AUSTER NEWS

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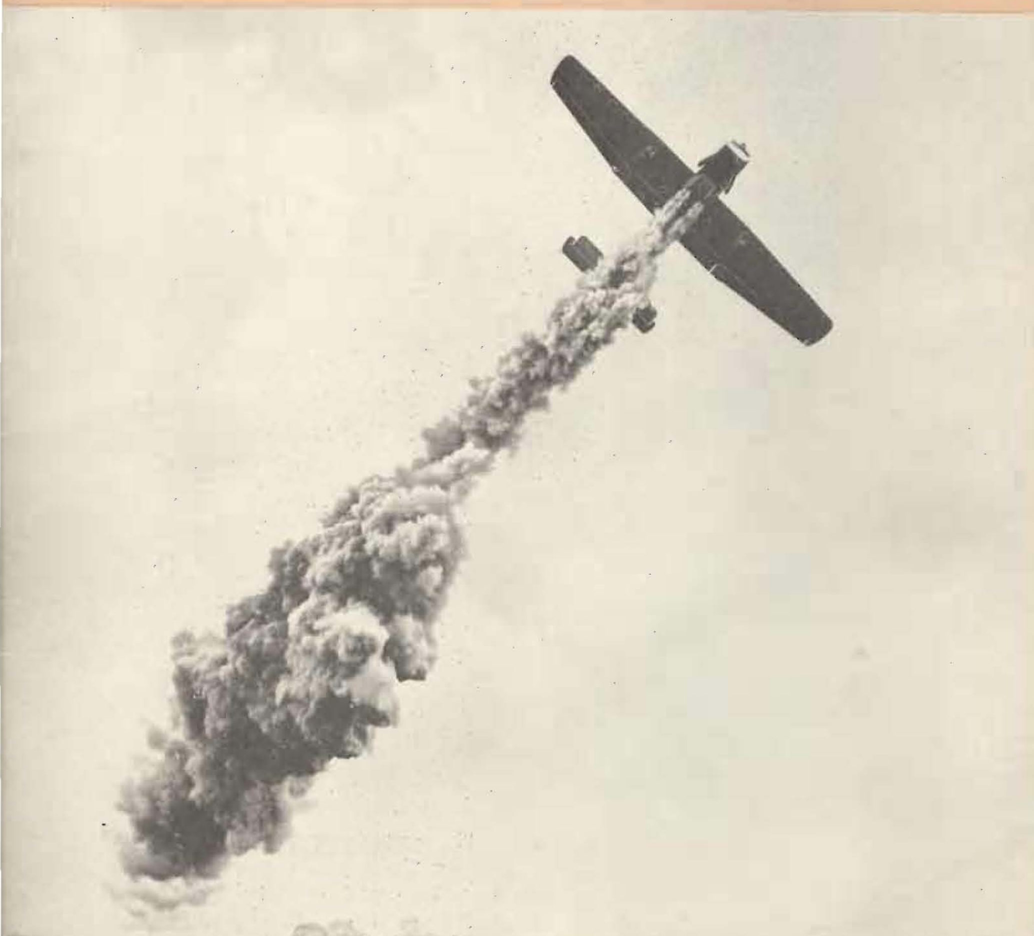
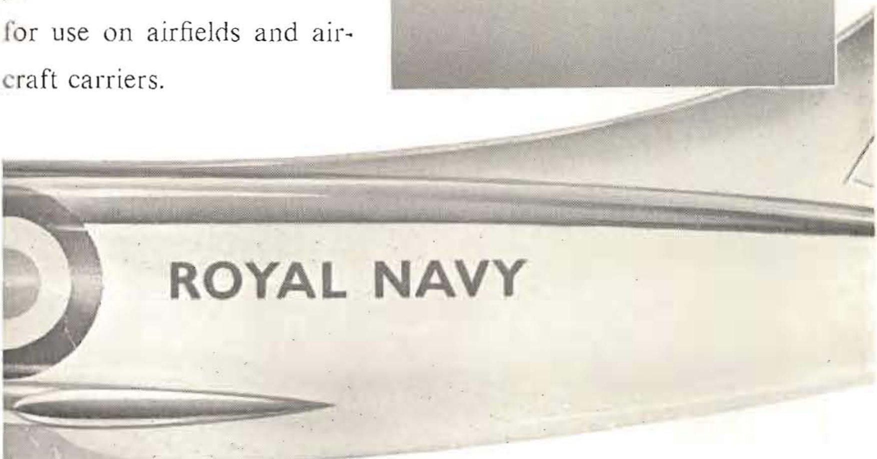
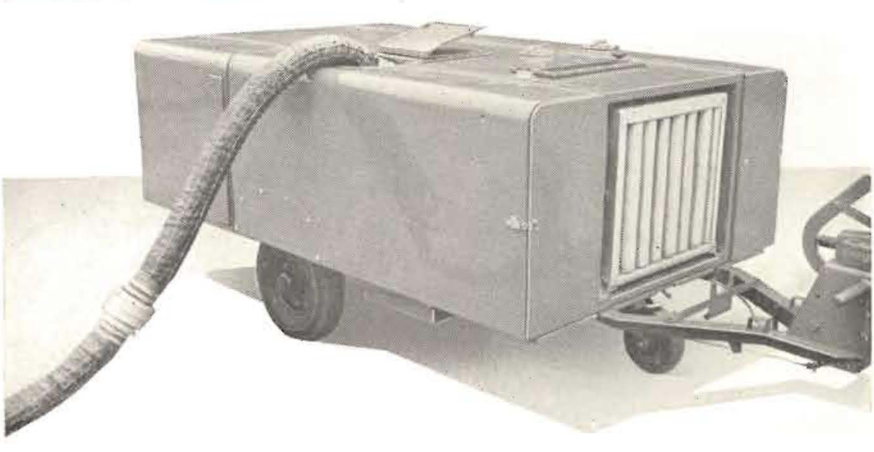


Vol 6 : No. 8

Blackburn

in production with Beverley Transports for the Royal Air Force, NA39 Strike Aircraft for the Royal Navy and low-pressure Gas Turbine Starters for use on airfields and aircraft carriers.





