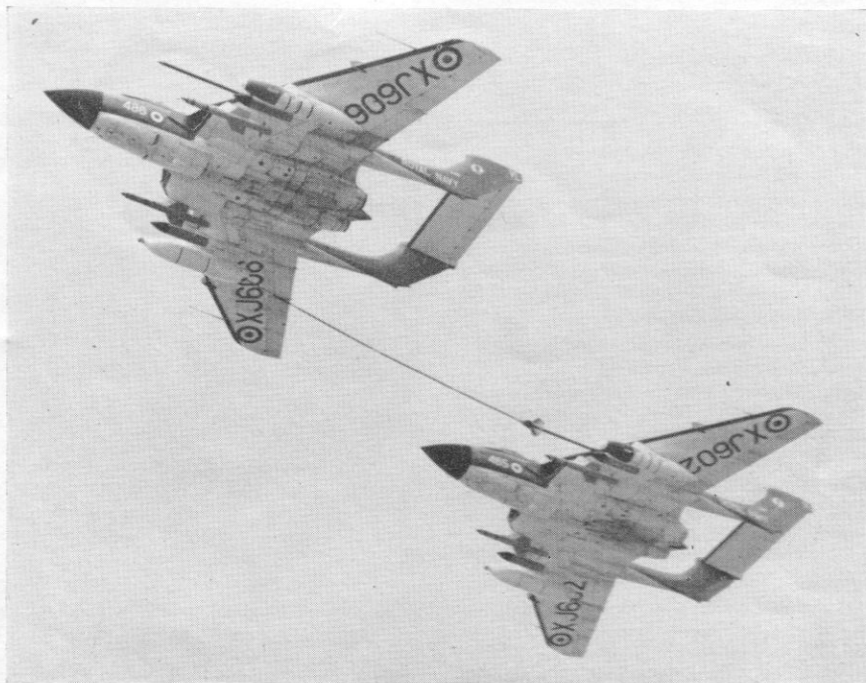
The military version of the Herald shown in model form.



heavier equipment. Simultaneously, two Pioneers, one single-engined and one twin dropped supplies, and then landed to evacuate casualties, whilst the eight helicopters returned with a variety of loads slung beneath them. One of the Belvederes carried a 105-mm. gun, weighing rather over 2,000 lb., and the other a long chassis Land Rover, weighing 3,500 lb.

This demonstration was not particularly easy to follow. For one thing, although the aircraft taking part were easily visible for most of the time, the men taking part were never easy to see, and from the western end of the airfield, which is approaching a mile away from the focal point in front of the President's tent, were for the most part out of sight altogether. From a military point of view, the less they can be seen, obviously the better. But for a demonstration of this sort, it is difficult to combine any satisfactory degree of realism with an adequate public display of the capabilities of the aircraft taking part. It is to be feared that many of the visitors who attended Farnborough, particularly on the public days, were unable to appreciate the amount of work that had been done to put on this demonstration, and that for many of them the significance of what was done was missed altogether. Few will have been able to see for themselves that a force of 330 fighting troops, together with vehicles, weapons, and supplies were put on to the ground in something less than five minutes. Delivered at this tempo, a force of a few hundred men may well be worth more than several thousands dispatched by less speedy methods, and it is in this context that the demonstration ought to be seen. It is with this in mind that many people no doubt examined the numerous exhibits in the static part of the show, dealing with VTOL and STOL transports, and the crop of air transportable weapons to go with them. Visitors to the British Aircraft Corporation's stand will have found much to interest them in this line.

Westlands, as in previous years, gave a very well planned demonstration of their products. Biggest of their exhibits was the Rotodyne, which flew past but did no hovering or transitions. Most impressive was the startling performance of a turbine-engined Wessex, which towed a load of 45 tons down the runway; in addition to an armoured vehicle on a transporter, the load included a Gnome-engine-Whirlwind which landed on another transporter for the purpose. Power of this sort suggests a number of possible applications. Westlands also showed a Belvedere from which descended a platoon thirty-one strong, of the Duke of Edinburgh Royal Regiment. They arrived, firing automatic weapons from the open doors of the aircraft, and from arrival to being in action on the ground took only forty seconds. This particular demonstration has historical interest, because it resembles closely at least one successful operation in deep jungle. The Westland flying display tied in very well with their static exhibits, and the people



Two Sea Vixens demonstrate the Flight Refuelling "buddy" system.

who planned it deserve considerable credit.

Although not new, two other items in the Flying Display must be mentioned. The first was Bill Bedford's display on the two-seat Hunter Trainer. This remains unsurpassed in its class. It is the only two-seat trainer capable of being adapted to carry the full range of instruments and fire-control systems fitted to such aircraft as the F.104, and at the same time put the instructor in a seat alongside his pupil so that both have an identical sight of the target, or instruments, or whatever is involved in the exercise. It has no flight limitations, and as visitors to earlier Shows will know, it is cleared for unlimited spinning. During rehearsals for this year's Show, we counted Bill Bedford doing no less than twenty turns in a fully developed spin as part of his demonstration. Equally impressive in a rather different category was Beamont's demonstration of the two-seat Lightning. This big aeroplane has quite exceptional manoeuvrability, and some of Beamont's tight turns were extraordinary, being completed within the kind of radius that would be small for much lighter and less powerful aircraft.

As a curtain raiser on the open days, visitors were treated to an attractive display by nine Turbulents of the Tiger Club. There were thus more Turbulents at Farnborough than any other civil type, and their performance on a total of 270 h.p. for the nine aircraft made an interesting contrast with the quarter of a million or so h.p. used by 74 Squadron for the last item.

The Royal Air Force

The Flying Display concluded with that part of the demonstrations provided by

the Royal Air Force. This included a jump from a Beverley by six instructors from the R.A.F. School of parachuting. Each has done a total of more than 200 jumps, and the highest had done over 800. On the opening day, one jumper landed exactly on the aiming mark, which was a white flare and was seen to pick it up from where he stood. The Central Flying School aerobatic team gave an immaculate display using four Jet Provosts, of the type used for *ab initio* flying training. This display is done using smoke, and the aircraft perform as two synchronised pairs. No. 92 Squadron, following in the pattern set by No. 111, their predecessors as the R.A.F.'s demonstration aerobatic squadron, gave a performance which suggested that some of them must have come from Treble One. The display was concluded by No. 74 Squadron with nine Lightnings. It would be too much to say that No. 74 stole the show; but they came precious near to it. Their display begins with a take-off in succession, using reheat; this in itself is a thunderous show of power, and is followed by a near vertical climb, at the top of which the squadron joins up in diamond nine. Then follows a series of formation aerobatics, wing overs, and tight turns maintaining as accurate and close formation as one has seen. The act ends with a fly-past in formation, and break overhead for a stream landing, taking rather less than twelve seconds per aircraft. No. 74 has not long had its new equipment. Their flying is an impressive tribute to aircraft and squadron alike, and leaves no doubt that the Lightning has in full measure not only sheer performance but all those other qualities as well which, added to performance, add up to a really superlative aircraft.