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AUSTER NEWS

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Editorial

Increasing demands for Aerial Spraying

THIS YEAR many countries throughout the world will see a big increase in the use of aircraft for agricultural duties within their borders. The main reason for this increase is that it has been proved that spray planes are capable of treating enormous areas in what a few years ago would have been considered an unbelievably short time. Great plantations of cotton and bananas once threatened with destruction by disease and insect plagues are now safe, with assured profitable futures for their owners — and all due to aerial spraying.

The success of current spray planes is, however, the fulfilment of experiments made years ago by the few far-sighted people who believed in the future of aerial spraying.

Auster Aircraft have pioneered the development of modern spray planes in the United Kingdom for over ten years. It was thought then that the only way of combating the huge problem of pest control on a big scale was from the air. The result is that this company now produces the widest range of agricultural aircraft in the world. capable of carrying loads varying from 450 lb. to 1,680 lb.

Cover Photo

LOOKING MORE LIKE a rocket plane than an agricultural aircraft, the Auster Agricola is seen jettisoning a load of chemical fertiliser.

AUSTER TREE ESCAPE GEAR

. . . New Essential Equipment

for Paratroops

WHEN PARATROOPS make their descent into the dropping zone their efficiency as a fighting force depends largely on their ability to re-group quickly from the dispersing effect the speed of the aircraft has upon their drop. One of the hazards that increases the delay of re-grouping is for a paratrooper to be entangled in trees. He has to climb down to the ground in full battle gear—totally unsuitable for tree climbing—and in many cases this apparently simple task ends in disaster as the parachutist has no means of lowering himself safely down. This proved to be the case in the last war when a survey of the resultant casualties in scores of airborne operations showed that the greatest menace to paratroopers was to be caught in trees after an otherwise successful drop. Night operations in particular were hazardous as paratroops who ended their drop in trees and could not estimate their height from the ground stood the risk of serious injury upon releasing themselves from their parachute harness.

The Special Air Service Regiment has found that this problem still exists. In Malaya for instance, 50 per cent of their parachutists dropped into jungle, successfully penetrated the tree tops, the remaining 50 per cent were trapped by branches and faced a dangerous drop to the ground before they could go into action.

Now however, a simple device has been produced which enables a safe descent to be made from the tallest of trees. It is the tree escape gear which has been developed by the Auster Company in close co-operation with the Royal Air Force Institute of Aviation Medicine at Farnborough.

Less than five inches (13 cm.) long and weighing only a few ounces, the device is attached to a harness worn around the waist. Running through the escape apparatus is 200 feet (61 metres) of nylon tape, one end of which is attached to the parachute harness. Upon landing in a tree the parachutist merely releases himself from his parachute harness and the tape runs smoothly through the escape gear, a light touch with one hand being sufficient to control his rate of descent from the tree. The tape is stowed neatly in a pack worn by the parachutist and has a breaking point of 2,250 lb. (1,021 kgs.)—ample strength for the load it has to carry. If required, much larger lengths of tape may be provided with the escape gear.

Currently, an increasing use is being made of paratroops for intervention in world 'trouble spots'. Where possible they are dropped in open country to avoid perhaps the problems already mentioned. Open country operations have the obvious disadvantage of giving no cover to the attacking troops and higher casualties must, and do, result. However, the new Auster device widens the selection of types of terrain for airborne operations to the point where forest areas and jungles need not be avoided but used to tactical advantage and with complete safety.

In countries such as Malaya, Indonesia, the South Americas, and many more, where jungles contain trees up to 200 ft. in height, the tree escape will prove to be essential equipment for paratroopers and aircrew who have to operate over this type of territory.

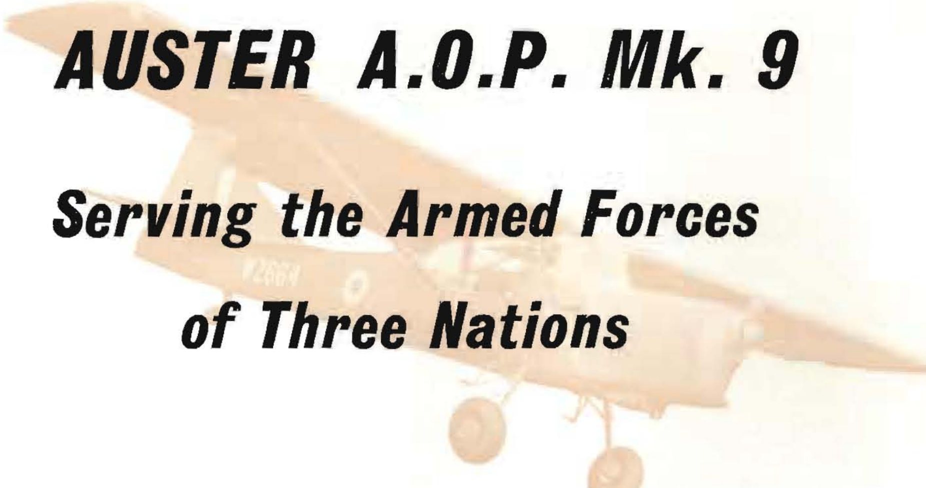
The initial cost of the gear, compared with the cost of training a paratrooper—or even his life—is negligible.

A safe descent being made from a tree top. The escape device can be seen on the tape above the demonstrator's hands.

In addition to airborne work, other spheres where this apparatus has possibilities are in Civil Defence and fire rescue work and mountaineering.—*END*

AUSTER A.O.P. Mk. 9

Serving the Armed Forces of Three Nations



THE Auster Company has produced light aircraft for Air Observation Post duties continually since 1940. During this time considerable experience has been gained and this is reflected in the A.O.P. Mark 9 which is in production for the Indian Air Force at the Company's Rearsby factory.

Introduction

Prior to the Mk. 9, military Auster types were utilising the same basic airframe together with engine installations of progressively greater power. The Auster Mk. 1—first aircraft to be used in large quantities by the British Army—was powered by the Cirrus Minor 1 of 90 h.p. Continual requests from the Army for increased performance and load carrying capacity lead to various engine changes and design improvements culminating six years later in the A.O.P. Mk. 6. However, in the Mk. 6 the limit of development was reached and it was clear that an entirely new aircraft was required, for Army requirements had changed considerably. Not only did they specify even shorter take-off and landing runs but in addition required more cabin room for extra crew or passengers and increased payload.

To meet these requirements, full advantage was taken of the new materials and processes that were currently available. These included Redux bonding, honeycomb structures and various types of plastics for fairings, etc. The use of these materials combined with an intimate knowledge of army operational activities, through long association, enabled Auster designers to produce the A.O.P. Mk. 9, an aircraft which, although larger than previous types, has a superior performance.

After its initial flight trials the Mk. 9 underwent a long series of searching tests including a period of intensive flying—a mandatory requirement—before acceptance into the Services. The intensive flying programme was a condensed simulation of the aircraft's eventual operational role. Into a 150-hour period were packed landings into ploughed fields, cross-wind take-offs, rough handling, endurance flights and heavy landings, all intended to determine the aircraft's ability to take heavy punishment but still keep flying.

The Mk. 9 came through the intensive flying successfully and went on to complete both Arctic and Tropical trials in Canada and Libya respectively.

To date the A.O.P. Mk. 9 has been supplied to the British Army, the Indian Air Force and the South African Air Force. Its versatility, easy flying characteristics and excellent performance from small air-strips have now all been proven in service under widely varying climatic conditions.

The primary role of the Mk. 9 is as a two-seat Air Observation Post but it is in its ability to perform alternative duties that the Mk. 9 has also proved so successful. Supplies dropping, light freighting, three-seat liaison, aerial photography, casualty evacuation and field telephone cable laying are all well within the scope of the Mk. 9 which features the unique 'unit' cabin design. Developed on a previous experimental aircraft, the 'unit' system consists of a detachable rear cabin floor which enables equipment for alternative roles to be quickly installed in an aircraft with the minimum of delay. The removal of six bolts allows the floor to be lowered clear of the aircraft and another floor complete with equipment for another duty, such as cameras for vertical or oblique photography, can be easily substituted. Special roles apart, the normal arrangement is that the rear observer's seat is mounted on this floor, and can face either forwards or aft.

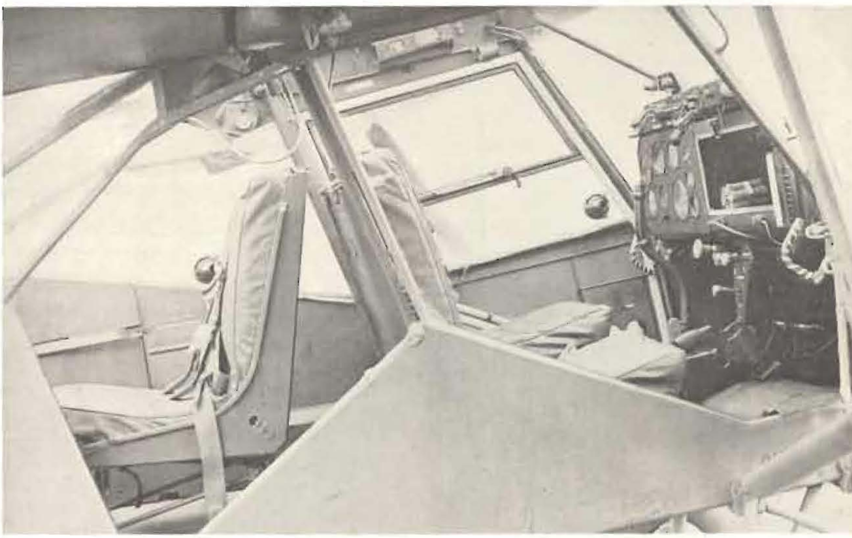
Tough army duties called for the well-tried steel tube construction to be retained for the fuselage of the Mk. 9 but a larger structure giving more cabin room was built and features three large entry doors. With a fabric covering, this type of construction lends itself to easy repair in the field where overhaul facilities are usually at a bare minimum.

The normal A.O.P. crew consists of two members, pilot and observer. The pilot's seat, on the port side, is adjustable for height and leg length and has attachments for armour plate, proof against small arms ground fire. A third seat, alongside the pilot's, may be installed together with dual controls for training purposes. All seats are suitable for back-type parachutes and if required can be removed, providing a clear floor for supplies stowage. Entry to the cabin, even when wearing bulky Arctic clothing, is easy with the large doors that are provided on both sides of the cabin. The forward doors are held open by automatic catches and have hinged direct-vision panels, the pilot's door featuring a handy map pocket. All three doors are jettisonable.

As may be expected, visibility from the cabin is excellent. An all-Perspex roof gives occupants an uninterrupted upward view and the rear-facing observer has a panoramic view over the flat-topped rear fuselage. A moulded windshield is blended into the wing roots, giving the pilot excellent vision forwards.

Instruments and Cabin Equipment

The instrument panel is neatly divided into two parts. The port half contains a flexibly-mounted panel including an artificial horizon and a direction indicator. Maintenance is simple—the whole panel hinges downwards, giving full access to the rear of the instruments. The starboard half of the panel is provided with a recess to house an Army type 62 radio. Electrical switches are systematically grouped along the top of the panel where they fall easily to hand. Illumination of the radio, instrument panel and compass is variable by a pilot-operated rheostat. Cabin temperatures can be closely controlled by finger-tip



The two doors on the starboard side of the Mk. 9 afford easy entry to both front and rear of the cabin. The starboard half of the instrument panel houses an M.F. radio (not fitted in photograph). Door jettison handles are striped for identification.

actuation of a selector. Adequate windscreen demisting is also provided.

Engine and ancillary controls have been grouped carefully to avoid confusion in the stress of battle or in darkness.

The flying controls consist of a stick type control column, and rudder pedals, the latter actuating powerful toe-operated hydraulic disc type brakes. These are light and effective for taxi-ing and are locked on by a pull-out knob below the throttle.

Effortless operation of the very large split flaps is assured by the introduction of a hydraulic assister. The flaps can be operated easily from either front seat position, and retract automatically in the air at the touch of a selector. Retraction rate is regulated and no 'sink' results. Extra lift for short take-offs and landings, and high drag for slow, steep approaches comes from the fitting of drooping ailerons. These, after take-off flap (22°) is selected, droop 10° giving full span

A light series bomb carrier can be fitted to the Mk. 9 to take advantage of tactical opportunities, or to train aircrew in light bombing. In this case four 4" flares are carried for target marking.

lift increase. A simple indication of the correct setting for take-off flap is a yellow line on an aileron hinge bracket.

A 'mixing box' is provided giving intercommunication through both the Army type 62 m.f. and STR-9X v.h.f. radios. The latter set is mounted in the rear of the cabin together with a 24-volt accumulator.

To improve m.f. radio reception at long range a trailing aerial reel is fitted in the cabin roof. The aerial is streamed by a small drogue cone mounted at the top of the rudder.

All-metal Wing and Tail Structures

Apart from plastic tip fairings and a fabric covering aft of the main spar the wings are of all-metal construction. The main component is a torsion box braced to the fuselage by a single metal streamline section strut. The leading edge of the torsion box is formed around a sturdy

An almost unlimited view from the Mk. 9's cabin ideally suits the aircraft for observation duties.

alloy tube offering high resistance to damage from both handling and collision with birds, etc. The plastic wing tip fairings incorporate landing lamps and navigation lights.

The normal fuel capacity of the Mk. 9 is 15 imp. gallons. This apparently low figure is adequate for the aircraft's A.O.P. role which is essentially a short-range duty. The fuel tank, which is self-sealing, is housed in the starboard wing root—easily accessible for both filling or removal. If extra range is required a further tank of similar capacity can be installed in the opposite wing. The wing-mounted pitot head is electrically heated and fully retractable to minimise damage during ground handling. If the aircraft is flown with the pitot head accidentally retracted the result is a 'low' A.S.I. reading—on the safe side.

For strength and light weight the tail unit is an all-metal design employing Reduxed skin stiffeners. The Redux process enables stiffeners to be bonded to the insides of the tail unit surfaces and permits the minimum use of ribs. In fact ribs are only situated at the tip and root of each component. Both horn balanced elevators and rudder, together with the flaps and ailerons, can be easily removed for inspection and transportation without upsetting the control circuits.

Rough airstrips call for a tough undercarriage, and jungle strips, ploughed fields and rutted cart tracks have all been used as landing areas by operational Mk. 9's. Each main leg is a solid forging and has a Dowty 'liquid spring' which cushions the heaviest landings and makes taxi-ing—over any surface—safe. Large low-pressure tyres give exceptional flotation on soft surfaces such as sand or mud. The pneumatic-tyred tailwheel is also equipped with a 'liquid spring' and is fully castoring although equipped with a steering linkage.

Cartridge starting and Ki-gass priming are used on the Blackburn Bombardier 180 h.p. motor. Turning a high efficiency fixed pitch metal propeller, the Bombardier can give the remarkably low fuel consumption of eight gallons an hour. Fuel-injection is a feature of the Bombardier—a big advantage—for the majority of operational flying in the Mk. 9 is carried out at low levels where instant engine response is essential. The plunger-type throttle can be opened or closed as rapidly as required to meet any emergency without the slightest hesitation on the pick-up.

The Use of Plastics

The Plastics Division of Auster Aircraft produces a wide range of components for the Mk. 9. Various types of plastics are employed in order to use the common advantages they offer of light weight, and their resistance to corrosion and damage. The main items that are built from plastic materials are usually non-load carrying and include: wing tip and rudder tip fairings, engine air intake, radio housing, cabin heat ducting, instrument panel decking, wheel brake covers, inspection panels and aerial drogue.

Flying the Mk. 9

The easy flying characteristics of the aircraft have now been sampled by many hundreds of service pilots under all climatic conditions. Its ultra-short take-off and landing runs have proved of immense value to squadrons operating from tiny jungle airstrips in Malaya. After take-off the Mk. 9 continues a steep continuous climb, easily clearing end-of-strip obstacles.

For impressions of the aircraft in the air the following extracts are taken from *The Aeroplane*, whose pilot wrote:

"Lateral control is undoubtedly where one looks first for quality, and the ailerons of the Auster 9 are above criticism. They are pleasantly harmonised with the rudder and elevators, the latter being the lightest of the controls. The ailerons are slightly heavier when 'drooped', but the change is barely perceptible, while only a slight touch of rudder is needed in turns . . .

"Stability follows the usual pattern. Directionally and fore-and-aft, the Auster 9 is positively stable, which relieves the pilot of a lot of work, while laterally it is neutrally stable at the normal cruising setting of 2,300 r.p.m. This gives an operating speed of about 90-93 knots (104-107 m.p.h.) and a fuel consumption of 11·5 a.n.m.p.g. At this figure, the Auster 9 can even compete quite favourably with many of the Army's surface vehicles . . .

'With take-off flap and reduced power, for slow flying the Auster 9 will find its own comfortable attitude at about 55 k. with ample control to roll rapidly from bank to bank if required. Despite the nose-high attitude, the view over the flat-topped and tapering cowling remains almost up to Naval deck-landing standard. Stalling the Auster 9 in this configuration involves a strong and determined pull on the stick to get the nose pointing almost vertically upwards, and the aircraft will eventually break cleanly away at about 30-35 k. I.A.S., after slight preliminary 'mushing', still with full lateral control.

"Flaps up and power off, the stall occurs after almost imperceptible buffeting at about 35-40 k. I.A.S., involving a height loss in the region of 200 ft. after releasing the stick. The Auster 9 is cleared for spinning, to Army requirements, as evidenced by the large fuselage strakes and dorsal fin. Entry and recovery are conventional, the height loss for the maximum permissible two turns being about 700 ft. . . .

"Every A.O.P. landing can be regarded as a precautionary landing, as it is done at minimum speed, flap being lowered progressively below 70 k. and the Auster 9 settles down to a steep approach at about 1,700 r.p.m. and some 50 knots. This can be further reduced by another 5 knots on finals, giving a high rate of descent in almost the three-point attitude. Very little aft stick movement is thus required, the best landing technique apparently being the use of a burst of engine to cushion the touch-down. The squashy undercarriage does the rest for you.

With flaps at the 'take-off' setting and ailerons 'drooped' the Mk. 9 can climb steeply away from short restricted airstrips. *'The Aeroplane' photo* giving a feather-bed arrival, and it is possible to stand on the brakes, particularly with an aft C.G., to keep the landing run down to as little as 50 yd. The total distance to clear 50 ft. is only 235 yd. in a light wind . . .

"Maximum diving speed is 140 knots and the 20-sec. overspeed power setting is 2,730 r.p.m. Neither is likely to be easily attained accidentally, so that the progressive lightening of elevator and trimmer is unlikely to lead to inadvertent overstressing. The load factors at 2,000 lb. are $+4$ and $-2g$. No great changes of trim occur throughout the speed range or with changes of power; the nose-down moment after throttling back the engine is happily almost exactly countered when flap is lowered. The result is that the floor lever controlling the trim tab in the port elevator need scarcely be touched from take-off to landing . . .

"In many ways, the first few seconds after becoming airborne in a new type crystallise all one's personal impressions; it is rare that these are radically altered by subsequent experience. In the Auster 9, the commendably light static friction of the controls sets the standard for all phases of flight, the aircraft responding quickly yet firmly, with a comfortable solidity of feel characteristic of a larger and heavier type. All this adds up to an easy and pleasant flying machine which, I remember, was the case with the Auster 9's antecedent, the bulky B.4 . . .

"In all respects, therefore, the Auster 9 compares favourably with the few other light A.O.P. aircraft in production abroad, having better performance and economy, for example, than its nearest American equivalent which has almost one-third more power."—*END*

In close formation two Mk. 9's patrol the Malayan jungle.

AUSTER A.O.P. Mk. 9

Specification . . .

Performance

Performance figures at 2,125 lb. (974 kg.). This figure equals full normal operational load including pilot, observer, two radios and full fuel load (15 imp. gal.).

Maximum level speed	127 m.p.h. (204 km/hr.)
Maximum cruising speed	110 m.p.h. (178 km/hr.)
Initial rate of climb	970 ft/min. (296 m/min.)
Absolute ceiling	19,500 ft. (5,950 m.)
Range, at economic cruising speed	240 st. miles (400 km.)
Take-off run to unstick in 6 m.p.h. wind (9·3 km/hr. wind)	100 yd. (91 m.)
Landing run in 6 m.p.h. wind (9·3 km/hr. wind)	50 yd. (46 m.)
Total take-off distance to clear 50 ft. in 6 m.p.h. wind (9·3 km/hr. wind)	225 yd. (206 m.)
Total landing distance from 50 ft. to stop, in 6 m.p.h. wind (9·3 km/hr. wind)	200 yd. (183 m.)

Weights

Empty weight	1,590 lb. (720 kg.)
Removable load	535 lb. (243 kg.)
All-up weight	2,125 lb. (974 kg.)
Overload category	2,330 lb. (1,057 kg.)

Dimensions

Wing area	197·6 sq. ft. (18·357 sq. m.)
Wing washout	1½ deg.
Length	23 ft. 8½ in. (7·2 m.)
Height on ground	8 ft. 11 in. (2·7 m.)
Wing span	36 ft. 5 in. (11·0 m.)
Wing chord	5 ft. 6 in. (1·6 m.)
Aerofoil section	N.A.C.A. 23012
Dihedral	2 deg. 0 min.
Propeller diameter	7 ft. (2·1 m.)
Wheel track	6 ft. 8 in. (2·0 m.)

General Arrangement

AUSTER A.O.P. Mk. 9

. . . fully equipped for its job

One of the reasons for the success of the Mk. 9 in service is that it is adequately equipped for the many roles it is regularly called upon to perform.

Everything necessary to ensure operational efficiency is built into the aircraft.

Crew comfort in particular has been closely studied resulting in the Mk. 9 being pleasant to fly, and to fly in, up to its maximum period of endurance. The following list details the comprehensive range of equipment fitted to the Mk. 9.

GENERAL EQUIPMENT

Pilot's map case. Verey pistol and stowage. Four Verey pistol cartridges and stowage. Spare starter cartridge stowage. Crowbar and stowage. First aid stowage. Emergency pack stowage. Wing removal spanner and stowage. Internal control locking device and stowage. Refuelling footstep and stowage. Two adjustable forward facing seats with cushions. One reversible rear seat with cushions. Seat harness on all seats. Armour plate for pilot—seat and back. Flexible tank in starboard wing, self-sealing base and sides. Fire extinguisher and stowage. Four controllable cabin ventilators. Hinged windows in forward doors. 'built-in' tie-down rings, cabin heating and windscreen de-misting system, provision for dual controls.

INSTRUMENTS

Air speed indicator. Altimeter. Direction indicator.
Turn and slip indicator. Artificial horizon.
Engine speed indicator.
Oil pressure gauge. Oil temperature gauge.
Compass. Fuel gauge. Cylinder head temperature gauge.

CONTROLS

Control column. Rudder pedals incorporating brake pedals.
Trim control. Hydraulic flap control.
Throttle control. Starter control.
Hot/cold and filtered air control. Oil cooler control.
Parking brake control. Ki-gass primer pump. Fuel cock.
Cabin heat control. Dual ignition switches and wiring.

UNDERCARRIAGE

Liquid spring undercarriage.
Wheel brakes, hydraulic disc type.
Tyres 8.50 × 6 ribbed (main wheels).
Steerable tail undercarriage with liquid spring.
Tyre 8.00—SC pneumatic (tail wheel).

ELECTRICS

Navigation lights. Compass light. Radio light (for A.62 radio) (this also illuminates switches). Instrument light. Emergency light and battery. Wiring, switch and bracket for landing lights. Part wiring for camera operation and heater. Pitot heater. Downward identification lamp. 12 V regulator for A.62 radio. Oil dilution wiring. Generator cut-out and voltage regulator. Power failure warning light. Accumulator with cannon plug. Oil temperature gauge wiring. Engine tachometer wiring.

RADIO

Intercom. sockets for three seating positions. Press-to-transmit button on control column. Muting switch. Mounting for A.62 radio. Mounting for V.H.F. radio. Fixed wiring for V.H.F. Whip aerial including bracket. Mixing switch. Wiring connectors, and winch aerial for A.62 set.

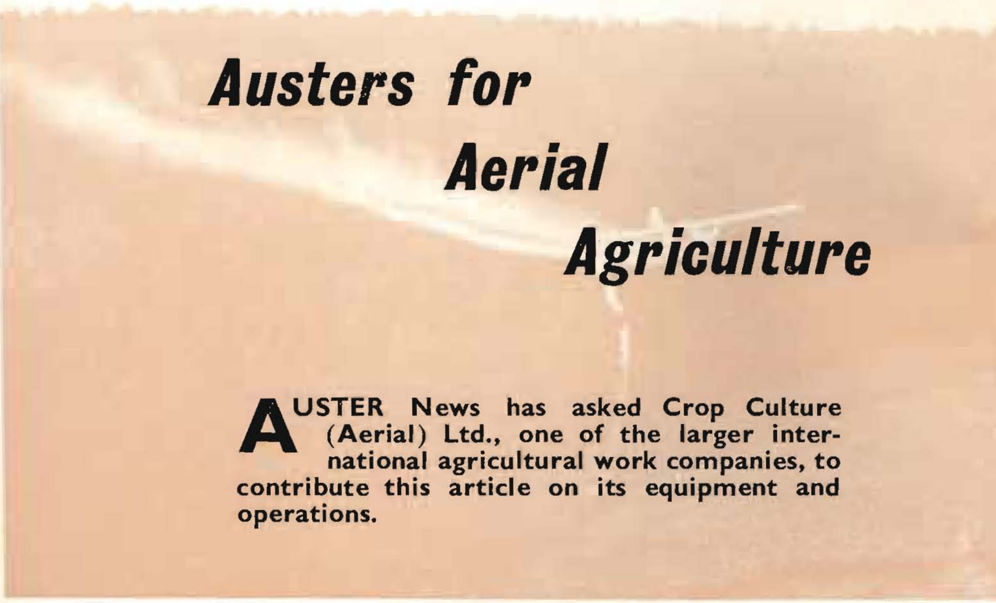
NOTE: Radios and control units are not included in this specification.

ENGINE CHANGE UNIT

Bombardier 203 engine. Vacuum pump (for instruments).
Coffman starter and exhaust pipe. Electrical generator.
Tacho generator. Hot/cold and filtered air intake.
Exhaust manifold and cabin heater element.

ENGINE INSTALLATION

'Crash-proof' oil tank.
Oil cooler complete with cooling duct and airflow control valve.
Oil pressure transmitter. Fuel deaerator and filter.
Ki-gass priming lines. Oil dilution valve.
Oil separator. Cabin heater control valve.
Generator cooling pipe. All-metal propeller.



Austers for Aerial Agriculture

AUSTER News has asked Crop Culture (Aerial) Ltd., one of the larger international agricultural work companies, to contribute this article on its equipment and operations.

Auster aircraft of various types have been used for agricultural work by Crop Culture (Aerial) Ltd. since 1954 when an Autocrat was modified for spray duties in the Sudan. Today, Crop Culture's fleet of over twenty fixed wing aircraft largely comprises Auster Alphas which are giving excellent service in such diverse places as the Sudan, the British Cameroons, Nigeria and the United Kingdom.

Before discussing the reasons for selecting the Auster for this type of work it is perhaps of interest to set out why it is that aeroplanes in this general category are used for agricultural duties on a world-wide scale.

It is well known that aircraft are capable of being used for farming work over terrain which is not suited to tractor-hauled ground appliances. This may be due to the prohibitive cost of placing and using ground machinery in locations which are not easily accessible, or which are hazardous, such as swamps, or the steep hill-side pastures of New Zealand.

But it is also true that there are often sound reasons for using the aeroplane rather than the ground appliance regardless of terrain.

First and foremost of these is speed. If the farmer were able to drive his tractor appliance across the field at 70 m.p.h., he would do so; the aeroplane can treat a field at speeds between 70 and 100 m.p.h. It is this ability to travel at speed which enables the aeroplane to do more work in a shorter time—and this means lower relative cost. Speed is also a vital factor if a sudden outbreak of disease is to be controlled quickly and effectively.

There are comparatively few places in the world where some form of ground equipment cannot be put into the field, but frequently the cost is prohibitive. Labour costs are today rising at such a rate that there are very few countries where manpower can justifiably be termed 'cheap'. Hence the advantage again of the aeroplane which calls for very little human support on the ground.

Furthermore, the aircraft is not only a fast, labour-saving agricultural machine, but is also a highly efficient spraying device in its own right by virtue of its inherent aerodynamic characteristics. As it passes through the air, it pushes a large volume of turbulent air downwards and backwards, thus providing a ready-made medium for discharging the liquid towards and into the vegetation on the ground.

If the spray is finely atomised, it will form a swirling mist of chemical which this downwash will distribute evenly throughout the crop.

Other factors favouring the aeroplane are its ability to treat large areas of the crop in a short space of time without at the same time crushing some of it beneath the wheels—as happens with a ground applicator—and the ability to operate when mud and slush in the field would bog down the tractor.

In short, the aeroplane is the newest and most versatile of farm machines, efficient, and able to cover large areas quickly with no damage to standing crops.

Crop Culture's aircraft are standard Auster Alphas with two main additions—a tank to contain the spray liquid chemical and the equipment for dispersing it. The tank used contains 48 imp. gallons and is situated on the floor behind the pilot in place of the rear seats. This tank is fitted with a special dump valve so that, should the pilot require to jettison the chemical, the operation of a lever opens a large sump in the side of the tank. The time taken to jettison a full load of spray liquid is approximately eight seconds.

The spraying equipment comprises two wing-tip mounted Micronair rotary atomisers. These units are designed and produced by Britten-Norman Ltd., an associate of Crop Culture.

The atomiser itself consists basically of a rotating gauze cylinder into which the chemical is fed under a pressure of 20-50 lb/sq. in. This principle enables droplets of an unusually precise constant size to be produced. A typical test showed that when the atomiser was set to produce droplets 46 microns in diameter, as much as 70 per cent of the droplets produced were within plus or minus 10 microns of this mass median diameter.

Each atomiser is driven by a windmill mounted beside it and connected to it by a 'Vee' belt. The windmill is equipped with a cable-operated brake so that the pilot may stop the unit in flight should he wish to do so—for example when ferrying the aircraft, or during a long trip from the landing strip to the scene of operations.

The size of the droplets may be regulated by adjustment of the angle of the windmill blades. Normal atomiser speeds are between 12 and 16,000 r.p.m., the higher speeds producing the smaller droplets. Oil-based chemicals are usually sprayed in droplets of 40-60 microns in diameter whilst water-based chemicals, which evaporate more easily, are usually applied at the larger size of between 80 and 120 microns. The liquid is passed to the atomisers through pipes which run up the rear lift struts and into the wing.

Pressure is supplied to the spray system by means of a wind-driven pump mounted on a special bracket which protrudes from the starboard side of the cabin just behind the door. An 'on-off' lever is fitted between the front seats. When the fluid is not being sprayed, the pump circulates the contents of the spray tank to prevent sedimentation. All valves and connections (except the two from the tank) are outside the aircraft.

The Alpha's performance with its heavy agricultural maximum load is still good. The endurance is over 3½ hours and the cruising speed between 70 and 80 m.p.h.

Dr. Bruce Chevatt and Crop Culture's Overseas Manager Jack Akers have an early morning talk prior to the aircralt spraying a Nigerian village to control Mosquitoes.

One of the most valuable of the Alpha's features—particularly in overseas operations—is the spare front seat enabling the operator to carry an engineer or representative to the scene of the spraying which, although only a few hours' flying time away, may represent one or more day's arduous surface travel by road or river boat.

These are among the many reasons why Crop Culture chose the

Auster for its spraying operations. These have included, over the past four years, treatments on cotton, coffee, peas and beans, hops, potatoes, bananas and cereals, and insecticidal work against mosquitos and locusts.

During 1957, Crop Culture's fleet (including Tiger Moths as well as Austers) have treated over three hundred thousand acres overseas and twelve thousand acres in the United Kingdom.

Finally, it may be of interest to describe a typical day in a Crop Culture spraying operation, such as the banana treatments being completed in West Africa. Work begins at about 5.30 a.m. The Alpha will be brought out of its hangar (which is sited alongside a prepared airstrip a mile or so from the plantation) and given its daily inspection. At 6 a.m., the pilot will be taxi-ing out to the take-off point on the 200-yard-long strip. At the end of the strip, the loading crew will fill up the spray tank with chemical by a petrol-driven pump. The pilot takes-off and begins his first sortie of the day. While he is away, the loading crew will be mixing more chemical and preparing for the return of the aircraft in about 15 minutes. During those 15 minutes, the Auster will have sprayed 44 acres at a rate of about one gallon per acre. The Auster lands, taxies straight up to the chemical pump and, without stopping the engine, is re-loaded in a matter of minutes. Several aircraft may be using the strip at one time and often there will be a queue for the loader. Each round trip will take about 20 minutes and by noon, when it becomes too hot to work, about 15 flights will have been made. During the afternoon, the pilot and crew rest, resuming operations about 4 p.m. Work will then continue until about six in the evening when darkness is approaching.

Operating mainly from rough, unprepared strips, it speaks well of the ruggedness of the Auster airframe that, even under such conditions, maintenance and repair is at a minimum.

Economy of cost demands high efficiency—there can be no delays due to the malfunctioning of equipment be it the aircraft or the re-loading pump. That is why Crop Culture has chosen the Auster Alpha for this exacting work. Coupled with the high performance of Britten-Norman spray equipment, Crop Culture is proving that crop treatment by air is practical, successful and economic.—*END*

The Alpha is Auster's answer to the need for a really low-priced aircraft capable of working hard under extremes of climate and arduous operational conditions. There is ample room for three adults, or two adults, plus two children on the rear bench-type seat. Many alternative duties can be performed by the Alpha fitted with the Gipsy Major 1 *engine of* 130 *h.p. These include glider- and banner-towing, aerial photography, club flying, charter work, and many more. Floats or skis of Auster design may also be fitted.*

High performance is the Alpha's winning feature with operators—at average loads such as two people and full fuel, take-off and landing runs are around the 100 *yd. mark.*—EDITOR.

AUSTER SERVICE BULLETIN

Issue No. 44 January/February 1958

Undercarriage Modification No. 1828

AUSTER J1, J1B, J1N, & CIVIL Mk. 5 AIRCRAFT

In order to increase the life of undercarriages fitted to the above mentioned aircraft it is strongly recommended that modification No. 1828 is embodied. This modification introduces a welded sleeve at the top of the radius rod and has proved very successful in service. *It should be noted that this modification is essential on J1N aircraft.* This work can be carried out by the Auster Repair and Service Department at Rearsby who would require the aircraft for a minimum period of one day. This is because the undercarriage has to be removed to enable the sleeves to be welded in position. Operators wishing to carry out the modification themselves may obtain all required materials and fitting instructions at low cost from : The Service Department, Rearsby, Leicester.

Tel: Rearsby 321, ext. 41

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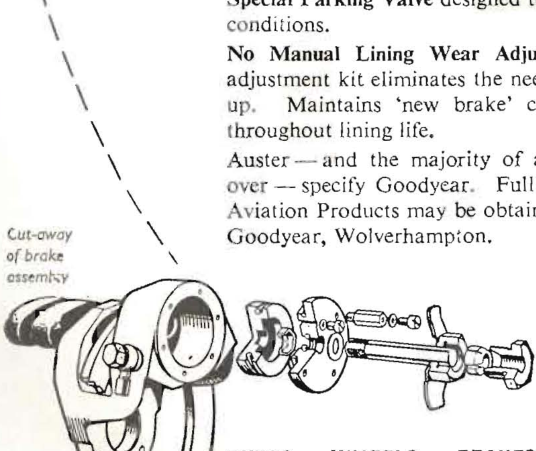
Cut-away of brake assembly



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